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A National Network for Communicable Diseases Surveillance

CONGENITAL RUBELLA IN AUSTRALIA - 1993 AND EARLY REPORTS FOR 1994

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Introduction

Since the introduction of rubella vaccination in Australia in 1970, there has been a marked decrease in the incidence of congenital infection[1]. The number of children born with defects is estimated to have fallen from up to 200 to less than 20 each year.

There has been specific surveillance of congenital rubella in the United States and Great Britain since the introduction of rubella vaccine, but not in Australia. In Britain, the National Congenital Surveillance Programme (NCRSP) was established in 1971, and in the United States the Centers for Disease Control set up the Congenital Rubella Syndrome Register at about the same time. In Australia, the records of the Australian Hearing Services (formerly the National Acoustics Laboratories) have provided an important proxy by monitoring the decline in incidence of children with congenital rubella deafness. Reports of congenital rubella syndrome have also been compiled by birth defects registers in some States and by the National Perinatal Statistics Unit, however, few reports have been received by these groups, especially in some States. Western Australia[2] and South Australia have supplemented or validated their birth defects registry reports from other sources and have more complete data.

In 1993 the Australian College of Paediatrics set up the Australian Paediatric Surveillance Unit (APSU), a national system for active voluntary reporting by paediatricians and other clinicians of selected rare diseases of children[3]. Conditions currently under surveillance include subacute sclerosing panencephalitis, acute flaccid paralysis, childhood dementia, drowning and near-drowning, extrahepatic biliary atresia, haemolytic uraemic syndrome, HIV/AIDS, Kawasaki disease, Rett syndrome, vitamin K deficiency bleeding and, since January 1993, congenital rubella.

The objectives of including congenital rubella in the APSU were: (i) to define more accurately its present incidence in Australia; (ii) to elucidate the reasons why mothers of children with congenital rubella have not been effectively vaccinated; and (iii) to monitor the outcome of rubella vaccination. The mass vaccination program commenced in Australia in 1971 with schoolgirls and non-pregnant women, and was accelerated in 1989-1990 when rubella vaccine (in the combined measles-mumps-rubella vaccine) was introduced for all children at the age of 12 months.

Methods

The APSU conducts surveillance of conditions in collaboration with investigators who undertake more detailed follow-up of cases of individual conditions. On behalf of these investigators, the APSU sends a monthly reply-paid card listing the conditions under surveillance to the participating clinicians, who include all members of the Australian College of Paediatrics, paediatricians listed by the Health Insurance Commission and the Royal Australasian College of Physicians, and members of paediatric sub-specialty organisations. The clinicians indicate whether they have seen any of the conditions during the last month and return the card even if they have 'nothing to report'. The unit notifies the appropriate investigator of the cases reported, and the investigator then sends a simple questionnaire to the clinician to document the case. This is de-identified to maintain confidentiality, but sufficient data are obtained to detect duplicate reporting.

For congenital rubella, paediatricians were asked to report any child or adolescent up to the age of 16 years who in their opinion had definite or suspected congenital rubella, with or without defects, based on history, clinical signs and laboratory findings. They were given a brief set of clinical and laboratory criteria to use as guidelines, but were encouraged to report even suspected cases for central evaluation.

Reports of congenital rubella syndrome or infection were also obtained from the *Communicable Diseases Intelligence* (*CDI*) Virology and Serology Reporting Scheme, the Australian Hearing Services and birth defects registers in an attempt to identify cases that had not been reported to the APSU.

The case definitions used in this report correspond with the most recent United Kingdom and United States classifications[4]:

Congenital rubella infection

No rubella defects but congenital infection confirmed by isolation of virus, or detection or IgM or persistent IgG in infant.

Congenital rubella syndrome

Confirmed — Typical rubella defect(s)* plus virus, IgM or persistent IgG in infant; or two or more rubella defects plus confirmed maternal infection in pregnancy.

Compatible — Two or more rubella defects with inconclusive laboratory data; or single rubella

defect plus confirmed maternal infection in pregnancy.

Possible — Compatible clinical findings with inconclusive laboratory data; for example, single defect plus probable maternal infection in pregnancy.

* Typical defects associated with congenital rubella include congenital heart disease, sensorineural deafness, cataracts, and retinopathy.

Results

The paediatrician response rate to the initial surveillance cards varied by State between 88% and 93%. Thirty-seven cases were reported between January 1993 and December 1994 with questionnaires returned by the diagnosing paediatrician. Twenty-two had congenital rubella syndrome or congenital rubella infection only, eight were duplicate reports, and seven did not fit the criteria.

Twelve of the 22 were born in 1993 (five) or 1994 (seven) in Australia: two in Queensland, two in the Australian Capital Territory, one in Victoria and seven in New South Wales (Table 1). There was one additional case of congenital rubella syndrome detected through the Australian Hearing Services (Greg Birtles, personal communication, 1995), which was not reported to the APSU. All six cases of congenital rubella syndrome reported to the *CDI* Virology and Serology Reporting Scheme and born in 1993 or 1994 (personal communication, 1995) were reported independently to the APSU, as was one case identified in the Victorian Birth Defects Register.

Three of the 12 infants reported through the APSU had no clinical defects (congenital rubella infection only), as maternal infection had occurred in the second or third trimester of pregnancy; two of these three were born in New South Wales (one in 1993 and one in 1994) and one was born in Queensland in 1994.

The other nine infants reporting through the APSU were classified as confirmed congenital rubella syndrome. All had multiple defects and two died (Table 2). For the thirteenth case, known to the Australian Hearing Service, we do not know whether deafness was the only defect, for reasons of confidentiality.

Seven of the 12 mothers had not been vaccinated, three gave a history of vaccination (documentation was not requested or validated) and in two the vaccination history was not known. These ages ranged from 16 to 40 years.

Two of the mothers were recent immigrants, one from Vietnam and the other from the Phillippines. Both these mothers had clear histories of rubella in early pregnancy, though in one this history was not elicited, because of language problems, until after the infant was born. Both infants were severely affected.

Six of the mothers of the nine affected children had high titres of rubella antibodies at their first antenatal visit, but had not been investigated further. Three of these mothers had a history of rash and had been tested early enough to be offered termination of pregnancy; the other three were also tested early, but had no history of rash.

Discussion

Congenital rubella is a vaccine-preventable condition. Data from the National Notifiable Diseases Surveillance System indicate that rubella activity has been high throughout Australia since spring 1992, with increased notifications from New South Wales, Queensland, South Australia and Western Australia in 1993[5]. However, a high proportion of these notifications involved infections in boys and young men, so it

Table 1. Congenital rubella cases born in 1993 and 1994, year of birth, State and Territory and source of information

Case	Year of birth	State or Territory	APSU	*CDI* Virology and Serology Reporting Scheme	Australian Hearing Services	Birth Defects Register
1	1993	Vic	+		+	+ (Victoria)
2		ACT	+	+	+	
3		NSW	+	+	+	
4		NSW	+			
5 (infection only)		NSW	+	+		
6 (infection only)	1994	NSW	+			
7 (infection only)		Qld	+			
8		NSW	+			
9		Qld	+			
10		NSW	+	+		
11		NSW	+	+	+	
12		ACT	+	+		
13		WA	-		+	

Table 2. Defects and outcome reported for congenital rubella cases born in 1993 and 1994

Case	Deafness	Eye defects	Congenital heart disease	Other defects	Outcome
1	+			Growth retardation	-
2	+			Cerebral palsy, bone changes, neonatal thrombocytopaenia	-
3	+	Bilateral cataracts	Patent ductus Pulmonary artery stenosis	Failure to thrive, delayed development	-
4			Patent ductus	Intracranial calcification, neonatal thrombocytopaenia	Died
5	-			Infection only, no defects	-
6	-			Infection only, no defects	-
7	-			Infection only, no defects	-
8	+			Intracerebral calcification, hepato- and splenomegaly, developmental delay	-
9	+	Retinopathy	Congenital heart disease, type not reported		-
10	?	Left cataract	Patent ductus, atrial septal defect	Microcephaly, hepato- and splenomegaly	-
11	+	Keratitis	Patent ductus	Intracranial calcification, microcephaly, intrauterine growth retardation, bone changes	-
12		Right cataract	Patent ductus		Died
13	+	This case was known to the Australian Hearing Services.			

was not clear if this outbreak would cause a rise in the number of cases of congenital infection.

It is likely that reporting through the APSU is almost complete now for 1993 (four infants with congenital defects), but additional reports for births in 1994 (presently five affected infants) can be expected. Reports have come only from the eastern States and the focus of cases in New South Wales and the Australian Capital Territory is in excess of what would be expected from their birth cohort relative to the other States (New South Wales and the Australian Capital Territory, 94,500 births per year; Victoria, 65,000; Western Australia, 25,000; Queensland, 45,000; South Australia, 20,000; Tasmania, 7000; Northern Territory, 3500). This may suggest either clustering of cases in the east, or underreporting to the APSU. Western Australian and South Australian data reports of terminations for rubella are evidence that cases may have occurred in States other than the eastern States. Carol Bower (Institute for Child Health Research, Perth) has been informed of two first trimester terminations for rubella in Western Australia in 1993 and one mid-trimester termination in 1994 (personal communication, 1994), while Sue Selden (South Australian Health Commission) knows of one termination in South Australia in 1993 (1994 data not yet available) (personal communication, 1994). Other States and Territories vary in their ability to collect data on terminations.

It is difficult to know if the total of ten affected infants (including the child known to the Australian Hearing Services) represents a rise in the incidence of congenital rubella syndrome, as no comparable data were available prior to 1993. Fortunately, Western Australia and South Australia have good records and appear not to have experienced a recrudescence of congenital rubella.

It is perhaps surprising that there have been no reports yet through the APSU of children born in 1993 or 1994 with congenital rubella syndrome and deafness as the only defect, although milder deafness alone may be diagnosed more often in older children. Approximately 20% (33% in recent Western Australian data (Carol Bower, personal communication, 1994)) of cases would be expected to have only deafness.

The failure to investigate the high rubella antibody titres found at the first antenatal visit in six of the mothers of these nine infants was disappointing, par-

ticularly as three had histories of a rash compatible with rubella and could have been counselled and offered termination of pregnancy.

In the United Kingdom (annual birth cohort 600,000) there have been 14 reported cases of congenital rubella born since January 1991[4]. It would seem that the rate there is less than in Australia, however, although there is a similar reporting system (through the British Paediatric Surveillance Unit), it is not possible to make a direct comparison of the British and Australian paediatricians' reporting compliance. In the United Kingdom, schoolgirl and adult vaccination commenced in 1970, and authorities have documented a marked decline in congenital rubella since the introduction of measles-mumps-rubella vaccine for all infants in 1988[4]. Terminations for rubella infection have also declined markedly in the United Kingdom since the early 1980s. In addition, it appears that close attention is paid to antenatal serological testing; in 1993, all 13 cases of rubella infection which were confirmd in the first trimester were terminated[4].

The United Kingdom monitors not only the outcome of rubella in pregnancy (births of children with congenital rubella syndrome or infection) but also the serological status of teenagers and pregnant women. In 1993 there was an increased proportion of seronegative girls aged 13 to 14 years (5.8%, compared with an average of 3.6% between 1986 and 1992) and of seronegative women (1.8%, compared with 1.3% in 1990)[4]. This surveillance (with similar surveillance of measles serological status) allowed implementation of early control measures before an expected outbreak - in November 1994 the United Kingdom carried out a one-off national campaign to immunise all persons aged five to 16 years with a combined measles-rubella vaccine[6]. Following this, rubella vaccination of teenage schoolgirls will cease, because children in the first cohort which received measles-mumps-rubella vaccine are now eight years old.

It is notable that nine of the 12 mothers who had infants with congenital rubella syndrome in the United Kingdom between 1991 and 1995 were immigrants, mostly from Asia[4]. Immigrants from countries without programs for rubella vaccination are often susceptible and have little knowledge of the risks of rubella in pregnancy. Two of the nine mothers with affected infants born in Australia in 1993 and 1994 were recent immigrants and serological testing in Western Australia has shown showed that only 88% of pregnant women of Asian derivation were immune to rubella[2]. This highlights the importance of targeting recent immigrants for rubella vaccination[6,7], and of careful attention to the postpartum vaccination of seronegative women.

The United States (annual birth cohort, four million) also experienced a recrudescence of congenital rubella syndrome in 1990 (31 cases) but reports have since decreased[8]. It would appear that the incidence of congenital rubella syndrome in the United States is very much lower than in Australia or the United Kingdom, but is it difficult to know how complete the data are. As the United States relied initially on mass vaccination of infants born since 1969, and far less on adolescent and adult vaccination than Australia and the United Kingdom, there are still many women of child-bearing age there who remain susceptible[9].

A long time has now elapsed since the introduction of rubella vaccination to developed countries, but cases of congenital infection continue to occur. The World Health Organization aims to eliminate indigenous congenital rubella and rubella in pregnancy from Europe by the year 2000[4]. If Australia is to keep pace, better surveillance and public and professional education are required. It is time governments significantly increased their financial support for these endeavours. It is planned to continue the Australian surveillance through the APSU.

Acknowledgments

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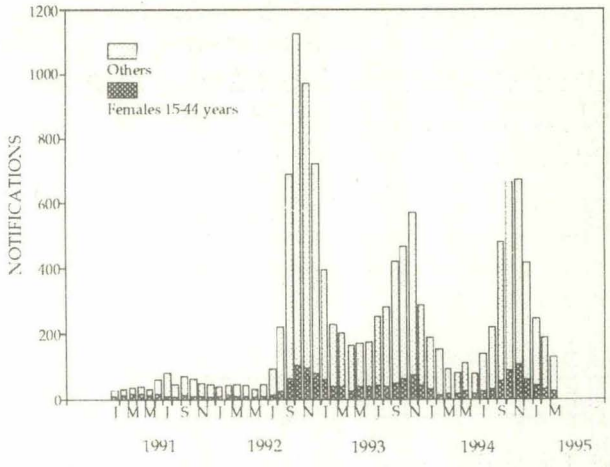
CDI editorial comment

Notifications of rubella received by the National Notifiable Diseases Surveillance System have increased markedly since 1991 (Figure). There was a total of 11,671 notifications received with onset between January 1991 and December 1994, and overall peaks in the spring of 1992, 1993 and 1994. Increased notifications were reported from the Australian Capital Territory in 1992, New South Wales in 1992 and 1993, Queensland since 1992, South Australia in 1992 and 1993, Victoria in 1992 and Western Australia (where it was not notifiable until early 1993) in late 1993 and in 1994. Almost half (5528) of the notifications have been for males in the 10 to 34 year age group. However, the notifications have also included 1638 females aged 15 to 44 years, for whom reporting peaks similarly occurred in spring 1992, 1993 and 1994.

The *CDI* Virology and Serology Reporting Scheme has also documented this recently increased rubella activity in Australia. As indicated in the article above, it received six reports of congential rubella syndrome in 1993 and 1994, all diagnosed by demonstration of IgM. There were also two other reports of adverse pregnancy outcomes associated with rubella infection in 1994; a 26 year old female with fetal death in utero at 18 to 20 weeks' gestation, and a 23 year old female who had delivered a stillborn infant (both diagnosed by demonstration of IgM). In addition, there have been a 25 reports of rubella diagnosed in pregnant women since 1993 - 11 in 1993, 12 in 1994 and two so far for 1995. The length of gestation was reported for only three of these (5 weeks, 17 weeks and 30 weeks).

Figure 1. Rubella notifications, 1991 to 1995, by month of onset and patient type



HIV IN AUSTRALIAN CHILDREN, 1993 AND 1994

Ann McDonald[1], *Elizabeth Elliott*[2], *Marilyn Cruickshank*[3], *Margaret MacDonald*[1], *John Zeigler*[3]

In May 1993, the Australian Paediatric Surveillance Unit (APSU) was established as a Unit of the Australian College of Paediatrics, with the objectives of monitoring trends in the occurrence of rare childhood disorders or conditions, or rare complications of common childhood conditions[1,2]. Paediatric HIV infection and perinatal exposure to HIV were included in the list of rare childhood conditions monitored by the APSU for several reasons. First, national surveillance for cases of newly diagnosed HIV infection and AIDS provides a relatively incomplete description of the extent and outcome of perinatal exposure to HIV as the majority of children born to women with HIV infection would be confirmed to be without HIV infection[3]. Second, a child's HIV status can only be confirmed following loss of maternal HIV antibody, which occurs over a variable length of time after the child's birth. In addition, children born to women with HIV infection represent a population of special interest in HIV disease. We report the results of the first 20 months of surveillance by the APSU of paediatric HIV infection and perinatal exposure to HIV.

At the end of each calendar month, the APSU forwards to paediatricians in Australia a report card listing the ten rare childhood conditions currently being monitored. Paediatricians to whom the report card is sent includes those recorded as members of the Australian College of Paediatrics and paediatrician members of the Royal Australasian College of Physicians, complemented by members of paediatric sub-speciality organisations, and paediatricians recorded by the Health Insurance Commission. The paediatricians are requested to indicate on the report card the number of children with each of the specified conditions seen during the previous month or to indicate that they had seen no such children, and to return the completed report card to the APSU. Children with HIV infection or disease who were aged less than 13 years at diagnosis and children born to women with diagnosed HIV infection were classified as cases of paediatric HIV infection or perinatal exposure to HIV[4].

The APSU compiled a list of paediatricians who reported having seen children with HIV infection or perinatal HIV exposure from the returned report cards

1. National Centre in HIV Epidemiology and Clinical Research, Sydney, New South Wales.
2. Australian Paediatric Surveillance Unit, Sydney, New South Wales.
3. Paediatric AIDS Unit, Prince of Wales Children's Hospital, Sydney, New South Wales.

Table 1. Reports of paediatric HIV infection or perinatal exposure to HIV made to the Australian Paediatric Surveillance Unit, May 1993 to December 1994, reports for which the questionnaire was returned, response rate and confirmed cases, by State or Territory

State or Territory	Reports received by APSU	Reports for which questionnaire was returned	Response rate (%)	Confirmed cases
ACT	0	-	-	-
NSW	79	75	95	42
NT	0	-	-	-
Qld	15	14	93	8
SA	7	7	100	2
Tas	0	-	-	-
Vic	33	21	64	12
WA	3	1	33	1
Total	137	118	86	65

and forwarded it to the National Centre in HIV Epidemiology and Clinical Research (NCHECR).

The paediatricians were sent a questionnaire seeking the name code, sex and date of birth of the child, the source of exposure to HIV (whether through transfusion of blood or blood products, treatment for haemophilia or through perinatal HIV exposure), and the child's current HIV disease status. Based on the response from the paediatricians, the reports were classified as either confirmed cases or duplicate reports of HIV infection or as perinatal HIV exposure or as reporting errors.

Over the 20 month reporting interval May 1993 to December 1994 inclusive, 137 reports of paediatric HIV infection or perinatal HIV exposure were received by the APSU. The distribution of reports, the response rate to the questionnaire and the number of confirmed cases of paediatric HIV infection or perinatal exposure to HIV, by State or Territory of report are summarised in Table 1.

The majority of reports of paediatric HIV infection in both 1993 and 1994 came from New South Wales and no reports were received from the Australian Capital Territory, the Northern Territory or Tasmania. By 30 April 1995, 118 of 137 questionnaires had been returned to the NCHECR, giving an overall response rate of 86% (82% in 1993 and 93% in 1994). Insufficient information was provided on the returned questionnaire to enable classification of the case for one report in both years. Therefore a completed questionnaire was available for 64 reports in 1993 and 52 reports in 1994 (total 116 reports).

Of the 64 reports in 1993 for which a completed questionnaire was available, 46 were of confirmed cases and 18 were identified as duplicate reports. In 1994, 19 reports were confirmed cases, and 32 duplicate reports and one reporting error were identified (Table 2).

The majority (63%) of confirmed cases reported in 1993 and all confirmed cases reported in 1994 were cases of perinatal exposure to HIV. Six (21%) of the 29 cases of perinatal HIV exposure reported in 1993 were born in 1993 and 15 cases (79%) of the 19 reported in 1994 were born in 1994. For seven children with perinatal HIV exposure born in 1994, HIV status remained indeterminate at 30 April 1995 and six children have been diagnosed with HIV infection. Of the 33 children born prior to 1994, 16 had been diagnosed with HIV infection, 16 had been confirmed as being HIV antibody negative and the HIV infection status of one case remained indeterminate at 30 April 1995.

Table 2. Confirmed cases of paediatric HIV infection or perinatal exposure to HIV by sex, exposure category and year of report

	1993			1994		
Exposure category	Male	Female	Total	Male	Female	Total
Mother with/at risk for HIV infection	19	10	29	10	9	19
Haemophilia/coagulation disorder[1]	14	0	14	0	0	0
Receipt of blood transfusion, blood components, or tissue[1]	1	2	3	0	0	0
Total	34	12	46	10	9	19

1. In all reported cases, exposure to HIV occurred prior to the 1985 introduction of HIV testing of all blood and blood products in Australia.

Almost all of the cases for which the exposure category was reported as haemophilia/coagulation disorder or receipt of blood transfusion, blood components or tissue, had been first diagnosed with HIV infection prior to 1990. By 31 March 1995, five of these cases were reported as having been diagnosed with AIDS and four had died following AIDS.

Reports to the APSU from paediatricians treating children with HIV infection or with perinatal exposure to HIV did not enumerate all such cases reported to the national surveillance centre. However, for 16% of cases of perinatal exposure to HIV seen in 1994 the APSU was the primary source of information.

Continued surveillance for paediatric HIV infection and perinatal exposure to HIV through the APSU, complemented by national surveillance for cases of newly diagnosed HIV infection, is expected to provide a more complete indication of the extent and outcome of perinatal exposure to HIV in Australia than had been previously available.

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CDI editorial comment

By 31 December 1994, a total of 123 children (under the age of 13 years at time of diagnosis) had been diagnosed as HIV positive in Australia since the introduction of HIV testing in 1985, and reported to the National HIV Database[1]. For 104 of these, presumed mode of transmission has been reported. Eighty-three were males, 20 with the reported exposure category of mother with/at risk for HIV infection, 49 with haemophilia/coagulation disorder and 12 with receipt of blood transfusion, blood components or tissue. The remaining 21 were females, 16 with the reported exposure category of mother with/at risk for HIV infection, and 5 with reported receipt of blood transfusion, blood components or tissue. Thirty-four of these children had been reported with AIDS (25 males and 9 females) and 28 had died (22 males and 6 females). Children have comprised 0.8% of diagnosed HIV infections (for which age was reported), 0.6% of reported AIDS diagnosis and 0.7% of reported deaths following AIDS in Australia.

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ROUTINE ENVIRONMENTAL HEALTH FOLLOW-UP OF NOTIFIABLE ENTERIC DISEASES

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Introduction

Prior to 1992 general practitioners throughout Western Australia notified all notifiable diseases to the Epidemiology Branch of the Health Department of Western Australia in Perth. Sexually transmissible diseases (STDs) were separately notified to the Murray Street Clinic which had a statewide responsibility for the management and control of STDs, but has since been disbanded. Environmental health follow-up was initiated from the Epidemiological Branch or the Environmental Health Branch of the Health Department of Western Australia in Perth (for typhoid, paratyphoid, listeriosis, cholera, ornithosis and legionellosis cases). This system, depending as it did on a number of central bureaucracies, each located at a separate address, resulted in significant delays in initiating routine follow-up of enteric diseases by environmental health officers in local shires and this was especially true in the rural parts of Western Australia.

In 1992 a pilot scheme was established in the Great Southern Region of Western Australia (population approximately 69,000) to trial a system of local disease notification and follow-up. Since 1992, notifiable diseases, including sexually transmissible diseases, occurring in residents of the Great Southern Region have been notified to the Public Health Unit in Albany and follow-up has been instigated from there. This report reviews this system of local routine environmental health follow-up of enteric diseases during 1994.

Methods

A notification form for use in the Great Southern Region was developed in consultation with general practitioners, and all notifiable diseases included on it. All notifications were forwarded to the Public Health Unit in Albany and were maintained on a confidential database, based on Epi Info version 5[1]. Local notifica-

tions were sent to Perth for collation with other notifications from the rest of the State.

The three pathology laboratories in the Region, two State Health Laboratories and one private laboratory, agreed to send to the Public Health Unit copies of reports of notifiable diseases identified in their laboratories. In order to protect confidentiality, patient names were not reported but the name of the requesting doctor and the patient's date of birth allowed for cross checking with the general practitioner notification. A monthly bulletin was sent to general practitioners, environmental health officers, community health nurses, participating laboratories and hospitals throughout the Region detailing the notifiable diseases from the previous month with clinical and epidemiological comments as appropriate.

On receipt of a notification of an enteric disease from a general practitioner, a standard investigation form was sent by post to the environmental health officer at the relevant shire and this form was returned to the Public Health Unit after the environmental health investigation had been completed.

Results

The Great Southern Region is represented by the Australian Bureau of Statistics Lower Great Southern (515) and Upper Great Southern (520) Statistical Divisions. There were 279 disease notifications in the Great Southern Region in 1994, representing a crude notification rate of approximately 404 per 100,000, not dissimilar to the Western Australian rate of 378 per 100,000 reported from the national database[2] or 460 per 100,000 reported from the State database[3], which included notifications for amoebiasis, giardiasis, methicillin-resistant *Staphylococcus aureus* and hookworm, not included on the national database.

The number of notifications has been increasing in the Great Southern Region since 1991 (Figure 1). This increase can be accounted for by an increasing population; a number of newly gazetted notifiable diseases in Western Australia, including rubella (non-congenital), genital chlamydia, Barmah Forest virus infection, invasive disease caused by *Haemophilus influenzae* type b, mumps and dengue; a probable increase in general practitioner notification compliance and a marked rise in notifications of hepatitis C following its gazettal as a notifiable disease in 1993.

The commonly notified diseases in the Great Southern Region were similar to those reported for the State and nationally (Figure 2), and in 1994 the nine most commonly notified diseases accounted for 84% of all notifications.

Routine environmental health follow-up was instigated for notifications of campylobacteriosis, giardiasis, hepatitis A, salmonellosis and shigellosis. These diseases accounted for 97 notifications in the Region in 1994 (35%). Requests for investigation were sent for 81 of the notifications. Follow-up investigation was not requested in instances where it would have been difficult, for instance when there had been a case of hepatitis A in a shearing team which had subsequently dispersed to other States or when a disease had been notified in a short-stay visitor from another State.

Figure 1. Notifications in the Great Southern Region, 1990 to 1994, by year

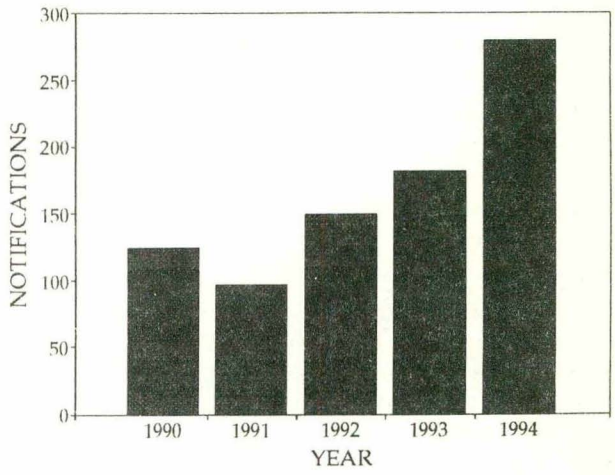
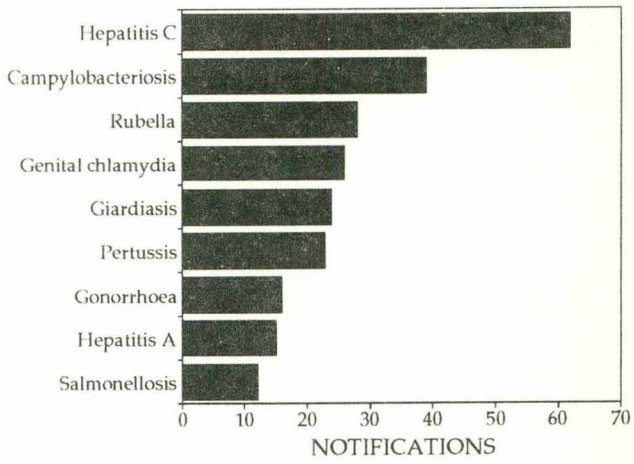


Figure 2. Most commonly notified diseases in the Great Southern Region, 1994



Of all investigation requests, 66 (81%) were completed, and follow-up was not completed for every notification of any of the enteric diseases. The reasons for incomplete follow-up were not investigated but follow-up can be very difficult in the more remote parts of the Region where environmental health officers visit only once every two to four weeks.

The average time taken from sending the environmental health follow-up request form to completion of the investigation was 6.8 days (standard deviation = 7.3 days and range 0-48 days); many reports were completed within two to three days of the request being received and 73% of all reports were completed within a week. This time included the postal delays in sending

and receiving the request and delays which included weekends. Follow-up requests are now sent by fax or made by telephone in order to try to overcome these problems.

Environmental health intervention was only undertaken following four of these 81 cases (5%). Three were from one agricultural college where the hygiene and food preparation at the college were extensively reviewed, and one was in a family discovered to be living in sub-standard accommodation which the shire undertook steps to remedy.

Intervention was generally not undertaken because, even though quite detailed food histories were taken in many cases, the source or vehicle for most of these enteric diseases remained obscure and there was no obvious intervention that was appropriate. Moreover, during 1994 no disease clusters were identified by environmental health follow-up, although in the previous year follow-up of a case of campylobacteriosis in a child led to the identification of other associated cases. These cases were thought to be related to an unlicensed day care facility at the local technical and further education (TAFE) college. Improvements in hygiene and food handling at the day care centre within the TAFE college were effected following this intervention.

Discussion

The trial of local disease notification and follow-up has demonstrated that environmental health officers employed by local shires are able to act promptly to investigate isolated cases of enteric disease. Investigations were usually completed and reports lodged with the local Public Health Unit within one week. There was, of course, a much longer delay between onset of symptoms and completion of follow-up but this depended on the delay in consulting a general practitioner, the time taken for laboratory identification of the agent, the delay in doctor notification and postal delays. However, while the environmental health officers had the opportunity of educating individuals and groups about hygiene and enteric diseases, it was unusual that a vehicle for an enteric pathogen and/or the circumstances that lead to transmission were discovered. Thus it was unusual that any environmental health intervention was instigated as part of a routine investigation.

This review of local diseases notification and follow-up in the Great Southern Region has therefore lead to the conclusions that disease notification and follow-up, including outbreak investigation[4], was efficiently handled at a local level. However, apart from the important opportunity to provide education, routine follow-up of isolated cases of enteric diseases, particularly giardiasis and campylobacteriosis, may not be an efficient use of the environmental health officers' time. A strong argument exists that follow-up of these enteric diseases should be confined to clusters, with exceptions, such as any isolated case of enteric disease in a food-handler, which should still be treated as a matter of urgency.

Unfortunately there is very little information on the timeliness or effectiveness of routine follow-up of giardiasis and campylobacteriosis, the most commonly notified enteric diseases, as opposed to regular review and follow-up of other enteric diseases, like hepatitis A[5], salmonellosis[6] and other episodes of food poisoning, whether notifiable or not[7]. As an indication, there were no reports of follow-up of either campylobacteriosis or giardiasis in *Communicable Disease Intelligence* in 1994[8].

It is important, therefore, to review the environmental health strategies employed, for these two diseases at least, and to decide whether routine follow-up is the most efficient method of disease control. Such a review for campylobacteriosis is in progress in the Environmental Health Branch of the Health Department of Western Australia.

Acknowledgments

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OVERSEAS BRIEFS

In the last two weeks, the following information has been supplied by the World Health Organization (WHO), the United States' State Department, the Program for Monitoring Emerging Diseases and the South Pacific Epidemiological and Health Information Service.

Ebola virus outbreak in Zaire

An outbreak of haemorrhagic fever caused by Ebola virus has been reported from Zaire. It is reported to have begun in February and to have resulted in 170 deaths by 11 May (including 14 health workers). The cases have reported from the city of Kikwit, in Bandundu Region, east of Kinshasa. There have also been possible cases reported from Musango, a city between Kikwit and Kinshasa, to which an affected Italian national had been transferred for treatment.

Zaire authorities have quarantined infected persons and travel to and from the area has been restricted. Staff from the WHO, the United States' Centers for Disease Control and Prevention (CDC), the Institut Pasteur and the National Institute of Virology in South Africa arrived in Kikwit on 10 May to undertake a field investigation, and to advise local health officials on patient care and management, and on outbreak control measures. Laboratory confirmation of Ebola virus was achieved for specimens which had been sent to the CDC in Atlanta, United States.

Three Ebola virus outbreaks (affecting a total of more than 500 persons) have been previously identified in Africa - in Yambuku, Zaire in 1976, and in southern Sudan in 1976 and in 1979. Ebola-related filoviruses were also reported from cynomolgus monkeys imported into the United States from the Philippines in 1989 and 1990 (*CDI* 1990;(1):8-9, (4):6-11, (6):2-3). Many of the monkeys died, however, although some of the monkey handlers seroconverted, there were no associated cases of human illness.

More recently, a Swiss female researcher who had been working with monkeys was repatriated from Côte d'Ivoire when she developed a febrile condition, in November 1994. In February, it was announced that she had Ebola virus antibodies, and that a blood sample taken in December was positive for Ebola virus. The patient recovered and there has been no evidence of secondary cases either in Côte d'Ivoire or in Switzerland. Investigations are continuing to identify any associated asymptomatic infections.

The virus causes a systemic febrile illness with multiple system involvement. It is usually characterised by sudden onset with malaise, fever, myalgia, headache and pharyngitis, followed by vomiting, diarrhoea, a maculopapular rash, limited renal and hepatic involvement and haemorrhagic diathesis. Case fatality rates have ranged from 50% to nearly 90%. Transmission occurs by direct contact with infected blood, secretions, organs or semen; nosocomial infections have been frequent.

The Departments of Human Services and Health and Foreign Affairs and Trade advise that travellers should consider postponing any visits to Zaire, and in particular to the affected or nearby areas. The Australian quarantine authorities, which monitor ill persons arriving in Australia, have been alerted to the outbreak and standard protocols are in place to review travellers who may have arrived from the affected areas. The Departments of Human Services and Health and Foreign Affairs and Trade and quarantine authorities are continuing to monitor the situation.

Dengue 3 in New Caledonia

An epidemic of dengue 3 is in progress in New Caledonia. Two hundred and seventy-four clinical cases were reported between 1 January and 5 March, with 188 laboratory confirmed as dengue 3, the same serotype that was responsible for the last epidemic in the region, in 1980. The outbreak began slowly in January, and in late February and early March, there were 60 to 70 cases per week. Cases have been confined to the main island, Grande Terre, with 115 reported from Noumea. The reported age range is from infancy to 86 years, with three-quarters between the ages of 20 and 64 years. Control activities undertaken and continuing have included ultra-low volume insecticide spraying, mosquito larvae control and a public information campaign.

Influenza in the Northern Hemisphere

Influenza activity reached a peak in Canada and the United States during the first two weeks of March and has since declined. A few countries in Europe (Austria, Belgium, Croatia, Latvia, Netherlands, Norway, Poland, the Russian Federation, United Kingdom) reported signs of increasing activity at the end of February or in March, but Switzerland remains the only European country reporting epidemic activity this season.

Influenza viruses have circulated widely in North America and Europe this season. Both influenza A(H_3N_2) and influenza B viruses have been common, sometimes found to be co-circulating. Influenza A(H_1N_1) virus has also been reported infrequently.

Cholera update

Somalia has reported 9091 cholera cases and 169 cholera deaths for the period 1 January to 31 March this year.

Cholera cases have been reported for January, February and March from Cambodia, Cameroon, Cape Verde, Costa Rica, El Salvador, Ghana, Guinea Bissau, India, Kenya, Laos, Philippines, Singapore, Somalia and in Rwandan refugee camps in Tanzania and Zaire.

COMMUNICABLE DISEASES SURVEILLANCE

Virology and Serology Reporting Scheme

There were 789 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 6, 7 and 8).

- One report of **measles** was received this period for a male in the 15 to 24 year age group. The number or reports received continues to decline (Figure 1).
- **Rubella** was reported for 5 patients this fortnight including 2 females in the 15 to 44 year age group. Diagnosis was by IgM detection (4) and fourfold rise in titre (one). In February the number of reports fell to its lowest level since July 1994 (Figure 2).
- Seven reports of **hepatitis A** were received this period, all in the 25 to 99 year age group.
- Positive **hepatitis B** serology was reported for 55 patients this fortnight, 33 males and 22 females. Thirty-five patients were in the 25 to 44 year age group, and 13 in the 15 to 24 year age group. Included were 3 pregnant females and one injecting drug user.
- Seventy-five reports of positive **hepatitis C** serology were received this period. Included were 46 males and 27 females (2 sex not stated). Fifty-six reports were for the 25 to 44 year age group. Included were 13 injecting drug users, one haemophiliac and the index case in a needlestick injury.
- **Ross River virus** was reported for 5 patients this fortnight, from Tasmania (3), the Australian Capital Territory (one) and Victoria (one). All diagnoses were presumptive (IgM detected). Included were 3 males and 2 females all in the 25 to 57 year age group. Specimen collection dates ranged from mid-March to mid-April. The number of reports received for the months of February and March were the lowest for those months since 1990.
- **Flavivirus (unspecified)** was reported for 2 patients this period, both males including a 29 year old with fever, rash and myalgia who had recently returned from Indonesia.
- Twenty-eight reports of **adenovirus** were received this fortnight diagnosed by virus isolation (19), antigen detection (7) and single high titre (2). Included was one each of adenovirus **types 1, 2** and **37.** Also included was isolation of untyped adenovirus from a post mortem lung specimen from a 17 year old male.
- **Herpes simplex virus type 1** was reported for 110 patients this fortnight. Diagnosis was by virus isolation (102), antigen detection (6) and IgM detection (2). Included was IgM detected in the serum of a 28 year old female who had had a foetal death in utero.
- One hundred and two reports of **herpes simplex virus type 2** were received, diagnosed by virus isolation (100) and antigen detection (2).

Figure 1. Measles laboratory reports, 1993 to 1995, by month of specimen collection

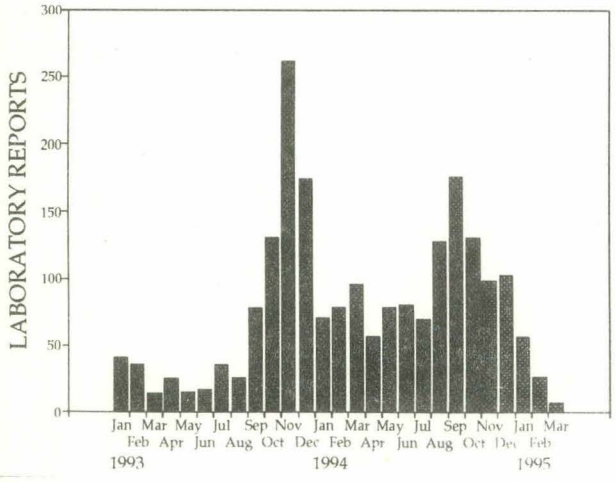
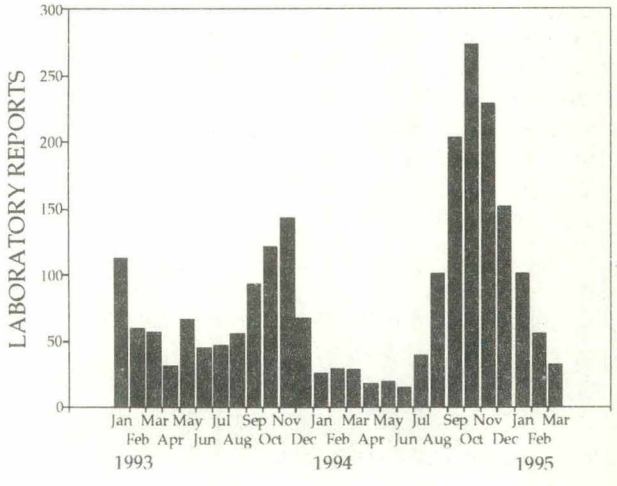
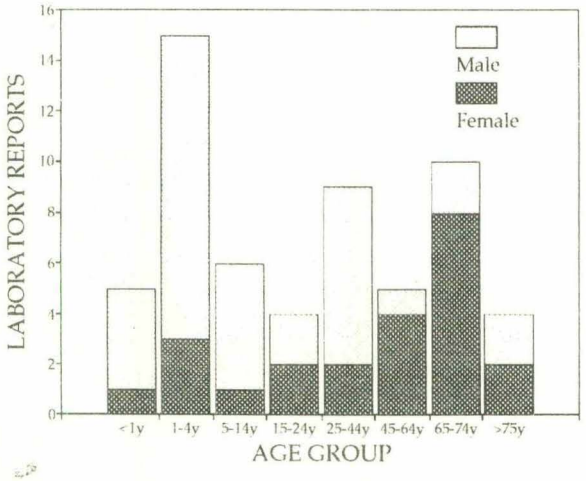


Figure 2. Rubella laboratory reports, 1993 to 1995, by month of specimen collection



- There were 40 reports of **cytomegalovirus** (CMV) this fortnight, 30 virus isolations, one antigen detection, 8 IgM detections and one single high titre. Included was virus isolation from the urine of a 3 year old liver transplant recipient (organ donor seropositive).
- **Varicella-zoster virus** was reported for 18 patients this period. Method of diagnosis included virus isolation (12), antigen detection (4), and IgM detection (2).
- **Papovavirus** was detected by electron microscopy in the urine of a 29 year old transplant recipient.
- Two reports of **coxsackievirus type B3** were received this period, isolated from the nasopharynx of a 2 month old male with a diagnosis of apnoea and from the faeces of a 2 year old male with gastroenteritis.
- **Coxsackievirus type B5** was isolated from the CSF of a 38 year old male with meningitis.
- Twenty-one reports of **rhinovirus** were received this period including 17 patients under the age of 4 years.
- Four reports of **enterovirus type 71** isolation were recieved this fortnight, all from Victoria. Included were 3 males and one female, 3 one year of age and one aged 19. Virus was isolated from the skin of 3 patients and the nasopharynx and faeces of one. One child was reported to be part of an outbreak in a child-care centre.
- **Influenza A** was reported for 17 patients this fortnight from New South Wales (4), Queensland (2), South Australia (7) and Victoria (4). Included were 12 males and 3 females (2 sex not stated) of whom 2 were over the age of 65 years. Method of diagnosis included virus isolation (8, specimen collection dates early to mid-April), antigen detection (3, specimens collected late April), fourfold rise in titre (2) and single high titre (4). A total of 61 reports has been received so far this year, 21 of whom were under the age of 4 years (Figure 3).

Figure 3. Influenza A laboratory reports, 1995, by age group and sex



- Four reports of **influenza B** were received this period, from New South Wales (2) and South Australia (2). Diagnosis was by virus isolation (2, specimen collection dates in mid-April), fourfold rise in titre (one) and single high titre (one). Seventeen reports have been received so far this year.
- Twenty-eight reports of **parainfluenza virus type 2** were received this period, 23 of which were for children under the age of 4 years. Method of diagnosis included virus isolation (11) and antigen detection (17). A total of 40 reports has been received for the month of April, more than for any month since May 1989.
- **Parainfluenza virus type 3** was reported for 14 patients this fortnight, 11 in the under 4 years age group. Diagnosis was by virus isolation (10) and antigen detection (4). Included was virus isolation from the nasopharynx of a one year old male who had meningitis.
- Fifty-nine reports of **respiratory syncytial virus (RSV)** were received this fortnight, 37 for patients under one year of age and 18 in the one to 4 years age group. Method of diagnosis included virus isolation (19) and antigen detection (40). The number of reports rose in the month of March but remains average for the time of year.
- **Rotavirus** was reported for 16 patients this period including 10 males and 6 females. Fifteen patients were under the age of 4 years.
- Thirty-five reports of ***Chlamydia trachomatis*** were received this fortnight including 16 males and 19 females. Diagnosis was by culture (18), antigen detection (12), nucleic acid detection (3) and single high titre (2).
- ***Mycoplasma pneumoniae*** was reported for 13 patients this period including 7 males and 6 females. The number of reports received so far for the year is the lowest since 1991.

Australian Sentinel Practice Research Network

Data for week 16 (ending 23 April) and week 17 (ending 30 April) are included in this issue of *CDI* (Table 1). There were 7835 consultations reported for week 16 and 7002 for week 17. The influenza reporting rate increased again this fortnight, with increases in reporting rates in Tasmania and South Australia, and high rates continuing to be reported from the Northern Territory and Victoria. The rate of gastroenteritis reporting was between 10 and 15 per 1000 consultations, as it is in most weeks.

Table 1. Australian Sentinel Practice Research Network, weeks 16 and 17, 1995

Condition	Week 16, to 23 April 1995		Week 17, to 30 April 1995	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	80	11.4	76	11.2
Rubella	1	0.1	2	0.3
Measles	0	0	2	0.3
Chickenpox	12	1.7	17	2.5
Pertussis	1	0.1	0	0
Gastroenteritis	80	11.4	83	12.2

National Influenza Surveillance 1995

Australian Capital Territory Department of Health; Australian Sentinel Practice Research Network; Communicable Diseases Intelligence Virology and Serology Reporting Scheme Contributing Laboratories; New South Wales Department of Health; Victorian Department of Health and Community Services; South Australian Health Commision; World Health Organization (WHO) Collaborating Centre for Influenza Reference and Research, Melbourne

Overall there has been a rise in the rate of influenza reporting since February. Data from the following schemes will be included in the next fortnightly report: the Victorian Sentinel General Practitioner Scheme, Victorian total deaths, Victorian Hospital Admissions, the Australian Capital Territory Sentinel General Practitioner Scheme, the Australian Capital Territory Schools Absenteeism Surveillance and South Australian deaths. Data from the WHO Collaborating Centre for Reference and Research was published in last fortnight's issue of *CDI* (p 218) and will also be included during the season.

Sentinel general practitioner surveillance (Figure 4)

- The **Australian Sentinel Practice Research Network** reported consultation rates for influenza-like illness of 8.0 and 11.4 per 1000 consultations for the weeks ending 16 April and 23 April respectively. The rate of reporting has continued to rise since mid February.
- **New South Wales** sentinel general practitioners reported rates of 7.5 and 11.8 per 1000 consultations for the weeks ending 9 and 16 April respectively. The consultation rate has risen since mid-February. Surveillance is being conducted by ten Public Health Units - Central Coast, Eastern Sydney, Northern Sydney, South East, Northern Districts, South Western Sydney, Hunter, Illawarra, Western Sydney and Wentworth, and South West. About 50 doctors have reported a total of about 5000 to 7000 consultations per week.

Absenteeism surveillance (Figure 5)

- **New South Wales Schools Absenteeism Surveillance** has documented absenteeism rates fluctuating between 1.0 and 4.1% since the begin-

Figure 4. Sentinel general practitioner influenza reports per 1000 encounters, by week and scheme

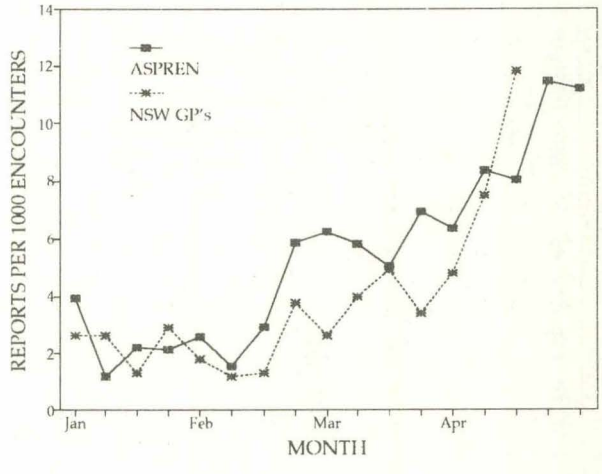


Figure 5. Influenza A laboratory reports, 1995, by method of diagnosis and week of specimen collection

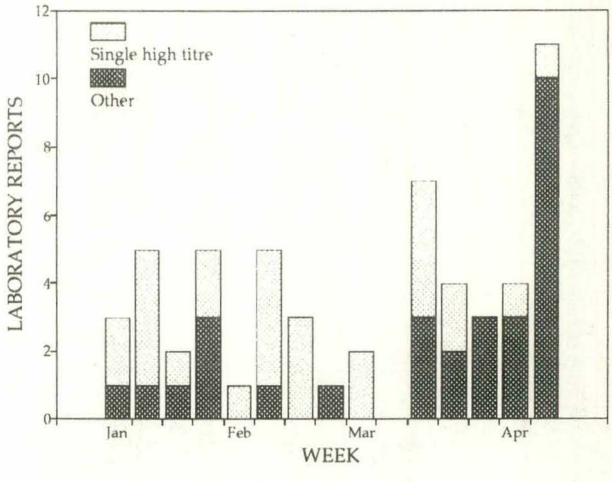
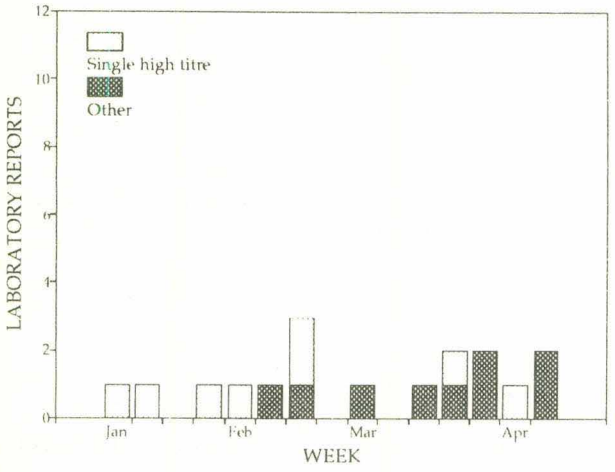


Figure 6. Influenza B laboratory reports, 1995, by method of diagnosis and week of specimen collection



ning of the year. Eight Public Health Units are contributing to this surveillance - Western New South Wales, Northern Sydney, South East, Central Sydney, South Western Sydney, Western Sydney and Wentworth, Central Western and South West. A total of about 3000 students have been included since late February.

Laboratory surveillance

- The *CDI* **Virology and Serology Reporting Scheme** has received 61 reports of **influenza A** so far this year including 33 diagnosed by a method other than single high titre. The number of reports rose in the month of April (Figure 5). **Influenza A** was reported for 17 patients this fortnight including 12 males and 3 females (2 sex not stated), of whom 2 were over the age of 65 years. Reports were received from New South Wales (4), Queensland (2), South Australia (7) and Victoria (4). Method of diagnosis included virus isolation (8, specimen collection dates early to mid-April), antigen detection (3, specimens collected late April), fourfold rise in titre (2) and single high titre (4).
- A total of 17 reports of **influenza B** has been received this year, 9 with diagnoses other than single high titre (Figure 6). Four reports of **influenza B** were received this period, from New South Wales (2) and South Australia (2). Diagnosis was by virus isolation (2, specimen collection dates in mid-April), fourfold rise in titre (one) and single high titre (one).

Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 10 laboratories. There were 172 reports of recent significant sepsis:

New South Wales: Hunter Area Pathology Service 26; South West Area Pathology Service, Liverpool 42; Prince of Wales Hospital 41.
Tasmania: Royal Hobart Hospital 15; Northern Tasmanian Pathology Service 2.
Western Australia: Princess Margaret Hospital for Children 8; Sir Charles Gairdner Hospital 14.
Northern Territory: Alice Springs Hospital 12.
Queensland: Ipswich General Hospital 1; Nambour Hospital 11.

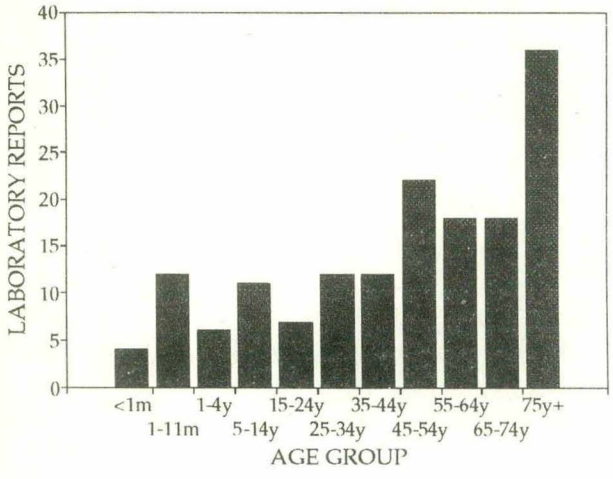
An additional 358 reports of sepsis with specimen collection dates from October 1994 to March 1995 were received. Included were 2 reports of *Streptococcus* Group B meningitis (1 week old male and a 3 week old female) and a report of *Haemophilus influenzae* type b meningitis (one year old male). Also included was a report of *Listeria monocytogenes* (blood isolate from a 70 year old immunosuppressed female), *Salmonella* Typhi (18 year old female). Three patients, all males aged 42 to 50 years were reported with MRSA (two had IV central lines and one was a transplant recipient). *Cryptococcus neoformans* was isolated from the blood of a 41 year old HIV positive male. Reports with specimen

Table 2. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical information						Risk factors				Total[1]
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary tract	Skin	Surgery	Immunosuppressed	IV line	Neonatal	
Staphylococcus aureus	2	2				1	2	6	5	4	32[2]
Staphylococcus coagulase negative					1		2	2	3	1	23
Streptococcus pneumoniae		7									10
Escherichia coli				3	11		1	4			33
Klebsiella pneumoniae				2				2	3		9

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 5.

Figure 7. LabDOSS reports of blood isolates, by age group



collection dates prior to the first day of last month are not included in the fortnightly report in *CDI* but are added to the annual data.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

Gram positive: 1 *Bacillus* species, 1 *Corynebacterium jeikeium*, 1 *Corynebacterium* species, 3 *Enterococcus faecalis*, 1 *Enterococcus faecium*, 1 *Enterococcus* species, 7 *Staphylococcus epidermidis*, 1 *Streptococcus* Group A, 2 *Streptococcus* Group B, 1 *Streptococcus* Group C, 2 *Streptococcus* Group G.

Gram negative: 2 *Acinetobacter* species, 2 *Branhamella catarrhalis*, 1 *Campylobacter jejuni*, 1 *Capnocytophaga* species, 1 *Citrobacter freundii*, 2 *Enterobacter aerogenes*, 1 *Enterobacter alvei*, 3 *Enterobacter cloacae*, 1 *Enterobacter* species, 1 *Flavobacterium* species, 1 *Klebsiella oxytoca*, 2 *Klebsiella* species, 1 *Neisseria polysaccharea*, 1 *Proteus vulgaris*, 1 *Pseudomonas fluorescens*, 4 *Pseudomonas aeruginosa*, 1 *Salmonella* Paratyphi, 1 *Salmonella* species.

Anaerobes: 2 *Bacteroides fragilis*, 1 *Fusobacterium* species.

There were 22 blood isolates reported for children age 4 years and under (Figure 7).

Hospital acquired blood isolates

A total of 32 isolates was reported as being hospital acquired. The most commonly reported organisms were *Staphylococcus aureus* (11, including 3 MRSA) and *Staphylococcus* coagulase negative (5).

Meningitis and/or CSF isolate reports

There were 7 reports of meningitis and/or CSF isolates. Included was 1 *Haemophilus influenzae* (type b, isolated from the CSF and blood of a 7 month old female), 4 *Streptococcus pneumoniae* (1 male under the age of 1 year and 3 females in the 1 to 27 year age group), 1 *Cryptococcus neoformans* (51 year old HIV positive male), 1 *Staphylococcus* coagulase negative (57 year old female).

Isolates from sites other than blood or CSF

Joint fluid: 1 *Staphylococcus aureus* (53 year old male with septic arthritis).

Peritoneal dialysate: 1 *Acinetobacter* species (70 year old male).

Pleural fluid: 1 *Staphylococcus aureus* (78 year old male).

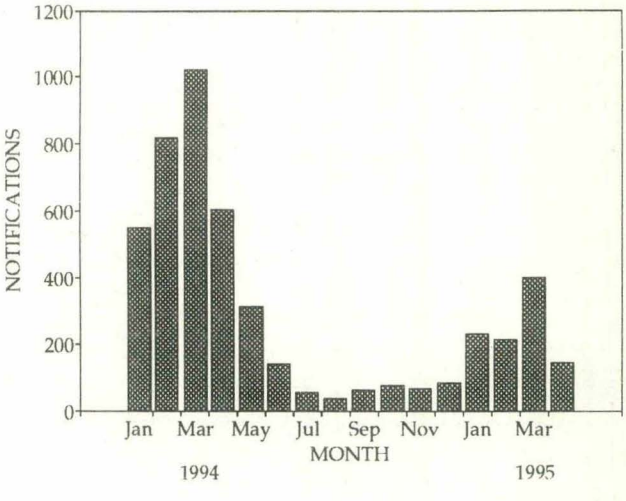
Other: 1 *Bacillus* species, 1 *Enterococcus* species, 2 *Staphlylococcus aureus.*

National Notifiable Diseases Surveillance System, 16 April 1995 to 29 April 1995

There were 1640 reports received in the period (Tables 3, 4 and 5). There continues to be fewer reports of Ross River virus infection than at the same time of year in the last 3 years (Figure 10).

- There were 221 cases of **Ross River virus infection** reported; 107 cases were male and 114 cases were female. Recorded ages were between the 10-14 and the 75-79 years age groups with 84% of cases in the 20-54 years age group. Onset dates were in December (one), February (15), March (90), and April (115). There have been fewer reports for the 1994-95 season compared with the 1993-94 season (Figure 8), especially from New South Wales and Queensland.
- Two cases of **brucellosis** were reported for males. The cases were in the 20-24 years and the 50-54 years age group respectively.
- There were 328 notifications of **campylobacteriosis** received; 162 cases were male, 162 cases were female, and the sex of four cases was not recorded. The cases were aged between the 0-4 and the 85-89 years age groups with 23% of the cases aged less than five years.

Figure 8. Ross River virus infection notifications, 1994 to 1995, by month of onset



- Forty-seven cases of **gonococcal infection** were reported; 27 cases were male and 20 cases were female. Recorded ages were between the 0-4 and the 70-74 years age groups with a single case recorded for a child aged less than one year.
- There were four notifications of ***Haemophilus influenzae* type b infection** received; three cases were male and one case was female. The cases were aged between the 0-4 and the 45-49 years age groups. A single case was aged less than five years. All onset dates were in April.
- Forty cases of **hepatitis A** were reported; 24 cases were male (aged on year, 5 years and 47 years) and 16 cases were female (5 years).
- There were 11 incident cases of **hepatitis B** reported; eight cases were male and 3 cases were female. The cases were aged between the 0-4 and the 40-44 years age groups.
- There were four cases of **legionellosis** reported. All cases were males, and the recorded ages were between the 40-44 and the 60-64 years age groups. Onset dates were in March (20) and April (2). There were no apparent clusters.
- Four cases of **leptospirosis** were reported; three cases were male and one case was female. The cases were aged between the 15-19 and the 45-49 years age groups.
- Two notifications of **listeriosis** were received. Both cases were female and they were in the 30-34 and the 35-39 years age groups respectively. The cases were resident in the Statistical Division of Melbourne.
- There were 15 notifications of **malaria**; 9 cases were male and five case were female. The cases were aged between the 5-9 and the 55-59 years age groups. Onset dates were in January (one), February (3), March (6), and April (5). Three cases were reported for residents of the 'malaria receptive zone'.
- Thirty cases of **measles** were reported; 12 cases were male, 17 cases were female, and the sex of one case was not reported. The cases were aged between the 0-4 and the 35-39 years age groups with 6 cases aged less than one year. There were 4 apparent clusters of between 2 and 4 cases each resident in the same postcode area. Apparent clusters were in New South Wales (one), Victoria (one), and Queensland (2).
- There were 11 notifications of **meningococcal infection** received; five cases were male and six cases were female. The cases were aged between the 0-4 and the 25-29 years age group with 2 cases aged less than five years and nine cases age less than 20 years.
- There were 74 cases of **pertussis** reported; 27 cases were male, 46 cases were female, and the sex of one case was not reported. The cases were aged between 0-4 and the 70-74 years age groups with 2 cases aged less than one year. There were 10 apparent clusters of between 2 and 5 cases each in the same postcode area. Recorded clusters were in New South Wales (one), Queensland (4), South Australia (2), Western Australia (one) and Tasmania (2).
- Seven cases of **Q fever** were reported; 5 cases were male and 2 cases were female. Recorded ages were between the 20-24 and the 60-64 years age groups.
- There were 54 notifications of **rubella** received; 36 cases were male and 18 cases were female. The cases were aged between the 0-4 and the 45-49 years age group with 10 cases reported for females in the 15-44 years age group.
- There were 207 cases of **salmonellosis** reported; 99 cases were male, 105 cases were female, and the sex of 3 cases was not reported. The cases were aged between the 0-4 and the 90-94 years age group with 49% of cases aged less than 5 years. There was a seasonal peak in notifications in March, as in 1994 (Figure 9).
- Fifty-one case of **syphilis** were reported; 25 cases were male and 26 cases were female. Recorded ages were between the 0-4 and the 90-94 years age group with a single case in a child aged less than one year.
- There were 34 cases of **tuberculosis** reported; 17 cases were male, 16 cases were female, and the sex of one case was not recorded. Onset dates were in October (one), December (one), January (one), February (one), March (9), and April (21).
- Two cases of **typhoid** were reported. Both cases were female, aged 34 years and 49 years.
- Eight cases of **yersiniosis** were reported; 5 cases were male and 3 cases were female. The cases were aged between the 0-4 and the 55-59 years age groups.

Figure 9. Salmonellosis notifications, 1994 to 1995, by month of onset and patient type

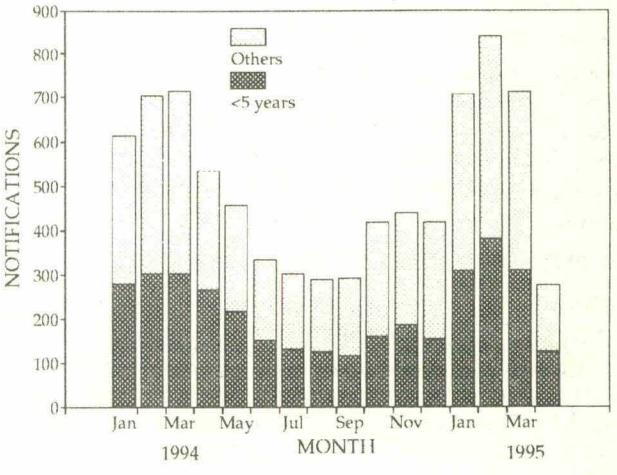
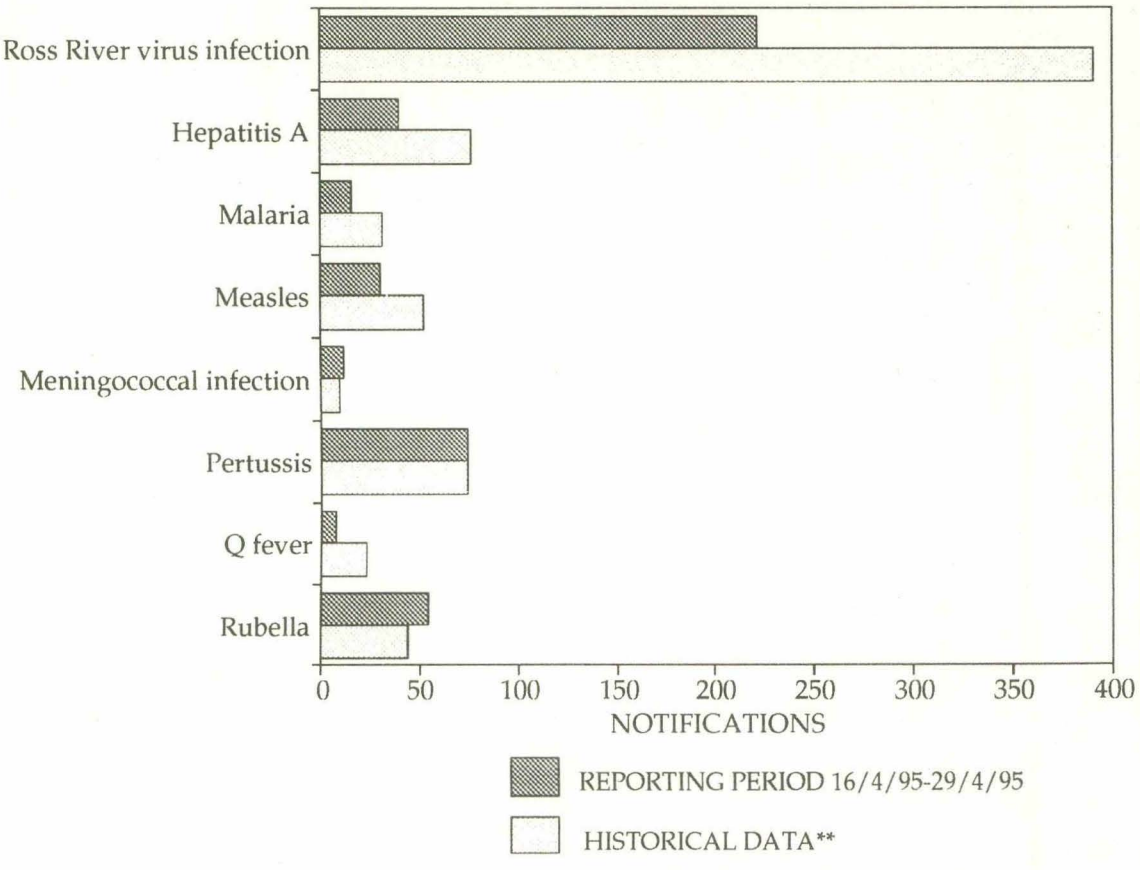


Figure 10. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



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 3. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 16 to 29 April 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1]			
									This period 1995	This period 1994	Year to date 1995	Year to date 1994
Diphtheria	0	0	0	0	0	0	0	0	0	7	0	20
Haemophilus influenzae b infection	0	2	0	0	0	0	2	0	4	6	33	68
Measles	0	8	5	6	1	2	6	2	30	148	638	1151
Mumps	1	0	NN	NN	1	0	0	0	2	1	15	6
Pertussis	1	16	5	26	9	7	4	6	74	165	1502	2087
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	6	2	0	34	1	0	8	3	54	43	821	599
Tetanus	0	0	0	0	0	0	0	0	0	0	2	6

1. 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

NN Not Notifiable.

Table 4. Notifications of other diseases[1] received by State and Territory health authorities in the period 16 to 29 April 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2] This period 1995	This period 1994	Year to date 1995	Year to date 1994
Arbovirus infection												
Ross River virus infection	0	10	16	193	1	-	1	0	221	375	1060	2795
Dengue	0	0	0	0	0		0	0	0	2	7	11
NEC[3]	0	14	0	14	0	2	7	0	37	52	326	277
Campylobacteriosis[4]	13	-	5	59	88	11	101	51	328	346	3443	3146
Chlamydial infection (NEC)[5]	4	NN	5	60	8	50	0	15	142	247	1950	2164
Donovanosis	0	NN	2	1	NN	0	0	0	3	3	30	34
Gonococcal infection[6]	2	8	9	14	2	0	0	12	47	129	908	1049
Hepatitis A	1	10	1	16	2	0	6	4	40	61	575	651
Hepatitis B incident	0	3	3	0	0	1	4	0	11	22	101	99
Hepatitis C incident	-	0	0	-	0	-	-	-	0	1	27	4
Hepatitis C unspecified	22			103		0	102	36	263	349	2602	2889
Hepatitis (NEC)	0	0	0	0	0	0	2	NN	2	0	13	16
Legionellosis	0	2	0	1	0	0	1	0	4	19	70	78
Leptospirosis	0	1	0	1	0	0	2	0	4	5	43	71
Listeriosis	0	0	0	0	0	0	2	0	2	0	33	11
Malaria	0	1	0	8	0	0	5	1	15	53	194	207
Meningococcal infection	0	1	0	4	1	0	4	1	11	8	96	91
Ornithosis	0	NN	0	1	1	0	5	1	8	2	55	36
Q fever	1	2	0	3	0	0	1	0	7	20	140	213
Salmonellosis (NEC)	0	27	24	68	30	2	36	20	207	267	2780	2522
Shigellosis[4]	1	-	2	4	3	0	4	1	15	48	307	320
Syphilis	0	10	9	19	0	0	6	7	51	113	666	791
Tuberculosis	0	2	0	8	5	1	17	1	34	48	361	359
Typhoid[7]	0	2	0	0	0	0	0	0	2	2	16	17
Yersiniosis (NEC)[4]	0	-	0	2	3	0	3	0	8	14	138	192

1. For HIV and AIDS, see Tables 2 and 3 *CDI* 1994;19:168. For rarely notified diseases, see Table 6.
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. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
5. WA: genital only.
6. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
7. NSW, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

Table 5. Notifications of rare[1] diseases received by State and Territory health authorities in the period 16 to 29 April 1995

DISEASES	Total this period	Reporting States or Territories	Year to date 1995
Botulism	0		0
Brucellosis	2	Qld 1, Vic 1	12
Chancroid	0		2
Cholera	0		0
Hydatid infection	0		9
Leprosy	0		2
Lymphogranuloma venereum	0		1
Plague	0		0
Rabies	0		0
Yellow fever	0		0
Other viral haemorrhagic fevers	0		0

1. Fewer than 50 cases of each of these diseases were notified each year during the period 1988 to 1993.

Table 6. Virology and serology laboratory reports by State or Territory[1] for the reporting period 20 April to 3 May 1995, historical data[2], and total reports for the year

	State or Territory[1]							Total this fortnight	Historical data[2]	Total reported this year
	ACT	NSW	Qld	SA	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA										
Measles virus		1						1	39.7	228
Mumps virus		2						2	3.3	24
Rubella virus	1	1		1	1	1		5	16.8	459
HEPATITIS VIRUSES										
Hepatitis A virus		6		1				7	15.8	174
Hepatitis B virus	2	33	1	2	1	16		55	97.8	830
Hepatitis C virus	11	8		28	23	5		75	172.5	2,127
ARBOVIRUSES										
Ross River virus	1				3	1		5	131.0	452
Flavivirus (unspecified)						2		2	.2	19
ADENOVIRUSES										
Adenovirus type 1						1		1	1.7	14
Adenovirus type 2						1		1	3.3	13
Adenovirus type 37						1		1	.0	1
Adenovirus not typed/pending		7	4	7		5	2	25	50.2	340
HERPES VIRUSES										
Herpes simplex virus type 1		20	20	16	2	51	1	110	146.8	1,784
Herpes simplex virus type 2		25	26	15	1	35		102	177.5	1,691
Herpes simplex not typed/pending		12				1	1	14	29.3	199
Cytomegalovirus		14	8	1	4	11	2	40	66.3	563
Varicella-zoster virus	1	8		4		5		18	41.2	429
Epstein-Barr virus		7		9		4		20	49.8	771
Herpes virus group - not typed						1		1	.7	10
OTHER DNA VIRUSES										
Parvovirus		1						1	2.8	52
PICORNA VIRUS FAMILY										
Coxsackievirus B3	1	1						2	.7	20
Coxsackievirus B5	1							1	.7	6
Echovirus type 3		1						1	.0	16
Echovirus type 22		1						1	.8	1
Echovirus type 30		1						1	7.8	31
Rhinovirus (all types)			3	3		15		21	28.2	260
Enterovirus type 71 (BCR)						4		4	.2	5
Enterovirus not typed/pending		12	17			11		40	40.0	364
ORTHO/PARAMYXOVIRUSES										
Influenza A virus		4	2	7		4		17	27.5	86
Influenza B virus		2		2				4	4.7	22
Parainfluenza virus type 1				1				1	24.0	12
Parainfluenza virus type 2			5	3		19	1	28	8.0	63
Parainfluenza virus type 3	2	1	5	1		3	2	14	16.3	225
Respiratory syncytial virus		16	11	2		29	1	59	70.2	258
OTHER RNA VIRUSES										
Rotavirus		2		7	2		5	16	33.5	318
Small virus (like) particle						1		1	1.5	4

Table 6. Virology and serology laboratory reports by State or Territory[1] for the reporting period 20 April to 3 May 1995, historical data[2], and total reports for the year, continued

	State or Territory[1]							Total this fortnight	Historical data[2]	Total reported this year
	ACT	NSW	Qld	SA	Tas	Vic	WA			
OTHER										
Chlamydia trachomatis not typed	1	11		12	7	4		35	101.7	837
Chlamydia psittaci		1				3		4	5.8	73
Chlamydia species		5						5	.2	26
Mycoplasma pneumoniae		5		1		7		13	47.0	129
Bordetella pertussis						4		4	10.8	316
Cryptococcus species		2						2	1.0	13
Treponema pallidum		2				1		3	16.8	258
Toxoplasma gondii		21				1		22	3.5	55
Schistosoma species		1				1		2	.2	20
Echinococcus granulosus		2						2	2.2	9
TOTAL	21	236	102	123	44	248	15	789	1,500.0	13,613

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 7. Virology and serology laboratory reports by clinical information for the reporting period 20 April to 3 May 1995

	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA												
Measles virus											1	1
Mumps virus											2	2
Rubella virus							1				4	5
HEPATITIS VIRUSES												
Hepatitis A virus						1					6	7
Hepatitis B virus						8			1		46	55
Hepatitis C virus				2		14					59	75
ARBOVIRUSES												
Ross River virus									2		3	5
Flavivirus (unspecified)											2	2
ADENOVIRUSES												
Adenovirus type 1											1	1
Adenovirus type 2				1								1
Adenovirus type 37								1				1
Adenovirus not typed/pending				8	8			2			7	25

Table 7. Virology and serology laboratory reports by clinical information for the reporting period 20 April to 3 May 1995, continued

	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
HERPES VIRUSES												
Herpes simplex virus type 1				8			63	8		19	12	110
Herpes simplex virus type 2				1			29			67	5	102
Herpes simplex not typed/pending	1						7			5	1	14
Cytomegalovirus		1	1	11				2			25	40
Varicella-zoster virus				1			12				5	18
Epstein-Barr virus				3							17	20
Herpes virus group - not typed							1					1
OTHER DNA VIRUSES												
Parvovirus							1					1
PICORNA VIRUS FAMILY												
Coxsackievirus B3											2	2
Coxsackievirus B5	1											1
Echovirus type 3				1								1
Echovirus type 22				1								1
Echovirus type 30											1	1
Rhinovirus (all types)				18							3	21
Enterovirus type 71 (BCR)							4					4
Enterovirus not typed/pending	1	2		13	6		5				13	40
ORTHO/PARAMYXOVIRUSES												
Influenza A virus				12							5	17
Influenza B virus				4								4
Parainfluenza virus type 1				1								1
Parainfluenza virus type 2				28								28
Parainfluenza virus type 3	1	1		12								14
Respiratory syncytial virus				56							3	59
OTHER RNA VIRUSES												
Rotavirus					13					1	2	16
Small virus (like) particle					1							1

Table 7. Virology and serology laboratory reports by clinical information for the reporting period 20 April to 3 May 1995, continued

	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
OTHER												
Chlamydia trachomatis not typed				1						30	4	35
Chlamydia psittaci				3						1		4
Chlamydia species										3	2	5
Mycoplasma pneumoniae				10							3	13
Bordetella pertussis				4								4
Cryptococcus species											2	2
Treponema pallidum		1									2	3
Toxoplasma gondii											22	22
Schistosoma species											2	2
Echinococcus granulosus											2	2
TOTAL	4	5	1	199	28	23	123	13	3	126	264	789

Table 8. Virology and serology laboratory reports by contributing laboratories for the reporting period 20 April to 3 May 1995

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	22
New South Wales	Prince Henry/Prince of Wales Hospitals, Sydney	138
	Royal Alexandra Hospital for Children, Camperdown	22
	South West Area Pathology Service, Liverpool	35
	Royal Prince Alfred Hospital, Camperdown	39
Queensland	State Health Laboratory, Brisbane	102
South Australia	Institute of Medical and Veterinary Science, Adelaide	124
Tasmania	Northern Tasmanian Pathology Service, Launceston	4
	Royal Hobart Hospital	36
Victoria	Microbiological Diagnostic Unit, University of Melbourne	4
	Monash Medical Centre, Melbourne	22
	Royal Children's Hospital, Melbourne	93
	Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital	133
Western Australia	Princess Margaret Hospital, Perth	15
TOTAL		789