Pertussis notifications in Australia, 1991 to 1997

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Abstract

Although pertussis is a vaccine-preventable disease, it has been epidemic in Australia since 1993 and recently claimed the lives of four children under three months of age. We reviewed national notifications of pertussis from 1991 to 1997 and found notification rates ranged from 2.0 per 100,000 population in 1991 to a peak of 30.5 per 100,000 population in 1994 despite pertussis vaccination coverage approaching 90% for the three-dose primary course. We found that notification rates were highest in infants (<1 year of age) and school aged children (5 - 14 years of age). Although there was a resurgence of pertussis in 1996, age-specific notification rates decreased for children aged 1 - 7 years and it appears that the diphtheria-tetanus-pertussis (DTP) booster introduced as a fifth dose at 4 - 5 years may be having an effect. We raise the possibility that the current whole cell pertussis vaccine may be providing only short-term immunity and that our results may reflect low or inadequate vaccine coverage among both the population at large and the individual cases. We identify gaps in the national surveillance system which require attention including under-reporting and the need for information on vaccination status of notified cases; method of diagnosis; and date of birth or age in months to identify the proportion of infants in the highest risk group, that is under six months of age. *Comm Dis Intell* 1997;21:145 - 148.

Introduction

Children under one year, and particularly those under six months of age, are at greatest risk of death from pertussis (whooping cough)[1,2]. Although pertussis is a vaccine-preventable disease, it has been epidemic in Australia since 1993 and has claimed the lives of four children under three months of age since October 1996[3]. While these children were too young to be adequately immunised in accordance with the recommended schedule[4], their risk of exposure would have been diminished if there was less pertussis in the community.

Parents and older siblings are considered to be an important source of pertussis[1,2]. Since 1993, national notification data have shown attack rates were highest among children under 15 years of age and that there was a smaller secondary peak among adults 30 - 49 years of age[3]. In an attempt to reduce transmission among school aged children and therefore reduce the potential for transmission to infants, a fifth dose of pertussis at 4 - 5 years (in the form of diphtheria-tetanus-pertussis (DTP) vaccine) was added to the recommended childhood

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vaccination schedule in August 1994[4]. This replaced the previous recommendation of combined diphtheria-tetanus (CDT) vaccine at school entry.

Our aim was to review national notifications of pertussis, describe the epidemic, assess any impact from the introduction of the DTP booster for 4 - 5 year old children and highlight gaps in the national data collection.

Methods

Pertussis is a notifiable disease under the public health legislation of each State and Territory. All States and Territories require medical practitioners to notify pertussis and all except Western Australia also require laboratories to do so. Nationally, notifications of pertussis have only been routinely collected since the establishment of the National Notifiable Diseases Surveillance System (NNDSS) in 1990.

The NNDSS receives de-identified notification data from each State and Territory, including age in years, date of onset and date of notification to the relevant public health authority[5]. Pertussis can be identified on clinical grounds, through laboratory diagnosis or by being epidemiologically linked to a laboratory confirmed case. Most States and Territories use the National Health and Medical Research Council (NHMRC) case definition[6]. That is:

- Isolation of *Bordetella pertussis* from a clinical specimen; or
- Elevated *Bordetella pertussis*-specific IgA in serum or *Bordetella pertussis* antigen in a nasopharyngeal specimen using immunofluorescence with a history of clinically compatible illness; or
- An illness lasting 2 weeks or more with one of the following:
  - paroxysms of coughing,
  - inspiratory 'whoop' without other apparent causes,
  - post-tussive vomiting; or
- An illness characterised by a cough lasting at least 2 weeks in a patient who is epidemiologically related to a laboratory confirmed case.

We reviewed notifications of pertussis received by the NNDSS up until 1 April 1997 and analysed those with a date of onset from 1 January 1991 to 28 February 1997. It should be noted that some of the 1996 and 1997 data may be subject to revision.

We calculated crude and age-specific notification rates using the Australian Bureau of Statistics estimates of the mid-year populations as our denominator.

Results

There were 19,815 notifications of pertussis to the NNDSS with onset from 1 January 1991 to 31 December 1996 and a further 1,447 with onset in the first two months of 1997. There was a clear seasonal pattern, with 64% of the notifications occurring over the spring and summer months from August to January (Figure 1). Notifications increased dramatically from 1993, with over 4,000 cases of pertussis occurring each year (4,453 in 1993; 5,443 in 1994; 4,168 in 1995 and 4,604 in 1996). A peak in late 1996 marked a resurgence in the epidemic, with 2,270 notifications having onset between November 1996 and January 1997. The majority of these cases resided in Victoria (30%), South Australia (25%) and New South Wales (25%). Overall, there were more females than males notified in every age group (male:female ratio 1:1.3) (Figure 2). More than 60% of notifications were for persons 10 years of age or older.

The crude notification rate per 100,000 population increased from 2.0 and 4.6 in 1991 and 1992 respectively to 25.2 in 1993. The crude rate remained high into 1996 (30.5 in 1994, 23.1 in 1995 and 25.2 in 1996). Notification rates were highest among infants under one year of age (Figure 3). However, since the NNDSS only receives age in years, it was not possible to determine what proportion of these were in the highest risk group, that is under six months of age. During the epidemic years, 1993 to 1996, pre-school aged children (1 - 4 years) had lower age-specific notification rates than school aged children (5 - 14 years).

Despite the resurgence of pertussis in 1996, the age-specific notification rates decreased for children aged 1 - 4 years and 5 - 9 years. Among the 5 - 9 year age group the rates actually increased for eight and nine year old children and were the highest recorded over the period (85.5 and 86.2 respectively per 100,000 population). Although declining, the rates for seven year old children were similar to those of eight and nine year

Figure 1. Pertussis notifications by month of onset, 1991 to February 1997

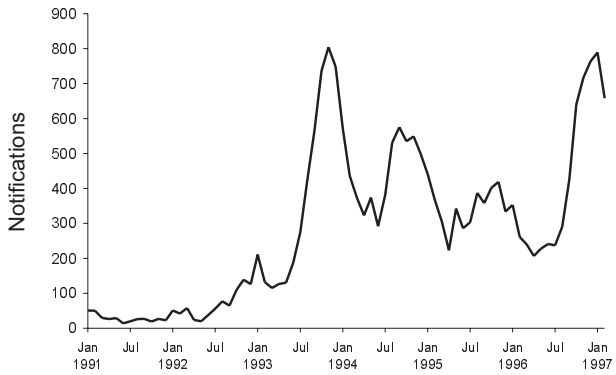
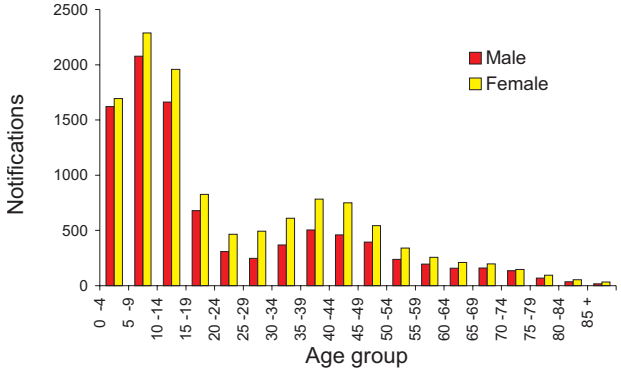


Figure 2. Pertussis notifications by age group and sex, 1991 to February 1997



old children (84.7 per 100,000 population). In contrast, five and six year old children (for whom the DTP booster had been available) had markedly lower rates (45.4 and 55.6 per 100,000 population respectively), even though they were probably exposed to the older children at school. There was no evidence of a decrease in the age-specific notification rates for infants aged less than one year.

Discussion

Pertussis epidemic

Peaks in pertussis incidence have been reported to occur every three to four years in Australia and overseas[7-12]. Rather than the expected cyclical peaks, the NNDSS data show sustained activity at the national level over the last four years, with a peak of 30.5 per 100,000 population in 1994. This may in part be due to increased awareness of pertussis and the requirement for notification on the part of medical practitioners and/or increased testing. For example, the media coverage of infant deaths due to pertussis in late 1996 and early 1997 may have resulted in some increased diagnosis and reporting. However, we believe this is unlikely to fully explain the apparent sustained epidemic of pertussis in Australia from 1993 which is continuing into 1997.

International comparisons

Comparisons between countries need to be balanced against variations in case definitions, methods of diagnosis and case ascertainment. At a crude level, pertussis notification rates in Australia are 10 times higher than those of the United States of America and three times those of England and Wales. The United States of America have a five-dose vaccination schedule similar to the current Australian schedule and have reported vaccination coverage for the three-dose primary course approaching 90%[13]. England and Wales have a three-dose vaccination schedule with vaccine coverage reported to be 93%[11]. The crude notification rates for pertussis in Australia are similar to those reported in Italy when the estimated pertussis vaccine coverage in that country was 38% for children under five years of age[10]. The 1995 Australian Bureau of Statistics immunisation survey estimated pertussis vaccine coverage for the primary course to be at similar levels to those in the United States of America, England and Wales (86% for one year old children)[14].

In contrast to the United States of America and Italy, Australian data show rates for school aged children above those for pre-school aged children[9,10,15]. Although this may reflect variations in case ascertainment between the countries, it could also suggest that either pertussis vaccine coverage in Australia is not as high as reported for the primary course, or that the current whole cell pertussis vaccine is at best only providing short-term immunity. Importantly, the effectiveness of Australia's current whole cell pertussis vaccine has not been tested[8].

Figure 3. Pertussis age-specific notification rate by year of onset, 1991 to 1996

Age specific notification rates

We suspect there are four factors contributing to the differences between notification rates for pre-school and school aged children in Australia:

- some of the school aged children are unvaccinated or inadequately vaccinated;
- others, although vaccinated, have waning or inadequate immunity;
- there is increased transmission at school entry due to exposure to children with pertussis; and
- there is better detection of cases among school aged children because case follow up tends to be more intensive in this age group than the pre-school age group where contacts may not be so clearly defined.

We cannot confirm the influence of these factors because the NNDSS data do not include vaccination status or method of diagnosis, and the effectiveness of the current whole cell pertussis vaccine remains uncertain.

DTP booster at 4 - 5 years

In England and Wales, there has been an upward shift in the age distribution of cases to school aged children as vaccination coverage has improved[16]. In the absence of accurate information on vaccine coverage (both for the general population and the individual case), two factors suggest the introduction of the DTP booster for 4 - 5 year old children in August 1994 may be having an effect. Firstly, there was a reduction in notification rates for 5 - 9 year old children in 1996 despite the resurgence of pertussis leading to an overall increase in rates. Secondly, in 1996, those aged five and six years (for whom the DTP booster was available) had markedly lower rates than the seven, eight and nine year old children (for whom the DTP booster was not routinely available). If the variation in the rates is due to the introduction of the DTP booster at 4 - 5 years, this may be a further indicator of short-term immunity provided by the vaccine or it may reflect low or inadequate vaccination coverage with the first four doses.

The surveillance system

Surveillance data need to be interpreted cautiously. Documented limitations of pertussis surveillance in the United States of America include

under-reporting, disproportionate representation of classic and severe cases, lack of uniform reporting criteria among states and undue reliance on laboratory diagnosis of pertussis by some states[9].

We believe there has been under-reporting of pertussis in Australia, however the degree of under-reporting is not known. While it is also likely that we have a disproportionate representation of classic and severe cases, it is possible that a proportion of the notified cases, particularly adults, are not true pertussis cases. If some of these cases were identified on the basis of serology alone, then, in the absence of clinical symptoms, they may not be recent infections and would therefore not be true pertussis cases. The NNDSS does not receive information on method of diagnosis, that is whether cases were:
(a) diagnosed clinically, and if so on what basis; (b) laboratory confirmed, and if so by what method; or
(c) epidemiologically linked to a laboratory confirmed case. Such information would enable a sensitivity analysis of the surveillance system and a review of the data using varying case definitions. States and Territories should adopt uniform case definitions and procedures for case ascertainment. If the variations continue, adequate information should be provided to describe the variations at the national level.

The focus of pertussis immunisation is to reduce the risk of disease in those at greatest risk. The very young are the group at highest risk of morbidity and mortality from pertussis. However the NNDSS only receives age in years so it is not possible to determine what proportion of infants are in the highest risk group, that is under six months of age. The NNDSS data should include date of birth or at least age in months if less than two years of age. Aboriginal and Torres Strait Islander people are another population group at increased risk of communicable diseases. Although the NNDSS collects information on indigenous status, this field is rarely completed and the impact of pertussis among Aboriginal and Torres Strait Islander peoples cannot be assessed.

Finally, the NNDSS does not receive information on the vaccination status of cases and this is clearly essential. With the introduction of acellular pertussis vaccines, the information will need to include not only whether a case has been vaccinated but also the particular brand of vaccine used.

Even allowing for the limitations of surveillance data, the evidence is clear that pertussis is a serious problem in Australia and that children are dying unnecessarily from this vaccine-preventable disease.

Acknowledgements

We thank members of the Communicable Diseases Network Australia New Zealand and associated staff of the States and Territories for their work in collecting the data.

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Measles in New Zealand

The Ministry of Health in New Zealand has reported a measles epidemic which began in late February. Most cases have been reported from Auckland and Waikato and a few cases from Wellington. Up to 16 May, 353 notifications had been received for 1997, with 86 in the previous week. Nineteen patients have been hospitalised and no deaths have been reported. Ninety-four cases (27%) were for infants under the age of 12 months, 75 (21%) were aged 12 - 23 months and 122 (35%) were in the 5 - 9 years age group.

Mathematical modelling predicted that there would be a measles epidemic in New Zealand in 1997 or 1998. The Ministry of Health has undertaken a two part approach to the outbreak. In December 1996 health professionals were warned of the predicted epidemic and advised to ensure that parents were aware of the need for their children to be immunised against measles. Further action involves the early identification of local outbreaks and the coordination of a prompt and intensified local response. This includes bringing forward the second dose of measles vaccine for all children in the 2 - 10 years age group. The age of the first dose may also be brought forward from 15 months to as low as six months depending on the age of those affected by the local outbreak.

National Health and Medical Research Council recommendations on measles vaccination

In Australia, the National Health and Medical Research Council (NHMRC) recommends MMR (measles, mumps, rubella vaccine) for all children at 12 months of age[1]. A second dose is recommended at 10 - 16 years of age. For populations with a high incidence of early measles infection, vaccination at nine months of age is recommended. In the Northern Territory, Aboriginal children receive a first dose of MMR at the age of nine months.

Unimmunised children in the following groups are at high risk of severe measles infection:

- children with chronic conditions such as cystic fibrosis, congenital heart or kidney disease, failure to thrive and Down syndrome;
- children over the age of one year in child-care centres, family day care and play groups;
- children living in institutions;
- Aboriginal and Torres Strait Islander children.

MMR vaccine can be used during a measles outbreak to protect susceptible contacts. This must be administered within three days of exposure. For immunocompromised individuals for whom MMR vaccine is contraindicated, normal human immunoglobulin should be given as soon as possible after exposure.

Reference

1. National Health and Medical Research Council. *The Australian immunisation handbook.* Sixth Edition. Canberra: Australian Government Publishing Service,1997.

Notices to readers

National Notifiable Diseases data on the Internet

Summarised data from the National Notifiable Diseases Surveillance System (NNDSS) is now available on the Internet. Information is available from 1991 to the present. Data will be updated fortnightly. The Internet address is: 'http://www.health.gov.au/hfs/pubs/nndss/nndss1.htm'

Changes at the CDI desk

After nine months as Editor of *Communicable Diseases Intelligence*, Dr Ana Herceg has moved on. Ana's hard work and dedication has ensured that *CDI* continues to be a publication of high standard. During this time Ana led the editorial team in making significant changes to *CDI*, including improvements to the design, readability and quality of the publication. Ana was also a strong supporter of the Master of Applied Epidemiology program, assisting students both in her role as Editor and as a local supervisor.

Ana's commitment will be maintained by a dedicated team, headed by Dr Bronwen Harvey. The editorial team will ensure that *CDI* continues as a quality publication and a valuable national resource for those working in communicable diseases.

Communicable Diseases Surveillance

Campylobacteriosis

Campylobacteriosis is a common cause of gastroenteritis in Australia, and is the most frequently notified food-borne disease. Since the early 1990s the number of notifications has been increasing (Figure 1). The true incidence of campylobacteriosis in Australia is likely to be underestimated, as many people do not seek medical attention or have a stool culture collected.

Campylobacter species are frequent commensals of the gastrointestinal tracts of both wild and domesticated animals. The usual species infecting humans are *Campylobacter jejuni* and *C. coli.* Human infection with *Campylobacter* most often occurs after the consumption of contaminated meat and poultry. Poultry is often contaminated with *C. jejuni*, which can survive frozen for months. Other sources of *Campylobacter* include water contaminated with animal faeces, unpasteurised milk and milk products, and salads cross-contaminated by raw meat or poultry during food handling. Person-to-person transmission has also been reported.

The incubation period for campylobacteriosis is 2 to 4 days. Fever, headache, myalgia and malaise begin 12 to 24 hours before the onset of diarrhoea and abdominal cramping. The diarrhoea may be severe and bloody, and the patient seriously unwell. Infected persons may excrete the organism in stools for 2 to 3 weeks. The infection is generally self limiting and does not require treatment with antibiotics.

The incidence of campylobacteriosis is higher in developing countries, and a peak in notifications is seen in children under 5 years of age. Most children probably have multiple symptomatic infections while young. Infections in older age groups are mostly asymptomatic. In developed countries, a second peak is also seen in young adults, possibly reflecting a lack of ongoing exposure to the organism (Figure 2).

In 1996, the National Notifiable Diseases Surveillance System (NNDSS) recorded 12,002 notifications of campylobacteriosis. The male:female ratio was 1.1:1. The highest number of notifications was for children in the 0 - 4 years age group, with 2,663 cases (22% of the total).

Campylobacteriosis occurs throughout the year but tends to peak in the summer months. Most cases appear to be sporadic rather than part of well defined outbreaks. A difficulty in detecting outbreaks of *Campylobacter* has been the lack of a practical sub-typing system.

Education to encourage appropriate food handling practices is an important strategy to decrease the burden of illness from *Campylobacter* and other food-borne illnesses in Australia.

Figure 1. Campylobacteriosis, 1991 to 1997, by month of onset

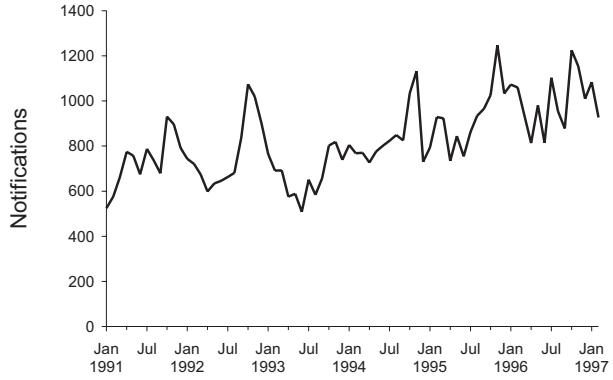
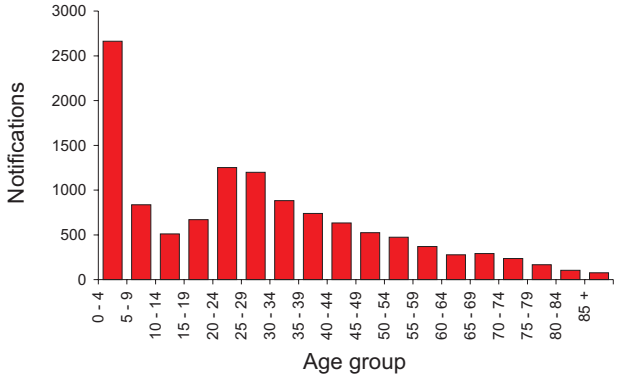


Figure 2. Campylobacteriosis, 1996, by age group



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.

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 30 April to 13 May 1997

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1997	This period 1996	Year to date 1997	Year to date 1996
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
Haemophilus influenzae type B	0	0	0	0	0	1	1	0	2	2	20	20
Measles	0	6	0	3	0	0	6	2	17	7	171	177
Mumps	0	1	0	NN	1	1	7	0	10	0	70	44
Pertussis	3	62	0	31	40	3	19	14	172	92	2891	1190
Rubella	0	0	0	30	4	2	7	1	44	71	553	1082
Tetanus	0	0	0	0	0	0	0	0	0	0	3	1

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 authoritories in the period 30 April to 13 May 1997

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1997	This period 1996	Year to date 1997	Year to date 1996
Arbovirus Infection (NEC)[3]	0	1	1	0	0	0	2	1	5	3	128	63
Barmah Forest virus infection	0	9	-	21	0	0	1	-	31	58	313	477
Campylobacteriosis[4]	8	-	0	133	78	16	84	45	364	407	4246	4317
Chlamydial infection (NEC)[5]	4	NN	19	142	2	20	84	32	303	332	3030	2616
Dengue	0	2	0	2	0	-	0	0	4	1	189	20
Donovanosis	0	NN	0	0	NN	0	0	1	1	0	11	19
Gonococcal infection[6]	2	15	54	35	0	1	21	36	164	195	1611	1350
Hepatitis A	0	38	3	40	1	0	11	2	95	81	1447	976
Hepatitis B incident	0	3	1	3	0	0	4	4	15	12	137	88
Hepatitis C incident	0	0	0	-	0	0	-	-	0	1	5	13
Hepatitis C unspecified	7	NN	11	122	NN	20	64	10	234	362	2985	3357
Hepatitis (NEC)	0	0	0	0	0	0	0	NN	0	0	9	10
Legionellosis	0	0	0	0	2	0	4	1	7	6	62	74
Leptospirosis	0	2	0	2	0	0	0	0	4	10	47	95
Listeriosis	0	0	0	0	0	0	0	0	0	5	38	22
Malaria	2	10	0	20	2	1	2	0	37	37	286	302
Meningococcal infection	1	6	1	2	1	0	7	1	19	13	125	95
Ornithosis	0	NN	0	0	0	0	6	0	6	1	27	30
Q Fever	0	9	0	16	0	0	0	0	25	21	202	175
Ross River virus infection	2	214	8	278	40	2	50	23	617	441	4958	6441
Salmonellosis (NEC)	6	60	3	67	14	8	48	21	227	261	3697	2625
Shigellosis[4]	0	-	1	2	4	0	4	14	25	23	364	250
Syphilis	0	16	4	8	0	1	1	2	32	51	449	537
Tuberculosis	0	7	0	2	1	1	17	2	30	47	358	431
Typhoid[7]	0	1	0	1	0	0	0	0	2	1	35	46
Yersiniosis (NEC)[4]	0	-	0	7	3	0	0	0	10	9	129	105

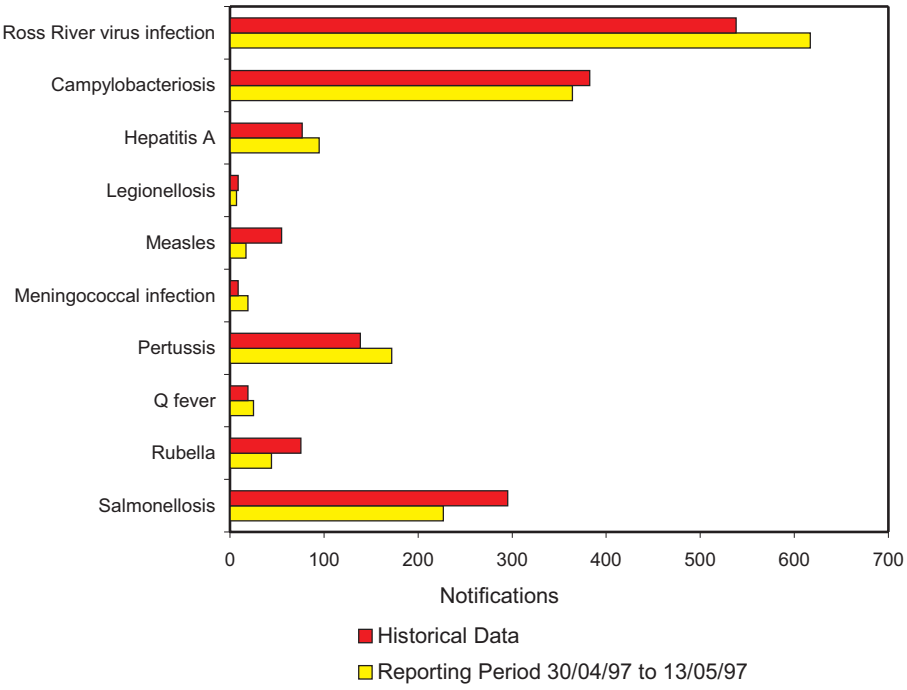
1. For HIV and AIDS, see Tables 4 and 5. For rarely notified diseases, see Table 3.
2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
3. NT and WA: includes Barmah Forest virus.
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.

Figure 3. 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.

Reporting period 30 April to 13 May 1997

There were 2,714 notifications received for this two week period (Tables 1, 2 and 3). The numbers of reports for selected diseases have been compared with historical data for corresponding periods in the previous three years (Figure 3).

Seventeen reports of measles were received this reporting period, six each from New South Wales and Victoria and three from Queensland. The number of notifications remains low (Figure 4). One hundred and fifty-nine reports of measles have been received with onset in 1997. Of these, 81 (51%) were in the 0 - 4 years age group and 23 (15%) were in the 5 - 9 years age group. The male:female ratio was 1:1.1.

Reports of Ross River virus infection remain at a high level, with 617 reports received in this period (Figure 5). The majority of reports were from Queensland (278) and New South Wales (214). There have been 4,815 infections notified so far for 1997. The peak number of reports for

Figure 4. Measles notifications, 1991 to 1997, by month of onset

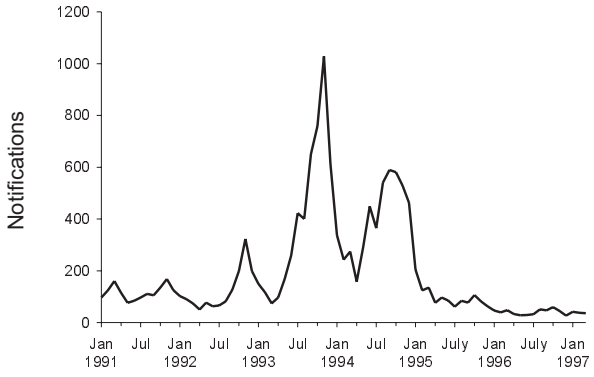


Figure 5. Ross River virus notifications, 1994 to 1997, by month of onset

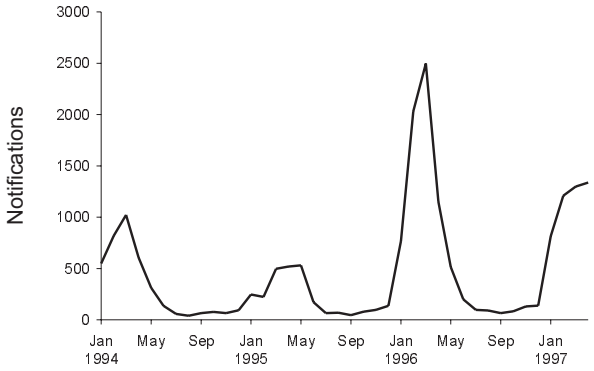


Figure 6. Ross River virus notifications, 1996, by age group and sex

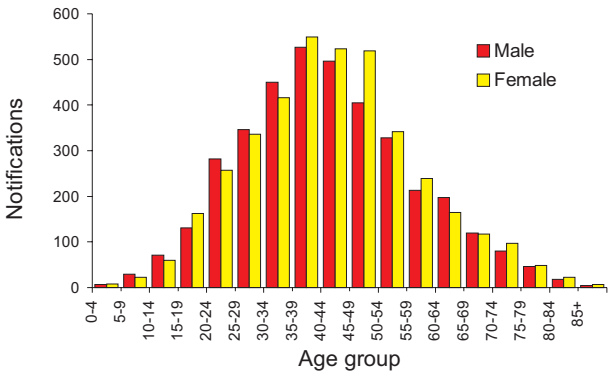


Table 3. Notifications of rare[1] diseases received by State and Territory health authorities in the period 30 April to 13 May 1997

Disease[2]	Total notifications 1997[3]
Brucellosis	14
Chancroid	1
Cholera	1
Hydatid Infection	8
Leprosy	7

1. Fewer than 60 cases of each of these diseases were notified each year during the period 1988 to 1996.
2. No notifications have been received during 1997 for the following rare diseases: botulism, lymphogranuloma venereum, plague, rabies, yellow fever, or other viral haemorrhagic fevers.
3. No notifications received during this reporting period.

1997 remains well below that received for 1996. However more reports have been received for the year to date than the total annual notifications for 1994 or 1995. Notifications in 1996 were highest in the 30 - 49 year age range (Figure 6).

There were 95 notifications of hepatitis A this period. The majority of reports were from Queensland (40) and New South Wales (38). Equal numbers of males and females were notified. The highest number of notifications was for the 5 - 9 years age group (17) followed by the 25 - 29 years age group (11). More reports for the year to date (1,447) have been received than for the same period in 1996 (976).

National Influenza Surveillance, 1997

Three types of data are included in National Influenza Surveillance, 1997. These are sentinel general practitioner surveillance conducted by the Australian Sentinel Practice Research Network, Department of Human Services, Victoria, Department of Health, New South Wales and Department of Health and Community Services, Northern Territory; laboratory surveillance data from the Communicable Diseases Intelligence Virology and Serology Laboratory Reporting Scheme, LabVISE, and the World Health Organization Collaborating Centre for Influenza Reference and Research; and absenteeism surveillance conducted by Australia Post. For further information about these schemes, see CDI 1997; 21:126.

Sentinel general practitioner surveillance

The ASPREN consultation rate for influenza-like illness rose slightly this fortnight to 5.9 per 1,000 encounters (Figure 7). This is low for the time of year; a rate of 10 per 1,000 encounters was recorded for a similar period in 1996. The consultation rate for influenza-like illness recorded by the New South Wales Sentinel General Practice Scheme rose to 6 per 1,000 encounters in early April but has since fallen.

Figure 7. Sentinel general practitioner influenza consultation rates, 1997, by week and scheme

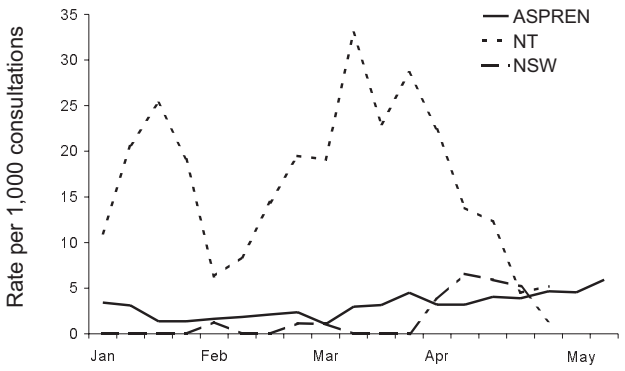
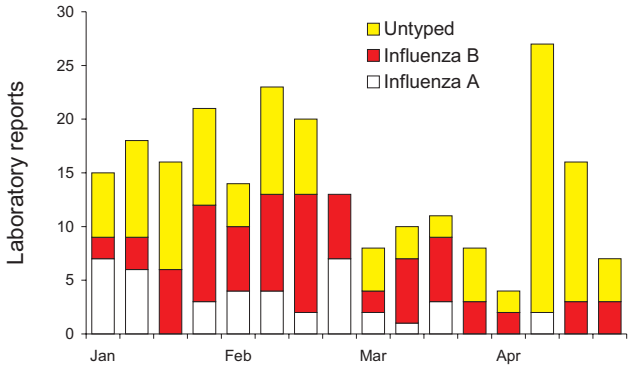


Figure 8. Laboratory reports of influenza, 1997, by week and type



Laboratory surveillance

Twenty-seven reports of influenza virus were recorded by the LabVISE scheme this fortnight, 4 influenza A, 5 influenza B and 18 untyped. For the year to date 250 reports of influenza have been received. Included were 41 reports of influenza A (16%), 80 of influenza B (32%) and 129 (52%) untyped influenza (Figure 8). Overall the male;female ratio was 1:1 and 20% of patients were over 65 years of age. The number of laboratory reports remains average for the time of year.

Absenteeism surveillance

Australia Post recorded a national absenteesim rate of 2.4% and 2.6% for the last two weekly periods, similar to previous weeks.

HIV and AIDS Surveillance

National surveillance for HIV disease is coordinated by the National Centre in HIV Epidemiology and Clinical Research (NCHECR), 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, by either the diagnosing laboratory (ACT, New South Wales, Tasmania, Victoria) or by a combination of laboratory and doctor sources (Northern Territory, Queensland, South Australia, 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.

Table 4. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 31 December 1996, by sex and State or Territory of diagnosis

										Totals for Australia			
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1996	This period 1995	Year to date 1996	Year to date 1995
HIV diagnoses	Female	0	0	0	0	0	0	0	0	0	3	63	72
	Male	1	25	0	8	3	1	16	5	59	48	784	765
	Sex not reported	0	0	0	0	0	0	0	0	0	0	6	8
	Total[1]	1	25	0	8	3	1	16	5	59	48	854	847
AIDS diagnoses	Female	0	1	0	0	0	0	0	0	1	1	27	32
	Male	0	11	0	3	1	0	8	2	25	53	527	728
	Total[1]	0	12	0	3	1	0	8	2	26	54	554	762
AIDS deaths	Female	0	0	0	1	0	0	0	0	1	2	16	39
	Male	0	11	0	1	1	0	5	3	21	48	436	600
	Total[1]	0	11	0	2	1	0	5	3	22	50	452	640

1. Persons whose sex was reported as transsexual are included in the totals.

Table 5. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 31 December 1996, by sex and State or Territory

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
HIV diagnoses	Female	18	476	4	98	44	4	178	76	898
	Male	176	10348	86	1710	599	78	3500	801	17298
	Sex not reported	0	2045	0	0	0	0	28	0	2073
	Total[1]	194	12883	90	1813	643	82	3715	880	20300
AIDS diagnoses	Female	7	148	0	32	18	2	56	19	282
	Male	80	4088	27	701	295	36	1448	316	6991
	Total[1]	83	4137	26	702	302	34	1428	321	7033
AIDS deaths	Female	2	106	0	27	14	2	38	12	201
	Male	52	2890	22	490	204	25	1136	229	5048
	Total[1]	54	3002	22	519	218	27	1180	242	5264

1. Persons whose sex was reported as transsexual are included in the totals.

Table 6. Australian Sentinel Practice Research Network reports, weeks 18 and 19, 1997

Condition	*Week 18, to 4 May 1997*		*Week 19, to 11 May 1997*	
	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters
Chickenpox	4	0.5	10	1.7
Gastroenteritis	93	11.3	65	11.0
HIV testing (doctor initiated)	14	1.7	5	0.8
HIV testing (patient initiated)	22	2.7	16	2.7
Influenza	50	6.1	35	5.9
Measles	0	0.0	0	0.0
Pertussis	0	0.0	2	0.3
Ross River virus infection	0	0.0	3	0.5
Rubella	0	0.0	0	0.0

Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting interval indicated, to allow for reporting delay and to incorporate newly available information. More detailed information on diagnoses of HIV infection and AIDS is published in the quarterly Australian HIV Surveillance Report, available from the National Centre in HIV Epidemiology and Clinical Research, 376 Victoria Street, Darlinghurst NSW 2010. Telephone: (02) 332 4648 Facsimile: (02) 332 1837.

HIV and AIDS diagnoses and deaths following AIDS reported for December 1996, as reported to 31 March 1997, are included in this issue of *CDI* (Tables 4 and 5).

Australian Sentinel Practice Research Network

The Australian Sentinel Practice Research Network (ASPREN) comprises 99 sentinel general practitioners from throughout the country. Approximately 9,000 consultations are recorded each week for 12 conditions. Of these, CDI reports the consultation rates for chickenpox, gastroenteritis, HIV testing (doctor initiated), HIV testing (patient initiated), influenza, measles, pertussis, Ross River virus infection and rubella. For further information including case definitions see CDI 1997;21:6.

Data for weeks 18 and 19 ending 4 and 11 May respectively are included in this issue of *CDI* (Table 6). The consultation rate for chickenpox has remained steady at rates similar to those seen during the autumns of 1995 and 1996. The consultation rate for gastroenteritis has continued at low levels since mid-January 1997. Consultation rates for HIV testing have been slightly higher in the current reporting period than the rates experienced during the previous six weeks. Consultation rates for Ross River virus infection have been slightly lower during the last six reporting weeks than during the summer and early autumn. The numbers of reported cases of measles, rubella and pertussis have remained low during 1997.

Sentinel Chicken Surveillance Programme

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Sentinel chicken flocks are used to monitor 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. Currently 24 flocks are maintained in the north of Western Australia, ten in the Northern Territory, ten in New South Wales and ten in Victoria. The flocks in Western Australia and the Northern Territory are tested year round but those in New South Wales and Victoria are tested only from November to March, during the main risk season.

Results are coordinated by the Arbovirus Laboratory in Perth and reported bimonthly. For more information see CDI 1997;21:6-7

Sentinel chicken serology was carried out for 24 flocks in Western Australia in March and April 1997. There has been widespread Murray Valley encephalitis and Kunjin activity in the north of Western Australia during this period. Table 7 shows the number of confirmed seroconversions to flaviviruses from the Kimberley, Pilbara and Gascoyne regions.

Six flocks of sentinel chickens from the Northern Territory were tested in March and April. There were seroconversions in the flocks at Katherine, Coastal Plains Research Station and Tennant Creek in April. These are preliminary results and have yet to be confirmed. All the chickens at Tennant Creek seroconverted, four to Murray Valley encephalitis, three to Murray Valley encephalitis and Kunjin, two to Kunjin, and one to flavivirus only. Two of the chickens at Katherine seroconverted, one to Murray Valley encephalitis and Kunjin, and one to Kunjin only. There was one new seroconversion to both Murray Valley encephalitis and Kunjin viruses at the Coastal Plains Research Station.

Table 7. Sentinel Chicken Surveillance Programme seroconversions, Western Australia, March and April 1997

	March			April				
	MVE	Kunjin	MVE and Kunjin	MVE	Kunjin	MVE and Kunjin	Flavivirus only	Total
Kimberley								
Kalumburu				2		1	1	4
Wyndham				1		1		2
Kununurra	3			1		5		9
Fitzroy Crossing				1				1
Derby	2	1		1	1	3		8
Broome	2		1	5		4		12
Pilbara								
Karratha						3		3
Harding Dam				8	1	1		10
Panawonica				1				1
Tom Price				4		2		6
Paraburdoo			1	2		5		8
Ophthalmia (Newman)	1	1	1	3		2	1	9
Whaleback Mine (Newman)					1	2		3
Exmouth						1		1
Gascoyne								
Carnarvon						1		1

The sentinel chicken surveillance programs in New South Wales and Victoria finished at the end of February 1997, and will resume in November.

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 773 reports received in the *CDI* Virology and Serology Laboratory Reporting Scheme this period (Tables 8 and 9).

Laboratory reports of respiratory syncytial virus usually peak in July and are continuing to increase as expected (Figure 9). There were 75 reports received this fortnight

Figure 9. Respiratory syncytial virus laboratory reports, 1995 to 1997, by month of specimen collection

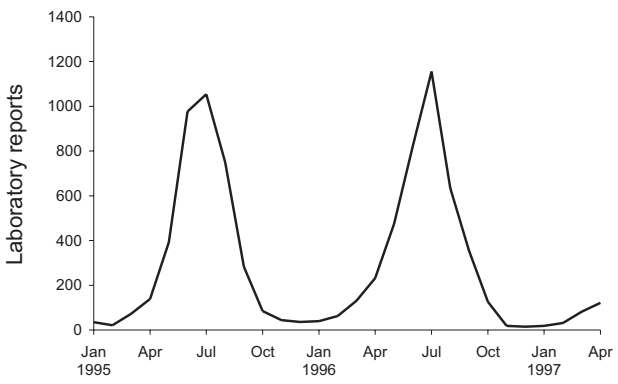
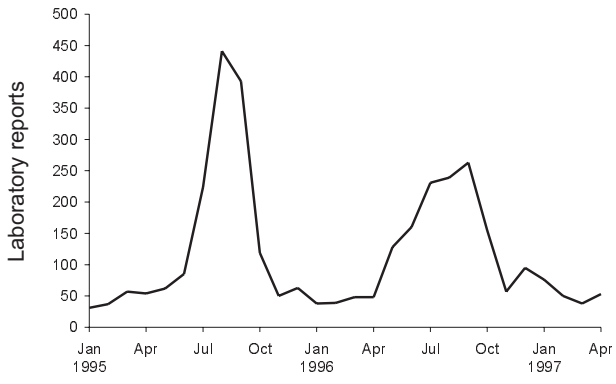


Figure 10. Rotavirus laboratory reports, 1995 to 1997, by month of specimen collection



with diagnosis by antigen detection (50), virus isolation (19), single high titre (3) and four-fold rise in titre (one). Two reports did not indicate the method of diagnosis.

Laboratory reports of rotavirus increased in April. Reports usually peak in July or August (Figure10). There were 32 reports received this fortnight, with diagnosis by antigen detection (30), virus isolation (one) and single high titre (one).

Reports of rhinovirus are low in comparison with previous years (Figure 11). Two reports were received in the last fortnight.

Figure 11. Rhinovirus laboratory reports, 1995 to 1997, by month of specimen collection

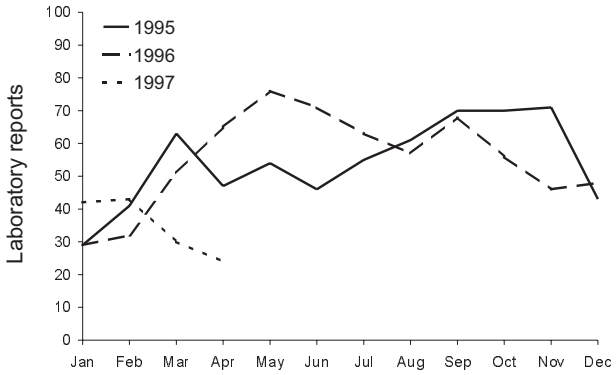


Table 8. Virology and serology laboratory reports by State or Territory[1] for the reporting period 24 April to 7 May 1997, historical data[2], and total reports for the year

	State or Territory[1]							Total this fortnight	Historical data [2]	Total reported in *CDI* in 1997
	NSW	NT	Qld	SA	Tas	Vic	WA			
Measles, mumps, rubella										
Measles virus				1				1	4.2	26
Mumps virus				2		1		3	3.7	20
Rubella virus			1	2				3	13.7	367
Hepatitis viruses										
Hepatitis A virus		10		1			2	13	18.2	395
Arboviruses										
Ross River virus		15	57	37		12	10	131	185.3	1,648
Barmah Forest virus			4				3	7	16.7	155
Dengue type 2			8					8	0	44
Dengue type 3			1					1	0	1
Flavivirus (unspecified)			1			1		2	2.2	21
Adenoviruses										
Adenovirus type 2				1				1	0.5	19
Adenovirus not typed/pending	2		3	8		7	3	23	36.2	394
Herpes viruses										
Cytomegalovirus			3	6	1	4	26	40	57.3	534
Varicella-zoster virus			2	8	1	1	5	17	37	624
Epstein-Barr virus	6	2	1	28		7	6	50	68.7	1,282
Other DNA viruses										
Poxvirus group not typed	1							1	0	1
Parvovirus				2		3		5	4.7	176
Picornavirus family										
Echovirus type 5						1		1	0	3
Echovirus type 31				1				1	0	1
Echovirus type 33				1				1	0	1
Echovirus not typed/pending				1				1	0	1
Rhinovirus (all types)				2				2	24.8	263

Table 8. Virology and serology laboratory reports by State or Territory[1] for the reporting period 24 April to 7 May 1997, historical data[2], and total reports for the year, continued

	State or Territory[1]							Total this fortnight	Historical data [2]	Total reported in *CDI* in 1997
	NSW	NT	Qld	SA	Tas	Vic	WA			
Ortho/paramyxoviruses										
Influenza A virus			4					4	16.2	151
Influenza B virus			2			1	2	5	4	122
Influenza virus - typing pending				17			1	18	0	145
Parainfluenza virus type 2	1					1		2	11.3	33
Parainfluenza virus type 3			2	2		3	3	10	13	350
Parainfluenza virus typing pending				11				11	0.8	171
Respiratory syncytial virus	6		1	7		45	16	75	92.8	437
Other RNA viruses										
Rotavirus				11		5	16	32	36.2	378
Norwalk agent			1					1	1.5	54
Other										
Chlamydia trachomatis not typed	4	112		31	2		46	195	132	2,177
Chlamydia psittaci						3		3	3.8	39
Mycoplasma pneumoniae	18	2		4		9	3	36	17.3	782
Coxiella burnetii (Q fever)	6		5					11	5.7	141
Rickettsia tsutsugamushi			10					10	0.2	15
Bordetella pertussis						39		39	11.5	951
Legionella pneumophila						1		1	0.5	8
Cryptococcus species							5	5	1	10
Leptospira canicola			1					1	0	1
Leptospira pomona			2					2	0.2	8
TOTAL	44	141	109	184	4	144	147	773	821	11,949

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 9. Virology and serology laboratory reports by contributing laboratories for the reporting period 24 April to 7 May 1997

State or Territory	Laboratory	Reports
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	40
	Royal Prince Alfred Hospital, Camperdown	3
Queensland	State Health Laboratory, Brisbane	108
South Australia	Institute of Medical and Veterinary Science, Adelaide	184
Tasmania	Royal Hobart Hospital, Hobart	4
Victoria	Monash Medical Centre, Melbourne	38
	Royal Children's Hospital, Melbourne	83
	Victorian Infectious Diseases Reference Laboratory, Fairfield	24
Western Australia	Princess Margaret Hospital, Perth	51
	Royal Perth Hospital	43
	Western Diagnostic Pathology	195
TOTAL		773

Overseas briefs

Source: World Health Organization (WHO)

Lassa fever, Sierra Leone

During the first four months of 1997, 353 cases of Lassa fever with 43 deaths (12%) were reported. The number of cases increased from 45 with 7 deaths (16%) in January to 75 cases and 9 deaths (12%) in February, and 147 cases with 20 deaths (14%) in March. However there was a decrease to 86 cases with 7 deaths (8%) in April. During 1996, 470 cases with 110 deaths (23%) were reported. The Ministry of Health and Sanitation, together with WHO, is planning activities to prevent the spread of the disease and improve management of suspect cases. Key district health personnel will be included in a nationwide training program on Lassa fever control that is planned for later in the year. The Ministry of Health and Sanitation is studying a plan for rodent control. Treatment with ribavirin was resumed in mid-April with the arrival of new supplies of the drug after the stock was depleted in February. Ribavirin will be distributed to other areas where health personnel are familiar with administration of this drug for the treatment of Lassa fever. The Ministry of Health and Sanitation is also establishing a national Lassa fever control program with a manager based in Kenema.

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