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# TUBERCULOSIS NOTIFICATIONS IN AUSTRALIA, 1994

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## Abstract

The fourth annual report of the National Mycobacterial Surveillance System (NMSS) is presented, containing notifications of new and reactivated cases of tuberculosis and cases of atypical mycobacterial infection reported in Australia in 1994. The overall rates of notification of tuberculosis have remained stable for some years and remain low by world standards. The situation is less clear for reactivated disease and atypical mycobacterial infection, both of which showed increased numbers of notifications in 1994. The data also show that some groups in the Australian community experience much higher than average rates of disease. These include Aboriginal and Torres Trait Islander people and persons born outside Australia. Surveillance through the NMSS has a major role to play in the control of these diseases. Efforts to further improve the quality of surveillance data in this database are recommended.

## Introduction

Tuberculosis and other mycobacterial infections are a major public health concern in both developing and developed countries[1, 2]. The incidence of new infections has risen in recent years in several developed countries and high rates of new disease have been reported by countries in the Australian region. In Australia, as in other developed countries, increased risk is recognised in several identifiable sub-populations. These include members of indigenous populations and some migrant groups, HIV-positive persons, elderly men living alone, homeless persons and refugees[3-7]. Increased resistance of mycobacteria to anti-microbial therapy is a major concern in some countries, although it has not been observed in Australia[8, 9].

The National Mycobacterial Surveillance System was begun in 1991 under the auspices of the Communicable Diseases Network Australia New Zealand. Its aims were to enhance the previously existing mechanisms of national surveillance of tuberculosis and other mycobacterial disease and to provide more comprehensive data to facilitate prevention and control measures. This report is the fourth from the NMSS, for the calendar year 1994. Previous reports have been published for the years 1991, 1992 and 1993[10-12].

## Methods

Data were collected by health authorities in each State and Territory under the provisions of the public health legislation in each jurisdiction. These data were provided to the NMSS in computerised format for collation and analysis. The dataset includes core fields in common with the National Notifiable Diseases Surveillance System including a unique identifier for each notification, disease code, postcode of residence, sex, dates of onset and report, Aboriginality, confirmation status of the report and the week of data transmission[13]. Supplementary data fields include date of birth, ethnicity, country of birth, length of residence in Australia for overseas-born persons, species of pathogen, principal site of disease, methods of diagnosis (culture techniques, microscopy, histology, tuberculin testing, radiography and clinical examination), antimicrobials used at the time of notification, BCG status, HIV status and reactivation status.

The case definitions were those used since 1986[14]:

1. Tuberculosis (new case)

- a case which has been confirmed by the identification of *Mycobacterium tuberculosis* (or *M. africanum* or *M. bovis*) by culture or by microscopy; or
- a case which has been diagnosed to be active clinically and which has been accepted as such by the State or Territory Director of Tuberculosis.

2. Tuberculosis (relapse or reactivation)

- a case of active tuberculosis diagnosed again (bacteriologically, radiologically or clinically) following previous full treatment (as deemed appropriate by the State or Territory Director of Tuberculosis) and considered to be inactive or quiescent.

3. Atypical mycobacterial infection

Clinical features consistent with one or more of the following:

- presence of a compatible disease process which is clinically, radiologically and / or pathologically not due to other causes,
- consistent repeated recovery of the same organism from the same site in moderate to abundant amounts,
- recovery of atypical mycobacteria from sites which are normally sterile.

Denominator population data and mortality data for tuberculosis and other mycobacterial diseases were obtained from the Australian Bureau of Statistics. Denominator data are estimates of relevant populations as at 30 June, 1994.

**Table 1. Notifications of new and reactivated cases of tuberculosis and rates per 100,000 population, 1994, by State or Territory**

| State or Territory | New cases | | Reactivations | | Total | |
|---|---|---|---|---|---|---|
| | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 |
| ACT | 9 | 2.99 | 3 | 1.00 | 12 | 3.99 |
| NSW | 386 | 6.38 | 32 | 0.53 | 418 | 6.91 |
| NT | 31 | 18.11 | 0 | 0.00 | 31 | 18.11 |
| Qld | 107 | 3.35 | 5 | 0.16 | 112 | 3.50 |
| SA | 53 | 3.61 | 2 | 0.14 | 55 | 3.74 |
| Tas | 13 | 2.75 | 2 | 0.42 | 15 | 3.18 |
| Vic | 286 | 6.39 | 49 | 1.09 | 335 | 7.48 |
| WA | 75 | 4.41 | 4 | 0.24 | 79 | 4.64 |
| TOTAL | 960 | 5.38 | 97 | 0.54 | 1057 | 5.92 |

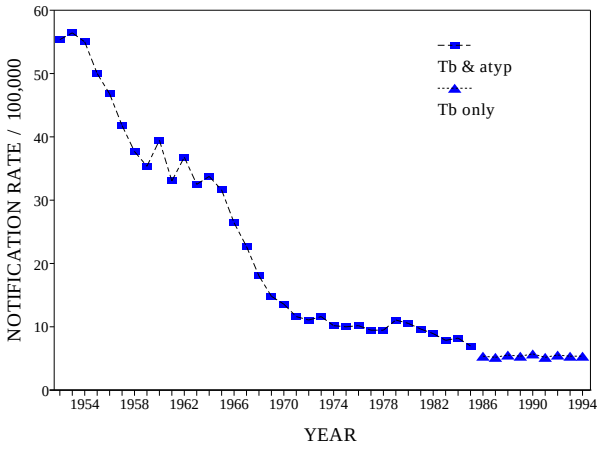
## Results

### Notifications

There were 960 notifications of new cases of tuberculosis in Australia for 1994. In addition, 97 cases of relapse or reactivation were notified (Table 1). The annual incidence rates of 5.38 per 100,000 population for new cases and 5.92 per 100,000 for total cases are similar to rates in recent years (Table 2). These rates have remained low in Australia since the early 1980s (Figure 1). However the rate for reactivations, 0.54 per 100,000 population, is higher than for any recent year. Rates of notification of both new and reactivated cases varied considerably between States and Territories (Table 1). The highest rates for notifications of new cases were reported by the Northern Territory (18.11 per 100,000), Victoria (6.39 per 100,000) and New South Wales (6.38 per 100,000).

Seven States and Territories also notified a total of 750 cases of atypical mycobacterial infection.

**Figure 1. Notification rates of new cases of tuberculosis per 100,000 population, Australia, 1952 to 1994, by year[1]**




1. Notifications from 1948 to 1985 include atypical disease.

**Table 2. Notifications of new and reactivated cases of tuberculosis and rates per 100,000 population, 1986 to 1994, by year**

| Year | New cases | | Reactivations | | Total | |
|---|---|---|---|---|---|---|
| | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 |
| 1986 | 863 | 5.39 | 43 | 0.27 | 906 | 5.65 |
| 1987 | 868 | 5.34 | 39 | 0.24 | 907 | 5.58 |
| 1988 | 925 | 5.59 | 29 | 0.18 | 954 | 5.77 |
| 1989 | 902 | 5.36 | 50 | 0.30 | 952 | 5.66 |
| 1990 | 979 | 5.73 | 37 | 0.22 | 1016 | 5.95 |
| 1991 | 903 | 5.21 | 47 | 0.27 | 950 | 5.48 |
| 1992 | 983 | 5.62 | 28 | 0.16 | 1011 | 5.78 |
| 1993 | 944 | 5.35 | 47 | 0.27 | 991 | 5.61 |
| 1994 | 960 | 5.38 | 97 | 0.54 | 1057 | 5.92 |

### Age and Sex

There were 512 notifications of new disease for males and 448 for females. The corresponding crude annual incidence rates were 5.74 and 5.00 per 100,000 population respectively (Table 3).

The highest numbers of reported new cases were in the 25-29 and 30-34 years age groups for both sexes (Table 3). Age-specific rates for both males and females were highest in the elderly, although there was a lesser peak in incidence for both sexes between 20 and 39 years of age (Figure 2).

### Principal sites of disease

The principal site of disease was reported for 817 notifications of new disease (86%). Of these 817 cases, 494 (61%) were pulmonary and 146 (18%) were lymphatic (Table 4). Pulmonary and pleural disease were more commonly reported for males and lymphatic disease was more common in females.

### Pathogen

The species of causative organism was reported for 652 notifications of new disease (68%, lower than the 74% reported for 1993). *M. tuberculosis* was reported for 642 cases, *M. bovis* for 3 cases and *M. africanum* for 7 cases.

**Figure 2. Age group and sex specific notification rates of new cases of tuberculosis per 100,000 population, 1994**

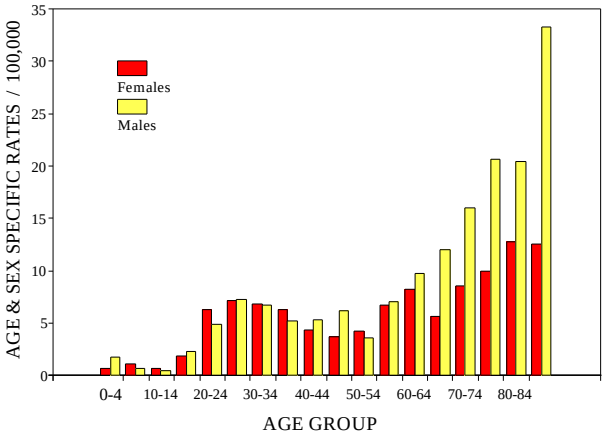



**Table 3. Notifications of new cases of tuberculosis and rates per 100,000 population, 1994, by age group and sex**

| | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| Age group (years) | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 | Notifications | Rate per 100,000 |
| 0-4 | 4 | 0.64 | 11 | 1.66 | 15 | 1.16 |
| 5-9 | 7 | 1.12 | 4 | 0.61 | 11 | 0.86 |
| 10-14 | 4 | 0.65 | 3 | 0.46 | 7 | 0.55 |
| 15-19 | 11 | 1.77 | 15 | 2.29 | 26 | 2.03 |
| 20-24 | 45 | 6.30 | 35 | 4.93 | 80 | 5.50 |
| 25-29 | 48 | 7.08 | 49 | 7.20 | 97 | 7.14 |
| 30-34 | 50 | 6.81 | 49 | 6.68 | 99 | 6.75 |
| 35-39 | 44 | 6.33 | 36 | 5.20 | 80 | 5.77 |
| 40-44 | 28 | 4.28 | 35 | 5.34 | 63 | 4.81 |
| 45-49 | 22 | 3.67 | 38 | 6.14 | 60 | 4.93 |
| 50-54 | 19 | 4.21 | 17 | 3.58 | 36 | 3.88 |
| 55-59 | 26 | 6.73 | 27 | 6.96 | 53 | 6.78 |
| 60-64 | 29 | 8.21 | 34 | 9.67 | 63 | 8.94 |
| 65-69 | 20 | 5.61 | 40 | 12.00 | 60 | 8.70 |
| 70-74 | 27 | 8.56 | 42 | 15.96 | 68 | 11.75 |
| 75-79 | 23 | 9.97 | 34 | 20.66 | 55 | 13.91 |
| 80-84 | 21 | 12.71 | 20 | 20.39 | 41 | 15.57 |
| 85+ | 16 | 12.51 | 18 | 33.25 | 34 | 18.68 |
| Unknown | 4 | | 5 | | | |
| TOTAL | 448 | 5.00 | 512 | 5.74 | 960 | 5.38 |

**Table 4. Notifications of new cases of tuberculosis, 1994, by reported principal site of disease and sex**

| Site | Females | | Males | | Total | |
|---|---|---|---|---|---|---|
| | Notifications | % of known | Notifications | % of known | Notifications | % of known |
| Pulmonary | 202 | 53.2 | 292 | 66.8 | 494 | 60.5 |
| Pleural | 13 | 3.4 | 37 | 8.5 | 50 | 6.1 |
| Lymphatic | 101 | 26.6 | 45 | 10.4 | 146 | 17.9 |
| Bone/Joint | 10 | 2.6 | 9 | 2.1 | 19 | 2.3 |
| Genito-urinary | 18 | 4.7 | 14 | 3.2 | 32 | 3.9 |
| Miliary | 3 | 0.8 | 3 | 0.7 | 6 | 0.7 |
| Meningeal | 5 | 1.3 | 10 | 2.3 | 15 | 1.8 |
| Peritoneal | 6 | 1.6 | 5 | 1.2 | 11 | 1.4 |
| Other sites | 22 | 5.8 | 22 | 5.0 | 44 | 5.4 |
| Site not reported | 68 | | 75 | | 143 | |
| TOTAL | 448 | | 512 | | 960 | |

### Methods of diagnosis

One or more of the diagnostic methods listed in Table 5 was reported to have been used for 888 (93%) of the 960 cases of new disease. In 804 (91%) of these 888 cases at least one of the methods was reported as testing positive to confirm the diagnosis of active tuberculosis.

For 72 cases none of the methods listed in Table 5 was reported as having been used. Other diagnostic methods were reported for some cases, including diagnosis at surgical operation or post-mortem in 11 cases.

Radiography was most frequently reported as a diagnostic method used, and was also most likely to confirm tuberculosis (in 78% of 743 cases). Histology was least used (32% of cases) and was also least likely to provide confirmatory evidence (30% of the 306 cases in which it was used). Culture was reported for 57% of cases in 1994, compared to 81% of cases in 1993. When used, culture was confirmatory in 76% of cases in 1994, similar to the 73% in 1993.

### Use of Antimicrobials

The use of antimicrobial therapy at the notification date was reported for 664 cases of new disease (69%, Table 6). It was reported that 659 patients were treated with isoniazid, 655 with rifampicin, 587 with pyrazinamide and 492 with ethambutol. Streptomycin was reported as having been used for only six patients. Other drugs were reported as having been used in a small number of cases. Ethionamide, prothionamide, cycloserine and ciprofloxacin were used in one case each. Pyridoxine was used as adjuvant therapy in 46 cases. A small number of regimes encompassed virtually all of the therapeutic combinations reported (Table 6). In nearly all cases three or four drugs were used. For 17 cases a statement indicated or suggested that no antimicrobial treatment had been provided and explanations were usually offered, including terminal status and post-mortem diagnosis.

### BCG status

BCG status was reported for only 143 notifications of new cases of tuberculosis (15%). Of these, 81 persons had previously received BCG vaccination and 62 had not. A further 212 persons were reported to have 'unknown' BCG status. In the remaining 510 cases no information was provided.

**Table 5. Notifications of new cases of tuberculosis, 1994, by diagnostic method**

| Diagnostic method | Method reported used[1] | | Test positive | |
|---|---|---|---|---|
| | Number | Per cent of total cases | Number | Per cent |
| Culture | 543 | 56.6 | 410 | 75.5 |
| Microscopy | 532 | 55.4 | 202 | 38.0 |
| Histology | 306 | 31.9 | 92 | 30.1 |
| Tuberculin testing | 391 | 40.7 | 207 | 52.9 |
| Radiography | 743 | 77.4 | 576 | 77.5 |
| Clinical examination | 404 | 42.1 | 271 | 67.1 |

1. Multiple diagnostic methods were reported for most cases.

**Table 6. Notifications of new cases of tuberculosis, 1994, by antimicrobials used at notification date**

| Drug combination | Notifications | % of known |
|---|---|---|
| Isoniazid + rifampicin + pyrazinamide + ethambutol | 452 | 67.0 |
| Isoniazid + rifampicin + pyrazinamide | 122 | 18.1 |
| Isoniazid + rifampicin + ethambutol | 25 | 3.7 |
| Isoniazid + rifampicin | 40 | 5.9 |
| Other combinations | 25 | 3.7 |
| Nil treatment / deceased at diagnosis | 17 | 1.6 |
| Not reported | 285 | - |
| TOTAL | 960 | |

### HIV status

HIV status was reported for only 75 notifications of new cases of tuberculosis (8%). Of these, 19 were reported to be HIV positive and 56 HIV negative. HIV-positive persons included 17 males aged 26 to 51 years (median 33 years). Seven males had pulmonary disease, three lymphatic disease and 2 pleural disease. The two females were a child with pulmonary disease and an adult with lymphatic disease.

### Country of birth

Information on country of birth was included in 838 notifications (87%) (Table 7). There were 201 notifications for persons reported as born in Australia, the annual crude incidence rate being 1.46 per 100,000 population. This was considerably lower than the rates for the two previous years (1.80 and 1.62 per 100,000 population in 1993 and 1992 respectively).

Six hundred and thirty-seven cases of new disease were reported to have been born overseas. The annual crude incidence rate for non-Australian born persons was 15.68 per 100,000 overseas born population, slightly higher than the rates in 1993 and 1992 (14.63 and 15.10 per 100,000 respectively). The highest numbers of notifications were for persons born in Viet Nam (140), the Philippines (73), UK and Ireland (57) and China (45).

The highest notification rates were for persons born in Viet Nam, the Philippines and Indonesia, all greater than 75 per 100,000 Australian residents born in the country concerned. The notification rates for migrants from China, India and Papua New Guinea were all close to 50 per 100,000.

The length of time that overseas born persons had been resident in Australia was reported for 442 notifications (69%). Reported duration of residence ranged from less than one year (122 notifications) to 91 years (Figure 3). The median was four years. For 231 cases (52%) notification of new disease had been made less than five years since arrival. Median lengths of residence were less than 10 years for persons born in most areas of Oceania and Asia, whereas they were more than 10 years for persons born in most European countries.

### Aboriginality

Aboriginality was reported for all but two of the 201 new cases of tuberculosis in Australian-born persons; 32 cases were reported in Aboriginal or Torres Strait Islander persons. This corresponds to an annual crude incidence rate of 10.6 per 100,000 population. This rate is approximately double the rate for Australia as a whole and about nine times the rate for non-indigenous Australian-born persons. Aboriginal and Torres Strait Islander persons included 11 females in the age range from 6 to 78 years (median 39 years) and 21 males in the age range 5 to 82 years (median 51 years). Pulmonary disease was reported for 8 females and 16 males. Several other primary sites of infection were reported, including miliary disease in a 13-year-old boy and a 43-year-old woman.

### Reactivations

Ninety-seven relapsed or reactivated cases of tuberculosis were notified (Table 1). These comprised 9.4% of total notifications and represented a notification rate of 0.54 per 100,000 population. This was twice the rate reported for 1993 and was considerably higher than rates reported for previous years (Table 2).

Included were 51 females (aged 14 to 91 years; median 58 years) and 26 males (aged 21 to 87 years; median 60 years). Site of disease was reported for 93 of the 97 cases; 67 had pulmonary disease, 16 lymphatic disease

**Figure 3. Notifications of new cases of tuberculosis in overseas born persons by duration of residence, 1994**

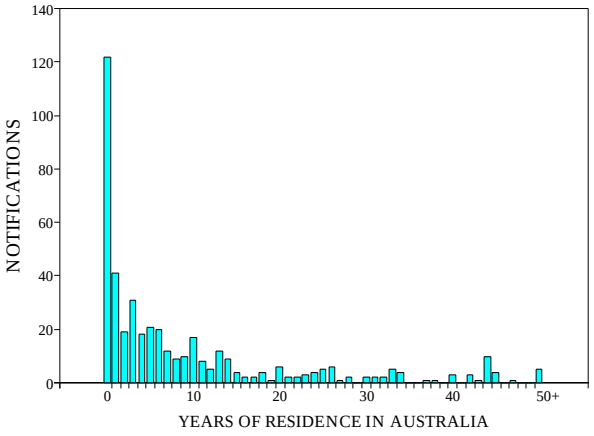


**Table 7. Notifications of new cases of tuberculosis, 1994, estimated rates per 100,000 population and median age, by country of birth**

| Country | Cases | Rate[1] per 100,000 persons | Median age (years) | Median length of residence (years) |
|---|---|---|---|---|
| OCEANIA | | | | |
| New Zealand | 8 | 2.8 | 63 | 13 |
| Papua New Guinea | 12 | 50.6 | | 0 |
| Other Oceania | 6 | - | - | |
| ASIA | | | | |
| China | 45 | 49.5 | 57 | 7 |
| Hong Kong | 19 | 22.1 | 36 | 3 |
| India | 36 | 48.0 | 33 | 3 |
| Indonesia | 31 | 79.5 | 29 | 2 |
| Philippines | 73 | 82.9 | 34 | 2 |
| Viet Nam | 140 | 98.6 | 33 | 4 |
| Turkey | 9 | 27.3 | 31 | 3 |
| Lebanon | 3 | 3.7 | 37 | 2 |
| Other Asia | 81 | - | - | |
| EUROPE | | | | |
| UK and Ireland | 57 | 4.6 | 72 | 34 |
| Greece | 13 | 9.0 | 65 | 32 |
| Italy | 17 | 6.5 | 61 | 33 |
| Former Yugoslavia | 15 | 8.5 | 49 | 6 |
| Other Europe | 37 | - | - | |
| Central & South America | 6 | - | - | |
| Africa | 18 | - | - | |
| Country not specified | 11 | - | - | |
| | | | | |
| TOTAL OUTSIDE AUSTRALIA | 637 | 15.68 | | |
| AUSTRALIA | 201 | 1.46 | 64 | |
| Not reported | 122 | - | - | |
| TOTAL | 960 | 5.38 | 43[2] | |

1. Incidence rates are calculated only for separate countries, per 100,000 Australian residents born in that country.
2. Median for all females is 40 years; median for all males is 46 years.

and three each had bone, joint or genito-urinary disease. In four cases disease in other sites was reported. HIV status was reported for only one case and was negative.

**Deaths**

In 11 cases information was included which indicated that the person had died. The Australian Bureau of Statistics reported 83 deaths during 1994 in which the primary underlying cause of death was tuberculosis[15], an annual death rate of 0.465 per 100,000 population. Fifty deaths were in males including 17 cases of pulmonary disease, four meningeal and/or central nervous system disease, three miliary tuberculosis and 26 due to late effects of tuberculosis. Thirty-three deaths in females were reported including nine cases of pulmonary disease, three meningeal and/or central nervous system disease, one miliary, one disease of other organs and 19 due to late effects.

**Atypical mycobacterial infection**

Atypical mycobacterial infection notifications were received from seven States and Territories. There was a total of 750 reports. Four States each reported more cases of atypical disease than of tuberculosis (new and reactivated), these reports accounting for 728 of the total. HIV status was reported for 151 cases, of which 142 (94%) were HIV-positive.

Of the HIV-positive cases, there were 138 males, their ages ranging from 23 to 72 years (median 40 years). The four females were aged from 36 to 49 years. Sites of infection were poorly specified.

Organisms reported were *M. avium-intracellulare* (525 notifications), *M. fortuitum-chelonae* (92), *M. gordonae* (35), *M. scrofulaceum* (21), *M terrae* (16), *M. marinum* (9), *M. kansasii* (8), *M flavescens* (6), *M. xenopi* (5), *M. gastri* (4), *M. slowaty* (2), *M. smegmatis* (2), *M. abscessii* (1), *M*

*szulgai* (1), *M. haemophilum* (1), untyped (6) and unknown / not reported (49 cases).

## Discussion

The results of this surveillance system for 1994 should be interpreted in conjunction with reports derived from other Australian data, in particular the Tuberculosis Laboratory Surveillance System[9].

Notification rates of new cases of tuberculosis have remained stable in Australia for several years and are low by world standards. However some groups in the community continue to be disproportionately affected. These include Aboriginal and Torres Strait Islander people and several immigrant groups. The high notification rate in the Northern Territory was only partially due to cases in Aboriginal persons, as 55% of notifications in that Territory were in non-Aboriginal persons.

The notification rates in persons from migrant groups from Viet Nam, the Philippines, Indonesia, China and India remain at high levels commensurate with the rates reported for the previous two years[11,12]. The short duration of residence in many cases in overseas borne persons, specifically those from Asian countries reflects the high prevalence of disease in their countries of origin.

The elderly have higher rates of tuberculosis than younger groups. There is a marked gender differential in those over 65 years with higher rates in males. These high rates in elderly males may be associated with factors such as homelessness, hostel residence and alcohol misuse, as in other countries[5] and warrant further investigation.

HIV-tuberculosis co-infection is recognised as a significant factor in the rising incidence of tuberculosis in many countries[6,7,16]. HIV status is poorly documented in this database. However, the lack of a gender difference in rates in younger age groups where most HIV infection occurs suggests that HIV does not currently play a major role in *M. tuberculosis* infection in this country.

The prevention of emergence of multidrug resistance is dependent on good surveillance, early diagnosis and effective treatment. Use of 4-drug treatment regimes are encouraged in this regard.

The number of cases of atypical mycobacterial infection reported for 1994 is much higher than that for 1993. The difference in numbers reported by States and Territories indicate that there is under-reporting of this category of mycobacterial infection from some jurisdictions.

There is a marked gender differential in notifications of atypical mycobacterial infections with a preponderance of males, particularly in HIV-positive persons. In view of the known association of both tuberculosis and atypical mycobacterial infection with HIV infection, efforts should be undertaken to improve this area of surveillance and to ascertain HIV status in relation to cases of both tuberculosis and atypical mycobacterial infection. In some countries the importance of establishing HIV status in cases of tuberculosis and offering testing for tuberculosis to persons seeking HIV tests has been demonstrated[17,18].

Information in the database was incomplete for several data fields, including methods of diagnosis, antimicrobials used, BCG status, HIV status, reactivation status, Aboriginality, country of birth and length of residence in Australia. The information recorded for some data items is completed in different ways in different jurisdictions. This is especially so for items in which some definitional latitude is allowed (for example onset date and report date). It is probably also true for the inclusion or otherwise of a case in the database, the assignation of 'confirmation status' and (in a few cases) the description and classification of the 'principal site of disease'. The extent to which information was provided on data fields such as HIV status, BCG vaccination status, use of diagnostic methods and use of antimicrobials varied considerably between datasets provided from different jurisdictions.

The lack of information in many cases about the use of culture methods to establish a diagnosis may reflect a diagnosis accepted as confirmed by other methods before the results of culture are known. Radiographic techniques are presumably heavily relied upon to establish a diagnosis, although bacterial culture and anti-microbial sensitivity testing are needed in the treatment phase. The increasing use of more sophisticated diagnostic methods, including DNA probes and PCR techniques, underlines a need for the National Mycobacterial Surveillance System to keep abreast of such developments.

The significance of the apparent increase in numbers of reactivated or relapsed cases is uncertain, because of the wide disparity in numbers reported by the separate States and Territories, and because the data has been coded in different ways in the separate databases supplied by them. Review of the definitions of relapse and reactivations, and of the methods of ascertainment and recording this information in individual cases, is recommended.

The notification rate for new cases of tuberculosis in Australia compares favourably with rates in other countries. However in view of the presence in this country of several vulnerable groups, some of whom have been shown to have much higher than average rates of disease, further efforts are warranted to improve surveillance of this important group of diseases.

The importance of adequate health screening procedures on incoming migrants and effective liaison with State / Territory health authorities is emphasised.

There are a number of deficiencies in current data collection procedures and these need to be rectified. The NMSS will be reviewed to address these issues and to consider the current review of tuberculosis control strategies being undertaken by the National Health and Medical Research Council Working Party on Tuberculosis.

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# HEPATITIS A ASSOCIATED WITH A CHILD-CARE CENTRE

*Graham Tallis*[1], *Mark Veitch*[2] *and Bronwen Harries*[1]

## Abstract

The Infectious Diseases Unit of the Victorian Department of Health and Community Services was notified in October 1995 that two staff members of a child-care centre had recently been ill with hepatitis A. Two more cases associated with the centre were promptly recognised. Investigations revealed four further cases associated with the centre over the preceding six weeks. After intervention with normal human immunoglobulin there was only one further case.

For early intervention to limit outbreaks of hepatitis A related to child-care centres, cases must be promptly reported to health authorities.

## Background

At least 15% of notified cases of hepatitis A in the United States are associated with child-care centres[1]. Similar data on sporadic cases are not available for Australia, but outbreaks related to child-care centres have been reported recently[2]. Hepatitis A is a notifiable disease in all Australian States and Territories.

Infants with hepatitis A have few specific symptoms[3], and the diagnosis may be missed in this age group. These nappy-wearing children pose a substantial risk to fellow child-care centre attenders, their families and centre staff. Various guidelines for the management of outbreaks related to child-care centres have recently been promulgated, emphasising the role of hygiene, the use of immunoglobulin and active vaccination of staff [3,4,5].

On 11 October 1995, the Infectious Diseases Unit of the Department of Health and Community Services, Victoria, was asked by the coordinator of a child-care centre in suburban Melbourne how to respond to two staff members who had been diagnosed with hepatitis A in the previous two weeks. The centre has 46 child-care places and employs 13 staff. It is located in two adjacent houses, one for infants and toddlers up to two years old, the other for pre-school age children aged three to five years.

## Methods and Interventions

In response to the notification we advised the coordinator of the centre to notify parents of all attending children that there had been cases of hepatitis A connected with the centre. An information sheet and letter advised parents to seek normal human immunoglobulin (NHIG) for children attending the centre from their local doctors. We advised staff to seek NHIG. We inspected hygiene and food handling at the centre and suggested improvements.

We investigated possible cases of hepatitis through their general practitioners and maintained surveillance for cases associated with the centre by questioning cases of hepatitis A notified to the Infectious Diseases Unit in the ensuing months.

We defined a case of hepatitis A associated with the centre as:

- a centre attender, staff member or household contact of an attender with serological evidence of recent hepatitis A infection (the presence of anti-HAV IgM),

  or

- jaundice and household contact with another confirmed case, between 1 August and 31 December 1995.

When it was clear that the outbreak involved at least four cases stretching back six weeks we sent a second letter to parents of children in the infant-toddler group advising them to seek NHIG for themselves and other household members. We conducted an immunisation session for families and children at the centre who had not yet received NHIG from their local doctors at which 30 doses of NHIG were administered.

## Results of Case Finding and Surveillance

Nine cases of hepatitis A were identified, including three staff members, five parents and one sibling of a child in the infant-toddler group at the centre (Table). Onset of illness was between September and December 1995 (Figure). There were no clinical cases of hepatitis A recognised in children at the centre.

One of the affected staff members (case 6) worked in the infant-toddler group house and also had a child in this group. The other staff member (case 3) worked in the pre-school group house and her own child attended the infant-toddler group.

The day after we sent information to parents, we learned of two more cases of hepatitis associated with the infant-toddler group. One (case 4) was the father of a child in the infant-toddler group, the other (case 7) was a child of an affected staff member (case 6) and the sibling of a child who attended the infant-toddler

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**Table. Details of cases of hepatitis A associated with a child centre, Victoria, 1995**

| Number | Age and sex | Jaundice | Confirmed anti-HAV IgM positive | Link to 0-2 years group house |
|---|---|---|---|---|
| 1 | 26 F | Yes | Yes | Child care worker in 0-2 years group |
| 2 | 31 F | No | Yes | Parent |
| 3 | 30 F | Yes | Yes | Parent of attender in 0-2 years group and child care worker in 3-5 years group |
| 4 | 43 M | Yes | Yes | Parent |
| 5 | 29 M | Yes | Yes | Parent |
| 6 | 33 F | Yes | Yes | Parent of attender and child care worker in 0-2 years group |
| 7 | 5 M | Yes | Not tested | Older child of case 6, sibling in 0-2 years group |
| 8 | 36 M | Yes | Yes | Parent |

group. In subsequent weeks, we identified three more parents of children in the infant-toddler group as recent cases of hepatitis A (cases 2, 5 and 8).

A third staff member (case 1) in the infant-toddler group house reported an illness comprising nausea, vomiting and fever which was diagnosed as gastroenteritis in late August. After returning to work for one day she again fell ill and noticed a yellow tinge to her sclera. She remained away from work for the rest of September. Serology in October confirmed recent hepatitis A infection.

The most recent case (case 9) is a parent of a child in the infant-toddler group. Her child received NHIG in October but she did not.

## Discussion

Control of hepatitis A associated with child-care centres involves recognising cases associated with the centre, scrupulous hygiene and administering NHIG to appropriate contacts. The possible role of active vaccination with hepatitis A vaccine should also be considered.

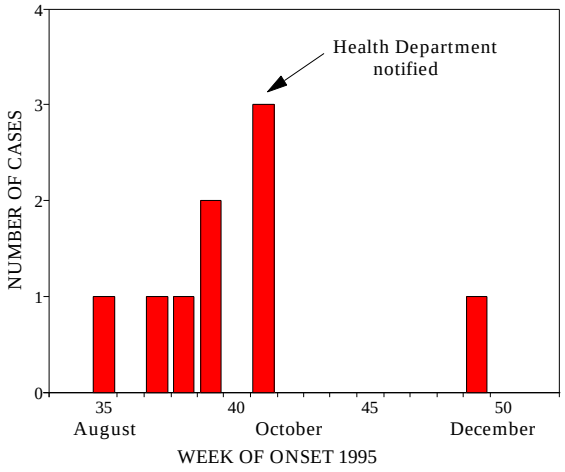
### Recognition

Medical practitioners need to be alert to the possibility of a 'silent' outbreak of hepatitis A among small children in a child-care centre when parents or siblings of such children, or staff of a centre, present with hepatitis A.

Unless cases of hepatitis A associated with child-care centres are reported promptly to public health authorities, clusters of cases will not be recognised and the opportunity to intervene effectively may be lost. The long incubation period of up to 50 days[4] further complicates the recognition and control of outbreaks.

In this outbreak there had been at least six cases of hepatitis associated with the centre (over six weeks) before the Infectious Diseases Unit was notified. Two further cases presented within three days. Hence, at the time of notification, eight of the nine cases were already

**Figure. Onset of cases of hepatitis A associated with a child-care centre, Victoria, 1995**




ill or infected and were not preventable by any actions at that time. We suspect that hepatitis A infection was occurring in the children in the infant-toddler group some weeks prior to the first adult case on 30 August and continued until mid to late October.

We chose not to seek blood samples from infants at the centre because by the time the Unit became involved there was substantial epidemiologic evidence implicating this group as the source of infection. Testing of saliva for hepatitis A antibodies has been used to investigate outbreaks of hepatitis A among children[6,7], but is not routinely available. This non-invasive approach might have provided supportive laboratory evidence that hepatitis A was occurring in small children at the centre.

### Hygiene

Hygiene was generally satisfactory at the centre, but hepatitis A poses particular problems in this respect as virus may survive for weeks on environmental

fomites[8]. Hand washing facilities must be available and used in nappy changing areas, food preparation areas and toilets. Bathrooms, toys, floors and surfaces in child-care centres must be cleaned daily with warm water and detergent. In an outbreak diluted bleach should be then used for disinfection[9].

**Immunoglobulin**

The aim of administering NHIG to centre attenders (in conjunction with other measures) is to reduce transmission of infection within and from this group[10]. The aim of administering NHIG to older contacts is to prevent or attenuate illness.

Guidelines for the use of NHIG in cases of hepatitis A related to child-care have recently been published by the American Public Health Association[4], the American Academy of Pediatrics[3], and the National Health and Medical Research Council (NHMRC)[5].

These guidelines recommend fairly limited use of NHIG in response to one or two cases of hepatitis A associated with nappy-wearing children at a child-care centre. The NHMRC recommends NHIG be given to unvaccinated staff if one case occurs in association with a centre and extending its use to centre attenders in contact with cases if two cases occur. The American guidelines recommend use of NHIG for centre attenders and unvaccinated staff for one or two cases associated with a child-care centre. However, when more than two cases related to a centre occur and / or cases occur over more than three weeks, wider use of NHIG may be justified including all family contacts of nappy-wearing centre attenders.

These recommendations recognise the ease with which hepatitis A is spread from nappy-wearing infants in child-care settings, the relative infrequency of clinically apparent hepatitis in infants and the likelihood that recognised cases of hepatitis A associated with child-care centres are tips of a larger iceberg.

**Active vaccination**

Staff of child-care centres where there are children in nappies should receive inactivated hepatitis A vaccine[5,9]. This could have prevented three cases in this outbreak. The role of hepatitis A vaccine in outbreaks is under investigation. Widespread active immunisation has been used in ongoing community-wide outbreaks of hepatitis A[11,12], but the vaccine is not currently licensed in Australia for use in children aged less than 5 years.

Hepatitis A vaccine (available in some countries in a paediatric dose) may have a role in preventing ongoing transmission in child-care centre outbreaks, provided outbreaks are recognised soon enough to intervene before the majority of infants have been infected. However if the outbreak has spread to the surrounding community, it may be difficult to define and vaccinate the wider population at risk of infection.

## Conclusion

In this outbreak, failure to recognise and notify cases of hepatitis A associated with a child-care centre impeded public health action to control the outbreak and reduce illness in contacts. Clinicians should investigate the possibility of a connection with child-care in all cases of hepatitis A.

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# OUTBREAK

## Ross River virus in Western Australia

*Mike Lindsay, Department of Microbiology, The University of Western Australia, QE II Medical Centre, Nedlands, WA 6907*

An outbreak of Ross River virus is currently in progress in coastal regions of the south-west of Western Australia. Over 544 serologically confirmed cases had been reported by late February 1996. The first cases were reported for October 1995. Fifteen cases were reported with dates of onset in November, followed by 70 in December, 356 in January and 106 (to date) in February 1996. The worst affected areas include coastal towns south of Perth. By January a number of cases had also been reported from Perth, although case follow-ups are likely to show that some of these infections were acquired further south during the Christmas holiday season.

# OVERSEAS BRIEFS

In the past fortnight the following information has been provided by the World Health Organization.

## Ebola outbreak in Gabon

As of 27 February a total of 24 cases including 13 deaths had been reported from Gabon. All cases were from Mayibout II, an isolated village with a population of 150 located 400 kilometres east of the capital city Libreville. Twelve of the dead were confirmed to have had direct contact with a dead chimpanzee.

An international team of medical experts is investigating the outbreak. A team from the Gabonese government is conducting surveillance of animals in the infected area following the discovery of several dead animals (one chimpanzee, one wild cat, one antelope and two gorillas).

The outbreak in Gabon is the second recent outbreak of Ebola haemorrhagic fever in Africa. In May 1995 316 cases and 245 deaths (77% case-fatality rate) were reported from Zaire. There was also a single case reported from Cote d'Ivoire last December. The patient survived.

The limited spread of the outbreak in Gabon has been attributed to several factors including a rapid response by the Ministry of Health in recognising the threat early and reacting appropriately. The government conducted a large-scale information campaign to inform the public about Ebola haemorrhagic fever, its mode of transmission and ways to avoid infection. In contrast to last year's epidemic which occurred in an urban zone, the outbreak in Gabon is in a rural area with a low population density, a natural advantage in limiting the further spread of infection.

Ebola virus transmission occurs by direct contact with the blood or body fluids of an infected person. Symptoms include the sudden onset of fever, followed by vomiting, diarrhoea and massive bleeding. The incubation period is between two and 21 days. There is no specific treatment or vaccine available for Ebola haemorrhagic fever.

The WHO does not recommend any travel restrictions to or within Gabon at this time.

## Influenza in the northern hemisphere

Epidemics of influenza were reported between October 1995 and February 1996 in many countries in Europe, North America, and Asia. After few reports in October 1995, influenza activity increased in November and reached a peak in December and, in some countries, in January 1996. By February, influenza had declined in most countries. Influenza A viruses have been widespread and caused moderate to severe epidemics affecting mainly children and young adults. European countries and China reported predominantly influenza A ($H_3N_2$) while influenza A ($H_1N1$) caused epidemics in Canada, Japan and most regions of the United States of America.

### *Influenza vaccine formula for the northern winter, 1996 to 1997*

The World Health Organization has recommended that trivalent influenza vaccines be used in the 1996 to 1997 northern season, and that they contain the following:

- A / Wuhan / 359 / 95($H_3N_2$) - like strain
- A / Singapore / 6 / 86($H_1N_1$) - like strain
- B / Beijing / 184 / 93 - like strain

This differs from last year'scomposition in that the first of these strains replaces an A / Johannesburg / 33 / 94 ($H_3N_2$)-like strain.

### Reference

1. Recommendations for the composition of influenza virus vaccines. *Wkly Epidemiol Rec* 1996;71:60-61.

### Meningitis

**Burkina Faso**. Outbreaks of meningococcal meningitis were reported on 7 February 1996. Two hundred and forty cases and 27 deaths were reported in Bam Province and in Yatenga Province 894 cases and 30 deaths. Seventy thousand doses of vaccine and 5,000 doses of oily chloramphenicol have been provided by WHO in support of national measures to contain the outbreaks.

**Nigeria**. Nine states in the north of the country have reported outbreaks of meningitis. To 15 February 1996 the Ministry of Health confirmed that more than 3000 cases and 400 deaths had been reported. The Ministry of Health in collaboration with WHO has sent a team of five experts to assess the situation and supervise control measures.

### Cholera

**Ecuador.** A new outbreak of cholera has been reported from Imbabura Province, Ecuador. A total of 416 cases and 4 deaths were reported in January. The majority of cases (71%) occurred in the Otovalo indigenous community. A group of national experts and a WHO / Pan American Health Organization epidemiologist are coordinating control measures.

**Nigeria.** Cholera outbreaks have been reported from Kano, Kwara, Ondo and Oyo States. To 19 February a total of 1,487 cases with 99 deaths were reported.

## NOTICES TO READERS

### Development of a National Communicable Diseases Surveillance Strategy

#### An invitation to make submissions

A National Communicable Diseases Surveillance Strategy (NCDSS) is being developed to enhance Australia's capacity to manage communicable diseases. The NCDSS aims to provide a comprehensive annual picture of the burden of communicable diseases that will improve national capacity to prioritise communicable disease threats and to develop control strategies. Issues being considered in the development of the Strategy include current surveillance arrangements and national co-ordination of surveillance activities. Laboratory issues are being considered in a related review. The Strategy is being developed on behalf of the Chief Health Officers of Australia. The process has been endorsed by the Australian Health Ministers' Advisory Council.

Submissions are invited on the development of a NCDSS. Further information, including terms of reference can be obtained by calling (06) 289 8351 or by faxing a request to (06) 289 7791. Please include your name, address and telephone number.

#### How to make your submission

Please make your submission in writing, word processing documentation diskette, or on audio tape, and include your name, address and phone number. Submissions should be sent to:

Dr Graeme Oliver, Secretary
NCDSS Committee
AIDS / Communicable Diseases Branch
MDP 15
Department of Human Services and Health
GPO Box 9848
Canberra ACT 2601

The closing date for receipt of submissions is **4 April 1996**.

All submissions will be held in a register of submissions which can be accessed by the public. If you would like your submission to be treated as confidential, please indicate this clearly. Submissions may however be subject to release under the Freedom of Information Act 1992.

### Reporting of acute flaccid paralysis cases and isolates of poliovirus

Australia is in the process of collecting data which will allow this country to be certified polio free[1]. This is part of the World Health Organization (WHO) initiative to eradicate poliomyelitis by the year 2000.

Two important factors which will help Australia meet the WHO criteria for a polio free country are surveillance of acute flaccid paralysis and testing of poliovirus isolates to detect wild poliovirus.

**Clinicians and laboratory staff are requested to actively participate in these schemes in order to allow Australia to be certified polio free as soon as possible.**

#### Reporting of cases of acute flaccid paralysis

Surveillance of acute flaccid paralysis (AFP) in children has been conducted through the Australian Paediatric Surveillance Unit since March 1995. The investigators in this study are Dr Ana Herceg (Commonwealth Department of Human Services and Health), Mrs Margery Kennett (National Polio Reference Laboratory), Dr Jayne Antony (New Children's Hospital) and Dr Helen Longbottom (Commonwealth Department of Human Services and Health).

The study of acute flaccid paralysis aims to meet the WHO criteria of adequate surveillance for possible cases of polio.The study also aims to estimate the annual incidence of AFP, document the causes of AFP and

describe the clinical picture of AFP cases, including outcomes. Possible causes of AFP include Guillain Barre syndrome, transverse myelitis, demyelination and viral infection.

**To definitely exclude polio the WHO requires 2 stool specimens to be taken and tested for poliovirus, preferably 24 hours apart, within the first two weeks after onset of paralysis for every case of AFP.**

Unfortunately this has been done for very few of the cases of AFP reported so far, and as a result a number of the cases must be classed as "polio compatible" under the WHO AFP classification criteria.

**Failure to adequately investigate cases of AFP according to the WHO criteria may compromise Australia's efforts to be certified polio free.**

To assist this study and the effort to certify Australia polio free, paediatricians are asked to ensure adequate stool specimens to meet the WHO criteria are taken for poliovirus testing from all cases of AFP, whether poliovirus infection is suspected or not. If adequate stool specimens have not been taken, another possible (but far less preferable as it does not directly fulfil the WHO criteria) option is to have paired sera tested for a rise in poliovirus antibodies.

All clinicians and laboratories are asked to keep in mind the need to test cases of acute flaccid paralysis for poliovirus infection.

Please report cases by phone to Dr Ana Herceg on (06) 289 8638.

## Testing of poliovirus isolates

Laboratories may receive specimens from cases where the diagnosis is acute flaccid paralysis (e.g. limb weakness, paralysis). If stool specimens have not been received laboratories are urged to contact the clinician to suggest these specimens are taken.

T**wo stool specimens from a case of acute flaccid paralysis should always be tested for poliovirus.**

Regional laboratories should forward specimens to their State or Territory virology laboratory for enterovirus isolation. If poliovirus is isolated the isolates and original faecal samples should be forwarded to the National Polio Reference Laboratory at Fairfield Hospital in Melbourne for intratypic differentiation.

In addition, **any poliovirus isolates obtained from other sources should be sent to the national polio reference laboratory for intratypic differentiation**. Other sources could include children with other illness, environmental samples or stool surveys. This testing will identify whether wild poliovirus is still circulating in the Australian community.

S**pecimens can be transported to the national polio reference laboratory at no cost to the originating laboratory**. These can be shipped through Qantas Australian Air Express / Marair. Please contact Ms Mary Engert, Marair, Melbourne Airport by phone on (03) 9335 2699, by fax on (03) 9330 4315 or toll-free on 1800 677 221 for transport details.

For further details on laboratory testing please contact Mrs Margery Kennett or Mrs Kerri Anne Brussen at the National Polio Reference Laboratory, Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital, Fairfield, Vic 3078; phone (03) 9280 2397; fax (03) 9481 3816.

### Reference

1. *CDI* notice to readers. Progress towards polio eradication in Australia. *Comm Dis Intell* 1995;19:43.

# International Travel and Health

## WHO Vaccination Requirements and Health Advice, 1996 Edition

The 1996 edition of the World Health Organization publication *International Travel and Health* is now available in English and French. This booklet is designed for health authorities, physicians, tourist agencies and other bodies who give health advice to travellers.

The booklet contains information on vaccination requirements of individual countries, areas where malaria transmission occurs, areas where *Plasmodium falciparum* is resistant to drugs, other potential health hazards and recommended travel precautions.

The booklet is available from WHO Distribution and Sales, 1211 Geneva 27, Switzerland; ISBN 92 4 158021 6; Sw.fr 15.00 / US $13.50; order number 1189600.

# Correction: Epidemiology of malaria in Australia 1991 - 1995

In *CDI* volume 20 issue number 4 of 19 February, on page 86 there was an error in the numbers of malaria reports for Tasmania. There were 54 cases of malaria reported for Tasmania between 1990 and 1994. Of these, the correct breakdown of species was 35 reports of *Plasmodium vivax*, 7 of *Plasmodium falicparum*, one of mixed *P. vivax* and *P. falciparum* and 11 unknown.

# COMMUNICABLE DISEASES SURVEILLANCE

## National Notifiable Diseases Surveillance System, 4 to 17 February 1996

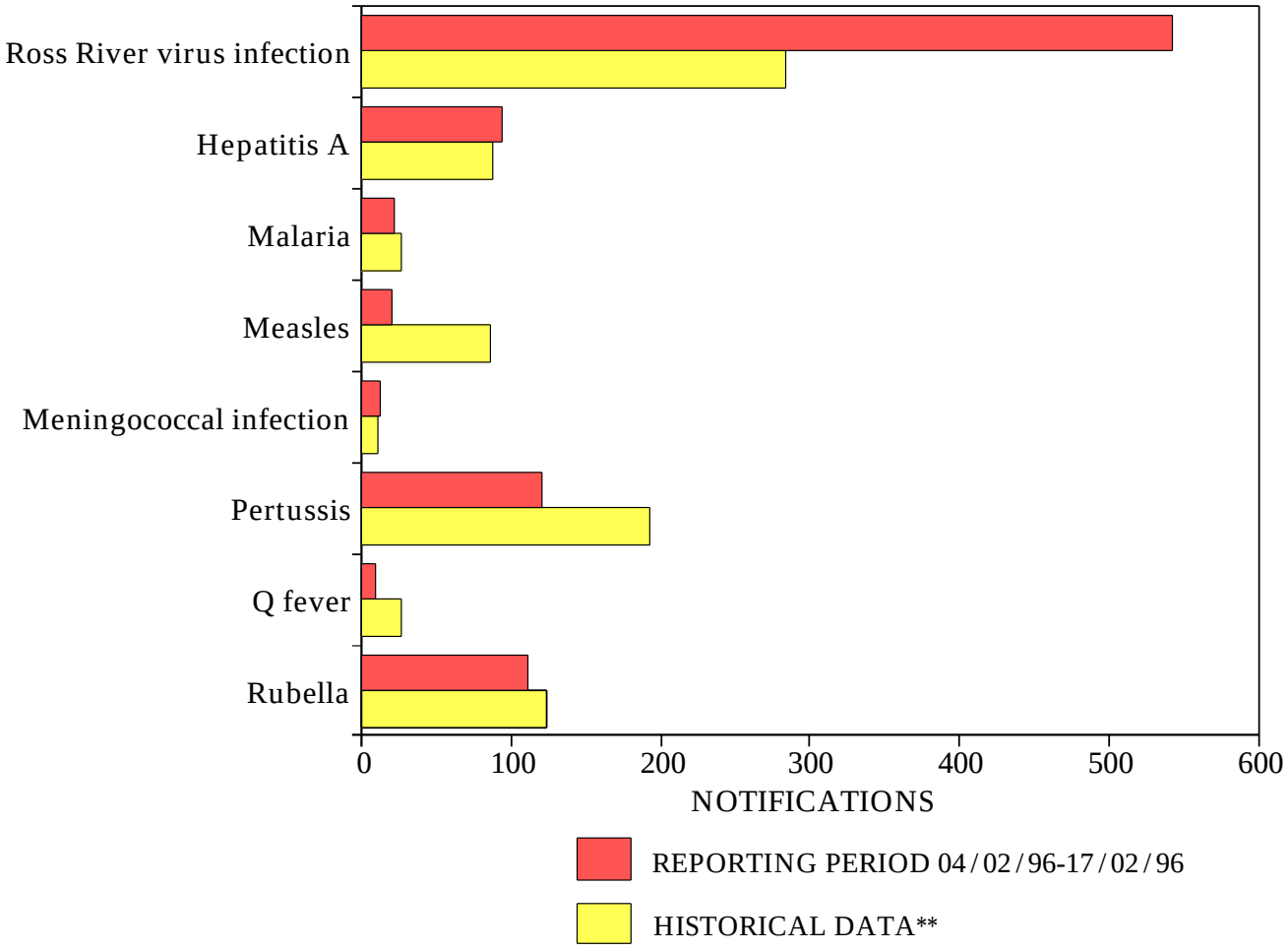
There were 3349 notifications received for this two week period (Tables 1, 2 and 3, and Figure 1).

- There were 542 notifications of **Ross River virus infection**, more than three times the number of 165 reported for the previous fortnight. The male:female ratio was 1.0:1.1. As for the previous reporting period, all age groups were affected, although more than two-thirds of cases were aged between 30 and 54 years, with peak numbers of cases for both sexes in the 35-39 years age group. More than 90% of the cases were reported from Queensland and Western Australia. Weekly numbers of notifications by reported date of onset show the progression of the epidemics in these two states.
- Thirty-four cases of **Barmah Forest virus infection** were reported from Queensland. Twenty cases were in the age range 30-54 years.
- Three cases of **dengue** were reported from Queensland and the Northern Territory; all were females aged between 30 and 54 years.
- Notifications of **campylobacteriosis** continue at a high level, with 471 cases reported in the current fortnight. The male:female ratio was 1.3:1.0; all age groups were affected, with 24% of cases being aged less than 5 years.
- There were 262 notifications of **chlamydial infection** received, more than half being reported from Queensland; 97 cases were male and 37 female; 70% of cases were aged between 15 and 29 years.
- There were 134 notifications of **gonococcal infection** received; 97 cases were male and 37 cases were female; 70% of the cases were aged between 15 and 29 years.
- Three cases of ***Haemophilus influenzae* type b infection** were reported during the period. All were male children aged from one to three years. One report was from the Northern statistical division in Queensland, and two were from metropolitan Adelaide.
- There were 93 cases of **hepatitis A** reported, including 78 in males and 14 in females. The cases were from all 5-year age groups up to 59 years, with 3 cases occurring in older persons; 53% of cases were in males aged from 20 to 34 years. More than two-thirds of the cases were reported from the metropolitan statististical divisions of Melbourne (35 cases) and Sydney (29).
- Seven cases of **hepatitis B (incident)** were reported; 5 were males and 2 were females; all were aged between 20 and 49 years.
- Six cases of **legionellosis** were reported. Five cases were in males, three of whom were over 70 years of age, and one each in the age groups 30-34 and 50-54 years. The female was in the 50-54 years age group. The cases were reported from five separate statistical divisions in three states.
- Eight cases of **leptospirosis** were reported. Their ages ranged from 25 to 59 years. All but one were males. The cases were reported from seven separate rural statistical divisions in three states.
- Twenty-two notifications of **malaria** were received; 18 were male and 4 were female. The ages of cases ranged from 0 to 67 years. Reports were received from 9 separate statistical divisions in 4 states and territories.
- Twenty-one cases of **measles** were reported; 7 cases were male and 14 cases were female. Their ages ranged from 0 to 49 years, 11 cases being under 5 years of age.
- There were 13 cases of **meningococcal infection** reported from 12 separate statistical divisions in 3 states. There were 9 females and 4 males. All age groups between 0-4 and 20-24 years were represented with one case in an older woman. One apparent cluster of two cases was reported from the same postcode area in metropolitan Melbourne.
- There were 120 notifications of **pertussis**, an increase of 70% from the number reported in the previous fortnight; 56 cases were male and 63 cases were female. All age groups but one from 0-4 years to 70-74 years were represented. Six cases were aged less than one year, and a further 12 cases were less than 5 years of age. Fifteen apparent clusters of two to four cases were reported from the same postcode area; the apparent clusters were reported from five separate states.
- Nine notifications of **Q fever** were received from six separate rural statistical divisions in northern New South Wales and Queensland. All were males, their ages ranging from 15 to 69 years.
- There were 111 cases of **rubella** reported; 77 cases were male and 34 were female. Recorded ages of cases were from all 5-year age groups up to 55-59 years, 41% of the cases (45) were reported in males 15-24 years of age, and 16% (18 cases) in women aged 15 to 44 years.
- There were 323 cases of **salmonellosis** reported; 154 cases were male and 161 cases were female; the sex of the remaining 8 cases was not reported; 41% of the cases were aged less than 5 years.
- Fifty cases of **syphilis** were reported; 28 cases were male and 21 female; the sex of the remaining case was not reported. All age groups from 10-14 years

to 50-54 years were represented, with one case being reported in an older person.

- There were 30 cases of **tuberculosis** reported; 18 cases were male and 12 cases were female, the sex of the remaining cases were not reported. All age groups between 0-4 years and 80-84 years were represented.
- Eight cases of **typhoid** were reported; 3 cases were male and 5 were female. The cases were reported from 6 separate statistical divisions in 5 states and territories.
- Seventeen cases of **yersiniosis** were reported; 8 cases were male, and 9 were female. Seven cases were reported in children under 5 years of age, all but one of the remainder being aged between 10 and 34 years.

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




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

## Table 1. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 4 to 17 February 1996

| DISEASES | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | TOTALS FOR AUSTRALIA[1] This period 1996 | This period 1995 | Year to date 1996 | Year to date 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diphtheria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Haemophilus influenzae* b infection | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 3 | 3 | 12 | 12 |
| Measles | 0 | 7 | 0 | 3 | 0 | 2 | 9 | 0 | 21 | 69 | 75 | 394 |
| Mumps | 0 | 2 | 0 | NN | 0 | 0 | 1 | 0 | 3 | 3 | 19 | 17 |
| Pertussis | 0 | 29 | 0 | 49 | 21 | 0 | 17 | 4 | 120 | 237 | 414 | 814 |
| Poliomyelitis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rubella | 4 | 9 | 1 | 38 | 5 | 3 | 48 | 3 | 111 | 136 | 580 | 504 |
| Tetanus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |

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 2. Notifications of other diseases[1] received by State and Territory health authorities in the period 4 to 17 February 1996

| DISEASES | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | TOTALS FOR AUSTRALIA[2] This period 1996 | This period 1995 | Year to date 1996 | Year to date 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arbovirus infection | | | | | | | | | | | | |
| Ross River virus infection | 0 | 27 | 21 | 271 | 0 | - | 4 | 219 | 542 | 109 | 839 | 344 |
| Dengue | 0 | 0 | 1 | 2 | 0 | - | 0 | 0 | 3 | 1 | 7 | 2 |
| Barmah Forest virus infection | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 34 | 26 | 72 | 62 |
| NEC[3,4] | 0 | 10 | 2 | 0 | 0 | 0 | 7 | 1 | 20 | 10 | 38 | 17 |
| Campylobacteriosis[5] | 14 | - | 9 | 152 | 107 | 26 | 73 | 90 | 471 | 480 | 1639 | 1494 |
| Chlamydial infection (NEC)[6] | 2 | NN | 10 | 141 | 12 | 10 | 39 | 48 | 262 | 272 | 919 | 915 |
| Donovanosis | 0 | NN | 1 | 1 | NN | 0 | 0 | 1 | 3 | 7 | 9 | 14 |
| Gonococcal infection[7] | 1 | 17 | 11 | 61 | 3 | 0 | 11 | 30 | 134 | 137 | 439 | 442 |
| Hepatitis A | 2 | 30 | 0 | 14 | 0 | 0 | 36 | 11 | 93 | 91 | 380 | 312 |
| Hepatitis B | 0 | 0 | 0 | 2 | 0 | 1 | 4 | 0 | 7 | 14 | 42 | 46 |
| Hepatitis C incident | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 5 | 8 |
| Hepatitis C unspecified | 10 | 0 | 5 | 161 | 0 | 5 | 152 | 34 | 367 | 433 | 1276 | 1152 |
| Hepatitis (NEC) | 0 | 0 | 0 | 0 | 0 | 0 | 2 | NN | 2 | 1 | 5 | 6 |
| Legionellosis | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 2 | 6 | 11 | 21 | 34 |
| Leptospirosis | 0 | 2 | 0 | 2 | 0 | 0 | 4 | 0 | 8 | 13 | 34 | 27 |
| Listeriosis | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 7 | 9 | 15 |
| Malaria | 3 | 9 | 0 | 0 | 0 | 0 | 6 | 4 | 22 | 42 | 94 | 96 |
| Meningococcal infection | 0 | 2 | 0 | 2 | 0 | 0 | 9 | 0 | 13 | 17 | 35 | 51 |
| Ornithosis | 0 | NN | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 6 | 19 | 28 |
| Q fever | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 9 | 21 | 46 | 72 |
| Salmonellosis (NEC) | 3 | 38 | 20 | 149 | 18 | 8 | 59 | 28 | 323 | 412 | 1032 | 1124 |
| Shigellosis[5] | 0 | - | 3 | 15 | 3 | 0 | 2 | 4 | 27 | 50 | 94 | 141 |
| Syphilis | 0 | 23 | 4 | 16 | 0 | 1 | 0 | 6 | 50 | 91 | 144 | 289 |
| Tuberculosis | 0 | 3 | 4 | 9 | 0 | 0 | 12 | 1 | 30 | 36 | 107 | 153 |
| Typhoid[8] | 1 | 2 | 0 | 1 | 0 | 0 | 2 | 2 | 8 | 5 | 20 | 11 |
| Yersiniosis (NEC)[5] | 0 | - | 0 | 16 | 1 | 0 | 0 | 0 | 17 | 16 | 44 | 81 |

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

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

**Table 3. Notifications of rare[1] diseases received by State and Territory health authorities in the period 4 to 17 February 1996**

| DISEASES | Total this period | Reporting States or Territories | Year to date 1996 |
|---|---|---|---|
| Botulism | 0 | | 0 |
| Brucellosis | 0 | | 3 |
| Chancroid | 0 | | 0 |
| Cholera | 0 | | 0 |
| Hydatid infection | 0 | | 4 |
| Leprosy | 0 | | 0 |
| Lymphogranuloma venereum | 0 | | 0 |
| Plague | 0 | | 0 |
| Rabies | 0 | | 0 |
| Yellow fever | 0 | | 0 |
| Other viral haemorrhagic fevers | 0 | | 0 |

1. Fewer than 60 cases of each of these diseases were notified each year during the period 1988 to 1994.

## Australian Sentinel Practice Research Network

Data for weeks 5 and 6 ending 4 and 11 February respectively are included in this issue of *CDI* (Table 4). The rate of reporting of gastroenteritis has declined since early January as has that for chickenpox.

## HIV and AIDS Surveillance

### Methodological note

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

**Table 4. Australian Sentinel Practice Research Network, weeks 4 and 5, 1996**

| Condition | Week 5, to 4 February 1996 | | Week 6, to 11 February 1996 | |
|---|---|---|---|---|
| | Reports | Rate per 1000 encounters | Reports | Rate per 1000 encounters |
| Influenza | 23 | 2.6 | 13 | 1.6 |
| Rubella | 8 | 0.9 | 3 | 0.4 |
| Measles | 1 | 0.1 | 0 | 0 |
| Chickenpox | 10 | 1.1 | 9 | 1.1 |
| Pertussis | 3 | 0.3 | 3 | 0.4 |
| Gastroenteritis | 142 | 15.7 | 123 | 14.7 |

**Table 5. New diagnoses of HIV infection new diagnoses of AIDS and deaths following AIDS occurring in the period 1 August to 31 August 1995 and reported by 30 November 1995, by sex and State or Territory of diagnosis**

| | | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | TOTALS FOR AUSTRALIA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | This period 1995 | This period 1994 | Year to date 1995 | Year to date 1994 |
| HIV diagnoses | Female | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 6 | 56 | 54 |
| | Male | 3 | 32 | 0 | 10 | 3 | 0 | 16 | 4 | 68 | 66 | 522 | 562 |
| | Sex not reported | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| | Total[1] | 3 | 33 | 0 | 10 | 3 | 0 | 18 | 4 | 71 | 72 | 588 | 624 |
| AIDS diagnoses | Female | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 18 | 22 |
| | Male | 0 | 17 | 0 | 4 | 1 | 0 | 4 | 3 | 29 | 74 | 312 | 517 |
| | Total[1] | 0 | 19 | 0 | 4 | 1 | 0 | 5 | 3 | 32 | 78 | 331 | 543 |
| AIDS deaths | Female | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 27 | 23 |
| | Male | 0 | 28 | 0 | 1 | 3 | 0 | 7 | 1 | 40 | 52 | 381 | 464 |
| | Total[1] | 1 | 29 | 0 | 1 | 3 | 0 | 7 | 2 | 42 | 54 | 409 | 490 |

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

**Table 6. Cumulative diagnosis of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 31 August 1995, by sex and State or Territory of diagnosis**

| | | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | AUSTRALIA |
|---|---|---|---|---|---|---|---|---|---|---|
| HIV diagnoses | Female | 15 | 539 | 3 | 94 | 44 | 4 | 163 | 69 | 931 |
| | Male | 161 | 9783 | 79 | 1519 | 553 | 70 | 3276 | 732 | 16173 |
| | Sex not reported | 0 | 2047 | 0 | 0 | 0 | 0 | 42 | 0 | 2089 |
| | Total[1] | 176 | 12376 | 82 | 1618 | 597 | 74 | 3489 | 803 | 19215 |
| AIDS diagnoses | Female | 4 | 126 | 0 | 25 | 17 | 2 | 45 | 14 | 233 |
| | Male | 67 | 3445 | 25 | 570 | 252 | 32 | 1242 | 253 | 5886 |
| | Total[1] | 71 | 3581 | 25 | 597 | 269 | 34 | 1294 | 268 | 6139 |
| AIDS deaths | Female | 2 | 93 | 0 | 19 | 13 | 2 | 28 | 9 | 166 |
| | Male | 49 | 2519 | 18 | 401 | 168 | 21 | 972 | 186 | 4334 |
| | Total[1] | 51 | 2618 | 18 | 422 | 181 | 23 | 1006 | 196 | 4515 |

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

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.

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 August 1995, as reported to 30 November 1995, are included in this issue of *CDI* (Tables 5 and 6).

## Surveillance of Serious Adverse Events Following Vaccination

The Serious Adverse Events Following Vaccination Surveillance Scheme is a national surveillance scheme which monitors the serious adverse events which occur rarely following vaccination. More details on the Scheme were published in *CDI* 1995:19;273-274.

Acceptance of a report does not imply a causal relationship between administration of the vaccine and the medical outcome, or that the report has been verified as to the accuracy of its contents.

It is estimated that 250,000 doses of vaccines are administered to Australian children under the age of 6 years every month.

### Results for the reporting period 21 January 1996 to 17 February 1996

There were 12 reports of serious adverse events following vaccination for this period. Reports were received from the Queensland (6) and Victoria (6).

Of the 12 reports, 3 were cases of persistent screaming, one of a hypotonic / hyporesponsive episode, two of a temperature of 40.5°C or more, two of convulsions and 4 were other events temporally associated with vacci-

**Table 7. Adverse events following vaccination for the following period**

| Event | Vaccines | | | | | Reporting States or Territories | Total reports for this period |
|---|---|---|---|---|---|---|---|
| | DTP | DTP / Hib | DTP / OPV / Hib | OPV / Hib | HepB | | |
| Persistent screaming | 1 | | 1 | 1 | | Qld, Vic. | 3 |
| Hypotonic / hyporesponsive episode | 1 | | | | | Vic | 1 |
| Temperature of 40.5°C or more | | 1 | 1 | | | Qld | 2 |
| Convulsions | | 1 | 1 | | | Qld | 2 |
| Other | 1 | | 1 | | 2 | Qld, Vic | 4 |
| Total | 3 | 2 | 4 | 1 | 2 | | 12 |

nation (Table 7). Of the 4 'other' events, one was an abscess at a DTP injection site, one was persistent screaming and leg swelling and two were episodes of drowsiness following hepatitis B vaccination.

Events associated with DTP vaccine alone or DTP in combination with other vaccines were associated with the first (4), second (3), third (1) and fourth (1) doses. One child was hospitalised. All children had recovered at the time the initial report was sent in.

## Sterile Sites Surveillance (LabDOSS)

Data for this four weekly period have been provided by 13 laboratories. There were 1185 reports of significant sepsis:

**New South Wales:** Prince of Wales, Sydney 104; Royal North Shore Hospital 42, Liverpool Hospital 110; John Hunter Hospital 234.
**Tasmania:** Royal Hobart Hospital 51; Northern Tasmania Pathology Service 30.
**Queensland:** Sullivan and Nicolaides Partners 53; Ipswich General Hospital 17.
**Australian Capital Territory:** Woden Valley Hospital 71.
**Northern Territory:** Alice Springs Hospital 31.
**Western Australia:** Princess Margaret Hospital For Children 23; Sir Charles Gairdner Hospital 108.
**South Australia:** Institute of Medical and Veterinary Science 311.

Organisms reported 5 or more times from blood are detailed in Table 8. Other blood isolates not included in Table 8 were:

**Gram positive:** 1 *Arcanobacterium haemolyticum*, 3 *Brevibacterium* species, 4 *Corynebacterium jeikeium*, 4 *Enterococcus faecium*, 2 *Lactobacillus* species, 1 *Leuconostoc* species, 1 *Listeria monocytogenes*, 2 *Micrococcus* species, 2 *Streptococcus* Group C, 1 *Streptococcus* Group G and 1 *Streptococcus* 'milleri'.

**Gram negative:** 1 *Aeromonas sobria*, 1 *Aeromonas hydrophila*, 1 *Agrobacterium radiobacter*, 2 *Campylobacter jejuni*, 2 *Citrobacter diversus*, 2 *Citrobacter freundii*, 4 *Citrobacter* species, 1 *Enterobacter agglomerans*, 1 *Flavibacterium* species, 1 *Gemella morbillorum*, 1 *Haemophilus parainfluenzae*, 1 *Hafnia* species, 1 *Neisseria cinerea*, 4 *Neisseria meningitidis*, 1 *Ochrobactrum anthropi*, *1 Pasteurella* species,1 *Pseudomonas* species, 4 *Serratia marcescens*, 1 *Sphingomonas paucimobilis*, 1 *Sphingomonas* species and 1 *Vibrio* species.

**Table 8. 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 | Perinatal | Neonatal | |
| *Bacillus* species | | | | | | | | 4 | | | | 7 |
| *Corynebacterium* species | | | | | | 3 | 1 | | | | | 8 |
| *Enterococcus faecalis* | | | 1 | 4 | 3 | 2 | 3 | 4 | 1 | | | 19 |
| *Enterococcus* species | | | | 3 | | 1 | 1 | | | | | 5 |
| *Staphylococcus aureus* | 20 | 1 | 3 | 5 | 5 | 36 | 16 | 51 | 31 | | 3 | 207[2] |
| *Staphylococcus* coagulase negative | | 4 | | | 3 | 11 | 12 | 30 | 22 | 1 | 10 | 119 |
| *Staphylococcus epidermidis* | | 1 | | | | 4 | 1 | 3 | 7 | | 1 | 32 |
| *Streptococcus* Group A | | | | | | 3 | | | | | | 6 |
| *Streptococcus* Group B | | 1 | | 3 | 2 | 4 | 3 | 1 | | 2 | | 19 |
| *Streptococcus* Group C | | 1 | | | | 1 | | | | | | 5 |
| *Streptocooccus* 'milleri' | | | | 6 | | 1 | 1 | 2 | | | | 11 |
| *Streptococcus pneumoniae* | | 28 | | 4 | 1 | | 1 | 9 | | | 1 | 43 |
| *Streptococcus sanguis* | | | 2 | 1 | | 1 | | | | | | 9 |
| *Streptococcus viridans* | | | 3 | 3 | | 1 | 1 | 3 | | | | 11 |
| *Streptococcus* species | | 3 | | | | 1 | | 7 | | | | 16 |
| *Acinetobacter* species | | 2 | | 1 | | 3 | 1 | 5 | | | | 14 |
| *Aeromonas* species | | | | 4 | | 1 | 1 | 1 | | | | 6 |
| *Enterobacter aerogenes* | | 3 | | | | | | 4 | | | | 8 |
| *Enterobacter cloacae* | | | | 3 | 1 | 1 | 1 | 7 | 1 | | | 17 |
| *Enterobacter* species | | 2 | | 1 | 1 | | 2 | 2 | 2 | | | 13 |
| *Escherichia coli* | 1 | 3 | 1 | 31 | 107 | 6 | 11 | 41 | 3 | 1 | | 217 |

**Table 8. LabDOSS reports of blood isolates, by organism and clinical information, continued**

| Organism | Clinical information | | | | | | Risk factors | | | | | Total[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bone / Joint | Lower respiratory | Endocarditis | Gastrointestinal | Urinary tract | Skin | Surgery | Immunosuppressed | IV line | Perinatal | Neonatal | |
| *Haemophilus influenzae* | | 6 | | | | 1 | | 4 | | 2 | | 13 |
| *Klebsiella oxytoca* | | | | 3 | 2 | 1 | | 1 | 1 | | 1 | 10 |
| *Klebsiella pneumoniae* | | 3 | | 8 | 7 | 1 | 1 | 13 | 1 | | 1 | 41 |
| *Klebsiella* species | | 1 | | 3 | 3 | | 2 | 2 | | | | 9 |
| *Morganella morganii* | | | | 1 | 3 | 1 | 2 | 2 | | | | 6 |
| *Proteus mirabilis* | 1 | | | 1 | 10 | 2 | | 4 | | | | 20 |
| *Pseudomonas aeruginosa* | | 9 | | 5 | 8 | 2 | 5 | 25 | 3 | | 1 | 61 |
| *Salmonella* species | | | | 1 | | | | 1 | | | | 5 |
| *Salmonella typhi* | | | | 7 | | | | | | | | 10 |
| *Serratia marcescens* | | 2 | | | 1 | | 1 | 1 | 1 | | | 5 |
| *Xanthamonas maltophilia* | | | | | | 1 | | 7 | | | | 12 |
| *Bacteroides fragilis* | | | | 1 | | 1 | | 2 | | | | 9 |
| *Bacteroides* species | | | | 4 | | 1 | 2 | | | | | 7 |
| *Clostridium perfringens* | | 1 | | 3 | | | | 3 | | | | 5 |
| *Candida albicans* | | | | 1 | | | 4 | 2 | 2 | | | 15 |
| *Candida* species | | | | | | | | | | | | 6 |

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 14.

**Anaerobes:** 1 *Actinomyces naeslundii,* 1 *Bacteroides corporis,* 2 *Bacteroides oralis,* 1 *Clostridium septicum,* 1 *Clostridium* species, 2 *Fusobacterium* species and 2 *Propionibacterium acnes.*

**Fungi:** 1 *Cryptococcus neoformans* and 1 *Cryptococcus neoformans* var. *neoformans.*

### Hospital acquired blood isolates

A total of 313 isolates was reported as being hospital acquired. The most commonly reported organisms were *Staphylococcus aureus* (91, including 14 MRSA), *Staphylococcus* coagulase negative (59), *Escherichia coli* (30), *Pseudomonas aeruginosa* (25) and *Klebsiella pneumoniae* (13).

### Meningitis and/or CSF isolate reports

There were 16 reports of meningitis and/or CSF isolates. Included was 1 *Neisseria meningitidis,* 2 *Haemophilus influenzae,* 2 *Streptococcus pneumoniae* and 2 *Streptococcus* coagulase negative (Table 9).

### Isolates from sites other than blood or CSF

**Joint fluid:** Fifteen reports were received this period including 8 *Staphylococcus aureus* (1 MRSA), 4 *Streptococcus* Group A, 1 *Streptococcus* Group B and 2 *Streptococcus* Group G.

**Peritoneal dialysate:** A total of 7 reports was received. Included was 1 *Staphylococcus aureus,* 3 *Staphylococcus* coagulase negative, 1 *Candida* species, 1 *Bacillus* species and 1 *Pseudomonas aeruginosa.*

**Pleural fluid:** Nine reports of organisms isolated from pleural fluid were received this period including 1 *Escherichia coli,* 1 *Staphylococcus aureus,* 2 *Streptococcus milleri,* 1 *Candida albicans,* 2 *Enterococcus Faecalis,* 1 *Proteus mirabilis* and 1 *Pseudomonas aeruginosa.*

**Other:** 1 *Acinetobacter* species, 1 *Enterococcus faecalis, 9 Escherichia coli,* 1 *Klebsiella oxytoca,* 1 *Morganella morganii,* 1 *Pasteurella* species, 2 *Proteus mirabilis,* 1 *Pseudomonas aeruginosa,* 1 *Pseudomonas* species, 9 *Staphylococcus aureus* (2 MRSA), 6 *Staphylococcus* coagulase negative, 1 *Streptococcus* Group B, 5 *Streptococcus* Group D (non enterococci), 1 *Streptococcus'* milleri', and 1 *Streptococcus* species.

**Table 9. LabDOSS reports of meningitis and/or CSF isolates, by organism and age group**

| | <1 month | 1-11 months | 1-4 years | 15-24 years | 25-34 years | 45-54 years | 55-64 years | 75+ years |
|---|---|---|---|---|---|---|---|---|
| *Acinetobacter* species | | | | | | 1 | | |
| *Citrobacter diversus* | 1 | | | | | | | |
| *Crypto neoformans* | | | | | 1 | | | |
| *Crypto neoformans* var. *gattii* | | | | | | | 1 | |
| *Enterobacter cloacae* | | 1 | | | | | | |
| *Enterococcus faecalis* | | | | | 1 | | | |
| *Escherichia coli* | | 1 | | | | | | |
| *Haemophilus influenzae* | | | | | | | | 2 |
| *Listeria monocytogenes* | | | | | | | 1 | |
| *Neisseria meningitidis* | | | | 1 | | | | |
| *Staphylococcus* coagulase negative | | 1 | 1 | | | | | |
| *Streptococcus pneumonae* | | | | | 1 | | | 1 |
| *Streptococcus* species | | | | 1 | | | | |

## Virology and Serology Reporting Scheme

There were 1738 reports received in the *CDI* Virology and Serology Reporting Scheme this period (Tables 10, 11 and 12).

- One report of **measles** was received this period. Diagnosis was by IgM detection.
- Two reports of **mumps** were received this period. Included was a 66 year old male from Queensland. Diagnosis was by IgM detection.
- **Rubella** was reported for 36 patients this period. Diagnosis was by IgM detection (21) and single high titre (15). Included were 15 females and 21 males.
- **Hepatitis A** was reported for 33 patients this period including 13 males and 20 females.
- Positive **hepatitis B** serology was reported for 146 patients this fortnight including 69 males and 76 females (one sex not stated). Included were 2 patients who had sustained needlestick injuries and 18 pregnant females. One hundred and twenty-five of the patients were aged between 15 and 44 years.
- Two hundred and fifty-four reports of **hepatitis C** were received this period. Included were 161 males and 93 females. Two patients had sustained needlestick injuries and 11 were injecting drug users.
- One report of **hepatitis D** was reported this period. Diagnosis was by IgM detection.
- Ninety-five cases for **Ross River virus** were reported this period diagnosed by IgM detection (41), single high titre (43) and fourfold change in titre (8). Seventy-six patients were aged between 25 and 64 years. The number of reports has increased in recent weeks (Figure 2).
- Fourteen reports of **Barmah Forest virus** were received this period, all from Queensland. Diagnosis was by IgM detection (3) and single high titre (11).

**Figure 2. Ross River virus laboratory reports, 1995 to 1996, by month of specimen collection**

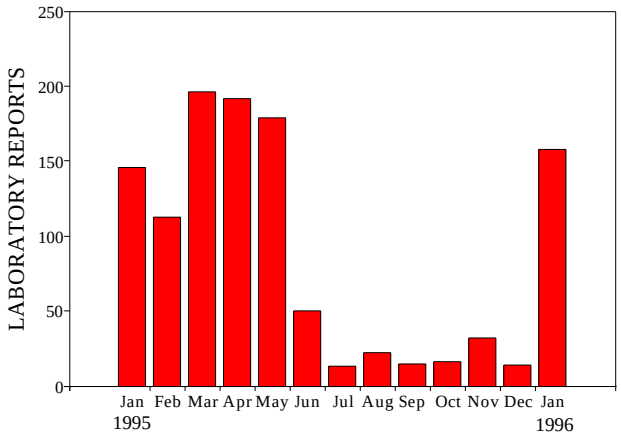
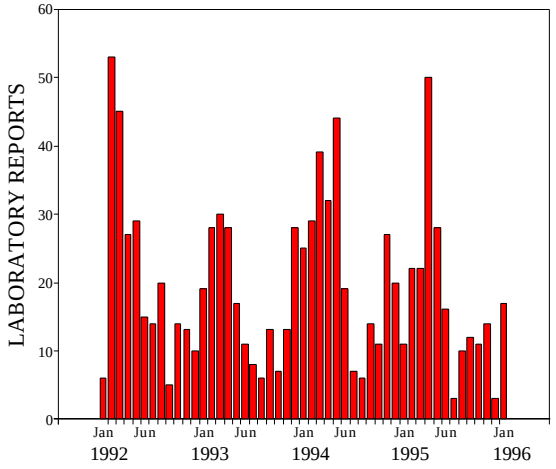


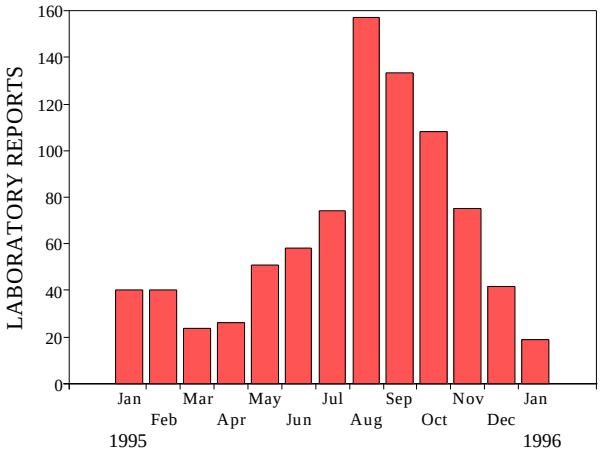

**Figure 3. Barmah Forest virus laboratory reports, 1992 to 1996, by month of specimen collection**



The number of reports has increased in recent weeks (Figure 3).

- **Sindbis virus** was reported for a 51 year old male from Queensland. Diagnosis was by single high titre.
- One report of **flavivirus** unspecified was received from New South Wales this period. Diagnosis was by IgM detection.
- Forty-eight reports of **adenovirus** untyped were received this period diagnosed by virus isolation (39) and antigen detection (9).
- **Herpes simplex virus type 1** was reported for 223 patients this reporting period. Diagnosis was by virus isolation (219) and antigen detection (4).
- Two hundred and twenty reports of **herpes simplex virus type 2** were received this period. Diagnosis was by virus isolation (219) and antigen detection (one).
- Forty-three reports of **herpes simplex virus** untyped were received this period. Diagnosis was by virus isolation (42) and IgM detection (one).
- Fifty-five reports of **cytomegalovirus** were received this period. Diagnosis was by virus isolation (22), nucleic acid detection (one) and IgM detection (31). Included were 5 HIV / AIDS patients, 17 injecting drug users, 28 pregnant females and 4 transplant recipients.
- **Varicella-zoster virus** was reported for 56 patients this period. Diagnosis was by virus isolation (36), IgM detection (6) and nucleic acid detection (14). Included was a one year old female with encephalitis.
- One hundred and eight reports of **Epstein-Barr virus** were received this reporting period. Diagnosis was by IgM detection.
- One reports of **parvovirus** was reported from Queensland this period. Diagnosis was by IgM detection.
- One **coxsackievirus type A9** isolate was reported from New South Wales this fortnight.
- **Echovirus type 14** was reported for 14 patients this period. Ten patients were male and 4 were female. Included was a 10 year old with meningitis.
- **Rhinovirus** was reported for 11 patients this period. Nine reports were from New South Wales and 2 from Victoria. Nine patients were between the ages of one and 4 years.
- Four reports of **enterovirus not typed** were received this period. All diagnoses were by virus isolation.
- **Influenza A** was reported for 8 patients this period. All patients were male and diagnosis was by virus isolation. Six were between the ages one and 4 years.

**Figure 4. Parainfluenza virus type 3 laboratory reports, 1995 to 1996, by month of specimen collection**




- **Parainfluenza virus type 1** was reported for one patient this period. Diagnosis was by antigen detection.
- Two reports of **parainfluenza virus type 2** were received this period. Diagnosis was by virus isolation and antigen detection.
- **Parainfluenza virus type 3** was reported for 7 patients this reporting period. Diagnosis was by virus isolation (6) and antigen detection (one). Reports were received from New South Wales (6) and Victoria (one). The number of reports has continued to decline in recent months after peaking in August (Figure 4).
- Twenty-three reports of **respiratory syncytial virus (RSV)** were received this period. Diagnosis was by virus isolation (2) and antigen detection (21). Fifteen patients were between the ages of one and 11 months.
- **Rotavirus** was reported for 29 patients this period. Twenty-eight reports were for patients under 4 years of age. Included were 14 females and 13 males (two sex not stated).
- ***Chlamydia trachomatis*** was reported for 132 patients this period. Diagnosis was by isolation (3), antigen detection (34), IgM detection (one) and nucleic acid detection (94).
- ***Chlamydia* species** were reported for 23 patients this reporting period. Diagnosis was by single high titre (one), fourfold change in titre (one) and IgM detection (22).
- Twenty-six reports of ***Mycoplasma pneumoniae*** were received this period. Included were 12 females and 14 males. Methods of diagnosis included single high titre (one), IgM detection (22), fourfold change in titre (one) and total antibody (2).
- ***Mycoplasma hominis*** was reported for one patient this period.

- Nine reports of ***Coxiella burnetti*** were received this period. Diagnosis was by fourfold change in titre (5) and IgM detection (4).
- Thirty-five reports of ***Streptococcus*** **Group A** were reported this period. Diagnosis was by single high titre.
- ***Bordetella*** was reported for 46 patients this reporting period (12 *Bordetella pertussis* and 34 *Bordetella* species). Included were 22 females and 24 males. *Bordetella* reports have increased in recent weeks (Figure 5).
- Twelve reports of ***Treponema pallidum*** were received this period. Eight patients were female including one who was pregnant. Diagnosis was by single high titre (one), total antibody (4) and IgM detection (7).
- Two reports of ***Toxoplasma gondii*** were received this period from Queensland.

**Figure 5. *Bordetella pertussis* and *Bordetella* species laboratory reports, 1994 to 1996, by month of specimen collection**

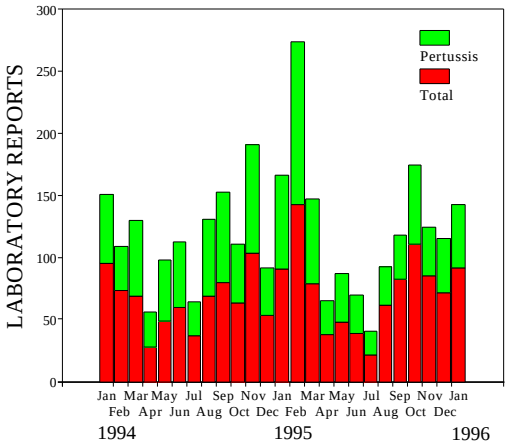



**Table 10. Virology and serology laboratory reports by State or Territory[1] for the reporting period 8 to 21 February 1996, historical data[2], and total reports for the year**

| | State or Territory [1] | | | | | | | | Total this fortnight | Historical data [2] | Total reported this year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | | | |
| MEASLES, MUMPS, RUBELLA | | | | | | | | | | | |
| Measles virus | | 1 | | | | | | | 1 | 33.0 | 12 |
| Mumps virus | | | | 2 | | | | | 2 | 3.3 | 8 |
| Rubella virus | | 7 | | 27 | | | | 2 | 36 | 30.7 | 155 |
| HEPATITIS VIRUSES | | | | | | | | | | | |
| Hepatitis A virus | | 12 | | 17 | | | 1 | 3 | 33 | 17.8 | 95 |
| Hepatitis B virus | | 78 | 6 | 49 | | 4 | 9 | | 146 | 99.7 | 406 |
| Hepatitis C virus | | 72 | 8 | 128 | | 21 | 4 | 21 | 254 | 236.5 | 1,018 |
| Hepatitis D virus | | 1 | | | | | | | 1 | 1.0 | 5 |
| ARBOVIRUSES | | | | | | | | | | | |
| Ross River virus | | 6 | 15 | 48 | | | 1 | 25 | 95 | 118.3 | 196 |
| Barmah Forest virus | | 1 | 1 | 12 | | | | | 14 | 11.3 | 28 |
| Sindbis virus | | | | 1 | | | | | 1 | 0.0 | 1 |
| Flavivirus (unspecified) | | 1 | | | | | | | 1 | 0.8 | 7 |
| ADENOVIRUSES | | | | | | | | | | | |
| Adenovirus not typed/pending | | 29 | | 5 | | | 10 | 4 | 48 | 37.5 | 317 |
| HERPES VIRUSES | | | | | | | | | | | |
| Herpes simplex virus type 1 | 1 | 91 | 8 | 94 | | 5 | 9 | 15 | 223 | 200.8 | 1,168 |
| Herpes simplex virus type 2 | | 75 | 3 | 127 | | 4 | 3 | 8 | 220 | 212.2 | 1,198 |
| Herpes simplex not typed/pending | | 42 | | 1 | | | | | 43 | 21.2 | 111 |
| Cytomegalovirus | | 22 | | 11 | | 4 | 9 | 9 | 55 | 50.7 | 286 |
| Varicella-zoster virus | 1 | 24 | | 26 | | 1 | 1 | 3 | 56 | 48.8 | 263 |
| Epstein-Barr virus | | 34 | 2 | 62 | | 1 | 1 | 8 | 108 | 79.2 | 426 |
| OTHER DNA VIRUSES | | | | | | | | | | | |
| Parvovirus | | | | 1 | | | | | 1 | 7.0 | 27 |

**Table 10. Virology and serology laboratory reports by State or Territory[1] for the reporting period 8 to 21 February 1996, 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 | NT | Qld | SA | Tas | Vic | WA | | | |
| PICORNA VIRUS FAMILY | | | | | | | | | | | |
| Coxsackievirus A9 | | 1 | | | | | | | 1 | 0.0 | 3 |
| Echovirus type 4 | | 2 | | | | | | | 2 | 0.0 | 2 |
| Echovirus type 7 | | 1 | | | | | | | 1 | 0.0 | 1 |
| Echovirus type 9 | | 2 | | | | | | | 2 | 0.5 | 15 |
| Echovirus type 14 | | 14 | | | | | | | 14 | 0.0 | 22 |
| Echovirus type 22 | | 2 | | | | | | | 2 | 0.0 | 4 |
| Poliovirus type 1 (uncharacterised) | | 1 | | | | | | | 1 | 0.8 | 1 |
| Poliovirus type 3 (uncharacterised) | | 1 | | | | | | | 1 | 0.5 | 3 |
| Rhinovirus (all types) | | 9 | | | | | 2 | | 11 | 15.7 | 138 |
| Enterovirus not typed / pending | | 2 | | 1 | | | 1 | | 4 | 31.2 | 174 |
| ORTHO / PARAMYXOVIRUSES | | | | | | | | | | | |
| Influenza A virus | | 8 | | | | | | | 8 | 10.7 | 45 |
| Parainfluenza virus type 1 | | | | | | | | 1 | 1 | 2.2 | 7 |
| Parainfluenza virus type 2 | | | | | | | | 2 | 2 | 1.3 | 8 |
| Parainfluenza virus type 3 | | 6 | | | | | 1 | | 7 | 9.7 | 184 |
| Respiratory syncytial virus | | 6 | 9 | 1 | 1 | | 3 | 3 | 23 | 15.8 | 200 |
| OTHER RNA VIRUSES | | | | | | | | | | | |
| HIV-1 | | | | 3 | | | 2 | | 5 | 3.0 | 25 |
| Rotavirus | 1 | 3 | 17 | | 1 | 4 | 2 | 1 | 29 | 24.7 | 244 |
| OTHER | | | | | | | | | | | |
| *Chlamydia trachomatis* not typed | | 15 | 14 | 88 | | 4 | 3 | 8 | 132 | 124.7 | 623 |
| *Chlamydia* species | | 23 | | | | | | | 23 | 2.5 | 37 |
| *Mycoplasma pneumoniae* | | 10 | | 14 | | | | 2 | 26 | 29.5 | 104 |
| *Mycoplasma hominis* | | | | | | | 1 | | 1 | 0.2 | 2 |
| *Coxiella burnetii* (Q fever) | | 4 | | 4 | | | 1 | | 9 | 10.3 | 27 |
| *Streptococcus* Group A | | 1 | 7 | 27 | | | | | 35 | 15.7 | 99 |
| *Bordetella pertussis* | | | | | | | 12 | | 12 | 30.8 | 110 |
| *Bordetella* species | | 1 | | 33 | | | | | 34 | 16.5 | 92 |
| *Treponema pallidum* | | 5 | 5 | 2 | | | | | 12 | 26.0 | 56 |
| *Toxoplasma gondii* | | | 2 | | | | | | 2 | 3.8 | 5 |
| TOTAL | 3 | 613 | 97 | 784 | 2 | 48 | 76 | 115 | 1,738 | 1,585.8 | 7,958 |

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 11. Virology and serology laboratory reports by clinical information for the reporting period 8 to 21 February 1996**

| | Encephalitis | 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 | | | | | | | | 14 | | | | 22 | 36 |
| HEPATITIS VIRUSES | | | | | | | | | | | | | |
| Hepatitis A virus | | | | | | | 10 | | | | | 23 | 33 |
| Hepatitis B virus | | | | | | | 10 | | | | | 136 | 146 |
| Hepatitis C virus | | | | | | | 39 | | | | | 215 | 254 |
| Hepatitis D virus | | | | | | | | | | | | 1 | 1 |

**Table 11. Virology and serology laboratory reports by clinical information for the reporting period 8 to 21 February 1996, continued**

| | Encephalitis | Meningitis | Other CNS | Congenital | Respiratory | Gastrointestinal | Hepatic | Skin | Eye | Muscle/joint | Genital | Other/unknown | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARBOVIRUSES | | | | | | | | | | | | | |
| Ross River virus | | | | | | | | 8 | | 28 | | 59 | 95 |
| Barmah Forest virus | | | | | | | | | | 5 | | 9 | 14 |
| Sindbis virus | | | | | | | | | | | | 1 | 1 |
| Flavivirus (unspecified) | | | | | | | | | | | | 1 | 1 |
| ADENOVIRUSES | | | | | | | | | | | | | |
| Adenovirus not typed/pending | | | | | 8 | 6 | | | 4 | | | 30 | 48 |
| HERPES VIRUSES | | | | | | | | | | | | | |
| Herpes simplex virus type 1 | | | | | 2 | | | 51 | 1 | | 44 | 125 | 223 |
| Herpes simplex virus type 2 | | | | | | | | 22 | | | 86 | 112 | 220 |
| Herpes simplex not typed/pending | | | | | | | | 1 | | | 3 | 39 | 43 |
| Cytomegalovirus | | | | 1 | 10 | 1 | 1 | | | 1 | | 41 | 55 |
| Varicella-zoster virus | 1 | | | | | | | 23 | | | | 32 | 56 |
| Epstein-Barr virus | | | | | 10 | | | 2 | | | | 96 | 108 |
| OTHER DNA VIRUSES | | | | | | | | | | | | | |
| Parvovirus | | | | | | | | | | 1 | | | 1 |
| PICORNA VIRUS FAMILY | | | | | | | | | | | | | |
| Coxsackievirus A9 | | | | | 1 | | | | | | | | 1 |
| Echovirus type 4 | | | | | | | | | | | | 2 | 2 |
| Echovirus type 7 | | | | | | | | | | | | 1 | 1 |
| Echovirus type 9 | | | | | | | | | | | | 2 | 2 |
| Echovirus type 14 | | 1 | | | | | | | | | | 13 | 14 |
| Echovirus type 22 | | 1 | | | | | | | | | | 1 | 2 |
| Poliovirus type 1 (uncharacterised) | | | | | | | | | | | | 1 | 1 |
| Poliovirus type 3 (uncharacterised) | | | | | | | | | | | | 1 | 1 |
| Rhinovirus (all types) | | | | | 5 | | | | | | | 6 | 11 |
| Enterovirus not typed/pending | | | | | 2 | | | | | | | 2 | 4 |
| ORTHO/PARAMYXOVIRUSES | | | | | | | | | | | | | |
| Influenza A virus | | | | | | | | | | | | 8 | 8 |
| Parainfluenza virus type 1 | | | | | 1 | | | | | | | | 1 |
| Parainfluenza virus type 2 | | | | | 2 | | | | | | | | 2 |
| Parainfluenza virus type 3 | | | | | 3 | | | | | | | 4 | 7 |
| Respiratory syncytial virus | | | | | 13 | | | | | | | 10 | 23 |
| OTHER RNA VIRUSES | | | | | | | | | | | | | |
| HIV-1 | | | | | | | | | | | | 5 | 5 |
| Rotavirus | 1 | | | | | 26 | | | | | | 2 | 29 |
| OTHER | | | | | | | | | | | | | |
| *Chlamydia trachomatis* not typed | | | | | | | | | 3 | | 75 | 54 | 132 |
| *Chlamydia* species | | | | | | | | | | | | 23 | 23 |
| *Mycoplasma pneumoniae* | | | | | 7 | | | | | | | 19 | 26 |
| *Mycoplasma hominis* | | | | | 1 | | | | | | | | 1 |
| *Coxiella burnetii* (Q fever) | | | | | | | 1 | | | | | 8 | 9 |
| *Streptococcus* Group A | | | | | 11 | | | 3 | | | | 21 | 35 |
| *Bordetella pertussis* | | | | | 12 | | | | | | | | 12 |
| *Bordetella* species | | | | | 10 | | | | | | | 24 | 34 |
| *Treponema pallidum* | | | | | | | | | | | 7 | 5 | 12 |
| *Toxoplasma gondii* | | | | | | | | | | | | 2 | 2 |
| TOTAL | 2 | 2 | | 1 | 98 | 33 | 61 | 124 | 8 | 35 | 215 | 1159 | 1738 |

**Table 12. Virology and serology laboratory reports by contributing laboratories for the reporting period 8 to 21 February 1996**

| STATE OR TERRITORY | LABORATORY | REPORTS |
|---|---|---|
| New South Wales | Institute of Clinical Pathology & Medical Research, Westmead | 371 |
| | Royal Alexandra Hospital for Children, Camperdown | 16 |
| | Royal North Shore Hospital, St Leonards | 14 |
| | Royal Prince Alfred Hospital, Camperdown | 25 |
| | South West Area Pathology Service, Liverpool | 139 |
| Northern Territory | Alice Springs Hospital | 28 |
| Queensland | Queensland Medical Laboratory, West End | 898 |
| Tasmania | Northern Tasmanian Pathology Service, Launceston | 9 |
| | Royal Hobart Hospital, Hobart | 39 |
| Victoria | Microbiological Diagnostic Unit, University of Melbourne | 3 |
| | Monash Medical Centre, Melbourne | 25 |
| | Royal Children's Hospital, Melbourne | 39 |
| Western Australia | Princess Margaret Hospital, Perth | 24 |
| | Western Diagnostic Pathology | 108 |
| TOTAL | | 1738 |



Contributions covering any aspects of communicable disease are invited. Instructions to authors can be found in *CDI* 1995;20:13.

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