COMMUNICABLE DISEASES INTELLIGENCE

ISSN 0725-3141 VOLUME 18 NUMBER 5 7 March 1994

CONTENTS

Editor: Helen Longbottom
Deputy Editor: Jenny Hargreaves

Editorial and Production Staff: Leslee Roberts, Margaret Curran, David Evans, Toni Hogan, Leona Seib and Michelle Wood

CDI is produced fortnightly by:
AIDS/Communicable Diseases Branch
Department of Human Services and Health
GPO Box 9848 Canberra ACT 2601
Fax: (06) 289 7791 Telephone: (06) 289 1555

Contributions covering any aspect of communicable diseases are invited. Publication does not preclude authors from arranging publication of their material elsewhere.

Opinions expressed in *CDI* are those of the authors and not necessarily those of the Department of Human Services and Health or other Communicable Diseases Network - Australia affiliates. Figures given may be subject to revision.

Parts of *CDI* are also available on the *CDI* Bulletin Board System, accessible with a computer, communications software and a modem on (06) 281 6695.

Consent for copying in all or part can be obtained from:
Manager, Commonwealth Information Service
Australian Government Publishing Service
PO Box 84 Canberra ACT 2600

COMMONWEALTH DEPARTMENT OF HUMAN SERVICES AND HEALTH

MALARIA SCREENING AND SURVEILLANCE IN THE NORTHERN TERRITORY - PROTOCOLS FOR ACTIVE SCREENING OF STUDENTS FROM HIGH RISK AREAS

Tiina Voolmann[1,2] *Bart Currie*[1], *Mahomed Patel*[2], *Peter Whelan*[1], *Vicki Krause*[1]

In the past malaria was endemic in the Northern Territory (NT), resulting in numerous deaths in the Aboriginal and mining communities. Extensive programs to eradicate malaria included active case surveillance, mass drug therapy and vector control. The last endemic case was reported in 1962 and the World Health Organization declared Australia malaria free in 1981. However, the Top End of the Northern Territory is still receptive to re-establishment of indigenous malaria. In addition to increasing numbers of imported malaria cases, introduced malaria (brief local transmission) occasionally occurs in tropical Australia[1,2], justifying concerns about indigenous malaria. To help decrease this risk in the NT and to decrease the morbidity from malaria, a passive surveillance program has been complemented with an active screening and surveillance program for students arriving from countries with endemic malaria.

Passive surveillance

A protocol with aggressive anti-malaria measures has been in place for a number of years for notified cases. The measures include:

- all laboratories immediately notifying cases to the NT Disease Control Centre (DCC),
- initial admission to hospital of all malaria cases to minimise parasite-mosquito contract and to supervise drug therapy,
- staff from DCC interviewing the patient for a detailed travel history before and after arrival in Australia,
- notifying the Medical Entomology Branch for assessment of the need for initiating vector investigation and control measures,
- contacting co-travellers and offering a blood test for malaria,
- home follow-up by Community Health staff to ensure compliance with primaquine eradication therapy.

Active screening and surveillance

In 1991, when five cases of malaria were diagnosed in 17 students from Papua New Guinea (PNG)[3], it became apparent that there was a need to monitor persons from high risk malarious areas who will spend prolonged periods of time in the Top End. (High risk areas are defined as PNG, Solomon Islands, Vanuatu, Myanmar, Laos, Cambodia, Vietnam and parts of Thailand, Malaysia and Indonesia[1].) These persons are more likely to have partial immunity to malaria with asymptomatic parasitaemia, but some will also develop severe clinical malaria while in Australia. Since secondary school students from high risk areas are readily identifiable when compared with other migrants, an active malaria screening and surveillance program was introduced.

Initially, screening was introduced into the secondary school system with the Department of Education. Students from high risk malarious areas were targeted with the following measures:

- a blood test to screen for malaria in initial entry into Australia. This measure was modified early in 1993 to include screening on every entry into Australia,
- recommending malaria prophylaxis during holidays at home, noting the loss of partial immunity when the students are out of a malarious area for prolonged periods, and
- a letter to students and their 'foster' parents alerting them to think of malaria and to seek medical advice for any illness.

Data were collected over the last three years from secondary school students in Darwin (Table 1). Of the 17 cases of malaria in secondary school students, asymptomatic infection was detected in five on screening. Eight developed clinical malaria soon after arrival in Australia before screening took place. Three students treated for clinical malaria subsequently relapsed with *Plasmodium vivax* malaria despite 14 days of 22.5mg daily primaquine. One student with asymptomatic *P. vivax* malaria on screening subsequently developed clinical *P. falciparum* malaria. One student with clinical *P. malariae* malaria in 1991 was reinfected during holidays in PNG and presented with clinical *P. falciparum* malaria soon after return to Darwin in 1993. It seems likely that in the NT we can expect malaria to be detected each year in at least one in 10 secondary students from high risk malarious areas such as PNG and the Solomon Islands.

Two problems have been identified since the introduction of this policy. Self-medication prior to arrival in Australia is common and compliance with malaria prophylaxis is poor in the holidays. Both problems are

1. Northern Territory Department of Health and Community Services, Darwin.
2. National Centre for Epidemiology and Population Health, Canberra.

Table 1. Overseas students from high risk malarious areas attending secondary schools in Darwin, and cases with malaria, by year

	1991	1992	1993
Students from high risk areas	17	34	54
Students treated for clinical malaria[1]	4	4	4
Students treated for asymptomatic malaria[1]	1	1	3
NT total malaria cases	45	30	34

1. 17 total cases in 12 students.

Table 2. Overseas students from malarious countries[1] attending university in Darwin, and cases with malaria, by year

	1991	1992	1993
Student numbers	78	81	90
Reported cases of malaria	0	0	2[2]

1. Low and high risk malarias countries combined.
2. One official notification and one self-medication admitted to the student health service doctor.

being addressed with educational efforts. However, with the new prophylactic guidelines recommended by the National Health and Medical Research Council[4], compliance in the future may be even more problematic since doxycycline requires daily administration and mefloquine costs around $8 for each weekly tablet. These concerns led to the recent change of our screening policy from initial entry only to screening on every entry into Australia.

The active screening program was extended in 1993 to include students at the NT University from malarious countries (Table 2). However, problems are anticipated in this setting also. These students are adults and possibly more likely to refuse screening. They are also accustomed to self-medicating at home when clinical malaria occurs and therefore may be more reluctant to seek medical advice or treatment. In contrast, the 'foster' parents of secondary school students usually actively seek help. Some adults students are accompanied by a spouse and children. Arrangements have been made for the students' family members to be tested free of charge at Community Health Clinics. The uptake and acceptance of these measures remain to be seen. Education is again necessary to obtain the voluntary co-operation of both students and their families. It will take several years to raise awareness among overseas students, local education staff and fellow students to a level where screening will be generally acceptable and self treatment uncommon.

Of note is that few cases of malaria have to date been notified from NT University students (Table 2). This may in part reflect self-medication. However, many of these students are from areas of substantially lower malaria risk when compared with the majority of the secondary students who come from PNG and the Solomon Islands[1]. It is anticipated that overseas student numbers in the NT will continue to increase, including more university students from high risk malarious areas.

In summary, we have delineated the NT malaria screening and surveillance system. The passive surveillance with its attendant protocol is now routine and well accepted. We are still in the process of initiating active screening and surveillance into the educational system. The initial measures appear to be tolerated by secondary students and to be acceptable to the school nurses and local student liaison officers who are vital to the program.

References

1 Forsyth S, Leoskow K, Pearce M, Riley I, Sleigh A, Srinivasa M. *Final report of the Australian Malaria Register for 1990.* Herston: Tropical Health Program University of Queensland Medical School, 1991.

2 Currie B. The diagnosis and treatment of malaria in Australia. *Aust Fam Physician* 1993;**22**:1773-1779.

3 Currie B, Whelan P, Dyer M, Beeby J, Noonan C, Patel M. Malaria in visiting Papua New Guinean students in the Northern Territory. *Comm Dis Intell* 1991;**15**:116-118.

4 National Health and Medical Research Council. Recommendations on malaria chemoprophylaxis. *Comm Dis Intell* 1993;**17**:594-601.

HOSPITAL-ACQUIRED INFECTION SURVEYS IN A CHILDREN'S HOSPITAL

Adapted from reports in the Children's Hospital Camperdown Monthly Infectious Disease Report, No 40, March 1993 and No 46, September 1993; editor D Isaacs

In February 1993 a team of stalwarts performed the sixth of our six-monthly cross-sectional surveys of hospital-acquired infection (HAI), and in August 1993, the seventh survey was performed. Previous studies were reported in *Monthly Infectious Diseases Report* No 10 (August 1990), No 16 (February 1991), No 24 (July 1991), No 29 (March 1992) and No 33 (July 1992)(*CDI* 1991;**15**:36-39; 1991;**15**:289-292; 1992;**16**:8-9; 1992;**16**:360-361 and 1992;**16**:474-475). In these surveys we visit each child in the hospital on a single day and assess whether or not they have an HAI. An HAI is defined as an active infection, symptomatic or currently receiving antimicrobial therapy, for an infection acquired in hospital or

Tabe 1. Duration of hospital stay and prevalence of HAI

	February 1993[1]		August 1993[2]	
Stay (days)	HAI (%)	Total	HAI (%)	Total
0-7	3 (2%)	127	1 (1%)	125
8-14	4 (20%)	20	3 (3%)	25
15-21	4 (36%)	11	2 (18%)	11
>21	3 (14%)	22	10 (36%)	28

1. Relative risk (95% CI) for > 14 days vs ≤ 14 = 4.5 (1.7 - 12.0); >7 days vs ≤ 7 = 8.8 (2.6 - 33.3).
2. Relative risk (95%CI) >14 days vs ≤ 14 = 11.5 (3.9 - 33.8); > 7 days vs ≤ 7 = 29.3 (4.0 - 216.8).

Table 2. Age and prevalence of HAI

	February 1993[1]		August 1993[2]	
Age (months)	HAI (%)	Total	HAI (%)	Total
<1	2 (12.5%)	16	0	13
1-6	2 (9%)	23	5 (18.5%)	27
7-12	0	11	2 (8%)	24
13-24	1 (6%)	18	2 (13%)	15
25-36	1 (5%)	21	1 (8%)	13
37-48	0	10	0	10
49-60	1 (6%)	16	1 (7%)	14
>60	7 (11%)	65	5 (7%)	73

1. No significant association between incidence of HAI and age.
2. No significant association between incidence of HAI and age.

Table 3. Sex and prevalence of HAI

	February 1993[1]		August 1993[2]	
Sex	HAI (%)	Total	HAI (%)	Total
Male	6 (6%)	98	9 (9%)	99
Female	8 (10%)	82	7 (8%)	90

1. Relative risk (95% CI) = 1.6 (0.6 - 4.9), not significant.
2. Relative risk (95% CI) = 1.2 (0.2 - 8.4), not significant.

Table 4. Intensive care and prevalence of HAI

	February 1993[1]		August 1993[2]	
Intensive care	HAI (%)	Total	HAI (%)	Total
Yes	4 (19%)	21	6 (21.4%)	28
No	10 (6.7%)	159	10 (6.2%)	161

1. Relative risk (95% CI) = 3.0 (1.04 - 8.8).
2. Relative risk (95% CI) = 3.5 (1.4 - 8.7).

Table 5. Service and prevalence for HAI

	Service	February 1993[1]		August 1993[2]	
		HAI (%)	Total	HAI (%)	Total
Medical	General	2 (6%)	33	3 (8%)	38
	Oncology	4 (22%)	18	3 (12.5%)	24
	Other	0	34	2 (5%)	37
	All medical	6 (7%)	85	8 (8%)	99
Surgical	General	1 (6%)	17	1 (6%)	17
	Orthopaedic	2 (11%)	18	0	11
	Neurosurgery	2 (15%)	13	3 (21%)	14
	Other	1	36	3 (9%)	33
	All surgical	6 (7%)	84	7 (9%)	75
Neonatal	Medical	1	5	1(9%)	11
	Surgical	0	4	0	2
	Medical and surgical	1	2	0	2
	All neonatal	2 (18%)	11	1 (7%)	15

1. No significant differences.
2. No significant differences.

Table 6. Surgery this admission and prevalence of HAI

	February 1993[1]		August 1993[2]	
Surgery	HAI (%)	Total	HAI (%)	Total
Yes	9 (12%)	78	10 (14.5%)	69
No	5 (5%)	102	6 (5%)	120

1. Relative risk (95% CI) = 2.4 (0.8 - 6.7), not significant.
2. Relative risk (95% CI) = 2.9 (1.1 - 7.5).

Table 7. Immunosuppression and prevalence of HAI

	February 1993[1]		August 1993[2]	
Immunosuppression	HAI (%)	Total	HAI (%)	Total
Yes	4 (18%)	22	3 (12%)	25
No	10 (6%)	158	13 (7.9%)	164

1. Relative risk (95% CI) = 2.9 (0.98 - 9.4), not significant.
2. Relative risk (95% CI) = 1.5 (0.5 - 4.9), not significant.

Table 8. Endotracheal tube and prevalence of HAI

	February 1993[1]		August 1993[2]	
Endotracheal tube	HAI (%)	Total	HAI (%)	Total
Yes	4 (25%)	16	1 (7.1%)	14
No	10 (6%)	164	15 (8.6%)	175

1. Relative risk (95% CI) = 4.1 (1.5 - 11.6).
2. Relative risk (95% CI) = 1.2 (0.2 - 8.4), not significant.

due to a previous hospital procedure (for example infected central line, infected shunt).

Children admitted with infection or developing symptoms within the incubation period of that disease were defined as having community-acquired infection (CAI).

We examined risk factors for HAI, as in previous surveys (Tables 1 to 12).

For children with HAI an estimate was made as to whether the infection was 'definitely preventable', such as, in general, wound infection, gastroenteritis and respiratory syncytial virus (RSV) infection, 'possibly preventable', for example shunt infections, central venous catheter infections or pneumonia, or 'not preventable', for example most urinary tract infections, otitis media and conjunctivitis.

At the time of the February survey, there were 180 in-patients, 14 (7.8%) with HAI and 17 (9.4%) with CAI. In August, there were 189 in-patients, 16 (8.5%) with HAI and 49 (26%) with CAI.

Table 9. Urinary catheter and prevalence of HAI

	February 1993[1]		August 1993[2]	
Urinary catheter	HAI (%)	Total	HAI (%)	Total
Yes	4 (25%)	16	4 (40%)	10
No	10 (6%)	164	12 (6.7%)	179

1. Relative risk (95% CI) = 4.1 (1.5 - 11.6).
2. Relative risk (95% CI) = 6.0 (2.4 -15.3).

Table 10. Intravascular cannula and prevalence of HAI

Intravascular	February 1993[1]		August 1993[2]	
cannula	HAI (%)	Total	HAI (%)	Total
Yes	9 (11%)	85	11 (11.5%)	96
No	5 (5%)	95	5 (5.4%)	93

1. Relative risk (95% CI) = 2.0 (0.7 - 5.8), not significant.
2. Relative risk (95% CI) = 2.1 (0.8 -5.9), not significant.

Table 11. Nature of hospital-acquired infection

Nature of infection	February 1993	August 1993
Catheter-related septicaemia	4	3
Pneumonia	4	3
Upper respiratory tract infection	0	2
Urinary tract infection	3	2
Shunt infection	1	1
Osteomyelitis	0	1
Gastroenteritis	1	2
Neonatal candidiasis	1	0
Respiratory syncytial virus bronchiolitis	0	1
Empyema	0	1

Our overall figures of 7.8% of in-patients having a current hospital-aquired infection in February and 9.4% in August are about average for the 7 surveys performed over 3.5 years, which have had rates of 12.6%, 9.2%, 7.0%, 5.1% and 5.4%. These are acceptable rates of HAI in comparison to other studies.

Four oncology patients were deemed to have had catheter-related infections in the February survey. However, all four were neutropaenic secondary to cytotoxic therapy, as well as having central catheters in situ, and the infecting organism (Gram negative bacilli) were more characteristic of neutropaenic sepsis than catheter-related sepsis. Nevertheless, a recent study has suggested that septicaemia in this setting is more likely to be catheter-related than due to the neutropaenia alone[1]. The mean number of antibiotics prescribed for each oncology patient was 3.0 (SD 1.7).

The categorisation of HAI into levels of preventability is clearly somewhat subjective, although we try to follow pre-determined guidelines. Thus, in general, wound infections, gastroenteritis and RSV infection are deemed 'definitely preventable', central venous catheter, shunt infections and pneumonia are 'possibly preventable', while urinary tract infections, otitis media and conjunctivitis are 'not preventable'. These categories are used as guidelines and a decision is made for each HAI.

Table 12. Was the HAI preventable?

	February 1993	August 1993
Not preventable	5	4
Possibly preventable	8	7
Definitely preventable	1	5

The August survey showed a slight increase in the number of HAI that were deemed preventable, either 'definitely' or 'possibly'. This may have been because of a larger than average number of children in hospital with community-acquired infections, thus increasing the exposure of other children to infection. Ongoing surveillance, both cross-sectional surveys such as this, and our longitudinal surveys of 'sentinel' infections, will help identify any breakdown in infection control.

Reference

1. Harms D, Gortiz I, Lambrecht W, Kabisch H, Erttmann R, Janka-Schaub G. Infectious risks of Broviac catheters in children with neoplastic disease: a matched pairs analysis. *Pediatr Infect Dis J* 1992;**11**:1014-1018.

LABORATORY TESTING FOR RUBELLA IN PERTH, JUNE 1993 TO JANUARY 1994

Tim Threlfall, Infectious Diseases Group, Health Services Statistics and Epidemiology Branch, Health Department of Western Australia

An increasing number of medical practitioner notifications of rubella has prompted this report on the results of rubella IgM testing at four Perth laboratories for the latter half of 1993 and January 1994. The participating laboratories were Clinipath, Perth Pathology, State Health Laboratory Services and Western Diagnostic Pathology. The data made available included age, sex and postcode for persons for whom a positive IgM result was obtained, and the total number of tests done for various periods. Laboratory cases were compared with the notifications of rubella made by medical practitioners to the Health Department of Western Australia over the same period.

Results

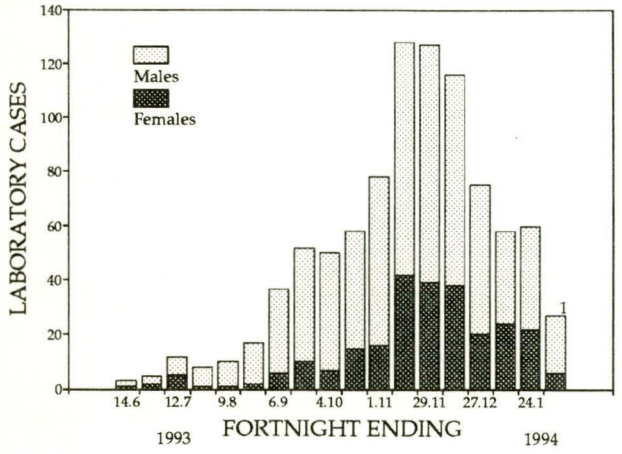
The laboratory data available clearly indicated an outbreak of rubella in this period, as illustrated by the distribution of positive IgM results over time (Figure 1). Positive results increased from July, peaked in November and have declined since then.

The four laboratories performed a total of 3621 tests for rubella IgM over the four month period, of which 917 (25%) were positive. The number of tests requested, for all four laboratories, increased markedly after the beginning of June 1993, and the proportion of positive results increased at a rapid rate, from 7% in June to a peak of 31% in November (Figure 2). There has been only a slight decline in the proportion of positive tests since then, to 27% in January.

Due to under-reporting, possible changes in testing patterns over time and the use of data from only four laboratories, the area of residence of those whose tests were positive does not necessarily represent the distribution of all rubella cases in the same time. However, any changes in the proportion of positive tests coming from residents of particular areas would have been of interest. Over the seven months surveyed, most positive results from the four laboratories were from residents of the metropolitan Health Regions (29% North Metropolitan, 26% South, 17% East). The distribution of positive results among the three metropolitan health regions did not vary appreciably over the four months covered by this report. All of the June positive results were from the metropolitan area, but 38% of the July results were from residents of rural areas. From August, over 75% of positive tests by the reporting laboratories were from Perth metropolitan area residents. It might be expected that the epidemic will be longer-lived in more densely-populated areas.

The majority of cases (73%) were male, and there was no marked trend in this proportion with time (Figure 1); the peak proportion of males in any month was 86% in August 1993. Sixty-one percent of males for whom a positive rubella IgM result was reported were aged between 15 and 24 years (Figure 3). The peak in the female age distribution occurred at a younger age than that for males. A secondary peak occured in women over the age of 35 years, and women predominated in the 35 to 60 year age range.

Figure 1. Rubella cases diagnosed in four Perth laboratories, 1 June 1993 to 7 February 1994, by fortnight and sex



1. Incomplete fortnight.

Figure 2. Rubella tests performed in four Perth laboratories, June 1993 to January 1994, by month and test results

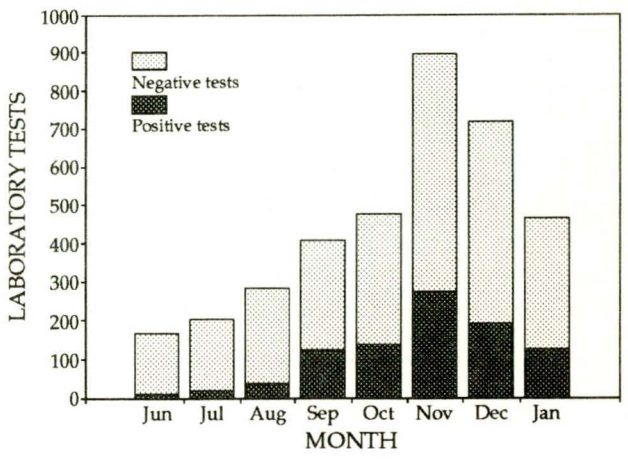


Figure 3. Rubella cases diagnosed in four Perth laboratories, June 1993 to January 1994, by age group and sex

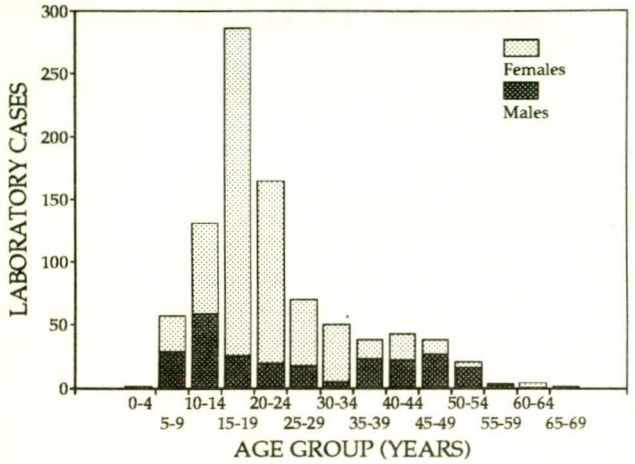
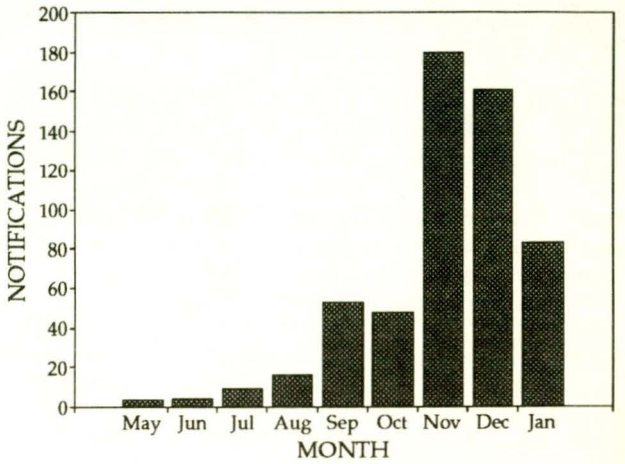


Figure 4. Rubella medical practioner notifications, Western Australia, May 1993 to January 1994, by month



There was no evidence of changes in the age distribution of laboratory positive cases over the period covered by this report, nor any suggestion of a difference in age distribution of cases from the three metropolitan Health Regions.

The pattern of medical practitioner notifications of rubella for May 1993 to January 1994 is similar to that shown by the numbers of tests requested, and the number of positive tests (Figure 4).

Comment

The increase in the proportion of tests which proved positive may have reflected an improvement in the selectivity with which a medical practitioner elected to request a rubella IgM test when a large number of cases were presenting. It will be of interest to observe changes in the proportion of positive tests as the number of rubella cases changes over time. One might expect that as an epidemic wanes, the number of tests requested will yield an increasing proportion of negative results, and that this might, in turn, lead to a reduction in the number of tests requested. Eventually the proportion of positive tests might return to 'baseline' levels such as the 7% seen in June, unless there has been a permanent 'learning' effect.

A small time delay between laboratory testing and medical practitioner notification of laboratory-confirmed cases would be expected, so that 'epidemics' based on the two sources of reports may be out of step with one another. Even allowing for this effect, there was clearly a significant under-reporting of rubella cases by medical practitioners. These were not the only laboratories testing for rubella IgM, so the true number of cases in Perth in this period is likely to have been greater than reported in the four laboratories. The proportion of all cases notified by medical practitioners appears to have been of the order of 50% at best.

The peak in rubella cases in females in the 5 to 14 years age group presumably reflected the fact that these patients were too young to have had rubella vaccine as scheduled for girls aged between 10 and 16 years, and too old to have had measles-mumps-rubella vaccinations at one year of age. There were about equal numbers of males and females in the 5 to 14 years age group, in contrast to the larger numbers of males in the 15 to 34 years age group who would not routinely have been vaccinated.

Acknowledgments

The assistance of staff at Clinipath, Perth Pathology, State Health Laboratory Services and Western Diagnostic Pathology in the provision of non-identifying data for this report is gratefully acknowledged.

CDI editorial comment

The National Notifiable Diseases Surveillance System and the *CDI* Laboratory Reporting Schemes have documented elevated rubella activity in Australia since spring 1992. In the spring of 1993 there were increased rubella notifications reported from New South Wales, Queensland and South Australia, as well as from Western Australia. A provisional total of 3633 cases was notified for 1993, 536 for females in the 15 to 44 years age group (14.8%). In 1992, there was a total of 3810 notifications, including 398 females aged 15 to 44 years (10.4%).

The *CDI* Laboratory Reporting Schemes have received 942 reports of rubella since the beginning of 1993. Included have been 11 pregnant females (age range 17 to 35 years) and three infants reported as congenitally infected (one born overseas but being managed in Australia).

The National Health and Medical Research Council recommends measles-mumps-rubella vaccine for all

infants at 12 months, and a second dose for both males and females at 10 to 16 years. This strategy is expected to lead eventually to increases in both the level of immunity in women of child-bearing age and the herd immunity of the community overall.

SALMONELLA SURVEILLANCE, AUSTRALIA, SECOND QUARTER 1993

Reproduced with acknowledgment from the National Salmonella Surveillance Scheme's Human Second Quarter Report, 1993, editor Joan Powling

There were 1523 reports received by the National *Salmonella* Surveillance Scheme (NSSS) for the second quarter of 1993 (Table 1).

New and unusual *Salmonella* serovars reported were *S.* Boecker (M/1 Qld); *S.* Istanbul (M/35 New South Wales ex Malaysia); *S.* Kedougou (M/Western Australia); *S.* Lagos (F/1 ex overseas, unspecified); *S.* Mikawasima (F/2 Northern Territory) and *S.* Mishmarhaemek (F/37 Western Australia ex Ethiopia). All except *S.* Lagos and *S.* Mikawasima are new records for the NSSS.

New and unusual phage types (PT) of *S.* Typhimurium were PT 23 (Queensland); PT 86 (Queensland); PT 135a (South Australia); PT 149 (M/36 South Australia, ate raw pig's liver in Asia); PT 150 (Western Australia) and PT 153 (Queensland). Phage types 86 and 149 are new records for the NSSS.

The Australian *Salmonella* Reference Laboratory has begun phage typing *S.* Anatum. PT 4 was reported in May from a traveller returning from Thailand.

Salmonella infections - case rates

There were 1126 Australian acquired cases of *Salmonella* infection reported during this quarter, a 6.7% decrease over the total number of cases for the same period last year. There were 75 follow-ups, 2 cases from migrants and refugees and 84 cases acquired overseas (Table 2).

By comparison to the second quarter of 1992, there was a 41% increase in the *Salmonella* case rate per 100,000 population in Western Australia due to an outbreak of *S.* Newport (see below) and a 21% increase in New South Wales. In Victoria there was a 43% decrease in case rate.

Infections acquired overseas

S. Enteritidis PT 4 (see *Microbiological Diagnostic Unit News*, below) was the most common *Salmonella* reported from travellers returning from overseas (Britain, Cyprus, Singapore, Malaysia, Papua New Guinea and Nepal). Other common overseas-acquired serovars were *S.* Emek (six cases), *S.* Agona and *S.* Hadar (five

Table 1. Total reports received, by State and Territory

	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total
Salmonella	13	302	153	378	73	249	26	93	1287
Shigella	0	19	16	25	14	34	0	19	127
Aeromonas	0	0	8	7	0	0	1	0	16
Campylobacter	0	0	30	0	1	0	0	0	31
Escherichia coli (EPEC)	0	2	0	5	0	0	0	0	7
Plesiomonas	0	0	2	0	0	0	0	0	2
Vibrio	0	0	1	0	1	0	0	0	2
Yersinia	0	13	8	28	1	1	0	0	51
Total	13	336	218	443	90	284	27	112	1523

Table 2. Case rates per 100,000 of *Salmonella* infection and total Australian acquired cases, by State and Territory

	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total reports
Second quarter 1993	4.0	4.7	2.8	13.3	4.6	16.1	5.5	56.8	1126
First quarter 1993	4.4	7.2	4.8	21.3	6.7	13.8	9.8	63.9	1583
Second quarter 1992	2.8	3.9	4.9	15.7	6.8	11.4	8.0	63.9	1208
Second quarter 1991	4.0	5.4	4.5	15.5	7.4	15.4	8.7	78.1	1351
Second quarter 1990	6.4	5.7	5.2	14.7	12.9	10.7	8.0	58.8	1355

cases each), *S.* Berta and *S.* Blockley. *S.* Agona, *S.* Blockley, *S.* Enteritidis and *S.* Muenchen were the predominant serovars detected in samples of raw and cooked satay during a recent survey of food stalls in Malaysia[1].

The cases aquired overseas are listed below. They include refugees and migrants.

ASIA

Unspecified countries: *S.* subsp I ser 4,5,12:i:-; *S.* Bareilly, *S.* Enteritidis PT 1, *S.* Stanley, *S.* Typhimurium PT 149, *Sh. sonnei* biotype f.
Indonesia: *S.* Hadar, *S.* Kentucky, *S.* Newport, *S.* Weltevreden, *Sh. flexneri* 2a, *Sh. sonnei* and *Sh. sonnei* biotype a; **Bali:** *S.* Agona (2), *S.* Amsterdam, *S.* Emek (5), *S.* Hadar (3), *S.* Kentucky, *S.* Lexington, *Sh. flexneri* 2, *Sh. sonnei* biotype a (2), *Y. enterocolitica.*
Thailand: *C. jejuni* subsp *jejuni*, *S.* Anatum PT 4, *S.* Berta, *S.* Bovismorbificans, *S.* Cerro, *S.* Eastbourne, *S.* Panama, *S.* Senftenberg, *S.* Virchow, *Sh. dysenteriae* 1, *Sh. flexneri* 6, *Sh. sonnei* biotype g.
Malaysia: *S.* Adelaide, *S.* Blockley, *S.* Enteritidis PT 4, *S.* Istanbul.
Singapore: *S.* Enteritidis PT 4 (2), *S.* Typhimurium untypable.
Vietnam: *S.* Berta, *S.* Javiana, *Sh. flexneri* 2 and *Sh. sonnei* biotype g.
Philippines: *S.* Agona, *S.* Enteritidis PT 1.
India: *S.* Agona, *S.* Braenderup, *S.* Ohio, *S.* Typhimurium untypable, *S.* Worthington, *Sh. flexneri* 1, *Sh. sonnei* biotype g.
Nepal: *S.* Enteritidis PT 4, *S.* Stanley, *Sh. sonnei.*
Maldives: *S.* Mbandaka.

AFRICA

Egypt: *Sh. flexneri* 3a.
Ethiopia: *S.* Mishmarhaemek, *Y. enterocolitica* O:3 Bio 4.

MIDDLE EAST

Cyprus: *S.* Enteritidis PT 4.
Lebanon: *S.* Typhimurium RDNC.

EUROPE

United Kingdom: *S.* Enteritidis PT 4.

PACIFIC

Papua New Guinea: *S.* Enteritidis PT 4.
Fiji: *S.* subsp I ser 3,10:r:-.
Western Samoa: *S.* Virchow.

AMERICAS

Mexico: *S.* Senftenberg.

Table 3. Typhoid and paratyphoid cases

Vi-phage type	Sex/age (years)	State or Territory	Notes
S. Typhi (18)			
51	F/20	Vic	Returned from Lebanon
A	F/12	Vic	Lebanese family - no travel recently
A	M/5	Vic	Same family as F/12 above
A	F/18	NSW	Acquired overseas
A	M/24	NSW	Acquired in India
A	M/2*	NSW	Acquired in Lebanon
A	M/16*	NSW	Brother of M/2 above - ex Lebanon
A	F/24	NSW	Laboratory acquired from *isolates
A	F/59	NSW	Food poisoning
D2	F/27	Qld	From Papua New Guinea
D2	M/39	ACT	Returned from Bangladesh
E2	F/37	Vic	Vistor from the Philippines
E7	ns[1]/37	Vic	No details
M3	M/27	NSW	No deatils
untypable	M/33	NSW	Acquired in India
untypable	F/25	Vic	From Chile
untypable	F/26	NSW	Returned from Indonesia
untypable j:z66	F/17	Tas	Visited Bali
S. Paratyphi A (2)			
1	M/40	WA	From Nepal
RDNC	M/28	Vic	Travel in Burma
S. Paratyphi B (1 carrier)			
Taunton	M/53	NSW	Repeat isolation after 6 months

1. ns not stated

UNSPECIFIED COUNTRIES

S. Agona, *S.* Berta, *S.* Blockley (2), *S.* Derby, *S.* Emek, *S.* Enteritidis PT 4, *S.* Hadar, *S.* Lagos, *S.* Newport (2), *Sh.sonnei* biotypes a and g, *E. coli* O125:K70:B15, *V. parahaemolyticus*, *Y. enterocolitica* O:3 Bio 4.

Typhoid and paratyphoid cases

There were 18 reports of *S.* Typhi, 2 of *S.* Paratyphi and one report of an *S.* paratyphi B carrier (Table 3).

There were 23 cases of S. Paratyphi B biovar Java reported during this quarter. Two cases were of 3b var (one acquired in Indonesia and the other not specified), one case was of 3b var 3 (Bali) and one of 1 var 3 (no overseas travel). There were ten cases of Battersea, all of which were from the region north of the Tropic of Capricorn except one for a visitor to the Northern Territory, six cases of Dundee (one from Bali), one RDNC and one untypable.

Isolations from blood, urine and unusual sites

During the quarter, there were 23 reports of bacteraemia, excluding enteric fever, 17 reports of isolates from urine and 10 reports of isolates from unusual sites (Table 4).

Table 4. Organisms reported from blood, urine and unusual sites

Organism	Sex/age (years)	State or Territory	Organism	Sex/age (years)	State or Territory
Bacteraemias excluding enteric fever (23)					
S. Aberdeen	F/<1	Qld	*S.* Typhimurium 9	M/46	NSW
S. Birkenhead	F/37	NSW	*S.* Typhimurium 9	M/59	Vic
S. Chester	F/1	SA	*S.* Typhimurium 9	M/12	NSW
S. Dublin	M/71	Vic	*S.* Typhimurium 9	F/71	Tas
S. Enteritidis PT 4	M/39	Qld	*S.* Typhimurium 9	F/39	Vic
S. Enteritidis PT 8	M/67	NSW	*S.* Virchow	M/6	Qld
S. Heidelberg	M/19	NSW	*S.* Virchow	F/<1	Qld
S. Heidelberg	F/11	Vic	*Sh. flexneri* var X	M/38	NSW
S. Kottbus	F/19	SA	*Y. enterocolitica* O:3 Bio 4	F/65	Qld
S. Typhimurium 135	M/39	Vic	*Y. enterocolitica* O:3 Bio 4	F/65	Qld
S. Typhimurium 135	M/30	NSW	*Y. enterocolitica* O:3 Bio 4	F/85	NSW
			Y. enterocolitica O:3 Bio 4	F/<1	NSW
Urines (17)					
S. Anatum	F/20	NSW	*S.* Muenchen	F/7	Qld
S. Arizonae	F/10	ACT	*S.* Ohlstedt	F/26	Qld
S. Choleraesuis	F/26	NSW	*S.* Saintpaul	F/37	NT
S. Hadar	F/14	NSW	*S.* Stanley	M/13	Vic
S. Hadar	M/67	Vic	*S.* Tennessee	F/33	Qld
S. Havana	M/80	NSW	*S.* Virchow	F/28	Qld
S. Heidelberg	F/80	Qld	*S.* Virchow	F/29	NSW
S. Heidelberg	F/5	NSW	*S.* Virchow	F/75	Qld
S. Misssissippi	F/23	Tas			
Unusual sites			Site		
A. caviae	M/ns[1]	Vic	Bile, liver transplant patient		
A. veronii bv sobria	M/54	Vic	Ascitic fluid		
S. Aberdeen	F/<1	Qld	CSF		
S. Chester	F/<1	Qld	Skin swab, query thrush infection		
S. Enteritidis 6a	M/ns[1]	Qld	Tissue biopsy		
S. Potsdam	F/2	Vic	Cervical abscess		
S. Saintpaul	F/37	NT	Vagina swab		
S. Typhimurium 141	F/17	NSW	Vaginal and facial lesion		
S. Typhimurium 179	M/27	Vic	Appendix abcess		
S. Typhimurium 9	F/71	Tas	Peritoneal fluid		

1. ns not specified

Shigella infections

A total of 127 reports of *Shigella* infections was received for this quarter. Of these, five were follow-up specimens, one was from a migrant and 21 were reported from travellers returning from overseas. This left a total of 100 cases reported as acquired in Australia (Table 5), a 23% decrease compared with the 130 for the corresponding period in 1992.

The most common was *Sh. sonnei* biotype a with 31 cases followed by *Sh. sonnei* (not biotyped) with 24 cases. The next most common were *Sh. flexneri* 2 (14 cases) and *Sh. boydii* 1 (13 cases).

Table 5. Cases of *Shigella* acquired in Australia

Organism	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total
Sh. boydii 1	0	1	0	0	3	4	0	5	13
Sh. flexneri	0	0	0	1	0	0	0	0	1
Sh. flexneri 2	0	0	0	0	0	14	0	0	14
Sh. flexneri 2a	0	0	0	1	1	0	0	5	7
Sh. flexneri 3	0	0	0	1	0	0	0	0	1
Sh. flexneri 3a	0	1	1	0	0	0	0	0	2
Sh. flexneri 6	0	0	0	1	1	1	0	0	3
Sh. flexneri var X	0	2	0	0	0	0	0	0	2
Sh. flexneri var Y	0	0	0	0	0	1	0	0	1
Sh. sonnei	0	1	0	14	0	9	0	0	24
Sh. sonnei biotype a	0	6	4	6	6	0	0	9	31
Sh. sonnei biotype g	0	0	1	0	0	0	0	0	1
Total	0	11	6	24	11	29	0	19	100

Table 6. Top ten *Salmonella* serovars

	Position in first quarter 1993	Number of cases	% of total	Origin and number of cases
S. Typhimurium	1	295	26.2	NSW 126, Vic 60, WA 43
S. Newport*	-	75	6.6	WA 65
S. Virchow	2	71	6.3	Qld 62
S. Saintpaul	3	52	4.6	Qld 27, NT 10, WA 9
S. Muechen	10	42	3.7	WA 16, Qld 12
S. Hadar*	9	37	3.3	NSW 19, Qld 6
S. Heidelberg	6	31	2.7	Qld 15, NSW 9
S. Chester*	5	30	2.7	Qld 15, NT 6, WA 6
S. Birkenhead	4	28	2.5	NSW 13, Qld 13
S. Infantis*	8	27	2.4	SA 19, NSW, Vic, WA, NT all 4
Total		688	61.0	

In: *S.*Newport.
Out: *S.* Bovismorbificans (14 cases).
* Associated with outbreaks or incidents.

Table 7. Top five phage types of *S.* Typhimurium

Phage type	Position in first quarter 1993	Number of cases	% of total	Origin and number of cases
9	2	67	22.7	NSW 30, Vic 19, Tas 9
135	1	49	16.6	NSW 24, WA 9, Vic 7
170	5	12	4.1	NSW 7, Vic 3
29	-	12	4.1	NSW 9, Qld 2
126	-	11	3.7	NSW 5, Vic 4
12a	3	11	3.7	NSW 9, WA 2
44	4	11	3.7	Vic 4, SA 4, NSW 2
Total		151	51.2	

Shigella infections acquired overseas included *Sh. boydii* 17 (Malaysia), *Sh. boydii* 4 (Thailand), *Sh. dysenteriae* 2 (Nepal), *Sh. flexneri* 2a (Vanuatu), *Sh. flexneri* 3a (Afghanistan, Vietnam), *Sh. flexneri* 6 (Pakistan, Nepal), *Sh. sonnei* (Bali), *Sh. sonnei* biotype a (Indonesia) and *Sh. sonnei* biotype g (Solomon Islands).

Top ten *Salmonella* serovars

The top ten *Salmonella* serovars accounted for 61% of the 1126 Australian acquired cases reported to the NSSS (Table 6). *S.* Typhimurium, with 295 cases from 25 phage types, was the most common serovar and accounted for 26% of the total Australian acquired cases. *S.* Newport was a newcomer to the top ten due to an outbreak of this serovar reported from Western Australia.

Phage types 9 and 135 were the most common *S.* Typhimurium phage types with 67 and 49 cases respectively, of which 69% were from New South Wales and Victoria (Table 7). The top five phage types accounted for 51% of Australian acquired cases of *S.* Typhimurium.

Mixed infections, first and second quarters, 1993

There were 34 reports of mixed infections in the first quarter of 1993 and 12 in the second quarter (Table 8).

Outbreaks, first and second quarters, 1993

There was one outbreak and five smaller incidents during the second quarter. The outbreak was of *S.* Newport in Perth which began in March and continued into July, involving 83 cases. The following were suspected and confirmed outbreaks reported for the first six months of 1993.

New South Wales

There were 24 more sporadic cases of ***S.* Hadar** reported from the Sydney region in the first quarter bringing the total number of cases reported from New South Wales since October 1992 to 69.

There was a ***S.* Bovismorbificans PT 14** incident reported from the Hunter region of New South Wales during which 10 cases, both adults and children, were reported during one month beginning in early January. PT 14 was also isolated from samples of minced meat, including sausage meat, in the Hunter region, samples of river and sea water in the Sydney region during the same period and from Sydney sewage in June. Three cases were reported from a child-care centre in Sydney in mid-July and there was one case reported from Canberra in late March, associated with the consumption of fish and chicken.

***Sh. sonnei* biotype a** was reported for 10 cases from Moree commencing in mid-January. Adults and young children, but no infants were reported.

Fifteen cases of ***S.* Typhimurium 135** infection were reported from the Lismore area in mid-March. Nine of the cases were adults, and six were young children, but not infants.

***S.* Heidelberg** was reported for 25 sporadic cases reported from Sydney from the second week in February to the end of March. A further five cases were reported in the middle of May.

There were four adult cases of ***S.* Infantis** reported from the Hunter region over four days in early March. Food samples were tested but the results were not conclusive.

Five cases of ***S.* Eastbourne** infection, all adults, were reported from an institution in Sydney in late February.

Queensland

There was an outbreak of ***S.* Chester** following a shearers' break up party in Charleville, Queensland in June. Three cases were reported out of 12 affected persons.

Sh. sonnei was reported for 15 cases from Rockhampton commencing in mid-February. Only three cases were adults.

There were six cases of ***S.* Aberdeen** among staff and customers of a wholesale food outlet in Rockhampton in February.

South Australia

***S.* Infantis** was reported for six cases from Adelaide in mid to late April. Three of the cases were children.

Western Australia

A further 29 cases *of* ***Sh. boydii* 1** were reported up until the end of June from the north-west of the State in a continuation of the outbreak which began in September 1992. Isolated cases have been reported from Queensland (2), South Australia (5) and the Northern Territory (10). The cause of this outbreak has not been established.

Seventy-four cases of ***S.* Newport**, both adults and children, were reported from Perth in the biggest outbreak so far for 1993. There were 19 cases reported in March, 13 in April and 21 in both May and June.

***S.* Choleraesuis var Australia** was reported for ten cases, five adults, reported in early January from Perth and also isolated from samples of Perth sewage in February.

Victoria

C. jejuni* subsp *jejuni was reported from an outbreak at a school camp in country Victoria in January, with 43 cases reported. During the investigation three different enteropathogenic *E. coli* and ten *Pl. shigelloides* were also isolated. All of the *C. jejuni* isolates associated with the outbreak had the same extended biotype profile and pulsed field gel electrophoresis pattern.

Northern Territory

***S.* Newport** was reported for four adults from a community on the Gove Peninsula on two days in June.

Table 8. Mixed infections, first and second quarters 1993

Organism	Sex/age (years)	State or Territory
S. subsp I ser 11:i:-, *S.* Chester	M/72	Qld
S. Aberdeen, *S.* Saintpaul	M/<1	Qld
S. Chester, *C. jejuni*	M/1	Qld
S. Derby, *E. coli, Clostridium difficile*	F/<1	Vic
S. Emek, *Sh. sonnei* biotype a	F/22	Vic
S. Enteritidis PT 26, *Sh.sonnei*	F/8[1]	Qld
S. Enteritidis PT 26, *Sh. sonnei*	F/4[1]	Qld
S. Hadar, *Campylobacter* species	M/<1	NSW
S. Havana, *Sh. boydii* 1	F/1	NT
S. Havana, *Campylobacter* species	M/1	NT
S. Heidelberg PT 1, *S.* Virchow	M/1	Qld
S. Jangwani, *Sh. flexneri* 2a	F/1	Qld
S. Litchfield, *Sh. boydii* 1	M/1	NT
S. Litchfield, *S.* Welikade	M/2	Qld
S. Livingston var 14+, *Campylobacter* species	F/22	NT
S. Mississippi, *C. jejuni*	M/4	Tas
S. Oranienburg, *Campylobacter* species	F/2	NT
S. Saintpaul, *A. hydrophila*	M/<1	Qld
S. Saintpaul, *C. jejuni, A. hydrophila*	F/<1	Qld
S. Saintpaul, rotavirus	M/1	NT
S. Singapore, *C. jejuni*	M/27	NSW
S. Thompson, *S.* Yarrabah	F/<1	Qld
S. Typhimurium PT 29, *Giarda* species	M/<1	Vic
S. Typhimurium PT 101 and PT 12a	F/1	Qld
S. Typhimurium PT 101 and PT 12a	F/<1	Qld
S. Typhimurium PT 101, *S.* Tennessee	M/1	NT
S. Typhimurium PT 126, *Campylobacter* species	M/73	NSW
S. Typhimurium PT 135, *S.* Bovismorbificans	F/<1	WA
S. Typhimurium PT 170, *Campylobacter* species	M/20	Vic
S. Typhimurium PT 179, *Campylobacter* species	F/29	ACT
S. Typhimurium PT 186 and PT 27	F/59	NSW
S. Typhimurium PT 202 and PT 5	F/9	Qld
S. Typhimurium untypable, *Giardia* species	M/3	Qld
S. Virchow, *Sh. flexneri* 4a mannitol neg	M/20	Vic
S. Worthington, *Sh. flexneri* 4a	F/<1[2]	Vic
S. Yolo, *Sh. flexneri* 6	M/25[2]	ACT
C. coli, Giardia species	M/76	Vic
C. jejuni subsp *jejuni, Pl. shigelloides*	F/ns[3]	Vic
C. jejuni subsp *jejuni, Pl. shigelloides*	F/17[1]	Vic
C. jejuni subsp *jejuni, Pl. shigelloides*	F/17[1]	Vic
E. coli O55:K59:B5, *Campylobacter* species	M/17[1]	Vic
Sh. flexneri 2a, *Sh. sonnei* biotype a	M/29	SA
Sh. flexneri 6, *Hymenolepis nana, Pl. shigelloides*	M/2	NSW
Sh. sonnei, Giardia lamblia, C. jejuni	F/2	Qld
Sh. sonnei biotype a, *E.coli*	M/18	Qld
Pl. shigelloides, Y. enterocolitica O:3 Bio 4	F/17	Vic

1. Part of outbreak (Victoria or Queensland).
2. Acquired overseas (F/<1 India, M/25 Egypt).
3. ns not stated.

Microbiological Diagnostic Unit news - *Salmonella* Enteritidis update

D Lightfoot, Microbiological Diagnositc Unit, University of Melbourne

Salmonella Enteritidis continues to be the major *Salmonella* serovar associated with gastroenteritis in the United Kingdom, Europe and the United States of America. Of the 31,352 *Salmonella* cases reported to the United Kingdom Public Health Laboratory Service in 1992, 20,084 were *S.* Enteritidis and 85.5% of these were PT 4[2]. In contrast, the major phage type in Hungary and other parts of eastern Europe is PT 1.

From 1976 through to 1991 the proportion of *S.* Enteritidis among the reported *Salmonella* isolates in the United States increased from 5% to 20%. *S.* Enteritidis was second only to *S.* Typhimurium except in 1989 and 1990 when it was the most frequently reported serotype. Until recently[3], *S.* Enteritidis has been largely confined to the north-east of the United States. However, in California in the first half of 1993, 21% of the reports were *S.* Enteritidis. The major phage types of American isolates are PT 8 and PT 13a.

There have been 809 Australian cases of *S.* Enteritidis reported to the NSSS (Table 9). Only 54 of the 127 cases of PT 4 so far reported to the NSSS were reported as acquired overseas but, in the absence of patient details, it is suspected that there are many more. There was one incident of a foodborne outbreak of gastroenteritis possibly involving PT 4 in Queensland in 1992[4]. PT 26, in contrast, is endemic in Queensland and parts of the south Pacific region; there was an incident involving this phage type in Brisbane in July 1991.

To date no *S.* Enteritidis PT 4 has been isolated from eggs or chicken products in Australia.

Details of the overseas-acquired human cases of *S.* Enteritidis are as follows:

PT 4 South-East Asia (unspecified) 4, Thailand 9, Hong Kong 8, Singapore 6, Malaysia 5, Indonesia (Bali) 2, Philippines 2, Sri Lanka 2, China 2, India 1, Papua New Guinea 1, Nepal 1, Europe (unspecified) 1, United Kingdom 5, Portugal 1, Romania 1, Italy 1, Germany 1, Cyprus 1.

PT 1 South-East Asia (unspecified) 2, Nepal 1, Hong Kong 1, Thailand 1, Philippines 1.

PT 6 Poland 1.

PT 6a Greece 1, Singapore 1.

PT 7a Sri Lanka 1.

PT 8 United Kingdom 1.

PT 9 Philippines 1.

PT 9a China 1.

PT 26 Fiji 1.

PT 28 India 1.

PT 31 Hong Kong 1.

RDNC Malaysia 1, Thailand 1.

The *S.* Enteritidis cultures which have been sent from overseas to the Microbiological Diagnostic Unit for phage typing are:

Fiji (7) PT 26 (7)

New Zealand (152) PT 9a (100), PT 4 (35; 51% acquired overseas), PT 19 (4), PT 26 (4), PT 1 (3), PT 8 (2), RDNC (2), PT 26 (1), PT 27 (1).

Solomon Islands (1) PT 6a (1).

References

1. Arumugaswamy RK, Ali GK, ab-Hamid SN. Satay and *Salmonella* and *Listeria* infection [letter]. *Lancet* 1993;**342**:247.
2. Update on *Salmonella* infection. PHLS-SVS edition 14, January 1993.

Table 9. Australian cases of *S.* Enteritidis reported to the NSSS

Year	Number	Number phage typed[1]	Major phage types[2] (number of cases) and percentages
1985	39	-	-
1986	61	-	-
1987	81	-	-
1988	77	-	-
1989	113	-	-
1990	101	-	-
1991	104	75	PT26 (29) 38.6%; PT4 (25) 33.3%; RDNC (6) 8%
1992	130	126	PT4 (57) 45.2%; PT 26 (37) 29.3%; RDNC (20) 15.9%
1993[3]	103	102	PT4 (45) 44.1%; PT26 (20) 19.6%; RDNC (17) 16.6%
Total	809	303	

1. Phage typing method of Ward[5].
2. Other phage types identified in 1991, 1992 and 1993: PT1 (8); PT1a(1); PT2 (1); PT6 (1); PT6a (2); PT7 (1); PT7a (1); PT8 (5); PT9 (1); PT9a(2); PT14 (4); PT146 (4); PT28 (1); PT31 (1); PT untypable (9).
3. Figures to October 1993.

3. Centers for Disease Control and Prevention. Outbreaks of *Salmonella* enteritidis gastroenteritis - California, 1993. *MMWR* 1993;42:793-797.

4. Hanna J. A missed opportunity to investigate a source of *Salmonella* Enteritidis phage type 4. *Comm Dis Intell* 1993;17:158-159.

5. Ward LR, de Sa JD, Rowe B. A phage typing scheme for *Salmonella* Enteritidis. *Epidemiol Infect* 1987;99: 291-294.

CDI editorial comment

A total of 1143 notifications of salmonellosis (not elsewhere classified) was received by the National Notifiable Diseases Surveillance System for the second quarter of 1993. This compared with 1554 for the first quarter of 1993 and 1146 for the second quarter of 1992. The corresponding figures for typhoid were 5, 20, and 8 notifications, respectively. Shigellosis was notified for 133 cases in the second quarter of 1993, 281 in the first quarter of 1993 and 166 in the second quarter of 1992. There have been 714 notifications of salmonellosis, 90 notifications of shigellosis and one notification of typhoid so far for 1994.

All of these diseases are notifiable in all States and Territories of Australia. Typhoid notifications include paratyphoid in New South Wales and Victoria.

SALMONELLA ENTERITIDIS PHAGE TYPE 4 FROM ENVIRONMENT OF EGG LAYING CHICKENS

Reproduced from the Australian Salmonella Reference Centre Monthly Report, December 1993, editors Chris Murray and Dianne Davos

Salmonella Enteritidis phage type 4 has been isolated from 37 samples of chicken faeces and one sample of chicken feed from three locations in one area of Queensland. Samples were taken as part of a survey of egg-laying birds. The survey has been on-going for some time and the majority of flocks up to now have been free of *S.* Enteritidis. This is the first record of *S.* Enteritidis phage type 4 in connection with chickens in Australia.

Follow-up investigations are being carried out at the properties concerned in an attempt to ascertain the source(s) of the organism.

Foodborne disease associated with *S.* Enteritidis has caused much concern in Europe and North America during the past decade. Phage type 4 has been the main phage type occurring in the United Kingdom, associated with egg-borne infection. Australia has not experienced the increase in *S.* Enteritidis infection which has occurred elsewhere. While human infection with *S.* Enteritidis phage type 4 has occurred, this has always been in low numbers, many of the cases have been acquired overseas, and there has been no significant change in frequency.

The Australian *Salmonella* Reference Centre has kept a close watch on *S.* Enteritidis isolations and has been routinely phage typing isolates since 1990. Information on the occurrence of *S.* Enteritidis in Australia was published in our monthly reports of August 1988, May 1989, May 1990 and October 1990. Since then numbers of human isolates of *S.* Enteritidis phage type 4 typed by this laboratory have been 18 in 1991, 26 in 1992 and 22 in 1993.

OVERSEAS BRIEFS

In the last two weeks, the following information has been supplied by the World Health Organization (WHO), the Institut Pasteur, Paris, the Department of Foreign Affairs and Trade, the Communicable Disease Centre, New Zealand, the Department of Health, Hong Kong, and Health and Welfare, Canada.

Yellow fever in Ghana

There was an outbreak of yellow fever in Ghana in October, November and December 1993. Nineteen villages in the District of Jiripa in the Upper West Region were affected. Forty-three cases were reported and the case-fatality rate was estimated at 38%. Twenty-two of 37 cases were in patients aged 15 years or more, and 15 were in younger age groups. The situation is under control following a mass immunisation campaign in the affected area and the bordering areas in Upper East and Northern Regions in January. The Jiripa District has been declared yellow fever infected.

Tetanus in Hong Kong injecting drug users

An outbreak of tetanus occurred among injecting drug users in Hong Kong in November and December 1993[1]. Active case finding identified 27 cases of tetanus, of which 13 died (as at 14 January 1994). The source of infection was likely to have been *Clostridium tetani* contaminated heroin.

Laboratory-acquired invasive meningococcal infection in Canada

In Canada, a medical technologist has died of *Neisseria meningitidis* serogroup C which was probably laboratory-acquired[2]. The index patient was a 14 year old male from a residential school who had three blood cultures positive for the organism. He presented with tachycardia, rash and shock, but recovered after a few days of antibiotic therapy.

Six days after the index case presented, a 35 year old medical technologist who had worked in the admitting hospital's microbiology laboratory presented with intense headache and rash, one day after onset of headache, vomiting and aching joints. Blood and CSF were taken for culture before appropriate antibiotic therapy was initiated. The patient's neurological condition deteriorated, however, and she died the next day. A group C meningococcus was identified in her CSF cultures. Later analysis showed it to share the same serotype and subtype as that of the index case and other isolates from the same area of Canada at the time. It also shared the same restriction fragment length polymorphisms as that of the index case and of one other patient, who could not be linked to the index case or the technologist.

An epidemiological investigation revealed that on the day after the index case presented, the technologist did the seeding on agar medium of the blood samples. The next day she had apparently prepared a concentrated bacterial suspension from the *N. meningitidis* colonies. This suspension was vortexed and then pipetted into the wells of a commercial identification gallery. All these operations were done on the workbench and not in a biosafety enclosure. No incident appeared to occur during the operations.

No other isolation of *N. meningitidis* had been made at the laboratory in the previous four months, and no other direct or indirect connection could be established between the technologist or those close to her and the index case.

Meningococcal disease in New Zealand

Since 1991, there has been an epidemic of meningococcal disease in New Zealand, predominantly group B[3]. In 1992, there were 155 notifications (4.6 per 100,000) and 8 deaths. In 1993, there were 200 notifications and nine deaths[4] and there were 12 cases and three deaths reported from 1 January to 18 February this year[5]. The rate of notification in Australia in 1992 was 1.73 per 100,000.

Hepatitis A in Macedonia

An epidemic of hepatitis A has been reported from the west of Macedonia. It is most widespread in Tetova, where 500 persons have been registered as having been infected in the last 12 months.

Influenza in the Northern Hemisphere

In western Europe, influenza activity has almost disappeared. Reports from Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Italy, Netherlands, Norway, Sweden, Switzerland and the United Kingdom indicate very little recent activity. Activity is still increasing in eastern European countries. In the last fortnight, Croatia has reported increased activity, severe complications and isolations of influenza A H_3N_2. The Czech Republic has reported high activity and influenza A H_3N_2 isolations, Lithuania has reported high epidemic levels in all main cities, and Romania has reported a type A epidemic which peaked in February. The Russian Federation has reported a spreading epidemic of severe disease, mostly affecting children and at epidemic levels in Archangelsk, Barnaul, Minsk and Tashkent. The Slovak Republic reported a sudden increase in activity in February with high morbidity in young children and detection of influenza A, and Yugoslavia has reported influenza A activity beginning in February. Activity in parts of Spain increased from the last week in January.

In the United States, activity is declining; widespread or regional activity was reported from only 23 States in February but pneumonia and influenza deaths were still above expected levels. A total of 99% of isolates have been influenza A H_3N_2.

A quiet season is continuing in Japan. Very little activity has been reported, but there have been isolates from 14 prefectures, mainly influenza A H_3N_2.

WHO influenza vaccine recommendations

The WHO has issued its recommendations for the influenza vaccine for the 1994-95 northern winter. The three components are an A/Shangdong/9/93 (H_3N_2)-like strain, an A/Singapore/6/86 (H_1N_1)-like strain and a B/Panama/45/90-like strain.

Cholera update

Cases of cholera have been reported for December, January and February from Argentina, Belize, Benin, Bolivia, Brazil, Burundi, China, Costa Rica, Djibouti, El Salvador, Guatemala, India, Hong Kong, Mexico, Mozambique and Nicaragua.

References

1. Ho YY. Review of notifiable diseases in Hong Kong 1993. *Public health and epidemiology bulletin* 1994;**3**:6-7.
2. Laboratory-acquired invasive meningococcus - Quebec. *Canada Communicable Disease Report* 1994;**20**:12-14.
3. Communicable diseases in New Zealand, 1992. *Communicable Disease New Zealand* 1993;93(S-1):1-46.
4. *Communicable Disease New Zealand Weekly* 1993;93(51, 52), 1994;94(1).

5. *Communicable Disease New Zealand Weekly* 1994;94(7).

COMMUNICABLE DISEASES SURVEILLANCE

Virology and Serology Reporting Scheme

There were 1382 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 8, 9 and 10).

- There were 37 reports of **measles** this fortnight including 25 from Queensland, 3 each from Victoria, New South Wales and Western Australia, and one each from Tasmania, the Northern Territory and the Australian Capital Territory. The number of reports has declined since the beginning of the year following a peak in November of last year. All diagnoses were by measles specific IgM detection.
- **Rubella** was reported for 18 patients this fortnight (7 from Queensland, 6 from South Australia, 2 each from Victoria and Western Australia and one from New South Wales). The number of reports has declined in recent months (Figure 1). Included was a case of congenital rubella (cataracts, splenomegaly and jaundice) in an 8 day old male from Nauru who was being treated in Victoria, and 2 females in the 15 to 44 year age group. Diagnosis was by viral IgM detection in all cases.
- Eight reports of **hepatitis A** were received this fortnight, 5 from Queensland, 2 from New South Wales and one (79 year old female) from South Australia.
- One hundred and seventy-seven reports of positive **hepatitis C** serology were received this fortnight. Included were 3 haemophiliacs aged 8, 13 and 14 years, all from South Australia.
- **Ross River virus** infection was reported for 123 patients this period, 4 with specimen collection dates in January and the remainder in February. One hundred and fifteen reports were from Queensland which has had a marked increase since the beginning of January. Three reports were from the Northern Territory (making a total of 8 since the beginning of November), 2 each from New South Wales and South Australia and one from Western Australia. All were presumptive diagnoses (viral IgM detected). Forty-nine patients reported muscle/joint disease, 6 skin disease and the clinical information was not available for the remainder.
- There were 15 cases of **Barmah Forest virus** infection reported this fortnight, 7 from Queensland, 6 from the Northern Territory and 2 from Western Australia. A confirmed diagnosis (fourfold rise in titre) was made in 5 cases, all with specimen collection dates in late January and early February. Two of these were from Western Australia (one from Broome and the other from the south-west) and three from the Northern Territory (precise location unknown). For the month of January a total of 14 cases have been reported, 9 from the Northern Territory, 3 from Queensland and 2 from Western Australia.
- Fifty-one reports of **adenovirus** were received this fortnight, 27 from South Australia, 12 from Victoria, 6 from Western Australia, 4 from New South Wales and 2 from Queensland. Nineteen patients reported respiratory symptoms, 11 gastrointestinal disease and 11 (all adenovirus type 8) eye disease.

Figure 1. Rubella laboratory reports, January 1993 to January 1994, by month of specimen collection

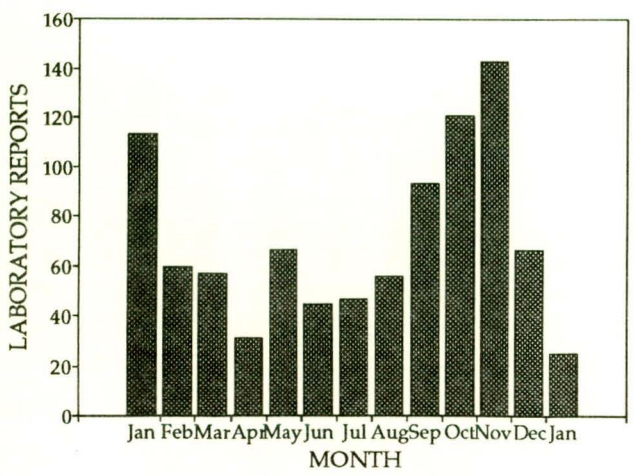
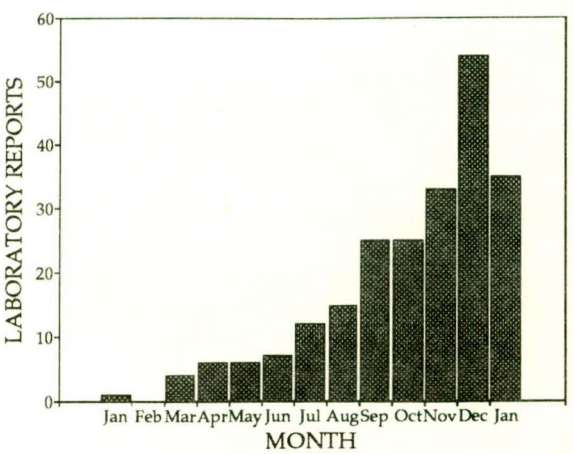


Figure 2. Echovirus type 30 laboratory reports, January 1993 to January 1994, by month of specimen collection



- **Herpes simplex virus type 1** was reported isolated from the eye of a 35 year old female with eye disease.
- **Herpes simplex virus type 2** was detected in the skin of a 2 week old male by immunofluorescence.
- There were 42 reports of **cytomegalovirus (CMV)** infection this fortnight. Included was an isolate from a lung specimen from a male who died and an isolate from a genital specimen from a 37 year old HIV positive male with a suspected sexually transmitted disease. Sixteen other reports were of virus isolation, one was a four-fold rise in titre and 22 were of viral IgM detection.
- Forty-six reports of **varicella-zoster virus** were received this fortnight, 17 from Queensland, 9 from Victoria, one from New South Wales, 10 from Western Australia, 8 from South Australia and one from Tasmania. Included was an 85 year old male with a diagnosis of chickenpox. Eighteen cases were diagnosed by virus isolation, 16 by antigen detection and 12 by IgM detection.
- **Epstein-Barr** virus was reported for 79 patients this fortnight. Included was a 5 year old female with encephalitis.
- **Parvovirus** was reported for 8 patients this fortnight, 4 from Western Australia, 2 from Victoria, one from Queensland and one from South Australia. Four patients were females in the 17 to 35 year old age group; one was pregnant. Symptoms included rash, arthritis, fever and sore throat. Diagnosis was by virus specific IgM detection.
- **Enteroviruses** were reported for 43 patients this fortnight, 38 virus isolations and 5 nucleic acid detections. Meningitis was reported for 15 patients, gastrointestinal symptoms for 5 and respiratory symptoms for 2. Included was a **coxsackievirus type B2** isolated from the nasopharynx of an 11 day old female with meningitis from New South Wales, and a **coxsackievirus type B5** isolated from the CSF from a Victorian male (age unknown). The number of **echovirus type 30** reports remains elevated (Figure 2), 8 having been received this period, 5 from Victoria, 2 from South Australia and one from Tasmania. An untyped enterovirus was reported isolated from the lung of a 4 month old male who had died suddenly, and also from the CSF of a 2 month old male with meningitis.
- Twenty-three reports of **rhinovirus** were received this period (Figure 3). Included was a 2 week old with an upper respiratory tract infection, and a 4 week old with pyrexia, both females.
- Eleven reports of **influenza A** virus were received this fortnight, 10 from South Australia and one from New South Wales. Four patients were over 65 years of age. One diagnosis was by virus isolation (isolated from the nasopharynx of a 7 month old male from New South Wales), and the remaining ten by single high titre.
- **Influenza B** was reported for 4 patients this period, all from South Australia. Two were over 65 years of age. One diagnosis was by fourfold rise in titre, and 3 by single high titre. More influenza B reports were received for 1994 than for any year since 1982 (Figure 4).
- **Parainfluenza virus** was reported for 11 patients this fortnight, 2 **parainfluenza type 1**, 2 **parainfluenza type 2**, 6 **parainfluenza type 3** and 1 untyped. All reported respiratory symptoms. Four diagnoses were by virus isolation, five by antigen detection, one by fourfold antibody rise and one by single high titre. Included was a parainfluenzavirus type 2 isolated from the nasopharynx of a 17 month old male with pneumonia (CMV also isolated from the same specimen), and parainflu-

Figure 3. Rhinovirus laboratory reports, 1992 to 1994, by month of specimen collection

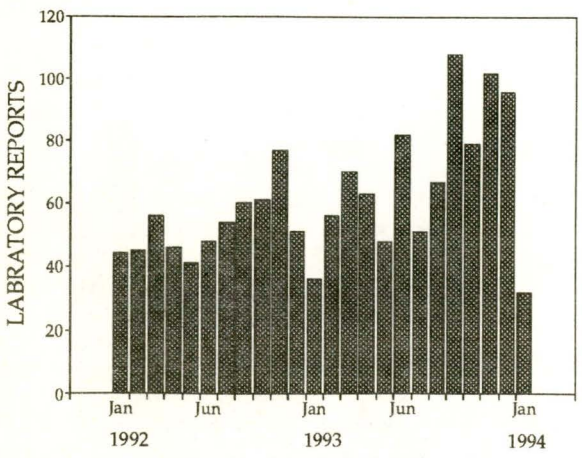
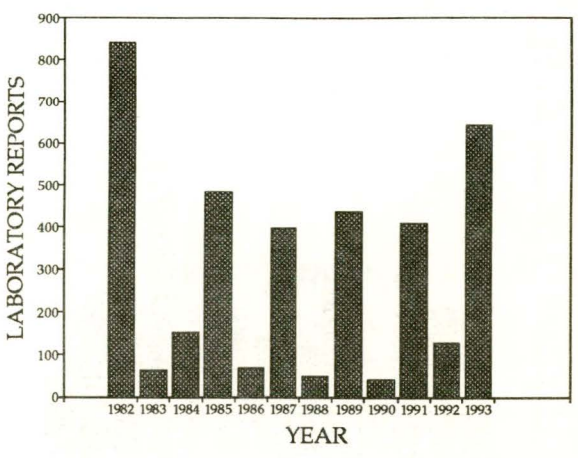


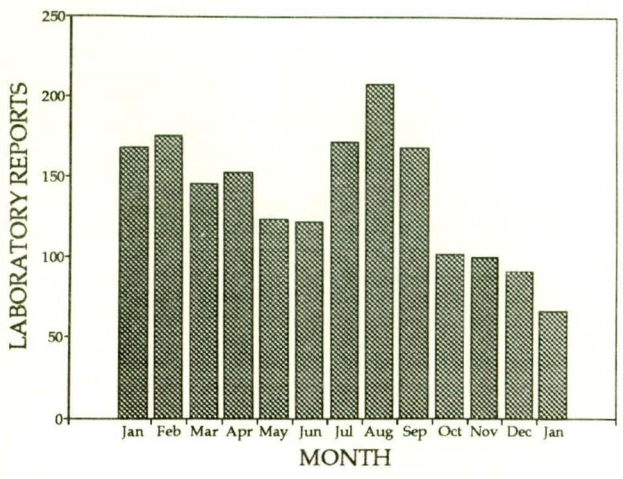
Figure 4. Influenza B laboratory reports, 1982 to 1993, by year of specimen collection



enzavirus type 3 infection in an 80 year old female with pneumonia.

- Eight reports of **respiratory syncytial virus (RSV)** were received this fortnight, 6 from Western Australia and one each from Queensland and the Australian Capital Territory. Diagnosis was by virus isolation (2), antigen detection (5), and fourfold rise in titre (1).The number of reports received in recent months has been high for the time of year, 45 having been received for January compared to an average of 18 for January in the previous 5 years.
- A **small round virus** was visualised by electron microscopy in the stool of an 11 month old male from New South Wales with gastroenteritis.
- Ninety-five cases of ***Chlamydia trachomatis*** were reported this fortnight, 85 reporting genital disease. Sixty-seven diagnoses were by isolation and 28 by antigen detection.
- ***Mycoplasma pneumoniae*** was reported for 29 patients this period, 2 single high titres, one four fold rise and 26 IgM detections. The number of reports remains low compared to this time last year (Figure 5).
- Ten cases of **Q fever** were reported this fortnight, 9 from Queensland and one from New South Wales. The youngest case was a 2 year old male with a high fever, and the eldest 55 years old. All diagnoses were by IgM detection.
- A single case of ***Rickettsia australis*** was reported for a 73 year old male from Victoria with fever and a rash. Diagnosis was IgM detection and fourfold rise in titre.
- There were 37 ***Bordetella*** reports this reporting period (19 *Bordetella pertussis* and 18 *Bordetella* species). Diagnosis was by antigen detection (2), single high titre (2), IgM detection (13) and IgA detection (20). The number of reports being received by this scheme remains high compared to this time last year.

Figure 5. *Mycoplasma pneumoniae* laboratory reports, January 1993 to January 1994, by month of specimen collection



Australian Sentinel Practice Research Network

No reports have been available for the Australian Sentinel Practice Research Network since the beginning of the year, due to problems being experienced in the processing of the data. Reports will be resumed as soon as possible.

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 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 AIDS deaths reported for September 1993, as reported to 31 December 1993, are included in this issue of *CDI* (Tables 1 and 2).

Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 10 laboratories. There were 175 reports of sepsis:

Sir Charles Gairdner Hospital Western Australia 19, Liverpool Hospital, New South Wales 67, Woden Valley Hospital, Australian Capital Territory 22, Sullivan and Nicolaides, Queensland 11, Northern Tasmanian Pathology Service, Tasmania 3, Nambour Hospital, Queensland 5, Central Queensland Pathology Service, Mackay 2, Princess Margaret Hospital for Children, Western Australia 11, Royal Hobart Hospital, Tasmania 8, Toowomba Pathology Laboratory, Queensland 27.

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates not included in Table 3 were:

Table 1. New diagnoses of HIV infection, new diagnoses of AIDS and deaths from AIDS occurring in the period 1 to 30 September 1993, by sex and State or Territory in which diagnosis was made

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA			
										This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
HIV diagnoses	Female	0	2	0	0	1	0	1	0	4	5	60	71
	Male	0	36	0	8	2	1	20	2	69	86	711	865
	Sex not reported	0	1	0	0	0	0	0	0	1	0	9	15
	Total[1]	0	39	0	8	3	1	21	2	74	91	783	953
AIDS diagnoses	Female	0	0	0	0	0	0	0	0	0	3	26	15
	Male	0	25	2	4	7	0	6	0	44	36	422	413
	Total[1]	0	25	2	4	7	0	7	0	45	39	415	429
AIDS deaths	Female	0	2	0	1	0	0	0	0	3	1	12	13
	Male	0	19	1	4	2	0	8	1	35	36	393	360
	Total[1]	0	21	1	5	2	0	8	1	38	37	407	375

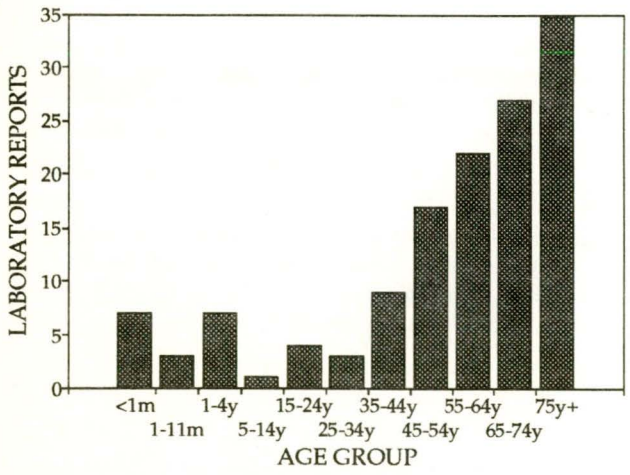
1. Persons whose sex was reported as transsexual are included in the totals.

Table 2. Cumulative diagnoses of HIV infection, AIDS and deaths from AIDS since the introduction of HIV antibody testing to 30 September 1993, by sex and State or Territory

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	AUSTRALIA
HIV diagnoses	Female	9	489	6	73	38	3	130	42	790
	Male	139	9091	70	1255	525	68	2911	625	14684
	Sex not reported	0	2030	0	1	0	0	44	0	2075
	Total[1]	148	11618	76	1332	563	71	3092	668	17568
AIDS diagnoses	Female	2	96	0	19	11	2	25	9	164
	Male	54	2573	20	380	188	25	931	183	4354
	Total[1]	56	2674	20	401	199	27	961	192	4530
AIDS deaths	Female	2	54	0	12	5	1	11	3	88
	Male	36	1713	12	266	108	18	665	123	2941
	Total[1]	38	1771	12	279	113	19	679	126	3037

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

Figure 6. LABDOSS reports of blood isolates, by age group



Gram positive: 1 Group A *Streptococcus*, 1 Group B *Streptococcus*, 2 *Streptococcus* 'milleri', 2 *Streptococcus sanguis*, 2 *Streptococcus* 'viridans'.

Gram negative: 1 *Salmonella* species (12 year old female from the Australian Capital Territory), 1 *Chryseomonas luteola*, 3 *Enterobacter* species (1 *E. cloacae*, 1*E. aerogenes*), 1 *Xanthomonas maltophilia*, 2 *Serratia* species (1 *S. marcescens*), 1 *Moraxella* species.

Anaerobes: 3 *Bacteroides fragilis*, 2 *Bacteroides species*, 1 *Clostridium perfringens*, 1 *Fusobacterium* species.

Fungi: 3 *Candida* species (2 *C. albicans*, 1 *C. glabrata*).

Isolates from sites other than blood or CSF

Peritoneal dialysate: 1 *Serratia rubidaea*, 2 *Staphylococcus epidermidis*.

Joint fluid: 4 *Staphylococcus aureus*, 1 Group A *Streptococcus*.

Other: 1 *Enterococcus* species, 2 coagulase negative *Staphylococcus*, 1 Group A *Streptococcus*, 1 *Streptoccocus* 'viridans', *6 Staphylococcus aureus* (1 MRSA), 2 *Serratia* species (1 *S. marcescens*), 2 *Escherichia coli*, 2 *Proteus mirabilis*, 1 *Pseudomonas aeruginosa*, 1 *Moraxella* species, 1 *Cryptococcus neoformans*.

Most reports were for patients over the age of 55 years (Figure 6).

Table 3. 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	Hospital acquired	Neonatal	
Staphylococcus aureus	1				2	1	3	3	5	1		30[2]
Staphylococcus coagulase negative									3	1		10[3]
Streptococcus pneumoniae		1				1						7
Enterococcus species				3				1				6[4]
Escherichia coli				6	7	1	4	8	2			32
Proteus mirabilis					1							6
Acinetobacter species								2				5[5]
Klebsiella species				2								7[6]
Pseudomonas species		1			1		3	1				6[7]

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 4.
3. *Staphyloccus epidermidis* 2, S. *auricularis* 1.
4. *Enterococcus faecalis* 4, *E. faecium* 1.
5. *Acinetobacter junii* 1.
6. *Klebseilla pneumoniae* 2,*K. oxytoca* 1.
7. *Pseudomonas aeruginosa* 3, *P. paucimobilis* 1.

Table 4. LabDOSS meningitis reports, by organism and age group

	< 1 month	1-11 months	1-4 years	5-34 years	35-44 years	45-54 years	Total
Neisseria meningitidis serogroup B		3	1			1	5
Klebsiella pneumoniae		1					1
Group B *Streptococcus*	1						1
Haemophilus influenzae type b			1				1
Streptococcus pneumoniae		1					1
Staphyloccoccus coagulase negative			1		1		2

CSF isolates and/or meningitis reports

There were 11 reports of CSF isolates and/or meningitis (Table 4).

National Notifiable Diseases Surveillance System, 6 February to 19 February 1994

There were 2278 notifications reported for this period (Tables 5, 6 and 7 and Figure 9). Due to a computer failure no reports have been received from Victoria since the beginning of the year.

- There were 419 notifications of **Ross River virus infection** in the period, 200 males and 215 females. Sex was unrecorded for 4 cases (Figure 7). The cases ranged in age from the 5-9 to the 75-79 years age groups. Age was unrecorded in one case. Eighty-three per cent (350) of the cases were aged between the 20-24 and 55-59 years age groups. In addition to the areas reporting in the past few weeks, notifications were received from the Statistical Divisions of Canberra (one), Northern South Australia (one), and Kimberley Western Australia (one). Reported onset dates were July (one), November (one), December (4), January (127) and February (285).
- Eighty-six notifications of **gonococcal infection** were received in the period. There were 55 males, 30 females and sex was unrecorded for one case. Ages ranged between the 15-19 and 75-79 years age groups with 43% (37) cases aged between the 15-19 and 30-34 years age groups.
- ***Haemophilus influenzae* type b infection** was notified for 9 cases, 5 males and 4 females. Seven cases were in the 0-4 years age group with one case aged less than one year. The remaining cases were in the 10-14 years and 30-34 years age groups respectively. Recorded onset dates for the cases less than 5 years were January (one) and February (6) (Figure 8). There was one apparent cluster of 2 cases with the same recorded onset date who were resident in the same postcode area in South Australia.

- A total of 79 notifications of **hepatitis A** was received this period. Forty-six cases were male and 33 were female. The cases ranged in age between the 0-4 and 90-94 years age groups.
- Seventy-three cases of **hepatitis B** were reported. There were 5 cases from States reporting incident data (representing new infections): Northern Territory (one) and Western Australia (4). These incident cases were 4 males and one female and recorded ages ranged between the 25-29 and 60-64 years age groups.
- A single case of **hydatid infection** was notified for a female in the 45-49 years age group resident in the Brisbane Statistical Division. The recorded onset date was February.
- Two cases of **legionellosis** were notified in females in the 20-24 and 50-54 years age groups. One case was resident in Sydney and the other case in north Queensland.
- There were 5 cases of **leptospirosis** notified for the period. All cases were male and they ranged in age from the 15-19 to the 60-64 years age group. Four cases were resident in rural Queensland and the remaining case was resident in Brisbane.
- Two cases of **listeriosis** were reported. Both cases were females resident in New South Wales and they were in the 0-4 and 30-34 years age groups.
- A total of 26 cases of **malaria** was notified, 16 males and 10 females. Recorded ages ranged from the 15-19 to the 50-54 years age group. Age was unrecorded in 2 cases. Eight cases were resident in the 'malaria receptive zone'. Recorded onset dates were October (one), November (7), December (3), January (8), and February (7).
- One hundred and thirty-nine notifications for **measles** were received ; 68 males, 70 females, and sex was unrecorded for one case. The cases ranged in age from the 0-4 to the 80-84 years age group, with 13 cases aged less than one year and the mean age of cases 12.7 years. There were apparent clusters recorded in New South Wales (6), Queensland (11) and Western Australia (one).
- There were eight notifications of **meningococcal infection**;, 4 males and 4 females. Recorded ages ranged between 0-4 and 90-94 years age groups. There was one apparent cluster of 3 cases notified from the same postcode area in Queensland with recorded onset dates within an 11 day period in January.
- Two hundred and fifteen notifications of **pertussis** were received; 87 males and 128 females. Cases ranged in age between the 0-4 and 90-94 years age groups. Age was unrecorded for one case. Nine of the cases were aged less than one year and 29 were less than five years.
- There were 25 notifications for **Q fever** received in the period, 24 males and one female. Cases ranged in age from 0-4 to 75-79 years age groups with 52% (13) of cases reported in males between the 20-24 and 30-34 years age groups. The majority of notifications (20) came from rural Statistical Divisions in New South Wales and Queensland.
- There were 66 notifications of **rubella** received, 51 cases were male, 14 cases were female and sex was unrecorded in one case. Recorded ages ranged between the 0-4 and 90-94 years age groups, with a mean age of 42.5 years. There were three notifications for females in the 15-44 years age group. Eight apparent clusters were recorded: New South Wales (one), Queensland (2), South Australia (one), Western Australia (4) , and Northern Territory (one).

Figure 7. Ross River virus infection, January 1992 to February 1994, by month of onset

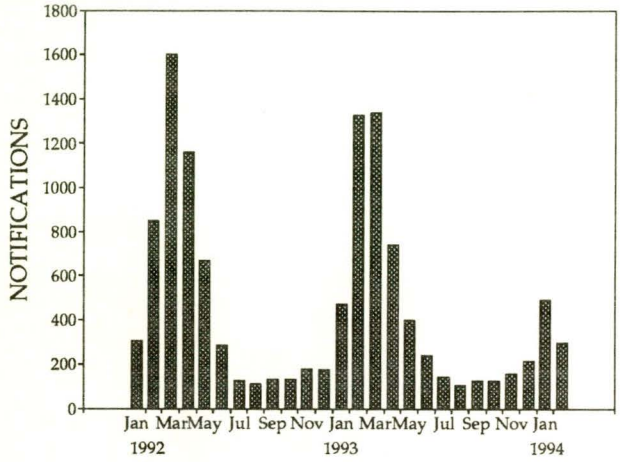
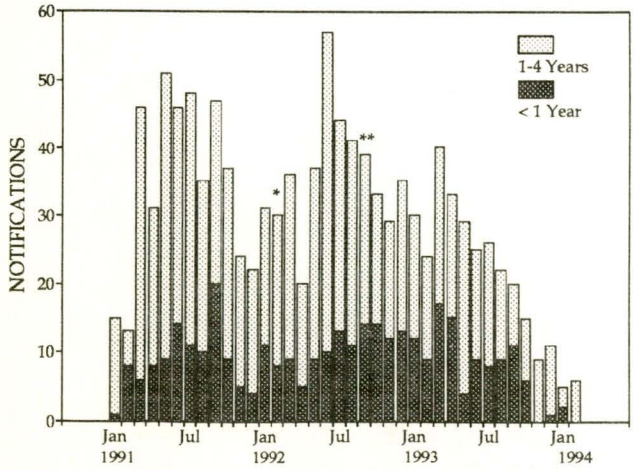


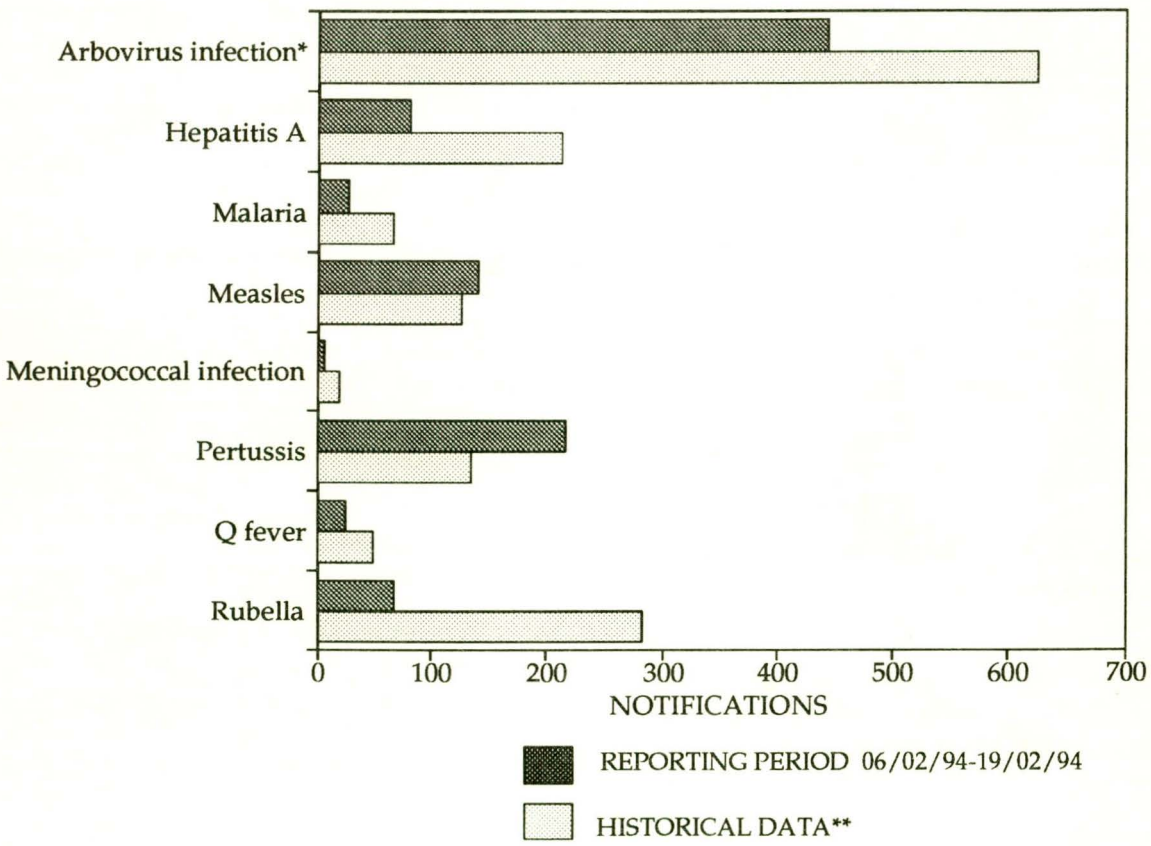
Figure 8. *Haemophilus influenzae* type b infection notifications, January 1992 to February 1994, by month of onset and age group



* PRP-D licensed in February 1992.
** Infant vaccine licensed in September 1992.

- Sixty-seven notifications of **syphilis** were received. Thirty cases were male and 37 were female. Recorded ages ranged from the 0-4 to the 75-79 years age groups. Age was unrecorded in 2 cases. One case was notified for a female less than one year.
- There were 20 notifications of **tuberculosis**: 11 males and 9 females. Cases ranged in age between the 10-14 and 75-79 years age groups. Recorded onset dates were November (3), December (one), January (8) and February (7). Month of onset was unrecorded for one case.
- There were 17 notifications of **yersoniosis** received. Ten cases were males and seven were females. Ages ranged between 0-4 and 55-59 years age groups. There was one apparent cluster of two cases recorded for the same postcode in Queensland with recorded onset dates 4 days apart in January.

Figure 9. Selected National Notifiable Diseases Surveillance System reports, and historical data **



* Includes Ross River virus and Dengue

** The historical data are the averages of the number of notifications in 6 previous 2-week reporting periods: the corresponding periods of the last 2 years and the periods immediately preceding and following those.

Table 5. Notifications of disease preventable by vaccines recommended by the NHMRC for routine childhood immunisation received by State and Territory health authorities in the period 6 February to 19 February 1994

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1] This period 1994	This period 1993	Year to date 1994	Year to date 1993
Diphtheria	0	0	0	0	0	0		0	0	0	1	0
Haemophilus influenzae b infection	0	2	0	3	4	0		0	9	47	26	85
Measles	6	29	0	100	1	0		3	139	177	529	327
Mumps	0	0	NN	NN	0	NN		0	0	0	2	0
Pertussis	0	57	0	92	41	0		25	215	243	681	407
Poliomyelitis	0	0	0	0	0	0		0	0	0	0	0
Rubella[2]	3	2	5	22	13	0		21	66	548	275	1076
Tetanus	0	0	0	NN	0	0		0	0	3	0	5

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.
2. NT, Tas: CRS only.

NN Not Notifiable.

Table 6. Notifications of other diseases[1] received by State and Territory health authorities in the period 6 February to 19 February 1994

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2] This period 1994	This period 1993	Year to date 1994	Year to date 1993
Arbovirus infection												
Ross River virus infection	1	21	64	327	0	NN		4	419	610	967	912
Dengue	0	-	0	0	-	NN		NN	0	15	2	27
NEC[3]	0	1	4	20	0	0		0	25	61	72	92
Campylobacteriosis[4]	15	-	6	78	71	21		42	233	1088	843	2006
Chlamydial infection (NEC)[5]	4	NN	41	122	0	6		21	194	837	670	1436
Donovanosis	0	NN	1	2	NN	NN		0	3	5	9	9
Gonococcal infection[6]	0	4	27	27	0	0		28	86	353	303	636
Hepatitis A	1	16	1	52	0	0		9	79	271	221	480
Hepatitis B[7]	11	0	1	57	0	0		4	73	245	244	475
Hepatitis C	16	0	17	199	0	14		45	291	466	754	860
Hepatitis (NEC)	0	1	0	0	0	0		NN	1	8	6	15
Legionellosis	0	1	0	1	0	0		0	2	9	11	16
Leptospirosis	0	0	0	5	0	0		0	5	25	16	44
Listeriosis	0	2	NN	0	0	0		0	2	8	4	14
Malaria	1	2	0	19	2	0		2	26	79	40	137
Meningococcal infection	0	1	0	4	1	0		2	8	32	38	57
Ornithosis	0	NN	0	1	1	0		0	2	14	3	29
Q fever	0	4	0	21	0	0		0	25	74	71	116
Salmonellosis (NEC)	1	34	15	133	26	8		29	246	727	700	1288
Shigellosis[4]	0	-	1	7	2	0		14	24	130	88	232
Syphilis	1	20	14	31	0	0		1	67	241	214	426
Tuberculosis	0	5	0	8	3	3		1	20	91	64	166
Typhoid[8]	0	0	0	0	0	0		0	0	10	1	17
Yersiniosis (NEC)[4]	0	-	0	14	3	0		0	17	59	73	117

1. For HIV and AIDS, see Tables 1 and 2. For rarely notified diseases, see Table 7.
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. SA, Tas: includes Ross River virus and dengue.
4. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
5. WA: genital only.
6. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
7. Acute cases only are reported by NSW, NT, SA, Tas and WA.
8. NSW and Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

Table 7. Notifications of rare[1] diseases recieved by State and Territory health authoritiesin the period 6 February to 19 February 1994

DISEASES	Total this period	Reporting States or Territories	Year to date 1994
Botulism	0		0
Brucellosis	0		1
Chancroid	0		0
Cholera	0		0
Hydatid infection	1	Qld	2
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 50 cases of each of these diseases were notified each year during the period 1988 to 1993.

Table 8. Laboratory reports by State or Territory[1] for the reporting period 10 February to 23 February 1994, 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	3	1	25		1	3	3	37	12.2	395
Mumps virus							2		2	2.8	21
Rubella virus		1		7	6		2	2	18	22.8	212
HEPATITIS VIRUSES											
Hepatitis A virus		2		5	1				8	26.8	66
Hepatitis B virus		17		12	3	1	26	15	74	86.2	457
Hepatitis C virus	3	21		26	50	4	10	63	177	101.5	1,075
ARBOVIRUSES											
Ross River virus		2	3	115	2			1	123	71.2	490
Barmah Forest virus			6	7				2	15	5.7	61
ADENOVIRUSES											
Adenovirus type 1					9				9	3.8	24
Adenovirus type 2		1			2		2		5	2.8	22
Adenovirus type 7					1				1	.0	2
Adenovirus type 8							7		7	.5	31
Adenovirus type 22							1		1	.2	1
Adenovirus not typed/pending		3		2	15		2	6	28	34.8	314
HERPES VIRUSES											
Herpes simplex virus type 1		17		31	30		43	34	155	163.5	1,015
Herpes simplex virus type 2		29		42	27	1	33	55	187	170.5	1,186
Herpes simplex not typed/pending	5	20		2			1	1	29	27.7	147
Cytomegalovirus		1		19	1	2	15	4	42	60.8	298
Varicella-zoster virus		1		17	8	1	9	10	46	29.2	238
Epstein-Barr virus		8	4	26	24	1	5	11	79	70.0	365
OTHER DNA VIRUSES											
Parvovirus				1	1		2	4	8	3.8	20
PICORNA VIRUS FAMILY											
Coxsackievirus B2		1							1	.0	6
Coxsackievirus B5							1		1	2.8	6

Table 8. Laboratory reports by State or Territory[1] for the reporting period 10 February to 23 February 1994, 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			
Echovirus type 30					2	1	5		8	.2	129
Poliovirus type 2 (uncharacterised)		1							1	1.0	6
Poliovirus type 2 (vaccine strain)					1				1	.0	1
Rhinovirus (all types)		3		1			8	11	23	18.3	216
Enterovirus not typed/pending		1		4			12	14	31	20.7	302
ORTHO/PARAMYXOVIRUSES											
Influenza A virus		1			10				11	3.3	107
Influenza B virus					4				4	3.0	72
Parainfluenza virus type 1							1	1	2	5.2	18
Parainfluenza virus type 2				1				1	2	2.3	6
Parainfluenza virus type 3		2			1		2	1	6	12.5	60
Parainfluenza virus typing pending							1		1	.8	5
Respiratory syncytial virus	1			1				6	8	10.8	145
OTHER RNA VIRUSES											
HIV-1				1				2	3	1.3	17
Rotavirus	4		1	4	1		4	2	16	18.2	196
Small virus (like) particle		1							1	1.8	4
OTHER											
Chlamydia trachomatis not typed	2	4		29	17	2	21	20	95	107.8	517
Chlamydia psittaci		1					4		5	4.8	20
Chlamydia spp typing pending					4				4	.3	4
Mycoplasma pneumoniae	1			17	6		4	1	29	58.5	268
Coxiella burnetii (Q fever)		1		9					10	13.0	107
Rickettsia australis						1			1	.0	2
Streptococcus group A		1		8			3		12	5.3	62
Yersinia enterocolitica							1		1	.0	2
Bordetella pertussis							19		19	2.2	131
Bordetella species		4		14					18	4.8	144
Leptospira species				1					1	.2	5
Treponema pallidum		12		3					15	12.2	74
Toxoplasma gondii				1					1	1.0	6
TOTAL	17	159	15	431	226	15	249	270	1,382	1,209.3	9,078

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

Table 9. Laboratory reports by clinical information for the reporting period 10 February to 23 February 1994

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA													
Measles virus					2			18				17	37
Mumps virus												2	2
Rubella virus				1				8				9	18
HEPATITIS VIRUSES													
Hepatitis A virus							4					4	8
Hepatitis B virus							13	2				59	74
Hepatitis C virus			1				24					152	177
ARBOVIRUSES													
Ross River virus								6		49		68	123
Barmah Forest virus								1		1		13	15
ADENOVIRUSES													
Adenovirus type 1					9								9
Adenovirus type 2					4	1							5
Adenovirus type 7					1								1
Adenovirus type 8									7				7
Adenovirus type 22						1							1
Adenovirus not typed/pending					5	9			4		1	9	28
HERPES VIRUSES													
Herpes simplex virus type 1					2			88	4		47	14	155
Herpes simplex virus type 2								47		1	128	11	187
Herpes simplex not typed/pending								17	2		4	6	29
Cytomegalovirus					3		1		1			37	42
Varicella-zoster virus								38				8	46
Epstein-Barr virus	1				11		3	2				62	79
OTHER DNA VIRUSES													
Parvovirus								1		3		4	8
PICORNA VIRUS FAMILY													
Coxsackievirus B2		1											1
Coxsackievirus B5		1											1
Echovirus type 30		6				2							8
Poliovirus type 2 (uncharacterised)												1	1
Poliovirus type 2 (uncharacterised)						1							1
Rhinovirus (all types)					10							13	23
Enterovirus not typed/pending		7			2	2						20	31
ORTHO/PARAMYXOVIRUSES													
Influenza A virus					3							8	11
Influenza B virus					1							3	4
Parainfluenza virus type 1					2								2
Parainfluenza virus type 2					2								2
Parainfluenza virus type 3					6								6
Parainfluenza virus typing pending												1	1
Respiratory syncytial virus					7							1	8
OTHER RNA VIRUSES													
HIV-1												3	3

Table 9. Laboratory reports by clinical information for the reporting period 10 February to 23 February 1994 continued

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
Rotavirus						14						2	16
Small virus (like) particle						1							1
OTHER													
Chlamydia trachomatis not typed						1					85	9	95
Chlamydia psittaci					4							1	5
Chlamydia spp typing pending											4		4
Mycoplasma pneumoniae					17							12	29
Coxiella burnetii (Q fever)					1							9	10
Rickettsia australis								1					1
Streptococcus group A					2					2		8	12
Yersinia enterocolitica									1				1
Bordetella pertussis					19								19
Bordetella species					10							8	18
Leptospira species												1	1
Treponema pallidum			1								3	11	15
Toxoplasma gondii												1	1
TOTAL	1	15	2	1	123	32	45	229	19	56	272	587	1382

Table 10. Laboratory reports by contributing laboratories for the reporting period 10 February to 23 February

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	19
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	56
	Royal Alexandra Hospital for Children, Camperdown	11
	South West Area Pathology Service, Liverpool	55
Queensland	Nambour Hospital	6
	Queensland Medical Laboratory, West End	458
South Australia	Institute of Medical & Veterinary Science, Adelaide	225
Tasmania	Royal Hobart Hospital	8
Victoria	Microbiological Diagnostic Unit, University of Melbourne	21
	Monash Medical Centre, Melbourne	27
	Royal Children's Hospital, Melbourne	61
	Victorian Infectious Diseases Reference Laboratory, Fairfiel	150
Western Australia	Princess Margaret Hospital, Perth	10
	State Health Laboratory Services, Perth	275
TOTAL		1382