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CONTENTS

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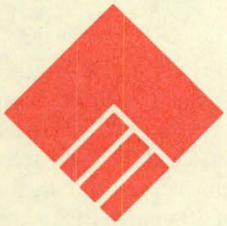

DEPARTMENT OF HEALTH, HOUSING AND COMMUNITY SERVICES

COMMUNICABLE DISEASES NETWORK-AUSTRALIA
A National Network for Communicable Diseases Surveillance

TETANUS IN THE MIDWEST AND GASCOYNE, WESTERN AUSTRALIA: IS THE CURRENT ADULT IMMUNISATION SCHEDULE APPROPRIATE?

(Heath Kelly, for the Midwest and Gascoyne Region Community Health Services, Western Australia)

Introduction

Early in 1992 in the Midwest and Gascoyne Health Region of Western Australia, two cases of tetanus occurred, both in older women. Older women are known to be at increased risk of tetanus in Israel[1], Poland[2], the USA[3] and the United Kingdom[4]. In addition to this, the first case of diphtheria in Western Australia for 20 years occurred early in 1992[5]. Tetanus is notified in Western Australia approximately 2 to 3 times each year[6]. Two cases in one health Region with a population of 63,600[7] in a three month period was in excess of the number expected (Poisson $p<0.01$). Given two cases of tetanus in the Region and one case of diphtheria in the State, a Regional campaign, aimed at increasing the uptake of adult diphtheria and tetanus (ADT) vaccine, was conducted over a period of 5 months. During the campaign a number of people had moderate or severe reactions to their ADT boosters. In order to investigate these reactions, tetanus and diphtheria antibodies were estimated in a sample of people who had an immunisation reaction and tetanus antibody titres were estimated in two other samples.

Case Reports

Case 1

In February 1992, a 63 year old woman sustained a rose thorn injury to the web space of her right thumb. Approximately seven days after her injury she developed stiffness in the jaw and was not fully able to open her mouth. The stiffness gradually progressed, she developed an aching soreness in her chest and back and was not able to flex her neck. The patient presented to her general practitioner suspecting that she may have tetanus. She had no definite recollection of ever having had a tetanus toxoid injection. The diagnosis was confirmed and the patient was transferred to the general physician in Geraldton. A small fragment of rose thorn was recovered from the wound. She was given tetanus immunoglobulin 4,000 units, penicillin and diazepam. Tetanus immunisation was commenced later in the course of the illness. The patient deteriorated after one week and was transferred to Perth, where she spent a further three weeks in hospital.

Case 2

Approximately two months later, a 55 year old woman stumped her left great toe. The nail of the toe was removed, the patient was given a tetanus toxoid injection and a course of oral flucloxacillin was started. The patient believed that she had had her childhood tetanus injections. Eight days following her injury, and despite the treatment that had been commenced, the patient developed stiffness in her jaw, had difficulty swallowing and complained of spasms in her left leg and back. Tetanus was diagnosed and she was admitted briefly to hospital on three separate occasions and given diazepam which resulted in some symptomatic relief. Four days after her last presentation she was again admitted to hospital with discomfort and spasms. The toe was further debrided and cleaned and the patient was given tetanus immunoglobulin 4,000 units, penicillin IV and a diazepam infusion for sedation and prevention of spasms. This treatment was satisfactory and the patient was discharged after one week.

Immunisation Campaign

As a result of these two cases of tetanus, a campaign aimed at increasing immunity to tetanus within the region was undertaken. Older people, and particularly older women, were seen as the target group.

Methods

Teams of community health nurses visited various community venues to conduct immunisation clinics. A community wide campaign, offering immunisation to the public, was held during a period of one week in a variety of locations, including shopping centres, caravan parks, pharmacies and shire offices. The campaign was widely advertised in the local media. Immunisation was also offered from the Community Health Services tent at all of the regional agricultural shows and at main street venues in some of the smaller towns within the region.

The National Health and Medical Research Council guidelines for immunisation were followed[8]. An adult diphtheria and tetanus (ADT) booster was offered to all adults who had not had a booster for more than 10 years (given the best recollection of each person). Vaccination was always given in the deltoid muscle.

Results

Approximately 3500 persons throughout the region, including more than 2700 in the Geraldton area, were immunised by community health nurses. An unknown number of persons were also immunised by their general practitioners. Of those persons immunised in the Geraldton area, 44% were aged over 40 years (the nominal target group).

During the week of the community immunisation campaign, a number of persons suffered reactions to their ADT boosters. The typical reaction occurred between 2 and 24 hours after the booster injection. The arm became tender, red and swollen between the shoulder

Table 1. Tetanus and diphtheria antibody titres in three groups of persons immunised as part of the Midwest and Gascoyne Health Region adult immunisation campaign

	IMMUNISED AND SIGNIFICANT REACTION	IMMUNISED AND NO REACTION	PRE IMMUNISATION; NO PREVIOUS REACTION
Number	16	14	13
Females : Males	15:1	8:6	5:8
Age (Years) - Mean ± SD[1]	52.8 ± 9.2	45.7 ± 14.2	47.6 ± 14.2
Tetanus titre (IU/mL) - Range	1.2 - 35.7	1.2 - 85.9	0.007 - 4.1
Mean ± SD[1]	13.7 ± 9.8[2]	16.1 ± 25.4	0.9 ± 1.8[3]
Diphtheria titre (IU/mL) - Range	0.2 - 82.2	Not measured	Not measured
Mean ± SD[1]	10.1 ± 20.7		

1. SD = standard deviation
2. No significant difference compared with sample immunised with no reaction
3. $P < 0.001$ for comparison with both other groups (Student's t-test)

and the elbow. There was also a slight systemic reaction with mild fever in the first 24-48 hours and tender axillary lymphadenopathy. Symptoms characteristically lasted for approximately one week.

In order to estimate the number of reactions to the ADT booster in the community, an article was published in the local newspaper inviting persons who had had any sort of reaction to contact the Community Health Centre. A total of 44 persons responded to this invitation, of whom 32 were considered to have had a reaction related to their immunisation. This represented a known reaction rate of 32 of the 2753 (1.2%) adults immunised in Geraldton by community health nurses. To investigate a possible cause for the immunisation reactions, diphtheria and tetanus antibody titres were estimated by CSL Ltd (formerly Commonwealth Serum Laboratories) in a sample (n = 16) of the persons with immunisation reactions. Tetanus antibody titres were also estimated in a sample of persons who had been immunised in the campaign but had had no significant reactions (n = 14) and in a further sample who were tested prior to immunisation at a local agricultural show (n = 13). No post immunisation antibody titres were performed in this latter group.

All groups showed a wide range of antibody titres (Table 1). In the 30 adults tested post immunisation, titres for tetanus antibody were well in excess of the protective level of 0.01 IU/mL[9], independent of whether subjects had a significant reaction to the booster. There was no significant difference in tetanus antibody titres between the sample of people who suffered an immunisation reaction and those who did not, but there was a significant difference between both these samples and the sample of persons tested prior to vaccination ($p < 0.001$, Student's t-test). For the 16 adults who had a significant reaction, diphtheria antibody titres post vaccination exceeded the protective level of 0.01 IU/mL, in one case by more than 8000-fold. Of these 16 adults, 14 had at least three of: swelling; pain or tenderness; locally increased temperature or systemic fever; or tender axillary lymphadenopathy.

Because each of these samples were samples of convenience there are differences in their age and sex compositions. However, high and low antibody titres were recorded in both men and women of various ages and the way in which the samples were chosen is unlikely to have significantly biased the results. There are more women in the sample who had a reaction to their ADT booster and there are two possible explanations for this. Women may be more likely to respond to general public invitations like that in the local newspaper and women were specifically targeted early in the campaign.

Persons who reacted to their ADT booster were immunised at various locations and on different days throughout the campaign and there was no evidence of an effect of location or time. Two different batches of ADT were used. The protocols for manufacture, dispensing and quality assurance were checked by CSL Ltd and no abnormalities found. One of the persons with a reaction was immunised by her general practitioner, using a third batch of ADT. Of the 16 persons who had a reaction, 4 had had a booster within the previous 10 years, but only one had had a booster within 9 years. This person was immunised in error. On the other hand, 4 of the 14 persons who were immunised and who had no reaction to their immunisation had also had a booster between 8 and 10 years previously. In these small samples the period between boosters did not affect the likelihood of having a reaction (4 of 16 immunised with reaction versus 4 of 14 immunised without reaction, having had a previous booster between 8 and 10 years; $p = 0.85$).

Discussion

The mean half-life of both tetanus and diphtheria antibodies has been estimated as between 3 and 12 years[10,11] and, given the titres in this study, this implies many years' protection for those persons whose antibodies have been estimated. No person tested post immunisation would appear to warrant another booster within 10 years. An immunisation reaction rate

of 1.2% has been documented in this campaign but this is likely to underestimate the true rate, as a number of persons, who did not respond to the newspaper invitation, have subsequently reported immunisation reactions to community health nurses.

These results have not arisen from a study aimed at defining the optimal time for ADT boosters but they nonetheless raise an important issue. Given the high levels of the tetanus antibody titres and the immunisation reaction rate, together with the fact that there is no established pre-booster test for predicting a local reaction, it may be prudent for Australia to adopt the guidelines promulgated in the United Kingdom for tetanus immunisation in adulthood[4], that adults immunised against tetanus with 5 doses (as specified in the guidelines) do not need further boosters unless presenting with a tetanus prone wound. In Australia an adult fully immunised according to the National Health and Medical Research Council guidelines[8] could receive up to 10 doses of ADT. Despite the fact that a proportion of the population may be effectively over-immunised and thus be at risk of hypersensitivity reactions, there are still people who are not immune to tetanus as indicated by the occasional occurrence of the disease.

Acknowledgments

The case reports on the two women with tetanus in the Midwest and Gascoyne Health Region were prepared from the discharge summaries of Dr Peter Terren with his consent and approval. The population based immunisation campaign was efficiently and enthusiastically organised by Mrs Gill Manuel and Mrs Jan Dawson. Dr Len Hartman of CSL Ltd provided advice and information and Mr Peter Karampetsos performed the antibody assays. Drafts of this report were critically reviewed by a number of people at CSL Ltd, including Dr L Hartman, Dr J McEwen, Dr L Rozen and Professor I Gust.

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TETANUS IN VICTORIA 1992: PUBLIC HEALTH LESSONS

(Kath Taylor, Public Health Officer, Infectious Diseases Unit, Department of Health and Community Services, Victoria; reproduced from Update A Quarterly Bulletin of Infectious Diseases, Department of Health and Community Services, Victoria, 1993;1:32)

There were four cases of tetanus in Victoria in 1992. Despite the statutory requirement for notification, not all of these were initially reported to the Health and Community Services Department by the treating hospital or doctor.

Case 1

A 59 year old female lacerated her hand while working in her garden. She was given tetanus toxoid and the wound was sutured but six days later it became infected. She was admitted to hospital with symptoms of extremely severe tetanus. Discharged after three months, she remains unwell, suffering muscle and joint pains.

Case 2

This was an 81 year old male with peripheral vascular disease and a gangrenous toe. Following the operation the wound became infected and 2.5 weeks after surgery

he developed tetanus. Despite intensive treatment he died 11 days later.

Case 3

A woman aged 45 years cut her finger while gardening and four days later she developed mild tetanus. She recovered after six weeks of treatment.

Case 4

A country boy of 10 stood on a rusty nail and six days later he developed mild tetanus. He responded to treatment and was discharged from hospital after six days.

Tetanus is a preventable disease provided adequate immunisation has been given.

Case 1 and case 2 had not received any immunisations.

Case 3 received immunisation in childhood but no booster doses.

Case 4 had received one dose only of DTP (diphtheria-tetanus-pertussis), when he was less than one year old.

Case 2 illustrates the necessity for active immunisation cover for operations, particularly orthopaedic procedures on the lower limb.

In the past there have been many deaths caused by tetanus. A report by the Commission of Public Health in 1959 revealed that during the period 1949-1958, eighty-two persons had died in Victoria from tetanus, and of three persons who contracted the infection following operations in 1958, two had died. A Tetanus Prevention Committee made recommendations that active immunisation be extended to school children over the age of seven years, and active immunisation be given to patients undergoing lower limb operations.

The tetanus organism is ubiquitous in soil, particularly in situations where manure is used on gardens. Many cases of tetanus have occurred among home gardeners following injuries often minor in nature caused by thorns, splinters etc., often too trivial to cause the patient to seek medical attention. The majority were not immunised or had inadequate immunisation. Older persons are at greater risk of developing tetanus as a result of inadequate past and current immunisation.

This potentially fatal disease can be prevented if full tetanus immunisation is given as part of routine childhood immunisation, and immunisation retained with booster doses at ten year intervals. This can be given as tetanus toxoid or as ADT (adult diphtheria-tetanus), which also serves to maintain diphtheria immunity. In addition, when a tetanus prone wound is treated and there is doubt that active immunisation exists, human tetanus immunoglobin should be administered as soon as possible after the injury. Simultaneously tetanus toxoid should be given in the other arm and arrangements made to complete the full course of treatment.

CDI Editorial Comment

From 1980 to 1992, between five and 14 cases of tetanus were notified in Australia annually. In 1991 and 1992 (the years for which age and sex information has been available) there were 21 notifications, seven in 1991 and 14 notified so far for 1992. Age and sex were reported for 20 of these; most were in older females, although there were four cases in males in the 40 to 49 year age group (Figure 1).

Deaths from this vaccine-preventable disease also occurs in Australia each year. In the period 1980 to 1991, there was a total of 28 deaths, between one and five annually (Australian Bureau of Statistics Mortility Tabulations, 1981 to 1992). Most of these have been in older females (Figure 2).

The NHMRC currently recommends that all persons are immunised against tetanus at the age of two, four, six and 18 months (usually with DTP - diphtheria-tetanus-pertussis), five years (with CDT - combined diphtheria-tetanus), and at 15 years and thereafter at

Figure 1. Tetanus notifications, 1991 and 1992, by age group and sex

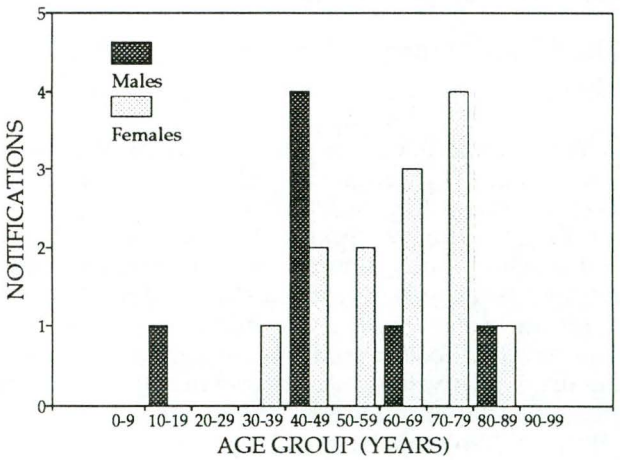
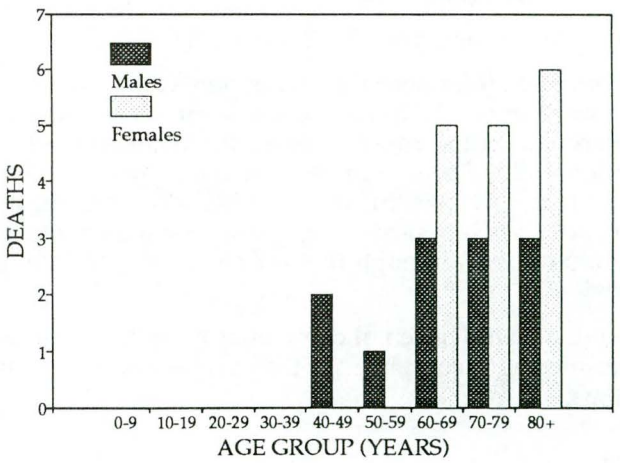


Figure 2. Tetanus deaths, 1980 to 1991, by age group and sex



10 year intervals (with ADT - adult diphtheria-tetanus). The recommendations for adult immunisation are currently under review.

Tetanus toxoid and human tetanus immunoglobulin are recommended for management of tetanus prone wounds, as detailed in a statement issued by the NHMRC in June 1992. Copies of this statement are available from the NHMRC Publications Officer, phone (06) 289 7646 or fax (06) 289 6957.

THE SCHOOL ENTRY IMMUNISATION CERTIFICATE IN VICTORIA

(Tony Stewart, Epidemiology Registrar, Infectious Diseases Unit, Department of Health and Community Services, Victoria; reproduced from Update A Quarterly Bulletin of Infectious Diseases, Department of Health and Community Services, Victoria 1993;1:28-30)

Immunisation is an established, effective and safe method of protecting the health of the population against certain infectious diseases. Yet the very success of vaccination and control over a number of diseases has created concerns that parents will become complacent and fail to immunise their children. Continued outbreaks of childhood, vaccine-preventable infectious diseases reflect upon our failure to reach and maintain the high levels of vaccine uptake necessary for herd immunity and led to changes in the Victorian Health Act in order to overcome this.

The Health (Immunisation) Regulations 1990

In Victoria, vaccination is promoted in multiple ways. One of these is through the provisions of the Health (Immunisation) Regulations. Since 1991, all children enrolling in primary school have been required to present a School Entry Immunisation Certificate, which the parents can only obtain from the local council. This certificate states whether the child has completed the required childhood immunisations against diphtheria, tetanus, poliomyelitis, measles and mumps. To be certified as 'fully immunised' for the purpose of school entry, children must have had:

- diphtheria and tetanus (DTP - diphtheria-tetanus-pertussis, or CDT - combined diphtheria-tetanus) - 4 doses
- poliomyelitis - 3 doses
- measles and mumps - 1 injection.

Certification for pertussis (whooping cough) is not required under the school entry regulations, because there was some concern about the increased risk of minor side effects when the vaccine is given to older children. At present, the NHMRC does not recommend pertussis vaccine be given to children over 4 years of age, although this policy is currently under review.

Students who have not completed all of the above are certified as 'incomplete' for the purposes of the regulations.

Incomplete certificates are issued in response to a parent:

1. signing an undertaking to have the relevant immunisations completed within a specified time. On completion of the immunisations required by the undertaking, the child's immunisation status should be appropriately adjusted; a completed immunisation certificate issued by the local council should replace the 'not completed' immunisation certificate presented on enrolment, and the outdated certificate should be discarded. (The vaccinations and consequent documentation regarding immunisation should generally be completed by the time of mid-year census.)
2. providing a medical declaration that there is a medical reason for not completing the course.
3. making a statutory declaration that the parent/guardian objects to vaccination on conscientious grounds.

The purpose of the legislation is not to make immunisation compulsory, but rather to ensure that all parents turn their minds to the question of immunisation rather than let it lapse through ignorance or apathy. While vaccination itself is not compulsory, certification of immunisation status is compulsory, and must be done on the prescribed form issued by the local council. Doctor's letters and photocopies of infant welfare books are insufficient. Statutory declarations also are not acceptable by the school but should be submitted to the local council and an appropriate certificate issued. If the child has not completed the required vaccinations, then their parent/guardian must obtain a certificate of incomplete immunisation from the local council.

The benefit to the school and wider community as a result of this legislation is that students who are not immunised against a particular disease (for example measles) can be quickly identified from records held at the school. In the event of a disease outbreak within the school, individuals at risk can then be excluded for their own safety. Furthermore, as vaccine coverage improves within a population, disease outbreaks become less likely, as there are not enough susceptible individuals to sustain person-to-person spread of infection.

The legislation also discourages complacency, as parents of children who are not fully vaccinated must make an active decision regarding immunisation.

The legislation provides for incremental introduction of certification over seven years. In 1993, schools are required to have certificates for children in preparatory year and Grades 1 and 2. This will increase each year, so by 1997, all students enrolled in primary school must have a certificate. Immunisation certificates are part of a child's education records and should be contained within any papers which accompany a child transferring between schools.

Analysis of School Entry Data 1992

Each year the Department of School Education conducts a mid-year census of all government schools in Victoria. In 1992 each school was required to specify the number of enrolments, number of students with complete certificates (fully immunised), the number of students with incomplete certificates (not fully immunised) and the number without a certificate (missing) for preparatory year and Grade 1. The census did not collect details on reasons for incomplete or missing certificates. It is not possible to determine, therefore, which immunisations were missing on an incomplete certificate, or the reasons why the full course of immunisation was not given (conscientious, religious or medical grounds). There is no comparable data on non-government schools.

The data from 1,586 schools which had preparatory year enrolments were analysed with respect to vaccination status and compliance with the regulations.

A total of 502 schools (31.7%) reported that 100% of their preparatory students were fully immunised, compared to 30.3% in 1991. In 1992, schools in the rural regions were more than twice as likely as urban schools to have 100% of their preparatory students fully immunised. A total of 453 schools (28.6%) reported that less than 80% of students were fully immunised, indicating that there is a potential risk for a disease outbreak such as measles to occur within these schools.

A total of 49.1% of schools (779) reported 100% of their preparatory students presented a certificate, (complete or incomplete immunisation). This compares favourably with 1991 when the figure was 37.6%. Rural schools were more likely to have no missing certificates than urban schools, which is probably related to the relative number of enrolments. Rural schools are generally smaller, and it is therefore easier to ensure full compliance by pursuing those who have not presented certificates.

Seventy-five schools (4.7%) reported that over half the preparatory students they had enrolled were accepted without presenting a certificate. This leaves considerable room for improvement.

There were 45,049 enrolments in preparatory year in the 1,586 schools. A total of 38,592 children (85.7%) were fully immunised, and this varied very little across the State. This compares to 85.2% for 1991. A total of 1,878 (4.2%) children were not fully immunised (compared with 2.0% in 1991), and 4,579 children (10.2%) did not present a certificate (compared with 12.8% in 1991).

The major difference therefore, has been a reduction in the number of children with missing certificates. The percentage of fully immunised children is essentially unchanged, and the proportion of children enrolling with incomplete certificates (not fully immunised) has increased.

Based on these figures, we can estimate the lower limit of Statewide measles coverage at time of school entry to be at least 85%, with little variation at the regional level. The data show considerable variation between council areas and between schools, which suggests that there are pockets where high numbers of susceptible children are at risk. Detailed reports have been sent to all local councils and State primary schools, with the objective of further improving the vaccination coverage.

Figure 1. Completed 1992 school entry immunisation certificates, Victoria

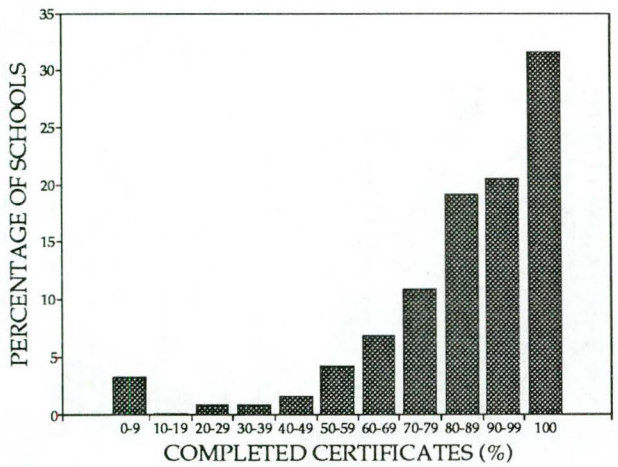
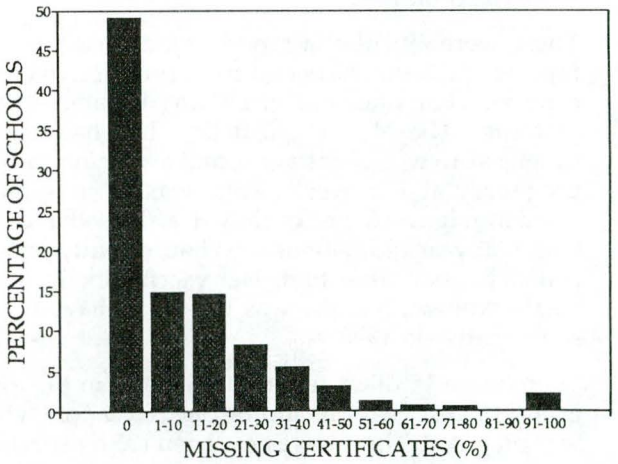


Figure 2. Missing 1992 school entry immunisation certificates, Victoria



OVERSEAS BRIEFS

In the last two weeks, the following information has been supplied by the World Health Organization and the Institut Pasteur, Paris.

Cholera Update

Newly infected areas are Kubang Pasu District (Kedah State) and Timor Laut District (Penang State) in Malaysia, Jhapa District in Nepal, Jujuy and Salta Provinces in Argentina, Guro and Tambara Districts (Manica Province) and Muturara District (Tete Province) in Mozambique, Mashonaland in Zimbabwe, and unspecified areas in Swaziland.

Cases have been reported for December and January from Argentina, Bolivia, Brazil, China, El Salvador, Guyana, Iraq, Mozambique, Panama, Swaziland and Zimbabwe.

Influenza in the Northern Hemisphere

In Asia, China has reported outbreaks in the northern part of the country since mid December. Initially, influenza B predominated, but influenza A H_3N_2 has recently become more common. In Japan, influenza B and influenza H_3N_2 have spread throughout the country since November. The number of cases of influenza-like illness and classes forced to close due to outbreaks have been four times higher than in the 1991-92 season.

In the United States, influenza B continues to dominate, and outbreaks continue to be reported. Activity is reported as sporadic in 28 States, regional in four States (Arizona, Missouri, Texas and Wisconsin) and widespread in New Mexico. A total of 256 strains had been isolated by 19 January; 98 per cent were type B.

In Europe, there has been moderate activity of influenza viruses. There have been only a few isolations, and no epidemic activity. Influenza B is dominating, especially in France. Isolates have been similar to B/Panama/45/90, the strain which was recommended for the Australian influenza vaccine for this year. Several countries are still reporting no influenza activity.

Yellow Fever in Kenya

An outbreak of yellow fever has been reported from Kenya, and confirmation of the diagnosis has been made by the Centers for Disease Control in Atlanta, USA. Baringo District in the Rift Valley Province has been declared infected. The World Health Organization recommends that all travellers to Kenya be vaccinated. Persons returning to Australia within six days of having been in Rift Valley Province will now be required to have been vaccinated.

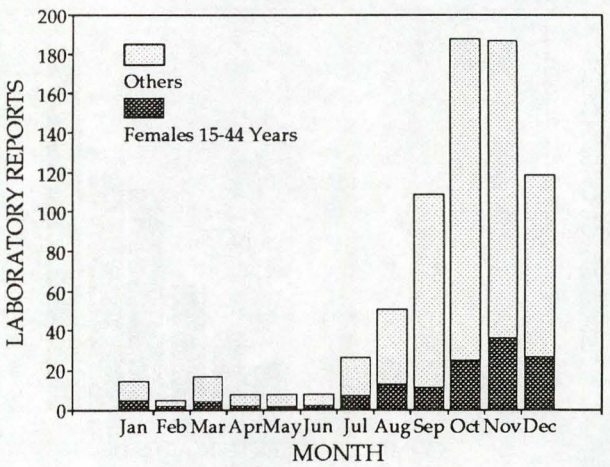
COMMUNICABLE DISEASES SURVEILLANCE

Laboratory Reporting Schemes

There were 1,222 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 7, 8 and 9), and 55 reports of isolates from normally sterile sites (LabDOSS).

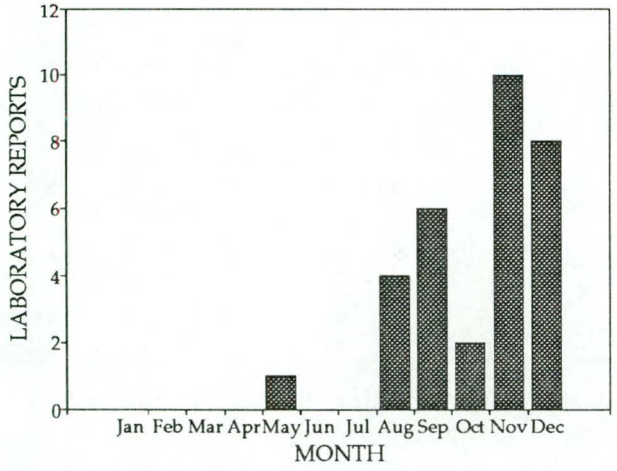
- There were 16 reports of **measles**, bringing the total for 1992 to 203. Nine reports were from New South Wales laboratories.
- There were 69 **rubella** reports. Included were 2 reports of the virus isolated from products of conception. For one, the virus was isolated from placenta. The 24 year old patient had had acute rubella at 16 weeks gestation, and a termination of pregnancy at 17.5 weeks. She was an unimmunised immigrant from South Africa. The other case was a 30 year old patient who had recently had a primary rubella infection. Her vaccination history was unknown, but she was known to have been seronegative in 1990.
- There were 15 other reports in females in the age group 15 to 44 years, including one 28 year old who was pregnant. There have now been 135 reports for patients in this group for 1992 (Figure 1). Other reports this fortnight included a male aged 34 years for whom encephalitis was the reported symptom, and a female aged 7 years with meningitis.

Figure 1. Rubella laboratory reports, 1992, by month of specimen collection and patient type



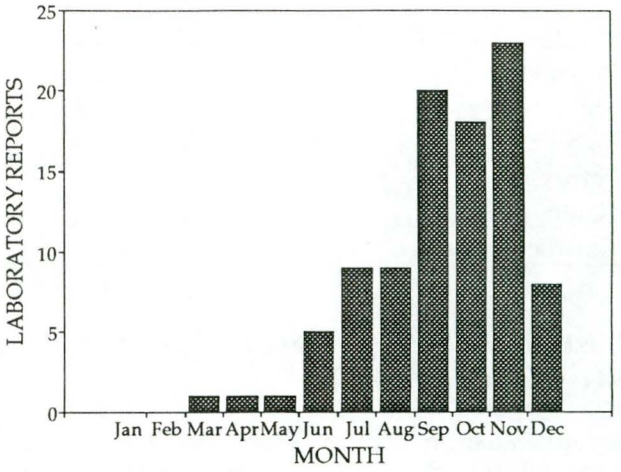
- **Hepatitis B** was reported for 96 patients. Included were 17 pregnant females, one HIV positive patient, and one patient with liver cancer.
- Ninety-two reports of **hepatitis C** were received. Included were one HIV positive patient, one haemophiliac, 14 patients with a history of injecting drug use, 2 pregnant females, one patient with a history of needlestick, and a 34 year old female and her 13 day old son.
- **Ross River virus** infection was reported for 15 patients (all IgM). Ten were from Western Australia, 3 were from Queensland, and there was one each from Victoria and Tasmania (survey result). Specimen collection dates were in November for 2 patients, December for 6 patients, and January for 7 patients.
- Four reports of **untyped flavivirus** were received. Three were in returned travellers, and thrombocytopaenia and fever were reported for the fourth.
- There were 3 reports of **echovirus type 7** infection. This virus is usually rare in Australia, but there have been 26 reports of it from Victoria, 4 from New South Wales and 1 from South Australia since May (Figure 2).

Figure 2. Echovirus type 7 laboratory reports, 1992, by month of specimen collection



- One unusual report of **poliovirus type 1** was received. The virus had been isolated from an eye specimen of a 4 month old male. The infant had had oral polio vaccine a few days earlier, and it was assumed that the virus had been transferred from his mouth or nose via his hand to his eye. He was being investigated for conjunctivitis; *Haemophilus influenzae* was also isolated from the eye specimen.
- **Adenovirus type 4** was reported for 5 patients, four with eye disease as the reported symptom. There have been 95 reports of this virus so far for 1992; 57 have been from South Australia, 23 from New South Wales and 15 from Victoria (Figure 3). Eye disease was reported for 48 patients, and respiratory tract disease for 32.

Figure 3. Adenovirus type 4 laboratoryreports, 1992, by month of specimen collection



- **Cytomegalovirus** infection was reported for 63 patients this fortnight. Included were 6 HIV positive patients (one also a haemophiliac), 7 with a history of transplant, 2 pregnant females, 2 infants with developmental delay, 1 patient who also had tuberculosis, and one patient for whom fitting was reported.
- There were 2 reports of untyped **influenza A** (both single high titres). One was in a female patient over the age of 65 years.
- ***Mycoplasma pneumoniae*** infection was reported for 62 patients, bringing the total for 1992 to 1,564 reports, and for January to 37 reports. The number of reports seems to be declining now after peaking in September-October.
- There were 11 laboratory reports of **Q fever** this fortnight. All were males; ages ranged from 27 to 58 years.
- There were 18 reports of infection with ***Bordetella pertussis*** or ***Bordetella*** species. Two patients were aged 2 months, and one was an 88 year old male.

Correction - *Chlamydia pneumoniae*

In *CDI* 1992;**16**:482, a laboratory diagnosis of *Chlamydia pneumoniae* was reported for a 16 year old female patient for whom 'sick budgies' was the reported risk factor. It was later decided that the patient had had pneumococcal pneumonia; *Streptococcus pneumoniae* was isolated from sputum. The positive immunofluorescence test was not able to be confirmed by an enzyme linked immunoassay for *Chlamydia* antigen.

Table 1. Australian Sentinel Practice Research Network, Weeks 4 and 5 1993

Condition	Week 4, to 24 January 1993		Week 5, to 31 January 1993	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	1	0.2	3	0.7
Measles	1	0.2	1	0.2
Rubella	2	0.4	1	0.2
Pertussis	1	0.2	0	0
Genital herpes	2	0.4	1	0.2
Gastroenteritis	50	9.2	41	9.1

Australian Sentinel Practice Research Network

The Australian Sentinel Practice Research Network collected data from 5,433 patient encounters in Week 4 and from 4,501 patient encounters in Week 5 (Table 1). Gastroenteritis was the most commonly reported condition, but was reported at a lower rate this fortnight than for the last few months of last year.

HIV and AIDS Surveillance

HIV and AIDS surveillance data are compiled by the National Centre in HIV Epidemiology and Clinical Research (NCHECR) from data supplied to the National HIV Database and the National AIDS Registry, which are maintained by the NCHECR on behalf of the States and Territories.

HIV and AIDS reports for September 1992 are repeated in this issue of *CDI* (Tables 2 and 3), with the figure for AIDS diagnoses for the year to date 1992 corrected from

Table 2. New diagnoses of HIV infection, new diagnoses of AIDS and deaths from AIDS occurring in the period 1 to 30 September 1992, by sex and State or Territory in which diagnoses was made

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA			
										This Period 1992	This Period 1991	Year to Date 1992	Year to Date 1991
HIV diagnoses	Female	0	1	0	0	1	0	1	2	5	5	69	61
	Male	1	36	0	9	2	2	28	4	82	96	860	961
	Total	1	37	0	9	3	2	29	6	87	108	951	1083
AIDS diagnoses	Female	0	0	0	0	0	0	0	0	0	0	4	6
	Male	0	1	0	1	1	0	0	0	3	4	283	233
	Total	0	1	0	1	1	0	0	0	3	4	287	240
AIDS deaths	Female	0	0	0	0	0	0	0	0	0	0	10	8
	Male	1	11	0	3	1	0	10	3	29	23	354	343
	Total	1	11	0	3	1	0	10	3	29	23	366	351

Table 3. Cumulative diagnoses of HIV infection, AIDS and deaths from AIDS since the introduction of HIV antibody testing to 30 September 1992, by sex and State or Territory

		ACT	NSW[1]	NT	Qld2	SA	Tas	Vic3	WA4	AUSTRALIA5
HIV diagnoses	Female	7	445	6	58	34	3	112	35	700
	Male	133	8587	62	1099	471	64	2704	586	13706
	Total	140	11062	68	1165	505	67	2887	622	16516
AIDS diagnoses[6]	Female	2	63	0	9	7	1	14	8	104
	Male	39	2006	12	300	140	19	739	159	3414
	Total	41	2071	12	310	147	20	755	167	3523
AIDS deaths[6]	Female	1	41	0	8	2	1	9	3	65
	Male	32	1357	6	199	81	13	522	103	2313
	Total	33	1399	6	208	83	14	532	106	2381

1. HIV total for NSW includes 5 persons whose sex was reported as transsexual and 2025 persons whose sex was not reported.
2. HIV total for QLD includes 3 persons whose sex was reported as transsexual and 5 persons whose sex was not reported.
3. HIV total for VIC includes 7 persons whose sex was reported as transsexual and 64 persons whose sex was not reported.
4. HIV total for WA includes 1 person whose sex was reported as transsexual.
5. HIV total for Australia includes 16 persons whose sex was reported as transsexual and 2094 people whose sex was not reported.
6. Persons whose sex was reported as transsexual are included in the totals.

587 to 287, and a further footnote added. These data will be updated monthly initially, and fortnightly in the near future.

Sterile Sites Surveillance (LabDOSS)

LabDOSS data will be presented fortnightly from this issue of *CDI*. Data for the fortnight ending 3 February have been provided by four laboratories. A total of 55 reports have been included (36 Northern Tasmania Pathology Service, 4 Dr T B Lynch Pathologist, Rockhampton, 6 Central Queensland Pathology Service, 9 Toowoomba General Hospital). There are fewer reports than usual because of the change to fortnightly reports; no table has been included. There were no reports of meningitis.

Blood Isolates

Gram positive: 6 *Staphylococcus aureus*, 4 *Staphyloccoccus epidermidis*, 1 *Staphylococcus* coagulase negative, 1 *Streptococcus* Group B, 2 *Streptococcus sanguis*, 1 *Corynebacterium jekeium*, 1 *Bacillus* species.

Gram negative: 2 *Haemophilus influenzae* type b (a 6 month old female with osteomyelitis and a 6 year old female with epiglotittis), 1 *Yersinia kristensenii* (73 yr old male, no clinical history), 1 *Acinetobacter* species, 4 *Escherichia coli*, 3 *Klebsiella* species (1 *K. oxytoca*, 2 *K. pneumoniae*) 1 *Proteus mirabilis*, 1 *Citrobacter diversus*, 1 *Morganella morganii*, 1 *Xanthomonas maltophilia*.

Anaerobes: 3 *Bacteroides fragilis*, 1 *Bacteroides thetaiotomicron*.

Isolates from Sites other than Blood or CSF

Peritoneal dialysate: 2 *Acinetobacter* species, 1 *Bacteroides fragilis*, 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.

Peritoneal fluid: 1 *Bacteroides* species, 1 *Candida albicans*, 1 *Citrobacter freundii*, 1 *Xanthomonas maltophilia*, 1 *Staphylococcus aureus*, 1 *Streptococcus* 'viridans', 1 *Escherichia coli*.

Joint fluid: 3 *Staphylococcus aureus*.

Other: 1 *Klebsiella pneumoniae*, 1 *Staphylococcus aureus*, 1 *Streptococcus* 'milleri'.

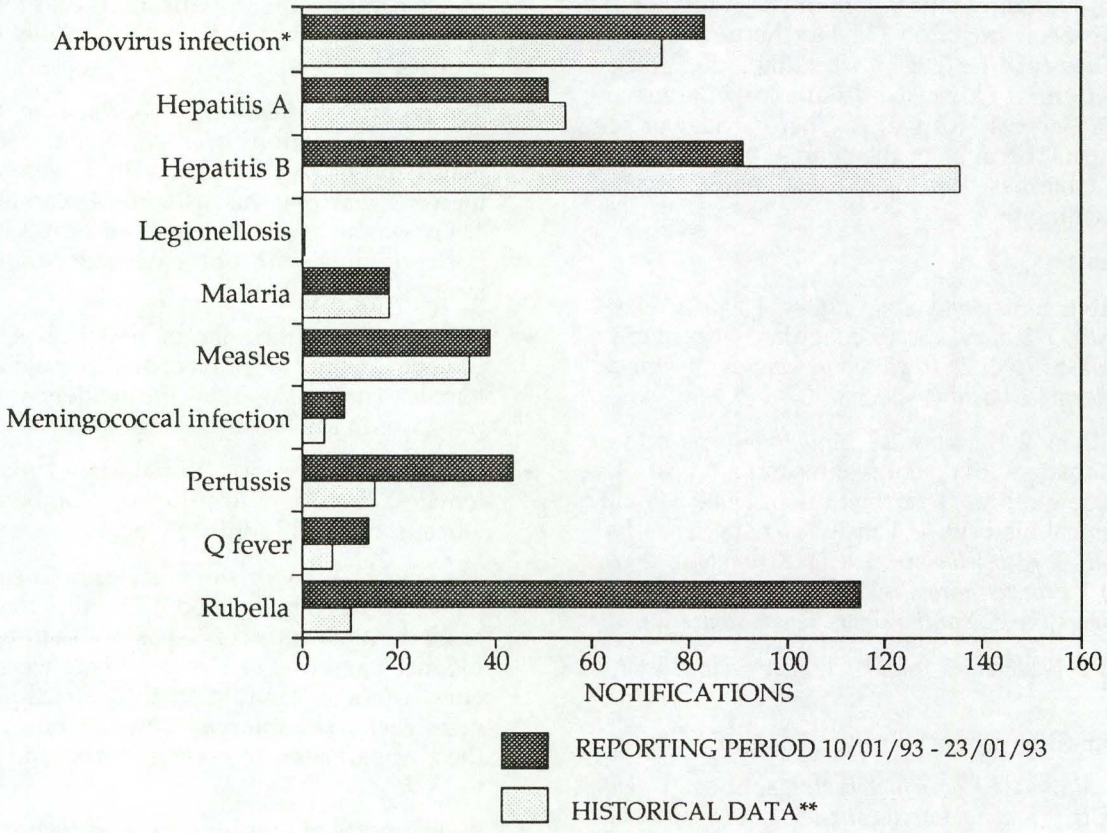
National Notifiable Diseases Surveillance System, 10 January to 23 January 1993

A total of 1,224 reports were received for this period (Tables 4, 5, 6; Figure 4). Reports were not available for Victoria.

- There were 74 reports received of notifications of **Ross River virus infection**. There were 35 males and 39 females. Ages reported ranged from the 0-4 to the 80-84 years age groups. In these reports onset dates were recorded as January in 51, December in 19 and November in 4. Locations were given as in Statistical Divisions on the Queensland coast, in southwestern Western Australia and Adelaide.
- A single notification of **dengue** was reported for a male in the 35-39 years age group in Townsville. The onset date was recorded as November.
- Two cases of **brucellosis** were notified, in males in the 15-19 years age group. They were from Brisbane and rural Queensland.
- **Gonococcal infection** was notified for 80 cases. Males comprised 63 notifications and females 17; ages ranged from the 15-19 to the 95-99 years age groups.
- Ten reports of ***Haemophilus influenzae* type b infection** notifications were received. Four were males and 6 were females. Three were aged less than one year; one was in the 30-34 years age group. There was an apparent cluster of 2 cases in a single postcode area with onset dates separated by an interval of 5 days.
- Fifty-seven notifications of **hepatitis A** were received. Twenty were recorded as male and 31 as female. The peak age specific incidence of notifications was in the 10-14 years age group with 9 cases.
- There were 18 reports of **malaria**, 11 males and 7 females. Locations were in the Canberra, North Queensland and Perth Statistical Divisions.
- There were 39 reports of **measles** notifications. Of these, 22 were males and 17 were females. In 5 cases the age was recorded as less than 1 year, and the mean age was 11.1 years. There were 7 apparent clusters in separate postcode areas with 2 to 4 cases each. The intervals between onset dates for these apparent clusters ranged from the same day to 11 days.
- Nine reports of **meningococcal infection** were received. Of these, 6 were males and 3 were females; ages ranged from the 0-4 to the 20-24 years age groups. There was an apparent cluster of 3 cases over an interval of 7 days in a single postcode area.
- **Pertussis** was notified for 44 cases. Twenty-four were males and 20 were females. Three of these cases were aged less than 1 year and 10 were aged less than 5 years. There were 5 apparent clusters of 2 to 4 cases each, occurring in separate postcode areas. Intervals between onset dates for the index and further cases ranged from onset on the same day to 6 days.
- There were 14 reports of notifications of **Q fever**. Of these, 10 were males and 4 were females. Ages ranged from the 0-4 years to the 95-99 years age groups. Twelve cases were reported from rural Queensland, with 1 each from Brisbane and Perth.
- There is still an increased incidence of **rubella**, with 115 notifications reported this period. Sex was recorded as male for 73 and female for 42. Three cases were recorded as being aged less than 1 year. The mean age of cases notified was 24.1 years. There were 20 reports for females in the 15-44 years age group. There were 23 apparent clusters of 2 to 7 cases each in separate postcode areas.

- There were 48 notifications of **syphilis** received. Of these, 21 were males and 27 were females. The age was recorded as less than 1 year in 1 case and less than 15 years in 2 cases.
- Two notifications of **typhoid** were received. Both were males in the 30-34 and in the 20-24 years age groups from the Sydney and Perth Statistical Divisions.

Figure 4. Selected National Notifiable Diseases Reports, and historical data **



* Includes Ross River virus and Dengue

** The Historical data are the averages of the number of notifications in 3 previous 2-week reporting periods: the corresponding periods of last year and the periods immediately preceding and following it.

Table 4. Diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation for the reporting period 10 to 23 January 1993

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1] This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
Diphtheria	0	0	0	0	0	0		0	0	1	0	1
Measles	6	14	0	6	11	0		2	39	46	47	72
Mumps	0	0	NN	NN	NN	NN		NN	0	2	0	3
Pertussis	0	5	0	22	5	8		4	44	11	53	21
Poliomyelitis	0	0	0	0	0	0		0	0	0	0	0
Rubella[2]	24	7	0	79	5	0		0	115	11	169	16
Tetanus	0	0	0	NN	0	0		0	0	0	0	0

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, WA: CRS only; ACT, NSW, Qld: rubella only; SA, Vic: rubella and CRS.

NN Not Notifiable.

Table 5. Other Notifiable Diseases[1], for the reporting period 10 to 23 January 1993

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2] This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
Arbovirus infection (NEC)[3]	0	0	NN	5	0	3		0	8	0	12	3
Ross River virus infection	0	-	4	53	5	NN		12	74	84	97	117
Dengue	0	-	0	1	-	NN		NN	1	1	1	2
Campylobacteriosis[4]	5	-	6	135	84	22		27	279	333	393	558
Chlamydial infection (NEC)	1	NN	10	99	0	16		0	126	238	190	390
Donovanosis	0	NN	0	1	NN	NN		0	1	0	2	0
Gonococcal infection[5]	1	3	17	27	0	1		31	80	84	112	125
Haemophilus influenzae type b[6]	1	1	NN	7	1	0		NN	10	13	12	26
Hepatitis A	0	4	6	39	0	0		2	51	73	74	97
Hepatitis B	0	9	2	70	1	1		8	91	183	151	246
Hepatitis C	4	5	1	143	NN	0		NN	153	323	213	592
Hepatitis (NEC)	0	0	0	1	0	0		NN	1	2	1	2
Legionellosis	0	0	0	0	0	0		0	0	0	1	0
Leptospirosis	0	0	0	0	0	0		0	0	6	0	7
Listeriosis	0	0	NN	0	NN	0		0	0	0	0	0
Malaria	1	0	0	16	0	0		1	18	20	28	35
Meningococcal infection	0	1	0	8	0	0		0	9	6	10	11
Ornithosis	0	NN	0	0	0	0		0	0	1	1	1
Q fever	0	0	0	13	0	0		1	14	8	21	12
Salmonellosis (NEC)	0	9	9	110	11	4		28	171	226	252	359
Shigellosis[4]	0	-	5	12	6	0		17	40	27	55	40
Syphilis	0	4	6	30	0	1		7	48	69	70	132
Tuberculosis	1	1	1	10	0	1		0	14	27	17	31
Typhoid[7]	0	1	0	0	0	0		1	2	1	2	2
Yersiniosis (NEC)[4]	0	-	0	18	7	0		0	25	30	35	39

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

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

Table 6. Rarely Notified Diseases[1] for the reporting period 10 to 23 January 1993

DISEASES	Total this Period	Reporting States or Territories	Year to Date 1993
Botulism	0		0
Brucellosis	2	Qld	2
Cholera	1	WA	1
Chancroid	0		0
Hydatid infection	0		0
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 1987 to 1992.

Table 7. Laboratory reports by State or Territory of reporting laboratory for the reporting period 14 to 27 January 1993, historical data[1], and total reports for the year

	STATE OR TERRITORY OF REPORTING LABORATORY						Total this Fortnight	Historical data[1]	Total reported this year
	ACT	NSW	Qld	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA									
Measles virus		9	4		3		16	13.5	60
Mumps virus		1			1		2	2.2	8
Rubella virus	1	5	42		13	8	69	5.3	273
HEPATITIS VIRUSES									
Hepatitis A virus		8	7			2	17	12.7	79
Hepatitis B virus	3	44	16	2	17	14	96	90.2	328
Hepatitis C virus	19		35	5		33	92	35.2	416
ARBOVIRUSES									
Ross River virus			3	1	1	10	15	21.5	83
Barmah Forest virus			1			2	3	.8	13
Dengue not typed						1	1	.2	6
Flavivirus (unspecified)					4		4	.3	12
ADENOVIRUSES									
Adenovirus type 1		1		1			2	5.0	18
Adenovirus type 2					1		1	4.8	12
Adenovirus type 3		3			2		5	2.5	22
Adenovirus type 4		1			4		5	1.2	25
Adenovirus type 5	1						1	.8	7
Adenovirus type 11						1	1	2.2	2
Adenovirus type 40		3					3	.2	3
Adenovirus not typed/pending		2	4		5	7	18	31.3	164
HERPES VIRUSES									
Herpes simplex virus type 1		11	41	5	45	45	147	144.0	548
Herpes simplex virus type 2		17	40	1	35	65	158	156.2	665
Herpes simplex not typed/pending	1	20	4		2	1	28	30.5	85
Herpes virus type 6		1					1	.2	1
Cytomegalovirus	2	7	12		34	8	63	67.0	224
Varicella-zoster virus		7	23		10	10	50	24.8	143
Epstein-Barr virus	3	16	41	1	2	8	71	50.0	302
Herpes virus group - not typed						2	2	6.8	5
OTHER DNA VIRUSES									
Papovavirus group						1	1	.2	2
Parvovirus					5	3	8	3.5	33
PICORNA VIRUS FAMILY									
Coxsackievirus A16		1					1	.2	5
Coxsackievirus B1		1			2		3	.0	16
Coxsackievirus B4	1						1	4.5	1
Coxsackievirus B5						7	7	1.5	18
Echovirus type 4					1		1	.5	2
Echovirus type 7		1			2		3	.0	19
Echovirus type 9	1						1	.7	11
Echovirus type 11		1					1	1.0	1
Echovirus type 17					1		1	.7	4
Echovirus type 22					1		1	.8	5

Table 7. Laboratory reports by State or Territory of reporting laboratory for the reporting period 14 to 27 January 1993, historical data[1], and total reports for the year, continued

	STATE OR TERRITORY OF REPORTING LABORATORY						Total this Fortnight	Historical data[1]	Total reported this year
	ACT	NSW	Qld	Tas	Vic	WA			
Echovirus type 25		1			2		3	.0	6
Poliovirus type 1 (uncharacterised)					1		1	2.2	8
Poliovirus type 2 (uncharacterised)		2	1				3	1.8	6
Poliovirus type 3 (uncharacterised)		1					1	.7	3
Rhinovirus (all types)	1	5	1	2	12	3	24	19.0	103
Enterovirus not typed/pending		1	3		5	4	13	25.5	115
ORTHO/PARAMYXOVIRUSES									
Influenza A virus						2	2	2.7	17
Parainfluenza virus type 3		9	1		8		18	21.2	97
Parainfluenza virus typing pending					1		1	2.0	2
Respiratory syncytial virus		3			1		4	11.2	26
OTHER RNA VIRUSES									
HIV-1			2			3	5	2.7	12
Rotavirus		6	5	9	4	10	34	20.8	184
Astrovirus		1					1	.3	1
Calici virus		1					1	1.5	1
OTHER									
Chlamydia trachomatis not typed	2	10	30	2		37	81	95.3	349
Chlamydia psittaci					3		3	4.2	16
Chlamydia species		1					1	.0	1
Mycoplasma pneumoniae		9	30		15	8	62	20.7	291
Coxiella burnetti (Q fever)		8	2			1	11	8.7	41
Rickettsia - Spotted fever group				1			1	.0	1
Streptococcus group A			14				14	.0	45
Salmonella typhi			1				1	.0	1
Yersinia enterocolitica			1				1	.0	1
Brucella species			1				1	.0	4
Bordetella pertussis			3	3	3		9	.0	15
Bordetella species			9				9	.0	51
Cryptococcus species			1				1	.0	3
Treponema pallidum		16					16	.0	63
TOTAL	35	234	378	33	246	296	1,222	963.2	5,084

1. 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 8. Laboratory reports by clinical information for the reporting period 14 to 27 January 1993

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA													
Measles virus								6		1		9	16
Mumps virus			1									1	2
Rubella virus	1	1					1	32		1		33	69
HEPATITIS VIRUSES													
Hepatitis A virus							9					8	17
Hepatitis B virus							21					75	96
Hepatitis C virus							18					74	92
ARBOVIRUSES													
Ross River virus										7		8	15
Barmah Forest virus								1		2			3
Dengue not typed										1			1
Flavivirus (unspecified)												4	4
ADENOVIRUSES													
Adenovirus type 1					2								2
Adenovirus type 2					1								1
Adenovirus type 3						1			3			1	5
Adenovirus type 4					1				4				5
Adenovirus type 5					1								1
Adenovirus type 11												1	1
Adenovirus type 40						2						1	3
Adenovirus not typed/pending					4	6		2	4			2	18
HERPES VIRUSES													
Herpes simplex virus type 1					5			85	8		37	12	147
Herpes simplex virus type 2		1						81			71	5	158
Herpes simplex not typed/pending				1				17			3	7	28
Herpes virus type 6												1	1
Cytomegalovirus	1		1	3	22		1		4	1		30	63
Varicella-zoster virus	1							34	1	1		13	50
Epstein-Barr virus	1	1			3		3	2				61	71
Herpes virus group - not typed								2					2
OTHER DNA VIRUSES													
Papovavirus group												1	1
Parvovirus								4				4	8
PICORNA VIRUS FAMILY													
Coxsackievirus A16								1					1
Coxsackievirus B1					2							1	3
Coxsackievirus B4					1								1
Coxsackievirus B5		6										1	7
Echovirus type 4												1	1
Echovirus type 7		1										2	3
Echovirus type 9		1											1
Echovirus type 11						1							1
Echovirus type 17												1	1
Echovirus type 22						1							1

Table 8. Laboratory reports by clinical information for the reporting period 14 to 27 January 1993, continued

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
Echovirus type 25						1		1				1	3
Poliovirus type 1 (uncharacterised)									1				1
Poliovirus type 2 (uncharacterised)						1						2	3
Poliovirus type 3 (uncharacterised)						1							1
Rhinovirus (all types)					23							1	24
Enterovirus not typed/pending	1	1			2	5			1			3	13
ORTHO/PARAMYXOVIRUSES													
Influenza A virus					1							1	2
Parainfluenza virus type 3		1			14	1						2	18
Parainfluenza virus typing pending					1								1
Respiratory syncytial virus				1	3								4
OTHER RNA VIRUSES													
HIV-1												5	5
Rotavirus						29						5	34
Astrovirus						1							1
Calici virus						1							1
OTHER													
Chlamydia trachomatis not typed					1				1		64	15	81
Chlamydia psittaci					3								3
Chlamydia species											1		1
Mycoplasma pneumoniae					38			2				22	62
Coxiella burnetti (Q fever)					1							10	11
Rickettsia - Spotted fever group												1	1
Streptococcus group A					2					4		8	14
Salmonella typhi												1	1
Yersinia enterocolitica										1			1
Brucella species												1	1
Bordetella pertussis					8							1	9
Bordetella species					7							2	9
Cryptococcus species												1	1
Treponema pallidum												16	16
TOTAL	5	13	2	5	146	51	53	270	27	19	176	455	1222

Table 9. Laboratory reports by contributing laboratories for the reporting period 14 to 27 January 1993

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	35
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	147
	Royal Alexandra Hospital for Children, Camperdown	20
	South West Area Pathology Service, Liverpool	68
Queensland	Dr TB Lynch, Pathologist, Rockhampton	60
	Queensland Medical Laboratory, West End	317
Tasmania	Northern Tasmanian Pathology Service, Launceston General Hospital	33
Victoria	Fairfield Hospital, Melbourne	198
	Royal Children's Hospital, Melbourne	48
Western Australia	Princess Margaret Hospital, Perth	21
	State Health Laboratory Services, Perth	275
TOTAL		1222