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A National Network for Communicable Diseases Surveillance

CIGUATERA FISH POISONING OUTBREAK IN BRISBANE

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Introduction

From 24 July to 2 August 1995, the Brisbane North Environmental Health Service investigated an apparent outbreak comprising seven incidents of ciguatera poisoning, involving 15 persons. The outbreak was suspected to have been due to Spanish mackerel steaks purchased from a northern Brisbane retail store on 21 and 22 July. From the times and dates of sale, it was considered that one, or possibly two, Spanish mackerel fish were implicated.

Investigation of the outbreak

On 24 July 1995, a member of the public contacted the Brisbane North Environmental Health Service complaining of an illness consistent with ciguatera poisoning.

The person had purchased a quantity of Spanish mackerel steaks from a northern suburb retail store on 21 July. He consumed two of the steaks at approximately 11.00pm on 22 July. Before retiring, approximately five hours later, he noticed his mouth was extremely dry and there was a burning sensation on the tip of his tongue. Upon arising later that morning, he began experiencing a tingling of the mouth and extremities. As the day progressed other symptoms became apparent, including diarrhoea and reversal of temperature sensation.

Following receipt of this complaint, the retail store was notified to withdraw their Spanish mackerel from sale pending further investigation. An interview with staff determined that only one large Spanish mackerel (heavier than 10kg) was cut into steaks and sold on 21 July. The store's invoices indicated that it received 52kg of Spanish mackerel, which included this fish, on 20 July. An inspection of the remaining stock determined that approximately 13kg had been sold prior to the initial report.

Table 1. Initial signs and symptoms¹ reported by 13 cases

Sign or symptom	Number of cases (%)
Diarrhoea	5 (38)
Circumoral paraesthesia	3 (23)
Abdominal pain	3 (23)
Nausea	3 (23)
Paraesthesia of the extremities	1 (8)
Hot/cold temperature reversal	1 (8)
Vomiting	1 (8)

1. Four persons recorded more than one initial sign or symptom and two persons did not record an answer.

Prior to the inspection, another customer had contacted the store complaining of an illness after consuming Spanish mackerel. An investigation of this complaint revealed a cluster involving three persons. Following the inspection, the store forwarded to the Environmental Health Service details of customer complaints of three other incidents, some of which were already known to the Service.

By 26 July the Service had confirmed three incidents, involving five people. Initial details indicated that all of the fish was purchased from the store on 21 July.

By 2 August the Service had investigated four more incidents, involving 10 persons. In three of the incidents, the fish had been purchased on 22 July. Although only one large Spanish mackerel was cut into steaks and sold on 21 July, additional fish was prepared for sale on 22 July. Consequently, persons purchasing Spanish mackerel on 22 July, may have received steaks from the previous day's stock or there was a second toxic fish involved.

The distributor, who was located in the Sunshine Coast region, was notified by the Sunshine Coast Environmental Health Service of the investigation. A list of outlets that had been supplied with Spanish mackerel from the same consignment was obtained and the commercial fisherman was interviewed.

It was determined that the Spanish mackerel was caught east of Fraser Island between 15 and 16 July. The distributor received the 283kg consignment of fish on 17 July. Between 17 and 20 July, the distributor supplied four outlets, including the store, with Spanish mackerel from this consignment. All outlets, except for a mobile vendor, had been contacted by 31 July. Although their stocks had been sold, they had not received any complaints from customers.

As of 1 September 1995, there had been no further reported incidents of ciguatera poisoning from the identified source.

Symptomatology

Of the 17 people who consumed the fish in the seven incidents, 15 reported being ill. Demographic and symptom data on these individuals were sought through a standard Queensland Health ciguatera poisoning questionnaire. This questionnaire was self-administered by 12 people and three were interviewed by telephone.

As there is no diagnostic test for ciguatera poisoning in humans, the diagnosis was based on clinical grounds and food history^{1,2,3,4}. The case definition was therefore a person who had consumed a recognised fish species carrier of the toxin, who reported the characteristic gastrointestinal and neurological symptoms.

All 15 ill persons became symptomatic after consuming Spanish mackerel steaks. They included eight males and seven females, ranging in age from 14 to 92 years (median = 19 years). Five persons reported consuming more than one steak, nine consumed one steak and one had less than a full steak.

The period from consumption to onset of symptoms ranged from one to 39 hours (median = 6 hours). Diarrhoea and paraesthesia around the mouth were reported as the most common initial symptoms (Table 1) by the 13 persons who answered this question.

Generalised weakness, reversal of hot and cold temperature sensation, diarrhoea, paraesthesia of the extremities and around the mouth were the most frequently reported signs and symptoms through the course of the illness (Table 2).

Four of the 15 ill persons sought medical attention. All were diagnosed with ciguatera poisoning, three by medical practitioners and one by a pharmacist. One person was admitted to hospital and administered intravenous mannitol.

Table 2. Reported signs and symptoms for the 15 cases

Sign or symptom	Number of cases (%)
Gastrointestinal	
Diarrhoea	12 (80)
Nausea	10 (67)
Abdominal pain	8 (53)
Vomiting	5 (33)
Neurological	
Hot/cold temperature reversal	12 (80)
Paraesthesia of the hands	12 (80)
Paraesthesia around the mouth	11 (73)
Paraesthesia of the feet	9 (60)
Dental pain	6 (40)
Headache	5 (33)
Ataxia	5 (33)
Tremors	3 (20)
Vertigo	1 (7)
Generalised	
Generalised weakness	13 (87)
Myalgia	10 (67)
Pruritus	10 (67)
Chills	9 (60)
Arthralgia	6 (40)
Eye irritation	5 (33)
Prostration	2 (13)
Excessive perspiration	1 (7)
Neck stiffness	1 (7)
Pain on urination	1 (7)

Discussion

Although sources other than the Spanish mackerel batch were not investigated as possible causes of these cases, it seems likely that one or two of the fish were the cause. The reported frequency of the signs and symptoms in this outbreak was consistent with ciguatera poisoning in other studies^{1,2,3}.

Ciguatera poisoning is a marine foodborne intoxication caused by the consumption of fish contaminated with ciguatoxin^{2,4}. This toxin is produced by the benthic dinoflagellate, *Gambierdiscus toxicus*, which is associated with dead coral reefs and marine algae^{1,2,4}. Ciguatoxin enters the food chain through small herbivorous fish ingesting the toxic dinoflagellate. These fish are subsequently preyed upon by larger carnivorous fish who acquire and accumulate the toxins^{1,2,3}. Consequently the larger the fish, especially carnivores, the greater the chance of them being toxic^{1,2,3}. Humans ingest the toxin by consuming either contaminated herbivorous fish or carnivorous fish that have eaten contaminated herbivorous fish⁵.

Species of fish commonly known to be associated with ciguatera poisoning include the moray eel, Chinaman, red bass and paddletail and these are not accepted by marketing authorities in Queensland⁷. However, coral trout, Spanish mackerel, reef cod, barracuda, emperor, groper and surgeon fish are available for purchase and can also be toxic.

Ciguatoxic fish exhibit no abnormalities and their head, viscera, especially the liver, roe and gonads, tend to be more toxic than the flesh⁴. The toxins are colourless, odourless and tasteless and are unaffected by heating, freezing or gastric juices^{1,5,6}. Currently, there are no generally available tests to detect ciguatoxin in fish prior to consumption^{1,3}, although such tests are under development overseas.

While the mortality associated with ciguatera poisoning is low^{1,6}, the clinical symptoms may be extremely debilitating and prolonged. The onset of illness is usually within one to 24 hours of consuming toxic fish and is generally characterised by a variety of gastrointestinal, neurological and occasionally cardiovascular symptoms^{1,2,4,6}. The severity of the symptoms may vary considerably, even among individuals poisoned by the same fish, and some persons consume toxic fish without suffering any ill effects^{1,6}. The period of recovery is usually days to weeks, but symptoms may persist for months⁴.

Evidence suggests that immunity does not follow the initial attack, instead the second and subsequent attacks tend to be more severe^{1,5}. Also the consumption of alcohol commonly exacerbates the symptoms^{4,5,6}. Therefore people suffering from ciguatera poisoning should be advised to avoid fish and alcohol for at least three months, and to reintroduce them into their diet cautiously⁶.

As there is no antidote for ciguatera poisoning, treatment is supportive^{1,4,6}. In acute cases intravenous

mannitol administered early in the clinical course has shown to be beneficial^{1,4,6}.

Due to the wide distribution of the dinoflagellate agent and the asymptomatic carrier fish, the prevention of ciguatera poisoning is extremely difficult¹. The implementation of preventive measures at the individual level therefore remains an effective strategy against contracting ciguatera poisoning⁵. These measures include being aware of the recognised toxic fish species, avoiding consuming the head, liver, roe, gonads and other viscera, being aware that the larger the fish the greater the chance of it being ciguatoxic and consuming only small portions of large fish. Individuals should also be aware of the symptoms of ciguatera poisoning as they can occur while consuming toxic fish^{1,2,4,7}.

The reporting of ciguatera poisoning to health authorities, as for any foodborne illness, can reduce the likelihood of further cases eventuating from an identified source in the community. As a notifiable disease in Queensland, ciguatera is substantially underreported⁴. In 1994 only five cases were recorded in the notifiable disease register (unpublished data).

This outbreak suggests the need for the development of routine detection tests for the fishing industry, diagnostic tests to evaluate clinical cases and effective treatment for persons who ingest ciguatoxic fish⁵.

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GONOCOCCAL SURVEILLANCE, AUSTRALIA, 1 APRIL TO 30 JUNE 1995

Derived from the Australian Gonococcal Surveillance Programme - AGSP; coordinator JW Tapsall, The Prince of Wales Hospital, Sydney, New South Wales

The Australian Gonococcal Surveillance Programme (AGSP) reference laboratories examined a total of 493 isolates of *Neisseria gonorrhoeae* for sensitivity to the penicillins, ceftriaxone, ciprofloxacin and spectinomycin and for high level resistance to tetracycline (TRNG) in the June quarter of 1995.

Antibiotic susceptibility patterns

Gonococcal susceptibility may vary enormously in different parts of Australia, and for this reason local rather than national aggregated data should be examined. The AGSP, by using a standardised system of sensitivity testing, can validly compare sensitivity patterns throughout Australia.

Penicillins

This group of antibiotics is least effective in Sydney (where close to 40% of isolates were resistant by one or more mechanisms) and Melbourne where nearly 30%

of strains were penicillin resistant. In contrast, only a small proportion of gonococci examined in other centres throughout Australia were resistant.

Figure 1 shows the proportion of strains fully sensitive to penicillin (FS, MIC \leq 0.03mg/L), less sensitive (LS, MIC 0.06 - 0.5mg/L), relatively resistant (RR, MIC \geq 1mg/L) or penicillinase-producing (PPNG) in Brisbane, Sydney, Melbourne and the Northern Territory and for all isolates throughout Australia. Strains which are PPNG or in the relatively resistant category usually fail to respond to the penicillins. (Data from the corresponding period in 1994 are shown in Figure 2.)

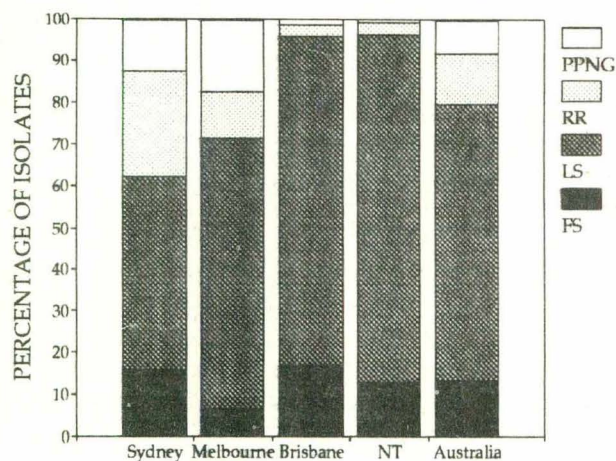
The proportion of gonococci resistant to the penicillins increased in Sydney and Melbourne in this quarter.

Throughout Australia there were 40 PPNG detected (8.1% of the total). Twenty-one PPNG were found in Sydney (12.6% of all isolates there), 14 (17.5%) in Melbourne, and small numbers in Perth and Brisbane.

Locally acquired infections with PPNG were seen only in Sydney and Melbourne.

Isolates resistant to penicillin by chromosomal mechanisms (CMRNG) - 61 (12.3%) in all - were more numerous than PPNG - a trend evident for some time with the exception of the first quarter of this year. These alterations were again almost entirely due to changes in Melbourne. Again most CMRNG were found in Sydney (42, or 25.3% of strains there) and nine (11.3%) in Melbourne. A few CMRNG were seen in Darwin, Perth and Brisbane. In the corresponding quarter of 1994 there were 29 (6.2%) PPNG and 54 (11.7%) CMRNG and in the March quarter of 1995 there were 46 PPNG and 36 CMRNG isolated throughout Australia.

Figure 1. The proportion of gonococcal isolates in Australia and in Brisbane, Sydney, Melbourne and the Northern Territory, by penicillin susceptibility¹, 1 April to 30 June 1995



1. FS fully sensitive; LS less sensitive; RR relatively resistant; PPNG penicillinase-producing.

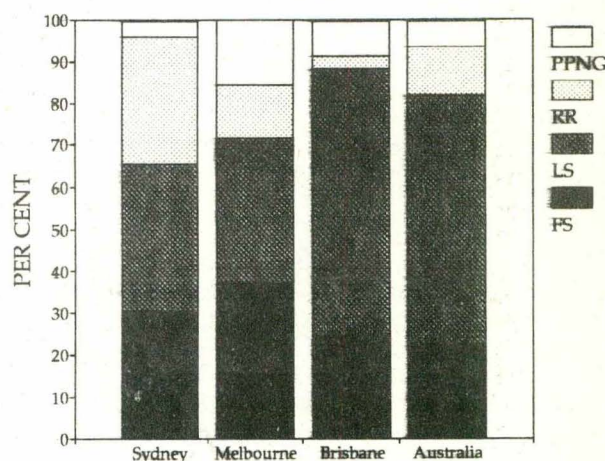
Ceftriaxone and spectinomycin

All 493 strains tested from all parts of Australia were sensitive to these injectable agents.

Quinolone antibiotics

In this quarter 29 of 493 isolates tested (5.9%) had some degree of quinolone resistance (QRGC) and half of these had high level quinolone resistance (see below). QRGC were seen in Sydney (19 - 11.5%), Melbourne (five - 6.3%) and Brisbane (five - 3.6%). Two of the five Melbourne, 10 of the 19 Sydney and one of the five Brisbane strains had high levels of quinolone resistance.

Figure 2. The proportion of gonococcal isolates in Australia and in Sydney, Melbourne and Brisbane by penicillin susceptibility¹, 1 April to 30 June 1994



1. FS fully sensitive; LS less sensitive; RR relatively resistant; PPNG penicillinase-producing.

Table. Gonococcal isolates in Australia, 1 April to 30 June 1995, by sex, site and region¹

	Site	Sydney	Melbourne	Brisbane	Adelaide	Northern Territory	Australia
Male	Urethra	119	65	63	10	39	306
	Rectal	14	9	2	1		26
	Pharynx	7	2	3	1		13
	Other	4		7		1	19
	Total	144	76	75	12	40	364
Female	Cervix	18	4	54	7	20	106
	Rectal			1	1		2
	Pharynx	5					5
	Other			8		1	15
	Total	23	4	63	8	20	128
Male:female ratio		6.3:1	19:1	1.2:1	1.2:1	2:1	2.8:1

1. Twenty-seven isolates from Western Australia are included in the totals for Australia.

The number and proportion of strains with high level quinolone resistance increased again in this period. In the first quarter of 1995, 22 of 553 isolates tested (4%) had some degree of quinolone resistance and 12 of these had high level resistance. In the December quarter of 1994, 11 isolates (2.7%) had some measure of quinolone resistance, three of these having high level resistance demonstrated¹.

Emerging quinolone (ciprofloxacin, norfloxacin, enoxacin) resistance has been a particular concern in recent surveys. Some level of quinolone resistance has been present in Australia since 1984 at least², but this has been at a level accommodated by the increased doses currently recommended. For example, the initial dose of ciprofloxacin (250mg) was insufficient to treat these gonococci which were mostly imported and with MICs of ciprofloxacin in the range 0.06 - 0.5mg/L. However the current recommendation for treatment of uncomplicated gonorrhoea is a single 500mg dose of ciprofloxacin. Infections with isolates with MICs in the above range respond to this regimen. Some years ago some strains in Sydney were identified with ciprofloxacin MICs of 1mg/L and 500mg doses failed to clear the infection³.

More recently a number of isolates with even higher MICs of ciprofloxacin (4 - 16mg/L) have been identified^{1,4} and continue to be isolated, in some centres in increasing numbers.

Data from World Health Organization sources indicate that these isolates are becoming increasingly common in nearby countries visited by Australian travellers⁵.

These factors should be borne in mind when treating gonorrhoea in patients entering or returning to Australia from South-East Asian destinations.

High level tetracycline resistance (TRNG)

Another interesting form of gonococcal resistance is high level plasmid-mediated resistance to the tetracyclines (TRNG). This type of resistance has emerged in the past decade and its spread throughout the world has been of particular concern in some quarters. Although tetracyclines are NOT recommended for treatment of gonorrhoea in Australia, strains are examined routinely by the AGSP for the presence of this high level tetracycline resistance.

Thirty-nine TRNG were identified throughout Australia in this quarter (7.9% of all strains). Most of these - 26 - were seen in Sydney where they accounted for 14.5% of isolates. There were six TRNG detected in Melbourne (7.5%), three in Adelaide, two in the Northern Territory and single isolates in Perth and Brisbane.

This is also a considerable increase on the number and proportion of TRNG seen in the March quarter when twenty-one TRNG were identified (3.8% of all isolates tested) and on the figures for the June quarter of 1994 - 19 gonococci, 4.9% of those tested.

Source of isolates

There were 364 isolates from men and 128 from women giving a male:female ratio of 2.8:1.0 when data are aggregated. However there were significant regional differences when data from individual centres were examined. Melbourne and Sydney had a high preponderance of isolates from males and Brisbane and the Northern Territory a low male:female ratio. Similarly, 23 of 26 male rectal and nine of 13 male pharyngeal isolates were from the centres with high male:female ratios (Table). There were four eye infections and one case of disseminated gonococcal infection in this quarter. The sex of one patient was not ascertained.

Number of isolates

The number of isolates examined - 493 - was the same as that for the December quarter of 1994 but much less than the number of strains examined in the previous quarter of this year (593). In the corresponding June quarter of 1994, 463 strains were examined. Additional strains are now being examined at the Royal Perth Hospital. The number of strains isolated in Melbourne was essentially unaltered when corresponding periods in 1994 and 1995 were compared. However the number of strains examined in Sydney in this quarter - 168 - is a considerable increase on the 104 seen in the June quarter of 1994. In the six months to June 30, 1995, 333 gonococci have been recorded whereas 248 were examined in the first half of 1994.

Note: Strains from the Northern Territory were isolated in Alice Springs, Darwin and the laboratories of Western Diagnostic Pathology in the Northern Territory and further tested in Perth, Adelaide and Sydney.

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OVERSEAS BRIEFS

In the last two weeks, the following information has been supplied by the World Health Organization and the Program for Monitoring Emerging Diseases.

Ebola Case in Côte D'Ivoire

On 6 December 1995 the World Health Organization (WHO) was informed of a suspected case of Ebola haemorrhagic fever in Côte d'Ivoire.

The patient is a 25 year old man from a village in neighbouring Liberia. He was admitted to a hospital in the Tabou Prefecture (south of the Tai National Park), last week. At the moment, the man appears to be recovering from the illness.

The diagnosis of Ebola infection was confirmed by serological tests carried out at the Institut Pasteur in Paris.

Within 24 hours a WHO team, including an expert from the Institut Pasteur, flew to Abidjan. They are now investigating the case on site and are working in close cooperation with the Ministry of Health of Côte d'Ivoire, Medecins sans Frontieres, EpiCentre (Paris) and the United Nations High Commission for Refugees.

The WHO team has ensured that the patient is properly isolated in the hospital and that all precautions have been taken to prevent spread of the infection. Members of the team will determine if any other cases have occurred in the same hospital. All contacts of the patient will be traced and thoroughly investigated. So far no other cases of the disease have been identified.

Last year one case of Ebola haemorrhagic fever was registered in Côte d'Ivoire. A Swiss technician contracted the infection after carrying out necropsy examinations of chimpanzees who had died of haemorrhagic fever. She recovered from the illness.

In order to study the epidemiology and ecology of the virus, WHO is presently organising an international

study which will be carried out in the Tai forest region of Côte d'Ivoire. It is still unknown which animal or insect acts as the reservoir or vector of the Ebola virus in nature.

Cholera update

In Cape Verde cholera has been reported every week since November 1994. By 5 November a total of 12,344 cases with 245 deaths had been notified. Of these, 879 cases with 4 deaths were reported for the period 9 October to 5 November. Control efforts have not succeeded in preventing the spread of the epidemic. When cases were detected in Sao Nicolau and Sal Islands in the period 9 October to 5 November all nine inhabited islands of Cape Verde had become infected. The last cholera epidemic in Cape Verde occurred in 1979.

In Cote d'Ivoire a cholera outbreak which started in September 1995 caused 2,027 cases and 150 deaths up to 12 November 1995. A World Health Organization (WHO) representative assisted in the organisation of a team to visit the affected areas and evaluate the situation and arrange for medical supplies.

In Iraq an outbreak of cholera reported from Sulaimaniyah Governorate in Northern Iraq has resulted in 519 cases, 264 of which have been confirmed, with three deaths to date. *Vibrio cholerae* O1 serotype Ogawa has been isolated. At the request of the Iraqi Ministry of Health, a WHO consultant has been sent to the area to assess and monitor the situation, provide guidance to the health authorities and co-ordinate inputs by non-government organisations. An intensive media campaign to raise public awareness about essential preventive measures has been successful in containing the spread of the outbreak.

In Senegal, despite the fact that cholera has been endemic in bordering countries for the past two years, no cases were reported until mid-August 1995. Between 15 August and 17 November 1995, 852 cases and 43 deaths were notified. A further 731 cases with 37 deaths

have been reported for the period 1 September the 12 November. Most cases were in the Departments of Dakar and Pikine in the Dakar Region and recently also

in the Departments of Mbacke and Touba in Diourbel Region.

CDI NOTICE TO READERS

Review of the role of laboratories in communicable disease surveillance and control

An invitation to make submissions

A review is being conducted into the role of laboratories in the surveillance and control of communicable disease in Australia. The review constitutes part of the detailed National Communicable Diseases Surveillance Strategy which has been endorsed by the Australian Health Ministers' Advisory Council (AHMAC) and is being developed on behalf of the Chief Health Officers of Australia.

You are invited to make a submission to the review process. Further information including terms of reference to be addressed can be obtained by calling (06) 289 8351 or by faxing a request to (06) 289 7791. Please include your name, address and telephone number.

How to make your submission

Please make your submission in writing, or on audio tape, and include your name, address and phone number. Send your submission to:

Ms Margaret Curran, Secretary
Laboratory Sub-Committee
AIDS/Communicable Diseases Branch
MDP 15
Department of Human Services and Health
GPO Box 9848
Canberra ACT 2601

The closing date for receipt of submissions is 7 February 1996.

All submissions will be held in a register of submissions that can be accessed by the public. If you would like your submission to be treated as confidential, please indicate this clearly (for example by marking your written submission 'CONFIDENTIAL'). However, submissions may be subject to release under the Freedom of Information Act 1992.

Publication of CDI

This is last issue of *CDI* for 1995. As is our custom, there will be no issue published between Christmas and New Year. The first issue for 1996 will be published on 8 January.

All the staff at *CDI* would like to wish you all the best for the festive season.

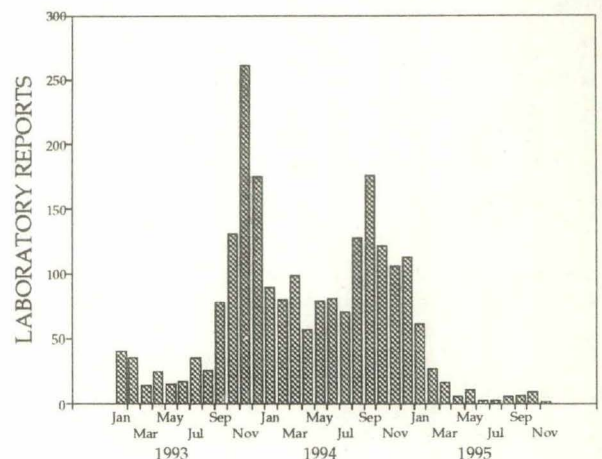
COMMUNICABLE DISEASES SURVEILLANCE

Virology and Serology Reporting Scheme

There were 1612 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 6, 7 and 8).

- Two reports of **measles** were received this period. The number of reports has remained low compared to the same period last year (Figure 1).
- **Rubella** was reported for 60 patients this period diagnosed by IgM detection (58) and fourfold rise in titre (2). Included were 16 females, 8 of whom were of childbearing age, and 43 males (one sex unknown). Also included was one positive rubella report for a pregnant 30 year old.
- Two reports of **mumps** were received this period. Reports were received from Victoria and Western Australia. Diagnosis was by IgM detection (one) and single high titre (one).
- **Hepatitis A** was reported for 21 patients this period including 15 males and 6 females.

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



- Positive **hepatitis B** serology was reported for 115 patients this fortnight including 55 males and 56 females (4 sex not stated). A total of 87 was in the 15 to 44 year age range.
- Two hundred and thirty-nine reports of positive **hepatitis C** serology were received this period. Included were 141 males and 90 females (8 sex not stated). One hundred and eighty-four reports were for the 25 to 44 year age range. Twenty-two were reported to be injecting drug users.
- **Ross River virus** was reported in 17 patients this fortnight. Thirteen of these were reported from Queensland and 4 from Western Australia. Diagnosis was by single high titre (8) and IgM detection (9). The number of reports received remains low.
- Six reports of **Barmah Forest virus** were received this period. The number of reports continues to decrease.
- A single report of **flavivirus** was received for a 27 year old from Victoria detected by single high titre.
- Thirty-six reports of **adenovirus** were received this fortnight diagnosed by virus isolation (19) and antigen detection (11). One report each was received for adenovirus types 1, 2, 7 and 42. **Adenovirus type 42** was reported for an HIV positive patient. Untyped adenovirus was reported for 30 patients.
- **Herpes simplex virus type 1** was reported for 197 patients this fortnight. Diagnosis was by virus isolation (192) and antigen detection (5).
- Two hundred and forty-seven reports of **herpes simplex virus type 2** were received this period diagnosed by virus isolation (242) and antigen detection (5). Included was a 3 month old male with an umbilical vesicle.
- Fifty-two reports of **cytomegalovirus** were received this period. Diagnosis was by virus isolation (23) and IgM detection (29). Included were 3 HIV/AIDS patients, 6 transplant recipients and 2 pregnant females.
- **Varicella-zoster virus** was reported for 55 patients this period. Diagnosis was by virus isolation (21), antigen detection (24), nucleic acid detection (1) and IgM detection (9).
- Eighty-nine reports were received for **Epstein-Barr virus** this fortnight. Diagnosis was by fourfold rise in titre (one) and IgM detection (88). Included was a 23 year old male with myocarditis.
- Twelve reports of **echovirus** were received this period. Cases were reported from New South Wales (3), Victoria (2) and Western Australia (7).
- **Rhinovirus** was reported for 19 patients this period. These included 10 reports from Victoria, 8 from New South Wales and one from Western Australia, all diagnosed by virus isolation.
- **Influenza A** was reported for 8 patients this fortnight. Diagnosis was by antigen detection (2),

single high titre (5) and fourfold rise in titre (one). A total of 755 reports has been received for the year to date. Ninety-two isolates were identified as being H₁N₁ subtypes and 9 as H₃N₂ subtypes. The number of reports received has continued to decline after reaching a peak in July this year.

- Three reports of **influenza B** were received this fortnight. Diagnosis was by single high titre (one) and fourfold rise in titre (2). The number of reports continued to decline this fortnight with a total of 335 reports this year to date.
- **Parainfluenza virus type 3** was reported for 31 patients this fortnight. Diagnosis was by virus isolation (11), antigen detection (19) and single high titre (one). Parainfluenza virus type 3 was reported for a 2 week old female with recurrent apnoea. Reporting continued to decrease this period.
- Twenty-one reports of **respiratory syncytial virus (RSV)** were received this fortnight. Method of diagnosis included virus isolation (7) and antigen detection (14). The number of reports continues to decline.
- **Rotavirus** was reported for 37 patients this period including 23 males and 14 females. Thirty-five (95%) reports were below 5 years of age.
- **Chlamydia trachomatis** was reported for 118 patients this period. Diagnosis was by isolation (12), antigen detection (9), nucleic acid detection (96) and single high titre (one). Included were 89 females and 29 males.
- **Chlamydia psittaci** was reported for 21 patients this fortnight. Six patients were female and 14 were male (male:female ratio 1.0:2.3). Fifteen reports (71%) were aged 45 years and over. Diagnosis was by single high titre (6), four fold rise in titre (10) and IgM detection (5). All reports this period were from the following Victorian Statistical Divisions; Central Highlands (one), Gippsland (one), Northeastern (2) and Melbourne (19). The number

Figure 2. *Chlamydia psittaci* laboratory reports, 1995, by age group and sex

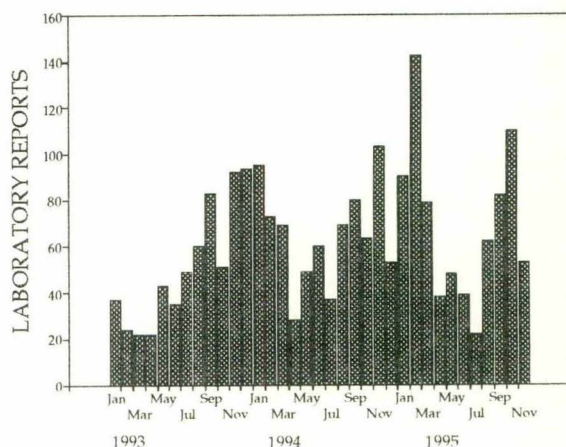
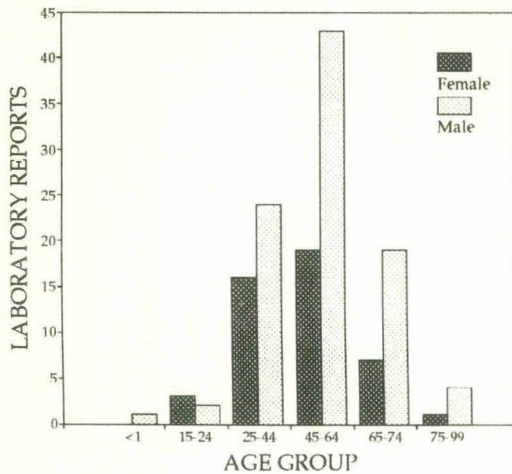


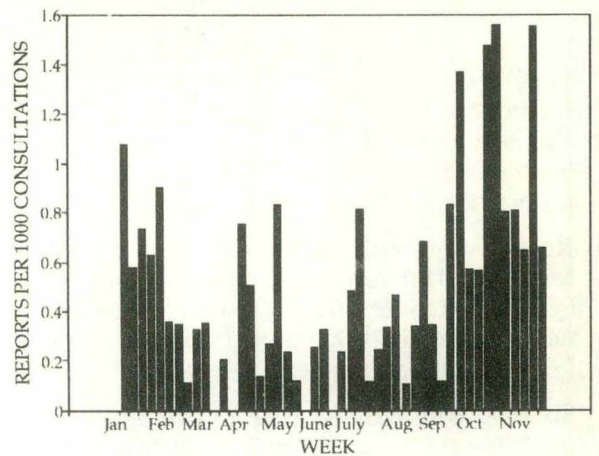
Figure 3. *Bordetella* laboratory reports, 1993 to 1995, by month of specimen collection



of psittacosis reports received this year has been high compared to previous years (Figure 2).

- Twenty-six reports of *Mycoplasma pneumoniae* were received this period for 9 males and 17 females. Method of diagnosis included single high titre (6), fourfold rise in titre (one), IgM detection (13) and total antibody (6).
- Twelve cases of *Coxiella burnetii* (Q Fever) were reported this fortnight. Diagnosis included single high titre (3), fourfold rise in titre (7) and IgM detection (2). Included was a report from a 19 year old male meat worker.
- Six reports of *Rickettsia australis* were received this fortnight. Method of diagnosis was single high titre (4), fourfold rise in titre (one) and IgM detection (one).
- *Streptococcus* Group A was reported for 19 patients this fortnight. Included was one case of rheumatic fever. All were diagnosed by single high titre.
- Fifty-three cases of *Bordetella* were reported this period (29 *Bordetella pertussis* and 24 *Bordetella* species). Twenty-six cases (49%) were in the 5 to 14 year age group. Included were 21 males and 31 females (one sex not stated). The number of reports has risen in recent months (Figure 3.)

Figure 4. Australian Sentinel Practice Research Network rubella reports per 1000



- *Toxoplasma gondii* was reported for a 29 year old pregnant female this fortnight. Diagnosis was by IgM detection.

Australian Sentinel Practice Research Network

Data for week 46 (ending 19 November) and week 47 (ending 26 November) are included in this issue of *CDI* (Table 1). There were 6428 consultations reported for week 46 and 6050 for week 47. The rubella reporting rate has been higher in recent weeks than during the middle of the year (Figure 4), as documented by the National Notifiable Diseases Surveillance System and the *CDI* Virology and Serology Reporting Scheme. Measles continues to be rarely reported.

Australian Encephalitis: Sentinel Chicken Surveillance Programme serological results, September and October 1995

AK Broom¹, JS Mackenzie², L Melville³, DW Smith⁴, PI Whelan⁵

Sentinel chicken serology testing was carried out for 15 of the 22 flocks in Western Australia in September and October 1995. There were no seroconversions during this period.

Table 1. Australian Sentinel Practice Research Network, weeks 46 and 47, 1995

Condition	Week 46, to 19 November 1995		Week 47, to 26 November 1995	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	16	2.4	24	4.0
Rubella	10	1.6	4	0.7
Measles	0	0	0	0
Chickenpox	3	0.5	12	2.0
Pertussis	1	0.2	1	0.2
Gastroenteritis	115	17.9	74	12.2

Seven flocks of sentinel chickens from the Northern Territory were tested in September and October. There was one more new seroconversion to Kunjun virus from the Coastal Plains Research Station near Darwin in early September.

Correction: in the 2 October issue of *CDI*, Vol 19 (20), page 502, the second line of the Sentinel Chicken Surveillance Programme report should end in 'July and August 1995' not 'March and April'.

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Surveillance of Serious Adverse Events Following Vaccination

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

Acceptance of a report does not imply a causal relationship between the administration of the vaccine and the medical outcome or that the report has been verified as to the accuracy of its contents. It is estimated that 250,000 doses of vaccines are administered to Australian children under the age of 6 years every month.

Results for the reporting period 29 October to 25 November 1995

There were 6 reports of serious adverse events following vaccination for the reporting period 29 October to 25 November 1995. Reports were for episodes which occurred between March and November 1995. Reports were received from the Australian Capital Territory (3), Queensland (one) and the Northern Territory (2).

Two reports were cases of persistent screaming, one of a hypotonic/hypo-responsive episode, one of a temperature of 40.5°C or more and 2 were other events temporally associated with vaccination (Table 2). Of the 2 'other' cases, one was a severe local reaction at a

CDT injection site and one was a rash, stridor, convulsion and loss of consciousness following administration of DTP, OPV and hepatitis B vaccines.

Events associated with DTP alone or DTP in combination with other vaccines were associated with the first (2), second (one), fourth (one) or fifth (one) dose. The child with a convulsion and loss of consciousness was hospitalised. All children had recovered at the time the initial report was sent in.

National Notifiable Diseases Surveillance System, 12 to 25 November 1995

There were 2593 notifications received for the period (Tables 3, 4 and 5). There continue to be fewer measles notifications reported than at the same time in the last 3 years (Figure 5). Dates of onset are not available for the data reported from Queensland.

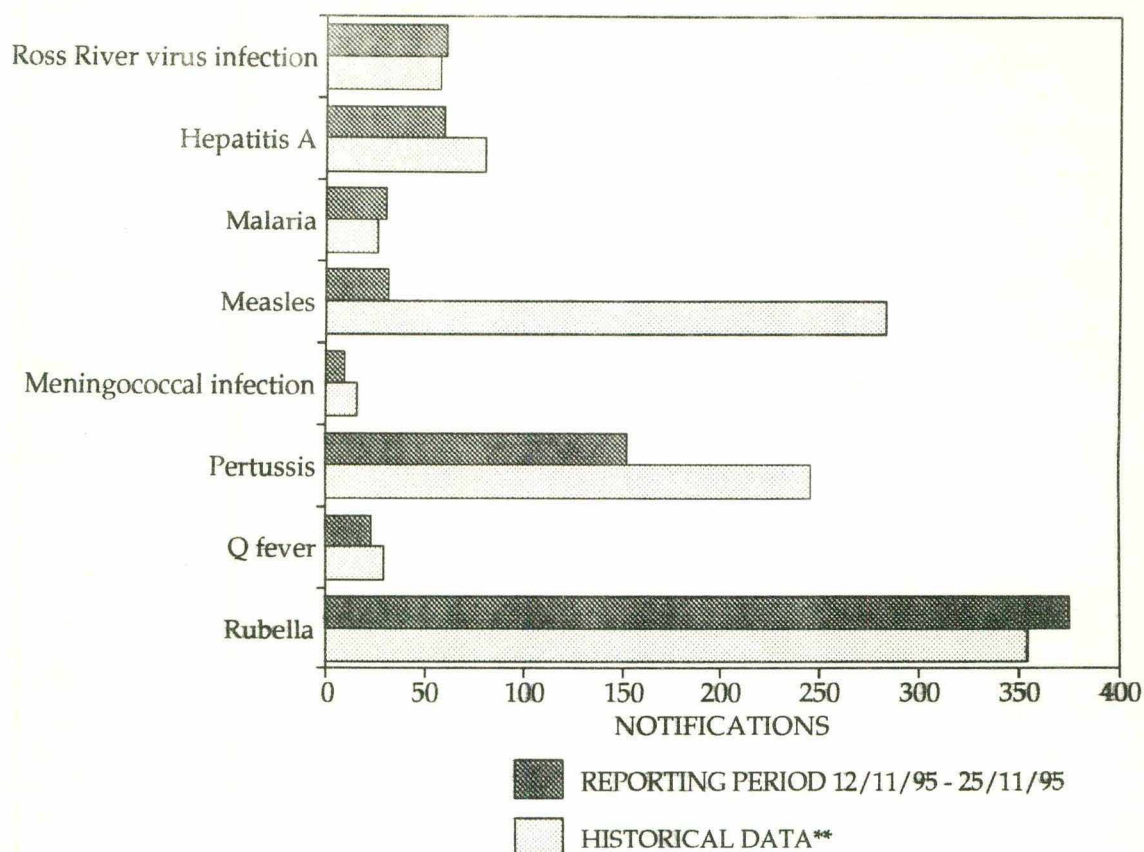
- There were 61 notifications of **Ross River virus infection**; 28 cases were male and 33 were female. Cases were aged from 15 to 84 years, and were reported from New South Wales, the Northern Territory, Queensland, South Australia and Victoria.
- A single case of **brucellosis** in a male in the age group 30-34 years was notified from Queensland.
- There were 514 notifications of **campylobacteriosis**; 275 cases were male, 237 cases were female and the sex of 2 was not reported. Cases were reported for all age groups from 0-4 years to 80-84 years, 23% being aged less than 5 years.
- There were 131 notifications of **gonococcal infection** received; 89 cases were male and 42 cases were female. Of the total, 10 cases were reported from New South Wales, 50 from the Northern Territory, 28 from Queensland, 3 from South Australia, 15 from Victoria and 25 from Western Australia. Sixty-seven per cent of cases were aged between 15 and 29 years.
- Three cases of **Haemophilus influenzae type b infection** were reported during the period, all for children in the age group 0-4 years. They included 2 males notified from New South and Queensland and a female child notified from South Australia.
- Fifty-nine cases of **hepatitis A** were reported; 34 cases were male and 25 were female. The cases were all aged from 0 to 64 years. Cases were re-

Table 2. Adverse events following vaccination for the period 29 October to 25 November 1995

Event	Vaccines				Reporting States or Territories	Total reports for this period
	DTP	DTP/OPV/ Hib	DTP/OPV/ Hep B	CDT/OPV		
Persistent screaming	1	1			ACT, NT	2
Hypotonic/hypo-responsive episode	1				ACT	1
Temperature 40.5°C or more	1				ACT	1
Other			1	1	NT, Qld	2
Total	3	1	1	1		6

- ported from both metropolitan and country areas of several States and Territories.
- Thirteen cases of **hepatitis B** were reported; 8 were male and 5 were female; cases were aged from 15 to 69 years.
 - Three cases of **hepatitis C (incident)** were reported, all males, from the age groups 20-24 years, 25-29 years and 35-39 years.
 - A single case of **hydatid disease** in a male in the age group 65-69 years was notified from Queensland.
 - Three notifications of **legionellosis** were received. All cases were male; 2 cases were reported from New South Wales, from the Statistical Divisions of Far West and Sydney, and one case was reported from the Victorian Statistical Division of North-Eastern. The cases were aged between 60 and 74 years.
 - Five cases of **leptospirosis** were reported, all but one of whom was male. The cases were from age groups between 20 and 49 years, and all were reported from country areas of Queensland and Victoria.
 - There were 30 notifications of **malaria** received; 22 cases were male and 8 were female. The cases were aged between 10 and 54 years. Reported onset dates were October and November. Cases were reported from 12 separate Statistical Divisions in 5 States and Territories.
 - Thirty-one cases of **measles** were reported; 17 cases were male and 14 cases were female. Six were reported in children aged less than two years; the ages of other cases ranged between 2 years and 46 years, with 5 cases in the age range 11-19 years. There were 2 apparent clusters of 2 and 3 cases each reported from the same postcode areas of New South Wales.
 - There were 10 cases of **meningococcal infection** reported; 5 cases were male and 5 were female. The cases were aged between 0 and 72 years, with 2 cases in the age group 0-4 years. There was one apparent cluster of 2 cases reported from the same postcode area in Western Australia.
 - Twenty-three cases of **ornithosis** were notified; 17 cases were male, 4 were female and the sex of the remaining two cases was not reported. The ages of cases were between 25 and 74 years.
 - There were 153 notifications of **pertussis**; 62 cases were male and 91 cases were female. All were aged between 0 and 79 years. Fifteen cases were aged less than one year a total of 27 being less than 5 years of age. There were 17 apparent clusters of between 2 and 4 cases each in the same postcode area. Apparent clusters were in New South Wales (13), Victoria (2) and South Australia (2).
 - Twenty-three notifications of **Q fever** were received from country regions of New South Wales, the Northern Territory, Queensland and Victoria; 17 cases were male and 6 were female; the ages of cases were between 15 and 54 years.
 - There were 375 cases of **rubella** reported; 284 cases were male, 88 cases were female, and the sex of 3 cases was not reported. Recorded ages of cases ranged from 0 to 64 years. Thirty-three cases were reported for females in the age range from 15 to 44 years. Over 50% of the cases (180) were reported in males 10-24 years of age.
 - There were 208 cases of **salmonellosis** reported; 90 cases were male and 112 cases were female; the sex of the remaining 6 cases was not recorded. The cases were aged from 0 to 85 years; 42% were aged less than 5 years.
 - Sixty cases of **syphilis** were reported; 29 were male and 30 were female, the sex of the remaining case was not reported. One case, a female, was aged under one year. All other cases were from 10 years to 79 years of age.
 - There were 53 cases of **tuberculosis** reported; 28 cases were male and 24 cases were female, the sex of the remaining case being unreported.
 - Three cases of **typhoid** were reported from the Perth Statistical Division. One case was male and two were female. The ages of cases ranged from 5 to 37 years.
 - Six cases of **yersiniosis** were reported; all cases were male. Cases were aged between 0 and 54 years.

Figure 5. Selected National Notifiable Diseases Surveillance System reports, and historical data¹



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

Table 3. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 12 November to 25 November 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA ¹			
									This period 1995	This period 1994	Year to date 1995	Year to date 1994
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
<i>Haemophilus influenzae</i> b infection	0	1	0	2	1	0	0	0	3	2	67	158
Measles	1	16	0	5	0	0	6	3	31	272	43	4300
Mumps	2	1	0	NN	0	0	2	0	5	5	132	87
Pertussis	0	54	1	54	21	0	19	4	153	251	904	5026
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	23	52	2	60	10	17	183	28	375	316	3553	2622
Tetanus	0	0	0	0	0	0	1	0	1	0	4	14

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision, so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.

NN Not Notifiable.

Table 4. Notifications of other diseases¹ received by State and Territory health authorities in the period 12 November to 25 November 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA ²				
									This period 1995	This period 1994	Year to date 1995	Year to date 1994	
Arbovirus infection													
Ross River virus infection	0	5	4	47	4	-	1	0	61	26	2469	3887	
Dengue	0	0	0	0	0	-	0	0	0	0	26	17	
NEC ³	0	1	0	28	0	0	0	0	29	24	855	535	
Campylobacteriosis ⁴	12	-	16	100	160	32	117	77	514	536	9926	9055	
Chlamydial infection (NEC) ⁵	6	NN	38	126	12	4	63	54	303	277	5731	5841	
Donovanosis	0	NN	1	1	NN	0	0	1	3	9	74	107	
Gonococcal infection ⁶	0	10	50	28	3	0	15	25	131	147	2846	2640	
Hepatitis A	0	13	1	22	3	0	20	0	59	83	1380	1746	
Hepatitis B	0	1	1	2	0	3	6	0	13	9	309	305	
Hepatitis C incident	-	3	0	0	0	-	-	-	3	5	87	38	
Hepatitis C unspecified	7		11	134		3	256	50	461	412	8777	8179	
Hepatitis (NEC)	0	0	0	0	0	0	1	NN	1	1	41	40	
Legionellosis	0	2	0	0	0	0	1	0	3	6	162	168	
Leptospirosis	0	0	0	2	0	0	3	0	5	1	126	111	
Listeriosis	0	1	0	0	0	0	1	0	2	5	54	26	
Malaria	2	3	0	22	1	0	2	0	30	25	581	658	
Meningococcal infection	0	2	0	3	1	0	1	3	10	12	163	350	
Ornithosis	0	NN	0	1	1	0	20	1	23	4	153	73	
Q fever	0	7	0	13	1	0	2	0	23	19	436	609	
Salmonellosis (NEC)	3	45	13	68	16	5	42	16	208	205	5571	4795	
Shigellosis ⁴	0	-	9	4	2	0	4	0	19	22	690	658	
Syphilis	0	32	15	12	0	0	0	1	60	105	1700	2099	
Tuberculosis	0	12	4	14	6	0	16	1	53	37	1068	921	
Typhoid ⁷	0	0	0	0	0	0	0	3	3	4	51	50	
Yersiniosis (NEC) ⁴	0	-	1	4	1	0	0	0	6	8	290	369	

1. For HIV and AIDS, see *CDI*; 19: 652-653. For rarely notified diseases, see Table 5.

2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.

3. Tas: includes Ross River virus and dengue.

4. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.

5. WA: genital only.

6. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.

7. NSW, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

Table 5. Notifications of rare¹ diseases received by State and Territory health authorities in the period 12 November to 25 November 1995

DISEASES	Total this period	Reporting States or Territories	Year to date 1995
Botulism	0		0
Brucellosis	1	Qld	27
Chancroid	0		2
Cholera	0		6
Hydatid infection	1	Qld	41
Leprosy	0		6
Lymphogranuloma venereum	0		1
Plague	0		0
Rabies	0		0
Yellow fever	0		0
Other viral haemorrhagic fevers	0		0

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

Table 6. Virology and serology laboratory reports by State or Territory¹ for the reporting period 16 to 29 November 1995, historical data², and total reports for the year

	State or Territory ¹							Total this fortnight	Historical data ²	Total reported this year
	NSW	NT	Qld	SA	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA										
Measles virus						1	1	2	85.2	281
Mumps virus						1	1	2	4.0	70
Rubella virus	7		28			10	15	60	108.7	894
HEPATITIS VIRUSES										
Hepatitis A virus	2	1	9			3	6	21	14.5	440
Hepatitis B virus	21	5	46		4	15	24	115	81.5	2,319
Hepatitis C virus	17	11	81		19	10	101	239	260.7	5,558
ARBOVIRUSES										
Ross River virus		1	13				3	17	31.7	1,054
Barmah Forest virus			6					6	6.5	229
Flavivirus (unspecified)						1		1	.3	40
ADENOVIRUSES										
Adenovirus type 1						1		1	2.8	35
Adenovirus type 3						1		1	2.7	50
Adenovirus type 7						1		1	.8	22
Adenovirus type 42						1		1	.0	1
Adenovirus not typed/pending	12		3		1	10	6	32	52.0	839
HERPES VIRUSES										
Herpes simplex virus type 1	15	4	77		3	59	39	197	181.3	4,612
Herpes simplex virus type 2	23	9	110		5	48	52	247	198.8	4,945
Herpes simplex not typed/pending	7		2			1		10	27.0	475
Cytomegalovirus	12	1	14		2	13	10	52	60.5	1,406
Varicella-zoster virus	5		29			9	12	55	41.8	1,024
Epstein-Barr virus	10	2	48		1	8	20	89	70.5	1,853
Herpes virus group - not typed						1	4	5	1.3	22
OTHER DNA VIRUSES										
Poxvirus group not typed			1					1	.0	5
Parvovirus			1			1		2	5.3	106
PICORNA VIRUS FAMILY										
Coxsackievirus B5	1							1	.7	8
Echovirus type 9	1					1		2	.2	24
Echovirus type 14	2							2	.2	12
Echovirus type 25						1		1	.0	3
Echovirus not typed/pending							7	7	.2	19
Poliovirus type 2 (uncharacterised)	6							6	.5	24
Poliovirus type 3 (uncharacterised)	1							1	.2	11
Rhinovirus (all types)	8					10	1	19	36.7	637
Enterovirus not typed/pending			3			3	13	19	43.7	847
ORTHO/PARAMYXOVIRUSES										
Influenza A virus	1		2	1		3	1	8	18.0	684
Influenza B virus	2					1		3	13.2	339
Parainfluenza virus type 3	9		3			16	3	31	27.3	770
Respiratory syncytial virus	5		7		2	4	3	21	35.8	3,774
OTHER RNA VIRUSES										
HIV-1	1		6		2		2	11	2.5	116
Rotavirus	11		3		11	7	5	37	77.8	1,605
Norwalk agent			2			3		5	.5	36
Coronavirus							1	1	.2	1

Table 6. Virology and serology laboratory reports by State or Territory¹ for the reporting period 16 to 29 November 1995, historical data², and total reports for the year, continued

	State or Territory ¹							Total this fortnight	Historical data ²	Total reported this year
	NSW	NT	Qld	SA	Tas	Vic	WA			
OTHER										
<i>Chlamydia trachomatis</i> not typed	13	5	63			6	31	118	106.8	2,487
<i>Chlamydia psittaci</i>						21		21	3.2	171
<i>Mycoplasma pneumoniae</i>	1		8		1	6	10	26	38.3	325
<i>Coxiella burnetii</i> (Q fever)			4			8		12	20.7	192
<i>Rickettsia australis</i>			1	1		4		6	.0	19
<i>Streptococcus</i> group A	2	6	11					19	19.7	543
<i>Bordetella pertussis</i>						28	1	29	26.5	601
<i>Bordetella</i> species			24					24	16.7	232
<i>Cryptococcus</i> species	2							2	.8	22
<i>Leptospira</i> species			1					1	1.5	23
<i>Treponema pallidum</i>	8					1	2	11	14.8	482
<i>Toxoplasma gondii</i>						1		1	1.5	110
<i>Schistosoma</i> species						7	3	10	.2	140
TOTAL	205	45	606	2	51	326	377	1,612	1,746.2	40,537

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.

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

Table 7. Virology and serology laboratory reports by clinical information for the reporting period 16 to 29 November 1995

	Encephalitis	Meningitis	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA												
Measles virus							1				1	2
Mumps virus											2	2
Rubella virus							12		1		47	60
HEPATITIS VIRUSES												
Hepatitis A virus					1	11					9	21
Hepatitis B virus						6					109	115
Hepatitis C virus			1			25					213	239
ARBOVIRUSES												
Ross River virus									4		13	17
Barmah Forest virus									3		3	6
Flavivirus (unspecified)											1	1
ADENOVIRUSES												
Adenovirus type 1				1								1
Adenovirus type 3				1								1
Adenovirus type 7				1								1
Adenovirus type 42											1	1
Adenovirus not typed/pending				12	10		1	1			8	32

Table 7. Virology and serology laboratory reports by clinical information for the reporting period 16 to 29 November 1995, continued

	Encephalitis	Meningitis	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
HERPES VIRUSES												
Herpes simplex virus type 1				6			111	13		56	11	197
Herpes simplex virus type 2							85			149	13	247
Herpes simplex not typed/pending	1						2			1	6	10
Cytomegalovirus				11							41	52
Varicella-zoster virus							37	1			17	55
Epstein-Barr virus				14			1				74	89
Herpes virus group - not typed							5					5
OTHER DNA VIRUSES												
Poxvirus group not typed											1	1
Parvovirus							1				1	2
PICORNA VIRUS FAMILY												
Coxsackievirus B5		1										1
Echovirus type 9											2	2
Echovirus type 14				1							1	2
Echovirus type 25				1								1
Echovirus not typed/pending				6			1					7
Poliovirus type 2 (uncharacterised)					2						4	6
Poliovirus type 3 (uncharacterised)											1	1
Rhinovirus (all types)				15							4	19
Enterovirus not typed/pending				10			3				6	19
ORTHO/PARAMYXOVIRUSES												
Influenza A virus				5							3	8
Influenza B virus											3	3
Parainfluenza virus type 3				26			1				4	31
Respiratory syncytial virus				20							1	21
OTHER RNA VIRUSES												
HIV-1											11	11
Rotavirus					37							37
Norwalk agent					3						2	5
Coronavirus											1	1
OTHER												
<i>Chlamydia trachomatis</i> not typed								2		67	49	118
<i>Chlamydia psittaci</i>				6							15	21
<i>Mycoplasma pneumoniae</i>				17							9	26
<i>Coxiella burnetii</i> (Q fever)				1		1					10	12
<i>Rickettsia australis</i>											6	6
<i>Streptococcus</i> group A				1			1		1		16	19
<i>Bordetella pertussis</i>				29							29	
<i>Bordetella</i> species				16							8	24
<i>Cryptococcus</i> species											2	2
<i>Leptospira</i> species											1	1
<i>Treponema pallidum</i>											11	11
<i>Toxoplasma gondii</i>											1	1
<i>Schistosoma</i> species											10	10
TOTAL	1	1	1	200	53	43	262	17	9	273	752	1612

Table 8. Virology and serology laboratory reports by contributing laboratories for the reporting period 1995

STATE OR TERRITORY	LABORATORY	REPORTS
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	50
	Royal North Shore Hospital, St Leonards	33
	Royal Prince Alfred Hospital, Camperdown	22
	South West Area Pathology Service, Liverpool	63
Queensland	Nambour Hospital	12
	Queensland Medical Laboratory, West End	660
Tasmania	Northern Tasmanian Pathology Service, Launceston	7
	Royal Hobart Hospital, Hobart	42
Victoria	Microbiological Diagnostic Unit, University of Melbourne	5
	Monash Medical Centre, Melbourne	24
	Royal Children's Hospital, Melbourne	82
	Unipath Laboratories	18
	Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital	202
Western Australia	PathCentre Virology, Perth	300
	Princess Margaret Hospital, Perth	13
	Western Diagnostic Pathology	79
TOTAL		1612