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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

AN INVESTIGATION OF AN OUTBREAK OF FOOD POISONING IN DARWIN

(Alan Ruben[1,2], Adrian Ralston[3], Angela Merianos[1,2], and Mahomed Patel[1])

On 1 April 1992, the Communicable Diseases Centre was notified that four persons had become ill with vomiting and diarrhoea following a dinner party six days earlier. The dinner, in the form of a buffet, had been held at the end of a conference for Health Managers on 26 March 1992, and the informant, who was ill herself, felt that oysters were the cause.

Methods

We obtained the names of the conference and dinner guests and a copy of the menu from the organisers. A questionnaire was sent out to all conference and dinner attendees the same morning.

Stool samples were requested from the persons who had become ill.

Environmental health officers conducted an investigation of the food handlers, the facilities and practices at the restaurant and the suppliers of the oysters.

Our working case definition was a gastrointestinal illness with an onset 12 to 72 hours, with symptoms of diarrhoea or vomiting, and fever, nausea or stomach pain.

Results

A total of 115 persons attended the conference, and 81 of those attended the dinner. An additional 29 persons, mainly partners of the delegates, attended the dinner but had not attended the conference, giving a total of 110 guests at the dinner.

The overall response rate to the questionnaire was 130/144 (90.3%), and 99 of the 110 had attended the dinner (90%). There was no significant statistical difference in the frequency of pre-dinner illness between dinner attendees (7/99) and non-attendees (2/29). The remaining 92 people who attended the dinner and were not ill previously were then further studied. Of this number, 18 (20%) had become ill following the dinner. None of the conference attendees who did not attend the dinner became ill after 26 March.

Nature of the Illness

The mean incubation period was 36 hours, with a range of 12 to 70 hours. Diarrhoea was the commonest symptom, occurring in 14 of the 18 ill guests (78%), with all ill guests suffering either vomiting or diarrhoea.

Attack Rates and Relative Risks

The highest attack rates were in persons who had eaten oysters (52%), mussels (41%), seafood mornay (30%) and prawns (27%). Relative risks were only significant for oysters (relative risk 8.4, 95% CI 3.0 - 23.0) and mussels (relative risk 4.3, 95% CI 1.8 - 10.4).

The relative risk for illness from oysters adjusted for mussels was 6.9 (95% CI 2.0 - 24.4, p= 0.0003). The relative risk for illness from mussels adjusting for the effect of oysters was 2.2 (95% CI 0.9 - 5.6, p=0.11).

Although the overall attack rate from oysters was only 52% (14/27), there was a dose-response relationship seen between illness and the number of oysters eaten (Table).

Table. Dose response effect of eating oysters

Number of Oysters Eaten	Number of Diners	Number of Cases	Attack Rate
Nil	65	4	6%
Any	27	14	52%
1 - 3	15	6	40%
4 - 6	12	8	67%
7 - 9	6	5	83%
10 or more	5	5	100%

Laboratory Investigation

Only six stool samples were obtained, seven days after the dinner, all from cases who were no longer symptomatic. No bacterial pathogens were identified. Because of the delay in specimen collection, and the expense of the tests, electron microscopy for viruses was not performed. No bacterial pathogens were grown from cultures of oysters and mussels.

Environmental Health Investigation

The environmental health officers investigated all aspects of the food handling and preparation. None of the restaurant staff had been ill, and none of their stool cultures grew pathogenic organisms. The oysters were labelled as coming from New Zealand, but when the authorities there were contacted it was found that the origin was elsewhere; that source has not been traced. No significant fault could be found in any other area.

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2. Communicable Disease Control, Darwin
3. Environmental Health Branch, Department of Health and Community Services, Darwin

Discussion

Our findings are highly suggestive of a causative agent in the oysters, with a strong dose-response effect. The significant crude relative risk for mussels is the result of confounding.

There were 4 persons who became ill but did not eat the oysters; one had the shortest incubation period and two the longest. It is possible that they were coincidentally ill.

There have been a number of food poisoning outbreaks in New South Wales and the Northern Territory implicating oysters harvested in the Georges River in Sydney[1]. In 1978, 2,000 persons in Australia and overseas had the source of their illness traced to these oysters[2]. In that same year, 60 persons in Darwin became unwell after eating oysters from the Georges River. Norwalk virus was implicated in these outbreaks, and in further outbreaks in New South Wales in 1984, 1989 and 1990[1], all resulting from oysters harvested from the Georges River. Despite attempts to purify the oysters prior to sale, they can become contaminated following heavy rains. This alters their immediate environment in terms of temperature and salinity, and also washes sewerage into the culture area from upstream.

A variety of pathogens has been shown to be transmitted by oysters, including *Salmonella, Shigella, Campylobacter, E. coli*, hepatitis A, and a number of *Vibrio* species[3,4,5,6]. Oyster consumption was implicated in a fatal case of *Vibrio vulnificus* in New South Wales in 1990[7].

No pathogen was identified in this outbreak. The incubation period and clinical syndrome are consistent with a Norwalk type virus infection. In the 1978 outbreak investigation, electron microscopy showed a variable yield of the virus from patients (19-50% in acute faeces specimens), with no significant findings from oysters on electron microscopy. Of the 15 patients in 1978 tested with paired sera, 11 (75%) developed antibodies[2]. None of the faeces specimens from our cases were collected at the time symptoms were present, and, because of the delay before notification, no blood tests were taken.

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A SALMONELLA TYPHIMURIUM OUTBREAK IN WESTERN AUSTRALIA

(Public Health Unit, State Health Laboratory Services and Environmental Health Branch, Health Department of Western Australia)

Salmonella Typhimurium accounted for 46% of all food poisoning incidents in the United Kingdom in 1984[1] and was the most common serotype in the United States of America in 1988[2]. In Western Australia, this serotype was responsible for 36% of all human salmonellosis cases in 1990[3]. There is an increased incidence in these cases during the summer months.

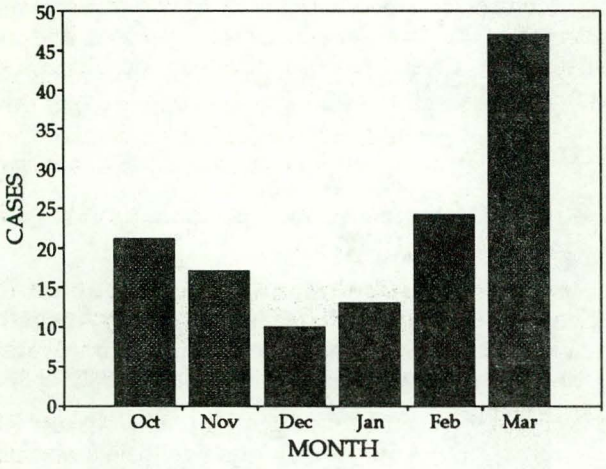
During the first week of March 1992, the Public Health Unit identified 20 cases of S. Typhimurium in a six day period compared with 13 cases and 24 cases for the entire months of January and February respectively (Figure).

The infections were widespread so it was suspected that they may have originated from a food product with a wide distribution throughout the State. An interesting feature was that eight of these 20 cases had surnames of Italian origin.

The State Health Laboratory Services (SHLS) alerted the Environmental Health Branch (EHB) of the Health Department and an investigation commenced on 13 March. The usual procedure of awaiting notification by the patients' medical practitioners was circumvented. The doctors concerned were telephoned for permission to interview the patients, or the parents of child patients, as soon as practicable.

As clearances were obtained from the patients' medical practitioners, the names, addresses and dates of birth were relayed to the local authorities for the areas in which they lived, with a request that the patient be interviewed immediately to try to identify any com-

Figure. ***Salmonella*** **Typhimurium cases, Western Australia, October 1991 to March 1992, by month**



mon food products. Initially, priority was given to the patients with names of southern European origin as there was a possibility that a continental-type food product was involved.

The EHB also decided to target smallgoods from several manufacturers following evidence from routine monitoring of effluents from these premises that S. Typhimurium was present in the period leading up to the outbreak. Five samples of smallgoods were drawn from each premises, however, all were found to be negative.

Coincidentally, on 16 March, the SHLS received three samples of salami from the Shire of Harvey following an interview with a patient who had been infected four weeks previously. The investigating Environmental Health Officer had found that of five people who had eaten together on 18 February, the patient was the only one to become ill. The only food consumed solely by the patient was a cured Italian salami.

In view of this report, nine samples of a range of smallgoods were drawn from the manufacturer in Perth for examination, and the EHB notified the local authorities interviewing patients to inquire if they had eaten the suspect smallgoods.

On 17 March, the City of Fremantle advised the EHB that the mothers of two child patients confirmed that they had purchased the suspect brand from the same delicatessen in Fremantle. This was followed by a further notification on 19 March from the City of Melville that the same brand of smallgoods was involved.

The first confirmation by the SHLS of the presence of S. Typhimurium in smallgoods was on Friday 20 March from the samples submitted by the Shire of Harvey. On receipt of this information, the EHB requested that the smallgoods manufacturer recall all its salami-type product and a seizure and detention order was placed on all stocks.

Further confirmation of this smallgoods manufacturer being the major source of infection came on Monday 23 March when S. Typhimurium was isolated from felino salami.

A further 84 samples of smallgoods from the same manufacturer were submitted for testing. S. Typhimurium was detected in a sample of Hungarian salami. An additional serovar, S. Anatum, was detected in two samples of felino salami and one sample of Hungarian salami.

Phage typing of the S. Typhimurium isolates by the Microbiological Diagnostic Unit, University of Melbourne, identified the 30 cases as RDNC (WA2), a phage pattern unique to Western Australia. Twenty-eight of these cases came from the Metropolitan area, one from the Shire of Harvey and one from the Shire of Roebourne. The same phage type was also found to be present in the smallgoods.

The manufacturer of the smallgoods distributed products to only two local authorities outside the metropolitan area - the Shires of Harvey and Roebourne.

The manufacturer's premises were closed for several days and the following conditions were applied before the premises could continue to operate:

- all existing products were to be tested for *Salmonella* contamination before being released for sale,
- thorough cleaning and sanitising was to be undertaken before production recommenced,
- products produced after the clean-up were to be tested to ensure they were free from *Salmonella* contamination,
- management was to develop a quality assurance programme for the premises based on the HACCP (Hazard Analysis of Critical Control Points) concept.

The Health Department monitored the premises to ensure that the required standards were attained and maintained.

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CAMPYLOBACTERIOSIS AND SALMONELLOSIS CASES IN A JUVENILE DETENTION CENTRE, QUEENSLAND

(John Bates, Microbiologist, Laboratory of Microbiology and Pathology, Brisbane; Virgil Kelk, Peter Boland and Andrew Loan, Environmental Health Officers, Queensland Health Regional Office)

Introduction

Cases of campylobacteriosis and salmonellosis occurred at a government operated juvenile detention centre during April, 1992. This centre is a farm based institution with dairy, piggery and crop producing facilities. It provides accommodation for up to fifty male juveniles and has a rotating staff of ninety persons. Advice was received that several juveniles had shown symptoms of campylobacteriosis since the Easter holiday break.

Investigation of Patients

Four juveniles had presented to the Centre's Director of Nursing for treatment. Faecal specimens were collected from each of these juveniles and submitted to a hospital laboratory for examination. One was positive for both *Campylobacter jejuni* and a Group B *Salmonella*, and two were positive for *C. jejuni* only. Some staff members were also thought to be symptomatic and one staff member and children were later confirmed as having a Group B *Salmonella*.

At the time of investigation, one juvenile who had been positive for *C. jejuni* had been released from the Centre, and the remaining three patients were interviewed.

All were aged between 15 and 17, and had suffered diarrhoea and other symptoms. The patient positive for *C. jejuni* had onset of illness on 18 April. He worked in the dairy, milking cows, cleaning the dairy and performing other general farm duties. The patient who was positive for both organisms had onset of symptoms on 22 April. He was in the remand section and was only allowed out for sport sessions. The third patient had onset of symptoms on 18 April. He worked in the kitchen, preparing food and cleaning. He had not had contact with farm animals for two weeks prior to his illness.

All juveniles had the same diet for the ten day period prior to the onset of their symptoms. This diet included unpasteurised milk, obtained from the Centre's dairy, three times each day. All water consumed was from the fully treated reticulated supply.

Inspection of facilities

Dairy

All milk for human consumption came from the dairy and was unpasteurised. As well as supplying milk for the Centre's use, the dairy also allocated up to 150 litres of unpasteurised milk for staff (for home use) each week.

Cleaning of equipment was found to be incomplete and ineffective; chilling of the milk was taking up to three times the recommended time. General hygiene was lacking amongst the operators and cross contamination was highly probable.

Kitchen

In the kitchen, there was ample provision for cross contamination to occur between raw and cooked foodstuffs. Foods were stored at incorrect temperatures and the standards of hygiene were poor.

Poultry

The Centre kept up to fifty hens for egg production. Cracked and broken eggs were discarded.

Water Supply

Water used in the Centre was derived from four sources, the fully treated reticulated town supply, rainwater tanks, a local creek and a bore. The reticulated fully treated town supply was fed into a fully covered above ground concrete water tank from where it was gravity fed throughout the Centre. This supply was the predominant source of drinking water. Rainwater was used on occasions for drinking purposes, although none of the juveniles interviewed could recall consuming this water. Water drawn from the local creek and bore was used to irrigate fodder crops. These crops were not irrigated in the ten day period prior to the onset of symptoms.

Microbiological Testing

The following samples were obtained from the Centre for microbiological examination:

1. Unpasteurised milk from the kitchen (five part sample)
2. Reticulated town water from the kitchen
3. Two samples of rainwater from tanks.

The milk was analysed by Australian Standard Methods for Standard Plate Count, coliforms and the presence of *Salmonella* spp. and *Listeria* spp. Analysis for *Campylobacter* spp. was performed using a modification of the US Food and Drug Authority method, followed by SAA enrichment procedures.

All five parts of the milk sample were negative for *Campylobacter* spp. but three were positive for a Group B *Salmonella* (*Salmonella* Typhimurium) (Table).

The samples of reticulated fully treated water from the kitchen and the samples of rainwater were bacteriologically fit for human consumption. *Campylobacter* spp.

Table. Microbiological results for the five parts of the milk sample

Sample	1	2	3	4	5
Standard Plate Count per mL at 30°C	1.9×10^6	3.3×10^6	6.3×10^4	3.8×10^6	1.9×10^6
Coliforms per mL	$>2.5 \times 10^4$	$>2.5 \times 10^4$	$>5.0 \times 10^3$	$>2.5 \times 10^4$	$>2.5 \times 10^4$
Salmonella spp. in 25mL	Detected	Detected	Not Detected	Detected	Not Detected
Campylobacter spp. in 100mL	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Listeria spp. in 25mL	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

were not detected in any of the samples of water submitted.

Discussion

The facts that all affected juveniles consumed unpasteurised milk at least three times a day, that staff had access to this same milk for home use, that Group B *Salmonella* was isolated from the patients, and that *Salmonella* Typhimurium (a Group B *Salmonella*) was isolated from the milk, suggest that the milk could have been the common carrier of the organisms. The evidence linking the unpasteurised milk to the cases of campylobacteriosis and salmonellosis is, nevertheless, circumstantial.

Unpasteurised milk has been, by far, the most commonly implicated vehicle in foodborne outbreaks of *Campylobacter* enteritis. Up to 10^4CFU/ml of *C. jejuni* have been detected in milk from infected cows[2] and in some instances the presence of *C. jejuni* in implicated raw milk has resulted from udder excretion rather than faecal contamination[1]. Several laboratories have attempted to isolate *C. jejuni* from raw milk, but seldom detect the organism. *C. jejuni* may not survive well in milk during transport and storage prior to analysis[1].

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INCREASED SALMONELLA ENTERITIDIS CASES IN SOUTH AUSTRALIA IN FEBRUARY-MARCH 1992

(Ossama El-Saadi[1,2], Jenny Feldheim[2], Chris Murray[3])

During the six week period to 3 April 1992, the Salmonella Reference Laboratory (SRL) of the Institute of Medical and Veterinary Science (IMVS), Adelaide, reported eight cases of *Salmonella* Enteritidis to the Communicable Disease Control Unit (CDCU), South Australian Health Commission. The CDCU undertook investigations in an attempt to find a common source of infection. The investigating officer contacted patients by telephone to inquire about recent overseas travel and foods consumed.

The dates of onset of the illness ranged from 26 February to 3 April 1992. Seven cases were infected with S. Enteritidis phage type 4; for the remaining case, the isolate was not typable. There were 5 males and 3 females. The mean age was 18 years (range 2 months to 38 years). The cases were widely spread geographically in both country and metropolitan areas, with no apparent clustering, apart from a mother and daughter in one household, and two brothers in another. The infections of the daughter and the second brother, which both had onsets within 2 weeks of the first cases in the households, were possibly due to spread within the household, as the incubation period is thought to be from six to 72 hours, and the period of communicability from several days to several weeks[1].

No common source of infection was able to be identified from the investigations made of these cases. One patient had a history of recent overseas travel, to Germany and Africa.

All *Salmonella* infections including S. Enteritidis infection are notifiable diseases in South Australia[2]. The rate of human salmonellosis recorded in Australia has not changed significantly over last 6 years, although there has been extensive variation in the notification rate of individual serotypes[3]. The proportion of total

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3. Salmonella Reference Laboratory, Institute of Medical and Veterinary Science

Table. Notified cases of *Salmonella* Enteritidis and total *Salmonella* notifications, South Australia, 1986 to 3 April 1992

Year	S. Enteritidis cases in the first 13 weeks of the year	S. Enteritidis - total cases in the year	Total *Salmonella* Cases
1986	0	3	361
1987	0	1	343
1988	1	1	398
1989	0	5	531
1990	1	9	636
1991	2	15	498
1992	8	8*	112*

* To 3 April 1992

Salmonella notifications for S. Enteritidis in South Australia has increased progressively since 1988 (Table). This increase is unlikely to have been due to difference in ascertainment.

The number of confirmed cases in the six week period to 3 April 1992, is well above the mean figure for corresponding periods in 1986 to 1991.

In South Australia, S. Enteritidis infection has usually been associated with overseas travel. The wide geographic distribution of cases, and the absence of an identified common source suggests that a single source was unlikely to be responsible for the increased number of cases reported. No public health intervention measures were taken.

Acknowledgment

Thanks to P. Weinstein for guidance and for reviewing the manuscript.

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MEASLES DIAGNOSIS BY VIRUS CULTURE

(Sonia Schepetiuk and Robert Norton, Division of Medical Virology, Institute of Medical and Veterinary Science, Adelaide)

Before the introduction of immunisation programs, diagnosis of measles was made on clinical grounds. After the introduction of measles vaccine to South Australia in 1970, the number of cases decreased from 3.4 cases/reporting doctor/annum in 1986 to 0.6 cases/reporting doctor/annum[1] in 1988. A decrease in the number of immune individuals has contributed to a rising incidence of measles infection during the past 5 years. The number of notifiable cases of measles in 1987 was 37, however by 1991 it had increased to 151. This represented an increase of 308% during the four-year period.

Fewer clinicians now have diagnostic experience with measles, therefore laboratory diagnosis is increasing in importance. During the past 5 years the number of requests for measles virus detection has increased. The requests have prompted the introduction of a culture enhanced immunofluorescence assay for the detection of measles antigen.

Clinical samples are spun onto LLC-MK2 cell monolayers and the growth of the virus is detected by specific measles antibodies in an immunofluorescence assay.

During the past 6 months, we have successfully isolated measles virus from 3 clinical cases.

Case 1: A 12 month old male who had not been immunised against measles, presented with pyrexia (temperature 38°C), cough and a rash suggestive of measles.

Case 2: A 15 month old male who had not been immunised against measles, presented with conjunctivitis, fever and subsequently developed a rash typical of measles. His 7 year old sister was one of a group of four children who had clinical measles confirmed by specific IgM serology about two weeks prior to this. All four children travelled to school on the same school bus.

Case 3: A 7 year old male child presented with fever, sore throat and an enanthem. There was no typical rash. He had been immunised against measles at the age of nine months and specific measles IgM was not detected.

Measles virus was isolated from nasopharyngeal aspirates and throat swabs taken from the three patients mentioned. The measles virus is relatively thermolabile and consequently isolation is difficult. While the clinical presentation is usually typical, this may not always be the case as was demonstrated in case 3. Failure of seroconversion following vaccination is said to occur in 5% of cases[2].

The serological detection of measles specific IgM remains the investigation of choice. However, in previously vaccinated individuals, measles specific IgM may not be produced in detectable levels[3]. The isolation of measles virus from nasopharyngeal aspirates or throat swabs of patients with clinically suspected measles should therefore be attempted.

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CDI Editorial Comment

There have been only 69 cases of measles reported in the *CDI* Laboratory Reporting Schemes with 1992 specimen collection dates. Sixty-one of these (88%) have been diagnosed serologically (49 IgM, 7 four-fold changes, 2 single high titres and 1 'other' in serum samples, and 2 CSFs with single high titres), and there have been 3 isolations (1 throat swab and 2 nasopharyngeal specimens), and 5 detections of antigen in nasopharyngeal specimens by immunofluorescence.

The proportion of serological diagnoses has not changed since 1987. That year, there was a total of 136 reports of measles; 120 (88%) were serological diagnoses (58 IgM, 21 four-fold change and 41 single high titre), and there were 9 isolations from nasopharyngeal specimens and 7 antigen detection reports.

OVERSEAS BRIEFS

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

Cholera Update

Newly infected areas are the Sergipe State in Brazil, the Kasese District in Uganda, Delta Amacuro State in Venezuela, and Kompong Cham Province in Cambodia.

Cases for July and August have been reported for Argentina, Belize, Bolivia, Brazil, Cambodia, El Salvador, Guatemala, Honduras, Iraq, Mozambique, Nepal, Nicaragua, Panama, Peru, Tuvalu and Venezuela.

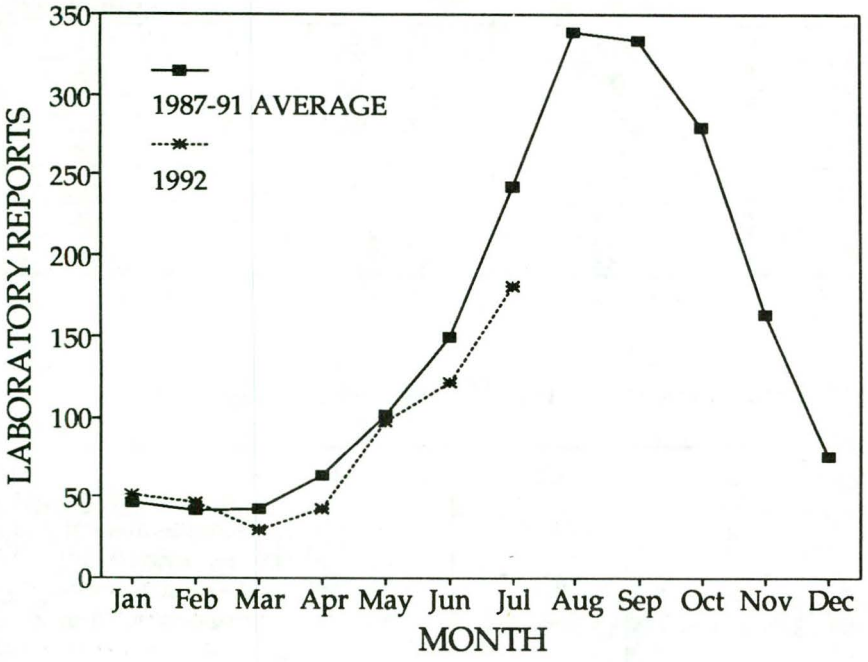
COMMUNICABLE DISEASES SURVEILLANCE

Laboratory Reporting Schemes

There were 1,878 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 6, 7 and 8).

- There were 99 reports of **influenza**. Eighty-three were untyped **influenza A** (20 isolations, 9 antigen detections and 61 serological diagnoses - 54 single high titres and 7 four-fold changes), 10 of **influenza A H_3N_2** (10 isolations and 9 antigen detections), and 6 of **influenza B** (1 antigen detection, and 5 serological diagnoses - 3 single high titres, 1 IgM and 1 four-fold change).
- Fifteen reports of untyped influenza A this fortnight were in persons over the age of 65 years, as were 2 reports of influenza B. One untyped influenza A report was for a 43 year old male organ transplant patient.
- **Respiratory syncytial virus** was reported for a total of 296 patients this fortnight, bringing the total for the year to 2964, above the average for recent years. Reports included siblings aged 3 years and 7 months, and 3 nosocomial infections (males aged 1 year, 2 years and 3 years).
- There continues to be fewer reports of **rotavirus** than the average for recent years (Figure 1). There were 148 reports this fortnight, including a 30 year old male renal transplant patient.
- Fifty-one reports of ***Mycoplasma pneumoniae*** infection were received this fortnight, bringing the total for July to 133 and for the year to 508. CNS

Figure 1. Rotavirus laboratory reports, 1992 and1987-91 average, by month of specimen collection



symptoms were reported for a 9 year old male patient, and encephalitis for another.

- **Ross River virus** infection was reported for 22 patients this period. All were from Queensland or Western Australia, and specimen collection dates for most were in July or August.
- Three reports of **measles** were received this fortnight. For a 12 year old male patient, CNS symptoms were reported and the diagnosis was by demonstration of a high measles titre in CSF.
- There were a further 22 reports of **dengue 2**. All were from the Townsville area and had specimen collection dates in June or July.
- One case of **kunjin virus** infection was reported. The patient was a 75 year old male from the Cairns area. No clinical information was supplied.
- **Rubella** was reported for 19 patients this fortnight, bringing the total for July to 21, more than for any month since November last year. The peak in rubella reports has occurred in October or November in most years in Australia. There were 3 reports this period of females of reproductive age, and CNS symptoms were reported for 1 of these (aged 36 years).
- **Hepatitis A** was reported for 20 patients. Myalgia was the reported syndrome for a 36 year old male, and injecting drug use was the reported risk factor for a 20 year old male.
- There were 134 reports of **hepatitis B**. Two had a history of injecting drug use, 2 had overseas travel recorded as a risk factor, 15 were pregnant and 1 patient was a 4 year old female with a hepatitis B carrier mother.
- **Hepatitis C** was reported for 137 patients. A history of injecting drug was reported for 20 patients, 1 patient was a 1 month old female whose mother was hepatitis C positive and another was a 26 year old pregnant female.
- **Herpes simplex type 2** reports this fortnight included a 50 year old male with CNS symptoms (CSF isolate), and infections in 3 pregnant females (26 years, 29 years, 29 years). **Herpes simplex type 1** was reported for a 34 year old male transplant patient. A fatal disseminated postnatal infection with **untyped herpes simplex** was reported for a 9 day old male. The virus was isolated from a nasopharyngeal specimen prior to death, and from post mortem oesophagus and lung tissue. Untyped herpes simplex was also reported for a 1 month old male with CNS symptoms, and a 6 year old male with encephalitis.
- There was 1 report of **enterovirus type 71** infection. The patient was a 6 day old infant who had meningitis. The virus was isolated from a CSF sample.
- There were 85 reports of **cytomegalovirus** infection. Included were 7 HIV positive patients (1 also with cerebral toxoplasmosis), 5 with a history of transplant (1 heart, 1 heart-lung, 3 renal), and 1 who was pregnant. Three congenital infections were reported, and there was 1 case of acute Guillain-Barré Syndrome in a 17 year old male, and 2 isolations of the virus from post-mortem tissue of SIDS victims (a 2 year old female and a 6 month old male). Cardiac symptoms were reported for a 60 year old male patient.
- **Q fever** was reported for 6 patients, all males aged between 20 years and 67 years. Two were described as meatworkers. **Syphilis** was reported for 21 patients. Included were 3 pregnant females, aged 23 years, 23 years, and 30 years.

Table 1. Australian Sentinel Practice Research Network, Weeks 34 and 35, 1992

Condition	Week 34, to 23 August 1992		Week 35, to 30 August 1992	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	105	13.5	62	11.4
Measles	4	0.5	1	0.2
Mumps	0	0	0	0
Rubella	5	0.6	5	0.9
Pertussis	0	0	0	0
Genital herpes	4	0.5	6	1.1
Gastroenteritis	79	10.2	71	13.0

Table 2. WHO Influenza Reference Laboratory typing results, 1992, by State and Territory

STATE OR TERRITORY	TOTAL	B	A			REFERENCE STRAINS
			TOTAL	H_3	H_1	
ACT	6	0	6	4	0	A/Shanghai/6/90 (2) A/Beijing/352/89 (1)
NSW	55	1	54	47	1	A/Shanghai/6/90 (8) A/Washington/15/91 (4) A/South Australia/66/92 (2) A/Beijing/352/89 (3) A/Shanghai/24/90 (2)
NT	15	0	15	11	0	A/Shanghai/6/90 (5) A/Beijing/352/89 (2) A/Washington/15/91 (1) A/Beij-Shanghai/6/90[1] (1)
SA	105	1	104	63	0	A/Shanghai/6/90 (30) A/Washington/15/91 (12) A/Beij-Shanghai/6/90[1] (9) A/Beijing/352/89 (6) A/Shanghai/24/90 (1) A/South Australia/66/92 (2)
Tas	3	0	3	3	0	A/Beij-Shanghai/6/90[1] (2) A/Washington/15/91 (1)
Vic	86	0	86	73	3	A/Texas/36/91 (2) A/Victoria/36/88 (1) A/Shanghai/6/90 (4) A/Washington/15/91 (3) A/Beijing/352/89 (4)
WA	30	0	30	6	0	A/Shanghai/6/90 (11) A/Shanghai/24/90 (2) A/Washington/15/91 (2) A/South Australia/66/92 (1) A/Beijing/352/89 (1)
TOTAL	300	2	298	211	4	A/Texas/36/91 (2) A/Victoria/36/88 (1) A/Shanghai/6/90 (60) A/Washington/15/91 (23) A/Beijing/352/89 (17) A/Beij-Shanghai/6/90[1] (12) A/South Australia/66/92 (5) A/Shanghai/24/90 (3)

1. Intermediate between A/Beijing/352/89 and A/Shanghai/6/90.

Australian Sentinel Practice Research Network

The Australian Sentinel Practice Research Network collected data from 7,777 patient encounters in Week 34 and 5,446 patient encounters in Week 35 (Table 1). The rate of reporting of influenza has continued to be less than it was during June and July. Gastroenteritis continues to be reported at a rate of between 7 and 13 reports per 1,000 encounters, as for the each week since the end of May. The rate of reporting of rubella this fortnight is higher than that recorded for any fortnight this year.

WHO Influenza Reference Laboratory Typing Results

The WHO Influenza Reference Laboratory has received a further 66 influenza isolates from *CDI* contributing laboratories, bringing the total for the year (to 27 August) to 300 (Table 2). All 66 isolates were from Victoria, all were influenza A and all but 2 were influenza A H_3N_2.

A further 33 isolates have been typed: 17 as like A/Shanghai/6/90 (Western Australia 7, New South Wales 6, Northern Territory 2, ACT 2), 6 as A/Beijing/352/89 (3 New South Wales, 2 Northern Territory, 1 ACT), 5 as like A/Washington/15/91 (4 New South Wales, 1 Western Australia), 3 as like A/South Australia/66/92 (2 New South Wales, 1 Western Australia) and 2 as like A/Shanghai/24/90 (1 Western Australia, 1 New South Wales).

(Alan Hampson, WHO Influenza Reference Centre, CSL, Melbourne)

National Notifiable Diseases Reports 9 August to 22 August 1992

A total of 1,705 reports of notifiable diseases was received during this period. All were in a format suitable for analysis.

- There were 46 reports of **Ross River Virus infection** bringing the total this year to 4,793 notifications. Notifications of this condition have fallen markedly for onset dates after June. This period, they were predominantly in coastal Queensland and Western Australia. There were 16 males and 30 females ranging between the 10-14 to the 85-89 years age groups.
- There were 35 reports of **dengue** this period with 34 from Townsville and surrounds. Thirty-four of the reports had onset dates in June and age groups ranged from 10-14 to 70-74. Males comprised 15 cases, females 20.
- There were 3 reports of **brucellosis**, 2 in males in the 30-34 and 45-49 years age groups and 1 in a female in the 65-69 years age group. All the cases were from rural Queensland.
- **Gonococcal infection** was notified on 76 occasions this period. Of these reports, 58 were in males, 15 in females and the sex was not recorded in 3. Five cases were reported in persons under the age of 15 years.
- There were 20 reports of ***Haemophilus influenzae* type b infection**. Eleven were in males, 7 in females and in 1 the sex was not recorded. Two cases were aged less than 1 year and 3 cases were aged more than 5 years. There were 2 apparent clusters of 2 cases each in separate postcode areas where the second case occurred within 1 and 5 days of the index case.
- Three apparently sporadic cases of **legionellosis** were notified, in a male in the 70-74 years age group and in a male and a female in the 45-49 years age group.
- A single case of **leprosy** was notified in a male in the 55-59 years age group.
- There were 6 cases of **leptospirosis** notified, 5 males and 1 female. All were from rural areas and were between the 10-14 years and 50-54 years age groups.
- There was a single notification of **listeriosis** in a male in the 70-74 years age group.
- There were 27 cases of **measles** notified, 12 males and 15 females. Three were of unknown age, and all but 4 of the others were aged over 1 year, with a mean age in the whole group of 11 years. There was an apparent cluster with 2 cases with onset on subsequent days within the same postcode area.
- Ten apparently sporadic cases of **meningococcal infection** were notified, 8 males and 2 females with ages ranging between the 0-4 and the 75-79 years age groups.
- There were 22 notifications of **pertussis** this period, 10 males and 11 females. Four were aged less than 1 year and 11 aged less than 5 years, with 1 of unknown age. There were 4 apparent clusters with 2 cases each in the same postcode areas with dates of onset of each pair separated by 0 to 7 days.
- **Q fever** was notified on 19 occasions. Eighteen were males and 1 female, all between the 15-19 years and 60-64 years age groups. All cases were notified from rural areas of Queensland, New South Wales and Victoria.

- There were 81 notifications of **rubella**, an increase from the 22 cases notified last period. Cases occurred in 13 apparent clusters of 2-6 cases each in different postcode areas. Of the 81 cases, 45 were male and 34 female, and sex was not recorded in 2. Thirteen cases were in females between the ages of 15 and 44 years. Onset dates of cases in all age groups and both sexes were predominantly in July, when there was an increase in notified rubella incidence (Figure 2). An increase in rubella has also been noted in ASPREN reports (Table 1) and in the *CDI* Laboratory Reporting Scheme (Table 6).
- There were 96 notifications of **syphilis**, 49 males and 47 females. Ten of these cases were aged less than 15 years.

Figure 2. Rubella notifications, 1992, by month of onset

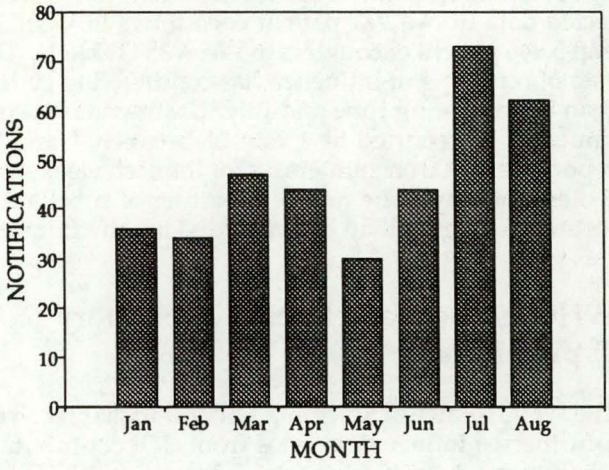
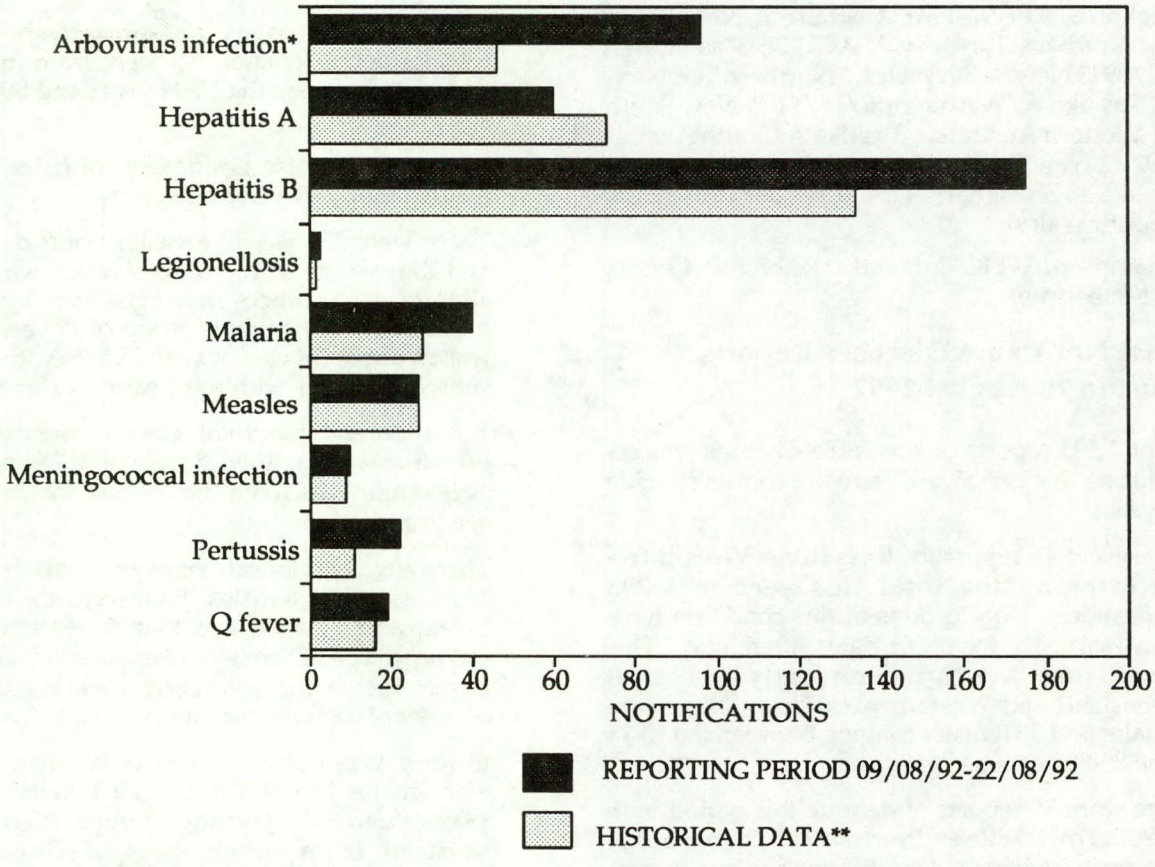


Figure 3. Selected National Notifiable Diseases Reports, and historical data **



* Includes Ross River virus and Dengue

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

Table 3. Diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation for the reporting period 9 to 22 August 1992

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1] This Period 1992	This Period 1991	Year to Date 1992	Year to Date 1991
Diphtheria	0	0	0	0	0	0	0	0	0	0	11	5
Measles	1	6	0	3	6	0	11	0	27	67	552	806
Mumps	0	0	NN	NN	NN	NN	0	NN	0	NN	15	NN
Pertussis	0	0	0	8	5	3	4	2	22	14	274	230
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Rubella[2]	0	0	0	20	0	0	61	0	81	17	374	276
Tetanus	0	0	0	NN	0	0	0	0	0	0	8	5

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision, so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
2. NT, Tas, WA: CRS only; ACT, NSW, Qld: rubella only; SA, Vic: rubella and CRS.

NN Not Notifiable.

Table 4. Other Notifiable Diseases[1], for the reporting period 9 to 22 August 1992

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2] This Period 1992	This Period 1991	Year to Date 1992	Year to Date 1991
Arbovirus infection (NEC)[3]	0	1	NN	10	0	0	4	0	15	4	259	170
Ross River virus infection	0	-	0	42	-	NN	0	4	46	26	4898	3290
Dengue	0	-	0	35	-	NN	0	NN	35	0	223	40
Campylobacteriosis[4]	0	-	14	105	90	19	65	36	329	362	5100	5162
Chlamydial infection (NEC)	1	NN	23	102	1	9	64	0	200	156	3723	2637
Donovanosis	0	NN	3	0	NN	NN	0	1	4	6	54	43
Gonococcal infection[5]	0	14	15	11	0	0	8	28	76	92	1852	1573
Haemophilus influenzae type b[6]	1	5	NN	3	1	2	8	NN	20	26	317	335
Hepatitis A	0	17	3	18	1	2	19	0	60	100	1267	1072
Hepatitis B	4	35	1	60	1	6	65	3	175	162	3995	2403
Hepatitis C	6	75	8	61	NN	7	47	NN	204	194	5176	2166
Hepatitis (NEC)	1	0	0	2	0	0	1	NN	4	3	44	229
HIV infection[7]	2	2	0	0	3	0	0	1	8	1	180	20
Legionellosis	0	0	0	0	1	1	1	0	3	2	130	74
Leptospirosis	0	0	0	3	1	0	1	1	6	4	69	90
Listeriosis	0	0	NN	0	NN	0	1	0	1	2	25	25
Malaria	3	2	0	23	0	1	7	4	40	38	509	554
Meningococcal infection	1	3	1	2	0	0	2	1	10	11	160	171
Ornithosis	0	NN	0	0	0	0	0	0	0	4	58	72
Q fever	0	3	0	13	0	0	3	0	19	29	300	449
Salmonellosis (NEC)	1	5	9	33	20	3	38	16	125	190	3376	4009
Shigellosis[4]	0	-	10	4	3	1	3	13	34	40	413	624
Syphilis	1	20	41	18	0	0	2	14	96	97	1636	1261
Tuberculosis	0	3	1	2	3	0	33	0	42	29	499	323
Typhoid[8]	0	1	0	0	0	0	0	0	1	1	37	52
Yersiniosis[4]	0	-	0	9	5	0	1	0	15	5	419	372

1. 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. NSW, 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. More complete data on new diagnoses of HIV infections are presented in the monthly *Australian HIV Surveillance Report*.
8. NSW and Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

Table 5. Rarely Notified Diseases[1] for the reporting period 9 to 22 August 1992

DISEASES	Total this period	Reporting States or Territories	Year to date1992
Botulism			0
Brucellosis	3	Qld	15
Cholera			3
Chancroid			3
Hydatid infection	3	Vic (2), WA (1)	25
Leprosy	1	NT	11
Lymphogranuloma venereum			2
Plague			0
Rabies			0
Yellow fever			0
Other viral haemorrhagic fevers			0

1. Fewer than 50 cases of each of these diseases were notified each year during the period 1986 to 1991.

Table 6. Laboratory reports by State or Territory of reporting laboratory for the reporting period 12 to 25 August 1992, 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	SA	Vic	WA			
MEASLES, MUMPS, RUBELLA									
Measles virus		1		2			3	12.3	99
Mumps virus					1		1	1.2	30
Rubella virus		3	6		6	4	19	8.5	131
HEPATITIS VIRUSES									
Hepatitis A virus	1	4	9	3	1	2	20	15.8	222
Hepatitis B virus	1	55	54	2	12	10	134	102.2	1,493
Hepatitis C virus	12		34	45		46	137	47.2	1,462
Hepatitis D virus			7				7	.5	34
ARBOVIRUSES									
Ross River virus			18			4	22	18.3	1,151
Barmah Forest virus			4			4	8	2.0	190
Dengue type 2			22				22	.2	169
Dengue not typed						2	2	.5	60
Kunjin virus			1				1	.8	8
Flavivirus (unspecified)			3		1		4	2.7	25
ADENOVIRUSES									
Adenovirus type 1	1	3			2		6	2.7	64
Adenovirus type 2		6			2		8	6.5	69
Adenovirus type 3		1			3		4	4.5	27
Adenovirus type 4		1					1	1.7	11
Adenovirus type 5		3					3	1.3	18
Adenovirus type 8					1		1	.8	14
Adenovirus type 9		1					1	.5	7
Adenovirus type 11		1					1	1.7	9
Adenovirus type 12		2					2	.0	3
Adenovirus not typed/pending		17	8	12	3	13	53	42.5	674

Table 6. Laboratory reports by State or Territory of reporting laboratory for the reporting period 12 to 25 August 1992, 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	SA	Vic	WA			
HERPES VIRUSES									
Herpes simplex virus type 1		24	46	14	28	32	144	130.2	2,350
Herpes simplex virus type 2		24	67	13	35	34	173	164.5	2,876
Herpes simplex not typed/pending	9	21	6			9	45	40.5	599
Cytomegalovirus		26	19		21	19	85	71.0	1,263
Varicella-zoster virus	1	4	11	1	4	3	24	19.3	424
Epstein-Barr virus	1	7	21	13	5	17	64	53.3	1,020
OTHER DNA VIRUSES									
Parvovirus					10		10	.8	101
PICORNA VIRUS FAMILY									
Coxsackievirus A16					1		1	1.3	11
Coxsackievirus B1		1			1		2	.0	14
Echovirus type 1		1					1	.2	2
Echovirus type 4				1			1	.2	6
Echovirus type 6						2	2	.7	79
Echovirus type 9	1				3	4	8	.2	153
Echovirus type 11		1					1	.8	8
Echovirus type 14		2					2	.2	5
Echovirus type 17		2					2	4.3	42
Echovirus type 21					1		1	.2	5
Echovirus type 22		1					1	.5	6
Poliovirus type 1 (uncharacterised)		2			1		3	2.5	42
Poliovirus type 2 (uncharacterised)		2					2	3.2	37
Poliovirus type 3 (uncharacterised)		5					5	2.0	24
Poliovirus type 1 (vaccine strain)		1					1	.0	1
Poliovirus not typed/pending		5					5	3.8	48
Rhinovirus (all types)		9	1		4	2	16	32.2	421
Enterovirus type 71 (BCR)					1		1	1.7	13
Enterovirus not typed/pending		9	14	2		6	31	24.8	621
ORTHO/PARAMYXOVIRUSES									
Influenza A virus	1	7	20	34	1	20	83	3.5	808
Influenza A virus H_3N_2		3	3		4		10	2.0	153
Influenza B virus				1	2	3	6	17.8	83
Parainfluenza virus type 1		1		2		2	5	4.0	268
Parainfluenza virus type 2			1			1	2	4.5	56
Parainfluenza virus type 3	1	2	4			10	17	15.8	297
Parainfluenza virus typing pending	1					2	3	2.5	78
Respiratory syncytial virus	7	53	37	66	40	83	286	288.7	3,037
OTHER RNA VIRUSES									
Rotavirus		82	6	17	5	38	148	184.3	902
Astrovirus		3					3	2.2	9
Reovirus (unspecified)					3		3	.0	6
Calici virus		1					1	1.5	18
Norwalk agent						1	1	.3	1
Coronavirus		2					2	.8	27
Small virus (like) particle		2					2	2.0	43

Table 6. Laboratory reports by State or Territory of reporting laboratory for the reporting period 12 to 25 August1992, 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	SA	Vic	WA			
OTHER									
Chlamydia trachomatis - A-K			1				1	2.8	4
Chlamydia trachomatis not typed		14	54	13	1	25	107	102.5	1,741
Chlamydia pneumoniae					1		1	.2	11
Mycoplasma pneumoniae	1	13	29	1	7		51	15.3	582
Coxiella burnetti (Q fever)		2	3		1		6	11.5	168
Streptococcus group A			16				16	.0	22
Streptococcus group B			4				4	.0	5
Bordetella pertussis			2				2	.0	4
Bordetella species			1				1	.0	2
Leptospira canicola			1				1	.0	1
Leptospira pomona			1				1	.0	4
Leptospira species			1				1	.0	5
Treponema pallidum		11	10				21	.0	56
Toxoplasma gondii			1		1		2	.0	8
TOTAL	38	441	546	242	213	398	1,878	1,495.0	24,540

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 7. Laboratory reports by clinical information for the reporting period 12 to 25 August 1992

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA													
Measles virus			1									2	3
Mumps virus												1	1
Rubella virus								9				10	19
HEPATITIS VIRUSES													
Hepatitis A virus							17			1		2	20
Hepatitis B virus							58					76	134
Hepatitis C virus							67					70	137
Hepatitis D virus							7						7
ARBOVIRUSES													
Ross River virus			1			1				11		9	22
Barmah Forest virus								1		3		4	8
Dengue type 2			1					2				19	22
Dengue not typed								1				1	2
Kunjin virus												1	1
Flavivirus (unspecified)								1				3	4
ADENOVIRUSES													
Adenovirus type 1					2	4							6
Adenovirus type 2					2	1		1				4	8
Adenovirus type 3					1				2			1	4

Table 7. Laboratory reports by clinical information for the reporting period 12 to 25 August 1992

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
Adenovirus type 4						1							1
Adenovirus type 5					2	1							3
Adenovirus type 8									1				1
Adenovirus type 9						1							1
Adenovirus type 11												1	1
Adenovirus type 12						2							2
Adenovirus not typed/pending	1		1		22	22			1			6	53
HERPES VIRUSES													
Herpes simplex virus type 1			2		4			75	8		45	10	144
Herpes simplex virus type 2			1					74			92	6	173
Herpes simplex not typed/pending	2		1		3			26			5	8	45
Cytomegalovirus			2	3	28	2	3		2			45	85
Varicella-zoster virus					1			16				7	24
Epstein-Barr virus					7			1				56	64
OTHER DNA VIRUSES													
Parvovirus								5				5	10
PICORNA VIRUS FAMILY													
Coxsackievirus A16								1					1
Coxsackievirus B1		1										1	2
Echovirus type 1						1							1
Echovirus type 4						1							1
Echovirus type 6		2											2
Echovirus type 9		6							1			1	8
Echovirus type 11												1	1
Echovirus type 14		1										1	2
Echovirus type 17		1										1	2
Echovirus type 21		1											1
Echovirus type 22	1												1
Poliovirus type 1 (uncharacterised)					2	1							3
Poliovirus type 2 (uncharacterised)					2								2
Poliovirus type 3 (uncharacterised)					3	1						1	5
Poliovirus type 1 (vaccine strain)					1								1
Poliovirus not typed/pending					1	4							5
Rhinovirus (all types)					12			1				3	16
Enterovirus type 71 (BCR)		1											1
Enterovirus not typed/pending	1	1			15	9						5	31
ORTHO/PARAMYXOVIRUSES													
Influenza A virus					66							17	83
Influenza A virus H_3N_2		1			8							1	10
Influenza B virus					1							5	6
Parainfluenza virus type 1					3							2	5
Parainfluenza virus type 2					2								2
Parainfluenza virus type 3					17								17
Parainfluenza virus typing pending					3								3
Respiratory syncytial virus					273							13	286

Table 7. Laboratory reports by clinical information for the reporting period 12 to 25 August 1992, continued

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
OTHER RNA VIRUSES													
Rotavirus						132						16	148
Astrovirus						1						2	3
Reovirus (unspecified)					1							2	3
Calici virus												1	1
Norwalk agent					1								1
Coronavirus						1						1	2
Small virus (like) particle						2							2
OTHER													
Chlamydia trachomatis - A-K											1		1
Chlamydia trachomatis not typed				1				3			90	13	107
Chlamydia pneumoniae					1								1
Mycoplasma pneumoniae	1		1		30							19	51
Coxiella burnetti (Q fever)										1		5	6
Streptococcus group A					4							12	16
Streptococcus group B										2		2	4
Bordetella pertussis					2								2
Bordetella species												1	1
Leptospira canicola												1	1
Leptospira pomona												1	1
Leptospira species												1	1
Treponema pallidum											1	20	21
Toxoplasma gondii												2	2
TOTAL	6	15	11	4	520	188	152	217	15	18	234	498	1878

Table 8. Laboratory reports by contributing laboratories for the reporting period 12 to 25 August 1992

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	38
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	133
	Prince Henry/Prince of Wales Hospitals, Sydney	143
	Royal Alexandra Hospital for Children, Camperdown	61
	South West Area Pathology Service, Liverpool	104
Queensland	Dr TB Lynch, Pathologist, Rockhampton	33
	Queensland Medical Laboratory, West End	255
	State Health Laboratory, Brisbane	258
South Australia	Institute of Medical & Veterinary Science, Adelaide	242
Victoria	Fairfield Hospital, Melbourne	212
	Microbiological Diagnostic Unit, University of Melbourne	1
Western Australia	Princess Margaret Hospital, Perth	171
	State Health Laboratory Services, Perth	227
TOTAL		1878