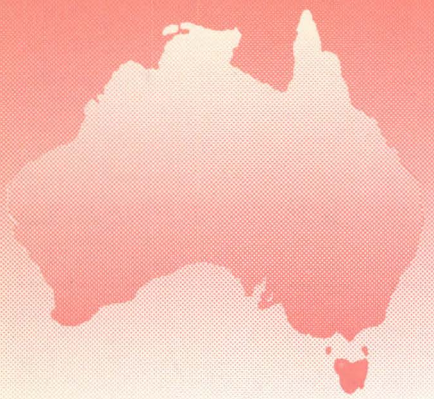

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DEPARTMENT OF HEALTH, HOUSING, LOCAL GOVERNMENT AND COMMUNITY SERVICES

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

ABSENTEEISM FROM A CHILD DAY-CARE CENTRE DURING A ROTAVIRUS OUTBREAK

(J Hanna and D Brookes, Centre for Disease Control, Tropical Public Health Unit, Cairns, Queensland)

On 7 July, a 9½ month old child attending a child day-care centre in Far North Queensland was sent home after developing fever, vomiting and diarrhoea. The child was seen by a doctor at the local hospital who certified that the child was 'fit to attend day-care'. He returned to the centre the following day but was again sent home because of persisting symptoms.

Within three days a further three children had developed similar symptoms, with two of the children (aged 11½ and 17 months) being hospitalised. Both hospitalised children were confirmed as having rotavirus. Over the next five days a further 19 children became ill; although no other children were tested, they are all assumed to have been infected by rotavirus. No further children were hospitalised, no staff members became ill and no new cases occurred after 16 July (Figure 1).

Children attending the centre are allocated to one of four groups: nursery (<15 months), toddlers (15 months to 2½ years), prekindy (2½ to 3½ years) and preschool (>3½ years). The nursery children are cared for separately from other children, whereas the older children mix together during the day every day. Six of the nursery children were affected; the remaining two had been ill during a widespread epidemic of rotavirus diarrhoea in Far North Queensland in 1992[1]. Altogether 23 (40%) of the children enrolled at the centre became ill (Table).

The nursery children were absent from the centre for an average of 4.5 days whereas older children were absent for an average of 2.6 days. Altogether, there was a total of 72 child-days absenteeism from the centre (Table and Figure 2).

Comment

Attendance at child day-care facilities is probably a risk factor for infection with rotavirus[2], and outbreaks of rotavirus infection have been described in child-care facilities elsewhere[3]. Extensive contamination of the day-care environment by rotavirus can occur during outbreaks.

Although there was very little rotavirus infection occurring in the general community at the time, presumably a reflection of the extensive 1992 outbreak[1], the current outbreak was focal, intensive and caused considerable absenteeism. Indeed, the child-days absent were almost equivalent to 14½ five-day weeks and therefore represent substantial lost productivity for the parents who had to care for the ill children. As expected, the peak incidence and the longest duration of symptoms occurred in the youngest group of children in the centre.

Figure 1. Rotavirus cases, by day and child-care group

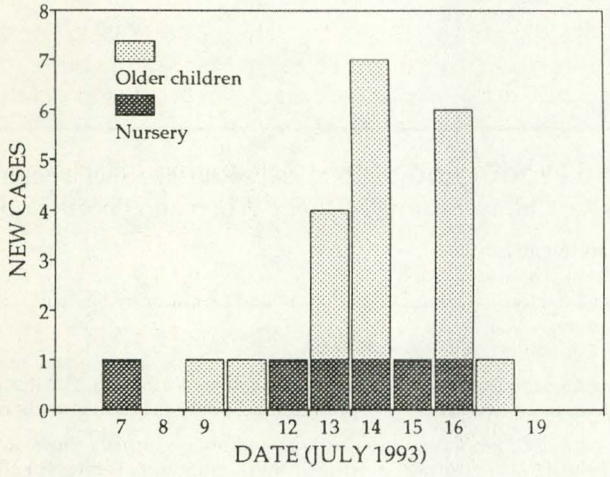

Figure 2. Absenteeism, by day and child-care group

Table. Enrolments, illness and absenteeism, by child-care group

	Nursery	Toddlers	Prekindy	Preschool	Total
Number enrolled	8	12	13	25	58
Number (%) ill	6 (75)	10 (83)	5 (38)	2 (8)	23 (40)
Total days absent	27	27	14	4	72
Average days absent	4.5	2.7	2.8	2	3.1

This outbreak occurred despite the routine cohorting of nursery children apart from older children, an active exclusion policy, regular cleansing of environmental surfaces (including toys) and well informed and motivated centre staff. Perhaps the outbreak, and therefore the consequent absenteeism and productivity costs, could have been prevented if the index case had not been allowed to return prematurely to the centre.

There is increasing interest in, and demand for, the care of mildly ill children in child-care facilities[5]. However, there can be no justification for the care of children with acute diarrhoea in such settings; they should be excluded until the diarrhoea has ceased[6]. Any relaxation of these exclusion criteria will encourage transmission of highly infectious enteric pathogens, in particular rotavirus, that could lead to extensive outbreaks necessitating considerable absenteeism and perhaps hospitalisation.

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CDI Editorial Comment

Outbreaks of diarrhoea in child day-care settings have been widely reported. The risk of diarrhoeal illness has been shown to be highest in children less than 13 months of age[1] and associated with environmental factors including the presence of non toilet-trained children, staff with combined duties of changing nappies/assisting toileting and preparation/serving of food, enteropathogen contamination of surfaces and children's normal behaviour of putting hands and objects in their mouths. Strategies to prevent transmission have been developed and shown to be successful for most of these factors.

Exclusion is widely used as a mechanism to reduce transmission of infectious diseases. The presence of enteropathogens (including rotavirus) in the environment and in the stools of asymptomatic children, and therefore the potential for transmission, has led to questions about the efficacy of exclusion policies. Contamination of the environment and spread between children is more likely to occur when the stool is liquid. Faecal containment is therefore a key issue in managing a potential outbreak of diarrhoea. In one study, faecal coliform contamination of the environment was less when clothes were worn over plastic pants, or when disposable nappies were used[2].

There is increasing interest in caring for mildly ill children in settings specifically designed for this purpose, a function separate from mainstream child-care. Early isolation of a child with diarrhoea, or early use of disposable nappies and alternative methods to prevent transmission continue to need to be assessed.

The NHMRC is developing guidelines for control of infectious diseases in day care settings. It is anticipated the document *Staying healthy in child care* will be available in early 1994.

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AN OUTBREAK OF GASTROINTESTINAL ILLNESS AMONGST SQUARE DANCERS IN THE VICTORIAN WIMMERA, MAY 1993

(Mark Veitch, National Centre for Epidemiology and Population Health, Australian National University, and Infectious Disease Unit, Department of Health and Community Services, Victoria; and Rory Wilby, Infectious Diseases Unit, Department of Health and Community Services, Victoria)

Background

A square dancing club held a dance in the school hall of a town in the Victorian Wimmera on the night of Saturday 1 May 1993. Dancers from various Victorian metropolitan and country square dancing clubs attended. They travelled to the Wimmera by a chartered bus or private cars, and stayed in commercial accommodation and private homes. Supper was provided at the dance, and barbecues were held in two Wimmera towns on the following day.

On Thursday 6 May the secretary of a visiting square dancing club rang the Infectious Diseases Unit, Department of Health and Community Services, Victoria, to report that many of the 40 club members who had attended the dance had developed gastrointestinal illnesses.

We report the results of the outbreak investigation to determine the nature and extent of this illness.

Methods

Initial investigations

We contacted several presumed cases to establish some detail of the illnesses. They described diarrhoea with abdominal pain which began suddenly of the morning of Monday 3 May. Some also complained of headache, back pain, vomiting and fever. Acute symptoms were self-limited. Two persons had attended their local doctor.

We also contacted local medical and environmental health officers to establish the background prevalence of gastrointestinal illness in the region. They had not noted more gastrointestinal illness than usual in the days or weeks before the dance. However, the chief scientist of the microbiology laboratory of the Wimmera Base Hospital reported that cryptosporidia had been identified in the stools of sixteen symptomatic persons from the Wimmera region during summer and autumn 1993, the last in mid-April. After local doctors were advised of these cases, there had been a dramatic increase in the number of faecal specimens submitted for microbiological analysis, but no increase in the number of pathogens identified.

We informed the Water Unit of Health and Community Services, Victoria of this suspected outbreak. The Wimmera media had recently reported algal blooms in reservoirs distantly related to the town water supplies, but it was considered unlikely that algae had contaminated relevant water supplies or caused the illnesses reported.

Data collection

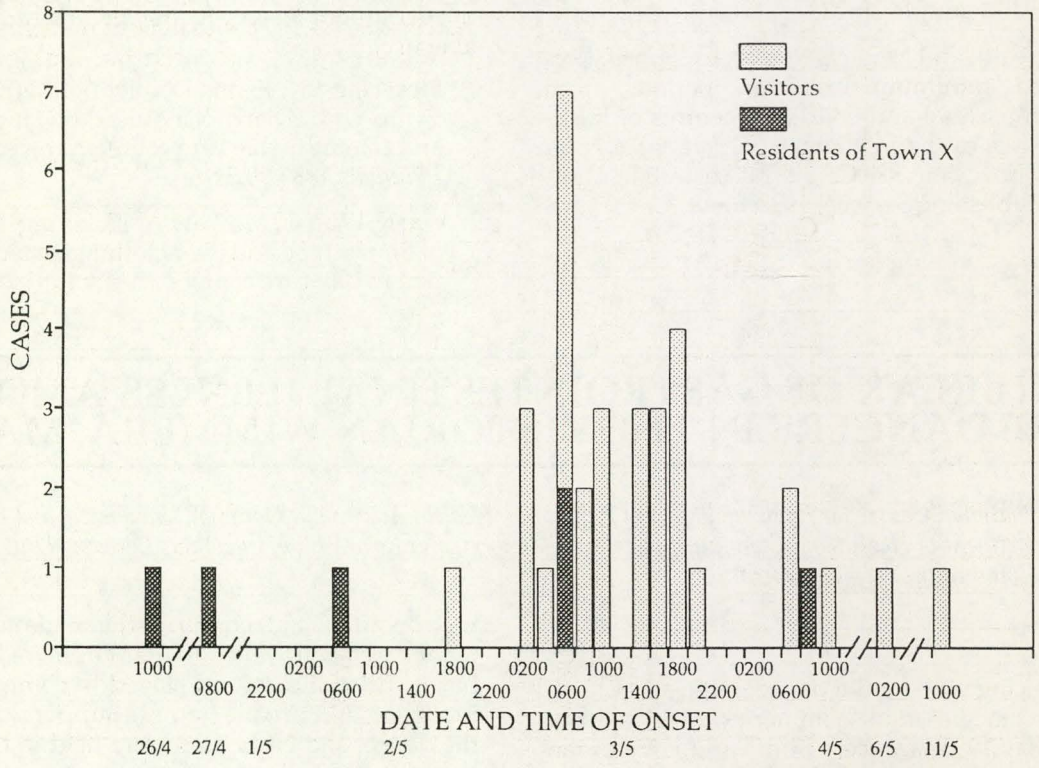
We obtained lists of people who went to the dance from the square dance organisers. We determined the food consumed at the square dance, information about its purchase and/or preparation and details of other meals, transport and accommodation, using a questionnaire administered by local Environmental Health Officers and members of the Infectious Diseases Unit. Environmental Health Officers collected faecal samples from members of the club which reported the outbre for microscopy, bacteriology and virology.

Case definition

We used the following definition of gastrointestinal illness:

1. diarrhoea or vomiting,
2. symptoms occurring within the period 26 April 1993 to 11 May 1993, and
3. attendance at the dance on 1 May 1993 or a barbecue in the Wimmera the next day.

Figure. Cases by date and time of onset



Results

All 68 persons who attended the dance (67 dancers and one bus driver) and three persons who only attended one of the two barbecues held the following day, completed questionnaires. The female:male ratio was 36:35. Their mean age was 42 years (range 3 to 80 years, median 44 years). Thirty-seven persons (52%) fulfilled the case definition. There was no statistically significant difference in attack rates by age or gender.

Nausea, diarrhoea, stomach cramps, headache and vomiting were the most commonly reported symptoms (Table 1). Myalgia/arthralgia was reported by six cases (16%), fever/chills by one (3%) and other symptoms by four (11%).

Two Wimmera residents became ill on 26 and 27 April. They were involved in preparation of food consumed at and after the dance and organisation of the activities of the weekend.

Thirty-three cases became ill between Sunday 2 May and Tuesday 4 May. Twenty of these (54% of all cases) became ill between 0200 hours and 1600 hours on Monday 3 May (Figure). The case with onset on 11 May may have been a secondary case, or have had an illness unrelated to the trip to the Wimmera 10 days earlier. This person reported consuming 'home made plum sauce', a gift from members of the host club, in the week following the dance.

The mean incubation period for illness following the dance supper (1 May 2200 hours) was 46.0 hours (median 37 hours, range 8.5 to 228 hours).

Square dancing club affiliation, mode of travel to the Wimmera, Saturday lunches or evening meals and accommodation on the night of the dance were not significantly associated with illness.

Supper at the square dance

We calculated attack rates (AR) and relative risks (RR) for gastrointestinal illness by food and drink consumed at the square dance supper. We excluded the two cases who were ill before the dance, and the three persons who did not attend the dance. Three items were associated with significant relative risks (Table 2).

There was a dose response relationship between the number of these 'risk' foods consumed, and illness (Table 3).

Most of the food consumed at the dance had been prepared by members of the host square dancing club. The ingredients had been purchased from a supermarket in Town Y, except for eggs used in the mini-quiches, which were from a local producer. Two local families prepared the drinks, mini-quiches, cold meat and cakes. Both families had several members ill with gastrointestinal illness between one and five days before the dance. The cordial had been prepared with tank (rain) water from the school supply, with commercial flavouring. It was distributed from a 10 litre plastic container which had been cleaned with a combination of hot town water and cold tank water. Water for the tea and coffee had also been drawn from the school tank and boiled in an urn. Another local square dancer, who had been in contact with ill workmates during the week before the dance, prepared the sausage rolls and tomato sauce.

Table 1. Symptoms reported by cases

	Number
Nausea	33 (89%)
Diarrhoea	28 (76%)
Stomach cramps	24 (65%)
Headache	22 (59%)
Vomiting	21 (57%)

Table 2. Square dance supper food items significantly associated with gastrointestinal illness

	Consumers			Non-consumers				
Food/drink	Number	Cases	AR[1]	Number	Cases	AR	RR[2]	95% CI[3]
Sausage rolls	47	29	0.62	19	4	0.21	2.93	(1.19-7.20)
Mini-quiches	19	14	0.74	47	19	0.40	1.82	(1.18-2.83)
Cordial	31	21	0.68	35	12	0.34	1.98	(1.18-3.32)

1. AR attack rate.
2. RR relative risk.
3. CI confidence interval

Table 3. Relationship of consumption of 'risk' foods at the square dance supper to illness

Number of 'risk' foods[1] consumed	Number	Cases	Attack rate	Odds ratio[2]
None	11	1	0.09	1.0
One	22	7	0.32	4.7
Two	23	17	0.74	28.3
All three	10	8	0.80	40.0

1. Sausage rolls, mini-quiches, cordial.
2. Chi square for linear trend = 18.84, p = 0.00001.

Table 4. Attack rates by place of Sunday lunch

	Number	Cases	Attack rate
Barbecue in Town X	24	17	0.71
Barbecue in Town Y	34	16	0.47
Private homes in Wimmera	7	0	0
En route back to Melbourne	3	1	0.33

Sunday lunch

We excluded the three cases who became ill before the barbecues when considering the risk of illness associated with the various Sunday lunches. Attack rates of gastrointestinal illness were determined according to where Sunday lunch was consumed (Table 4).

There was no significant association between illness and attendance or consumption of food at either barbecue. Three visitors who had not attended the square dance attended the barbecue in Town X. Two ate sausage rolls left over from the dance and became ill the next day. One, who remained well, ate 'nothing'.

Water in the Wimmera

There were 18 cases amongst 25 persons who drank untreated town water (AR 0.72) and 20 cases amongst 42 who drank boiled or tank water (AR 0.48). These results are confounded by people who drank water from both sources, drank cordial at the dance, or inaccurately recalled the sources of the water they drank on the weekend.

Microbiological studies

Samples of faeces from twelve persons, including eight cases, were analysed for bacterial, protozoal and viral pathogens. *Blastocystis hominis* was found in the faeces of two, one of whom had been ill. Cysts of *Giardia lamblia* were present in the faeces of one asymptomatic person. No bacterial pathogens were grown from cultures, and cryptosporidia were not detected.

Faeces from the above twelve persons, and from an additional nine, including six cases, underwent electron microscopy for viral pathogens. None were identified.

During the weeks following the outbreak the pathology department of Wimmera Base Hospital did not identify any particular pathogen causing localised or widespread outbreaks of gastrointestinal illness. No further cryptosporidia were detected. Fewer faecal samples were being received by the laboratory.

Discussion

The Saturday night dance and supper, and the two barbecue lunches 15 hours later were exposures common to almost all square dancers. Both these gatherings were potential sources of the outbreak. Evidence for the dance and supper being the source includes the three food items associated with small but significant relative risks of illness, the dose-response effect seen with these foods, the illness of two persons who did not attend the dance but ate sausage rolls left over from the dance the next day, and the lack of association between attendance at the barbecues or consumption of foods specific to the barbecues with illness.

The three food or drink items statistically associated with illness conferred only a two to three-fold increased risk of illness. Twenty-five cases consumed two or three risk foods. It is therefore difficult to implicate a particular food item as the source of infection.

Several food preparers for the dance, including the two cases who became ill on 26 and 27 April, had been either ill in the week before the dance, had ill family members, or contact with ill people. An infectious agent may thus have been introduced to and spread by food.

The analysis of exposures after the dance is confounded by the preceding common exposure at the dance. The one case to become ill between the dance and barbecu[illegible] was a Wimmera resident, and may therefore have been infected as part of a local outbreak, rather than from food or contact at the dance. Two of the three persons who went to the barbecues in Town X without recent exposure to the local environment, or to the dance, became ill. Both these persons ate sausage rolls left over from the dance supper which were associated with a significant relative risk of illness when consumed at the dance supper. Persons at both barbecues became ill, as did persons who attended neither. There were no foods common to both barbecues, although sausage rolls were eaten at both the dance and the Town X barbecue, and home-made tomato sauce was eaten at both the dance and the Town Y barbecue.

Wimmera residents reported noting much more diarrhoeal illness than usual in the weeks around the dance although this phenomenon was not noted by the local Medical Officers of Health. The first two cases to develop symptoms may thus have been representative of an outbreak of gastroenteritis occurring in the Wi[illegible]mera of which the square dancing locals and visitors became part. A more remote common source such as the local water may have transmitted an infectious agent to both local residents and visitors. Local doctors were aware of cases of cryptosporidiosis in the area and a form of surveillance had been established before the present outbreak. However, no particular pathogens had been identified by the local laboratory, although specimens from adults were not routinely processed for viruses.

Gastrointestinal illness was present amongst some dancers and their families and contacts before the dance. Agents of gastroenteritis may be spread by close personal contact[1]. The relative intimacy and frequency of partner changes which are integral to square dancing may have facilitated such spread. Person to person spread may have occurred at the dance or at one of the other gatherings of dancers during the weekend.

The illnesses described by cases in this outbreak were consistent with infection by viruses (Norwalk-like agents, rotavirus, enteric adenovirus), cryptosporidia,

and bacteria (*E. coli, Campylobacter, Salmonella*). Most specimens were collected four days after the onset of the outbreak, when many cases were asymptomatic. This delay in specimen collection would have reduced the likelihood of identifying pathogens in faeces. An invasive bacterial infection is unlikely due to the moderate severity of the symptoms and absence of positive cultures. For similar reasons, cryptosporidiosis can probably, but not definitely, be excluded. The incubation period was too long for a gastroenteritis due to a preformed toxin, but was consistent with those of viral gastroenteritis and enterotoxin-producing *E. coli* disease, as were the illnesses.

Conclusion

This small outbreak of gastrointestinal illness was associated withs the consumption of several food items at a square dance supper. Similar illness was reported in the wider Wimmera community around the same time. Transmission of an infectious agent by other routes, such as a remote common source or person to person contact may also have occurred.

Acknowledgments

We thank the square dancers, local Environmental Health Officers, the Microbiological Diagnostic Unit, University of Melbourne and the Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital for their assistance in this investigation, and Dr Angela Merianos, Research Fellow, National Centre for Epidemiology and Population Health, Australian National University, for her help in preparing this report.

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AN OUTBREAK OF GASTROENTERITIS AT A BROWNIE CAMP

(Sue Selden[1,2], Scott Cameron[1], Peter Jarrett[3] and Colin Clark[4])

Introduction

On Monday 31 May 1993 the Communicable Disease Control Unit (CDCU) of the South Australian Health Commission (SAHC) received a call from a mother whose daughter had become ill whilst attending a Brownie camp (28 to 30 May) at a campsite in the Adelaide Hills, some 20 kilometres northeast of Adelaide. The mother reported that 35 of about 150 Brownies and staff had taken ill by 10.00am on Sunday 30 May when parents arrived to collect their children and the camp was prematurely closed. The children had gastrointestinal symptoms and some had required medical treatment. The Food, Nutrition and Regional Services (FNRS) of SAHC, which is responsible for the investigation of foodborne outbreaks, was notified immediately.

Methods

The list of camp attenders and the menu was supplied by Brownie leaders. A questionnaire on foods and drinks consumed and illness details was prepared by the FNRS. Environmental Health Officers (EHOs) from the four local council areas where the majority of children lived delivered the questionnaires to the households involved, with containers and instructions for the collection of fresh specimens of vomitus and faeces. Two faecal specimens were subsequently tested for bacteria, viruses and parasites. The campsite local council EHO was contacted and a site survey requested.

The first 55 questionnaires returned were analysed and showed that the majority of children and adults complained of a range of gastroenteritis-related symptoms. The questionnaires also reported complaints of a blocked and overflowing toilet block at the campsite, 'funny' tasting tank water, and the presence of animal droppings on the beds and floors in the dormitories when the campers first arrived. One father stated that during the rain on the Saturday night there had been ankle-deep water behind the activities hall and the smell of raw sewage.

In view of this apparently high attack rate, all other known campers were contacted by telephone and details of illness (symptoms, onset and duration) sought. This confirmed the high attack rate and also revealed that secondary cases were common in the families of camp attenders. About one third of households were contacted to seek secondary cases of recent onset for collection of fresh faecal and vomitus specimens.

An ill case was defined as suffering from vomiting, nausea, diarrhoea and/or abdominal cramps with or without myalgia, headache and/or fever.

1. Communicable Disease Control Unit, South Australian Health Commission.
2. National Centre for Epidemiology and Population Health, Canberra.
3. Environmental Surveillance Unit, South Australian Health Commission.
4. Food Surveillance Unit (formerly Food, Nutrition and Regional Services), South Australian Health Commission

On 10 June, water samples were collected from taps in the camp kitchen and a site inspection was undertaken by FNRS and CDCU staff. When faecal coliforms were identified in the initial water samples and the site inspection indicated problems with a septic tank, a further site inspection was undertaken, on 17 June, to test the integrity of the water bore and to identify sources of possible water pipe contamination. Water samples were collected from the bore (top, shallow/medium and deep), the header tank, the rainwater tank, all the taps in the kitchen and one tap in the caravan area. The tap from the rainwater tank in the kitchen had been removed. Information on the bore was sought from the Department of Mines.

Organisers of a camp for disadvantaged children held the week prior to the Brownies' camp were contacted and asked if they could provide information on any illness in those attending, with onset during or immediately after the camp.

Results

Geography, geology and camp site inspection

The camp is situated in a narrow valley with cattle and horses kept on properties backing onto the campsite. Sheep grazed on the steep slope to one side above the bore. The creek through the camp runs through these properties and would be heavily contaminated with animal dung after rain.

The first inspection of the camp showed that the dormitories were clean but had evidence of heavy millipede infestation (not animal dung). One septic tank pump had obviously been recently repaired. It was situated 100 metres uphill from the bore which was located behind the main activities hall and hidden by tall grass. The toilet block near this septic tank was locked although it was denied that there had been any problem with this septic tank at the time of the camp. The kitchen was clean and there was a new warning sign over the tap from the rain water tank. This tank was in poor condition and its water thought to be contaminated.

During the second camp inspection we were informed that there had been trouble with one septic tank pump with occasional overflow for perhaps the last three months. The normal outflow for the effluent ran down the side of the property (close to the bore) and discharged in to a soakage trench, 50 metres below the bore. There was a depression in front of the bore casing. Water which collected in it during the testing of the bore quickly drained into the soil. Agricultural pipe had been laid up and down the hill to deal with the large amounts of water run-off that occurred during rain, and the soil above them had settled to form channels that ran down behind the activities hall, within two metres of the bore (Figure 1). Any septic tank overflow would have been washed down these channels during rain. Soil from one of the channels smelt of effluent. The bore water was not treated in any way and the 'pure' water was one of the attractions of the camp.

The Department of Mines informed us that the bore was 27 metres deep and the water table was at 2.7 metres. Bedrock in the area was generally between five to six metres below the surface and being of slate and quartz was not impervious.

Survey results: Brownies' camp

Information was eventually obtained from 95% (138/145) of attenders. Of these, 84% (116/138) had been ill between 29 May and 1 June 1993. The peak of illness was on 30 May (Figure 2). Eighty-six per cent (100/116) of the children (aged seven to 15 years) were ill as were 73% (16/22) of the adults (aged from 18 to 66 years).

Figure 1. Schematic drawing of septic tank, drains and bore site at the campsite

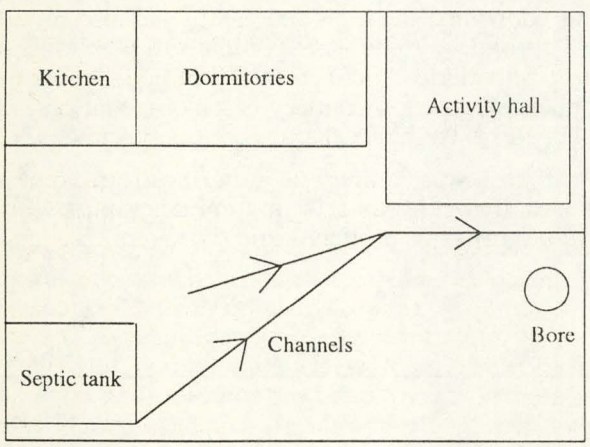


Figure 2. Gastroenteritis cases at the Brownie camp, by time of onset, 28 May to 2 June 1993

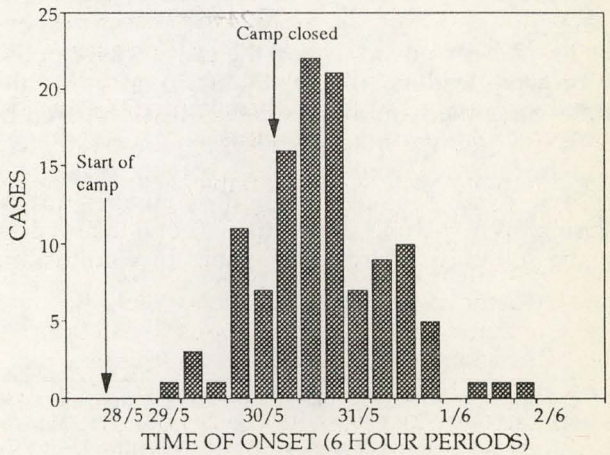


Table 1. Gastroenteritis cases in Brownies and adults, by reported symptoms

Symptoms	Brownies (per cent) (n=100)	Adults (per cent) (n=16)	Total (per cent) (n=116)
Vomiting	87	60	84
Nausea	85	93	86
Diarrhoea	38	53	40
Abdominal cramps	68	50	65
Myalgia	26	61	30
Headache	60	85	63
Fever	50	46	49
Sore throat	33	39	34

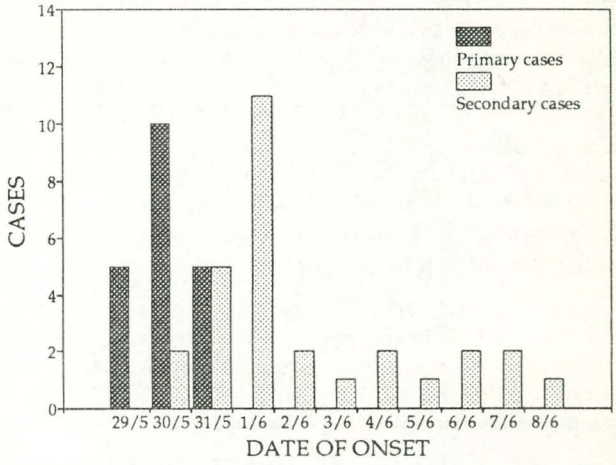
Sixty-five per cent (90/138) of campers complained of vomiting, nausea and/or diarrhoea with or without abdominal cramps, myalgia, headache and/or fever. Sixteen per cent (22/138) complained only of nausea, vomiting and/or diarrhoea and 3% (4/138) had prolonged abdominal cramps with or without myalgia. The symptoms in decreasing order of frequency (for both adults and children) were nausea (86%), vomiting (84%), abdominal cramps (66%), headache (63%), fever (49%), diarrhoea (40%), sore throat (34%) and myalgia (30%). Children were more likely to have had vomiting and cramps, and adults nausea, headache and diarrhoea (Table 1).

One of the nauseated children had fallen and hit her head when trying to get out of the bunk at the camp on the night of 29 May. She had been sent home with suspected concussion that night and her mother stated it was difficult to know how much of the nausea and other symptoms (unspecified) were due to concussion or to the camp illness.

The incubation period was difficult to determine. The first child was ill within nine hours of arriving at camp, two others within 12 hours. Sixty-two per cent (72/116) were ill within 24 to 48 hours of arrival, and a further 35% during the following 24 hours. Three children were ill 48 to 60 hours after leaving camp. The incubation period was approximately 24 to 48 hours in known secondary cases in household contacts (Figure 3). It is possible that some of the later cases in campers could have been secondary cases who acquired the infection from aerosolised virus in vomitus.

The duration of illness was variable, with 51% reporting being ill for one day or less and 94% being ill for three days or less. Most parents would have completed the questionnaire by this time. At the time of telephone contact (at the beginning of the second week), however, it was not uncommon to be told the child had been sick for 24 to 48 hours, then seemed well (and went to school) for 24 to 48 hours, to then begin vomiting (with or without diarrhoea) for a further 24 hours. Secondary cases had a similar course, with both adults and children having a relapsing illness and being still unwell one week later.

Figure 3. Secondary cases of gastroenteritis in 19 Brownie campers' households, 28 May to 8 June 1993, by day



In 19 households with 20 primary cases, there were 29 possible secondary cases. Of these, 61% complained of diarrhoea, 61% vomiting, 38% nausea and 23% cramps. About half of the households which were contacted reported secondary cases.

Camp 2: camp for disadvantaged children

Fifty-three per cent (17/32) of the children attending this camp complained of vomiting, nausea, cramps and diarrhoea in the days following the camp. Some of the children were sick for a few days, went to school for a day or so, then became sick again. In one family of four children, the two oldest, who always drink a lot of water, were sick for nearly two weeks. Only one of the 10 adults was affected. In view of the information we already had, no further follow up was undertaken.

Microbiological results

The two faecal specimens were negative for parasites, pathogenic bacteria and viruses. One mother informed us that *Blastocyctis hominis* was detected in a faecal specimen collected from her daughter during the second phase of diarrhoea. No fresh specimens were available from secondary cases by the time they were identified.

The results of the water sampling indicated faecal contamination of the bore had occurred (Table 2).

Discussion

This investigation is interesting for a number of reasons. Initially it was presumed that the outbreak was foodborne and the questionnaires were prepared to facilitate risk assessment associated with consumption of various food items. The camp site was visited by the local EHO and thought to be satisfactory. The water samples indicated faecal contamination, however, the taps had not been flamed and some local contamination may have occurred. When the first group of questionnaires suggested that 90% of attenders had varying

Table 2. Water sample results

Date	Water source	Coliforms per 100 mL	Faecal coliforms per 100 mL	*E. coli* per 100 mL
10 June	Left tap	>181	>181	28
	Right tap	181	181	13
17 June	Left tap	181	11	3
	Right tap	181	2	2
	Cleaner's tap	92	17	5
	Tap near barbecue	>181	22	10
	Caravan area tap	181	16	11
	Rainwater tank	>181	3	3
	Header tank	181	7	5
	Bore - deep	>181	12	10
	Bore - shallow	54	10	7
	Bore - tap (first sample)	>181	21	21

gastrointestinal symptoms the focus was changed to a waterborne aetiology.

Until the final visit on 17 June there were conflicting reports regarding a malfunctioning septic tank with probable contamination of the bore, and a rainwater tank which was probably contaminated but would not have been used. All taps were flamed for the collection of the second group of samples. The history, site examination and water microbiology all indicated faecal contamination of the bore had occurred. There had been little rain in the two weeks between the end of the camp and the collection of the last water samples. With no further overflow from the septic tank, die-back (the normal decrease in numbers of viable organisms that occurs over time) could have occurred in the bore. The level of contamination of the bore water at the time of the camp is not known but it can be assumed that the Brownies used faecally contaminated water for foods, drinks and washing.

The aetiology of the outbreak was not determined although the epidemiology (symptomatology, incubation period and duration of illness) is suggestive of a Norwalk-like virus. Norwalk virus antigen was not available for paired serological tests, so blood samples were not sought from the cases.

Norwalk virus illness following contamination of underground water sources from septic tank problems is well-documented[6,7] and water-borne viral disease is associated with the presence of bacterial indicators in water[8]. Norwalk-like virus illnesses have an incubation period of 24 to 48 hours with a range of 10 to 51 hours, and a mean duration of 12 to 60 hours. Nausea is a prominent symptom and most cases also have vomiting, non-bloody diarrhoea and abdominal cramps, with diarrhoea relatively more prevalent in adults and vomiting in children. Twenty-five to 50% of cases also report headaches, fever, chills and myalgia[1,2]. Explosive outbreaks and rapid spread suggest inhalation of aerosolised virus occurs either from faecal contamination of the environment or from vomitus containing virus[1,2]. Recent literature records attack rates of 30% to 67% with a mean of 50% for Norwalk-like viral illnesses[3,4,5].

This outbreak, however, differs from existing descriptions of Norwalk-like viral illness, in particular in the high attack rate and the biphasic nature of the illness.

The first child was ill nine hours after arrival at the camp. There had been background gastro-enteritis in the schools with which her illness may have been connected. The last three children to become ill did so 48 to 60 hours after leaving the camp. Two of these may have been secondary cases, as other family members attended the camp and were ill.

An attack rate of 84% is much higher than attack rates previously noted. No limiting case definition was used and all those with gastrointestinal symptoms were included. This was done for two reasons. First, even those who had only one symptom (for example nausea or abdominal cramps) had a duration of three days or more and were partially incapacitated by the illness. Second, as the causative agent had not been identified it was felt necessary to consider the full spectrum of illness during the outbreak.

The epidemic curve could be consistent with the continued exposure to a contaminated source or with propagated transmission from a point source outbreak, or a combination of the two. The Brownies were accommodated in dormitories each sleeping up to 40 children and adults. Throughout the Saturday night there were at least 20 girls vomiting, many being unable to leave their bunks. One of the leaders described 'vomit hitting the walls and the floor everywhere'. Dormitories are known to be a risk factor for secondary cases of viral gastroenteritis[2,9].

A history of a five to seven day illness, with a symptom-free period in the middle, was not unusual in our study. Description of a similar pattern could not be found in the available literature although it has been reported that elderly persons may be affected for longer than one week[2]. With faecal contamination of the water it is possible that two aetiological agents could

have been involved, however, with the same pattern seen in many of the secondary cases this is less likely.

Conclusion

An outbreak of acute gastroenteritis at a Brownie camp was investigated. Although no aetiological agent was identified, a Norwalk-like viral illness is postulated. Faecally contaminated drinking water and a contaminated environment (from blocked toilets and septic overflow, and vomiting) probably contributed to the high attack rate.

The camp site had been due to close for major re-development and two scheduled camps were voluntarily cancelled by the camp owners following this outbreak. The following recommendations were given to the camp owners:

1. the local EHO will monitor the bore by water sampling monthly,
2. the Department of Mines will advise on rehabilitation of the bore surroundings,
3. the bore water supply should be chlorinated, and
4. drains should be reconstructed and moved away from the bore.

Note

By attending the camp the Brownies earned their camping badge inscribed with the insignia 'Camping is Fun'.

Acknowledgments

We wish to thank the Public Health and Environmental Health Service, South Australian Health Commission, and the Institute of Medical and Veterinary Science, Adelaide, for their participation and support.

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OVERSEAS BRIEFS

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

Cholera Update

An outbreak has been reported in various provinces of Afghanistan. The Government is taking control measures in collaboration with international agencies. Tajikistan has reported cases and deaths from its southern border area which is adjacent to Afghanistan. Ilala and Kinondoni Districts of the Dar es Salaam Region of Tanzania have been declared infected. Moatize District, Mutarara District and Tete City in Tete Province of Mozambique and Chepo and Chiman Provinces of Panama have been removed from the list of infected areas.

Cases have been reported for June and July from Afghanistan, Belize, Bolivia, Brazil, Colombia, El Salvador, Ghana, Honduras, Mexico, Mozambique, Nicaragua, Peru, Tajikistan, Tanzania and Venezuela.

Typhoid in Western Samoa

The number of cases of typhoid reported in Western Samoa is decreasing. On the island of Upolo, carriers have been identified and treated. On the island of Savaii, carriers are now being sought and 3000 doses of vaccine are being distributed.

Influenza Update

In New Zealand, influenza occurred in most areas in June. Influenza A H_3N_2 predominated, but influenza B was also isolated from sporadic cases and during a localised outbreak in the Wellington region.

In South Africa, increased influenza activity has been noted since the beginning of May, and a few cases of influenza A have been laboratory confirmed. One isolate was identified as influenza A H_3N_2.

COMMUNICABLE DISEASES SURVEILLANCE

Virology and Serology Reporting Schemes

There were 2148 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 10, 11 and 12). Included were some reports from Queensland that were unable to be included last fortnight.

- **Measles** was reported for 7 patients, one from Tasmania and six from Queensland. There has been a total of 151 cases of measles reported with 1993 specimen collection dates.
- There were 19 **rubella** reports this fortnight. There were 6 females in the age group 15 to 44 years, including 2 who were pregnant.
- **Hepatitis C** was reported for 167 patients. One was a haemophiliac, one had a needlestick injury as the reported risk, one had a history of blood transfusion, 2 were pregnant, one was HIV positive, one had NK cell deficiency and 36 had a history of injecting drug use.

  Cases were reported for the first time to the *CDI* Laboratory Reporting Schemes on the basis of detection of nucleic acid (RNA) in serum samples. This test indicates viral activity in the liver and infectivity. In acute infections, it is positive and then becomes negative. In chronic infection, 2 patterns are seen. In some patients, the test is always positive. In others, it alternates between being positive and negative.
- There were 80 reports of **Ross River virus** infection this fortnight, bringing the total for the year to 1508. All were presumptive (IgM). The peak in reports this year was in March.
- **Barmah Forest virus** infection was reported for 8 patients. All diagnoses were presumptive (IgM) and all were from Queensland.
- **Murray Valley encephalitis virus (MVE)** infection was reported for a 33 year old female patient from Katherine in the Northern Territory. Encephalitis was the reported syndrome for this confirmed case. A total of nine confirmed cases of MVE infection have been reported for this year so far. Four have been from patients in the Northern Territory, 4 from Western Australia and one not stated. There have been 3 females and 6 males. The ages have been one year (3 patients), 2 years, 24 years, 29 years, 33 years, 38 years and 62 years. Encephalitis was the reported syndrome for 7 patients, general malaise was reported for one and there was no clinical information for the other.
- Flavivirus activity continues to be reported from northern Queensland. **Dengue 2** was reported for 110 patients. All were presumptive (IgM). One hundred were from Townsville, one from Mt Isa, 4 from Mackay and 5 from Cairns. Specimen collection dates were March (5), April (63), May (38) and June (4). Presumptive **untyped dengue** was reported for 34 patients, 33 from Townsville and one reported from Toowoomba. Specimen collection dates were March (2), April (19) and May (13). **Unspecified flavivirus** was reported for 21 patients, all from Townsville. All were presumptive (IgM). Specimen collection dates were April (10), May (10) and June (1). These reports peaked in March-April this year, earlier than the June peak last year.
- **Echovirus type 11** was reported for seven patients this fortnight. There have been 50 reports of this virus this year, more than for any year since 1990. Twenty-one have been from New South Wales, 23 from Victoria, three from Western Australia and one each from the ACT, South Australia and Queensland. Meningitis and/or CSF isolate was reported for 26 patients, eye disease for one patient, cardiac symptoms for one, gastrointestinal for 3, respiratory disease for 13, general malaise or fever for 2 and one isolate was from postmortem respiratory tract tissue from an infant who had suffered SIDS.
- There were 71 reports of **influenza**, 24 of **untyped influenza A** (2 isolates, 5 antigen detections, 1 IgM, 15 single high titres, 2 other serological), one of an influenza A H_3N_2 isolate, one of an untyped influenza isolate and 45 of **influenza B** (12 isolations including one B/Panama-like, 3 antigen detections, one fourfold change and 29 single high titres). Two influenza A reports and two influenza B reports were for patients aged over 65 years. Encephalitis was the reported symptom for a 53 year old male with influenza B. Another influenza B report was an isolate from postmortem lung tissue from a 6 year old male.

  There has been a total of 117 reports of influenza A and 140 reports of influenza B with 1993 specimen collection dates so far. For influenza B, this is more than reported for 1991, the last year in which it

predominated. For influenza A, it is much less than for 1992, when influenza A H_3N_2 was dominant (Figures 1 and 2). Most influenza reports (both A and B) have been from Queensland, South Australia and Western Australia and 9 influenza A reports have been received from Victorian laboratories.

Figure 1. Influenza A laboratory reports, 1992 and 1993, by month of specimen collection

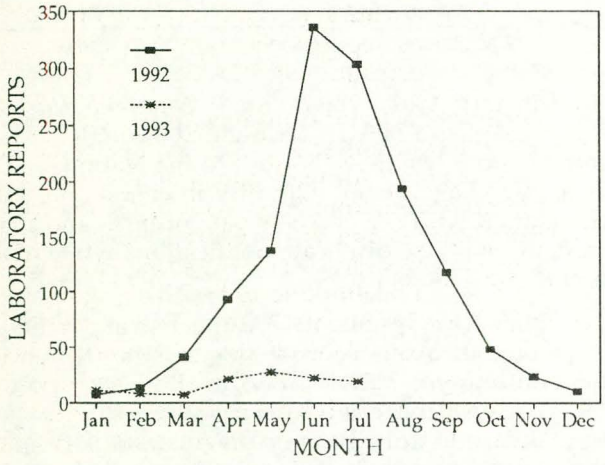
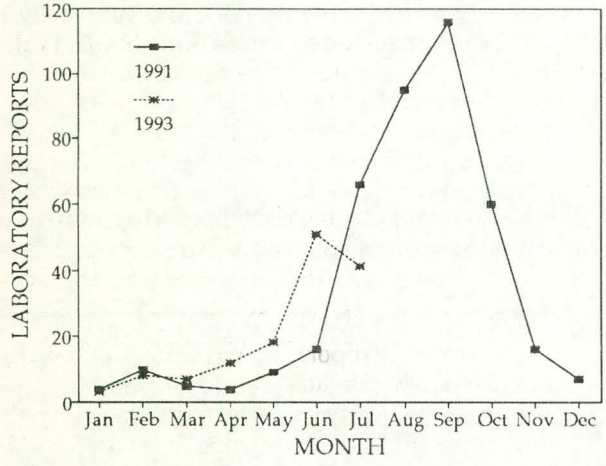


Figure 2. Influenza B laboratory reports, 1991 and 1993, by month of specimen collection



- **Respiratory syncytial virus** infection was reported for 479 patients this fortnight. There were 29 reports for patients aged less than one month, and 290 for those aged 1 to 11 months. Included were a child in the 5 to 14 year age group with a malignancy and a 12 week old premature infant with severe respiratory distress.
- There were 137 **rotavirus** reports this fortnight. There were 45 in children aged less than one year, 77 aged between one and 4 years and 12 in patients aged over 5 years. The male:female ratio was 2.0:1.0 (91 males and 46 females). The number of rotavirus reports received so far this year is higher than the average recorded for the last 5 years (Figure 3).
- *Bordetella pertussis* infection was reported for 9 patients. Three were aged between one and 11 months, one was in the age group 1 to 4 years and there were 5 aged more than 5 years. Included was a patient from whom the organism was isolated.
- There were 26 cases of **Q fever** reported this fortnight. Four were in females and 22 were in males. Abattoir work or other animal contact was reported as a risk factor for 4 patients.
- *Treponema pallidum* infection was reported for 41 patients. Risk factors reported were migrant/refugee or overseas travel for 6 patients, pregnancy for 5 patients and one patient was HIV positive (died). One male patient (age group 45 to 64 years) was diagnosed by serological tests on a CSF sample and had encephalitis as the reported syndrome.

Figure 3. Rotavirus laboratory reports, 1993 and 1988-92 average, by month of specimen collection

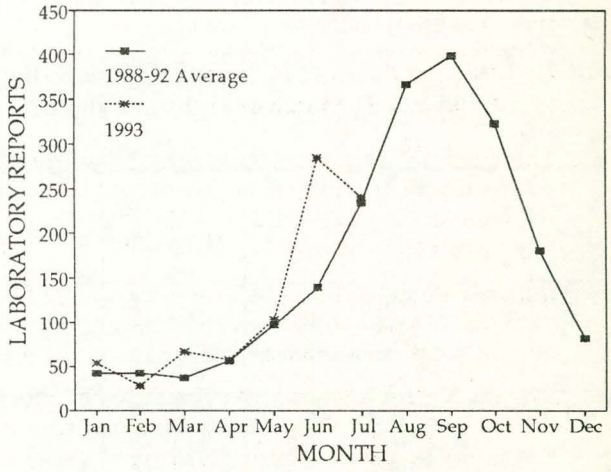


Table 1. Australian Sentinel Practice Research Network, Weeks 30 and 31 1993

Condition	Week 30, to 25 July 1993		Week 31, to 1 August 1993	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	97	14.6	71	12.5
Measles	2	0.3	1	0.2
Rubella	2	0.3	1	0.2
Pertussis	0	0	3	0.5
Genital herpes	4	0.6	6	1.1
Gastroenteritis	87	13.1	56	9.8

Australian Sentinel Practice Research Network

The Australian Sentinel Practice Research Network collected data from 6665 patient encounters in Week 30 and from 5689 patient encounters in Week 31 (Table 1). Influenza and gastroenteritis continue to be reported at high rates.

HIV and AIDS Surveillance

Methodological note

National surveillance for HIV disease is coordinated by the National Centre in HIV Epidemiology and Clinical Research (NCHECR), in collaboration with State and Territory health authorities and the Commonwealth of Australia. Cases of HIV infection are notified to the National HIV Database on the first occasion of diagnosis in Australia, by either the diagnosing laboratory (ACT, New South Wales, Tasmania, Victoria) or by a combination of laboratory and doctor sources (Northern Territory, Queensland, South Australia, Western Australia). Cases of AIDS are notified through the State and Territory health authorities to the National AIDS Registry. Diagnoses of both HIV infection and AIDS are notified with the person's date of birth and name code, to minimise duplicate notifications while maintaining confidentiality.

Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting interval indicated, to allow for reporting delay and to incorporate newly available information. More detailed information on diagnoses of HIV infection and AIDS is published in the quarterly *Australian HIV Surveillance Report*, available from the National Centre in HIV Epidemiology and Clinical Research, 376 Victoria Street, Darlinghurst NSW 2010. Telephone: (02) 332 4648 Facsimile: (02) 332 1837.

HIV and AIDS diagnoses and AIDS deaths reported to 30 June 1993 for 1 to 31 March 1993, and cumulative to 31 March 1993, are included in this issue of *CDI* (Tables 2 and 3).

Table 2. New diagnoses of HIV infection, new diagnoses of AIDS and deaths from AIDS occurring in the period 1 to 31 March 1993, by sex and State or Territory in which diagnosis was made

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA			
										This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
HIV Diagnoses	Female	0	2	0	0	0	0	1	0	3	7	21	26
	Male	2	66	0	7	5	0	19	1	100	95	253	326
	Sex not reported	0	3	0	1	0	0	0	0	4	5	6	13
	Total[1]	2	73	0	8	5	0	20	1	109	107	282	366
AIDS Diagnoses	Female	0	0	0	0	0	0	0	0	0	0	2	3
	Male	0	26	0	1	0	0	5	2	34	23	107	83
	Total[1]	0	26	0	1	0	0	5	2	34	23	109	86
AIDS Deaths	Female	1	0	0	0	0	0	0	0	1	2	4	6
	Male	1	18	1	7	2	0	10	0	39	44	93	122
	Total[1]	1	19	1	7	2	0	10	0	40	46	97	128

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

Table 3. Cumulative diagnoses of HIV infection, AIDS and deaths from AIDS since the introduction of HIV antibody testing to 31 March 1993, by sex and State or Territory

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	AUSTRALIA
HIV Diagnoses	Female	10	462	6	62	36	3	124	40	743
	Male	137	8892	66	1139	494	65	2814	607	14214
	Sex not reported	0	2029	0	1	0	0	64	0	2094
	Total[1]	147	11390	72	1205	530	68	3009	648	17069
AIDS Diagnoses	Female	2	77	0	15	10	2	18	9	133
	Male	47	2340	16	343	155	24	852	183	3960
	Total[1]	49	2422	16	359	165	26	873	192	4102
AIDS Deaths	Female	2	45	0	10	3	1	9	3	73
	Male	34	1469	7	230	96	13	583	120	2552
	Total[1]	36	1516	7	241	99	14	594	123	2630

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

Victorian Influenza Surveillance System

Included in this issue of *CDI* are results for 1993 fortnights 3 to 6 for the Victorian Influenza Surveillance System (Table 4). This system is conducted by the Infectious Diseases Unit of Health and Community Services, Victoria, and includes surveillance data supplied by sentinel general practitioners, diagnostic laboratories, hospitals, schools and industry. Total deaths (which usually increase during influenza epidemics) are also being monitored.

Laboratory cases and the rate of hospital admissions have increased over this period.

(Raina MacIntyre, Health and Community Services, Victoria)

Australian Encephalitis Sentinel Chicken Surveillance Programme: serological results - June 1993

Sentinel chicken serology was undertaken for 19 of 24 flocks in the Pilbara and Kimberley regions of Western Australia. A total of 35 seroconversions to flaviviruses were observed during June, of which 29 were to Murray Valley Encephalitis (MVE) virus, one was to Kunjin virus, and 5 were due to dual infections with MVE and Kunjin viruses. In the Kimberley region, there were 11/23 seroconversions among the three flocks located in Broome, 10 of which were to MVE and one was a dual infection; 9/10 seroconversions occurred in the flock at Derby (site 2), 7 of which were to MVE and 2 were dual infections; and 3/5 seroconversions occurred at Fitzroy Crossing, all of which were due to MVE virus. In the Pilbara region 4/12 seroconversions were observed at the Harding Dam (site 2), of which 3 were to MVE and one was a dual infection; 1/8 chickens seroconverted to MVE at Harding Dam (site 1); 1/9

Table 4. Victorian Influenza Surveillance System, fortnights 3 to 6, 1993

	Fortnight 3 31 May to 7 June	Fortnight 4 14 to 25 June	Fortnight 5 28 June to 9 July	Fortnight 6 12 to 23 July
General practices (34) Influenza cases (per 100 patients seen)	45 (0.7)	25 (0.6)	56 (1.0)	28 (0.7)
Laboratories (2) Influenza cases (per 100 specimens)	1[1]	0	3[1] (1.2)	9[2] (4.7)
Hospitals (3) Influenza and/or pneumonia admissions (per 100 admissions)	33 (0.66)	25 (0.78)	33 (1.00)	32 (1.00)
Industry (2) Total absenteeism (per cent)	75 (2.4)		78 (4.2)	65 (6.0)
Schools (30) Total absenteeism, Tuesday (per cent)	1867 (14.5)	1867 (12.0)	678 (7.4)	502 (7.0)
Deaths, total from all causes (per 10,000 population)	1361 (2.9)	1217 (2.9)	1249 (2.9)	1363 (3.2)

1. Influenza A.
2. 6 infleunza A, 3 influenza B.

chickens seroconverted to MVE at Ophthalmia; 1/12 chickens seroconverted to MVE at Paraburdoo; and 4/11 chickens seroconverted at Pannawonica, of which 2 were due to MVE, one to Kunjin, and one was a dual infection.

There results indicate that MVE virus activity continues to be widespread at a number of centres in the Kimberley and Pilbara regions. The number of chickens seroconverting during June should be read in conjunction with earlier results reported for April and May (*CDI* 1993;**17**:291-292) as many of the chickens in these flocks had seroconverted to MVE and/or Kunjin viruses earlier. However, the total number of seroconversions is fewer than reported in May, suggesting that virus activity may be starting to decrease. Flavivirus activity (largely due to MVE) has been significantly higher and more widespread during 1993 than has been seen in any year previously, due initially to the severe flooding in the Kimberley region in February 1993. The continued activity late in the season is unusual, particularly with the low overnight temperatures commonly recorded in inland areas of the Pilbara. A further health warning for the Kimberley and Pilbara regions was issued by the Health Department of Western Australia on 23 July 1993.

Flavivirus serology was also carried out for 7 flocks in the Northern Territory. Ten seroconversions to flaviviruses were observed, 8 of which were due to MVE and 2 to Kunjin. One of 10 chickens at Gove seroconverted to MVE; 1/13 chickens seroconverted at Katherine; 4/17 chickens seroconverted at Murgenella, of which 3 were to MVE and one to Kunjin; and 4/15 chickens seroconverted at Palumpa, of which 3 were to MVE and one to Kunjin. This latter chicken had previously seroconverted to MVE.

Information of the location of sentinel chicken flocks has been described in *CDI* 1992;**16**:55-57 and *CDI* 1992;**16**:169.

(A K Broome and J S Mackenzie, Department of Microbiology, The University of Western Australia)

Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 8 laboratories. *CDI* welcomes Sir Charles Gairdner Hospital, Western Australia to the LabDOSS scheme.

A total of 108 reports have been included: Sir Charles Gairdner WA 30, Liverpool Hospital NSW 16, Woden Valley Hospital ACT 31, Sullivan Nicolaides Qld 8, Northern Tasmanian Pathology Service 8, Nambour Hospital Qld 6, TB Lynch Pathologists, Rockhampton QLD 7, Central Queensland Pathology Service 2. Woden Valley Hospital supplied additional data for the period April to June 1993. These data have been merged into the total 1993 file.

Organisms reported 5 or more times from blood are detailed in Table 5.

Figure 4. LabDOSS reports of isolates from blood, by age group

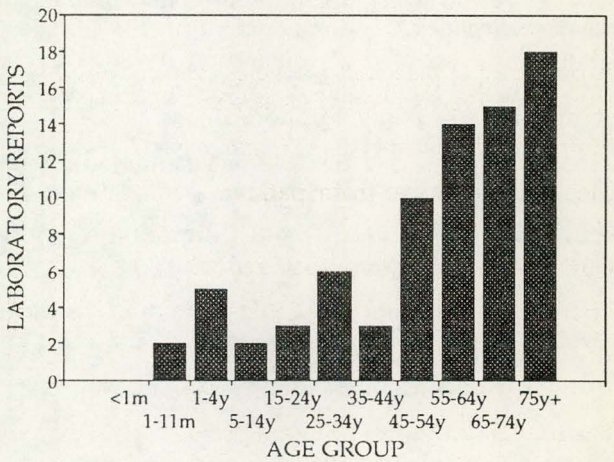


Table 5. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total[1]	Total Reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal		
Staphylococcus aureus[2]	4					1	2		1			10	343
Staphylococcus epidermidis								1				8	108
Staphylococcus coagulase negative[3]	1											6	160
Enterococcus species[4]												5	71
Streptococcus pneumoniae		2										5	73
Escherichia coli					2		1	1				16	434

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.
3. *Staphylococcus capitis* 2, *S. haemolyticus* 1, *S. hominis* 1, *S. saprophyloticus* 1.
4. *Enterococcus faecalis* 3, *E. faecium* 1.

Table 6. LabDOSS meningitis reports, by organism and age group

	1-4 years	5-14 years	25-34 years	35-44 years	55-64 years	Total	Total reported this year
Haemophilus influenzae type b	1			1		2	24
Haemophilus parainfluenzae	1					1	1
Klebsiella pneumoniae					1	1	2
Neisseria meningitis group B			1			1	8
Streptococcus pneumoniae		1				1	11

Other blood isolates not included in Table 5 were:

Gram positive: 1 *Streptococcus* Group B , 1 *Streptococcus sanguis*, 3 *Streptococcus* 'viridans' , 1 *Streptococcus* species, 1 *Corynebacterium* JK species, 1 *Lactococcus cremoris*

Gram negative:1 *Salmonella* species (age 2 years, failure to thrive), 1 *Acinetobacter* species, 3 *Klebsiella pneumoniae*, 1 *Klebsiella oxytoca*, 1 *Enterobacter cloacae*, 1 *Enterobacter* species, 1 *Pseudomonas* aeruginosa, 1 *Pseudomonas* species, 1 *Neisseria meningitidis* group B (1 year old female, QLD), 1 *Providencia* species, 3 *Proteus mirabilis*, 1 *Xanthomonas maltophilia*.

Anaerobes: 1 *Bacteroides* species, 1 *Bacteroides thetaiotomicron*, 1 *Propionobacterium* acnes.

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

Most isolates were from patients over the age of 45 years (Figure 4).

CSF Isolates and meningitis reports

There were 46 reports of CSF isolates and/or meningitis (Table 6).

Isolates from sites other than blood or CSF

Peritoneal dialysate: 1 *Staphylococcus aureus*, 1 *Streptococcus* 'milleri', 1 coagulase negative *Staphylococcus*.

Joint fluid: 3 *Staphylococcus aureus*, 1 Group G *Streptococcus*.

Other: 3 *Escherichia coli*, 4 *Corynebacterium* species, 1 *Enterococcus faecalis*, 1 *Haemophilus influenzae* (no type provided), 2 *Pseudomonas aeruginosa*, 1 *Serratia marcescens*, 1 *Staphylococcus aureus*, 1 coagulase negative *Staphylococcus*, 1 *Staphylococcus epidermidis*.

National Notifiable Diseases Surveillance System, 11 to 24 July 1993

There were 1,616 reports received this period (Tables 7, 8 and 9, and Figure 8).

- Ninety-three cases of **Ross River virus infection** were notified this period. There were 35 males, 49 females and sex was not recorded for 9 cases. Ages recorded in these cases ranged from the 0-4 to the 80-84 years age groups. Cases were reported from statistical divisions in much of New South Wales and Queensland, rural Victoria, Pilbara and Southwest Western Australia.
- There were 110 notifications of **dengue** received, for a total for the year to date of 387 notified cases (Figure 5). This fortnight, 44 reports were for males and 66 were for females. Ages reported ranged from the 10-14 to the 85-89 years age groups. Ninety-eight cases were recorded in residents of Townsville and surrounding areas, 4 were from Cairns, 3 from Brisbane, 2 from Mackay, one from Hughenden, one from Mt Isa and one from Toowoomba.
- There was a single case of **brucellosis** in a male from western Sydney in the 30-34 years age group.
- Forty-four cases of **gonococcal infection** were notified this period. There were 37 males and 7 were females aged between the 15-19 years and the 75-79 years age groups.
- ***Haemophilus influenzae*** type b infection was reported for 20 cases, to bring the total for the year to date to 258, compared with 282 for the equivalent period last year (Figure 6). This fortnight's notifications were for 13 males and 7 females. Three of the cases were aged less than one year and 16 were less than 5 years. There was an apparent cluster of 2 cases in a single postcode area, onset dates were separated by an interval of 7 days.

Figure 5. Dengue notifications, January 1992 to July 1993, by month of onset

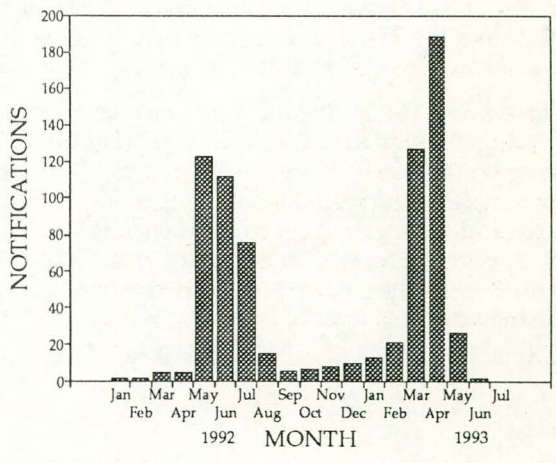


Figure 6. *Haemophilus influenzae* type b infection notifications, January 1991 to July 1993

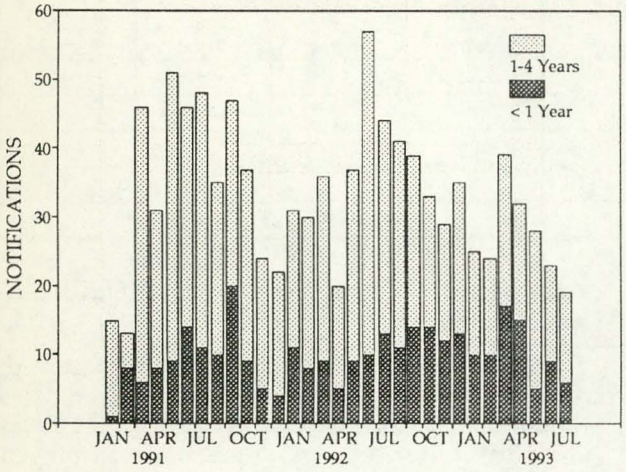
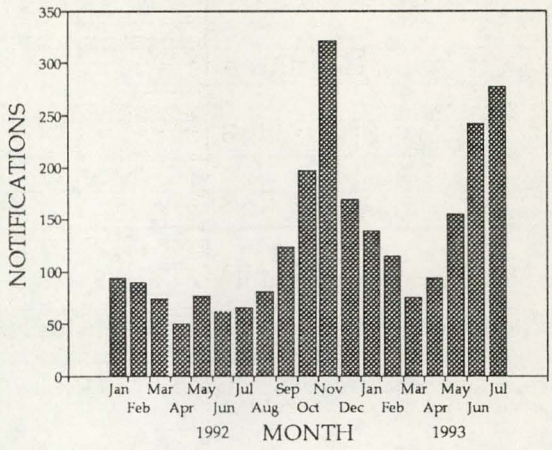
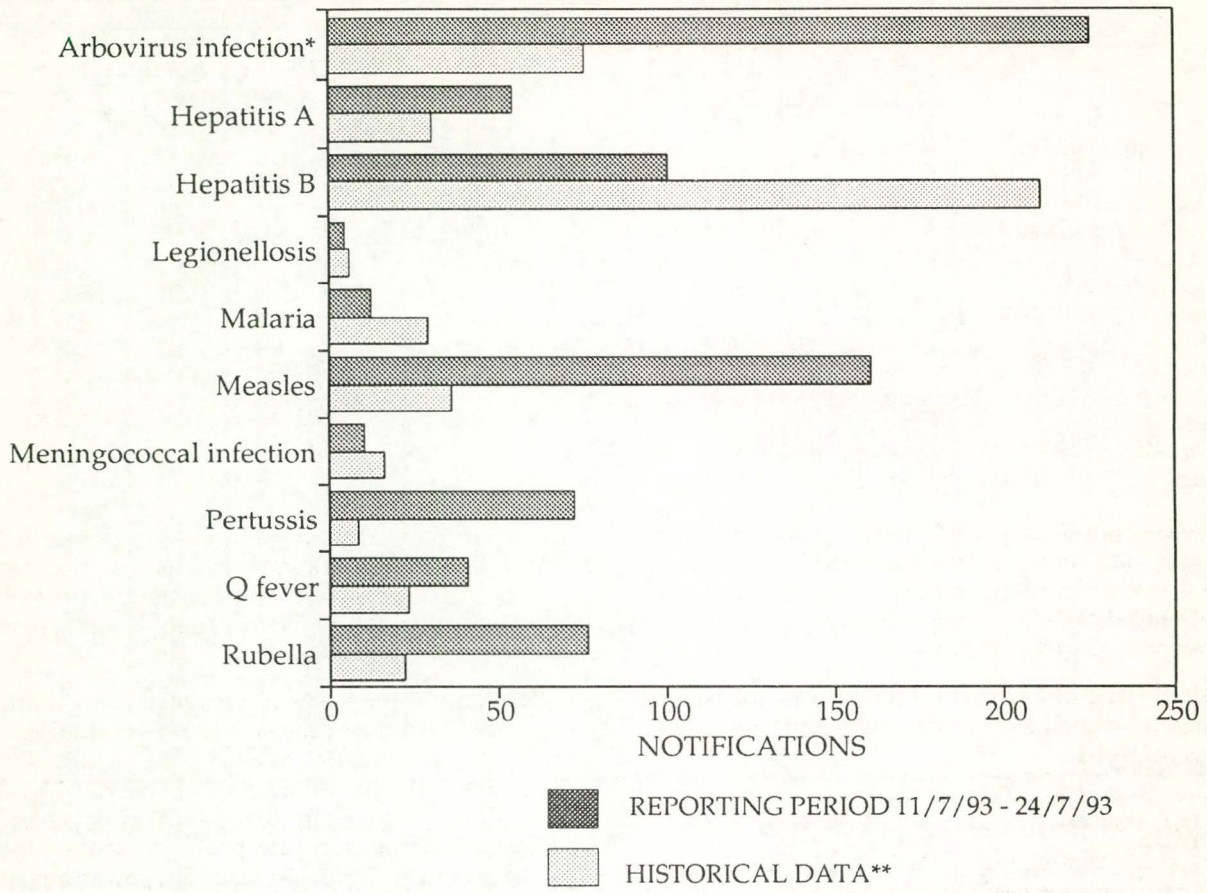


Figure 7. Measles notifications, January 1992 to July 1993, by month of onset



- Fifty-five notifications of **hepatitis A** were received this period. They were for 32 males, 21 females and sex was not recorded for 2 cases. Ages ranged from the 0-4 to the 65-69 years age group, peaking in the 5-9 years age group (10 cases).
- A single case of **hydatid infection** was notified, in a female in the 25-29 years age group, from rural Queensland.
- There were 4 cases of **legionellosis** notified this period. All were females in the 70-74 years (2 cases), 55-59 and 40-44 (1 case each) years age groups. Two cases had recorded onset dates on the same day in the same postcode area.
- A single case of **leprosy** was reported, in a female in the 35-39 years age group, from Melbourne.
- Five cases of **leptospirosis** were reported for 4 males and one female, with ages ranging between the 10-14 and the 50-54 years age groups. They were from Brisbane and rural areas of Queensland and Victoria.
- There were 2 notifications of **listeriosis**, in a male in the 40-44 years age group and in a female in the 65-69 years age group.
- Thirteen reports of **malaria** were received, for 11 males and 2 females. Ages ranged between the 20-24 and the 75-79 years age groups. Two were in the 'malaria receptive zone'.
- There were 161 notifications of **measles** received, to bring the total for the year to 1,025 (Figure 7). Of these notifications, 104 were for males and 57 were for females. Fourteen cases were aged less than one year, and the mean age was 12.2 years. There were 24 apparent clusters in separate postcode areas with 2 to 8 cases eac. Nineteen clusters were in Tasmania.
- There were 11 notifications of **meningococcal infection**, for 5 males and 6 females. Six cases had recorded ages in the 0-4 years age group, the oldest case was in the 75-79 years age group. There were no apparent clusters.
- Seventy-three cases of **pertussis** were notified to bring the total for the year to 896. A single case was aged less than one year, 9 were aged less than 5 years and ages ranged up to the 90-94 years age group. There were 8 apparent clusters of 2 or 3 cases each in separate postcode areas. Intervals between the index and further cases ranged from onset on the same day to 28 days.
- There were 41 notifications of **Q fever**, 38 for males and 3 for females. Ages ranged from the 15-19 to the 60-64 years age groups.
- There were 77 notifications of **rubella** received, including one case notified as congenital rubella. There were 43 males, 31 females and sex was not recorded in 2 cases. The mean age was 16.3 years and there were 13 reports for females in the 15-44 years age group. There were 15 apparent clusters of 2 to 4 cases each in separate postcode areas.
- There were 76 notifications of **syphilis** received this period. Forty were for males, 32 for females and sex was not recorded in 4 cases. Two cases were aged less than one year.
- There were 30 notifications of **tuberculosis**, 15 males and 15 females. Onset dates were recorded as February (1), May (1), June (8) and July (20). Ages ranged from the 0-4 to the 85-89 years age groups.

Figure 8. Selected National Notifiable Diseases Surveillance System reports, and historical data **



* Includes Ross River virus and Dengue

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

Table 7. Notifiable Diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation for the reporting period 11 to 24 July 1993

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1] This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
Diphtheria	0	0	0	0	0	0	0	0	0	3	30	11
Haemophilus influenzae b infection[2]	1	5	2	1	3	0	6	2	20	17	258	282
Measles	13	31	0	12	0	100	4	1	161	28	1025	508
Mumps	0	0	NN	NN	NN	NN	0	1	1	0	5	15
Pertussis	4	9	0	11	19	4	13	13	73	7	896	241
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Rubella[3]	8	4	0	43	10	0	8	4	77	29	1574	280
Tetanus	0	0	0	NN	0	0	0	0	0	0	5	7

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 SA: only as 'bacterial meningitis'; meningococcal infection is separately notified; Tas: only as 'non-meningococcal meningitis'; Vic: epiglottitis and meningitis only.

3. NT, Tas: CRS only; ACT, NSW, Qld: rubella only.

NN Not Notifiable.

Table 8. Other Notifiable Diseases[1], for the reporting period 11 to 24 July 1993

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2] This Period 1993	This Period 1992	Year to Date 1993	Year to Date 1992
Arbovirus infection (NEC)[3]	0	2	6	12	0	1	2	0	23	5	389	194
Ross River virus infection	0	2	7	74	1	NN	5	4	93	64	4668	4855
Dengue	0	-	0	110	-	NN	0	NN	110	11	387	162
Campylobacteriosis[4]	3	-	17	95	77	10	79	30	311	280	4437	4483
Chlamydial infection (NEC)[5]	4	NN	6	146	0	4	44	35	239	240	3689	3840
Donovanosis	0	NN	0	0	NN	NN	0	0	0	6	30	47
Gonococcal infection[6]	0	4	5	20	0	0	5	10	44	118	1681	1676
Hepatitis A	0	12	0	35	6	0	2	0	55	56	1120	1171
Hepatitis B	8	3	0	70	0	2	2	16	101	227	1258	2888
Hepatitis C	12	0	NN	105	0	17	96	87	317	370	3584	4687
Hepatitis (NEC)	0	2	0	1	0	0	0	NN	3	3	45	37
Legionellosis	0	0	0	2	0	0	2	0	4	13	99	123
Leptospirosis	0	0	0	3	0	0	2	0	5	2	96	63
Listeriosis	1	1	NN	0	NN	0	0	0	2	3	29	23
Malaria	4	0	0	0	0	0	7	2	13	14	354	434
Meningococcal infection	0	3	0	3	0	0	3	2	11	18	136	136
Ornithosis	0	NN	0	1	0	0	2	0	3	8	51	57
Q fever	0	16	0	24	0	0	1	0	41	28	460	278
Salmonellosis (NEC)	2	24	13	20	11	5	16	14	105	141	2975	3121
Shigellosis[4]	0	-	4	5	3	0	2	4	18	19	456	352
Syphilis	0	26	19	20	0	3	4	4	76	102	1265	1481
Tuberculosis	0	7	0	2	7	1	12	1	30	48	524	424
Typhoid[7]	0	0	0	0	0	0	0	0	0	3	22	32
Yersiniosis (NEC)[4]	0	-	2	5	1	0	4	0	12	14	250	388

1. For HIV and AIDS, see Tables 2 and 3. For rarely notified diseases, see Table 7.
2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
3. SA, Tas: includes Ross River virus and dengue.
   WA: includes 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 and Vic: includes paratyphoid.

NN Not Notifiable.
NEC Not Elsewhere Classified.
- Elsewhere Classified.

Table 9. Rarely Notified Diseases[1] for the reporting period 11 to 24 July 1993

DISEASES	Total This Period	Reporting States or Territories	Year to Date 1993
Botulism	0		0
Brucellosis	1	NSW	12
Chancroid	0		1
Cholera	0		2
Hydatid infection	1	Qld	15
Leprosy	1	Vic	7
Lymphogranuloma venereum	0		1
Plague	0		0
Rabies	0		0
Yellow fever	0		0
Other viral haemorrhagic fevers	0		0

1. Fewer than 50 cases of each of these diseases were notified each year during the period 1987 to 1992.

Table 10. Laboratory reports by State or Territory of reporting laboratory for the reporting period 15 to 28 July 1993, historical data[1], and total reports for the year

	STATE OR TERRITORY OF REPORTING LABORATORY							Total this fortnight	Historical data [1]	Total reported this year
	ACT	NSW	Qld	SA	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA										
Measles virus			6			1		7	7.3	202
Mumps virus			1			1		2	.5	40
Rubella virus		1	12	6				19	7.3	638
HEPATITIS VIRUSES										
Hepatitis A virus		1	4	3		2	1	11	14.8	379
Hepatitis B virus		23	24	3		7	13	70	85.8	1,592
Hepatitis C virus	9	4	15	47	3	1	88	167	113.7	2,474
Hepatitis D virus			1					1	1.8	37
ARBOVIRUSES										
Ross River virus			78				2	80	32.8	1,606
Barmah Forest virus			8					8	10.3	162
Dengue type 2			110					110	18.8	301
Dengue not typed			34					34	4.2	91
MVE virus			1					1	.5	9
Flavivirus (unspecified)			21					21	3.7	88
ADENOVIRUSES										
Adenovirus type 1		2				2		4	4.7	53
Adenovirus type 2		3				2		5	4.5	69
Adenovirus type 3		3				3		6	3.7	154
Adenovirus type 4						1		1	1.3	59
Adenovirus type 5		1						1	1.5	22
Adenovirus type 7		1				1		2	.0	7
Adenovirus type 19						1		1	1.5	3
Adenovirus not typed/pending		1	27	5		8	12	53	49.7	780
HERPES VIRUSES										
Herpes simplex virus type 1	1	2	41	35	1	47	30	157	129.5	2,621
Herpes simplex virus type 2		16	50	28	1	38	42	175	170.3	3,106
Herpes simplex not typed/pending	2	14	4			1	4	25	37.2	414
Cytomegalovirus		3	30			16	10	59	65.0	1,014
Varicella-zoster virus	2	1	5	3		5	8	24	19.7	608
Epstein-Barr virus			32	14		4	4	54	57.0	1,171
OTHER DNA VIRUSES										
Molluscum contagiosum							1	1	1.2	6
Parvovirus						6		6	3.7	80
PICORNA VIRUS FAMILY										
Coxsackievirus B1		3				1		4	.8	67
Coxsackievirus B3						1		1	.5	12
Echovirus type 7		2				1		3	.0	94
Echovirus type 9		1						1	4.8	46
Echovirus type 11		3				4		7	.2	54
Echovirus type 14		2						2	.2	23
Echovirus type 30						3		3	.0	22
Poliovirus type 1 (uncharacterised)		1						1	2.7	31
Poliovirus type 2 (uncharacterised)		1				1		2	4.0	24
Poliovirus type 3 (uncharacterised)		4						4	2.2	21
Rhinovirus (all types)		6	5			12	2	25	28.0	465
Enterovirus not typed/pending			11			8	8	27	34.2	483

Table 10. Laboratory reports by State or Territory of reporting laboratory for the reporting period 15 to 28 July 1993, historical data[1], and total reports for the year, continued

	STATE OR TERRITORY OF REPORTING LABORATORY							Total this fortnight	Historical data [1]	Total reported this year
	ACT	NSW	Qld	SA	Tas	Vic	WA			
ORTHO/PARAMYXOVIRUSES										
Influenza A virus		1	14	2	1	4	2	24	61.8	135
Influenza A virus H_3N_2		1						1	7.8	2
Influenza B virus			29	6		3	7	45	13.0	145
Influenza virus - typing pending							1	1	.0	3
Parainfluenza virus type 1			1	1				2	4.3	19
Parainfluenza virus type 2		3	6	4		3	1	17	4.0	84
Parainfluenza virus type 3	3	2	2	3		10	4	24	19.3	314
Parainfluenza virus typing pending						2	1	3	2.2	30
Respiratory syncytial virus	20	58	96	99	2	158	46	479	357.5	1,967
OTHER RNA VIRUSES										
Rotavirus	24	35	2	18	2	40	16	137	106.5	999
Small virus (like) particle		1						1	2.0	31
OTHER										
Chlamydia trachomatis not typed	3	10	11	11		1	26	62	86.5	1,900
Chlamydia psittaci			3					3	4.5	55
Mycoplasma pneumoniae		2	41	13		17	1	74	33.2	1,231
Coxiella burnetii (Q fever)			24				2	26	13.8	326
Rickettsia species - other			2					2	.0	3
Streptococcus group A			2					2	1.0	180
Bordetella pertussis			1		1	7		9	.3	117
Cryptococcus species			2					2	.7	8
Leptospira species			2					2	.7	11
Treponema pallidum		8	33					41	5.7	434
Entamoeba histolytica			2					2	.2	8
Toxoplasma gondii			1			1		2	.5	41
Echinococcus granulosus			2					2	.3	12
TOTAL	64	220	796	301	11	424	332	2,148	1,655.3	27,183

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 11. Laboratory reports by clinical information for the reporting period 15 to 28 July 1993

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA													
Measles virus								1				6	7
Mumps virus					1							1	2
Rubella virus								8		1		10	19
HEPATITIS VIRUSES													
Hepatitis A virus						1	8					2	11
Hepatitis B virus							23					47	70

Table 11. Laboratory reports by clinical information for the reporting period 15 to 28 July 1993

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
Hepatitis C virus							22					145	167
Hepatitis D virus							1						1
ARBOVIRUSES													
Ross River virus			2		1	1		4		21		51	80
Barmah Forest virus						1				1		6	8
Dengue type 2			3		1		1	5	1	5		94	110
Dengue not typed								1		1		32	34
MVE virus	1												1
Flavivirus (unspecified)								1				20	21
ADENOVIRUSES													
Adenovirus type 1					2	1						1	4
Adenovirus type 2					3	1						1	5
Adenovirus type 3					1				3			2	6
Adenovirus type 4												1	1
Adenovirus type 5												1	1
Adenovirus type 7					1							1	2
Adenovirus type 19									1				1
Adenovirus not typed/pending					25	11			3			14	53
HERPES VIRUSES													
Herpes simplex virus type 1					6	1		92	2		34	22	157
Herpes simplex virus type 2					1	1		56			102	15	175
Herpes simplex not typed/pending				1	2			13	1		3	5	25
Cytomegalovirus	1	1		1	25		1					30	59
Varicella-zoster virus	1	1			1			14				7	24
Epstein-Barr virus					5	1		1		1		46	54
OTHER DNA VIRUSES													
Molluscum contagiosum								1					1
Parvovirus								1				5	6
PICORNA VIRUS FAMILY													
Coxsackievirus B1		1										3	4
Coxsackievirus B3												1	1
Echovirus type 7		1	1		1								3
Echovirus type 9		1											1
Echovirus type 11		2			2							3	7
Echovirus type 14		1				1							2
Echovirus type 30		3											3
Poliovirus type 1 (uncharacterised)					1								1
Poliovirus type 2 (uncharacterised)					1							1	2
Poliovirus type 3 (uncharacterised)					1	1						2	4
Rhinovirus (all types)					22	1		1				1	25
Enterovirus not typed/pending		1	1		11	4		3				7	27
ORTHO/PARAMYXOVIRUSES													
Influenza A virus					11	1				4		8	24
Influenza A virus H_3N_2					1								1

Table 11. Laboratory reports by clinical information for the reporting period 15 to 28 July 1993, continued

	Encephalitis	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
Influenza B virus	1	1			24	1				2		16	45
Influenza virus - typing pending					1								1
Parainfluenza virus type 1					2								2
Parainfluenza virus type 2					14							3	17
Parainfluenza virus type 3					22							2	24
Parainfluenza virus typing pending					3								3
Respiratory syncytial virus					463	1						15	479
OTHER RNA VIRUSES													
Rotavirus					1	133						3	137
Small virus (like) particle						1							1
OTHER													
Chlamydia trachomatis not typed					1				1		53	7	62
Chlamydia psittaci					1							2	3
Mycoplasma pneumoniae					49					1		24	74
Coxiella burnetii (Q fever)					1	1	1					23	26
Rickettsia species - other												2	2
Streptococcus group A												2	2
Bordetella pertussis					9								9
Cryptococcus species												2	2
Leptospira species												2	2
Treponema pallidum	1					1				1	3	35	41
Entamoeba histolytica												2	2
Toxoplasma gondii												2	2
Echinococcus granulosus												2	2
TOTAL	5	13	7	2	717	165	57	202	12	38	195	735	2148

Table 12. Laboratory reports by contributing laboratories for the reporting period 15 to 28 July 1993

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	64
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	100
	Royal Alexandra Hospital for Children, Camperdown	50
	South West Area Pathology Service, Liverpool	70
Queensland	Dr TB Lynch, Pathologist, Rockhampton	52
	Queensland Medical Laboratory, West End	113
	State Health Laboratory, Brisbane	631
South Australia	Institute of Medical & Veterinary Science, Adelaide	301
Tasmania	Northern Tasmanian Pathology Service, Launceston	11
Victoria	Fairfield Hospital, Melbourne	227
	Royal Children's Hospital, Melbourne	197
Western Australia	Princess Margaret Hospital, Perth	93
	State Health Laboratory Services, Perth	239
TOTAL		2148