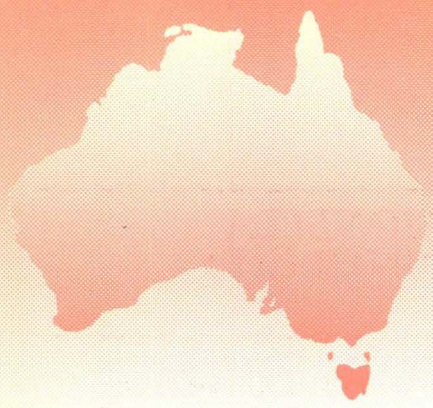

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CONTENTS

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COMMONWEALTH DEPARTMENT OF HUMAN SERVICES AND HEALTH

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

INVESTIGATION OF AN OUTBREAK OF *SALMONELLA* TYPHIMURIUM AMONGST DINERS AT AN INNER CITY RESTAURANT IN BRISBANE

Chris Towner, Adam Sorby, Environmental Health Officers, Division of Public Health, Brisbane North Regional Health Authority; Francis Law, Environmental Health Officer, Brisbane City Council; Brad McCall, Public Health Medical Officer, Southern Zone Population Health Unit, Upper Mt Gravatt, Queensland

Introduction

On 22 February 1995, the Environmental Health Unit of the Brisbane North Regional Health Authority was contacted by the Communicable Diseases Branch, Queensland Health regarding a case of salmonellosis. Notification of this case had been made on the basis of a *Salmonella* positive stool specimen from a hospitalised patient. This patient had eaten a meal at an inner city Brisbane restaurant on 12 February 1995 and had informed hospital staff that several companions at that meal had also been ill. The Environmental Health Unit, in association with Brisbane City Council Environmental Health Officers and the Zonal Population Health Unit (Brisbane North/Sunshine Coast Regions) investigated this outbreak. We report the results of the investigation.

Methods

A sample of patrons who dined at the restaurant during this period was obtained through advice from affected patrons, the restaurant reservation list and publicity generated by the local media.

All members of the sample were interviewed personally and a foodborne illness questionnaire was completed about two weeks after they had dined at the restaurant. All the diners had eaten 'dim sum', which involves the selection of food from trolleys brought to the table, rather than ordering from a menu. A pictorial menu of the numerous food items was made available by the restaurant and was used to assist in the completion of the questionnaires. Food specific attack rates and measures of association were calculated using Epi Info version 6.02.

The food preparation area of the restaurant was inspected and food handling practices were observed and noted. A number of samples of food prepared in the restaurant and environmental swabs from the food preparation areas were submitted to the Queensland Health Laboratory of Microbiology and Pathology for examination.

Results of testing of faecal specimens of a limited number of affected patrons were obtained from medical practitioners and pathology laboratories. Faecal specimens were also obtained from principal food handlers at the restaurant.

Results

Epidemiology

Four notifications of salmonellosis were received in relation to this outbreak. The affected people had all consumed dim sum meals at the same restaurant during the period 10 to 12 February 1995.

By 15 March 1995, 36 restaurant patrons had been identified, 21 of whom had symptoms of foodborne illness. They were three groups of diners who had consumed meals at the restaurant on different days during the period 10 to 12 February 1995 (Table 1). No illnesses were reported from patrons who had consumed meals after this period.

Questionnaires were completed by the 36 patrons in the three groups (100% response). Twenty-one (58%) reported symptoms of foodborne illness after eating at the restaurant, eleven had consulted a medical practitioner and two had required hospitalisation. The commonest symptoms reported were stomach cramps and diarrhoea (Table 2). The mean age of the affected patrons was 34 years (range 6 to 54 years). Incubation periods ranged from 4 to 70 hours with an average incubation period of 29 hours. The average duration of illness was 123 hours (five days), within a range of two to 350 hours (14 days).

Each of the three groups of patrons consumed most of the foods listed on the dim sum menu. Of 44 menu choices which were consumed, 12 were significantly associated with an increased risk of illness in patrons (Table 3).

Table 1. Cases, attack rates and incubation periods, by date of restaurant attendance

Date of restaurant attendance	10.2.95	11.2.95	12.2.95
Persons in affected dining groups	3	5	27
Persons ill	2	1	18
Attack rate	66%	20%	66%
Mean incubation period (hours)	25	9	30
Median incubation period (hours)	25	9	30

Inspection of restaurant premises

Environmental Health Officers from the Brisbane City Council had previously inspected the restaurant on 16 February in response to an isolated complaint. Subsequent inspections were conducted by Regional and Council Environmental Health Officers on several occasions from 24 February 1995 as part of this investigation. Hygiene standards at the restaurant were found to be unsatisfactory. Early morning visits identified that food preparation had commenced although the kitchen had not been cleaned from the previous night. Leftover food, uncleaned utensils, food encrusted cutting boards and an unclean environment were obvious. Storage space for perishable foods was insufficient and foods were not stored properly in the cold room, in particular there was inadequate separation of cooked and raw foods. Frozen chickens were defrosted by leaving several in a sink of water overnight. Personal hygiene (for example, handwashing) was also unsatisfactory.

Dim sum was served from 11am until 3pm. Dim sum food items were prepared on the day of consumption, as early as 6.00am and generally in bulk. Steamed food was placed in individual serves in woven cane baskets; baked food was not placed in individual serves. Prepared food for lunch was stored at ambient temperature (29°C) before and after steaming or baking. Food was reheated as required and placed on trolleys with steamers for serving. Temperature monitoring of reheated food indicated that food temperature exceeded 80°C if the heating time was of at least six minutes' duration. Temperatures of greater than 70°C are required for at least two minutes to ensure the destruction of *Salmonella*[1]. During the busiest periods of food preparation, there was a potential for insufficient reheating of food to these required levels.

Table 2. Symptoms reported

Symptom	Cases
Stomach cramps	19 (90.5%)
Diarrhoea	16 (76.2%)
Fever	16 (76.2%)
Muscle pains	15 (71.4%)
Headache	14 (66.7%)
Vomiting	5 (23.8%)
Sore throat	4 (19%)

Table 3. Relative risks for food items consumed[1]

Menu item	Relative risk	95% confidence interval
Shark's fin dumplings	1.75	1.33-2.41
Chicken feet in black bean sauce	1.79	1.07-2.99
Steamed chicken wrap	1.75	1.33-2.41
Pork chop black bean sauce	1.75	1.33-2.41
Pan stick savoury dumplings	1.75	1.33-2.41
Glutinous rice parcel in lotus leaf	1.82	1.07-2.99
Steamed rice, chicken chinese sausages	1.75	1.33-2.41
Flat bean curd roll	1.75	1.33-2.41
Mango dessert	1.95	1.20-3.10
Sweet bean curd	1.83	1.36-2.61
Stuffed mushroom	1.83	1.34-2.50

1. Only food items with significant relative risks are included in this table.

Bacteriology

Medical practitioners had requested faecal specimens from four affected patrons, from two different groups of diners. All of these specimens were positive for *Salmonella* Typhimurium phage type 8.

On 2 March 1995, faecal specimens were obtained from the four principal food handlers employed by the restaurant. No bacterial pathogens were cultured from these specimens.

Food items prepared during the period 10 to 12 February were not available for analysis. Fourteen dim sum items were sampled at the restaurant on 24 February and submitted for examination for the presence of *Salmonella* species. No *Salmonella* species were isolated from these specimens.

Eight swabs of fittings and appliances in the food preparation area were taken. *Salmonella* species were not detected although five swabs were positive for *Bacillus cereus*.

Discussion

This outbreak of foodborne illness affected patrons dining on three separate days at a large inner city restaurant. It is estimated that, in total, several hundred persons dined at the restaurant during the three days, so it is possible that many more, who we were unable to identify, were also affected. The identified organism, *Salmonella* Typhimurium is the serovar most frequently reported by the National *Salmonella* Surveillance Scheme[2]. Phage type 8 was also the most common isolate in Queensland during the month of the outbreak (John Bates, personal communication).

The isolation of this organism in faecal samples of affected diners and the mean incubation period of 29 hours are consistent with an outbreak of *Salmonella* infection amongst these groups of diners[3]. However, the range of incubation periods, durations of illnesses and the isolation of other bacteria from kitchen implements suggest that symptoms may also have arisen from other food poisoning related pathogens.

Although food samples were collected and a foodborne illness questionnaire suggested a number of menu items were significantly associated with the occurrence of illness in patrons, it was not possible to identify a single food source as a cause of this outbreak. This may have been influenced by the large number of items (44) in the food questionnaire as well as the associated difficulties of identification and recall two weeks after the event.

The results of the inspection of the food preparation and storage areas of this restaurant indicated a number of potential avenues for the contamination of food and growth of bacteria. It is likely that the infected foods were contaminated through inappropriate food handling practices. In particular, the inadequate segregation of cooked and raw foods and the potential for insufficient cooling and reheating may have contributed to the development of this outbreak.

Environmental health officers from Brisbane City Council have since conducted an education campaign amongst the food handlers and other staff to address these issues, particularly in regard to timeliness and temperature control.

Acknowledgments

The assistance of John Bates and the staff of the Queensland Health Laboratory of Microbiology and Pathology, Brisbane and the Microbiological Diagnostic Unit, University of Melbourne is gratefully acknowledged.

References

1. Department of Health, United Kingdom. *Management of outbreaks of foodborne illness*. Guidance produced by a Department of Health Working Group, 1994. Department of Health, 1995.
2. Powling J, Truong B, Lightfoot D, Adams P, editors. National *Salmonella* Surveillance Scheme report, second quarter, 1994. *Comm Dis Intell* 1995;**19**:159-165.
3. Benenson AS, editor. *Control of communicable diseases in man*, 15th ed. Washington: American Public Health Association, 1990.

OUTBREAK OF *SALMONELLA* GASTROENTERITIS IN THE AUSTRALIAN CAPITAL TERRITORY, FEBRUARY-MARCH 1995

Marisa Gilles[1,2], *Ross Bailie*[1,3], *Mahomed Patel*[1], *Irene Passaris*[3], *Peter Collignon*[3]

Introduction

Salmonellosis is recognised as a major public health problem in the western World[1-3], and food poisoning outbreak management has an increasing profile. Although salmonellosis rarely causes death it causes considerable morbidity[4].

On 13 February 1995, public health officials in the Australian Capital Territory (ACT) noticed that the number of salmonellosis notifications received since the beginning of the year was markedly greater than previously (an average of five cases a month). During the period 21 January to 20 February, 27 cases of salmonellosis were notified, the majority from the southern part of Canberra. By 21 February the predominance of the *Salmonella* Bredeney, a serovar rarely described in food poisoning outbreaks around the world[5-10] was recognised and the existence of an outbreak declared.

After discussions with the adjoining Public Health Units in New South Wales it became apparent that the outbreak also involved cases in 15 public health areas in New South Wales. This report describes the outbreak in the ACT, and discusses the possible sources of the outbreak. The New South Wales Public Health Network is coordinating further epidemiological studies of the outbreak of *S.* Bredeney infection in eastern Australia[11], in cooperation with the Communicable Diseases Network of Australia and New Zealand.

Methods

Two case definitions were accepted in the investigation. A confirmed case was defined as anyone in the ACT with a gastrointestinal illness between 1 January and 5 May 1995 from whose faeces or blood *S.* Bredeney was isolated. A possible case was defined as a person with any of the following symptoms: vomiting, nausea, diarrhoea, abdominal pain, without microbiological confirmation of *S.* Bredeney, together with presence at an event associated with a confirmed case.

Confirmed cases were identified through the notifiable disease surveillance system and active surveillance through public and private laboratories in the ACT. Possible cases were identified through interviewing cases and persons who had attended an event associated with a confirmed case.

Preliminary questioning led to the identification of three clusters of illness: a christening party, a takeaway

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2. State Health Purchasing Authority, Western Australia.
3. Australian Capital Territory Department of Health and Community Care.

meal, and an office party at a restaurant. Structured questionnaires were delivered by telephone to the guests of the christening and the persons who ate the takeaway. For the investigation of the office party, a similar structured and self administered questionnaire was used.

The questionnaires were designed after obtaining details of the foods available at each event and included a detailed food history together with details of symptoms.

Data were entered into Epi Info and analysed using food specific attack rates to determine risk ratios.

Results

From 23 January until 31 March, 29 cases of infection with *S.* Bredeney were notified in the ACT. The epidemic curve shows a peak of confirmed cases in the first two weeks of February (Figure).

The median age of the cases was seven years (range 10 weeks to 44 years); 13 cases (45%) were under five years of age. Sixteen cases (55.2%) were female. Every case experienced diarrhoea, with 24 (77%) describing abdominal pain. Two of the children were admitted to hospital with a suspected acute appendicitis. Four other cases required hospitalisation, two of whom had positive blood cultures (6.8%). There was geographic clustering of cases in suburbs adjacent to a major shopping centre in the southern part of Canberra.

The investigation of the three clusters is described below.

Cluster 1

Thirteen out of 45 persons who attended a christening lunch at a private home reported gastrointestinal symptoms which occurred within 26 hours. None of the children became sick. The nineteen children were reported not to have eaten quiche, salads, prawns, dip or cream cake. Confirmation of *S.* Bredeney infection was obtained from only one of the guests.

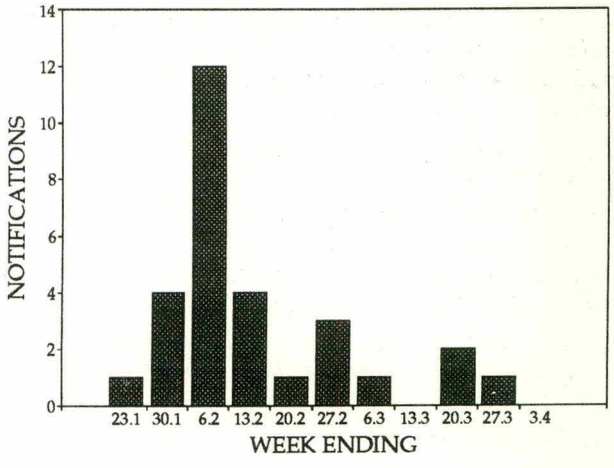
There was no significant association between any of the foods eaten and illness. Quiche was initially significantly associated with illness (RR 6.8, 95% CI: 2.2-20.0) but after adjustment for possible confounding with other foods by stratification the relative risk dropped to 3.7 (95% CI: 0.5-29.2). None of the foods were available for microbiological examination.

Three weeks after the christening party samples were taken of remaining stocks of raw ingredients for the quiche and remaining quiche mixture. These were negative for *S.* Bredeney. It was not possible to determine whether all the ingredients sampled were used in the quiche eaten at the christening.

Cluster 2

On 29 January eight persons ate a take away meal purchased from restaurant A. Five developed diarrhoea and vomiting 12 to 36 hours afterwards. One child had *S. Bredeney* identified in her faeces.

Figure. Cases of *S.* Bredeney infection, 3 January to 3 April 1995, by week of onset of illness



None of the foods eaten had a significant association with becoming ill. No food from the meal remained for examination at the time of the investigation, but samples of other cooked ingredients were taken for microbiological examination. Three weeks later some spices were tested, when anecdotal reports had implicated condiments added to the meals. None were positive for *S.* Bredeney.

Cluster 3

Twenty-four persons from an office attended a banquet at restaurant B. Nineteen of the 24 persons returned self-completed questionnaires. Ten reported developing diarrhoea and vomiting within 6 to 36 hours of the meal.

Faecal samples available from two of the guests were positive for *S.* Bredeney. None of the nine food items was significantly associated with illness. No food remained from the banquet but all the foods included on the menu were sampled for microbiological examination a week after the banquet. None were positive for *S.* Bredeney.

Discussion

The fact that *S.* Bredeney is rare facilitated the early identification of the outbreak in the ACT. The occurrence of this outbreak in the summer months is compatible with the seasonal trend for salmonellosis in Australia[12].

In Australia, *S.* Bredeney has been detected in farm effluent, raw egg pulp, chicken feed[11], and dried infant milk formula (Scott Cameron, personal communication).

None of the foods consumed by the persons in the three clusters were significantly associated with illness. Based on an elevated relative risk, although not significant, the investigation of cluster 1 suggested that the vehicle could have been one of the ingredients of the quiche, or some condiment consumed by the quiche

eaters but not specifically included in the questionnaires. The take away meal in cluster 2 did not include cheese, and the office party in cluster 3 did not include eggs (ingredients of the quiche that could have been vehicles for *S.* Bredeney), making it unlikely that these foods were the vehicle for infection. Evidence suggests that condiments were common to all clusters, however, the type and source of condiment is unknown.

A number of *Salmonella* isolates have been found in spices imported from Asian countries (Chris Murray, personal communication). Normally the cooking process renders the *Salmonella* harmless, but contaminated condiments could be added after cooking, and thus are biologically plausible as a source of *S.* Bredeney.

The distribution of the cases in New South Wales[11], Queensland (John Sheridan, personal communication) and the ACT provides evidence against a vehicle of infection such as milk or eggs which are supplied locally. The onset of illness for all cases occurred over two months, with a clustering of cases over a two week period. This would favour a vehicle with a short shelf life, unlike condiments which can be used for many months.

The clustering of cases around a major shopping centre in southern Canberra suggested that cases had acquired their infection from a common source. There was insufficient information, however, concerning the distribution of goods to and from food outlets in the area to identify a possible vehicle for the infection.

The procedure of characterising the *Salmonella* serotypes only at reference laboratories coupled with the concurrent outbreak of *Escherichia coli* haemolytic-uraemic syndrome in South Australia[13] led to a delay in both notifying and investigating cases.

Additional information on distribution patterns of implicated foods may be helpful in determining the source. Furthermore, food sampling following the identification of added cases should be informed by epidemiological information[14] and should be timely. Although condiments may have been a possible source the evidence is not conclusive.

Acknowledgments

This investigation would not have been possible without the support, the time and involvement of Ralph Anthony, Tanya Martin, Errol Holsworth, Patrick Lorkin, Stewart Horsman, Jorge Guillen of ACT Health and the expertise of Linda Halliday and the rest of the staff in the Microbiology Department at Woden Valley Hospital.

References

1. Voss SN, Thomas HF, Kimmance K. Food poisoning at a wedding reception. *CDR Rev* 1992;2:R121-123.
2. PHLS-SVS. Update on *Salmonella* infection. 10th ed. January 1992.
3. WHO surveillance programme for control of foodborne infections and intoxications in Europe. Fifth report 1985-1989. Berlin: Rober von Ostertag Institute, 1992.
4. House of Commons, Welsh Affairs Committee. Third Report. Arrangements for handling serous outbreaks of food poisoning in the light of the *Salmonella* outbreak in July and August 1989 in North Wales. London: Her Majesty's Stationery Office, 1991.
5. Caroli G, Levre E, Armani G, Momaci E. Polyresistant *Salmonella* Bredeney in a general surgical ward. *Ann Sclavo Collana Monogr* 1977;19:490-493.
6. Fox JG. Beaucage CM. The incidence of *Salmonella* in random-source cat purchased for use in research. *J Infect Dis* 1979;137:362-365.
7. Gimenez-Marti MJ, Hidalgo-Sanchez J, Ros-Die A, Moragues-Colomar V. Presencia de *Salmonella* en la cuenca norte-oeste de L'Albufera de Valencia. *Rev Sanid Hig Publica Madr* 1990;64:535-545.
8. Hering E, Fuenzalida O, Lynch B, Prado V. Clinico-epidemiological analysis of an outbreak of *Salmonella* Bredeney infection in new born infants. *Rev Chil de Pediatr* 1979;50:81-88.
9. Landgraf M, Goncalves JA, Falcao DP. Outbreak of food poisoning due to *Salmonella bredeney. Rev Saude Publica* 1985;19:92-93.
10. Alonso JL, Alonso MA, Usera MA, Echeita A. The occurrence of *Salmonella* serotypes in marine recreational waters of Valencia, Spain. *Microbiologia* 1992;8:44-48.
11. Kraa E, Baker D. *Salmonella* Bredeney outbreak in eastern states. *NSW Public Health Bulletin* 1995;9:17-18.
12. Longbottom H, Evans D, Myint H, Hargreaves J. Annual report of the National Notifiable Diseases Surveillance System, 1993. *Comm Dis Intell* 1994;18:518-548.
13. Cameron S, Walker C, Beers M, Rose N, Anear E. Enterohaemorrhagic *Escherichia coli* outbreak in South Australia associated with the consumption of mettwurst. *Comm Dis Intell* 1995;19:70-71.
14. Salmon RL, Palmer SR, Ribeiro CD, Hutchings P, Coleman TJ, Willis FJA, Allsup TN, Ritchie WN. How is the source of food poisoning outbreaks established? The example of three consecutive *Salmonella* enteritidis PT 4 outbreaks linked to eggs. *J Epidemiol Community Health* 1991;45:266-269.

CDI editorial comment

By the end of March 1995, there had been 87 cases of *Salmonella* Bredeney reported to the National *Salmonella* Surveillance Scheme (NSSS) from New South Wales, 27 from the Australian Capital Territory (ACT) and 13 from Queensland[1]. The first report was for an isolate made in late January and the largest numbers of reports

were for isolates made in the second and third weeks of February. All age groups were affected but only seven were for children under the age of 12 months. New South Wales isolates were reported from regional areas as well as from metropolitan Sydney, and Queensland isolates were centred around Brisbane. Included were 10 blood isolates and one isolate from urine. Reports of cases have declined since the end of March.

The NSSS has received an average of 23 reports of human *S.* Bredeney isolates each year, ranging from 14 reports in 1991 to 42 reports in 1986[1]. The number of cases reported earlier this year from the eastern States was therefore very unusual. The wide distribution suggested a food widely available in New South Wales and the ACT but with a limited distribution in other areas of Australia[2]. As for food samples taken in the ACT, however, food samples tested in New South Wales were negative for *S.* Bredeney and a common source was not able to be identified[2]. The New South Wales Public Health Network is currently undertaking a case control study in a further attempt to identify a common food source.

S. Bredeney has been present at a low level in the food chain in Australia for the past two decades with isolates reported to the NSSS and the Australian *Salmonella* Reference Laboratory from beef, pork, buffalo and horse meats, eggs and milk powders[1]. Environmental isolates have included dairy environment samples (Victoria) and pig abattoir, meat processing and sewage effluents (Western Australia). Reports for 1994 were typical of most years: pigs in Queensland, cattle in South Australia, meat mix from Victoria, pork meat from New South Wales, raw egg pulp and poultry feed from a University of Queensland survey, meatmeal for animal consumption from Victoria, samples from meat (smallgoods) processing, pig abattoir, sewage effluents, drinking and river waters (all from Western Australia) and sewage sludge from New South Wales.

References

1. Powling J, Huang Q, Lightfoot D, Adams P, editors. Human third quarter report 1994. *National Salmonella Surveillance Scheme Report* 1995; (2).
2. Kraa E, Baker D. *Salmonella* Bredeney outbreak in eastern States. *NSW Public Health Bulletin* 1995; **6**: 17-18.

NATIONAL *SALMONELLA* SURVEILLANCE SCHEME REPORT, FOURTH QUARTER, 1994

Reproduced from the Human Fourth Quarter Report 1994, National Salmonella Surveillance Scheme Report 1995;(3); editors Joan Powling, Qiming Huang, Diane Lightfoot, Petrina Adams

There were 1690 reports received by the National *Salmonella* Surveillance Scheme (NSSS) for the fourth quarter of 1994 (Table 1). This was more than the total for the second quarter (1200) but similar to the total for the fourth quarter of 1993 (1610). There were 1441 *Salmonella* reports compared with 1364 in the fourth quarter of 1993.

Salmonella infections acquired in Australia

The total number of new *Salmonella* cases acquired in Australia for the quarter was 1206 (Table 2). There were 118 follow-ups, five cases in immigrants and 112 cases acquired overseas. The 1206 Australian acquired cases of *Salmonella* infection represented a 6.6% increase over the total number of cases for the same period last year (1131). Increased *Salmonella* case rates per 100,000 population were recorded in South Australia (23%) and New South Wales (7%). The 39% decrease in Tasmania was a return to the norm compared with the high rate last year associated with an outbreak of *S.* Typhimurium PT 9.

Infections acquired overseas

S. Enteritidis phage type (PT) 4 was the most common *Salmonella* infection acquired overseas with 41 cases reported from travellers returning from Asia (Indonesia, Thailand, Malaysia, China, Hong Kong), Zimbabwe, Middle East, Germany, Malta, Italy, New

Table 1. Total reports of enteric pathogens, fourth quarter 1994, by State or Territory

	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total
Salmonella	9	318	315	362	137	151	35	114	1441
Shigella species	2	22	22	39	6	39	0	20	150
Aeromonas species	0	1	1	2	0	0	0	0	4
Campylobacter species	0	0	52	0	0	0	0	1	53
E. coli (EPEC)	0	1	0	0	0	0	1	0	2
Plesiomonas species	0	0	0	0	0	0	0	0	0
Vibrio species	0	1	1	1	0	0	0	0	3
Yersinia species	0	11	5	20	1	0	0	0	37
Total	11	354	396	424	144	190	36	135	1690

Table 2. Case rates per 100,000 of *Salmonella* infection acquired in Australia and total reports, selected quarters, by State or Territory

	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total reports
4th quarter 1994	2.4	4.5	5.4	10.9	8.1	7.0	6.8	63.4	1206
4th quarter 1993	4.4	4.2	5.6	12.6	6.6	6.9	11.2	65.2	1131
4th quarter 1992	1.6	3.9	3.0	10.7	3.9	7.9	5.7	55.5	890
4th quarter 1991	5.6	5.1	3.5	14.1	5.6	8.5	4.8	54.9	1098
4th quarter 1990	2.4	5.8	4.6	12.8	5.6	8.7	7.1	43.3	1131
4th quarter 1989	10.4	5.8	5.5	14.0	10.7	13.8	8.9	83.3	1426

Caledonia and unspecified countries. This was an almost threefold increase over the number of overseas acquired PT 4 in the same period last year. There were five cases of *S.* Enteritidis PT 6a, acquired in Thailand (3), Bali and Africa, and three cases of PT 34, two of which were acquired in Malaysia.

The cases acquired overseas (except enteric fever) are listed as follows:

ASIA

Indonesia: *S.* Enteritidis PT 4 (4), *S.* Hadar, *S.* Virchow, *Sh. flexneri* 3a, *Sh. flexneri* 6, *Sh. flexneri* var Y, *Sh. sonnei;* Bali: *S.* subsp I ser 4,5:i:-, *S.* Adelaide, *S.* Albany, *S.* Blockley, *S.* Derby (2), *S.* Enteritidis PT 4 (15), PT 6a and RDNC, *S.* Hadar (3), *S.* Isangi, *S.* Livingstone, *S.* Schwarzengrund, *S.* Senftenberg, *S.* Thompson, *S.* Typhimurium PT 12a (2), *S.* Weltevreden, *Sh. sonnei.*
Thailand: *S.* Blockley, *S.* Chester, *S.* Enteritidis PT 4 (3) and PT 6a (3), *S.* Rissen, *S.* Stanley, *S.* Virchow.
Malaysia: *S.* Enteritidis PT 4 (2), PT 34 (2), *S.* Sofia subsp II.
China: *S.* Blockley, *S.* Enteritidis PT 4.
Hong Kong: *S.* Enteritidis PT 4 (3) and PT 13a.
Vietnam: *C. coli, S.* Virchow.
Japan: *S.* Agona.
India: *S.* Hadar, *Sh. dysenteriae* 7, *Sh. flexneri* 2b, *Sh. sonnei.*
Nepal: *S.* Singapore.
Bangladesh: *Sh. flexneri* 1a.
Pakistan: *S.* Infantis.
Unspecified: *S.* subsp I ser ,4,5,12:i:-, *S.* Blockley, *S.* Paratyphi B bv Java 3b var 3, *Sh. flexneri* 3a.

AFRICA

South Africa: *Sh. dysenteriae* 1.
Zimbabwe: *S.* Enteritidis PT 4.
Unspecified: *S.* Enteritidis PT 6a, *S.* Kiambu.

MIDDLE EAST

Lebanon: *S.* Enteritidis PT 4.
Turkey: *Sh. flexneri* 1b.
Unspecified: *S.* Enteritidis PT 4.

EUROPE

Germany: *S.* Enteritidis PT 4.
Poland: *S.* Infantis, *S.* London.
Spain: *S.* Typhimurium PT 12a.
Malta: *S.* Enteritidis PT 4, *S.* Typhimurium untypable.
Italy: *S.* Enteritidis PT 4.

PACIFIC

New Caledonia: *S.* Enteritidis PT 4.
Vanuatu: *S.* Mississippi, *S.* Typhimurium PT 64.

AMERICAS

Chile: *S.* Typhimurium PT 44.
Central America: *Sh. sonnei* biotype a.

UNSPECIFIED COUNTRIES: *S.* Alachua, *S.* Blockley, *S.* Enteritidis PT 4 (5), PT 9 var, PT 34 and RDNC, *S.* Litchfield, *S.* London var 15+, *S.* Montevideo, *S.* Potsdam, *Sh. boydii* 4, *Sh. boydii* 18, *Sh. flexneri* 1b (2), *Sh. flexneri* 2a.

Shigella infections

There was a total of 150 cases of *Shigella* infection reported, similar to the 156 reported last quarter and the 141 reported for the fourth quarter of 1993. One hundred and twenty-four cases of *Shigella* infection were reported as acquired in Australia (Table 3) as against 107 for the corresponding period in 1993, an increase of 16%. Seven reports were follow-up specimens, one was from an immigrant and 18 were reported for travellers returning from overseas.

Sh. flexneri serotypes 2 and 2a, *Sh. sonnei* and *Sh. sonnei* biotype a accounted for 83% of all Australian acquired *Shigella* infections. *Shigella* infections reported as acquired overseas included *Sh. boydii* serotypes 4 and 18 (countries not specified), *Sh. dysenteriae* serotypes 1 (South Africa) and 2 (India), *Sh. flexneri* serotypes 1a (Bangladesh), 1b (Turkey), 2b (India), 3a (Indonesia), 6 (Indonesia) and Y (Indonesia), *Sh. sonnei* (India, Bali), *Sh. sonnei* biotype a (Central America) and *Sh. sonnei* biotype g (Malaysia).

Outbreaks

There were several suspected or confirmed outbreaks during the quarter. The largest of these involved *S.* Bonn (11 adult cases over three days in Brisbane), *S.* Enteritidis PT 4 (13 cases in the Riverland region of South Australia in October) and *S.* Typhimurium PT 8 (17 cases in and around Tamworth in northern New South Wales in December).

Table 3. Cases of *Shigella* acquired in Australia, by State or Territory

	ACT	NSW	Vic	Qld	SA	WA	Tas	NT	Total
Sh. boydii	0	1	0	0	0	0	0	0	1
Sh. boydii 1	0	0	1	0	0	1	0	0	2
Sh. boydii 2	0	0	0	0	0	1	0	0	1
Sh. flexneri	0	6	0	0	0	0	0	0	6
Sh. flexneri 2	0	0	0	6	0	17	0	0	23
Sh. flexneri 2a	1	4	3	5	3	0	0	10	26
Sh. flexneri 2b	0	0	0	0	1	0	0	0	1
Sh. flexneri 3	0	0	0	1	0	0	0	0	1
Sh. flexneri 3a	0	0	1	0	0	0	0	0	1
Sh. flexneri 6	0	0	0	0	0	0	0	1	1
Sh. flexneri var X	0	0	2	0	0	0	0	0	2
Sh. flexneri var Y	0	0	0	0	0	1	0	0	1
Sh. flexneri untypable	0	0	0	0	0	0	0	1	1
Sh. sonnei	0	3	0	2	0	14	0	0	19
Sh. sonnei biotype a	1	2	4	19	1	0	0	8	35
Sh. sonnei biotype g	0	0	2	1	0	0	0	0	3
Total	2	16	13	34	5	34	0	20	124

Table 4. Typhoid and paratyphoid cases

(Vi)-phage type	Sex/age (years)	State or Territory	Notes
S. Typhi			
D2	M/19	WA	Ex Indonesia
D2	F/16	SA	Returned from Indonesia
D2	F/18	WA	No details
E1a	M/31	NSW	Ex Indonesian refugee camp
degraded	M/9	NSW	No details
untypable	M/16	WA	Acquired in South-east Asia
untypable	F/17	NSW	Travel in Bali and Jakarta
untypable	F/30	NT	Travel in Indonesia
untypable	M/46	NSW	No details provided
untypable j:z66 phase	M/39	WA	Acquired in Bali
untypable j:z66 phase	F/56	NSW	Recent return from Indonesia
S. Paratyphi			
1	M/50	NSW	No details
2	F/31	Vic	Visited India
6	F/36	Vic	Returned from India
RDNC	M/25	WA	Returned from Indonesia
RDNC	M/38	Vic	Recent arrival from India
untypable	M/27	Vic	No details
untypable	F/24	Vic	Cambodian immigrant
S. Paratyphi B			
1 var 3	F/NS[1]	Qld	History not provided
3a var	F/55	NSW	No information
Jersey var	M/1	NT	No details
RDNC	F/65	NSW	Previous 3a variant

1. NS not stated.

Northern Territory

Five cases of *S.* Typhimurium PT 12a were reported from mid-October to mid-November from the Alice Springs area (two adults and three young children).

New South Wales

Seventeen cases of *S.* Typhimurium PT 8 were reported from mid- to late October from Tamworth, several reporting food poisoning (nine children - all but one over two years, and eight adults).

Queensland

S. Bonn was reported for 12 cases from Brisbane from 18-21 October (all adults).

S. Saintpaul was reported for 14 cases in Rockhampton in October and November (six children, six teenagers and two adults).

Nine cases of *Sh. sonnei* biotype a were reported from Mount Isa from 26 to 28 November, eight children and one 87 year old male.

There were five cases of *Sh. flexneri* 2 reported in late December from Rockhampton (four children and one teenager).

South Australia

Twelve cases of *S.* Enteritidis PT 4 were reported from the Riverland region from mid- to late October (four children and eight adults).

S. Bovismorbificans PT 7 was reported for ten cases from October to November in Adelaide (seven children and three adults).

There were nine cases of *S.* Adelaide in Adelaide from late October to November (six adults and three children).

S. Typhimurium PT 108 was reported for 11 cases in Adelaide in mid-November (nine adults and two children).

S. Newport was reported for six cases in mid-December from Adelaide, Whyalla and Port Augusta (five adults and one child).

There were also increases in reports of *S.* Typhimurium PT 9, PT 64 and PT 135 during the quarter and continuing into 1995.

Victoria

S. Typhimurium PT 135 was reported for 15 cases from early to mid-October in Melbourne (seven children, two adults, two teenagers and three persons of unknown age).

There were ten cases of *S.* Typhimurium PT 12a in Melbourne from late November to December (seven children and three adults).

Typhoid and paratyphoid cases

There were 11 cases of *S.* Typhi infection, 7 cases of *S.* Paratyphi A and 4 cases of *S.* Paratyphi B reported for the quarter. All those for which information was supplied were reported as acquired overseas or were refugees or migrants (Table 4).

There were 10 cases of *S.* Paratyphi B biovar Java. Two cases of phage type 3b var 3 were reported as acquired overseas (one from South-east Asia and the other not specified). There were five cases of phage type Battersea, four from the Northern Territory and one from Queensland (food poisoning after eating turtle meat), and one case each of phage types Dundee (F/23 Western Australia), 1 var 3 (M/12 Queensland and 3b var (M/2 New South Wales).

Isolations from blood, urine and unusual sites

There were 20 reports of isolates from blood (excluding enteric fever), 11 of isolates from urine and eight of isolates from unusual sites in the quarter (Table 5).

Salmonella serovars and phage types

The top ten *Salmonella* serovars accounted for 67% of Australian acquired cases reported to the NSSS (66% for the fourth quarter of 1993). The most common serovar was *S.* Typhimurium with 475 cases (Table 6) from 26 phage types (Table 7), of which the most common were PT 9 (101 cases) and PT 135 (100 cases). *S.* Saintpaul was in second place with 55 cases (33 from Queensland) followed by *S.* Enteritidis with 50 cases. The most common phage type of *S.* Enteritidis was PT 4 (29 cases) which was associated with a local outbreak in South Australia in October involving 13 cases. This phage type was also reported for cases from other States for which information on whether overseas acquisition was likely was not included.

New and unusual *Salmonella* serovars reported during the quarter were *S.* Alachua (F/32 Northern Territory), *S.* Albany (F/27 Western Australia), *S.* Colindale (F/<1 Victoria), *S.* Hull (F/<1 Northern Territory), *S.* London var 15+ (F/47 South Australia, ex overseas), *S.* Virginia (F/6 New South Wales) and *S.* Weltevreden var 15+ (M/52 New South Wales). Unusual phage types of *S.* Typhimurium were PT 36 (M<1/ New South Wales), PT 55 (F/8 Victoria), PT 105 (F/47 Western Australia), PT 110 (M/2 New South Wales) and PT 151 (F/46 New South Wales).

Mixed infections

There were 30 reports of mixed infections for the third and fourth quarters of 1994 (Table 8).

Update

There were 82 cases of *S.* Typhimurium PT 179 var reported from Melbourne between late February and May. All age groups were affected and cases came mainly from the western region extending as far as Geelong. Pulsed field gel electrophoresis profiles are in progress on faecal and food isolates.

Table 5. Isolations from blood, urine and unusual sites

Organism	Sex/age (years)	State or Territory	Organism	Sex/age (years)	State or Territory
Bacteraemias					
C. jejuni	F/1	Vic	*S.* Typhimurium PT 9	M/89	Qld
C. jejuni	M/77	Vic	*S.* Typhimurium PT 12a	F/21	NT
S. Aberdeen	F/1	Qld	*S.* Typhimurium PT 44	M/70	Vic
S. Chester[1]	M/24	NSW	*S.* Typhimurium PT 44	M/NS[2]	Vic
S. Chester	M/1	Qld	*S.* Typhimurium PT 64	F/78	NSW
S. Dublin	F/67	Qld	*S.* Typhimurium PT 135	M/28	Vic
S. Heidelberg PT 1	F/1	Qld	*S.* Typhimurium PT 179	M/84	Vic
S. Infantis	F/19	Vic	*S.* Typhimurium RDNC	M/<1	Qld
S. Oranienburg	F/2	NT	*S.* Virchow	M/25	NSW
S. Thompson	M/60	NT	*S.* Virchow	M/<1	Qld
Urine isolates					
S. Give	F/34	Tas	*S.* Saintpaul	F/45	Qld
S. Give	M/35	Tas	*S.* Senftenberg	F/33	Vic
S. Heidelberg	F/66	Vic	*S.* Typhimurium 9	F/59	Vic
S. Infantis	F/81	Vic	*S.* Typhimurium 170	F/30	ACT
S. Infantis	F/66	Vic	*S.* Typhimurium RDNC	F/56	Qld
S. Newport	F/24	NSW			
Unusual sites isolates			Site		
A. veronii biovar sobria	M/63	NSW	Wound swab		
S. Birkenhead	M/55	Qld	Peritoneal fluid		
S. Paratyphi A 1	F/50	NSW	Liver abscess		
S. Paratyphi B 3a var	F/55	NSW	Wound swab		
S. Potsdam	M/33	Qld	Left thumb		
S. Senftenberg	F/19	NSW	Colonic fluid		
S. Thompson	F/9	ACT	Unspecified tissue		
S. Typhimurium PT 4	M/72	Vic	Unspecified wound		
S. Typhimurium PT 13	M/<1	NSW	Joint fluid		
S. Typhimurium PT 44	F/52	Tas	Colonic biopsy and faeces		
S. Typhimurium PT 135	M/47	NSW	Fluid from scrotum		
S. Welikade	M/<1	NT	Elbow (*S.* Chester from faeces)		

1. Acquired overseas (Thailand).
2. NS not specified.

Table 6. Top ten *Salmonella* serovars

	Position this quarter	Position last quarter	Cases	% of total	Origin and number of cases
S. Typhimurium[1]	1	1	475	39.4	
S. Saintpaul[1]	2	5	55	4.6	Qld 33, WA 12
S. Enteritidis[1]	3	6	47	3.9	Qld 14, SA 13, NSW 9
S. Virchow	4	3	47	3.9	Qld 42
S. Infantis	5	8	38	3.1	Vic 18, NSW 8
S. Chester	6	-	35	2.9	Qld 14, WA 11
S. Birkenhead	7	9	32	2.7	Qld 21, NSW 11
S. Bovismorbificans[1]	8	4	30	2.5	SA 11, NSW 7, Vic 5
S. Meunchen	9	-	28	2.3	WA 12, Qld 6
S. subsp I ser 16:1, v:-	10	2	21	1.7	Qld 9, NSW 8
Total			808	67.0	

From mid-February to May several cases of the unusual serovar *S.* Brandenburg were reported from New South Wales and the Australian Capital Territory. With the exception of two neonates from a metropolitan hospital, all cases were adults. Two cases were reported from the Australian Capital Territory, seven were reported from Sydney and there was one each from Parkes and Kempsey. *S.* Brandenburg has been isolated from imported hommus in recent years.

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

Phage type	Position this quarter	Position last quarter	Cases	% of total	Origin and number of cases
9[1]	1	2	101	21.3	Vic 44, NSW 39
135[1]	2	1	100	21.0	Vic 47, NSW 19, SA 16
44	3	3	40	8.4	Vic 19, Tas 10
8[1]	4	5[2]	35	7.4	NSW 18, SA 7, Vic 7
12a[1]	5	5[2]	30	6.3	Vic 12, NT 7, SA 4
Total			306	64.4	

1. Associated with outbreak or incident.
2. Equal fifth position last quarter.

Table 8. Mixed infections, third and fourth quarters 1994

Organisms	Sex/age (years)	State or Territory
S. I ser 16:l,v:-, *C. jejuni* subspecies *jejuni*	M/<1	Vic
S. I ser 16:l,v:-, *Campylobacater* species	M/7	Vic
S. I ser 16:l,v:-, *S.* Typhimurium PT 9	F/<1	NSW
S. I ser 16:l,v:-, rotavirus	F/3	NSW
S. Aberdeen, *Y. enterocolitica*	F/<1	Qld
S. Adelaide, *S.* Typhimurium PT 64	F/62	SA
S. Agona, *S.* Enteritidis PT 4	F/37[1]	SA
S. Blockley, rotavirus	F/1	Qld
S. Enteritidis PT 34, *Plesiomonas* species	M/45[1]	Vic
S. Give, *Campylobacter* species	M/30	Tas
S. Give, *S.* Typhimurium PT 12a	M/<1	NT
S. Hadar, *Giardia lamblia*	F/27	SA
S. Havana, *C. jejuni* subspecies *jejuni*	M/22	Vic
S. Havana, *S.* Wandsworth	M/<1	NT
S. Infantis, *C. jejuni* subspecies *jejuni*	F/19[1]	NSW
S. London, *S.* Infantis	F/39[1]	SA
S. Oranienburg, *S.* Typhimurium PT 12a	M/<1	NT
S. Sofia subspecies II, *C. jejuni* subspecies *jejuni*	F/77	Vic
S. Typhimurium PT 64, rotavirus	F/1	Qld
S. Typhimurium PT 64, *Sh. flexneri*	F/25[1]	Qld
S. Typhimurium PT 135, C. *jejuni* subspecies *jejuni*	M/1	Vic
S. Virchow, *C. jejuni* subspecies *jejuni*	M/57	NSW
S. Virchow, *Cryptosporidium parvum*	M/<1	Qld
S. Welikade, *S.* Chester	M/<1	NT[2]
C. jejuni subspecies *jejuni*, *A. hydrophila*	F/45	Vic
C. jejuni subspecies *jejuni*, *Y. enterocolitica*	M/<1	Vic
C. jejuni subspecies *jejuni*, *Pl. shigelloides*	F/29[1]	Vic
Sh. sonnei biotype g, *Giardia lamblia*	M/29[1]	Vic
Sh. dysenteriae 7, *Giardia lamblia*	M/3[1]	Vic
Yersinia species, *Campylobacter* species	M/1	NSW

1. Acquired overseas (F/37 not specified, M/45 not specified, F/19 Japanese exchange student, F/39 overseas visitor from Britain, F/25 Vanuatu, F/29 Bali, M/29 India, M/3 India).
2. *S.* Welikade isolated from septic left elbow and *S.* Chester from faeces.

From mid-January to the end of February there were 19 cases of *S.* Saintpaul from Perth and all age groups were affected. Whilst this is a common serovar in the north-west of Western Australia, it is not commonly reported from Perth.

COMMENTARY

Barmah Forest virus

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Because of the Australian continent's protracted geological and geographical isolation from the rest of the world, dating back some 50 million years to the time that Australia broke free from the ancient southern supercontinent of Gondwanaland, the flora and fauna in this country developed uniquely. As a result, although some arboviruses found in Australia occur in other parts of the world, many Australian arboviruses do appear to be unique to this continent. Likewise, their vertebrate hosts with whom they evolved are predominantly marsupials, although imported placental mammals, including man, are susceptible to some of these viruses.

Nine arboviruses which have been isolated in Australia are known to be pathogenic; it is likely that some others are also pathogenic. In addition, there are undoubtably more arboviruses to be discovered in the field.

Barmah Forest virus (BFV) was first isolated from the Barmah Forest in Victoria in 1974 by Marshall et al during mosquito trapping for virus isolation during the Murray Valley virus encephalitis epidemic in 1974[1]. In their studies of human arbovirus infections along the south coast of New South Wales, Drs Mike Cloonan, Trevor Vale and colleagues found antibodies in some blood donors to BFV, and to Trubanaman and Gan Gan viruses from the family Bunyaviridae, and isolated a number of unidentified arboviruses which needed characterisation. Their antibody studies indicated that BFV was present in persons living in the coastal strip from Nowra south to Batemans Bay and Moruya. At the time they could not ascertain whether these viruses actually caused human illness[2]. Hawkes et al in 1987 found widespread distribution of BFV infection in humans in New South Wales[3].

The first observation that BFV may be pathogenic was made as a result of studies by the latter group on sera taken from patients suffering from epidemic polyarthritis in the 1983-84 epidemic of Ross River virus (RRV)[4]. As has been found in Western Australia and elsewhere, during an outbreak of RRV infection, many cases of epidemic polyarthritis occur which are not due to RRV. Amongst the 1984 epidemic polyarthritis cases in New South Wales, three were found to be due to BFV. This was the first recorded observation of its pathogenicity. Also in the 1984 RRV epidemic, three cases of illness were attributed to infection by Kokobera virus, one of the flaviviruses[5].

Subsequently, Queensland workers isolated BFV from the blood of patients in the acute stage of the illness and contributed to our knowledge of the infection's morbidity and clinical manifestations[6]. The recent report of a BFV outbreak on the south coast of New South Wales[7], the report of cases in Gippsland in Victoria[8] and other reports from the Northern Territory, Western Australia and Queensland show that BFV is a significant cause of epidemic polyarthritis in many parts of Australia.

Further study of the natural history of BFV illness needs to be conducted. I have seen one person in whom it appears BFV infection may have precipitated chronic fatigue syndrome; more observations are needed. A number of patients with RRV epidemic polyarthritis have developed a chronic fatigue-like syndrome with or without persistence of polyarthritic symptoms. Work needs to be done, perhaps using techniques such as PCR, to investigate the possible persistence of RRV or its antigens in the host in such cases. Viral genomic sequences have been reported in cases of persistent rubella arthropathy.

Following Vale and Cloonan's finding of antibodies in blood donors to Trubanaman and Gan Gan viruses[2], our group subsequently reported three patients suffering an epidemic polyarthritis-like illness resulting from Gan Gan virus infection and two with similar pictures due to Trubanaman infection[9].

The purpose of this communication is to indicate to potential arbovirologists that several arboviruses for which diagnostic laboratories could screen have been identified as pathogenic, and that more arboviruses, some of which are probably pathogenic, are out there in the field waiting to be found and characterised. This is indeed a most fascinating and challenging discipline involving field, laboratory, clinical and epidemiological work.

References

1. Marshall ID, Woodroofe GM, Hirsch S. Viruses recovered from mosquitoes and wild life serum collected in the Murray Valley of south eastern Australia, February 1974, during an epidemic of encephalitis. *Aust J Exp Biol Med Sci* 1982;**60**:457-470.
2. Vale TG, Carter IW, McPhie KA, James GS, Cloonan MJ. Human arbovirus infections along the south coast of New South Wales. *Aust J Exp Biol Med Sci* 1986;**64**:307-309.
3. Hawkes RA, Boughton CR, Naim HM, Myrick BA, Ramsay LG. Barmah Forest virus infection in hu-

mans in New South Wales. *Med J Aust* 1987;**146**:569-573.

4. Boughton CR, Hawkes RA, Naim HM. Illness caused by Barmah Forest-like virus in New South Wales. *Med J Aust* 1988;**148**:146-147.
5. Boughton CR, Hawkes RA, Naim HM. Illness caused by Kokobera-like virus in south eastern Australia. *Med J Aust* 1986;**145**:90-92.
6. Phillips DA, Murray JR, Aaskov JG, Weimers MA. Clinical and sub-clinical Barmah Forest virus infection in Queensland. *Med J Aust* 1990;**152**:463-466.
7. Van Buynder P, Sam G, Russell R, Murphy J, Cunningham A, Hueston L et al. Barmah Forest virus epidemic on the south coast of New South Wales. *Comm Dis Intell* 1995;**19**:188-191.
8. Norris PM, Robinson P. Barmah Forest virus disease in Gippsland, Victoria. *Comm Dis Intell* 1995;**19**:373-375.
9. Boughton CR, Hawkes RA, Naim HM. Arbovirus infection in humans in New South Wales: seroprevalence and pathogenicity of certain Australian bunyaviruses. *Aust NZ J Med* 1990;**20**:51-55.

OVERSEAS BRIEFS

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

Influenza update

The number of influenza isolates increased fourfold in New Zealand between May and June. They were from all parts of the country, but more were from the South Island. Five of the 79 isolates were typed as influenza A H_3N_2 and the remainder have been influenza B.

Zambia has reported isolations of influenza A H_3N_2 from eight cases in June, the first isolates detected since January 1995.

In South Africa, a surveillance program in Cape Town based on absenteeism in workplaces, health care facilities and schools registerd above expected absenteeism in schools and a municipal health department from the second half of May to around mid-June. Specimens collected in May and June yielded five influenza A viruses. Two were further identified as influenza A H_1N_1, the first isolates of this subtype detected in the Cape area since 1987.

In Thailand, influenza viruses were isolated from sporadic cases from March to June. Isolates in May and June were identified as influenza A and those in June were identified as influenza A and influenza B. Some influenza A isolates have been further identified as influenza A H_1N_1.

Cholera update

The Ukraine reported 185 cases for the period 11 June to 10 July. Two cases of cholera were reported from the Russian Federation in July, one from Rostov-on-Don and one from Chechnya. Brava Island and Fogo Island in Cape Verde have been declared infected.

The World Health Organization considers that cholera due to *Vibrio cholerae* O139 seems less likely to become a global threat that first thought when it emerged in 1992[1]. Since the first reports in India, it has been isolated from 10 countries in Asia: China, Hong Kong, India, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Sri Lanka and Thailand. In 1994, only Malaysia, Myanmar, Nepal, Singapore and Thailand reported cases due to this serogroup, and it was responsible for only one large outbreak, involving 3487 reported cases in Thailand.

Cholera cases have been reported since March from Angola, Argentina, Belize, Bukino Faso, Burundi, Cameroon, Cape Verde, Costa Rica, Ecuador, El Salvador, Ghana, Guinea, Honduras, India, Kenya, Laos, Liberia, Mali, Mexico, Nicaragua, Peru, the Russian Federation, Sierra Leone, Singapore, Somalia, Uganda, Ukraine and Zaire.

Reference

1. Cholera in 1994 part 1. *WHO Wkly Epidemiol Rec* 1995; **70**: 201-208.

COMMUNICABLE DISEASES SURVEILLANCE

Virology and Serology Reporting Scheme

There were 2830 reports received in the *CDI* Virology and Serology Reporting Scheme this fortnight (Tables 9, 10 and 11).

- **Measles** was reported for one patient this fortnight. A total of 2 reports was received for the month of June, the lowest number for any month since July 1989 (Figure 1).
- Two reports of **mumps** were received this period for a 17 year old Victorian male and a 56 year old male from Queensland. Both diagnoses were by IgM detection.

- **Rubella** was reported for 6 patients this period including 5 males in the 22 to 52 year age group and a 49 year old female.
- **Hepatitis A** was reported for 14 patients this period. Included were 7 males and 7 females all in the 5 to 64 year age range. Two pairs of patients were from the same postcode regions of Queensland.
- Positive **hepatitis B** serology was reported for 145 patients this fortnight including 75 males and 69 females (one sex not stated). Eighty patients were in the 25 to 44 year age group and 34 in the 15 to 24 year age group. Included were 3 injecting drug users, 9 pregnant females and one HIV positive patient.
- Two hundred and ninety reports of positive **hepatitis C** serology were received this period. Included were 182 males and 103 females (5 sex not stated). Eighty reports were for the 25 to 44 year age group. Included were 26 injecting drug users and 7 pregnant females.
- **Ross River virus** was reported for 34 patients this period, 28 of whom were from Queensland. The number of reports received for the months of May and June were average for the time of year following the receipt of below average numbers earlier in the year (Figure 2).
- Fourteen reports of **Barmah Forest virus** were received this period. The number of reports continued to fall during the month of June and was average for the time of year.
- Forty-three reports of **adenovirus** were received this fortnight. Diagnosis was by virus isolation (28), antigen detection (10), fourfold rise in titre (2) and single high titre (3). Included was untyped adenovirus detected by immunofluorescence in the nasopharynx of a 2 year old female with pancreatitis.
- **Herpes simplex virus type 1** was reported for 242 patients this fortnight. Diagnosis was by virus isolation (236), antigen detection (5) and IgM detection(one).
- Two hundred and ninety-nine reports of **herpes simplex virus type 2** were received, diagnosed by virus isolation (298) and antigen detection (one).
- Seventy-five reports of **cytomegalovirus** were received this period, for 39 males and 36 females, 24 of whom were under the age of one year. Diagnosis was by virus isolation (52), antigen detection (3), nucleic acid detection (one), IgM detection (18) and single high titre (one). Included was virus isolation from the urine of a 14 month old female who was excreting the virus at the time of birth (born prematurely at 26 weeks gestation). Also included was a one month old male who was anaemic and had hepatosplenomegaly and a 32 year old HIV positive male who died.
- **Epstein-Barr** virus was reported for 16 patients this fortnight. Included were 43 males and 55 females, 61 of whom were in the 15 to 24 year age group.
- Three reports of **parvovirus** were received this period from Queensland (2) and Victoria (one). Included was a 77 year old male with recurrent anaemia and abnormal liver funcion tests.
- **Coxsackievirus type B3** was isolated from the CSF of a 7 day old male from New South Wales.
- Two reports of **echovirus type 11** were received this period including virus isolation from the CSF of a 3 year old female.
- **Enterovirus type 71** was reported for 4 patients this fortnight, for 2 males and 2 females, all in the one to 44 year age range. Included was a 9 year old male with hand, foot and mouth disease.
- **Rhinovirus** was reported for 22 patients this period 13 of whom were under the age of one year.

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

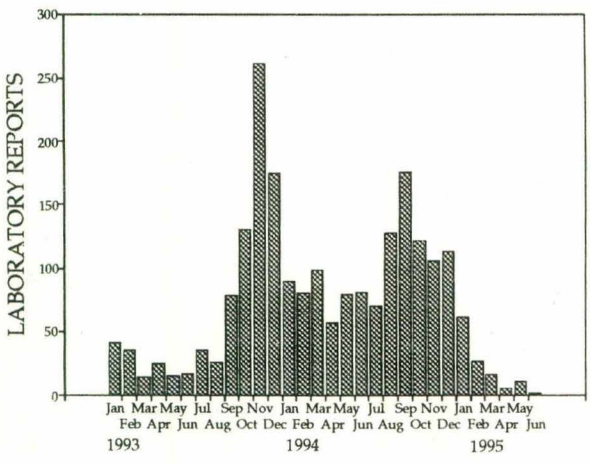
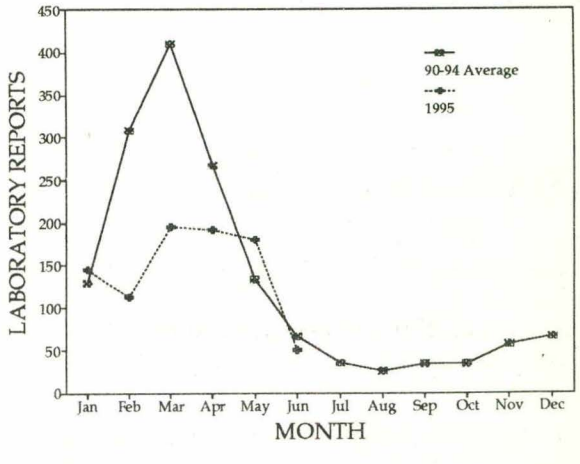


Figure 2. Ross river virus laboratory reports, 1990 to 1994 average and 1995, by month of specimen collection



- **Influenza A** was reported for 88 patients this fortnight including 12 reports of subtype H_1N_1. Forty patients were under the age of 5 years. Diagnosis was by virus isolation (48, specimen collection dates from early June to mid-July), antigen detection (10), fourfold rise in titre (6), IgM detection (2), and single high titre (22). Reports were received from the Australian Capital Territory (5), New South Wales (19), Queensland (24), South Australia (24), Victoria (11) and Western Australia (5). Included were 3 infants with bronchiolitis. A total of 473 reports has been received for the year to date including 268 males and 201 females. Forty-nine isolates were identified as H_1N_1 subtypes and 5 as H_3N_2 subtypes.
- Twenty-six reports of **influenza B** were received this fortnight. Diagnosis was by virus isolation (14, specimen collection dates from mid-June to mid-July), antigen detection (3), fourfold rise in titre (2) and single high titre (7). Reports were received from New South Wales (8), Queensland (10), South Australia (3) and Victoria (5). A total of 99 reports has been received so far this year, for 52 males and 46 females, 24 of whom were in the 25 to 44 year age group.
- Twenty-four reports of **parainfluenza virus type 2** were received this period, all for patients under the age of 5 years. All diagnoses were by virus isolation. The number of reports received fell in the month of June (Figure 3).
- **Parainfluenza virus type 3** was reported for 52 patients this fortnight, 30 for patients under the age of one year. Diagnosis was by virus isolation (29), antigen detection (21) and serology (2). Included was a one year old female with fever, rash and suspected meningococcal disease. The number of reports rose in the months of May and June (Figure 3).
- Eight hundred and thirty-two reports of **respiratory syncytial virus (RSV)** were received this fortnight, 577 for patients under one year of age and 215 in the one to 4 year age group. Method of diagnosis included virus isolation (227), antigen detection (594) and single high titre (11). Included was a 5 month old male with respiratory failure, 2 and 3 month old males with suspected pertussis and a 7 month old male who also had rotavirus. The number of reports received rose sharply in June to above average figures for the month (Figure 4). A total of 2249 reports have been received for the year to date, 68% of which were for infants under the age of 12 months (Figure 5).
- **Rotavirus** was reported for 110 patients this period including 58 males and 52 females. One hundred and seven cases were for children of 4 years of age or under. The number of reports received in recent months has been below average for the time of year (Figure 6).
- ***Chlamydia trachomatis*** was reported for 163 patients this period including 67 males and 96

Figure 3. Parainfluenza virus type 2 and 3 laboratory reports, 1994 to 1995, by month of specimen collection

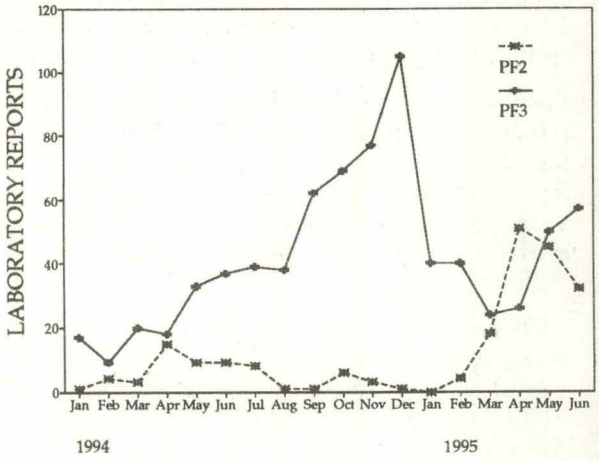


Figure 4. RSV laboratory reports, 1990 to 1994 average and 1995, by month of specimen collection

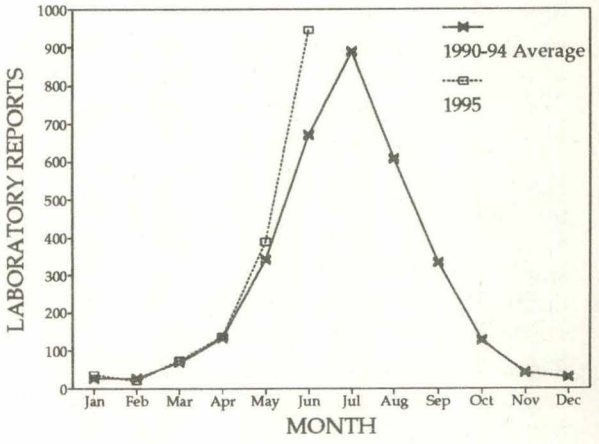


Figure 5. RSV laboratory reports, 1995, by age group and sex

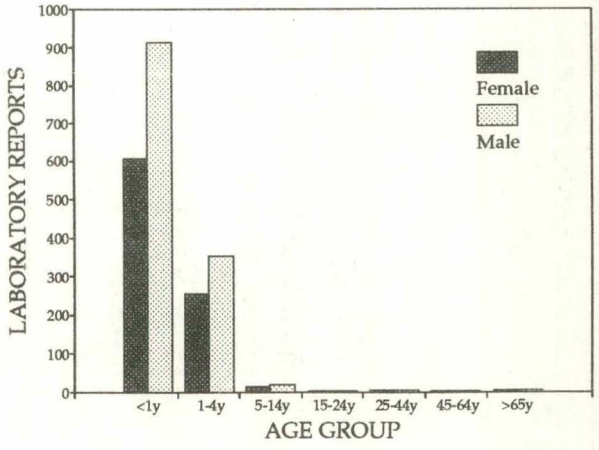


Figure 6. Rotavirus laboratory reports, 1990 to 1994 average and 1995, by month of specimen collection

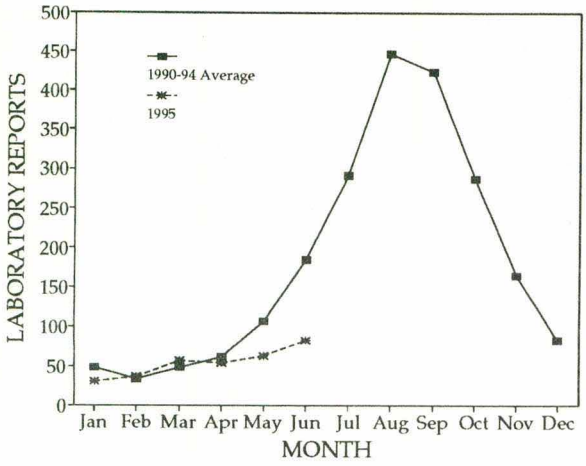
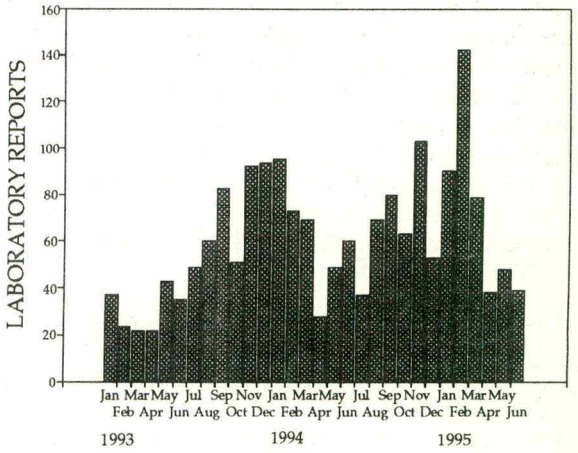


Figure 7. *Bordetella* pertussis laboratory reports, 1993 to 1995, by month of specimen collection



females. Diagnosis was by virus isolation (50), antigen detection (45) and nucleic acid detection (68). Included were 2 males aged 2 weeks, one of whom was reported to have had severe haemorrhagic conjunctivitis.

- Eighteen reports of ***Mycoplasma pneumoniae*** were received this period, for 8 males and 10 females, 14 of whom were under the age of 5 years. A total of 17 reports was received for the month of June, below average for the time of year.
- ***Bordetella*** was reported for 7 patients this period (4 ***Bordetella pertussis*** and 3 ***Bordetella* species**). Cases ranged in age from one month to 64 years and one male and 6 females were included. The number of reports has remained low in recent months after peaking in February (Figure 7).
- ***Toxoplasma gondii*** was reported for 2 patients this fortnight including a 20 year old mother whose baby had hepatosplenomegaly, anaemia and failure to thrive.
- Positive ***Strongyloides stercoralis*** serology was reported for 17 and 51 year old females from the Northern Territory.

Australian Sentinel Practice Research Network

Data for week 28 (ending 16 July) and week 29 (ending 23 July) are included in this issue of *CDI* (Table 1). There were 8093 consultations reported for week 28 and 7359 for week 29. The **influenza** reporting rate was about the same this fortnight as last fortnight. The highest rates were reported from Queensland, New South Wales and South Australia, and there were few reports received from Victoria, the Australian Capital Territory, Tasmania, Western Australia and the Northern Territory. Reports of **measles** continue to be rare.

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

Table 1. Australian Sentinel Practice Research Network, weeks 28 and 29, 1995

Condition	Week 28, to 16 July 1995		Week 29, to 23 July 1995	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	203	25.1	165	22.4
Rubella	1	0.1	2	0.3
Measles	0	0	0	0
Chickenpox	8	1.0	16	2.2
Pertussis	0	0	3	0.4
Gastroenteritis	98	12.1	105	14.3

Table 2. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 28 February 1995, by sex and State or Territory of diagnosis

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA			
										This period 1995	This period 1994	Year to date 1995	Year to date 1994
HIV diagnoses	Female	0	4	0	2	1	0	0	1	8	7	18	13
	Male	0	46	0	12	1	0	22	4	85	83	156	158
	Sex not reported	0	1	0	0	0	0	0	0	1	1	4	3
	Total[1]	0	51	0	14	2	0	22	5	94	91	178	174
AIDS diagnoses	Female	0	3	0	1	0	0	0	0	4	2	4	3
	Male	0	12	0	3	0	1	9	2	27	60	59	130
	Total[1]	0	15	0	4	0	1	9	2	31	62	63	133
AIDS deaths	Female	0	2	0	0	0	0	1	0	3	1	5	6
	Male	0	26	0	7	2	0	12	1	48	52	89	106
	Total[1]	0	28	0	7	2	0	13	1	51	55	94	113

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

Table 3. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 28 February 1995, by sex and State or Territory of diagnosis

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	AUSTRALIA
HIV diagnoses	Female	13	532	4	88	44	4	154	60	899
	Male	153	9680	78	1479	531	69	3208	700	15898
	Sex not reported	0	2048	0	0	0	0	43	0	2091
	Total[1]	166	12267	82	1571	575	73	3412	761	18907
AIDS diagnoses	Female	3	119	0	24	14	2	37	13	212
	Male	64	3288	24	528	243	32	1173	234	5586
	Total[1]	67	3417	24	554	257	34	1216	247	5816
AIDS deaths	Female	2	78	0	18	10	2	21	8	139
	Male	46	2315	17	370	152	21	901	169	3391
	Total[1]	48	2399	17	390	162	23	928	177	4144

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

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 deaths following AIDS reported for February 1995 and cumulative to 28 February 1995, as reported to 31 May 1995, are included in this issue of *CDI* (Tables 2 and 3).

National Influenza Surveillance 1995

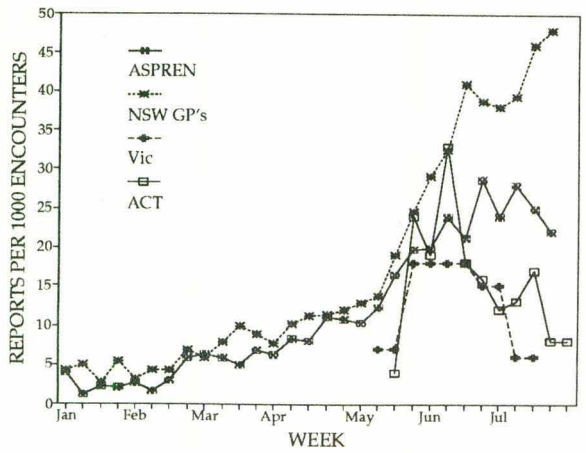
Australian Capital Territory Department of Health and Community Care; Australian Sentinel Practice Research Network; Communicable Diseases Intelligence Virology and Serology Reporting Scheme Contributing Laboratories; New South Wales Department of Health; Australia Post; Victorian Department of Health and Community Services; South Australian Health Commision; World Health Organization (WHO) Collaborating Centre for Influenza Reference and Research, Melbourne

Overall the rate of influenza reporting has remained stable this fortnight.

Sentinel general practitioner surveillance (Figure 8)

- The **Australian Sentinel Practice Research Network** reported 25 and 22 reports per 1000 encounters for the weeks ending 16 and 23 July respectively, a slight decrease on the rate reported in previous weeks. The rate of reporting for influenza like illness rose in Queensland this period, whilst that for South Australia, New South Wales and Victoira fell.

Figure 8. Sentinel general practitioner influenza reports per 1000 encounters, 1995, by week and scheme



- The **Victorian sentinel general practitioners reporting scheme** demonstrated a decline in the consultation rate for influenza like illness from 15 to 6 per 1000 encounters this period.
- **New South Wales sentinel general practitioners** reported rates of 46 and 48 per 1000 consultations for the weeks ending 16 and 23 July respectively, an increase on the rates reported in previous weeks.
- **The Australian Capital Territory Sentinel General Practitioner Scheme** reported a fall in the consultation rates for influenza like illness to 8 per 1000 encounters for the weeks ending 23 and 30 July respectively.

Absenteeism surveillance (Figure 9)

- **Australia Post** reported a national absenteeism rate of 2.5% for the week ending 23 July, similar to the rate reported in previous weeks. There was little variation in the rate of reporting for each of the States and Territories compared to previous reporting periods.

Figure 9. Absenteeism reports, 1995, by week and scheme

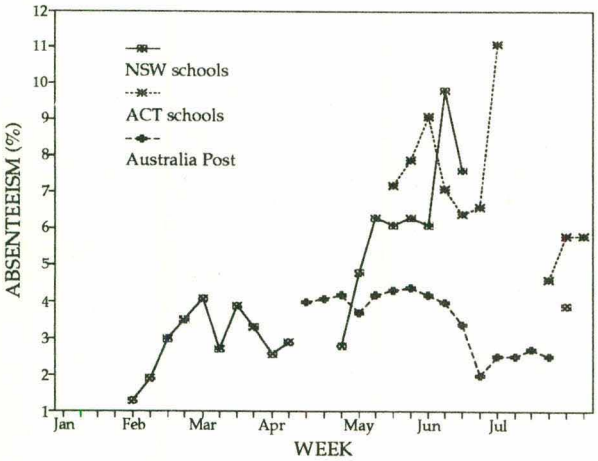
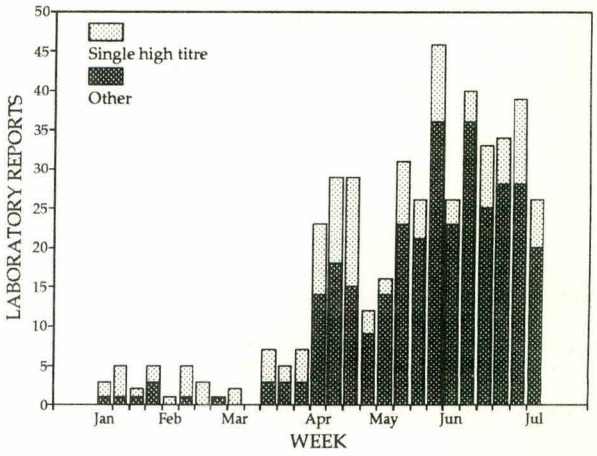


Figure 10. Influenza A laboratory reports, 1995, by method of diagnosis and week of specimen collection

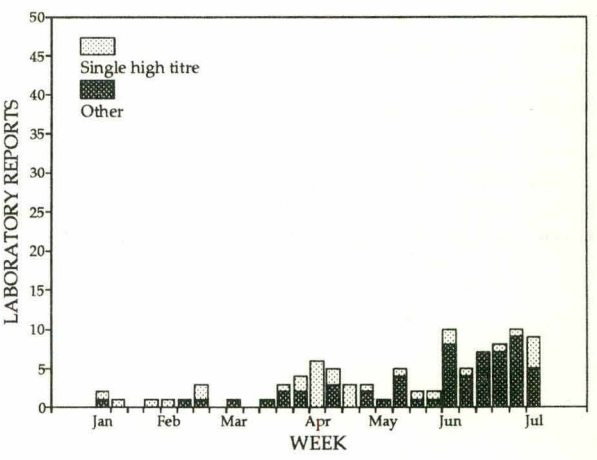


- **New South Wales Schools Absenteeism Surveillance** fell to 3.9% this period.
- The **Australian Capital Territory Schools Absenteeism Surveillance** rates have fallen in recent weeks to 5.8% for the weeks ending 25 July and 6 August.

Laboratory surveillance

- **Influenza A** was reported for 88 patients this fortnight including 12 reports of subtype H_1N_1. Forty patients were under the age of 5 years. Diagnosis was by virus isolation (48, specimen collection dates from early June to mid July), antigen detection (10), fourfold rise in titre (6), IgM detection (2), and single high titre (22). Reports were received from the Australian Capital Territory (5), New South Wales (19), Queensland (24), South Australia (24), Victoria (11) and Western Australia (5). Included were 3 infants with bronchiolitis. A total of 473 reports has been received for the year to date including 268 males and 201 females. Forty nine isolates were identified as H_1N_1 subtypes and 5 as

Figure 11. Influenza B laboratory reports, 1995, by method of diagnosis and week of specimen collection



H_3N_2 subtypes. The number of reports has fallen slightly in recent weeks (Figure 10).

- Twenty six reports of **influenza B** were received this fortnight. Diagnosis was by virus isolation (14, specimen collection dates from mid June to mid July), antigen detection (3),fourfold rise in titre (2) and single high titre (7). Reports were received from New South Wales (8), Queensland (10), South Australia (3) and Victoria (5). A total of 99 reports has been received so far this year for 52 males and 46 females, 24 of whom were in the 25 to 44 year age group.The number of reports rose slightly in the month of June but remains low compared to that for influenza A (Figure 11).

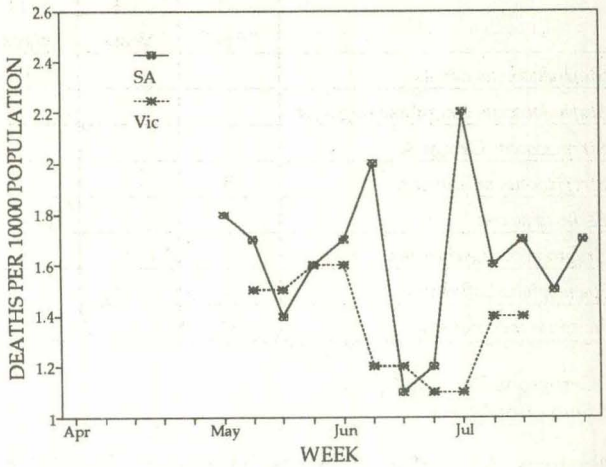
Deaths surveillance (Figure 12)

- **Victorian total deaths surveillance** reported a death rate of 1.4 per 10,000 population for the fortnight ending 16 July, slightly higher than the reported rate in the preceding fortnights.
- **South Australia deaths surveillance** rates remained stable at 1.5 and 1.7 per 10,000 population for the weeks ending 23 and 30 July respectively.

Other surveillance

- **Victorian hospital admissions surveillance** reported admission rates for influenza and/or pneumonia of 0.8 per 100 patients for the last fortnight, the same as that reported in the previous period.

Figure 12. Total deaths surveillance, 1995, by week and State



Sterile Sites Surveillance (LabDOSS)

Data for this four weekly period have been provided by 13 laboratories. There were 518 reports of significant sepsis:

New South Wales: Hunter Area Pathology Service 63; Liverpool Hospital 88.
Tasmania: Royal Hobart Hospital 24; Northern Tasmania Pathology Service 16.

Table 4. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical information						Risk factors				Total[1]
	Bone/joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary tract	Skin	Surgery	Immunosuppressed	IV line	Neonatal	
Enterococcus faecalis		1			2			1	1		6
Staphylococcus aureus	4	1	2	1	3	10	6	11	13	2	69[2]
Staphylococcus epidermidis	1						1	2	11		23
Staphylococcus coagulase negative	2	2		4		3	3	7	10	1	60
Streptococcus Group B				1		2	1			3	12
Streptococcus pneumoniae	1	15		1			1	1			32
Streptococcus species		1	1			1			1		11
Escherichia coli		1	1	11	34	1	6		2	1	77
Acinetobacter species		1						3	1		7
Enterobacter species		1	1	1	1			4	1		8
Bacteroides fragilis				2	1			1	1		6
Klebsiella pneumoniae		1		3	4		2	5		1	14
Neisseria meningitidis											7[3]
Proteus mirabilis					5	1	1	3			8
Pseudomonas aeruginosa		1		1	4	1	2	6	3		18
Candida albicans					1		1	2	1		6

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.

Table 5. LabDOSS reports of meningitis and/or CSF isolates, by organism and age group

	<1 year	1-4 years	5-14 years	15-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	Total
Staphylococcus aureus			1							1
Staphylococcus coagulase negative					1					1
Streptococcus Group A							1			1
Streptcoccus pneumoniae	3							2	1	6
Escherichia coli									1	1
Cryptococcus neoformans						1		1		2
Haemophilus influenzae	3									3
Neisseria meningitidis	1[1]	1	1[1]	1	1		1[2]			6

1. Serogroup B.
2. Serogroup Z.

Western Australia: Princess Margaret Hospital for Children 25; Sir Charles Gairdner Hospital 35.
Queensland: Ipswich General Hospital 15; Nambour Hospital 6; Royal Brisbane Hospital 59; Sullivan Nicholaides and Partners 45.
South Australia: Institute of Medical and Veterinary Science, Adelaide 68.
Australian Capital Territory: Woden Valley Hospital 45.
Northern Territory: Alice Springs Hospital 29.

Organisms reported 5 or more times from blood are detailed in Table 4.

Other blood isolates not included in Table 4 were:

Gram positive: 2 *Bacillus* species, 1 *Corynebacterium jeikeium*, 4 *Corynebacterium* species, 1 *Enterococcus faecium*, 1 *Nocardia* species, 1 *Staphylococcus saprophyticus*, 1 *Staphylococcus haemolyticus*, 4 *Streptococcus* Group A, 1 *Streptococcus* Group C, 1 *Streptococcus* Group D, 4 *Streptococcus* Group G, 4 *Streptococcus* 'milleri' and 3 *Strepotococcus sanguis*.

Gram negative: 1 *Achromobacter* species, 1 *Aeromonas hydrophila*, 1 *Citrobacter diversus*, 1 *Citrobacter freundii*, 2 *Enterobacter aerogenes*, 1 *Enterobacter agglomerans*, 3 *Enterobacter cloacae*, 1 *Gemella* species, 3 *Haemophilus influenzae* (all females 1 year old) 1 *Moraxella* species, 2 *Morganella morganii*, 1 *Pseudomonas* species, 1 *Salmonella* species, 1 *Salmonella* Typhi (22 year old male travelled overseas) and 3 *Xanthomonas maltophilia* (all females in the age range 19 to 79 years, including one 59 year old female who had had surgery).

Anaerobes: 1 *Clostridium perfringens*, 2 *Clostridium* species, 1 *Fusobacterium* species, and 1 *Propionibacterium* species.

Fungi: 1 *Candida* species, 1 *Cryptococcus neoformans* var *neoformans* (38 year old immunocompromised female), 2 *Rhodotorula rubra* and 1 *Trichlosporon beigelii* (immunosuppressed 64 year old male).

There were 284 blood isolates reported for patients over the age of 44 years (Figure 13).

Hospital acquired blood isolates

A total of 118 isolates was reported as being hospital acquired. The most commonly reported organisms were *Candida albicans* (6), *Escerichia coli* (8), *Klebsiella pneumoniae* (6), *Pseudomonas aeruginosa* (9), *Staphylococcus aureus* (22, including 1 MRSA), *Staphylococcus* coagulase negative (26), and *Staphylococcus epidermidis* (8).

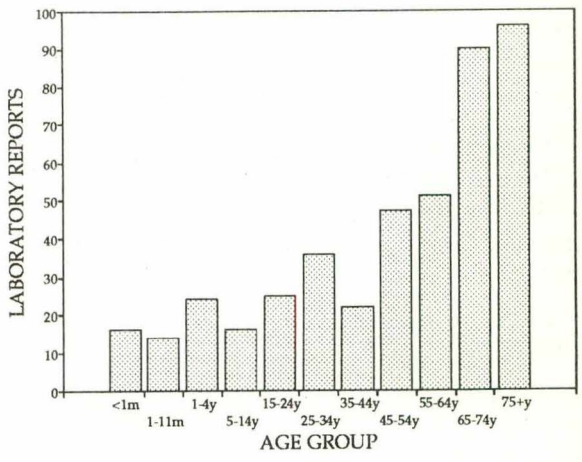
Meningitis and/or CSF isolate reports

There were 21 reports of meningitis and/or CSF isolates (Table 5). Included were 2 *Cryptococcus neoformans*, 1 *Escherichia coli*, 3 *Haemophilus influenzae*, 6 *Neisseria meningitidis* (all males with age range 1 to 46 years; 2 serogroup B and 1 serogroup Z), 1 *Staphylococcus aureus* (13 year old female with an infected shunt), 1 *Staphylococcus* coagulase negative, 1 *Streptococcus* Group A and 6 *Streptococcus pneumoniae* (3 of these under 1 year old).

Isolates from sites other than blood or CSF

Joint fluid: Seventeen reports were received this period including 1 *Enterobacter* species, 1 *Neisseria gonorrhoeae* (15 year old female with septic arthritis) 9 *Staphylococcus aureus* (6 males and 3 females, age range

Figure 13. LabDOSS reports of blood isolates, by age group



24 to 77 years), 2 *Staphylococcus* coagulase negative, 1 *Streptococcus* Group B, 1 *Streptococcus* Group G 1 *Streptococcus pneumoniae* (56 year old male) and 1 *Streptococcus* sanguis (83 year old male with osteomyelitis).

Peritoneal dialysate: Three reports were received and all were males in the age range 40 to 62 years. Included was 1 *Candida* species and 2 *Staphylococcus* coagulase negative.

Pleural fluid: Five reports of organisms isolated from pleural fluid were received this period and all were females in the age range 5 to 71 years. Included was 1 *Haemophilus influenzae*, 1 *Pseudomonas aeruginosa*, 1 *Staphylococcus* coagulase negative, 1 *Streptococcus pneumoniae* and 1 *Streptococcus* species.

Other: 1 *Aspergillus* species, 1 *Bacteroides fragilis*, 1 *Candida albicans*, 1 *Corynebacterium jeikeium*, 1 *Enterobacter aerogenes*, 2 *Enterococcus* species, 4 *Escherichia coli*, 1 *Klebsiella pneumoniae*, 1 *Klebsiella* species, 2 *Proteus mirabilis*, 6 *Staphylococcus aureus*, 3 *Staphylococcus* coagulase negative, 1 *Streptococcus* 'milleri', 1 *Streptococcus pneumoniae*, 1 *Streptococcus sanguis* and 2 *Streptococcus viridans*.

National Notifiable Diseases Surveillance System 9 July 1995 to 22 July 1995

There were 1559 notifications received in the period (Figure 16 and Tables 6, 7 and 8).

- There were 46 cases of **Ross River virus infection**; 27 cases were male, 18 cases were female and the sex of one case was unrecorded. The cases were aged between the 5-9 and the 75-79 years age groups.
- There were 326 notifications of **campylobacteriosis** received; 157 cases were male, 167 cases were female, and the sex of 2 cases was unrecorded. The cases were aged between the 0-4 and the 80-84 years age groups.
- There were 53 cases of **gonococcal infection** reported; 30 cases were male, 21 cases were female, and the sex of 2 cases was unrecorded. The cases were aged between the 0-4 and the 50-59 years age groups with 72% of cases in the 15-34 years age group.
- There was one case of ***Haemophilus influenzae* type b infection** reported in a 2 year old female from New South Wales.
- Thirty-eight cases of **hepatitis A** were reported; 21 cases were male, 16 cases were female and the sex of one case was unrecorded. Recorded ages were between the 0-4 and the 85-89 years age groups. Notification rates have been lower recently than during the last few years (Figure 14). Epidemics were recorded in New South Wales during 1991-1992 and in Queensland during 1993-1994. The remaining States collectively had a smaller increase in notifications during 1991.
- Ten notifications of **hepatitis B** were received; 5 cases were male and 5 cases were female. Recorded ages were between the 15-19 and the 45-49 years age groups.
- There were two notifications of **hydatid infection**, one in a 70 year old female and another in a 29 year old female.
- There were 4 notifications of **legionellosis**; all cases were female and aged between 45 and 75 years.
- Nine notifications of **leptospirosis** were received; 8 in males aged 6 to 51 years and one in a 36 year old female.
- Twenty-five cases of **malaria** were reported; 18 cases were male and 7 cases were female. Recorded ages were between the 5-9 and the 85-89 years age groups.
- There were 27 notifications of **measles**; 14 cases were male and 12 cases were female. Recorded ages were between the 0-4 and the 35-39 years age

Figure 14. Hepatitis A notifications per 100,000 population, 1991 to 1995, by State or Territory and month of onset

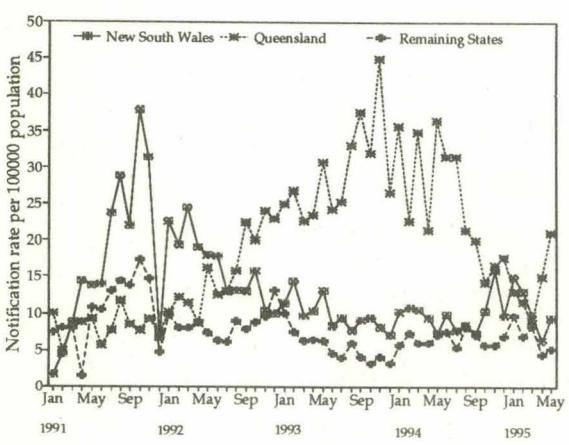
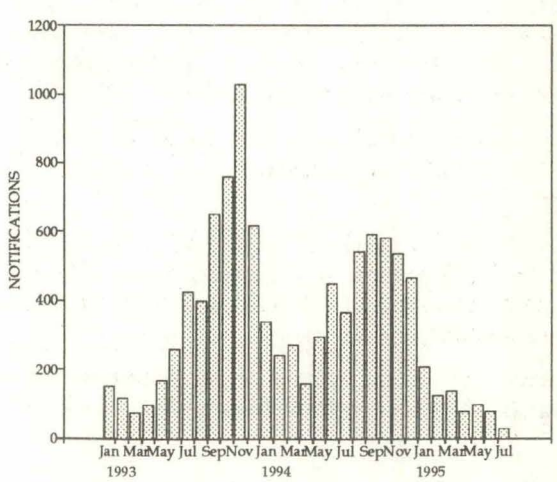


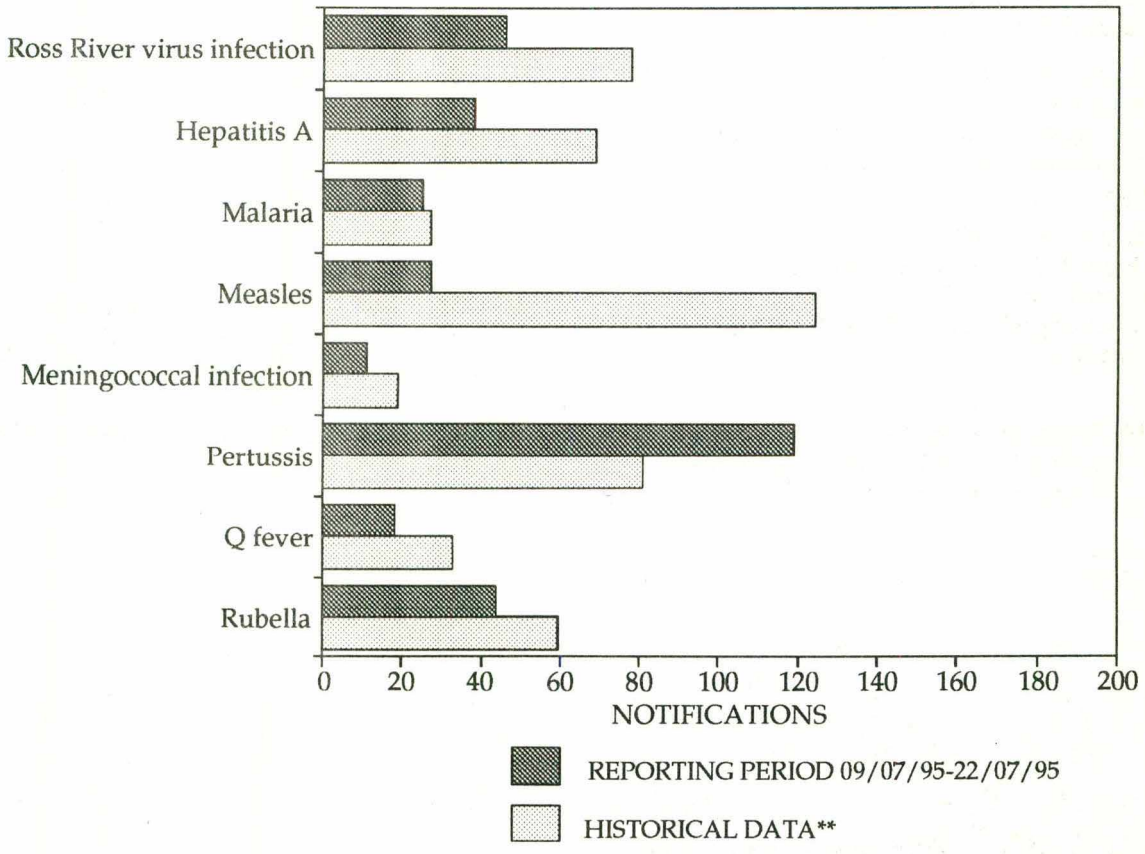
Figure 15. Measles notifications, 1993 to 1995, by month of onset



groups with 22 cases aged less than twenty years. There were 3 apparent clusters of 2 cases in the same postcode area in New South Wales (2) and Queensland (one). There have been few notifications of measles in recent months compared with the same periods in 1993 and 1994 (Figure 15).

- Eleven cases of **meningococcal infection** were reported; 8 cases were male and three cases were female. The cases were aged between the 0-4 and the 45-49 years age groups with 6 cases aged less than 6 years.
- There were 119 cases of **pertussis** reported for the period; 44 cases were male, 71 cases were female and the sex was unrecorded for four cases. Recorded ages were between the 0-4 and the 75-79 years age groups with 47% of cases aged less than 16 years old. There were 13 apparent clusters of between 2 and 7 cases each in the same postcode area. Apparent clusters were in New South Wales (5), Queensland (7) and Tasmania (one).
- Eighteen cases of **Q fever** were received; 14 cases were male and 4 cases were female. Recorded ages were between the 10-14 and the 60-64 years age groups.
- There were 44 notifications of **rubella**; 31 cases were male and 13 cases were female. Recorded ages were between the 0-4 and the 45-49 years age groups with 19 cases reported for males in the 15-24 years age group.
- There were 123 cases of **salmonellosis** reported; 53 cases were male, 66 cases were female, and the sex of 4 cases were not reported. The cases were aged between the 0-4 and the 90-94 years age groups with 44% of cases in the 0-4 years age group.
- Fifty-three cases of **syphilis** were reported; 24 cases were male, 28 cases were female, and the sex of one case was unrecorded. The cases were aged between the 15-19 and the 90-94 years age groups.
- There were 31 notifications of **tuberculosis**; 20 cases were male and 11 cases were female. The cases were aged between the 0-4 and the 80-84 years age groups.
- Nine cases of **yersiniosis** were reported; 5 cases were male and 4 cases were female. Recorded cases were between the 0-4 and the 30-34 years age groups.

Figure 16. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



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

Table 6. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 9 to 22 July 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[1]			
									This period 1995	This period 1994	Year to date 1995	Year to date 1994
Diphtheria	0	0	0	0	0	0	0	0	0	0	1	0
Haemophilus influenzae b infection	0	1	0	0	0	0	0	0	1	6	45	120
Measles	0	18	2	2	0	1	4	0	27	160	905	2067
Mumps	0	2	2	NN	0	0	0	0	4	0	38	12
Pertussis	1	45	1	42	8	5	16	1	119	130	2338	3003
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	2	6	0	8	0	8	9	11	44	56	1128	872
Tetanus	0	0	0	0	0	0	0	0	0	1	3	8

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

NN Not Notifiable.

Table 7. Notifications of other diseases[1] received by State and Territory health authorities in the period 9 to 22 July 1995

DISEASES	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	TOTALS FOR AUSTRALIA[2]			
									This period 1995	This period 1994	Year to date 1995	Year to date 1994
Arbovirus infection												
Ross River virus infection	0	5	3	34	0	-	0	4	46	48	2170	3636
Dengue	0	1	0	0	0	-	0	0	1	0	15	12
NEC[3]	0	8	0	17	0	0	2	0	27	13	658	448
Campylobacteriosis[4]	11	-	4	62	105	26	69	49	326	366	5693	5384
Chlamydial infection (NEC)[5]	0	NN	4	56	9	11	0	21	101	145	2730	3578
Donovanosis	0	NN	1	0	NN	0	0	0	1	3	49	61
Gonococcal infection[6]	0	10	13	21	1	0	0	8	53	114	1547	1709
Hepatitis A	1	10	3	14	0	1	7	2	38	86	915	1157
Hepatitis B	0	2	3	1	1	0	2	1	10	9	200	189
Hepatitis C incident	-	5	0	-	0	-	-	-	5	0	59	8
Hepatitis C unspecified	3		12	138		4	211	16	384	502	5014	5223
Hepatitis (NEC)	0	1	0	0	0	0	0	NN	1	1	24	24
Legionellosis	0	2	0	0	1	0	0	1	4	6	116	126
Leptospirosis	0	0	0	5	2	0	2	0	9	7	69	95
Listeriosis	0	0	0	1	1	0	0	0	2	2	40	19
Malaria	1	1	0	20	2	0	1	0	25	39	378	440
Meningococcal infection	1	3	0	1	2	0	3	1	11	12	190	170
Ornithosis	0	NN	0	0	0	0	2	0	2	5	74	60
Q fever	0	9	0	7	0	0	2	0	18	28	254	401
Salmonellosis (NEC)	0	16	7	39	14	3	24	20	123	159	4030	3647
Shigellosis[4]	0	-	6	11	3	0	3	4	27	29	485	467
Syphilis	1	35	4	12	0	1	0	0	53	101	1095	1460
Tuberculosis	1	9	0	7	2	1	9	2	31	34	582	638
Typhoid[7]	0	0	0	0	0	0	0	0	0	2	23	26
Yersiniosis (NEC)[4]	0	-	0	4	4	0	1	0	9	12	211	274

1. For HIV and AIDS, see Tables 2 and 3. For rarely notified diseases, see Table 8.
2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
3. Tas: includes Ross River virus and dengue.
4. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
5. WA: genital only.
6. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
7. NSW, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

Table 8. Notifications of rare[1] diseases received by State and Territory health authorities in the period 9 to 22 July 1995

DISEASES	Total this period	Reporting States or Territories	Year to date 1995
Botulism	0		0
Brucellosis	0		17
Chancroid	0		0
Cholera	0		1
Hydatid infection	2	Qld 1, Tas 1	18
Leprosy	0		4
Lymphogranuloma venereum	0		0
Plague	0		0
Rabies	0		0
Yellow fever	0		0
Other viral haemorrhagic fevers	0		0

1. Fewer than 50 cases of each of these diseases were notified each year during the period 1988 to 1993.

Table 9. Virology and serology laboratory reports by State or Territory[1] for the reporting period 13 to 26 July 1995, historical data[2], and total reports for the year

	State or Territory[1]								Total this fortnight	Historical data[2]	Total reported this year
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA											
Measles virus		1							1	17.5	255
Mumps virus				1			1		2	3.8	47
Rubella virus	1		1	3	1				6	18.7	523
HEPATITIS VIRUSES											
Hepatitis A virus		1		10	1		2		14	18.0	283
Hepatitis B virus	4	33	4	56	22		26		145	92.8	1,446
Hepatitis C virus	24	56	4	109	74	14	9		290	235.7	3,481
Hepatitis D virus		1		1					2	.8	12
ARBOVIRUSES											
Ross River virus		1	3	28		1	1		34	28.3	972
Barmah Forest virus	1	1		12					14	5.0	187
Flavivirus (unspecified)			1	1					2	5.0	31
ADENOVIRUSES											
Adenovirus type 1					2				2	3.5	21
Adenovirus type 2							1		1	5.0	17
Adenovirus type 3					1				1	8.3	41
Adenovirus type 5					1				1	1.7	4
Adenovirus type 7					1				1	.5	14
Adenovirus type 8							1		1	.8	17
Adenovirus type 46							1		1	.0	3
Adenovirus not typed/pending	1	8		5	15			6	35	47.2	527
HERPES VIRUSES											
Herpes simplex virus type 1	2	24	5	123	30	4	54		242	182.2	2,960
Herpes simplex virus type 2		57	4	152	40	2	43	1	299	213.0	3,046
Herpes simplex not typed/pending	8	10		3				4	25	26.7	297
Cytomegalovirus	2	14		21	3	1	29	5	75	74.3	912
Varicella-zoster virus		6		23	7		6	4	46	39.8	661
Epstein-Barr virus		12		52	28	1	5		98	58.3	1,187

Table 9. Virology and serology laboratory reports by State or Territory[1] for the reporting period 13 to 26 July 1995, historical data[2], and total reports for the year, continued

	State or Territory[1]								Total this fortnight	Historical data[2]	Total reported this year
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA			
OTHER DNA VIRUSES											
Parvovirus				2			1		3	4.5	76
PICORNA VIRUS FAMILY											
Coxsackievirus B3		1							1	.7	27
Echovirus type 11		2							2	4.7	2
Echovirus type 14		1							1	1.5	4
Poliovirus type 1 (uncharacterised)		1							1	1.5	11
Poliovirus not typed/pending		2							2	.3	2
Rhinovirus (all types)		2		6			14		22	34.2	395
Enterovirus type 71 (BCR)							4		4	.0	25
Enterovirus not typed/pending		7		15		1	7		30	40.7	580
ORTHO/PARAMYXOVIRUSES											
Influenza A virus	5	19		13	23		11	5	76	62.3	444
Influenza A virus H_1N_1				11	1				12	.0	49
Influenza B virus		8		10	3		5		26	20.3	103
Parainfluenza virus type 1		1			3				4	22.3	24
Parainfluenza virus type 2		1		17	4		2		24	7.8	158
Parainfluenza virus type 3		8		17	4		4	19	52	19.0	373
Parainfluenza virus typing pending						2		2	4	4.8	20
Respiratory syncytial virus	33	262		200	55	12	163	107	832	430.7	2,298
OTHER RNA VIRUSES											
HIV-1				6					6	2.5	57
Rotavirus	1	16			9	4	43	37	110	139.7	633
Norwalk agent							3		3	.3	8
Small virus (like) particle							1		1	1.2	7
OTHER											
Chlamydia trachomatis not typed	4	23	12	80	16	2	23	3	163	102.7	1,514
Chlamydia psittaci							8		8	3.8	96
Chlamydia species					1				1	.5	38
Mycoplasma pneumoniae				17	1				18	55.0	203
Coxiella burnetii (Q fever)		1		6			2		9	15.8	131
Rickettsia spp - other							1		1	.3	5
Streptococcus group A		3	7	20			1		31	11.3	379
Yersinia enterocolitica				1			1		2	.8	37
Bordetella pertussis							4		4	11.3	422
Bordetella species				3					3	3.3	86
Leptospira species				2					2	.7	17
Treponema pallidum		18	3	1			1		23	17.2	360
Entamoeba histolytica							1		1	.8	12
Toxoplasma gondii				1			1		2	4.5	92
Schistosoma species							5		5	.2	57
Strongyloides stercoralis							3		3	.0	8
TOTAL	86	601	44	1028	346	44	488	193	2,830	2,114.3	25,697

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

Table 10. Virology and serology laboratory reports by clinical information for the reporting period 13 to 26 July 1995

	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
MEASLES, MUMPS, RUBELLA												
Measles virus							1					1
Mumps virus											2	2
Rubella virus							3				3	6
HEPATITIS VIRUSES												
Hepatitis A virus				1		6					7	14
Hepatitis B virus						36					109	145
Hepatitis C virus		1			5	48				1	235	290
Hepatitis D virus						2						2
ARBOVIRUSES												
Ross River virus							1		5		28	34
Barmah Forest virus							2		2		10	14
Flavivirus (unspecified)											2	2
ADENOVIRUSES												
Adenovirus type 1				2								2
Adenovirus type 2									1			1
Adenovirus type 3				1								1
Adenovirus type 5				1								1
Adenovirus type 7				1								1
Adenovirus type 8								1				1
Adenovirus type 46											1	1
Adenovirus not typed/pending				19	10			2			4	35
HERPES VIRUSES												
Herpes simplex virus type 1				12			126	12		79	13	242
Herpes simplex virus type 2				1			27			269	2	299
Herpes simplex not typed/pending				3			5			12	5	25
Cytomegalovirus	2	1	1	26		3	2	5			35	75
Varicella-zoster virus				1			32	1			12	46
Epstein-Barr virus	1			10		2	1				84	98
OTHER DNA VIRUSES												
Parvovirus						1					2	3
PICORNA VIRUS FAMILY												
Coxsackievirus B3											1	1
Echovirus type 11											2	2
Echovirus type 14					1							1
Poliovirus type 1 (uncharacterised)				1								1
Poliovirus not typed/pending				1							1	2
Rhinovirus (all types)				21							1	22
Enterovirus type 71 (BCR)							4					4
Enterovirus not typed/pending	3			12			2				13	30
ORTHO/PARAMYXOVIRUSES												
Influenza A virus				57			1				18	76
Influenza A virus H_1N_1				11							1	12
Influenza B virus				17							9	26
Parainfluenza virus type 1				4								4
Parainfluenza virus type 2				24								24
Parainfluenza virus type 3		2		45			1				4	52
Parainfluenza virus typing pending				4								4
Respiratory syncytial virus				776							56	832

Table 10. Virology and serology laboratory reports by clinical information for the reporting period 13 to 26 July 1995, continued

	Meningitis	Other CNS	Congenital	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	Total
OTHER RNA VIRUSES												
HIV-1											6	6
Rotavirus				4	102						4	110
Norwalk agent					3							3
Small virus (like) particle					1							1
OTHER												
Chlamydia trachomatis not typed				1			3	4		151	4	163
Chlamydia psittaci				2							6	8
Chlamydia species				1								1
Mycoplasma pneumoniae				7		1					10	18
Coxiella burnetii (Q fever)									1		8	9
Rickettsia spp - other											1	1
Streptococcus group A				4			4		6		17	31
Yersinia enterocolitica											2	2
Bordetella pertussis				4								4
Bordetella species				1							2	3
Leptospira species											2	2
Treponema pallidum											23	23
Entamoeba histolytica											1	1
Toxoplasma gondii											2	2
Schistosoma species											5	5
Strongyloides stercoralis					1						2	3
TOTAL	6	4	1	1075	123	99	215	25	15	512	755	2830

Table 11. Virology and serology laboratory reports by contributing laboratories for the reporting period 13 to 26 July 1995

STATE OR TERRITORY	LABORATORY	REPORTS
Australian Capital Territory	Woden Valley Hospital, Canberra	92
New South Wales	Prince Henry/Prince of Wales Hospitals, Sydney	164
	Royal Alexandra Hospital for Children, Camperdown	81
	Royal Prince Alfred Hospital, Camperdown	34
	South West Area Pathology Service, Liverpool	279
Queensland	Queensland Medical Laboratory, West End	796
	State Health Laboratory, Brisbane	315
South Australia	Institute of Medical and Veterinary Science, Adelaide	347
Tasmania	Northern Tasmanian Pathology Service, Launceston	11
	Royal Hobart Hospital, Hobart	32
Victoria	Microbiological Diagnostic Unit, University of Melbourne	13
	Monash Medical Centre, Melbourne	38
	Royal Children's Hospital, Melbourne	159
	Unipath Laboratories	28
	Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital	249
Western Australia	Princess Margaret Hospital, Perth	192
TOTAL		2830