Unusual cluster of mild invasive serogroup C meningococcal infection in a university college

Mark Ferson, [1] Lorraine Young,[1] Geoff Hansen,[2] Jeff Post,[3] John Tapsall,[4] Tiffany Shultz,[4] Athena Limnios,[4] David Lee,[1] Giuletta Pontivivo,[1] Keira Morgan,[1] Porl Reinbott,[5] Yvonne Duffy,[5] Peter Robertson[5] and Philip Jones[3]

Abstract

The objective of this study was to describe the epidemiology and public health response to an apparent cluster of *Neisseria meningitidis* serogroup C infection in university students in a residential college. A conventional epidemiological approach was taken, supported by routine and novel diagnostic techniques. Over the two days of 21-22 August 1997, three cases of suspected meningococcal infection were notified from a residential college complex at a university campus in the Sydney metroplitan area. *Neisseria meningitidis* was grown from throat swabs of all three cases, and was isolated from the blood of one case only. All three isolates were typed as C:2a:P1.5,2. Seroconversion was demonstrated by a novel method in the three cases. Rifampicin was given to all identified contacts. Forty-seven days after the index case, a 19 year old female living in the same complex was diagnosed with bacterial meningitis, and identified contacts given rifampicin. When this isolate was found to be group C, it was decided to vaccinate residents of the college complex. Genotyping and serotyping (C:2a:P1.5) later revealed the fourth isolate to be distinct from isolates from Cases 1-3. In conclusion the authors note that Australia's increasing capacity to type meningococcal strains is essential to understanding the epidemiology of this disease. Furthermore, typing information is of critical importance when decisions are made regarding mass vaccination. As early antibiotic treatment may inhibit isolation of the organism,

1. South Eastern Sydney Public Health Unit, Zetland, New South Wales
2. University Health Service, University of NSW, Kensington, New South Wales
3. Dept of Infectious Diseases, Prince Henry/Prince of Wales Hospitals, Randwick New South Wales
4. Neisseria Laboratory, Dept of Microbiology, SEALS, Randwick, New South Wales
5. Serology, Dept of Microbiology, SEALS, Randwick, New South Wales

Corresponding author: Assoc Prof. Mark J Ferson, Director, South Eastern Sydney Public Health Unit, Locked Bag 88, Randwick, New South Wales 2031. Email: mfers@doh.health.nsw.gov.au

ISSN 0725-3141
Volume 23
Number 10
30 September 199

Contents

development of novel approaches to diagnosis and typing should be supported. *Commun Dis Intell* 1999;23 261-264.

Introduction

The importance of *Neisseria meningitidis* (*N. meningitidis)* serogroup C (NMSC) as a cause of sporadic cases and outbreaks of invasive meningococcal infection in industrialised countries has risen during the past decade. In particular strains of phenotype C:2a:P1.5 and C:2a:P1.5,2 have increasingly caused outbreaks with high case-fatality rates in Canada, the United States of America and Europe.[1] Clusters caused by similar if not identical strains have been identified in Australia since 1996,[2] including a cluster of 11 cases of confirmed invasive C:2a:P1.5 infection linked to a western Sydney nightclub.[3] Over a three-day period in August 1997 three cases of suspected meningococcal infection were notified among students living in a residential college complex at a university in the Sydney metropolitan area. The epidemiology of and public health response to this cluster of cases are described, and both the unusual clinical features and diagnostic techniques used to support the identification of the cluster are highlighted.

Methods

Epidemiological methods

Cases were those with consistent clinical features in whom NMSC strains were isolated from normally sterile sites or a throat swab. Contact tracing and chemoprophylaxis was carried out in accordance with standard New South Wales (NSW) public health practice and National Health and Medical Research Council (NHMRC) guidelines.[4] Conventional bacteriology with serogroup determination was undertaken at South Eastern Area Laboratory Service, Randwick. In some instances, throat swabs were taken from contacts and these were also subjected to culture for *N. meningitidis*; resulting isolates were typed as described below.

Phenotyping

Serotyping and serosubtyping were performed in the Department of Microbiology and Infectious Diseases, South Western Area Pathology Service, Liverpool, NSW, based on the detection of outer membrane protein antigens using a standard set of monoclonal antibodies obtained from Dr J Poolman, National Institute for Public Health, The Netherlands.

Genotyping

Strain differences based on genotypic variation were determined by pulsed field gel electrophoresis (PFGE). Four enzymes (Spe1, BglII, Nhe1 and Not1) were used to digest gel plugs containing meningococcal DNA and the digested plugs electrophoresed in a contour-clamped homogeneous electric field apparatus (CHEF DR III, Bio-Rad). Gels were stained with ethidium bromide and photographed under ultraviolet light. Strain relatedness was determined by the criteria of Tenover.[5] Strains examined were the cultures from the students and strains of similar phenotypes from cases which had occurred in western Sydney.

Serological assays

An enzyme-linked immunosorbent assay (ELISA) was developed to quantitate anti-meningococcal IgG and IgM serum antibodies. The antigens were purified outer membrane proteins from *Neisseria meningitidis* serogroup B, serotypes/serosubtypes 4:P1.15 and 15:P1.7, 16, and serogroup C, serotype/serosubtype 2a:P1.2 (strains supplied by Manchester Public Health Laboratory Service, UK). The antigens were purified using the method described by Guttormsen and coworkers.[6] Class specific antibodies were detected using phosphatase labelled goat anti-human IgG or IgM as conjugate. The optimal dilutions of serum, antigen and conjugate were determined using positive and negative sera identified by checkerboard titrations. The cut-off value for each immunoglobulin class was established by testing 100 sera collected from blood donors. The cut off was taken as the mean plus three standard deviations of the optical density readings obtained from these sera. When possible, acute and convalescent sera were collected from cases and assayed.

Results

Case 1

On 21 August a notification was received of growth of NMSC on a throat swab taken on 15 August from an 18 year old male hospitalised with a provisional diagnosis of glomerulonephritis. He had given a history of fever, sore throat, arthralgia, and when seen had a purpuric rash and microscopic haematuria. Blood cultures, taken after initiation of antibiotics, were negative. He was treated with IV penicillin and discharged, well, after four days. He was a resident of one of the colleges within a college complex.

Case 2

On the same afternoon a presumptive case was notified by the University Health Service in a 19 year old female resident of the same college as Case 1. She had presented that day with a 1-day history of fever, sore throat, headache, myalgia, arthralgia (especially in ankles, wrists and shoulders); a mild purpuric rash was visible on the feet and arms. Blood cultures and a throat swab both later grew NMSC. She remained in hospital for 3 days.

Case 3

On 22 August, a further presumptive case was notified by the University Health Service in a 20 year old female student from a different college in the same college complex. She had complained of sore throat, fever, arthralgia and a rash with onset on 18 August. Blood cultures were sterile but a throat swab later grew NMSC. She was hospitalised for 5 days.

Public health response to the three cases

Cases were interviewed to determine any links between them and to identify at-risk contacts. It was revealed that Case 2 had cared for Case 1 when he first became ill. No clear link was found between these cases and Case 3, although the affected colleges shared a common dining hall. Rifampicin prophylaxis was provided to contacts by university, emergency department and public health staff.

All college residents and relevant university staff were advised by letter and e-mail of the outbreak, mechanisms of transmission of infection, and restrictions placed on congregating within the college complex. In particular, due to the possible link of the shared dining hall, residents were given take-away meals for two weeks.

The annual college ball planned for 23 August, which would have attracted alumni and friends from around NSW, was cancelled on the advice of the Chief Health Officer. On 22 August, NSW Health issued a media release to alert those potentially at risk. Primary care physicians in the vicinity of the university were informed of the possible cluster and asked to contact the Public Health Unit regarding suspected cases.

On 26 August, a teleconference of experts was convened to discuss further public health action, including the possibility of vaccination of college residents. At the time there were still only three cases in the cluster, of which one was a secondary case, and only one case had been confirmed by blood culture. As these three cases did not satisfy the criteria for an outbreak, it was decided not to initiate a mass vaccination program.

Case 4

On 7 October, 47 days after the index case was notified, a 19 year old female living in the same complex was diagnosed with meningitis, and identified contacts given rifampicin. When this isolate was found to be serogroup C, a decision was made to vaccinate residents of the college complex. Prior to this, a highly publicised vaccination program had been undertaken in a boarding school in south western Sydney in response to a cluster of NMSC. In the period 13-21 October, 440 (91%) college residents of the complex were vaccinated by Public Health Unit and University Health Service staff.

Typing of isolates

Isolates from Cases 1, 2 and 3 were all serotyped as C:2a:P1.5,2 , whilst Case 4 was typed as C:2a:P1.5. Isolates from Cases 1-3 were shown by PFGE to be indistinguishable from each other and distinct from the Case 4 isolate. However, the latter isolate was indistinguishable, by serotyping and PFGE, from strains obtained from recent western Sydney cases.

Meningococcal serology

Cases 1-3 demonstrated IgG seroconversion and IgM positivity, which was not found with contacts (Table 1).

Discussion

This cluster of invasive serogroup C meningococcal infection which involved three young adults residing in a university college was suspected clinically and epidemiologically, and confirmed by phenotyping and genotyping of isolates. The cluster had a number of unusual features: all three illnesses were relatively mild, necessitating only brief hospitalisations, and were characterised by fever, sore throat, joint pain and transient purpuric rash. Bacteraemia could only be established in one case, but strains of indistinguishable phenotype and genotype were isolated from the throats of all three cases. The diagnosis of invasive disease in all three cases was suggested by the constellation of systemic symptoms and by the use of a novel serological assay which demonstrated the appearance of meningococcus-specific IgM as well as IgG seroconversion.

During the last decade, an increase has been observed in the prevalence of C:2a strains (attributed to the ET37 complex) in Canada,[7,8] the United States[9] and Europe.[10] Outbreaks have particularly affected adolescents and young adults, and have been characterised by a large proportion of cases of fulminant meningoccaemia and high case-fatality rates.[11] Serogroup C outbreaks have been recorded in Australia in recent years, including five clusters in north Queensland during 1990-1994,[12] and an outbreak of severe disease caused by a C:2a:P1.5 strain in western Sydney in 1996.[3] The strain causing the UNSW cluster was associated with much milder disease and seems to have appeared only transiently in Sydney, as no other C:2a:P1.5,2 strains were detected in NSW during 1997.[13]

The first three cases in the cluster did not conform to the definition of an outbreak for the purposes of a mass vaccination program.[4] Following identification of the fourth case a vaccination program was introduced, partly as a response to public concerns related to cases at the university and in other Sydney schools and colleges at around the same time. What was thought to be a fourth case in the cluster was later shown by phenotyping and genotyping to be distinct. This illustrates the difficulty that may occur in balancing public concerns with the recommendations outlined in the NHMRC guidelines,[4] and the importance of rapid serotyping/subtyping of isolates during an apparent cluster. A labour intensive, expensive and disruptive mass vaccination campaign would have been avoided if the decision to vaccinate had awaited the serotyping results. This highlights the need for continuing support of facilities for the rapid serotyping/subtyping of isolates during the investigation of an apparent cluster. A decision regarding vaccination should not be made without this typing information.

In addition, increased support is required for the use of novel approaches to the diagnosis of invasive meningococcal disease, including the polymerase chain reaction technique. These approaches will be of increasing importance as more cases of suspected disease are treated with parenteral antibiotics prior to hospitalisation. It is recommended that a throat swab collected at the time of presentation be sent for meningococcal culture in all suspected cases of invasive disease and that any meningococcal isolates obtained be stored for typing. Further work is underway investigating the place of serological testing in the diagnosis of invasive meningococcal infection.

Acknowledgements

We wish to thank the Chief Executive, residents and staff of the College complex at the university, for their prompt response to our recommendations, and staff of St Vincent's Microbiology Department and Prince of Wales Hospital for reporting suspected cases.

References

1 Patel M. Meningococcal disease in Australia: looking at the past, thinking of the future. *Comm Dis Intell* 1997;21:233-6.

2 Australian Meningococcal Surveillance Programme. Annual report of the Australian Meningococcal Surveillance Programme 1996. *Commun Dis Intell* 1997; 21:217-21.

Table 1. Results of throat swab culture and serology for Cases 1-3 and selected contacts

Case or contact	No.	Throat swab culture	Acute serology	Convalescent serology
Case	1	NMSC	M (+) G (-)	M (+) G (+)
Case	2	NMSC	M (-) G (-)	M (+) G (+)
Case	3	NMSC	M (-) G (-)	M (+) G (+)
Contact	1	-	M (-) G (-)	M (-) G (-)
Contact	2	No growth	M (-) G (+)	
Contact	3	NM, non-groupable	M (-) G (-)	
Contact	4	No growth	M (-) G (-)	
Contact	5	No growth	M (-) G (-)	
Contact	6	No growth	M (-) G (+)	
Contact	7	No growth	M (-) G (-)	
Contact	8	No growth	M (-) G (+)	
Contact	9	NM, non-groupable	M (-) G (-)	

NMSC = *Neisseria meningitidis* serogroup C

NM = *Neisseria meningitidis*

M = IgM

G = IgG

3. Jelfs J, Jalaludin B, Munro R et al. A cluster of meningococcal disease in western Sydney, Australia initially associated with a nightclub. *Epidemiol Infect* 1998;120: 263-70.
4. NHMRC. Guidelines for the control of meningococcal disease in Australia. Canberra: AGPS, 1996.
5. Tenover FC, Arbeit RD, Goering RV et al. Interpreting chromosomal restriction patterns produced by pulsed field electrophoresis: criteria for bacterial typing. *J Clin Microbiol*1995;33:2233-9.
6. Guttormsen HK, Wetzler LM, Naess A. Humoral immune response to the class 3 outer membrane protein during the course of meningococcal disease. *Infect Immun* 1993;61:4734-4742.
7. Ashton FE, Ryan JA, Borczyk A, Caugant DA, Mancino L, Huang D. Emergence of a virulent clone of *Neisseria meningitidis* serotype 2a that is associated with meningococcal group C disease in Canada. *J Clin Microbiol* 1991;29:2489-2493.
8. Whalen CM, Hockin JC, Ryan A, Ashton F. The changing epidemiology of invasive meningococcal disease in Canada, 1985 through 1992. *JAMA* 1995;273: 390-394.
9. Raymond NJ, Reeves M, Ajello G et al. Molecular epidemiology of sporadic (endemic) serogroup C meningococcal disease. *J Infect Dis* 1997;176:1277-1284.
10. Connolly M, Noah N. Is group C meningococcal disease increasing in Europe? A report of surveillance of meningococcal infection in Europe 1993-6. *Epidemiol Infect* 1999;122:41-49.
11. Gold R. Meningococcal disease in Canada: 1991-92. *Can J Public Health* 1992;83:5-8.
12. Hanna J, McCall B, Murphy D. Invasive meningococcal disease in north Queensland, 1990-1994. *Commun Dis Intell* 1996;20:320-324.
13. Australian Meningococcal Surveillance Programme. Annual report of the Australian Meningococcal Surveillance Programme, 1997. *Commun Dis Intell* 1998;22:205-11.

Communicable Diseases Surveillance

Highlights

Communicable Diseases Surveillance consists of data from various sources. The National Notifiable Diseases Surveillance System (NNDSS) is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) is a sentinel surveillance scheme. The Australian Sentinel Practice Research Network (ASPREN) is a general practitioner-based sentinel surveillance scheme. In this report, data from the NNDSS are referred to as 'notifications' or 'cases', whereas those from ASPREN are referred to as 'consultations' or 'encounters' while data from the LabVISE scheme are referred to as 'laboratory reports'.

Vaccine preventable diseases

With the exception of *Haemophilus influenzae* type b (Hib) infection the other vaccine preventable diseases notifications for the year to date, were lower than in 1998. In particular the number of notifications of pertussis and rubella were notably lower.

The number of pertussis notifications was higher for this reporting period (302) than both the previous one (245) and the corresponding reporting period in 1998 (289). However, the number of cases for the year to date was lower in 1999 (2,619) than 1998 (4,894), reflecting an ongoing decrease in the year to date case numbers.

The number of rubella notifications was lower for this reporting period (23) than the previous one (34) and the corresponding reporting period in 1998 (104). Overall, the number of cases for the year to date decreased in 1999 (259) compared with 1998 (578).

The number of Hib infections was higher for this reporting period (3) than the previous one (1) and the corresponding reporting period in 1998 (2). Overall the number of cases for the year to date increased in 1999 (30) compared with 1998 (22). The ratio of males to females was 1:1.5 for this reporting period. The peak number of cases for males (7) and females (6) occurred in the 0-4 year age group with a second peak for females in the 70-74 year age group (4).

Meningococcal disease

The number of notifications of meningococcal disease (58) did not increase in this reporting period compared with the previous period (64) or the corresponding period in 1998 (62). However, the number of cases for the year to date reported in 1999 (373) was higher than for the same period in 1998 (308).

Vectorborne

The number of cases of dengue infection was higher for this reporting period (5) than for the previous one (2) but lower than for the corresponding reporting period in 1998 (22). Likewise, the overall number of cases to date for the year has decreased for 1999 (163) compared with 1998 (378).

The number of cases of Ross River virus infection for this reporting period (34) was lower than the previous period (67) and for a similar period in 1998 (81). However, overall the number of cases to date for the year increased for 1999 (3,986) compared with 1998 (2,412).

Zoonoses

The number of cases of Q fever for this reporting period (14) was similar to the previous period (12) but significantly lower than for a similar period in 1998 (49). Overall the number of cases to date for the year had decreased for 1999 (324) compared with 1998 (386).

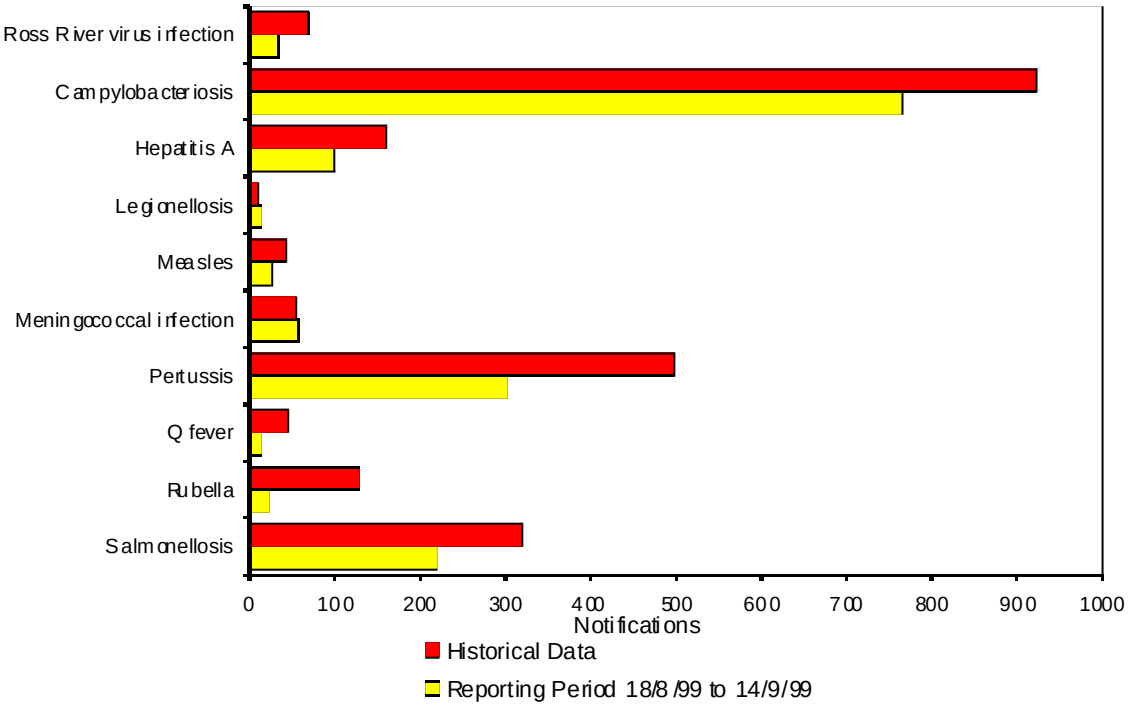
Tables

There were 4,477 notifications to the National Notifiable Diseases Surveillance System (NNDSS) in the four week period, 18 August to 14 September 1999 (Tables 1 and 2). The numbers of reports for selected diseases have been compared with historical data for corresponding periods in the previous three years (Figure 1).

There were 3,853 reports received by the *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) in the four week period, 12 August to 8 September 1999 (Tables 3 and 4).

The Australian Sentinel Practice Research Network (ASPREN) data for weeks 33 to 36, ending 12 September 1999, are included in this issue of *CDI* (Table 5).

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



1. The historical data are the averages of the number of notifications in the corresponding 4 week periods of the last 3 years and the 2 week periods immediately preceding and following those.

Table 1. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 18 August to 14 September 1999

Disease[1]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999[2]	Year to date 1998
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
H. influenzae type b infection	0	1	0	0	1	0	1	0	3	2	30	22
Measles[3]	0	1	0	0	0	1	21	3	26	31	202	255
Mumps	1	2	2	0	0	1	4	7	17	30	129	139
Pertussis	5	123	0	0	15	108	44	7	302	312	2,619	4,894
Rubella[3]	0	2	0	1	0	0	17	3	23	104	259	578
Tetanus	0	0	0	0	0	0	1	0	1	1	2	4

NN. Not Notifiable

1. No notification of poliomyelitis has been received since 1978.
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. Notifications for Victoria include suspected cases.
4. Includes congenital rubella.

Table 2. Notifications of diseases received by State and Territory health authorities in the period 18 August to 14 September 1999

Disease[1,2,3]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999[4]	Year to date 1998
Arbovirus infection (NEC)	0	0	0	0	0	0	0	0	0	2	70	52
Barmah Forest virus infection	0	9	2	0	0	0	1	2	14	31	507	435
Brucellosis	0	0	0	0	0	0	1	0	1	2	20	30
Campylobacteriosis[5]	21	-	24	6	184	51	369	110	765	1,136	8,787	8,340
Chancroid	0	0	0	0	0	0	0	0	0	0	0	1
Chlamydial infection (NEC)[6,7]	17	146	65	6	66	34	208	146	688	975	9,518	7,659
Cholera	0	0	0	0	0	0	1	0	1	0	3	3
Dengue	0	3	1	0	0	0	0	1	5	22	163	378
Donovanosis[7]	0	0	1	0	NN	0	0	0	1	1	14	26
Gonococcal infection[8]	2	77	76	1	12	2	41	76	287	424	3,869	3,732
Haemolytic uraemic syndrome[9]	NN	1	0	0	0	0	NN	0	1	3	13	10
Hepatitis A	0	13	11	1	3	1	29	42	100	133	1,159	2,067
Hepatitis B incident	0	2	0	0	0	0	1	2	5	19	202	190
Hepatitis B unspecified[10]	0	137	0	0	0	7	208	21	373	496	4,858	4,466
Hepatitis C incident	0	6	0	-	1	0	1	10	18	33	210	213
Hepatitis C unspecified[10]	8	458	19	17	98	33	608	83	1,324	1,596	14,059	13,559
Hepatitis (NEC)[11]	0	0	0	0	0	0	0	NN	0	2	14	12
Hydatid infection	0	NN	0	0	0	0	1	0	1	7	22	32
Legionellosis	0	2	0	0	3	0	3	6	14	12	191	176
Leprosy	0	1	0	0	0	0	0	0	1	0	4	2
Leptospirosis	0	0	0	0	0	0	3	2	5	7	276	117
Listeriosis	0	0	0	0	1	0	2	0	3	4	33	42
Malaria	2	10	9	0	1	1	4	4	31	32	518	564
Meningococcal infection	3	23	0	0	3	1	19	9	58	62	373	308
Ornithosis	0	NN	0	0	2	1	5	0	8	1	60	27
Q Fever	0	9	0	1	0	0	2	2	14	49	324	386
Ross River virus infection	0	13	4	0	1	1	4	11	34	81	3,986	2,412
Salmonellosis (NEC)	0	71	12	4	24	4	57	48	220	376	5,594	5,676
Shigellosis[5]	1	-	4	0	4	0	8	9	26	35	412	445
SLTEC, VTEC[12]	NN	0	0	NN	3	0	NN	NN	3	1	20	9
Syphilis[13]	3	36	19	1	0	0	0	3	62	188	1,299	1,095
TTP[14]	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	2	19	2	0	5	0	1	5	34	87	632	693
Typhoid[15]	0	5	0	0	0	0	0	0	5	4	52	52
Yersiniosis (NEC)[5]	0	-	0	1	1	0	1	0	3	7	109	164

1. Diseases preventable by routine childhood immunisation are presented in Table 1.
2. For HIV and AIDS, see Tables 6 and 7.
3. No notifications have been received during 1999 for the following rare diseases: lymphogranuloma venereum, plague, rabies, yellow fever, or other viral haemorrhagic fevers.
4. 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.
5. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
6. WA: genital only.
7. Notifications from NSW have been received since September 1998, and were first reported in *CDI* in Issue 23(9).
8. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
9. Nationally reportable from August 1998.
10. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the numbers of testings being carried out.
11. Includes hepatitis D and E.
12. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC) became nationally reportable in August 1998.
13. Includes congenital syphilis.
14. Thrombotic thrombocytopaenic purpura became nationally reportable in August 1998.
15. NSW, Qld: includes paratyphoid.

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

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 12 August to 8 September 1999, and total reports for the year

	State or Territory[1]								Total this period	Total reported in 1999[2,3]
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA		
Measles, mumps, rubella										
Measles virus							3		3	143
Mumps virus							1	2	3	40
Rubella virus		2		41		1	2	1	47	108
Hepatitis viruses										
Hepatitis A virus			13	19				11	43	296
Hepatitis D virus				1					1	5
Arboviruses										
Ross River virus		6	10	65		1		2	84	1,215
Barmah Forest virus				14				1	15	135
Dengue not typed								2	2	40
Flavivirus (unspecified)			1	1					2	16
Adenoviruses										
Adenovirus type 1							1		1	18
Adenovirus type 4		1							1	13
Adenovirus type 8							1		1	1
Adenovirus type 37							1		1	14
Adenovirus type 40								5	5	59
Adenovirus not typed/pending		26		10			19	26	81	898
Herpes viruses										
Herpes virus type 6								3	3	10
Cytomegalovirus		17		44			30	10	101	851
Varicella-zoster virus		21	6	115	1	1	33	22	199	1,246
Epstein-Barr virus		6	6	216		1	8	8	245	1,740
Other DNA viruses										
Papovavirus group							1		1	11
Molluscum contagiosum								2	2	13
Parvovirus		2		33	3		16	10	64	342
Picorna virus family										
Coxsackievirus B5		1							1	6
Echovirus type 9		1							1	4
Echovirus type 11		23	2						25	44
Echovirus not typed/pending							1		1	120
Poliovirus type 1 (uncharacterised)		3							3	2
Poliovirus type 2 (uncharacterised)		2							2	21
Poliovirus type 3 (uncharacterised)		1							1	20
Rhinovirus (all types)		40					6	7	53	7
Enterovirus type 71 (BCR)							5	1	6	340
Enterovirus not typed/pending		1	2	8			4	51	66	621
Ortho/paramyxoviruses										
Influenza A virus		92	1	112			72	125	402	1,432
Influenza A virus H3N2							4		4	27
Influenza B virus		37		10			4	6	57	182
Parainfluenza virus type 1		2		1			1	1	5	36
Parainfluenza virus type 2							7	2	9	95
Parainfluenza virus type 3		22		12			8	49	91	561
Parainfluenza virus type 4								1	1	3
Respiratory syncytial virus		189	1	151		1	190	134	666	2,307

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 12 August to 8 September 1999, and total reports for the year (continued)

	State or Territory[1]								Total this period	Total reported in 1999[2,3]
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA		
Other RNA viruses										
Rotavirus		256					82	65	403	1,507
Norwalk agent							3		3	60
Other										
Chlamydia trachomatis not typed		45	62	301			4	48	460	2,305
Chlamydia pneumoniae								1	1	1
Chlamydia psittaci							3		3	73
Chlamydia species		2		4					6	17
Mycoplasma pneumoniae		5	1	103			26	2	137	854
Coxiella burnetii (Q fever)		4	1	37				1	43	144
Rickettsia spp - other								2	2	10
Streptococcus group A		4	12	87					103	142
Yersinia enterocolitica				1					1	10
Brucella species				3					3	5
Bordetella pertussis		1	1	133			11	2	148	526
Legionella longbeachae								2	2	31
Leptospira species		1		11				1	13	6
Treponema pallidum		8	130	86				1	225	311
Entamoeba histolytica				1					1	2
Total	0	821	249	1,620	4	5	547	607	3,853	19,046

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.
2. In 1999, data from the Institute of Clinical Pathology & Clinical Research, Westmead were under reported up to September.
3. Totals comprise data from all laboratories. 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.

Table 4. Virology and serology laboratory reports by contributing laboratories for the reporting period 12 August to 8 September 1999

State or Territory	Laboratory	Reports
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	190
	New Children's Hospital, Westmead	372
	Royal Prince Alfred Hospital, Camperdown	178
Queensland	Queensland Medical Laboratory, West End	1,938
	Townsville General Hospital	22
Victoria	Royal Children's Hospital, Melbourne	378
	Victorian Infectious Diseases Reference Laboratory, Fairfield	166
Western Australia	PathCentre Virology, Perth	363
	Princess Margaret Hospital, Perth	246
Total		3,853

Table 5. Australian Sentinel Practice Research Network reports, weeks 33 to 36, 1999

Week number	33		34		35		36	
Week ending on	22 August 1999		29 August 1999		5 September 1999		12 September 1999	
Doctors reporting	56		49		49		30	
Total encounters	7,839		7,103		6,876		4,130	
Condition	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters
Influenza	137	17	105	15	77	11	30	7
Rubella	0	0	0	0	1	0	1	0
Measles	2	0	2	0	2	0	0	0
Chickenpox	9	1	8	1	9	1	7	2
New diagnosis of asthma	14	2	3	0	7	1	7	2
Post operative wound sepsis	9	1	7	1	5	1	3	1
Gastroenteritis	61	8	53	7	58	8	35	8

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The system coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC). Notifications of these diseases are made to State and Territory health authorities under the provisions of their respective public health legislations. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 1999;23:55.

LabVISE is a sentinel reporting scheme. Twenty-one laboratories contribute data on the laboratory identification of viruses and other organisms. Data are collated and published in Communicable Diseases Intelligence every four weeks. These data should be interpreted with caution as the number and type of reports received is subject to a number of biases. For further information, see CDI 1999;23:58.

ASPREN currently comprises about 100 general practitioners from throughout the country. Up to 9,000 consultations are reported each week, with special attention to 12 conditions chosen for sentinel surveillance in 1999. CDI reports the consultation rates for seven of these. For further information, including case definitions, see CDI 1999;23:55-56.

Additional Reports

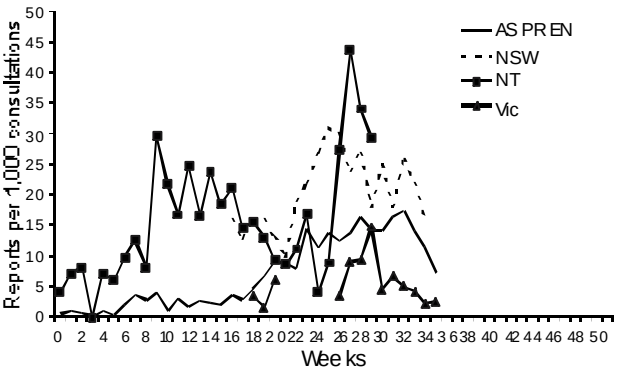
National Influenza Surveillance, 1999

Three types of data are included in National Influenza Surveillance, 1999. These are sentinel general practitioner surveillance conducted by the Australian Sentinel Practice Research Network, Department of Human Services (Victoria), Department of Health (New South Wales) and the Tropical Influenza Surveillance Scheme, Territory Health (Northern Territory); laboratory surveillance data from the Communicable Diseases Intelligence Virology and Serology Laboratory Reporting Scheme, LabVISE, and the World Health Organization Collaborating Centre for Influenza Reference and Research; and absenteeism surveillance conducted by Australia Post. For further information about these schemes, see CDI 1999; 23:56.

Sentinel general practitioner surveillance

Over the last 4 week reporting period up until 8 September 1999 reports of influenza consultations were provided from ASPREN and the Victorian Sentinel Scheme. Reports were not available from The Tropical Influenza Surveillance Program (NT) due to the management of the Timorese refugees and reports were not available from the NSW Sentinel Scheme for the last week of the reporting period. From the available data the

Figure 1. Sentinel general practitioner influenza consultation rates, 1999, by scheme



rate of reports of influenza consultations had a consistent downward trend. By the end of the period the rate of reports of influenza consultations had reached 7/1,000 for ASPREN, 2/1,000 for the Victorian Sentinel Scheme and 16/1,000 for the NSW Sentinel Surveillance Scheme. The rates for ASPREN and the Victorian Sentinel Scheme were returning to levels seen in late April to early May of this year (Figure 1).

Laboratory surveillance

For the year to date a total of 1,442 laboratory reports of influenza have been received. Of these 1,323 (92%) were influenza A and 119 (8%) influenza B. The trend in the number of laboratory reports was downwards, consistent with the trend in the clinical notifications (Figure 2). The number of influenza A reports to date is again less than the previously recorded high noted in 1998 (Figure 3).

Figure 2. Laboratory reports of influenza, 1999, by type and by week of specimen collection

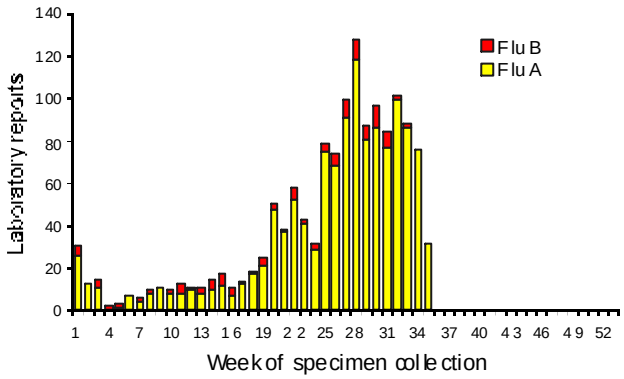
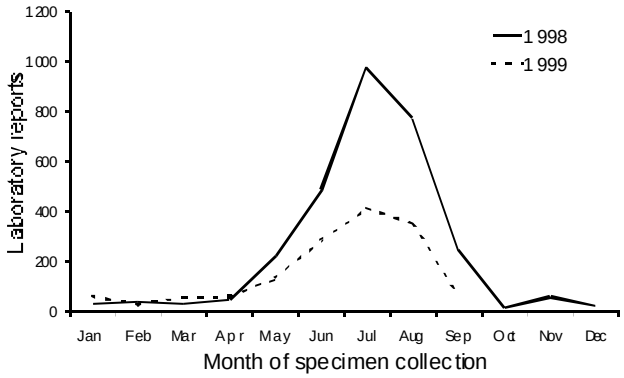


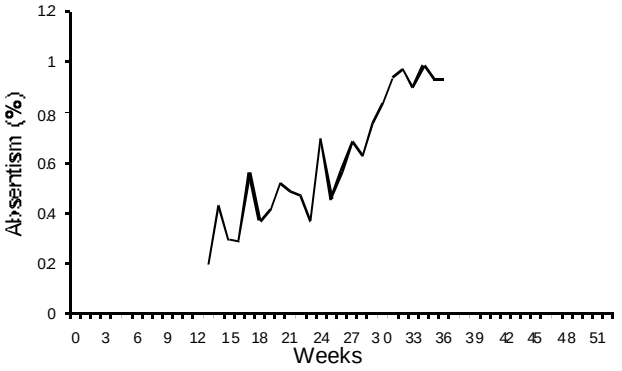
Figure 3. Laboratory reports of influenza, 1998-99, by month of specimen collection



Absenteeism surveillance

The average rate for the last 4 week reporting period were 0.95% and the maximum rate was 1.0%. The rates show a plateauing of the upwards trend noted in previous reports but again a marked increase compared to a similar period in 1998 (Figure 4).

Figure 4. Absenteeism rates in Australia Post, 1999



HIV and AIDS Surveillance

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

Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting interval indicated, to allow for reporting delay and to incorporate newly available information. More detailed information on diagnoses of HIV infection and AIDS is published in the quarterly Australian HIV Surveillance Report, and annually in HIV/AIDS and related diseases in Australia Annual Surveillance Report. The reports are available from the National Centre in HIV Epidemiology and Clinical Research, 376 Victoria Street, Darlinghurst NSW 2010. Telephone: (02) 9332 4648; Facsimile: (02) 9332 1837; http://www.med.unsw.edu.au/nchecr.

HIV and AIDS diagnoses and deaths following AIDS reported for 1 to 30 June 1999, as reported to 30 September 1999, are included in this issue of CDI (Tables 6 and 7).

Table 6. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 30 June 1999, by sex and State or Territory of diagnosis

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Totals for Australia: This period 1999	This period 1998	Year to date 1999	Year to date 1998
HIV diagnoses	Female	1	2	0	0	0	0	1	0	3	5	34	39
	Male	0	14	0	4	1	0	10	0	29	48	272	333
	Sex not reported	0	2	0	0	0	0	0	0	2	0	2	5
	Total[1]	0	18	0	4	1	0	11	0	34	53	308	377
AIDS diagnoses	Female	0	0	0	0	0	0	0	0	0	1	3	7
	Male	0	2	0	0	0	0	0	0	2	25	41	146
	Total[1]	0	2	0	0	0	0	0	0	2	26	44	153
AIDS deaths	Female	0	0	0	0	0	0	0	0	0	2	1	4
	Male	0	2	0	1	0	0	2	0	5	13	40	72
	Total[1]	0	2	0	1	0	0	2	0	5	15	42	76

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

Table 7. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 30 June 1999, by sex and State or Territory

		State or Territory: ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
HIV diagnoses	Female	24	591	9	138	57	5	206	109	1,139
	Male	189	10,630	107	1,908	655	79	3,813	884	18,265
	Sex not reported	0	260	0	0	0	0	24	0	284
	Total [1]	213	11,500	116	2,053	712	84	4,056	996	19,730
AIDS diagnoses	Female	8	173	0	46	21	3	67	26	344
	Male	85	4,546	35	794	330	44	1,595	344	7,773
	Total [1]	93	4,731	35	842	351	47	1,669	372	8,140
AIDS deaths	Female	3	113	0	30	15	2	47	16	226
	Male	64	3,135	24	557	227	28	1,250	245	5,530
	Total [1]	67	3,256	24	589	242	30	1,303	262	5,773

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

CDI subscription renewal

We are asking readers to check that the details on the mailing label in your *CDI* wrapper are correct and to complete and return this form by 31 October 1999.

IMPORTANT: It is important that you enclose the current mailing label when you return this form so that we know which record to update. Any subscriber who has not returned a subscription form by 31 October 1999 will be deleted from the mailing list. Completed forms should be returned to:

Deputy Editor, *CDI*
MDP 6
Department of Health and Aged Care
GPO Box 9848
Canberra, ACT 2601
AUSTRALIA

OR

Deputy Editor, *CDI*
Fax: 02 6289 7735 (within Australia) or
Fax: +61 2 6289 7735 (overseas)

Please complete the following details:

Paste your current mailing label here

☐ Yes, please renew my subscription. My details are correct.

☐ Yes, please renew my subscription and amend my details as below.

☐ Please replace my name with the person whose details appear below.

☐ I don't currently receive *CDI* but would like a new subscription. My details are below.

☐ I am not receiving the correct number of copies. No. of copies _____

Please print in BLOCK LETTERS: Title: _____

First Name: _____ Surname:_____

Position: _____

Organisation: _____

Address: _____

_____

City: _____ State:_____ Country: _____ Postcode: _____

Bulletin Board

The Queensland Institute of Medical Research
Symposium on Q Fever
13-14 October 1999
Brisbane, Queensland
Phone: 07 3844 1138
Fax: 07 3844 0909
Email: qfever@icms.com.au

Institute of Nanotechnology
The Surgery Room of the 21st Century
1-2 November 1999
The Diagnostic Centre of the 21st Century
3-4 November 1999
Glasgow, Scotland
Phone: 44 1786 447520
Fax: 44 1786 447530
Email: julie@nano.org.uk

The theme of the conference is taken from the Royal Academy of Engineering's publication *Medical Engineering - A Field With Potential*. The keynote address: *Lab-on-a-Chip Technologies - The Future* will be given by Professor Andreas Manz, Imperial College of Science, Technology and Medicine.

Some of the topics are of interest to communicable diseases. For details see contacts above.

Australasian Society for HIV Medicine Inc
11th Annual Conference
9-11 December 1999
Perth, Western Australia
Contact: ASHM Conference Secretariat
C/- ICMS Australasia Pty Ltd, GPO Box 2609,
Sydney, NSW, 2001
Phone: 02 9241 1478
Fax: 02 9251 3552

Advance notice

The First Pacific Rim Biomedical Seminar
Transportation of Infectious and Diagnostic Substances
3 March 2000
Sheraton on the Park
Sydney, NSW
Contact: Christine Sherwood
Phone: 1800 023 560; or
Sydney: 9693 2988
Email: sherwood@worldcourier.com.au

International Society of Travel Medicine/WHO/CDC
2nd European Conference of Travel Medicine
29-31 March 2000
Venice, Italy
Contact: Dr Walter Pasini, Italy
Phone: 390-541-24301
Fax: 390-541-25748
Email: wpasini@rimini.com

Australian Society for Infectious Diseases Meeting
April 16-19, 2000
Fairmont Resort Leura
Organisers: Dart Associates:
Phone: 02 94189396
For scientific content: Contact Tom Gottlieb,
Concord Hospital
Phone: 02-97677533
Fax; 02-97677868 or
Email: Tom@micr.crg.cs.nsw.gov.au

Australian Infection Control Association
First Biennial Conference
Infection Control Beyond 2000
3-5 May 2000
Hilton Adelaide International, South Australia
Contact: AICA 2000 Secretariat
PO Box 1280 , Milton, Queensland 4064
Phone: 07 3369 0477
Fax: 07 3369 1512
Email: aica2000@im.com.au
Website: http://www.aica.org.au/aica2000.htm

Australian School of Environmental Studies
Arbovirus Research in Australia
3-7 July 2000
Couran Cove Nature Resort, Gold Coast, Queensland
Contact Dr Michael Brown, Queensland Institute of
Medical Research, PO Box Royal Brisbane Hospital,
Herston, Queensland, 4029
Website: http://www.mcaa.org.au

Royal North Shore Hospital
Outpatient Parenteral Therapy - beyond 2000
17-22 September 2000
Fairmont Resort
Leura, New South Wales
Phone: 02 9956 8333
Fax: 02 0056 5154
Email: confact@conferenceaction.com.au

The Australasian Society for HIV Medicine
12th Annual Conference
16-19 November 2000
The Carlton Crest, Melbourne, Victoria
Phone: 02 9382 1656
Fax: 02 9382 3699
Email: B.Pearlman@unsw.edu.au

The CDI Bulletin Board is provided as a service to readers. Every effort has been made to provide accurate information, but readers are advised to contact the relevant organisation for confirmation of details. Information about the availability of resources is included when space allows. Inclusion of a resource on the Bulletin Board does not imply endorsement of the resource by either the Communicable Diseases Network Australia New Zealand or the Commonwealth Department of Health and Aged Care.

Overseas briefs

Source: World Health Organization (WHO)
This material has been condensed from information on the WHO Internet site. A link to this site can be found under 'Other Australian and international communicable diseases sites' on the CDI homepage.

St. Louis encephalitis, United States of America

An outbreak of St. Louis encephalitis (SLE), a viral infection transmitted by mosquitos, was reported for the first time in New York City in early September. Of the 11 cases, 3 have died. Another 80 cases are being investigated, of which approximately 10% are considered probable cases of SLE, based on clinical criteria. Of the 11 cases mentioned above, 9 were in older adults aged 58-87 years; the other 2 were aged 38 and 15. The course of the illness in these younger patients has been less severe.

As the laboratory-confirmed cases were in residents of Queens (8), Brooklyn (1) and South Bronx (2), local authorities have undertaken vigorous measures to control the mosquito population, by spraying the entire city with malathion (by air) or resmethrine (on the ground). Active surveillance for human cases and mosquitos continues.

Cholera

Ghana

An outbreak of cholera has been reported in the Builsa district of the Upper East region, one of the frontier districts with Burkina Faso. As at 23 August, 269 cases with 9 deaths had been reported from 3 of the 6 subdivisions of the district, including areas classified as hard to reach because of flooding and muddy terrain at this time of the year. Laboratory investigations have confirmed cholera, Inaba subtype. Measures so far taken include intensive public education campaigns aimed at prevention and early reporting of cases for treatment, mobilisation of stocks for case management at regional level and dispatch of regional-level rapid response teams. The regional authorities are also involved in social mobilisation for diarrhoeal disease prevention in neighbouring districts.

Cholera is endemic in Ghana. As at 31 August 1999, a total of 3,997 cases and 100 deaths had been reported to WHO. There has been an increase of almost 1,000 cases in the last month.

Somalia - Update

Cholera is endemic in Somalia. As at 31 August 1999, a total of 6,964 cases have been reported to WHO this year. The disease is appearing in new areas and since 1 August, 3-4 cases of watery diarrhoea have been registered every day at Bosaso hospital; 190 cases have been admitted, of which 84 were males and 106 females (F:M ratio, 1.26:1). The age group most affected has been > 5 years (60% of cases). There have been 15 deaths (case-fatality rate, 8%).

Over 90 % of cases are from the same residential area. Investigations have shown that they had been drinking from 100 wells located in that same area, adjacent to pit latrines.

Three control committees have been set up in Bosaso town, namely for social mobilisation, water and sanitation, and case management. The wells, which have been shown by analysis to be positive for vibrios, are being chlorinated. UNICEF is working on a piped-water project for the area.

Sierra Leone

The Ministry of Health and Sanitation has reported an outbreak of cholera to WHO, with 134 cases and 1 death between 1 and 6 September. Of 8 stool specimens sent for laboratory tests, 6 were positive for *Vibrio cholerae* O1 subtype Ogawa. Tests have revealed sensitivity to tetracycline, doxycycline and cotrimoxazole.

WHO and other partners have been supporting the Ministry in taking appropriate control measures, e.g. reactivation of the cholera task force, establishment of specific subcommittees (for surveillance, case management and sanitation) and of cholera treatment centres. Mass health education campaigns are being carried out and communications networks are being strengthened. Available supplies are adequate for the treatment of 3,000 cases.

Editor: Jenny Thomson

Deputy Editor: Corrine Rann

Editorial and Production Staff

Ming Lin, Alison Milton

Editorial Advisory Board

Charles Watson (Chair), Mary Beers, Margaret Burgess, Scott Cameron, John Kaldor, Margery Kennett, Cathy Mead

Subscriptions

Deputy Editor, *CDI*, MDP 6, Department of Health and Aged Care, GPO Box 9848, Canberra ACT 2601
Fax (02) 6289 7735

Website

http://www.health.gov.au/pubhlth/cdi/cdihtml.htm

Contributions

Contributions covering any aspects of communicable diseases are invited. All contributions are subject to the normal refereering process. Instructions to authors can be found in *CDI* 1999;23:59.

Contacts other than subscriptions

CDI is produced every four weeks by the National Centre for Disease Control, Department of Health and Aged Care, GPO Box 9848, Canberra, ACT, 2601; Fax: (02) 6289 7791, Phone: (02) 6289 8245; email: cdi.editor@health.gov.au.

This journal is indexed by *Index Medicus* and Medline.