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WHAT CAN LABORATORY NOTIFICATIONS TELL US ABOUT CHLAMYDIA INFECTION?

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In New South Wales, *Chlamydia trachomatis* infection was gazetted as a notifiable disease in 1998. Subsequently the number of laboratory notifications has more than doubled between 1999 and 2002, with 5,542 cases reported in 2002.[1] This article describes the findings of an enhanced surveillance program based on the follow-up of notifications received by a Sydney metropolitan public health unit.

BACKGROUND

Sexually Transmitted Infections (STIs) are common among adult Australians; self-reported data estimate that 20.2 per cent of men and 16.9 per cent of women have been diagnosed with an STI at some point in time.[2] *Chlamydia* has been estimated to be the cause of this infection in 1.7 per cent of males and 3.1 per cent of females.[2]

Chlamydia trachomatis is the world's most common bacterial STI, with an estimated 89 million new cases each year.[3] Infection can be asymptomatic and can have long-term adverse sequelae including Pelvic Inflammatory Disease (PID), ectopic pregnancy, infertility, and chronic pelvic pain.[4] In the United States, it is estimated that 25–50 per cent of the 2.5 million cases of PID that are reported annually are due to *Chlamydia*.[5]

The use of DNA amplification techniques now provides highly-sensitive and specific laboratory tests that can be performed on urine samples.[6] This has facilitated the introduction of community-wide screening programs, with some European screening prevalence studies calculating prevalence rates of 2.2–2.3 per cent in men and 1.5–2.9 per cent in women.[7] Sweden has estimated a higher rate of 6.1 per cent,[8] and the United States has reported an even higher rate of 9.2 per cent among asymptomatic female army recruits.[9]

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Under the *NSW Public Health Act 1991*, laboratories must notify NSW Health when clinical specimens test positive for *Chlamydia trachomatis*. All new laboratory notifications of *Chlamydia trachomatis* infection are entered in the NSW Notifiable Disease Database (NDD). Since 2002, the Central Sydney Public Health Unit has followed-up Chlamydia notifications for local residents (population approximately 500,000). The aims of the enhanced surveillance program were to identify groups at risk, quantify the extent of contact tracing, and assess the feasibility of the system of enhanced surveillance.

TABLE 1

CASE DEMOGRAPHICS AND PRACTITIONERS' RESPONSES FOR CHLAMYDIA, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=297

Case Characteristics	*n*	%
Sex		
Male	153	52
Female	144	48
Aboriginal		
Yes	3	1
No	294	99
Median age in years		
Male	34.0	range 18.8–69.8
Female	25.1	range 14.6–54.8
Country of birth		
Australia	124	42
China	20	7
United Kingdom	25	8
New Zealand	8	3
Vietnam	8	3
Other	48	16
Unknown	64	22
Language spoken at home		
English	202	68
Chinese	19	6
Vietnamese	8	3
Other	22	7
Unknown	46	15
Occupation		
Employed	130	44
Unemployed	17	6
Student	37	12
Home duties	8	3
Unknown	105	35
Site of collection #		
Urine	176	59
Endocervical	81	27
Urethra	18	6
Anal	33	11
Reason for testing		
Symptoms–Signs	164	55
Screening	74	25
Contact tracing	30	10
Other	27	9
Unknown	2	1
Contact tracing performed		
Yes	250	84
No	47	16

Note: # Can have more than one specimen site for a case.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

METHODS

The Central Sydney Public Health Unit routinely enters notifications of Chlamydia infection into the NDD. For this study, an additional electronic database was maintained to enable recording of information that could not be directly entered into the NDD. Notifications received for the same individual but from a different specimen were considered new notifications, provided there was at least a 12-week separation between times of collection.

Active follow-up was conducted of notifications (excluding neonatal infections) resulting from tests ordered on the residents of the Central Sydney Area Health Service between 1 December 2002 and 31 May 2003. Medical practitioners who had requested the Chlamydia test that resulted in the notification were asked to complete a written standardised questionnaire to provide additional information about the patient. Information was collected on their occupation, country of birth, language spoken at home, aboriginality, reason the test was ordered, the site of the body from which specimens were collected, and method of contact tracing used. Questionnaires for notifications received in the preceding week were posted out at the end of each week with a second request sent if there was no response within three weeks.

Ethics committee approval was not sought, as the collection of this information is standard public health practice for the surveillance of a notifiable disease.

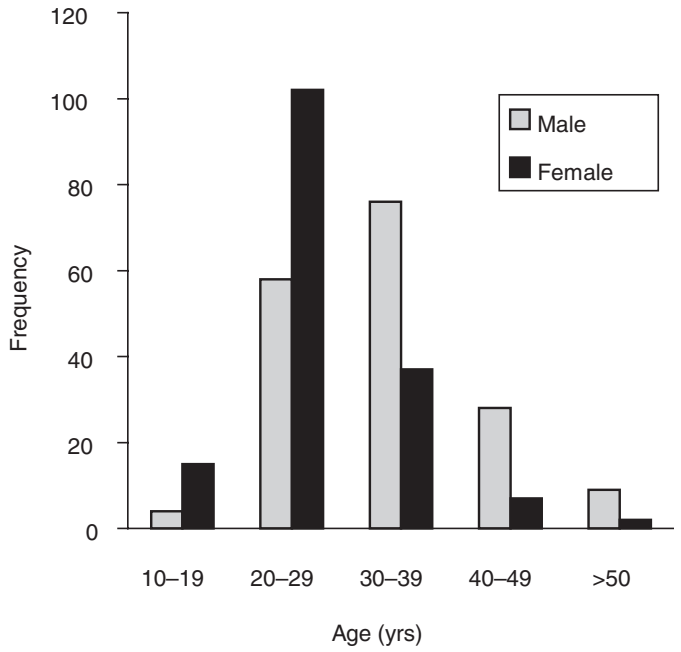
The results were analysed using the statistical software STATA,[10] to: provide descriptive information, test for an association between age and reason for the test (reason for the test was categorised into 'symptomatic', 'screening', and 'other' for this analysis), and test for an association between reason for test and whether contact tracing was performed. Chi squared and Fisher's exact tests were performed where appropriate. The Kruskal-Wallis test was used to analyse age across groups, as it was not normally distributed.

RESULTS

Three-hundred-and-thirty-nine new notifications were recorded in NDD for the study period. There were 176 (52 per cent) males and 163 females (48 per cent) with median ages of 33.3 years and 25.1 years respectively.

FIGURE 1

AGE DISTRIBUTION IN 10 YEAR BANDWIDTHS FOR MALES AND FEMALES NOTIFIED AS HAVING CHLAMYDIA, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=339



Source: Communicable Diseases Branch, Notifiable Diseases Database (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

Figure 1 presents the age of the patients grouped in 10-year age bands for males and females. There were more female than male cases in the 20–29 year age group, with the reverse being observed in the 30–39 year age group.

There were 339 questionnaires sent out with 297 responses received giving a response rate of 88 per cent. Table 1 summarises the information obtained from the responses to the questionnaires (*n*=297). The number of males and females was similar. More than half of the notifications resulted from urine specimens, twice as many as from the next most common specimen site, the endocervix. Some degree of contact tracing was reported for almost 85 per cent of notifications.

TABLE 2

REASON FOR ORDERING A CHLAMYDIA TEST FOR MALES AND FEMALES, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=295[#]

Reason for test	Female		Male	
	n	%	*n*	%
Symptomatic	73	51	91	59
Screening	37	26	37	25
Other	32	23	25	16
Total	**142**		**153**	

note: [#] reason for test unknown for two cases.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

Table 2 describes the reason that a Chlamydia test was ordered for males and females. A higher proportion of males were tested because of clinical symptoms in comparison to females although the presence of clinical symptoms was the most common reason for ordering a test in both groups. Considering only the female cases, the median age for women tested due to symptoms was 26.1 years (*n*=73), 25.9 years (*n*=37) for women who were diagnosed through screening, and 23.7 years (*n*=32) for women who were tested for other reasons. The Kruskal-Wallis test for equality of age ranks did not reveal a significant difference in ages between these groups (p=0.08, df=2).

Of the 250 instances where contact tracing was done, 148 were performed by the patient, 54 by the treating doctor, 35 by the Central Sydney Sexual Health Service, and 13 by other means.

TABLE 3

WAS HAVING A TEST FOR CHLAMYDIA BECAUSE OF SYMPTOMS ASSOCIATED WITH CONTACT TRACING, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=295

Reason for test	Contact tracing performed		No contact tracing		*p* value
	n	%	*n*	%	
Symptoms	135	82	29	18	0.36[a]
No symptoms	113	86	18	14	

Notes: [a] chi squared.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

TABLE 4

WHETHER PATIENT OR DOCTOR REQUESTED A SCREENING TEST FOR CHLAMYDIA ASSOCIATED WITH CONTACT TRACING OCCURRING, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=74 [#]

Screening request	Contact tracing performed		No contact tracing		*p* value
	n	%	*n*	%	
Patient	39	83	8	17	0.54[a]
Doctor	23	85	4	15	

Notes: [a] Fisher's exact.
[#] reason for test unknown for two cases.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

There was no association between having a test because of symptoms and whether contact tracing had been performed (Table 3).

For those cases that presented for screening there was no association between whether the doctor or patient initiated the screening and whether contact tracing had been performed (Table 4).

DISCUSSION

A high response rate was achieved, using a surveillance system that was not resource intensive. The surveillance system identified an equal gender balance among individuals notified, with males being older than females. A relatively low proportion of notifications was from individuals who did not speak English at home. Some form of contact tracing had been done for the majority of cases.

As only positive tests are notified, the system's ability to provide insights into both patient and medical practitioner screening behaviour is limited. Campaigns to prevent STIs often advocate screening of groups that are at risk. When evaluating the effectiveness of a campaign, it would be more appropriate to conduct surveillance on the number of tests requested by practitioners rather than the number of notifications received by public health units.

In April 2003, the NSW Department of Health delivered a community-wide Chlamydia education campaign targeted at younger people. The period of our study overlapped this campaign and as such the findings from the later part may reflect the impact of this initiative. However, this overlap period was short.

This study identifies some opportunities to ensure public health control measures aimed at reducing genital Chlamydia infection are targeted appropriately. First, nine per cent of notifications were for females aged less than 20 years, which highlights the significance of the infection in this group. Second, there may be evidence that non-English speaking individuals are experiencing barriers to accessing medical services for STIs. The region covered by the Central Sydney Area Health Service is known to have a high proportion of residents who speak a language other than English at home (41.3 per cent).[11] However only approximately 20 per cent of cases for whom language spoken at home was identified indicated they spoke a language other than English at home. This apparent under representation may indicate that non-English speaking residents are experiencing difficulties in accessing sexual health services.

While acknowledging the limitations of a notification system to assess screening behaviour, the finding that only 25 per cent of infections in both sexes were diagnosed through screening suggests that widespread screening is not occurring. As younger women are at higher risk of contracting Chlamydia, it has been recommended that screening programs target this group.[12] If younger women were being preferentially targeted for screening it is likely that the age of women diagnosed as a result of screening would be lower than that of women diagnosed as a result of investigations of symptoms. This was not the case in our study, suggesting that the screening that is being conducted is not being targeted at the groups at highest risk.

The application of 'best practice' for STI contact tracing would initiate contact tracing for every identified case of Chlamydial infection.[13] Our finding that contact tracing did not occur for over 15 per cent of cases indicates an opportunity to improve practice. Further, as over half of the contact tracing was initiated by the patients, it is important that they are provided with advice, support

materials, and skills to ensure they have the capacity to carry out this role effectively.

Contact tracing was not associated with whether the case had symptoms, or whether the diagnosis was made as a result of screening, or who initiated screening. This would suggest that factors other than the reason why an individual has presented for a test determine whether contact tracing is performed.

CONCLUSION

The enhanced Chlamydia surveillance system described in this article can efficiently identify at-risk groups and monitor the extent of contact tracing that is occurring. There is limited evidence of screening among at-risk groups. Some form of contact tracing is occurring for the majority of diagnosed cases. These results could be used to provide a baseline for an evaluation of the Chlamydia education campaign in the Central Sydney Area Health Service.

REFERENCES

1. Graphical Online Data Surveillance Evaluation for Notifiable Diseases (GODSEND). Sydney: Centre for Epidemiology and Research, NSW Department of Health, 2003.
2. Grulich A, de Visser R, Smith A et al. Sexually transmissible infection and blood-born virus history in a representative sample of adults. *Aust N Z J Public Health* 2003, 27(2): 234–241.
3. World Health Organization. *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates*. Geneva: WHO, 2001.
4. Cates W Jr, Rolfs RT Jr, Aral SO. Sexually transmitted diseases, pelvic inflammatory disease, and infertility: an epidemiologic update. *Epidemiol Rev* 1990; 12: 199–220
5. Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med* 2001; 20(3-S): 95–107
6. Black CM. Current methods of laboratory diagnosis of Chlamydia trachomatis infections. *Clin Microbiol Rev* 1997; 10: 160–84.
7. Low N and Egger M. What should we do about screening for genital Chlamydia? *Int J Epidemiol* 2002; 2002;31: 891–3
8. Swedish Institute for Infectious Disease Control. *Communicable Disease in Sweden 2000. The Annual Report of the Department of Epidemiology*. Stockholm: Smittskyddinstitutet, 2001.
9. Gaydos CA, Howell MR, Pare B et al. Chlamydia trachomatis infections in female military recruits. *N Engl J Med* 1998; 339: 739–44.
10. StataCorp. *Stata Statistical Software: Release 7.0*. College Statico,Texas: StataCorp, 2002.
11. Wen et al. *A 2001 demographic profile of the Central Sydney Area Health Service*. Sydney: Division of Population Health, Central Sydney Area Health Service, 2003.
12. Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med* 2001; 20(3-S): 95–107.
13. Australasian Society for HIV Medicine. *Australasian Contact Tracing Manual: 2nd edition (revised)*. Sydney: Australasian Society for HIV Medicine, 2002.

ERRATUM

VIRAL GASTROENTERITIS FACT SHEET

The September–October 2003 issue of the *NSW Public Health Bulletin* (Volume 14, Number 9–10) contained a fact sheet for Viral Gastroenteritis. At the end of the fact sheet, readers interested in further information on suitable fluids for children with gastroenteritis were referred to the 'Gastroenteritis in Children' fact sheet on the website of the Children's Hospital at Westmead.

This fact sheet was jointly developed by the Children's Hospital at Westmead and the Sydney Children's Hospital at Randwick. The fact sheet is available from the websites of both hospitals at **www.chw.edu.au** and **www.sch.edu.au**.

CAPACITY BUILDING INFRASTRUCTURE GRANTS WORKSHOP

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In 1996, the NSW Department of Health implemented a competitive Infrastructure Grants Program, which awarded infrastructure grants to biomedical–clinical, public health, and health services research organisations in NSW. Since 1996, infrastructure funding to public health and health services research organisations has been provided through Stream 3 of the Infrastructure Grants Program.

The NSW Department of Health Capacity Building Infrastructure Grants (CBIG) Program replaces funding to research organisations previously awarded through Stream 3 of the Infrastructure Grants Program. The Department recently conducted the first funding round of the CBIG Program. The grants provided under the CBIG Program are designed to provide support for research infrastructure, with a focus on providing a sustainable environment in which the capacity to conduct research is enhanced, career paths are expanded, and training in public health, primary health care, and health services research is realised.

The aims of the CBIG Program are to: build the capacity and competitiveness of NSW research organisations in the fields of public health, primary health care, and health services research; and encourage research in these fields that addresses the priorities of NSW Health. The priority areas of the CBIG are: major causes of burden of disease, risks to health, the delivery of health services, and transfer of research findings into policy and practice. Applicants were required to outline a research program that addressed at least one of these priorities.

In August 2003, the NSW Minister for Health announced that six NSW research organisations would each receive $1.5 million, over the three-year period 2003–04 to 2005–06, under the first round of the CBIG Program. These organisations are:

- Australian Rural Health Research Collaboration, Moree, Lismore, and Broken Hill;
- Centre for Health Informatics, University of NSW;
- Centre for Health Service Development, University of Wollongong;
- Centre for Infectious Diseases and Microbiology–Public Health, Westmead;
- Consortium for Social and Policy Research on HIV, Hepatitis C, and Related Diseases, University of NSW;
- Newcastle Institute of Public Health, Hunter Medical Research Institute.

In October 2003, a CBIG Workshop was held at which all successful applicants presented their capacity building plans to the NSW Department of Health, other successful applicants, and invited interested parties. The aim of the Workshop was to assist the recipients of grants to refine and finalise their plans through feedback and discussion. Dr Gregory Stewart, Chief Health Officer, welcomed applicants to the Workshop and Dr Louisa Jorm, Director of the Centre for Epidemiology and Research, provided an overview of the Program and discussed potential research opportunities.

The presentations from the successful applicants illustrated the diversity of research being undertaken in NSW. The Australian Rural Health Research Collaboration described research into cost effective and sustainable models of falls prevention in older people. The Centre for Health Informatics provided an overview of Home Telecare, whereby the development of new processes and technologies will improve the delivery of health services to elderly people in their homes. The Centre for Health Service Development provided an overview of five of their research themes: casemix classification across settings, health and community care financing, care coordination, health service delivery and organisation, and management decision-making. The Centre for Infectious Diseases and Microbiology–Public Health outlined their participation in the national serosurveillance of vaccine preventable diseases and provided an example of an educational initiative of developing a new postgraduate lecture series in medical microbiology. The Consortium for Social and Policy Research on HIV, Hepatitis C and Related Diseases outlined a plan to establish a research and policy 'clearinghouse', which would be designed to facilitate the sharing of information and resources. The clearinghouse will have a national search capability for sites relating to HIV, hepatitis C and illicit drug use research and policy. The Newcastle Institute of Public Health described the 'Hunter Cohort', which will comprise of 10,000 people aged 60 years or older from the Hunter region, and will study factors related to health and ageing.

The CBIG Workshop also provided the opportunity for successful applicants to network with colleagues from across NSW. Final capacity building plans were submitted to the NSW Department of Health at the end of November 2003.

Information about the Capacity Building Infrastructure Grants Program is available from the NSW Department of Health website at **www.health.nsw.gov.au/public-health/rad**.

EPIREVIEW

MENINGOCOCCAL DISEASE IN NEW SOUTH WALES, 1991–2002

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BACKGROUND

Meningococcal disease is caused by invasive infection with the bacteria *Neisseria meningitidis*. Humans are the only natural reservoir for *N. meningitidis*, 5–10 per cent of whom have naso-pharangeal colonisation of the bacteria at any given time.[1] The bacteria are transmitted between people by secretions from the naso-pharynx. Disease occurs in rare instances when a virulent strain of the bacteria invades through the naso-pharynx. Disease can present in a variety of syndromes, usually meningitis and/or septicaemia, and more uncommonly pneumonia, otitis media, septic arthritis, urethritis, and purulent pericarditis.[1]

N. meningitidis can be classified into serogroups, with serogroups B and C the most commonly reported in developed countries.[1,2,3] Risk factors for developing meningococcal disease include: close contact with a case; age, in particular early childhood or early adulthood; the seasons of winter and early spring; exposure to tobacco smoke; overcrowding; the immunosuppressive effect of preceding viral infections; and exposure to environmental dust.[1,4,5]

In NSW, laboratories and hospitals are required by law to notify cases of meningococcal infection to public health units (PHUs). The staff of PHUs investigate cases to identify close contacts and provide advice and prophylaxis according to national guidelines.[2] PHU staff enter data about cases into a statewide database for notifiable diseases, which is maintained by the NSW Department of Health. The Australian Meningococcal Surveillance Programme collates data from the notifications from all states and territories, and reports their findings annually.[14]

Meningococcal C vaccines have been licensed for use in Australia since early 2002. In October 2002, the Commonwealth Department of Health and Ageing announced funding over a four-year period for a national Meningococcal C Vaccination Program, commencing in early 2003, for all people 1–19 years of age.[6] In September 2003, the National Health and Medical Research Council recommended the introduction of routine meningococcal C vaccination of all children at 12 months of age.[7]

In 1999, the United Kingdom was the first country to introduce a large-scale national immunisation program for serogroup C meningococcal disease. At the time, concerns were raised regarding the potential effects of decreasing the incidence of serogroup C, and the potential for 'serogroup switching' by the bacteria, thereby causing an increase in serogroup B infections. However, subsequent studies have not shown a significant increase in 'serogroup switching', in the United Kingdom or elsewhere.[8,9]

Establishing the endemic incidence of meningococcal disease in NSW, prior to the introduction of the national vaccination program, will allow future analysis of changes in meningococcal epidemiology, and to detect potential trends in the incidence of various serogroups. The epidemiology of meningococcal disease notifications in NSW between 1991 and 1999 has previously been reviewed.[10] This article presents previously unpublished findings for that period, as well as a comparison with meningococcal disease notifications for the years 2000–2002.

METHODS

In NSW, a case of meningococcal disease is defined according to national guidelines.[2] Case definitions changed in the late 1990s, with the acceptance of nucleic acid test methods and serology as evidence of infection. We analysed data for cases of meningococcal disease from the statewide database for the years 1991 to 2002.[11] The characteristics of cases notified for the years 2000, 2001, and 2002 were compared with cases notified for the period between 1991–1999.

Cases were analysed by year of onset, place of residence, gender, age group, indigenous status, disease syndrome (meningitis–septicaemia), serogroup, disease outcome, and diagnostic method. The analysis for the age of cases reflected the anticipated distribution of the disease in the population. Consequently, cases aged less than five years were analysed by year of age, cases aged between 5–24 years in 5-year age bands, cases aged between 25–64 in 20-year age bands, and the remainder of the population 65 years and over were included in one age group. Place of residence was categorised by the 'Greater Sydney' area health services and the 'Rural NSW' area health services. The Greater Sydney category covered all the major urban areas in NSW and included the Sydney and Central Coast Area Health Services, and the Hunter and Illawarra Area Health Services. Factors associated with the death of cases were examined, but this examination was restricted to notifications between 1997 and 2002 because the data was not complete for preceding years.

Descriptive analysis was performed using the statistical programs SAS and Microsoft Excel 2000 Version 9. The relative risk of death was calculated for the period 1997

TABLE 1

CHARACTERISTICS OF CASES NOTIFIED WITH MENINGOCOCCAL DISEASE, NSW, FOR THE YEARS 2000, 2001, AND 2002, COMPARED WITH 1991–1999

Case characteristics	1991–1999 Cases	% total	Rate per 100,000	Deaths	Case Fatality Rate	2000 Cases	% total	Rate per 100,000	Deaths	Case Fatality Rate	2001 Cases	% total	Rate per 100,000	Deaths	Case Fatality Rate	2002 Cases	% total	Rate per 100,000	Deaths	Case Fatality Rate	Total (1991–2002) Cases	% total	Rate per 100,000	Deaths	Case Fatality Rate
Residence																									
Greater Sydney Area*	754	(52.5)	3.5	51	(6.8)	146	(58.9)	3.8	8	(5.5)	129	(56.1)	3.3	3	(2.3)	126	(58.6)	3.2	10	(7.9)	1155	(54.2)	3.2	72	(6.2)
Rural NSW	664	(46.2)	3.2	37	(5.6)	101	(40.7)	3.8	6	(5.9)	101	(43.9)	3.8	4	(4.0)	87	(40.5)	3.2	9	(10.3)	953	(44.7)	3.2	56	(5.9)
Unknown	19	(1.3)	.	1	(5.2)	1	(0.4)	.	0.0	0.0	.					2	(0.9)	.	0.0		22	(1)	1	1	(4.5)
Sex																									
Male	773	(53.8)	2.5	54	(7.0)	138	(55.6)	4.3	3	(2.2)	111	(48.3)	3.4	5	(4.5)	123	(57.2)	3.8	12	(9.8)	1145	(53.8)	3.1	82	(7.2)
Female	663	(46.0)	2.1	35	(5.3)	110	(44.3)	3.4	11	(10.0)	119	(51.7)	3.6	2	(1.7)	91	(42.3)	2.7	7	(7.7)	983	(46.2)	2.6	47	(4.8)
Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	(0.5)	0.0	0.0	2	(0.1)	0.0	0.0								
Aboriginal or Torres Strait Islander																									
Indigenous	76	(5.3)	7.0	5	(6.6)	8	(3.2)	6.7	0.0		9	(3.9)	7.5	0.0		15	(7.0)	12.5	0.0		108	(5.1)	7.5	5	(4.6)
Non-indigenous	1361	(94.7)	2.3	84	(6.2)	240	(96.8)	3.7	14	(5.8)	221	(96.1)	3.4	7	(3.2)	200	(93.0)	3.1	19	(9.5)	2022	(95.0)	2.6	124	(6.1)
Age group (years)																									
<1	253	(17.6)	29.1	17	(6.7)	28	(11.3)	32.8	1	(3.6)	37	(16.1)	43.4	2	(5.4)	23	(10.7)	27.0	2	(8.7)	341	(16)	39.2	22	(6.5)
1	186	(12.9)	21.3	8	(4.3)	16	(6.5)	18.8	1	(6.25)	15	(6.5)	17.6	0.0		12	(5.6)	14.1	1	(8.3)	229	(10.8)	26.3	10	(4.4)
2	89	(6.2)	10.2	4	(4.5)	12	(4.8)	14.1	1	(8.3)	8	(3.5)	9.4	0.0		11	(5.1)	12.9	0.0		120	(5.6)	13.7	5	(4.2)
3	56	(3.9)	6.4	3	(5.3)	10	(4.0)	11.5	1	(10)	4	(1.7)	4.6	0.0		9	(4.2)	10.3	0.0		79	(3.7)	9.0	4	(5.1)
4	55	(3.8)	6.3	2	(3.6)	7	(2.8)	8.0	0.0		7	(3.0)	8.0	0.0		2	(0.9)	2.3	0.0		71	(3.3)	8.1	2	(2.8)
Total <5	639	(44.5)	14.6	34	(5.3)	73	(29.4)	16.9	4	(5.5)	71	(30.9)	16.8	2	(2.8)	57	(26.5)	13.6	0.0		840	(39.4)	16.1	43	(5.1)
5–9	103	(7.2)	2.4	8	(7.8)	23	(9.3)	5.2	1	(4.3)	17	(7.4)	3.8	1	(5.9)	23	(10.7)	5.2	2	(8.7)	166	(7.8)	3.2	12	(7.2)
10–14	87	(6.1)	2.1	14	(16.1)	17	(6.9)	3.8	0.0		16	(7.0)	3.6	0.0		21	(9.8)	4.7	1	(4.8)	141	(6.6)	2.7	1	(0.7)
15–19	224	(15.6)	5.2	4	(1.8)	53	(21.4)	11.9	3	(5.7)	26	(11.3)	5.8	1	(3.8)	41	(19.1)	9.2	2	(4.9)	344	(16.2)	6.6	20	(5.8)
20–24	105	(7.3)	2.3	11	(10.5)	26	(10.5)	5.8	1	(3.8)	21	(9.1)	4.7	1	(4.8)	20	(9.3)	4.4	2	(10)	172	(8.1)	3.1	8	(4.7)
25–44	135	(9.4)	0.7	10	(7.4)	33	(13.3)	1.7	3	(9.1)	51	(22.2)	2.6	1	(2)	27	(12.6)	1.4	4	(14.8)	246	(11.5)	1.1	19	(7.7)
45–64	77	(5.4)	0.6	10	(13.0)	19	(7.7)	1.3	2	(10.5)	19	(8.3)	1.2	0.0		17	(7.9)	1.1	4	(23.5)	132	(6.2)	0.8	16	(12.1)
65+	67	(4.7)	0.9	8	(12.0)	4	(1.6)	0.5	0.0		9	(3.9)	1.1	1	(11.1)	9	(4.2)	1.1	1	(11.1)	89	(4.2)	0.9	10	(11.2)
Syndrome																									
Meningitis	771	(53.7)	1.2	27	(3.5)	108	(43.5)	1.7	4	(3.7)	82	(35.7)	1.3	0.0		71	(33.0)	1.1	3	(4.2)	1032	(48.5)	1.4	34	(3.3)
Septicaemia	403	(28.0)	0.7	50	(12.4)	56	(22.6)	0.9	9	(16.1)	77	(33.5)	1.2	5	(6.5)	117	(54.4)	1.8	15	(12.8)	681	(32)	0.9	79	(11.6)
Unspecified	263	(18.3)	0.4	12	(4.6)	84	(33.9)	1.3	1	(1.2)	71	(30.9)	1.1	2	(2.8)	27	(12.6)	0.4	1	(3.7)	417	(19.6)	0.6	16	(3.8)
Serogroup																									
Serogroup B	279	(19.4)	0.5	18	(6.5)	93	(37.5)	1.4	6	(6.5)	91	(39.6)	1.4	2	(2.2)	104	(48.4)	1.6	8	(7.7)	567	(26.6)	0.8	34	(6.0)
Serogroup C	231	(16.1)	0.4	20	(8.7)	64	(25.8)	1.0	4	(6.3)	38	(16.5)	0.6	5	(13.2)	53	(24.7)	0.8	10	(18.9)	386	(18.1)	0.5	39	(10.1)
Serogroup W135	11	(0.8)	0.0	1	(9.1)	4	(1.6)	0.1	0.0		1	(0.4)	0.0	0.0		1	(0.5)	0.0	0.0		17	(0.8)	0.0	1	(5.9)
Serogroup Y	11	(0.8)	0.0	1	(9.1)	7	(2.8)	0.1	1	(14.3)	2	(0.9)	0.0	0.0		2	(0.9)	0.0	0.0		22	(1.0)	0.0	2	(9.1)
Serogroup Unknown	905	(63.0)	1.5	49	(5.4)	80	(32.3)	1.2	3	(3.8)	98	(42.6)	1.5	0.0		55	(25.6)	0.8	1	(1.8)	1138	(53.4)	1.5	53	(4.7)
Method of Detection																									
Clinically	67	(4.7)	0.1	4	(6.0)	17	(6.9)	0.3	1	(5.9)	32	(13.9)	0.5	0.0		21	(9.8)	0.3	1	(4.8)	137	(6.4)	0.2	6	(4.4)
Culture	638	(44.4)	1.2	47	(7.4)	98	(39.5)	1.5	7	(7.1)	84	(36.5)	1.3	6	(7.1)	97	(45.1)	1.5	11	(11.3)	918	(43.1)	1.2	71	(7.7)
Microscopy	79	(5.5)	0.1	3	(3.8)	15	(6.0)	0.2	0.0		9	(3.9)	0.1	1	(11.1)	14	(6.5)	0.2	1	(7.1)	117	(5.5)	0.2	4	(3.4)
PCR	35	(2.4)	0.0	2	(5.7)	38	(15.3)	0.6	2	(5.6)	30	(13.0)	0.5	0.0		43	(20.0)	0.7	5	(11.6)	146	(6.9)	0.2	9	(6.2)
Serology	106	(7.4)	0.2	10	(9.4)	48	(19.4)	0.7	2	(4.2)	67	(29.1)	1.0	0.0		31	(14.4)	0.5	1	(3.2)	251	(11.8)	0.3	13	(5.2)
Unknown	489	(34.0)	0.9	22	(4.5)	24	(9.7)	0.4	2	(8.3)	6	(2.6)	0.1	0.0		7	(3.6)	0.1	0.0		526	(24.7)	0.7	25	(4.8)
Antigen detected	22	(1.5)	0.0	1	(4.5)	7	(2.8)	0.1	0.0		2	(0.9)	0.0	0.0		2	(0.9)	0.0	0.0		33	(1.5)	0.0	1	(3.0)
Total	**1437**		**2.6**	**89**	**(6.2)**	**248**		**3.8**	**14**	**(5.6)**	**230**		**3.5**	**7**	**(3.0)**	**215**		**3.3**	**19**	**(8.8)**	**2130**		**2.8**	**129**	**(6.1)**

Notes: * For purposes of this analysis Greater Sydney includes the Sydney and Central Coast Area Health Services and the Illawarra and Hunter Area Health Services.

Source: Communicable Diseases Branch, NSW Notifiable Diseases Database (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

to 2002 using the epidemiological software Epi Info version 6.04d. We used the Health Outcomes Information Statistical Toolkit (HOIST), maintained by the Centre for Epidemiology and Research of the NSW Department of Health, to calculate crude incidence rates using Australian Bureau of Statistics year-specific mid-year population data for NSW,[11] and rates for Aboriginal and Torres Strait Islander people using Australian Bureau of Statistics population estimates for 2001.[12] For cases aged less than five years, crude incidence rates for 2001 and 2002 were calculated using mid-year population estimates for the year 2000.[11]

RESULTS

Incidence

From 2000 to 2002, 693 cases of meningococcal disease were notified, which represents an average of 231 cases per year and a crude incidence rate of 3.5 per 100,000 people. This incidence is considerably higher than for the previous study period (1991 to 1999), when an average of 160 cases (2.6 per 100,000) were notified each year (Tables 1 and 2). Annual peaks of notifications occurred consistently during winter and spring (Figure 1).

Serogroup

From 2000 to 2002 serogroup B notifications were almost twice as common as serogroup C; the incidence of serogroup B was 1.5 cases per 100,000 population (*n*=288) and for serogroup C incidence was 0.8 per 100,000 (*n*=155). These rates are higher than for the previous study period 1991–1999 (Table 1). The proportion of meningococcal disease notifications due to an unknown serogroup was substantially lower in 2000–2002 (34 per cent of cases) than for 1991–1999 (63 per cent of cases).

TABLE 2

NOTIFICATIONS OF MENINGOCOCCAL DISEASE, NSW, BY YEAR 1991–2002, ANNUAL AVERAGE RATE, AND CASE FATALITY RATE

Year	Cases	% total	Average annual rate per 100,000	Deaths	Case fatality rate
1991	128	6.0	2.2	3	2.3
1992	122	5.7	2.0	8	6.6
1993	153	7.2	2.5	11	7.2
1994	142	6.7	2.3	15	10.6
1995	113	5.3	1.8	7	6.2
1996	161	7.6	2.6	7	4.3
1997	219	10.3	3.5	7	3.2
1998	184	8.6	2.9	17	9.2
1999	215	10.1	3.4	14	6.5
2000	248	11.6	3.8	14	5.6
2001	230	10.8	3.5	7	3.0
2002	215	10.1	3.3	19	8.8
Total	**2130**		**2.8**	**129**	**6.1**

Source: Communicable Diseases Branch, NSW Notifiable Diseases Database (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Age and Serogroup

From 2000 to 2002, the highest notification rates occurred in children aged less than one year (34.4 per 100,000). In the same period, children aged 1–4 years had an annual average rate of 11.0 per 100,000 people and adolescents 15–19 years had an annual average rate of 9.0 per 100,000. From 1991 to 1999 the age distribution of cases was similar.

Between 2000–2002, the highest notification rates of serogroup B meningococcal disease were in children less than one year of age (16.4 per 100,000 people), children 1–4 years of age (6.4 per 100,000), adolescents 15–19 years of age (3.2 per 100,000), and young adults 20–24 years of age (2.1 per 100,000). Serogroup C notification rates during the same period were highest in children less than one year of age (4.7 per 100,000), adolescents 15–19 years of age (3.5 per 100,000), children 1–4 years of age (2.3 per 100,000) and young adults 20–24 years of age (1.0 per 100,000). Between 1991–1999, notification rates for both serogroup B and C were highest in children less than one year of age (7.1 and 1.7 per 100,000 respectively).

Sex

In 2000–2002, 54 per cent of notifications were male, this was similar to the previous study period (1991–1999).[10]

Place of residence

In rural NSW, for 2000–2002, the rate of meningococcal disease notifications (3.4 per 100,000 people) was similar to that for Greater Sydney (3.5 per 100,000 people). In rural NSW between 1991–1999, the notification rate was slightly higher (2.9 per 100,000) than in Greater Sydney (2.3 per 100,000).

Aboriginal and Torres Strait Islanders

The annual average rate of meningococcal disease notifications among Aboriginal and Torres Strait Islander people was 8.9 per 100,000 in 2000–2002, compared with 7.0 per 100,000 in 1991–1999. Almost half of the notifications in 2000–2002 were serogroup B (*n*=15), 25 per cent were serogroup C (*n*=8), and the remaining cases were due to an unspecified serotype.

Diagnostic method

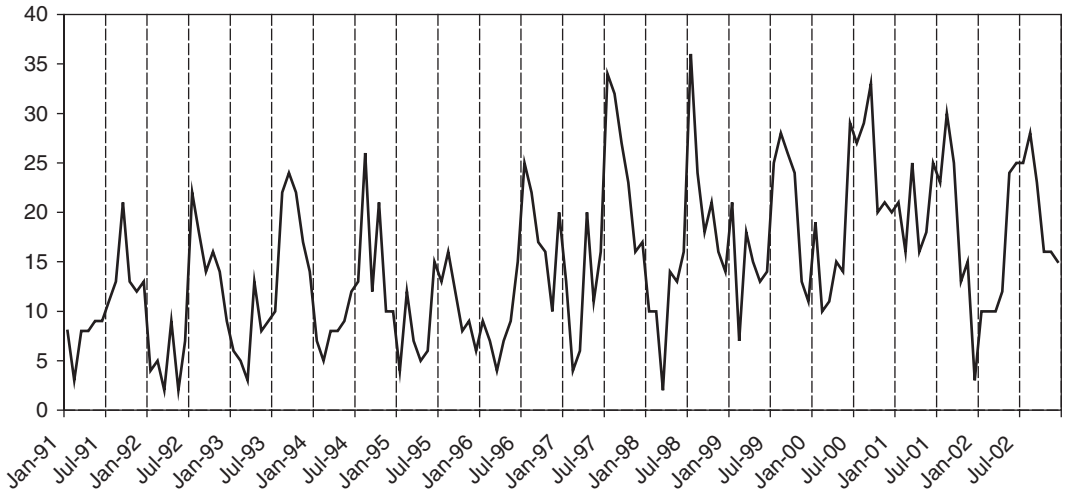
Laboratory confirmed cases comprised 84 per cent (*n*=585) of all notifications between 2000–2002, and 61 per cent (*n*=880) in 1991–1999. Bacterial culture remains the most common laboratory method used to diagnose the disease, with the use of serological and nucleic acid (for example, polymerase chain reaction or PCR) techniques steadily increasing in recent years (Table 1).

Syndrome

In 2000–2002, 38 per cent of cases (*n*=262) were reported to have meningitis, 40 per cent septicaemia (*n*=280) and for 22 per cent (*n*=151) the nature of their presentation was not specified. Overall, septicaemia was the most

FIGURE 1

NUMBER OF NOTIFICATIONS OF MENINGOCOCCAL DISEASE BY MONTH OF ONSET, NSW, 1991–2002



Source: Communicable Diseases Branch, NSW Notifiable Diseases Database (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Notes: For purposes of this analysis Greater Sydney includes the Sydney and Central Coast Area Health Services and the Illawarra and Hunter Areas Health Services.

common presentation for cases less than 15 years of age (46 per cent), above 65 years of age (55 per cent), and in males (43 per cent). Meningitis was the most common syndrome for cases between 15 and 64 years of age (42 per cent). The incidence of meningitis and septicaemia in serogroup B disease was similar. Septicaemia was the most common presentation in serogroup C disease, occurring in 48 per cent (*n*=75) of reported cases, compared to 32 per cent (*n*=49) with meningitis.

DEATHS

Incidence

Between 2000–2002, 40 deaths due to meningococcal disease were reported, which represents 5.8 per cent of all cases for this period. There were no deaths reported of indigenous cases. The proportion of cases that died was generally higher in: males; older adults; those from rural NSW; cases with serogroup C infections; and cases with septicaemia (Table 1).

Between 1997–2002, there were no significant associations between the death of cases, and their sex or place of residence. However, death was significantly associated with septicaemia (RR: 2.8; CI: 1.7–4.7), serogroup C meningococcal infection (RR: 2.7; CI: 1.6–4.4), and increasing age. Cases aged between 45–64 years were more than twice as likely to die than cases in other age groups (RR: 2.3; CI: 1.3–4.1).

DISCUSSION

In NSW between 2000–2002, meningococcal disease remained uncommon, occurring most frequently in young children and adolescents. Meningococcal disease due to serogroup B infection was twice as common as serogroup C infection. The age-distributions for cases with serogroups B and C infections were largely similar, although serogroup B was the most common strain causing disease in very young children. Approximately six per cent of the cases die from their illness, and the case fatality rate tends to be higher in males, cases presenting with septicaemia, older adults, and cases of serogroup C infection.

The overall number of notifications of meningococcal disease in NSW has increased from 1991 to 2002. The reasons for the increase in incidence have not been established, however it is likely that factors such as increased case ascertainment and reporting by clinicians, and increasingly sensitive laboratory tests, may have played a role.

The completeness of notification data contained in the statewide database for notifiable diseases has increased substantially in recent years. The increase in the notification rate for Aboriginal and Torres Strait Islander people may also be, in part, due to the increasing completeness of data describing the indigenous status of cases.

Notification data for meningococcal disease are limited in their scope. Information describing the various risk factors associated with developing disease is not collected. A close correlation between notification and hospitalisation data suggests that notifications are a good estimate of incidence since the degree of underreporting of cases is very low.[10]

The epidemiology of meningococcal disease in Australia has been described previously,[13] and the national surveillance program reports annually.[14] Perhaps the most notable difference between NSW and several other Australian states is that meningococcal B disease is the most common presentation in NSW.[14]

Exposure to tobacco smoke has been identified as a risk factor for developing meningococcal disease, and may play a role in a third of cases.[4] While reducing exposure to tobacco smoke is an effective public health strategy to control the incidence of meningococcal disease, vaccination is likely to have a more immediate affect. The ongoing identification and reporting of the serogroups responsible for meningococcal disease cases by the surveillance system is of particular importance following the introduction of meningococcal C immunisations. Ongoing monitoring of the epidemiology of the disease is essential to measure the effectiveness of the vaccination program, and to detect any trends in capsular switching that may be promoted, which may increase the incidence of serogroup B notifications.

NSW has begun an enhanced surveillance program for meningococcal disease. This program seeks to improve the completeness and quality of the case data, and collect data on a wider range of risk factors and outcomes than previously gathered.

Early diagnosis and treatment is thought to reduce the risk of death. However, the data available for this analysis are limited, and likely to represent the experience of the severe end of the disease spectrum. More detailed investigations would assist the interpretation of these findings, such as enhanced surveillance to determine the influence of known risk factors and the spectrum of disease severity. Describing the long-term sequelae of meningococcal disease for patients may increase our understanding of the affect of this disease on the NSW population.

CONCLUSION

This study used surveillance data to describe the epidemiology of meningococcal disease in NSW, and to identify groups at increased risk of infection and mortality. Surveillance data can be used to compare the epidemiology of meningococcal disease before and after the introduction of the meningococcal C vaccination program.

ACKNOWLEDGEMENTS

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REFERENCES

1 Rosenstein NE, Perkins BA, Stephens DS, et al. Meningococcal Disease. *N Engl J Med* 2001; 344(18): 1378–1388.

2 Commonwealth of Australia. *Guidelines for the early clinical and public health management of meningococcal disease in Australia*. Canberra: Commonwealth Department of Health and Aged Care, 2001.

3 Chin J (editor). *Control of Communicable Diseases Manual: 17th edition*. Washington DC: American Public Health Association, 2000.

4 Fischer M, Hedberg K, Cardosi P, et al. Tobacco smoke as a risk factor for meningococcal disease. *Pediatr Infect Dis J* 1997; 16: 979–83.

5 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: 263–270.

6 Patterson K, Minister for Health and Ageing. *Media release: One Million Children to get Meningococcal C Vaccine Sooner*. November 24, 2002. Available online at www.health.gov.au/mediarel/yr2002/kp/kp02128.htm.

7 National Health and Medical Research Council). *The Australian Immunisation Handbook: 8th edition*. Canberra: National Capital Printers, 2003.

8 Balmer P, Borrow R, Miller E. Impact of meningococcal C conjugate vaccine in the UK. *J Med Microbiol* 2002; 51: 717–722.

9 De Wals P, De Serres G, Niyonsenga T. Effectiveness of a mass immunisation campaign against serogroup C meningococcal disease in Quebec. *JAMA* 2001; 285(2): 177–181.

10 McAnulty J, Habib M, Muscatello D. Meningococcal Disease in NSW 1991–1999. *N S W Public Health Bull* July 2000; 11: 128–130.

11 Communicable Diseases Branch, NSW Notifiable Diseases Database and Australian Bureau of Statistics population estimates (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

12 Australian Bureau of Statistics 2001 Indigenous Profiles (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

13 Jelfs J, Munro R. Epidemiology of meningococcal disease in Australia. *J Paediatr Child Health* 2001; 37: S3–S6.

14 The Australian Meningococcal Surveillance Programme. Annual report of the Australian Meningococcal Surveillance Programme, 2001. *Commun Dis Intell* 2002; 26(3): 407–418.

COMMUNICABLE DISEASES REPORT, NSW, FOR DECEMBER 2003 AND JANUARY 2004

NEW WEB PAGE FOR INFECTIOUS DISEASES

The NSW Department of Health now provides a new link to infectious diseases information on its website at **www.health.nsw.gov.au** under Quick Links. This new page offers updates on public health activities related to communicable disease control in NSW, as well as disease-specific fact sheets and epidemiological reviews.

TRENDS

Reports of communicable disease in NSW received through to the end of January 2004 are summarised in Tables 4 and 5 and Figure 1. These data indicate that the incidence of **meningococcal disease** and **pertussis** declined through summer. The number of cases of **gonorrhoea** declined slowly but steadily throughout 2003.

The number of cases of **cryptosporidiosis** has increased, especially in the Mid North Coast and Greater Murray Area Health Services. Cryptosporidiosis is a disease characterised by watery diarrhoea, which can last for several days and is caused by ingestion of the waterborne chlorine-resistant parasite *Cryptosporidium*. While no links among patients have been identified to date, investigations are continuing. In NSW in previous years, large outbreaks of this infection have been linked to swimming in contaminated pools.[1] Other risk factors include contact with people and animals with the infection and drinking untreated water. To avoid contaminating swimming areas, people with diarrhoea should not enter swimming pools for at least one week after their symptoms have resolved.

Reports of **hepatitis A** increased in December (20 patients) and January (18 patients), mainly from metropolitan area health services. Four of these cases were linked to a restaurant where a food handler with hepatitis A had worked (see report below), and others cases have been linked to travel (including several people who travelled to Lebanon). People who have not been vaccinated for hepatitis A, or have not had the infection, and who are planning to travel to areas where hepatitis A is endemic, which includes most non-industrialised countries, should be vaccinated against hepatitis A.

Two confirmed cases of **measles** have been reported recently, both in overseas travellers. People planning to travel overseas should check their measles vaccination status, and everyone older than four years of age (and born after 1966) should have had two doses of measles vaccine before travelling.

Reference

1. Menzies R. Epi*Review* : Cryptosporidiosis in NSW, 1990–2000. *N S W Public Health Bull* 2002; 13(3): 54–57.

A FOOD HANDLER DIAGNOSED WITH HEPATITIS A

On the 11 December, the Central Sydney Public Health Unit (CSPHU) was notified of a case of hepatitis A in a man. The CSPHU interviewed the man, who reported working as a chef in a restaurant in a large community club in Central Sydney. His duties comprised food handling and preparation, including raw salads and sandwiches, for one of the club's busy restaurants. He mentioned experiencing symptoms of a gastroenteritis-like illness while at work. Although he reported to regularly wash his hands between preparation tasks, he did not wear gloves and had not received specific training in food handling. The period he was infectious while working was from 22 November to 9 December 2003.

Hepatitis A is typically transmitted from person-to-person by the faecal–oral route. Foodborne transmission commonly occurs when an infected person contaminates food during its preparation.[1] Common source outbreaks caused by cooked and uncooked food contaminated by food handlers have occurred,[2] such as the recent outbreak in Massachusetts where 46 people were infected.[3] Post-exposure prophylaxis with normal human immunoglobulin (NIGH) can prevent hepatitis A and is most effective when given early and within 14 days after exposure.[4]

The club estimated that 1,000 patrons may have dined at the restaurant in the period that the case was infectious. Patrons were alerted to the risk of possible hepatitis A transmission through contaminated food served at the restaurant by a media release, an 1800 hotline, and through club staff calling restaurant patrons for whom there were booking details on record. A clinic was set up to provide advice and offer NIGH to patrons who ate at the restaurant during the period that the case was infectious. At the clinic, a patrons' eligibility for NIGH was assessed, based on the date they dined at the restaurant, previous history of hepatitis A infection, and immunisation. Patrons without a completed immunisation history or prior infection with hepatitis A, who were within 14 days of exposure, were offered NIGH. All food handlers of the club were recommended to have NIGH.

Over five days, the clinic screened an estimated 1,166 people, 398 of whom did not qualify for NIGH and 768 of whom were provided with NIGH. The 1800 hotline was linked to an information line that operated from the clinic and received approximately 350 calls.

The incubation period for hepatitis A is typically 2–6 weeks. By 31 January, four possible secondary cases emerged. Only one of these people had received NIGH; however, the exposure of that person was outside the two-week period for the administration of NIGH to be effective.

References

1. Chin J. *Control of Communicable Diseases Manual: 17th edition*. Washington DC: American Public Health Association, 2000; 238–243.
2. Massoudi MS, Bell BP, Paredes V, Insko J, Evans K, Shapiro CN. An outbreak of hepatitis A associated with an infected food-worker. *Public Health Rep* 1999; 114: 157–164.
3. Centers for Disease Control. Foodborne Transmission of Hepatitis A: Massachusetts, 2001. *MMWR* 2003; 52: 565–567.
4. Commonwealth Department of Health and Ageing. *The Australian Immunisation Handbook, 8th edition*. Canberra: Commonwealth of Australia, 2003. Available at www.immunise.health.gov.au/handbook.htm.

ENTERIC DISEASE OUTBREAK CAUSED BY NOROVIRUS INFECTION ON A CRUISE SHIP

Late in December 2003, the South Eastern Sydney Public Health Unit investigated a large outbreak of gastrointestinal illness on a passenger cruise ship.

Before docking in Sydney, the ship's doctor reported illness in up to 200 passengers, through the Public Health Unit's Cruise Ship Health Surveillance Program. Some specimens from ill passengers tested positive for Norovirus. Norovirus outbreaks are commonly reported in densely-populated settings, such as cruise ships, where person-to-person spread is the major mode of transmission.

In response to the outbreak, the ship's crew enhanced surveillance and medical care for possible cases, removed self-service food buffets, and increased the frequency of environmental cleaning regimes aboard the vessel. The outbreak subsequently subsided.

SALMONELLOSIS OUTBREAK LINKED TO A RESTAURANT

On 26 November 2003, Western Sydney Public Health Unit (WSPHU) was notified of group of six people who became ill within 24–48 hours of dining at a restaurant on 21 November 2003. The following week, another group of 11 adults reported gastroenteritis within 24–72 hours of dining at the same restaurant on 23 November 2003. A further two cases who dined at the restaurant on 24 November were notified on 3 December 2003. One of these cases died. *Salmonella typhimurium* 170 was isolated from the stools of 13 cases, and in the blood from the case who died.

The WSPHU contacted a number of diners who had booked tables at the restaurant between 21–28 November, to establish if there was any evidence of continuing illness. A further two cases were identified in diners subsequent to 28 November.

Food inspectors visited the premises, as a result of the first report of illness. While the premises were found to be clean, food preparation practices indicated a potential for cross contamination. Corrective actions were discussed with the proprietor at the time.

On 5 December 2003, a teleconference was held between members of the NSW Department of Health Communicable Diseases Branch and the WSPHU at which it was decided that ongoing transmission could not be excluded and that the safety of diners could not be reasonably guaranteed if the restaurant continued to operate. On these grounds, it was concluded that the health of the public would be best protected if the restaurant were required to cease operating in the short-term, pending further assessment and management of any risks identified.

The restaurant was served a closure order on 5 December. Education on hygiene and food handling was first conducted on 27 November and again on 3 and 5 December. All perishable food was destroyed and the restaurant was thoroughly cleaned. On 8 December the order to close the restaurant was revoked and the restaurant was re-opened.

A case-control study was performed to assess the association between foods consumed and illness. Preliminary analysis suggested that a cooked rice dish may be responsible for illness. It is planned to report the results of the study and further details of the investigation in a future edition of the *NSW Public Health Bulletin*.

MURRAY VALLEY ENCEPHALITIS VIRUS DETECTED IN A MENINDEE SENTINEL CHICKEN

On 23 December 2003, routine testing of the sentinel chicken flock at Menindee, 100 kms south of Broken Hill, detected Murray Valley Encephalitis (MVE) virus in a single chicken. No other chickens in the 15-strong flock tested positive. Two further tests have confirmed the infection, with no other birds becoming positive. The NSW Arbovirus Disease Monitoring Program has a number of sentinel flocks throughout the state. No other flocks reported any seroconversions. Similarly, flocks in Western Australia, the Northern Territory, and Victoria, reported no detections this season.

MVE virus is a virus affecting birds that is transmitted by mosquitoes. The last time MVE virus was detected in sentinel flocks in NSW was in 2001,[1] when flocks in Menindee, Wanaaring, Bourke, and Macquarie Marshes tested positive. At that time, flocks in the Far West of the State converted first, with the virus apparently moving eastwards stopping at the Macquarie Marshes. Despite a number of opportunistic surveys of chicken flocks and other sentinels around the Dubbo, Moree, and Macquarie Marshes regions, no other detections were noted. However, while flocks along the Murray River did not detect any virus, an opportunistic serosurvey of domestic animals around the Menindee and Far West regions did show evidence of recent infection by the virus in animals as far south as Pooncarrie, 125 km south east of Menindee.

While the human population potentially at risk in the region is small, the Far West Area Health Service and the NSW Department of Health advised the public via media

outlets of the risk of mosquito-borne disease around Menindee and Kinchega National Parks (particularly for campers in the advice to screen tents). Personal protective measures—including the use of mosquito screens around houses and tents and insect repellent and wearing light coloured clothing that covers the legs and arms—should be taken, especially by anglers and boaters, gardeners, and fruit pickers. Hospitals and general practitioners in Broken Hill, Mildura, and Adelaide, have been advised to maintain a high level of suspicion for MVE, when diagnosing encephalitic-type symptoms.

Reference

1. Communicable Diseases, NSW: March 2001. *N S W Public Health Bull 2001*; 12(3): 89–91.

INVESTIGATION OF POSSIBLE SARS CASES

On 14 January 2004, the Communicable Diseases Branch received a report that two flight attendants were admitted to a Sydney hospital with the diagnosis of possible SARS. They had become ill with influenza-like symptoms the previous morning, soon after arriving in Melbourne on a flight from China. The flight had departed from Guangzhou, where four sporadic cases of SARS were reported in December and January. The flight attendants had flown on to Sydney and presented to hospital the following day after their symptoms became worse.

The clinicians isolated the patients, used full personal protective equipment, and ensured that appropriate testing was performed for SARS and other possible pathogens. An expert panel of health professionals met by teleconference to help guide the management of the cases. Both patients were released from hospital three days later, when their improving clinical condition and negative laboratory tests effectively ruled out SARS. One flight attendant was subsequently shown to have influenza A and a specific diagnosis in the other remains unknown. Guidelines for the management of possible SARS cases can be found at the NSW Department of Health website at **www.health.nsw.gov.au** by clicking on the Quick Link to Infectious Diseases.

RECOMMENDATIONS FROM THE NSW TASKFORCE ON SARS

Severe Acute Respiratory Syndrome (SARS) first appeared in southern China in late November 2002. By late February 2003, the disease began to spread around the world and on 12 March the World Health Organization (WHO) issued a global alert. Yet less than four months later, the epidemic was over. Central to the containment of this new disease was unprecedented international cooperation between public health, clinical, and laboratory teams. A new coronavirus was identified as the cause of SARS; and, no specific treatment has been identified. As of 15 October, 27 countries reported probable cases of SARS to the WHO. A total of 8,098 probable infections, and 774 deaths, are estimated to have occurred worldwide, predominantly in certain provinces of China, and in Hong Kong, Taiwan, Singapore, Hanoi (Vietnam), and Toronto (Canada).

The SARS epidemic highlights the speed with which infections may spread around the world, and the need for a rapid and coordinated international public health response. With no reliable tests available for early diagnosis, and no specific treatment available, the most effective means of interrupting transmission was rapid identification and isolation of cases, follow up and quarantine of close contacts, and rigorous infection control practices.

In late April 2003, in response to the threat of severe acute respiratory syndrome, or SARS, the NSW Minister for Health announced the formation of the NSW Taskforce on SARS (TSARS). The TSARS first met on 1 May and comprised experts in the fields of public health, clinical medicine (intensive care, emergency medicine, mental health, and general practice), microbiology, infection control, ambulance, counter disaster, industrial relations, and communications. The TSARS provided a forum for discussion between health and other professionals about issues concerning SARS in NSW.

The TSARS was to advise the Chief Health Officer on:

- measures to be taken to prepare the NSW Health system for any outbreak of SARS in NSW;
- implementation of national disease control guidelines on SARS;
- communication strategies to inform health care workers and the general public of SARS-related issues;
- appropriate integration of clinical, public health, quarantine, and other services.

Five subcommittees were formed to address issues around infection control, clinical response and capacity, community health, clinical management, and staffing. Some of the key recommendations of TSARS were implemented during the time of the SARS crisis and others will require implementation in the near future.

In NSW, there were a total of 56 patients investigated who fitted the WHO definition of ‘suspect’ or ‘probable’ cases of SARS. All cases had travelled to a former SARS-affected area and all have completely recovered. Only one case has been confirmed by laboratory testing, and is in fact Australia’s only confirmed case. This case was a foreign traveller infected in Hong Kong en route to Australia in late February, prior to the WHO issuing the global alert. The diagnosis was made retrospectively and a thorough investigation found no evidence of further spread.

Since the announcement by the WHO on 5 July that human-to-human transmission of SARS had been

interrupted by January 2004, three further cases of SARS have been recorded globally: one each from Singapore and Taiwan—both thought to have been acquired from laboratory accidents—and a third in Southern China in late December, the source of which remains unclear. At the time of writing, there has been no secondary spread from these cases reported.

While at the time of writing (February 2004) the threat of SARS around the world appears low, it is important to remember that a single case is capable of igniting an outbreak. An environmental source has yet to be identified and it is unknown at this stage whether or not SARS is a seasonal disease. The risk of SARS re-emerging is therefore unknown and ongoing vigilance for the disease is needed.

The TSARS made 18 key recommendations. These are that:

1. NSW Health finalise an implementation strategy for the key recommendations of TSARS and that NSW Health devote the appropriate resources needed to carry out this strategy.
2. A strategy be developed for informing and educating the public in the event of a major communicable disease outbreak. Content will need to include general information about the unfolding epidemic, preventive messages, and advice on what to do if an individual suspects that they have the disease.
3. NSW Health establish improved systems for rapid communication of urgent advice to general practitioners and other medical practitioners. This may include systems using email, facsimile, print media, mobile phone networks, or rapid distribution of written materials through mail, or via services such as pathology couriers. The feasibility of utilising the existing mailing database of the NSW Medical Board needs to be explored.
4. All area health services report on proposed early management of possible SARS cases and their contacts, specific to their local circumstances, using a framework provided by NSW Health to ensure consistency of approach. Each area's plan needs to address the development of proposed fever clinics. This would entail nominating facilities and staff for the screening, triage, assessment, and isolation of cases. Consideration also needs to be given to 'staging facilities' for those that require observation but not acute hospital care.
5. All area health services identify and report on their strategies for management of SARS cases and their contacts in the community. This will include plans for patient transport, outpatient care, appropriate community supports for individuals in isolation and quarantine, and accommodation facilities for those unable to be managed in their homes. When a SARS case is released into home isolation, it is the responsibility of the treating clinicians (either hospital treating team or general practitioner) to formulate a comprehensive discharge plan.
6. NSW Health strengthens infection control practices in health care facilities by employing a 'whole-of-system' approach. A greater focus on infection control at orientation sessions for new staff, provision of regular training and modelling on senior staff are some suggestions. A review of infection control policies and adherence to them is warranted, along with new systems to support senior health care facility management in improving infection control. In liaison with bodies representing general practitioners, a strategy needs to be developed to improve infection control in the general practitioner setting.
7. The NSW Department of Health Counter Disaster Unit designate a small number of suitable hospitals to manage suspected SARS patients in the event of an outbreak. Facilities are to be identified early, however, the final decision regarding their use would depend on the extent and location of any outbreak and must remain flexible.
8. Area health services ensure staff caring for possible SARS cases are screened for conditions that might increase their risk of serious disease, are well trained in infection control and the use of personal protective equipment, are aware of the risks involved, and are provided with adequate roster relief. Dedicated SARS teams were used in SARS-affected areas overseas, and are recommended in NSW. Additionally, if isolation of staff is required, they are to be provided with appropriate accommodation and arrangements made for the care of any dependents.
9. The NSW Department of Health Counter Disaster Unit review options for air transportation of possible SARS patients and identify barriers to safety, and strategies to overcome these.
10. NSW Health ensure the expert panel continues to be available to advise on management of SARS cases.
11. During any future outbreak of SARS, and in the inter-epidemic periods, that laboratories performing SARS testing in NSW ensure specimens sent to them for analysis have been triaged by the local public health unit. Laboratories will test specimens according to national guidelines and provide timely results of all tests relevant to the case to both the treating clinician and the public health unit.
12. NSW Department of Health Legal Branch identifies methods to streamline the process for making notifiable an emerging communicable disease, where initially only syndromic clinical criteria exist.
13. NSW Department of Health Legal Branch examine mechanisms for ensuring asymptomatic contacts of patients with SARS and other such communicable diseases can be placed in mandatory quarantine should it be deemed necessary by the Chief Health Officer.

14. NSW Health establish a central cache of personal protective equipment with sufficient stock to protect health care workers in an outbreak.
15. The database of negative pressure and isolation facilities held by NSW Health Counter Disaster Unit be kept up-to-date and that a uniform standard to isolation and infection control infrastructure be used when designing or upgrading any future health care facilities.
16. In the event of a future SARS threat to Australia, a national border surveillance strategy be developed in light of existing evidence. This new strategy should be rapidly deployed. Additionally, if the Commonwealth perceives a future need for airport nurses to screen for SARS, their employment should be the responsibility of the Australian Quarantine Inspection Service.
17. NSW Health maintains a high level of vigilance for developments in relation to SARS and that national surveillance guidelines are disseminated to relevant groups for implementation in NSW.
18. NSW Health disseminate relevant reports of TSARS to key stakeholders.

QUARTERLY REPORT: AUSTRALIAN CHILDHOOD IMMUNISATION REGISTER

Table 1 presents the percentage of fully immunised children aged 12 months to less than 15 months in each area health service, reported by all service providers.

These data refer to five different cohorts of children whose age has been calculated 90 days before data extraction. The information contained in each of the reports has been extracted from the Australian Childhood Immunisation Register (ACIR) and may not reflect actual coverage due to under-reporting. Table 2 presents the percentage of fully immunised children identified as Aboriginal or Torres Strait Islander in New South Wales for the same cohort, reported by all service providers.

TABLE 1

PERCENTAGE OF FULLY IMMUNISED CHILDREN FOR FIVE SEPARATE COHORTS OF CHILDREN AGED 12 MONTHS TO LESS THAN 15 MONTHS BY AREA HEALTH SERVICE

Area Health Service	31 Dec 02	30 Mar 03	30 Jun 03	30 Sept 03	31 Dec 03
Central Coast	93	93	92	93	95
Central Sydney	90	91	90	90	89
Hunter	94	94	95	93	94
Illawarra	92	92	93	92	93
Northern Sydney	91	90	91	91	90
South Eastern Sydney	91	90	91	92	90
South Western Sydney	92	91	90	91	90
Wentworth	90	93	91	92	91
Western Sydney	92	92	90	91	91
Far West	89	93	88	91	93
Greater Murray	93	92	94	93	93
Macquarie	92	92	94	93	93
Mid North Coast	90	90	89	90	91
Mid Western	94	94	93	94	91
New England	93	92	92	95	95
Northern Rivers	85	85	84	85	84
Southern	91	89	91	92	89
NSW	**91**	**91**	**91**	**91**	**91**
Australia	**92**	**91**	**91**	**92**	**91**

TABLE 2

PERCENTAGE OF FULLY IMMUNISED CHILDREN IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER, FOR FIVE SEPARATE COHORTS AGED 12 MONTHS TO LESS THAN 15 MONTHS

	31 Dec 02	31 Mar 03	30 Jun 03	30 Sept 03	31 Dec 03
NSW	**86**	**86**	**84**	**88**	**85**
Australia	**84**	**86**	**84**	**87**	**82**

QUARTERLY REPORT: HIV INFECTIONS TO THE END OF SEPTEMBER 2003

In 2002, there was a 15 per cent increase in the number of people reported to have newly-diagnosed HIV infection (392 cases) compared with 2001. This trend continued to the September quarter of 2003 (Table 3). In NSW, for the nine months to 30 September 2003, 322 people were reported to have been newly-diagnosed with HIV, which is an increase of 13 per cent and 24 per cent over the same periods of 2002 and 2001 respectively.

Of these 322 cases, 35 per cent (*n*=114) infections were reported to have been newly-acquired (as opposed to newly-diagnosed). This compares with 32 per cent (*n*=124) in 2002, 29 per cent (*n*=98) in 2001, 25 per cent (*n*=87) in 2000 and 25 per cent (*n*=94) in 1999. Newly-acquired HIV infection is defined as a new diagnosis of HIV infection with a reported negative test in the previous 12 months, or recent seroconversion illness, or laboratory evidence of new infection (including p24 antigen).

During the period January 1999 to September 2003, 90 per cent of newly-diagnosed HIV infections have been in men, and 96 per cent of newly-acquired HIV infections have been in men. Male-to-male sexual contact remains the predominant risk factor (65 per cent of all notifications, and 83 per cent of notifications of newly-acquired infection); the age group 30–39 years is the most affected and accounts for much of the rise in notifications since 2001.

TABLE 3

CHARACTERISTICS OF NSW RESIDENTS REPORTED WITH HIV INFECTION, AIDS, OR WHO HAVE DIED FROM AIDS, 1981 TO MARCH 2003

Characteristic	All cases 1981–March 2003						Cases for 2002						January–March 2003					
	HIV		AIDS		AIDS deaths		HIV		AIDS		AIDS deaths		HIV		AIDS		AIDS deaths	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Gender																		
Female	707	5.4	212	4.1	121	3.4	31	7.9	3	3.6	1	3.8	26	8.1	0	0.0	2	9.1
Male	12197	92.5	5007	95.7	3395	96.3	350	89.3	79	95.2	25	96.2	289	89.8	58	98.3	20	90.9
Transgender	25	0.2	14	0.3	9	0.3	3	0.8	1	1.2	0	0.0	0	0.0	1	1.7	0	0.0
Not stated	261	2.0	0	0.0	0	0.0	8	2.0	0	0.0	0	0.0	7	2.2	0	0.0	0	0.0
Age																		
0–2	27	0.2	7	0.1	3	0.1	1	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3–12	36	0.3	11	0.2	8	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13–19	210	1.6	13	0.2	9	0.3	1	0.3	0	0.0	0	0.0	2	0.6	0	0.0	0	0.0
20–29	4130	31.3	761	14.5	543	15.4	90	23.0	3	3.6	2	7.7	69	21.4	3	5.1	3	13.6
30–39	5077	38.5	2161	41.3	1442	40.9	182	46.4	26	31.3	8	30.8	129	40.1	17	28.8	6	27.3
40–49	2505	19.0	1541	29.4	1036	29.4	83	21.2	38	45.8	13	50.0	73	22.7	21	35.6	11	50.0
50–59	821	6.2	558	10.7	353	10.0	23	5.9	13	15.7	3	11.5	37	11.5	14	23.7	2	9.1
60 +	288	2.2	181	3.5	131	3.7	12	3.1	3	3.6	0	0.0	12	3.7	4	6.8	0	0.0
Not stated	96	0.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exposure																		
Male homosexual–bisexual	7891	59.8	4235	80.9	2920	82.8	246	62.8	53	63.9	18	69.2	219	68.0	46	78.0	14	63.6
Male homosexual–bisexual and IDU	327	2.5	212	4.1	145	4.1	12	3.1	10	12.0	3	11.5	6	1.9	2	3.4	2	9.1
Injecting drug use	433	3.3	105	2.0	52	1.5	9	2.3	0	0.0	1	3.8	10	3.1	2	3.4	1	4.5
Heterosexual	968	7.3	327	6.2	156	4.4	60	15.3	14	16.9	3	11.5	50	15.5	8	13.6	5	22.7
Haemophilia–Coagulation disorders	114	0.9	52	1.0	46	1.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Blood-Tissue recipient–NSI *	122	0.9	102	1.9	90	2.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vertical	37	0.3	14	0.3	7	0.2	1	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Undetermined	3250	24.6	45	0.9	22	0.6	47	12.0	4	4.8	1	3.8	35	10.9	1	1.7	0	0.0
Not stated	48	0.4	141	2.7	87	2.5	17	4.3	2	2.4	0	0.0	2	0.6	0	0.0	0	0.0
Residence																		
Greater Sydney **	7407	56.2	4357	83.3	2959	83.9	332	84.7	63	75.9	20	76.9	247	76.7	43	72.9	19	86.4
Rest of New South Wales	903	6.8	701	13.4	429	12.2	41	10.5	17	20.5	4	15.4	49	15.2	10	16.9	3	13.6
Unknown	4880	37.0	175	3.3	137	3.9	19	4.8	3	3.6	2	7.7	26	8.1	6	10.2	0	0.0
Total	13190	100	5233	100	3525	100	392	100	83	100	26	100	322	100	59	100	22	100

Source: NSW HIV–AIDS database, Communicable Diseases Branch, NSW Department of Health. Recent HIV data may contain duplicates.

* Needle-stick injury.

** Greater Sydney area health services include Central Sydney, North Sydney, Western Sydney, Wentworth, South West Sydney, and South East Sydney.

FIGURE 1

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JANUARY 1998 TO JANUARY 2004, BY MONTH OF ONSET

These are preliminary data: case counts for recent months may increase because of reporting delays. Laboratory-confirmed cases, except for measles, meningococcal disease and pertussis.

NSW population	
Male	50%
<5	7%
5–24	28%
25–64	52%
65+	13%
Rural*	42%

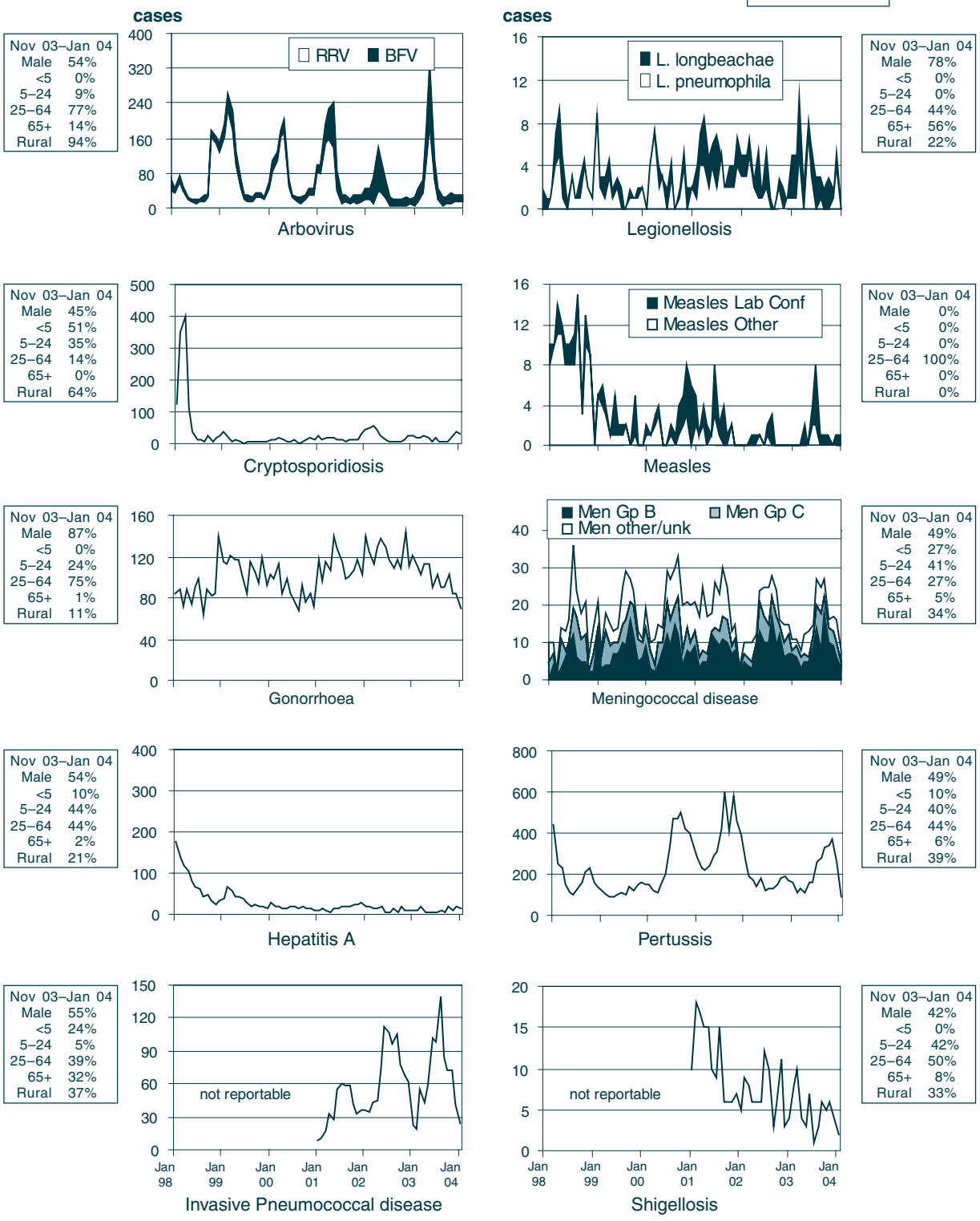

TABLE 4 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN DECEMBER 2003 BY AREA HEALTH SERVICES

Condition	Area Health Service																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Dec†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	68	67	52	25	25	23	79	35	95	20	21	11	14	24	9	16	14	8	610	7,460
Gonorrhoea*	9	9	4	1	3	1	1	1	30	4	2	1	-	1	2	-	-	-	70	1,241
Hepatitis B - acute viral*	-	1	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	4	70
Hepatitis B - other*	15	20	1	5	31	5	3	3	26	-	1	4	-	-	1	-	2	2	120	3,181
Hepatitis C - acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113
Hepatitis C - other*	54	33	20	29	29	35	27	31	53	29	25	7	12	14	8	12	15	24	458	6,958
Hepatitis D - unspecified*	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	13
Syphilis	18	10	7	2	9	2	1	2	24	1	1	1	1	1	1	-	1	-	84	887
Vector-borne																				
Barmah Forest virus*	-	-	-	-	-	-	2	2	-	5	5	-	1	-	-	3	2	-	20	452
Ross River virus*	-	-	-	-	-	-	-	1	-	-	3	-	-	-	4	2	2	-	12	494
Arboviral infection (Other)*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	79
Malaria*	-	2	-	2	1	1	-	1	-	-	-	-	-	-	-	-	1	-	9	127
Zoonoses																				
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Leptospirosis*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	41
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	1	-	-	-	4	-	-	-	1	-	-	-	-	3	-	-	9	87
Q fever*	-	-	-	-	-	-	1	-	1	-	-	2	3	1	2	1	2	-	13	295
Respiratory and other																				
Blood lead level*	3	1	-	-	2	-	6	-	-	1	-	1	6	1	5	-	-	-	26	431
Influenza*	-	3	1	2	2	-	-	-	6	-	-	-	-	-	-	-	-	-	14	895
Invasive pneumococcal infection*	4	7	7	1	9	3	4	5	7	-	-	1	-	-	1	12	2	-	63	808
Legionella longbeachae infection*	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	3	36
Legionella pneumophila infection*	-	1	2	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	5	24
Legionnaires- disease (Other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Meningococcal infection (invasive)*	3	1	2	1	5	1	1	-	1	-	1	-	-	-	-	-	1	-	17	197
Tuberculosis	9	1	7	2	-	-	1	1	8	1	-	-	-	-	-	-	-	-	30	375
Vaccine-preventable																				
Adverse event after immunisation**	-	-	1	-	1	2	1	-	-	-	-	-	1	1	1	1	-	-	9	204
H. *Influenzae b* infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
Mumps*	1	5	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	7	38
Pertussis	28	41	45	9	42	2	20	23	32	1	12	4	5	7	1	17	27	-	316	2,660
Rubella*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	-	2	1	2	1	1	2	-	1	-	3	7	2	-	-	3	1	-	26	186
Giardiasis*	-	21	6	2	7	2	4	1	17	-	2	8	3	4	1	2	-	-	80	1,008
Haemolytic uraemic syndrome	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3	6
Hepatitis A*	2	-	3	-	1	-	-	-	2	1	-	1	-	1	-	-	-	-	11	111
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Listeriosis*	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	2	27
Salmonellosis (not otherwise specified)*	3	26	20	13	26	3	7	6	21	6	2	4	4	2	-	3	-	-	146	1,854
Shigellosis*	-	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	4	62
Typhoid and paratyphoid*	-	2	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	5	33
Verotoxin producing *E. coli**	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2

* lab-confirmed cases only + includes cases with unknown postcode * * HIV and AIDS data are reported separately in the *NSW Public Health Bulletin* each quarter

** AEFIs notified by the school vaccination teams during the National Meningococcal C Program are not included in these figures. These notifications are reviewed regularly by a panel of experts and the results will be published quarterly in the *NSW Public Health Bulletin* in 2004.

CSA = Central Sydney Area
NSA = Northern Sydney Area
WSA = Western Sydney Area
WEN = Wentworth Area
SWS = South Western Sydney Area
CCA = Central Coast Area
HUN = Hunter Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
NRA = Northern Rivers Area
MNC = North Coast Area
NEA = New England Area
MAC = Macquarie Area
MWA = Mid Western Area
FWA = Far West Area
GMA = Greater Murray Area
SA = Southern Area
CHS = Corrections Health Service

TABLE 5 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN JANUARY 2004 BY AREA HEALTH SERVICES

Condition	Area Health Service																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Jan†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	35	61	58	16	42	30	69	22	150	28	24	30	9	13	14	22	13	5	648	648
Gonorrhoea*	27	10	6	1	3	1	-	2	55	3	-	-	-	-	1	1	-	-	110	110
Hepatitis B - acute viral*	1	1	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	5	5
Hepatitis B - other*	37	18	13	7	37	3	4	1	28	4	1	3	-	-	1	1	1	-	159	159
Hepatitis C - acute viral*	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	2	2
Hepatitis C - other*	51	27	14	6	72	32	31	31	53	31	25	5	5	22	14	12	10	19	463	463
Hepatitis D - unspecified*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Syphilis	29	9	11	4	23	2	1	3	27	2	4	3	2	2	8	2	-	-	132	132
Vector-borne																				
Barmah Forest virus*	-	-	1	-	-	-	1	2	-	10	6	-	-	-	-	2	1	-	23	23
Ross River virus*	-	1	-	-	-	-	1	3	-	5	1	1	2	2	3	1	-	-	20	20
Arboviral infection (Other)*	1	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	3
Malaria*	-	1	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	4	4
Zoonoses																				
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptospirosis*	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	2	2
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	-	-	3	-	-	1	-	-	-	1	-	1	-	-	6	6
Q fever*	-	-	-	-	-	-	1	1	-	-	1	3	7	-	2	-	2	-	17	17
Respiratory and other																				
Blood lead level*	-	1	-	-	1	-	2	4	-	2	-	1	1	-	3	-	-	-	15	15
Influenza*	-	2	3	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	9	9
Invasive pneumococcal infection*	2	3	4	2	7	10	7	3	6	-	1	-	2	3	1	-	2	-	54	54
Legionella longbeachae infection*	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	2
Legionella pneumophila infection*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Legionnaires- disease (Other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meningococcal infection (invasive)*	-	1	2	-	-	-	1	2	-	-	-	-	3	-	-	-	-	-	5	5
Tuberculosis	3	8	1	-	4	-	3	-	4	-	-	-	-	-	-	1	-	-	26	26
Vaccine-preventable																				
Adverse event after immunisation**	-	-	-	-	-	-	1	-	-	-	2	-	-	1	-	2	2	-	8	8
H. *Influenzae b* infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	2	2
Mumps*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1
Pertussis	21	37	46	20	23	10	27	11	30	4	5	5	-	7	1	24	9	-	280	280
Rubella*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	-	3	2	2	4	1	4	1	4	1	11	3	-	2	-	8	1	-	48	48
Giardiasis*	2	19	11	11	2	2	5	-	15	-	2	4	1	2	1	1	2	-	80	80
Haemolytic uraemic syndrome	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Hepatitis A*	5	4	3	-	3	1	-	-	7	-	-	2	-	2	-	1	-	-	28	28
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Listeriosis*	-	-	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	3	3
Salmonellosis*	11	16	14	7	27	7	17	3	32	22	14	14	3	4	2	8	3	2	208	208
Shigellosis*	-	-	-	-	-	-	-	-	1	1	-	2	-	-	-	-	-	-	4	4
Typhoid and paratyphoid*	-	-	2	-	1	-	-	-	3	-	-	-	-	-	-	-	-	-	7	7
Verotoxin producing *E. coli**	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1

* lab-confirmed cases only + includes cases with unknown postcode * * HIV and AIDS data are reported separately in the *NSW Public Health Bulletin* each quarter

** AEFIs notified by the school vaccination teams during the National Meningococcal C Program are not included in these figures. These notifications are reviewed regularly by a panel of experts and the results will be published quarterly in the *NSW Public Health Bulletin* in 2004.

CSA = Central Sydney Area
NSA = Northern Sydney Area
WSA = Western Sydney Area
WEN = Wentworth Area
SWS = South Western Sydney Area
CCA = Central Coast Area
HUN = Hunter Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
NRA = Northern Rivers Area
MNC = North Coast Area
NEA = New England Area
MAC = Macquarie Area
MWA = Mid Western Area
FWA = Far West Area
GMA = Greater Murray Area
SA = Southern Area
CHS = Corrections Health Service