NSW Public Health Bulletin

Volume 9, Numbers 8 and 9
August–September 1998

NSW HEALTH

ISSN 1034 7674
State Health Publication PH 980118

THE SYDNEY WATER INCIDENT: JULY–SEPTEMBER 1998

Recent events in Sydney have highlighted the difficulties of understanding and managing the risks posed by the water-borne parasites, *Cryptosporidium* and *Giardia*. Here we present a brief history from a health perspective of what followed the detection of these parasites at very high levels in treated drinking water and some preliminary analyses of the search for illness associated with this.

FIRST EPISODE

On Monday, 27 July 1998, the Sydney Water Corporation reported that it had detected a possible local ingress of contaminated material into the water pipes that served a small section of the eastern Sydney central business district. This report followed the detection of unusual levels of cryptosporidium oocysts and giardia cysts in drinking water in the same area (and not elsewhere) over the previous weekend. Initially, these were thought to be dead organisms that had collected in the biofilm (the material that collects over time in the lining of the pipes) and had been released by flushing of the pipes.

The presence of the protozoan parasites, *Cryptosporidium* and *Giardia*, in treated drinking water presents a difficult public health issue. There is no scientific consensus on the minimum levels of the parasites in water that may cause a health hazard, and guidelines for public health action are not available. In addition, these parasites are much more resistant to conventional water disinfection methods than traditionally used indicators of contamination (such as faecal coliforms). Although sufficient levels of chlorine in the distribution system will kill giardia after a few hours, cryptosporidium parasites are highly resistant to chlorine at levels that, practicably, can be achieved in drinking water. In the absence of a clear association between the detection of parasites in treated water and risk to public health, the trigger for public health action has usually been the finding of other water-system problems that might signal exposure of consumers to inadequately treated water. These include failures of the water-treatment process or breaches in the integrity of the treated-water distribution system.

In response to the finding of a possible source of contamination, an urgent teleconference of experts in public health, communicable-disease epidemiology, microbiology and water systems was called.

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The group recommended that Sydney Water issue an alert advising persons living in or visiting the affected area of Eastern Sydney not to drink tap water unless it had been boiled for at least one minute. Meanwhile, Sydney Water continued an intensive search for the likely source of the contamination. Subsequent testing found levels of parasites decreasing in the affected area.

Two days later, on Wednesday night, 29 July, the Sydney Water Corporation reported the detection of parasites across a much wider area of the system. *Cryptosporidium* and *Giardia* were found in water supplying a large part of Sydney, between the harbour and the Georges River (approximately 1 million people). That night the boil-water alert was extended to cover this area.

Further data received the following day suggested that the water supplied to an even wider area of the city could be affected, and the alert was extended to areas north of the harbour and south of the Georges River (approximately 3 million people).

An expert panel was formally convened to advise the Chief Health Officer on the lifting of the water alert over the next few days as uncontaminated water from Warragamba Dam was flushed through the system. The all-clear had been given across the city by 4 August.

SECOND EPISODE

In mid-August, Sydney's drinking water catchments received extremely heavy rainfall, resulting in an unprecedented rapid filling of the Warragamba Dam from around 58 per cent capacity to 100 per cent within a few days. On 25 August, the Sydney Water Corporation reported detecting up to 1079 cryptosporidium oocysts and 347 giardia cysts per litre at different sites in the distribution system. After consultation with the expert panel and others, the NSW Health Department issued a renewed boil-water alert, covering most of Sydney, that night.

Two days later, the Sydney Water Corporation reported the detection of cryptosporidium and giardia parasites in water from the previously unaffected Orchard Hills and Warragamba treatment plants, which supply water to the lower Blue Mountains and Penrith on Sydney's western fringe. Consequently, the alert was extended to cover these areas.

By 1 September, however, water treated by all the plants was proving consistently clear of parasites, allowing a progressive lifting of the boil-water alert as each postcode area was shown to be receiving clear water.

Four days later, on 5 September, while the progressive lifting of the alert was still under way, the Sydney Water Corporation reported detecting more than 500 cryptosporidium oocysts and more than 3500 giardia cysts in treated water from the Prospect plant. Positive results were also obtained at the Orchard Hills and Warragamba treatment plants. The wide variations in these readings, which had by now been occurring for over a month, prompted the NSW Health Department, in consultation with the expert panel, to issue a new boil-water alert for most of Sydney. This was to be maintained for two weeks, until more information about the nature of the contamination and the health effects became available.

Finally, on 19 September, after clear water had been flowing for several days from all three treatment plants, the alert was lifted across the city.

EFFECTS ON HEALTH

Following the initial detection of cryptosporidium and giardia parasites in Sydney drinking water, at the end of July, the NSW Health Department initiated a series of measures to assess the effects of the contaminated water on the community. Enhanced surveillance was conducted using several approaches, including notifications, special surveys and analysis of the results of ongoing surveillance schemes.

ENHANCED SURVEILLANCE

Six public health units in Sydney regularly telephoned selected laboratories, general practitioners, emergency departments, pharmacies and nursing homes seeking information on any increase in cases of diarrhoeal illness. Under the *Public Health Act 1991* (NSW), laboratories are required to notify to Public Health Units (PHUs) cases of cryptosporidiosis but not of giardiasis. Microbiology laboratories were asked to report, each day, the total number of stool specimens received for microbiological examination and the number of giardiasis and cryptosporidiosis cases they had diagnosed. General practitioners, emergency departments and pharmacies were asked to report their impressions of whether there had been any change in the numbers of patients presenting with diarrhoea. Nursing homes were asked to report the number of residents who had diarrhoea that day. Daily surveillance continued from 3 August until 12 August and resumed on 27 August following the second boil-water alert.

Public Health Units were asked to report a summary of their findings to the NSW Health Department at the end of each day and to enter any cases of giardiasis and cryptosporidiosis (in Sydney residents) into the centrally collated NSW Health Notifiable Diseases Database.

Apart from expected day-to-day variations in reports of diarrhoea (which are most likely to represent background rates), there was a slight increase in reports of giardiasis in Sydney residents in early August (Table 1). However, there were very few reports of, and no increase in, cryptosporidiosis in Sydney residents.

There were no reports of significant increases in the number of attendances for the management of diarrhoea at the selected emergency departments, general practices and pharmacies. One nursing home in the Eastern Suburbs reported an outbreak of diarrhoea affecting about 20 of the 100 residents over the period 13 to 28 August. The illness was of short duration and all the patients recovered. The staff considered that the diarrhoea was probably due to a gastrointestinal virus, and no specimens were obtained. No other nursing homes reported outbreaks of diarrhoeal illness.

Data from the enhanced surveillance did not indicate that there was an increase in diarrhoeal illness in the Sydney area. The small increase in giardiasis is likely to be attributable to increased testing and identification of background cases unrelated to drinking Sydney water. This is supported by data available to the South Eastern Sydney Public Health Unit showing that laboratory isolation of other gastrointestinal pathogens (not related to drinking water), particularly campylobacter, increased in the same period as isolates of giardia increased. These cases would not have been caused by water-borne campylobacter, as chlorination would have inactivated these organisms.

TABLE 1

LABORATORY REPORTS OF CRYPTOSPORIDIOSIS AND GIARDIASIS, BY SPECIMEN DATE, SYDNEY, JULY TO SEPTEMBER 1998

Week beginning	Faecal specimens[a]	Cryptosporidiosis[b]	Giardiasis[c]
5 July	822	0	3
12 July	805	1	0
19 July	927	3	5
26 July	1637	2	13
2 Aug	2464	0	27
9 Aug	824[d]	0	14
16 Aug	NES[e]	0	16
23 Aug	873[f]	2	11
30 Aug	1752	3	18
6 Sep	1885	1	19

Notes:

(a) Number of faecal specimens submitted for micro-biological examination each week. Complete data for the entire period were available from three Area health services (Northern Sydney, South Eastern Sydney and Western Sydney).

(b) Notifications from Sydney Metropolitan Area health services.

(c) Data from selected laboratories.

(d) Data incomplete: samples available for 9–12 August only.

(e) NES = no enhanced surveillance 13–26 August.

(f) Data incomplete: samples available for 27–29 August only.

HOUSEHOLD SURVEY NO. 1

To help identify any large outbreak of water-borne diarrhoeal disease at an early stage and to determine the effect of the public health alert on the behaviour of Sydney residents, the NSW Health Department initiated a household survey in August after the first boil-water alert. Subjects were asked about the incidence of diarrhoeal illness and compliance with the boil-water alert.

The survey included 503 people in 163 households in areas of Sydney affected by the boil-water alert and 520 people in 173 households in areas unaffected by the alert. Participants were randomly selected from the electronic White Pages and stratified by health service area. The survey began on 5 August. This date was chosen to allow sufficient time for illness to have developed after an incubation period beginning on 29 July, but is unlikely to have allowed enough time for illness to have developed in people who continued to drink unboiled tap water after 29 July.

Diarrhoea lasting for more than three days was considered most likely to reflect infection with the parasites *Giardia* or *Cryptosporidium*, since these infections typically cause a longer-lasting illness than many other pathogens. Reported diarrhoea of shorter duration was considered more likely to have other causes, including viral infections, and is more prone to reporting bias.

Preliminary analysis shows that 2 to 3 per cent of individuals living in affected and unaffected households reported diarrhoea lasting more than three days in the previous month, and 2 per cent reported diarrhoea on the day of the survey (Table 2). Rates of diarrhoea of any duration in the previous month were also similar in affected and unaffected areas (10 and 11 per cent, respectively).

HOUSEHOLD SURVEY NO. 2

Following the second boil-water alert, issued on 25 August, the NSW Health Department began a second survey of households in affected and unaffected areas from 4 to 8 September.

This survey was expanded to include an additional 80 households in the Nepean and lower Blue Mountains areas, because of the possibility that these residents may have been exposed to contaminated water before the second boil-water alert was extended to those areas on 27 August. The survey covered 763 persons in 261 households affected by the boil-water alert, and 595 persons in 195 households in areas unaffected by the alert.

Preliminary analysis shows that, in both affected and unaffected households, in the previous month, 1 to 4 per

TABLE 2

HOUSEHOLD SURVEY NO. 1: CHARACTERISTICS AND RESPONSES OF PERSONS IN SYDNEY, THE BLUE MOUNTAINS, THE HUNTER AND ILLAWARRA AREAS, 5 TO 8 AUGUST 1998 (PRELIMINARY ANALYSIS)

Characteristic	Control		Exposed	
	n	%	*n*	%
Households	173		163	
Individuals	520		503	
Mean age (years)	33.7		37.3	
Females	264	51	258	51
Mean glasses water/day[a]	3.7		3.9	
Diarrhoea				
Diarrhoea since 1 July 98	56	11	50	10
Diarrhoea >3 days definitely	10	2	9	2
Diarrhoea >3 days possibly	18	3	16	3
Diarrhoea on interview day	11	2	8	2
Effect of boil-water order				
Boiled drinking water ≥1 min			382	74
Boiled drinking water <1 min			40	8
Drank unboiled tap water			35	7
Drank bottled water			207	40
Brushed teeth with boiled water			314	60
Lived in household where foods were washed in boiled water			289	55

Note:

(a) Of those who responded that they drank tap water.

TABLE 3

HOUSEHOLD SURVEY NO. 2: CHARACTERISTICS AND RESPONSES OF PERSONS IN SYDNEY, THE BLUE MOUNTAINS, THE HUNTER AND ILLAWARRA AREAS, 4 TO 8 SEPTEMBER 1998 (PRELIMINARY ANALYSIS)

Characteristic	Control		Exposed	
	n	**%**	***n***	**%**
Households	195		261	
Individuals	595		763	
Mean age	33.9		35.9	
Females	303	51	389	51
Mean glasses water/day[a]	4.1		5.7	
Diarrhoea				
Diarrhoea since 4 August 98	49	8	104	13
Diarrhoea >3 days definitely	13	2	10	1
Diarrhoea >3 days possibly	22	4	28	4
Diarrhoea on interview day	14	2	16	2
Seen doctor about diarrhoea since 4 August 98	15	3	25	3
Effect of boil-water order				
Boiled drinking water ≥1 min			655	86
Boiled drinking water <1 min			32	4
Drank unboiled tap water			96	13
Drank bottled water			368	48
Brushed teeth with boiled water			296	58
Lived in household where foods were washed in boiled water			461	60

Note:

(a) Of those who responded that they drank tap water.

cent of persons had diarrhoea lasting more than three days, and 2 per cent of persons had diarrhoea on the day of the survey (Table 3). Individuals in affected areas reported a higher rate of diarrhoea of any duration (13 per cent) than individuals in unaffected areas (8 per cent). However, the increased reporting of diarrhoea lasting three days or less in households in affected areas is not consistent with illness due to water-borne parasites and probably represents reporting bias.

CONCLUSION

Available data suggest that there was no measurable increase in disease attributable to drinking Sydney water, even though it apparently contained very high levels of cryptosporidium oocysts and giardia cysts. While this result would be unsurprising if all people in affected areas had been boiling their water, survey results indicate that compliance with the boil-water alert was well below 100 per cent. In addition, it is probable that exposures to contaminated water occurred before the contamination was identified and the boil-water alerts could be issued. Therefore, some people would have been exposed to contaminated water, and it would be expected that some of these would have become sick. The fact that rates of illness did not increase has not yet been explained.

Further work to examine the viability and infectivity of the parasites in animal models is under way. There is a need for development of tests to determine the viability and infectivity of these organisms to assist decision making in any future events. The Sydney water incident will doubtless stimulate further studies that will expand our understanding of these organisms, and better equip water suppliers, public health practitioners and the community to avoid potential water-borne outbreaks of the future.

CANCER IN NSW: INCIDENCE AND MORTALITY 1995

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This article highlights some of the information available from the latest report of cancer incidence and mortality in NSW, which was published by the NSW Cancer Council in May.[1] A decrease in cancer mortality was confirmed for both men and women. This fall was mainly caused by decreases in rates of death from cancers of the gastrointestinal tract in both sexes, lung cancer in men and breast and reproductive cancers in women. The incidence rate of prostate cancer fell in 1995. This marked the end of a dramatic increase in rates between 1988 and 1994 associated with widespread use of prostate-specific antigen testing.

THE 1995 REPORT

Cancer has been a notifiable disease since 1 January 1972. Notifications are provided by patient-care institutions and pathology laboratories. The annual report of cancer incidence and mortality contains:

- numbers and rates
- the leading cancers
- the most common cancers, by age
- childhood cancers
- trends and projections
- information about specific cancers
- age-specific tables of incidence and mortality
- appendixes about the cancer registry, coding practices, the demography of NSW, statistics and publications.

MOST COMMON CANCERS

For 1995, 26 619 new cases of cancer and 11 403 deaths from cancer were registered. The five most common cancers in men were prostate cancer, lung cancer, melanoma of skin, colon cancer and rectal cancer. The five most common cancers in women were breast cancer, colon cancer, melanoma of skin, lung cancer and rectal cancer.

TRENDS IN INCIDENCE AND MORTALITY

Between 1973–1977 and 1995, the incidence rates of cancer of all sites combined rose by 44 per cent for males and 29 per cent for females. The major contributors to this increase were prostate cancer and melanoma in men and breast cancer in women. Notable trends described in the report include the following:

- Prostate cancer incidence rates fell in 1995 after rapid increases between 1988 and 1994.
- Rates for lung cancer continued to decrease in males and rise in females.
- Cervical cancer was only two-thirds as common as in the early 1970s.
- For all cancers, mortality rates have fallen annually since 1985 by 0.8 per cent for males and 0.6 per cent for females. Age-adjusted mortality for men is the lowest it has been since the cancer registry began operation, and for women it is the lowest since 1980.
- The large increases in incidence of cancers of the prostate in men and breast in women have not been reflected in mortality rates, but the mortality changes for stomach, pancreas and lung cancers and mesothelioma are similar to those for incidence.

Figures 1 and 2 (page 96) show the average annual changes in incidence and mortality from the mid-1980s to 1995.

The full report can be found under 'Statistics' on the Cancer Council's Web site (http://www.nswcc.org.au). A printed copy may be ordered from the NSW Central Cancer Registry, NSW Cancer Council, Locked mail bag 1, Kings Cross NSW 1340, telephone (02) 9334 1902.

REFERENCE

1. Coates MS, Armstrong BK. *Cancer in New South Wales. Incidence and Mortality 1995.* Sydney: NSW Cancer Council, 1998.

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FIGURE 1

ANNUAL CHANGES IN CANCER INCIDENCE RATES, NSW 1985 TO 1995

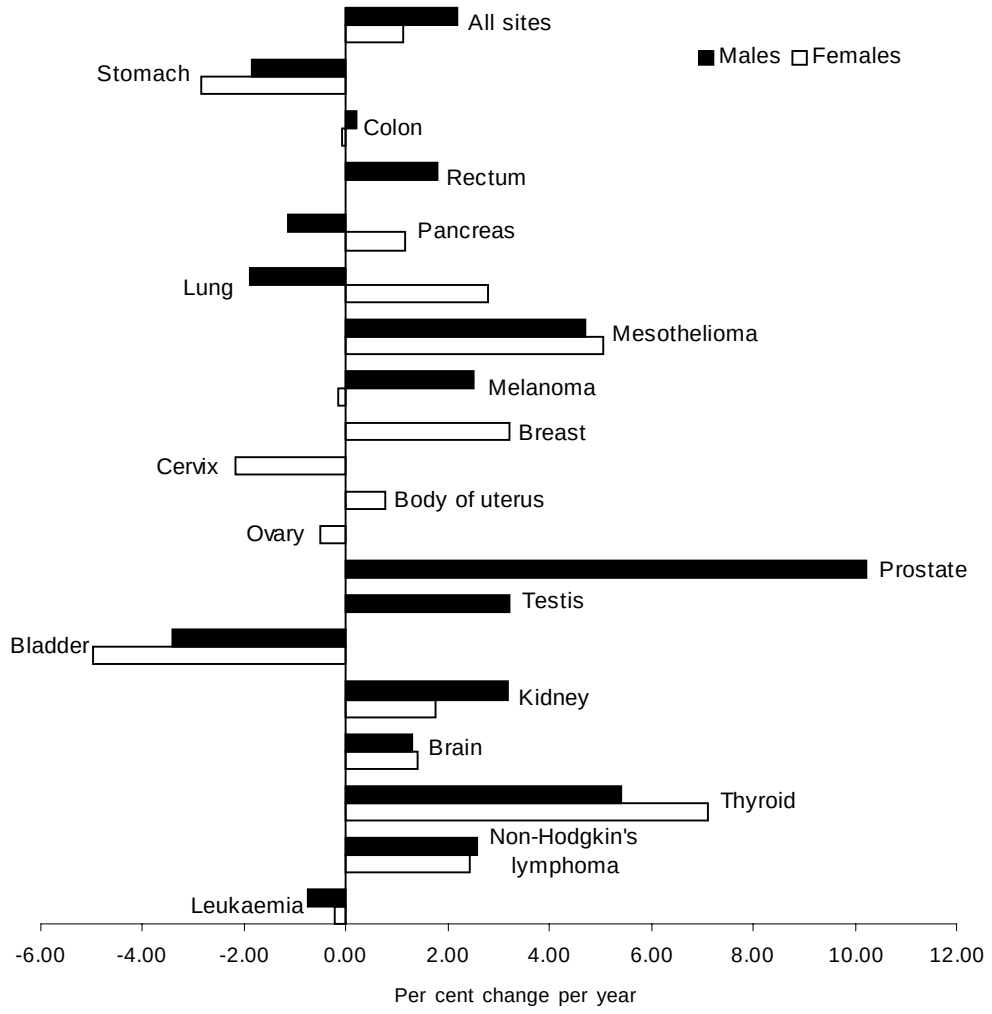


FIGURE 2

ANNUAL CHANGES IN CANCER MORTALITY RATES, NSW, 1985 TO 1995

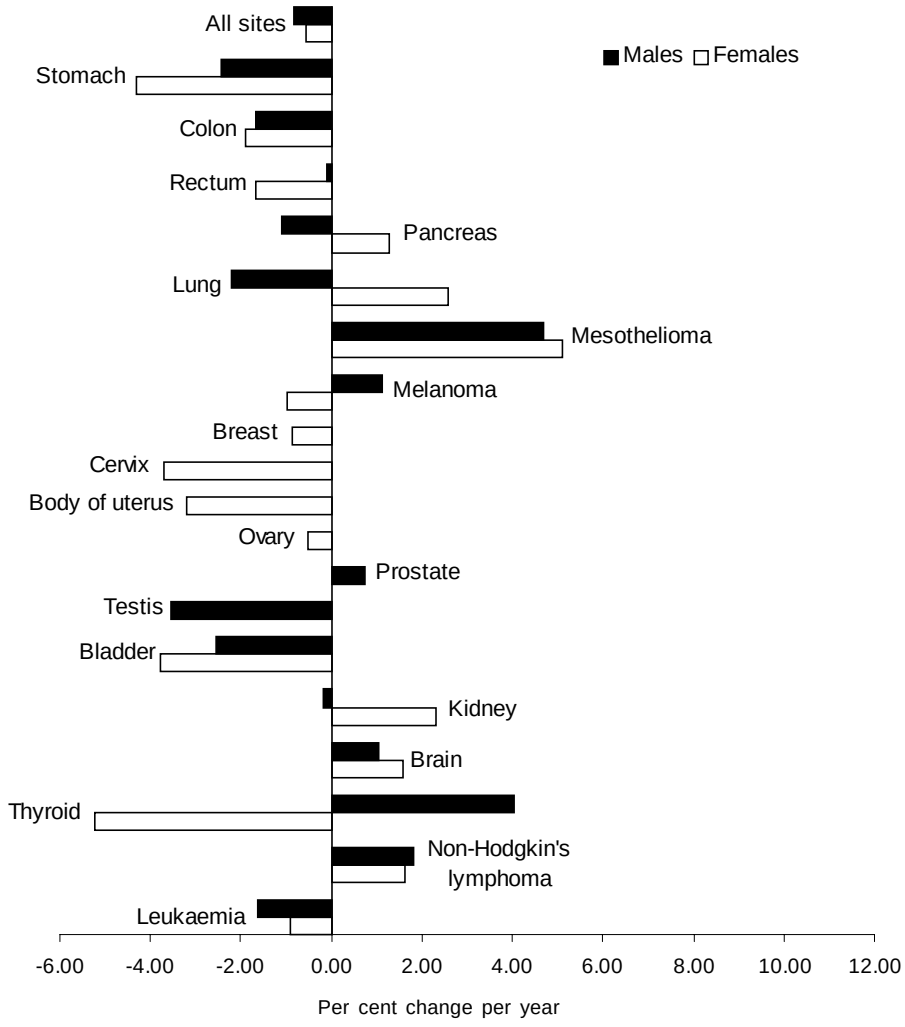
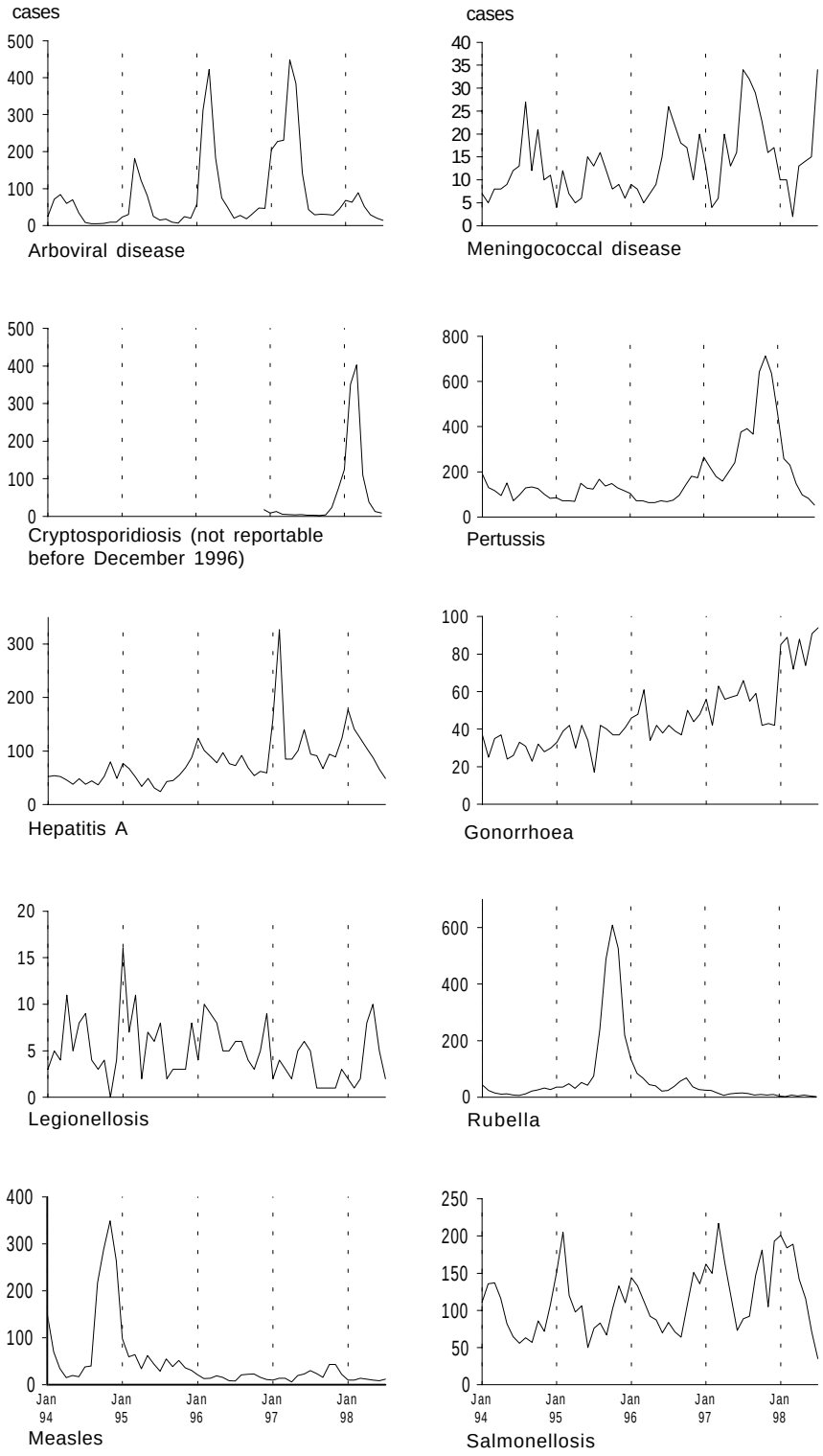


FIGURE 3

REPORTS OF SELECTED INFECTIOUS DISEASES, NSW, JANUARY 1994 TO JULY 1998, BY MONTH OF ONSET

These are preliminary data: case counts in recent months may increase because of reporting delays



INFECTIOUS DISEASES, NSW: AUGUST 1998

TRENDS

Meningococcal disease increased markedly in July, as expected for this time of year (Figure 3). Recent cases have been evenly distributed throughout the State: 18 of the 34 cases reported in July were from outside the Sydney metropolitan area. No clustering of cases has been detected. The total number of cases reported for July is equal to the highest monthly figure reported in recent years (July 1997). Nine deaths have been reported so far this year, compared with seven in 1997, 1996 and 1995.

Gonorrhoea has continued to increase steadily in recent years. This trend will be reported on in the October issue of the *NSW Public Health Bulletin.*

From this issue, gonorrhoea will replace Q fever among the diseases selected for detailed reporting via our infectious diseases graphs (Figure 3). Gonorrhoea is representative of the sexually transmitted diseases, is an important indicator of the prevalence of unsafe sex and has been increasing in NSW over recent years. A full report on gonorrhoea will be included in the infectious diseases report in the next issue.

INFLUENZA SURVEILLANCE ACTIVITY UPDATE

Influenza activity is now declining following a peak in early August.

Clinical activity

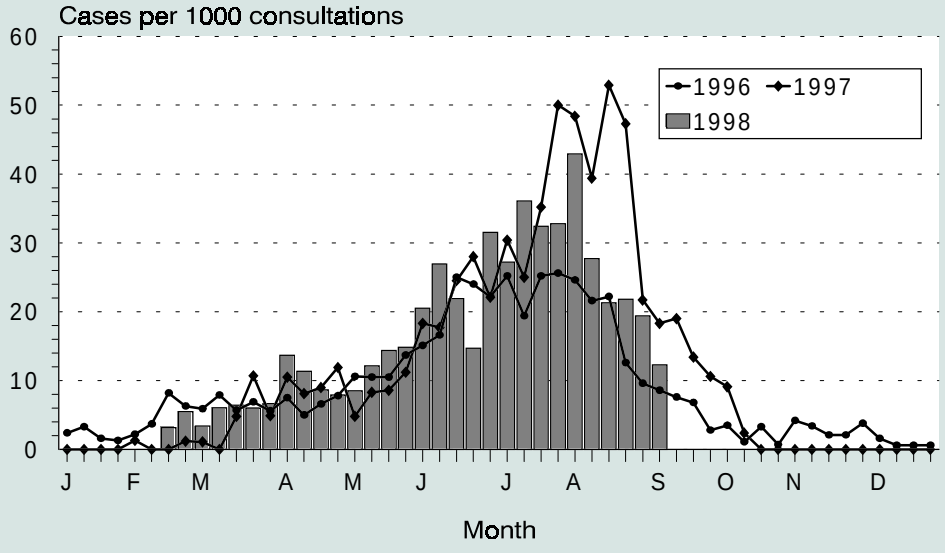
Recently, the activity of influenza-like illness has declined markedly, from a peak of 43 cases per 1000 consultations in the first week of August (Figure 4). This year's peak was higher than that reached in 1996 but lower than the peak for 1997. Reports of influenza-like illness from the NSW Sentinel General Practitioner Surveillance Scheme were received through four Public Health Units from approximately 30 general practitioners, covering 3500 consultations per week.

Virological activity

Laboratory reports of influenza A declined from a peak of 88 isolates in the second week of August to 18 in the second week of September. Influenza B has been almost totally absent this season, with only two isolates identified in the past month. The rate of influenza A isolation per 100 specimens submitted is shown in Figure 5 (the rate shows influenza activity independent of the number of laboratories reporting). The isolation rate of influenza A also declined markedly. The number of influenza A isolates was considerably higher this year than last year, which had a relatively serious influenza season. This finding is not reflected in the clinical surveillance reported above and

FIGURE 4

INFLUENZA-LIKE ILLNESS, BY WEEK OF CONSULTATION, WITH HISTORICAL COMPARISONS, FROM NSW GP SENTINEL SURVEILLANCE



may reflect increased testing and/or reporting rather than increased disease activity.

Directed virological surveillance

Influenza A was by far the most common respiratory virus isolated. During August an average of 25 samples were submitted each week by 12 general practitioners. An average of three samples each week were positive for influenza A, and none were positive for other respiratory viruses. Samples were received from cases across a broad range of ages but samples from children under 10 years of age were more likely to be positive (25 per cent) than those from other age groups (7 per cent). No information on subtypes for these samples is available yet from the World Health Organization (WHO) reference laboratory in Melbourne.

Australian surveillance

The following data are reported by the National Centre for Disease Control. Influenza-like illness activity reported by sentinel general practices under the ASPREN scheme (Australian Sentinel Practice Research Network) peaked in July at 21 per 1000 consultations, considerably lower than the 1997 peak of 50. The Victorian scheme also peaked in July at 26 per 1000 consultations. These peaks were earlier and lower than the peak in NSW.

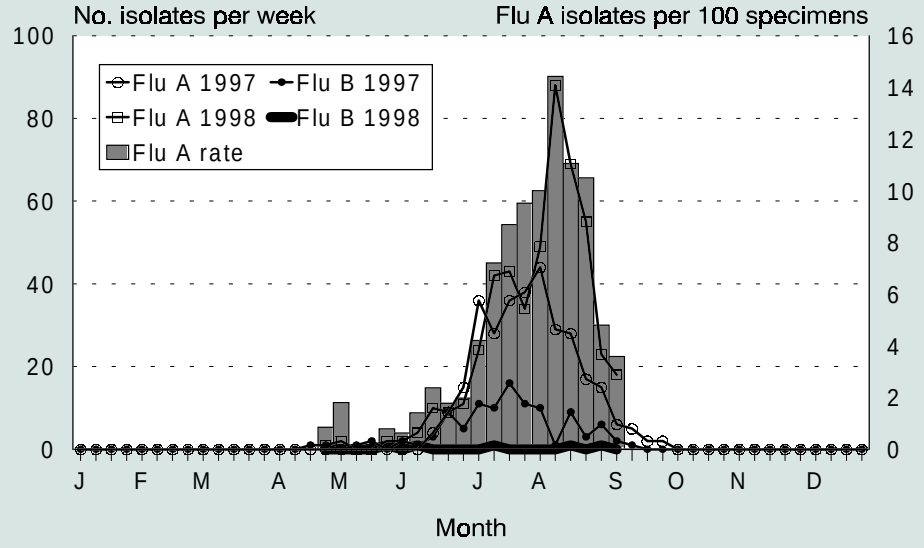
As is the case for NSW, the number of Australian reports of influenza A this year is higher than in recent years, in contrast to the number of clinical reports, which is lower. There may be higher rates of testing or reporting of laboratory results this year. Eight per cent of laboratory-reported influenza this year has been influenza B and 92 per cent influenza A. All influenza A isolates typed this year by the WHO reference laboratory in Melbourne have been H3N2.

International surveillance

New Zealand has reported decreasing sporadic activity in the last week of August, and appears to have had a relatively mild influenza season. Chile also has reported only sporadic activity in the last week of August. Few recent reports have been received from other countries. All virological reports of influenza to WHO, worldwide, for the past month have been for influenza A: there have been none for influenza B.

FIGURE 5

NUMBER OF INFLUENZA VIRUS ISOLATIONS, NSW, 1997 AND 1998, AND RATE OF INFLUENZA A ISOLATES PER 100 SPECIMENS, 1998[a]



(a) Four laboratories reported in 1997, seven in 1998.

TABLE 4

INFECTIOUS DISEASE NOTIFICATIONS RECEIVED IN JULY 1998 BY AREA HEALTH SERVICES

Condition	Area Health Service (1998) CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	Total for July**	Total to date**
Blood-borne and sexually transmitted																			
AIDS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	46
HIV infection*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	114
Hepatitis B: acute viral*	–	–	3	–	–	–	–	–	2	–	–	–	–	–	–	–	–	5	37
Hepatitis B: other*	51	30	64	10	34	5	8	11	47	6	4	5	3	3	3	3	1	292	2451
Hepatitis C: acute viral*	3	–	–	–	–	–	–	1	–	–	11	–	–	–	–	–	–	15	61
Hepatitis C: other*	112	31	156	44	54	51	53	32	72	45	33	16	5	22	–	19	20	778	5811
Hepatitis D: unspecified*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12
Hepatitis acute viral (not otherwise specified)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Gonorrhoea*	19	9	7	1	1	1	4	–	45	–	2	1	–	1	–	–	–	91	569
Syphilis	11	2	11	1	3	2	–	–	14	–	1	1	5	1	–	–	–	52	342
Vector-borne																			
Arboviral infection*	–	–	–	–	–	1	5	–	–	4	4	1	1	–	–	1	–	17	371
Malaria*	3	1	1	2	–	–	–	–	4	1	–	–	–	–	–	–	–	12	111
Zoonoses																			
Brucellosis*	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	2	2
Leptospirosis*	–	–	–	–	–	–	1	–	–	–	1	2	–	–	–	–	–	4	16
Q fever*	–	1	–	–	–	1	2	1	1	2	–	–	1	1	1	1	1	14	129
Respiratory and other																			
Blood lead level	1	1	–	–	6	–	4	2	1	–	1	1	–	1	–	–	1	19	576
Legionnaires' disease	–	1	1	3	–	–	–	–	–	2	2	–	–	–	–	–	–	9	33
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Meningococcal infection (invasive)	1	3	1	3	2	3	2	3	6	1	–	–	–	2	2	3	2	34	99
Mycobacterial tuberculosis	1	3	8	–	7	–	–	–	1	–	–	–	–	–	–	–	–	20	232
Mycobacteria other than TB	10	13	–	–	2	1	1	1	–	1	2	–	–	–	–	–	2	34	184
Vaccine-preventable																			
Adverse event after immunisation	–	–	1	–	1	–	–	–	1	–	–	2	–	3	–	–	1	9	145
H. influenzae b infection (invasive)	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	2	8
Measles	–	2	–	–	1	–	1	3	–	2	–	3	–	–	–	–	1	13	79
Mumps*	1	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–	–	4	27
Pertussis	6	6	10	5	3	1	5	11	10	3	2	4	1	3	17	16	1	105	1766
Rubella*	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–	–	–	3	35
Tetanus	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Faecal–oral																			
Botulism	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cholera*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Cryptosporidiosis	2	–	–	–	1	–	–	1	1	4	2	1	–	–	–	–	–	12	1087
Food-borne illness (not otherwise specified)	–	–	–	–	–	3	–	–	–	–	–	–	–	6	–	–	2	11	125
Gastroenteritis (in an institution)	–	–	–	–	–	–	–	2	–	–	–	–	–	–	1	–	–	3	178
Haemolytic uraemic syndrome	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Hepatitis A	10	3	8	4	3	1	–	1	12	6	7	–	–	14	3	–	–	75	791
Hepatitis E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4
Listeriosis*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20
Salmonellosis (not otherwise specified)*	5	8	–	3	13	4	2	3	8	13	1	–	–	1	–	5	1	69	1045
Typhoid and paratyphoid*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	22
Verotoxin-producing *E. coli*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1

* lab-confirmed cases only ** includes cases with unknown postcode

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INFECTIOUS DISEASES, NSW: SEPTEMBER 1998

TRENDS

The major focus of activity for the NSW Health Department has been the identification of parasites in Sydney drinking water, but NSW is also experiencing the usual seasonal increase in cases of **meningococcal** disease for this time of year (Figure 6).

MENINGOCOCCAL DISEASE IN STUDENTS IN WESTERN SYDNEY

Meningococcal disease has been diagnosed in two students associated with the Werrington campus of the University of Western Sydney. The first student became ill on 22 August 1998, and a clinical diagnosis of meningococcal septicaemia was made. Although specimens were taken, meningococcal organisms were not isolated. Polymerase chain reaction assay of cerebrospinal fluid indicated *Neisseria meningitidis* serogroup C but, as this test is not fully validated, the diagnosis of serogroup C disease was considered probable rather than confirmed. The close contacts of this case were offered prophylaxis with rifampicin.

The second student became ill on 21 September 1998 and was hospitalised with a clinical diagnosis of meningococcal septicaemia. The diagnosis was confirmed by isolation of *N. meningitidis* serogroup C. The close contacts of this case were also offered prophylaxis.

The campus is non-residential and about 3200 people attend. Apart from attendance on the campus, no other link was established between the cases. The university broke up for a two-week holiday on 25 September, the day after the second case was notified.

A teleconference of an expert group, including the local public health staff, microbiologists and infectious disease epidemiologists, was immediately convened. It was decided to confer closely with the university authorities and to inform all students and staff about the cases and the nature of the disease. This was accomplished by a mail-out to the students' home addresses combined with e-mail messages to those with an e-mail address (about 30 per cent), the posting of information on the university's Web page and a press statement. It was decided not to offer vaccination to the student body on the basis of the information available at that time, but that this approach would be reviewed in the light of any new information. Finally, enhanced surveillance for other potentially linked cases was established through contact with laboratories and other Public Health Units (PHUs).

INFLUENZA SURVEILLANCE ACTIVITY UPDATE

Summary

Influenza activity has continued to decline following a peak in early August.

Clinical activity

During August, influenza-like illness activity declined to a relatively low level following a peak early in the month (Figure 7). Reports of influenza-like illness from the NSW Sentinel General Practitioner Surveillance Scheme are received through four PHUs from about 35 general practitioners, covering more than 3500 consultations per week.

Virological activity

Laboratory reports of influenza A peaked in the second week of August with 88 diagnoses and decreased to 11 in the third week of September. There have been few reports of influenza B all season, with only one case reported for the month of August. Diagnoses of respiratory syncytial virus also peaked in the second week of August, with 120 cases, and decreased to 42 in the third week of September. The rate of isolation of influenza A showed a trend similar to that of crude influenza A numbers (Figure 8).

Directed virological surveillance

In the NSW sentinel surveillance program, during August an average of 12 general practitioners submitted 25 samples each week for testing for respiratory viruses from patients with influenza-like illness. An average of three samples each week tested positive for influenza A and none were positive for other respiratory viruses. Samples were received from cases across a wide range of ages. However, samples from children were more likely to be positive (42 per cent) than those from other age groups (10 per cent). All diagnoses of influenza so far this year through this scheme have been type A.

International surveillance

All virological reports of influenza to the World Health Organization, worldwide, for the past month have been for influenza A, except for one report of influenza B, an isolated case from Finland.

FIGURE 6

REPORTS OF SELECTED INFECTIOUS DISEASES, NSW, JANUARY 1994 TO AUGUST 1998, BY MONTH OF ONSET

These are preliminary data: case counts in recent months may increase because of reporting delays

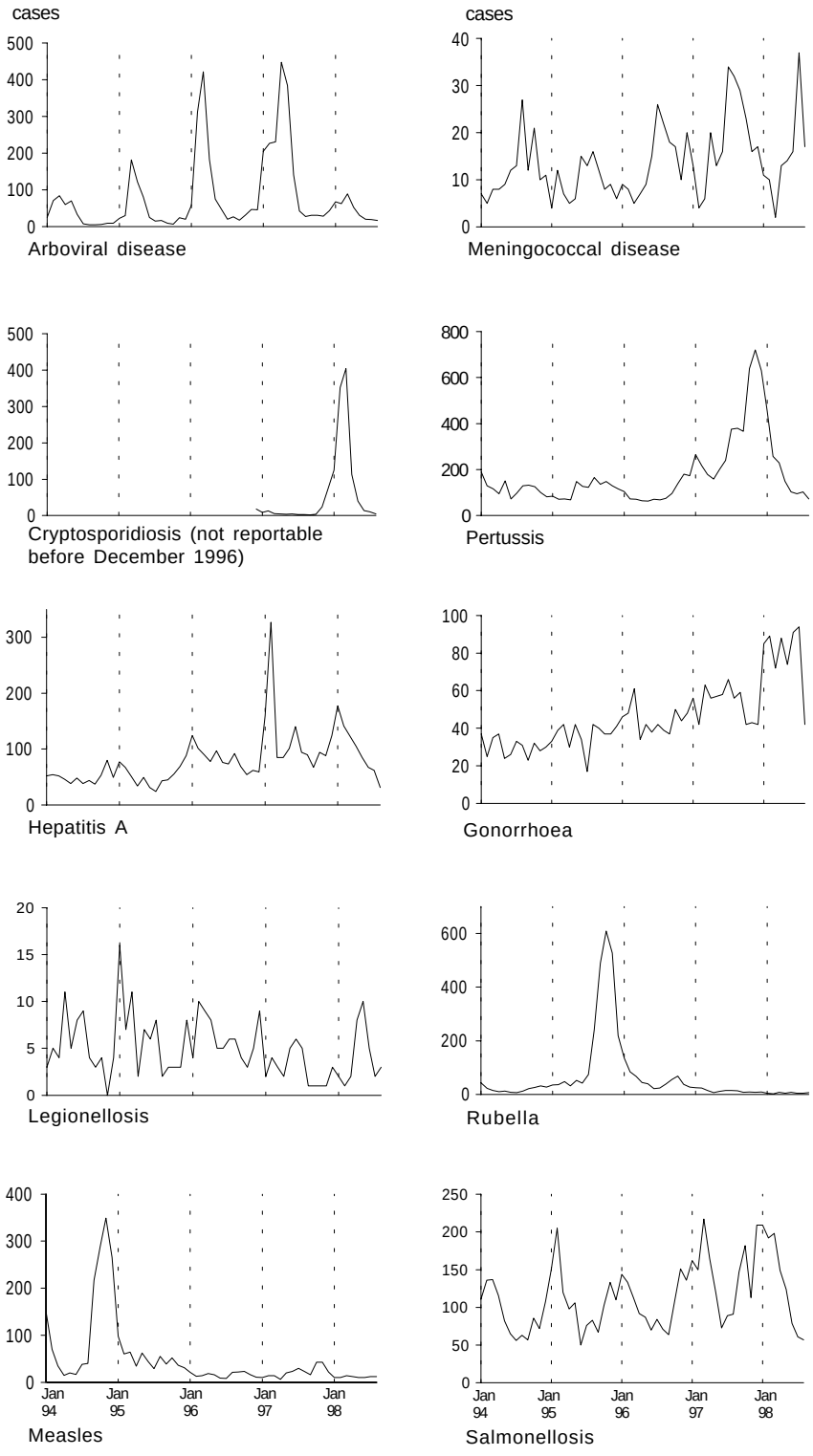


FIGURE 7

INFLUENZA-LIKE ILLNESS, BY WEEK OF CONSULTATION, WITH HISTORICAL COMPARISONS, FROM NSW GP SENTINEL SURVEILLANCE

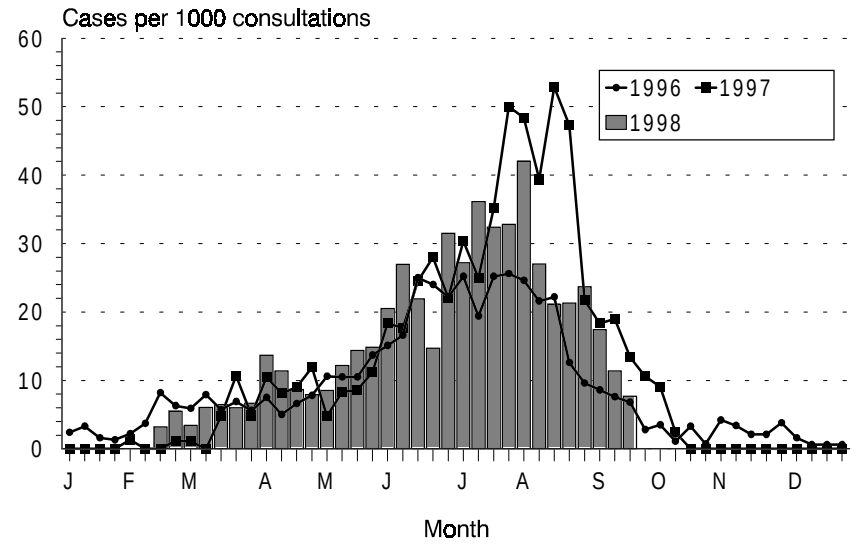
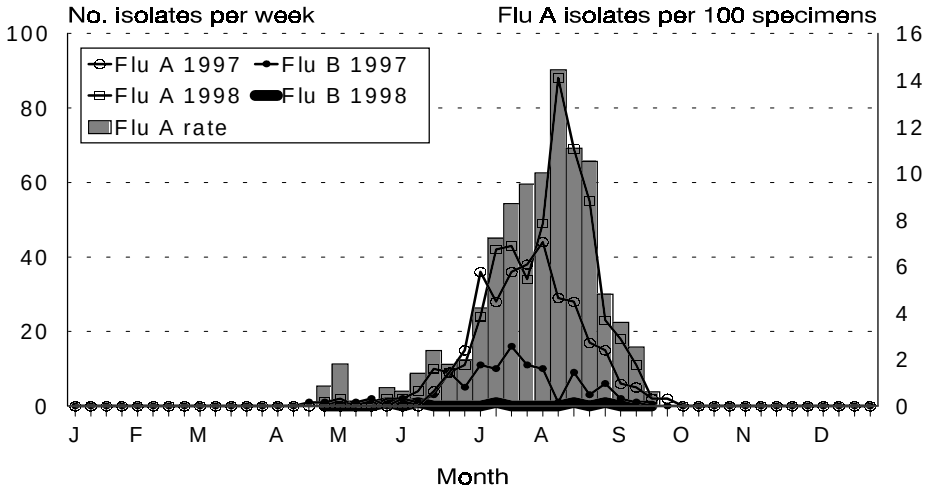


FIGURE 8

NUMBER OF INFLUENZA VIRUS ISOLATIONS, NSW, 1997 AND 1998, AND RATE OF INFLUENZA A ISOLATES PER 100 SPECIMENS, 1998[a]



(a) Four laboratories reported in 1997, seven in 1998.

TABLE 5

INFECTIOUS DISEASE NOTIFICATIONS RECEIVED IN AUGUST 1998 BY AREA HEALTH SERVICES

Condition	Area Health Service (1998)																	Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	for Aug**	To date**
Blood-borne and sexually transmitted																			
AIDS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	46
HIV infection*	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	2	231
Hepatitis B: acute viral*	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	39
Hepatitis B: other*	49	32	19	4	12	3	9	6	49	1	5	3	2	1	5	4	1	210	2750
Hepatitis C: acute viral*	6	–	–	–	–	–	–	–	1	1	–	–	–	1	–	–	–	9	71
Hepatitis C: other*	77	49	148	28	12	70	34	19	85	35	39	11	1	28	1	22	6	674	6617
Hepatitis D: unspecified*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	3
Hepatitis: acute viral (not otherwise specified)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Gonorrhoea*	19	6	6	–	5	1	–	1	35	1	4	–	1	–	1	–	–	81	660
Syphilis	11	8	9	4	–	–	–	–	10	1	1	2	2	1	2	–	–	51	396
Vector-borne																			
Arboviral infection*	1	1	2	–	–	1	–	1	1	5	2	–	3	–	2	–	2	22	395
Malaria*	2	2	2	1	–	1	–	–	1	–	1	–	–	–	–	–	–	10	120
Zoonoses																			
Brucellosis*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Leptospirosis*	–	–	–	–	–	–	2	–	–	–	–	1	–	–	–	–	–	3	19
Q fever*	–	–	–	–	–	–	–	–	–	3	2	3	4	1	1	1	–	15	145
Respiratory and other																			
Blood lead level	6	2	10	4	–	3	13	–	1	–	1	–	–	4	–	–	1	45	634
Legionnaires' disease	1	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	3	36
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Meningococcal infection (invasive)	1	2	3	1	–	2	2	1	2	1	–	–	–	2	–	–	1	18	119
Mycobacterial tuberculosis	4	6	–	–	1	–	–	2	7	–	–	–	–	–	–	–	3	23	274
Mycobacteria other than TB	1	1	–	–	–	1	1	–	3	–	4	–	–	–	–	1	1	13	200
Vaccine-preventable																			
Adverse event after immunisation	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	145
H. influenzae B infection (invasive)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8
Measles	2	–	2	–	–	2	–	–	–	–	2	–	–	5	–	–	–	13	93
Mumps*	2	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	4	31
Pertussis	5	2	7	5	12	1	1	22	16	6	7	3	–	18	6	7	3	121	1898
Rubella*	1	–	–	–	–	–	–	–	1	–	3	–	–	–	–	–	–	5	41
Tetanus	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Faecal–oral																			
Botulism	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cholera*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Cryptosporidiosis	–	–	–	–	–	–	–	–	4	1	–	–	1	–	–	–	–	6	1096
Food-borne illness (not otherwise specified)	–	–	–	–	–	8	–	–	–	–	–	–	–	2	–	–	–	10	135
Gastroenteritis (in institution)	–	–	–	16	–	–	–	–	–	–	–	–	1	–	–	–	–	17	194
Haemolytic uraemic syndrome	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	3
Hepatitis A	4	4	3	1	2	1	–	2	6	2	12	2	–	2	–	–	–	42	833
Hepatitis E	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4
Listeriosis*	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–	–	3	23
Salmonellosis (not otherwise specified)*	15	13	–	–	4	3	5	1	9	4	2	2	–	1	–	2	1	64	1167
Typhoid and paratyphoid*	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	25
Verotoxin-producing *E. coli*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1

* lab-confirmed cases only

** includes cases with unknown postcode

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The *NSW Public Health Bulletin* is a publication of the NSW Department of Health. The editor is Dr Lynne Madden, Manager, Public Health Training and Development Branch, NSW Health Department. Rhana Pike is production manager.

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