IMPROVING NOTIFICATIONS OF MENINGITIS

Infectious disease notification requirements changed in November 1991 with the introduction of the Public Health Act 1991. The number of medical conditions that medical practitioners were required to notify fell from 52 to 10, and responsibility for notification was given to hospital Chief Executive Officers (CEOs) and laboratories[1].

Meningococcal infection was one of the diseases notifiable by medical practitioners under the Public Health Act 1902. From November 1991 meningococcal meningitis and septicaemia became notifiable by hospital CEOs and by laboratories. Haemophilus influenzae type b (Hib) epiglottitis, meningitis and septicaemia became notifiable by laboratories and hospital CEOs for the first time in NSW.

We reviewed methods of case ascertainment of bacterial meningitis to:

- determine the trends in disease incidence; and
- compare the efficiency of different data sources for case ascertainment.

METHODS

Hospital separations

The number of hospital separations was calculated using the Inpatient Statistics Collection (ISC), a computer database of data routinely collected on each patient discharged from hospital. Diagnosis is coded using the International Disease Classification, 9th revision — Clinical Modification (ICD9-CM).

Data were extracted for three financial years, 1989-1990, 1990-1991 and 1991-1992. Records coded for meningococcal meningitis (code 036.0), meningococcal septicaemia (036.2) and meningococcal infection (not otherwise specified — NOS) were extracted. Duplicate records representing transfers between hospitals, and cases of neonatal meningitis were excluded. In addition, records for Hib (320.0), septicaemia (038.4) and epiglottitis (464.3) and bacterial meningitis (320.0-320.9) were extracted for the financial year 1991-1992.

Infectious disease notifications

Passive surveillance of infectious diseases occurs in NSW through notifications to Public Health Units. These notifications have been recorded on a computer database, called the Infectious Diseases Surveillance System (IDSS) since 1991. Notifications for meningococcal infection in the years 1989 to 1992 were extracted from IDSS and Hib infection for 1991 and 1992. Cases of neonatal meningitis and duplicate records were excluded.

Rate calculation and matching of datasets

Records from ISC and IDSS for 1991-1992 were matched on date of birth, postcode of residence and date of admission.

Incidence rates were calculated using denominators obtained from the Australian Bureau of Statistics (ABS)[2].

RESULTS

There were 322 separations for bacterial meningitis for the period July 1, 1991 to June 30, 1992 — a rate of 5.5 per 100,000 population. Of these, 74 were meningococcal meningitis at a rate of 1.3 per 100,000 and 137 were Hib meningitis at a rate of 2.3 per 100,000. The remaining 110 separations were for meningitis due to unspecified bacterium (0.9 per 100,000), pneumococcal meningitis (0.5 per 100,000), and streptococcal meningitis (0.3 per 100,000), meningitis due to other specified bacteria (0.1 per 100,000) and Staphylococcal meningitis (0.05 per 100,000).

For children aged between four weeks and five years there were 210 separations for bacterial meningitis, a rate of 48.1 per 100,000. Of these, 35 were meningococcal infection (8.0 per 100,000) and 127 Hib infection (29.1 per 100,000). In all, more than 66 per cent of the cases of meningitis occurred in children less than five years of age and 60 per cent of these were due to Hib infection.

In 1989-1990, 49 per cent of the meningococcal meningitis cases identified through hospital separations were identified in the passive surveillance system (Table 12). This had risen to 55 per cent in 1990-1991, and to 84 per cent in 1991-1992. When the records for 1991-1992 were matched, 70 per cent of the IDSS could be matched in the ISC.

Before November 1991 meningococcal infection notifications to the NSW Department of Health were not required to be differentiated into meningitis and septicaemia. This is evident in the high proportion of notifications which were unclassified. If the cases are compared, including those in

Infectious diseases

► *Continued from page 45*

Two of the notifications of PT4 have been identified as being related to overseas travel (Hong Kong and Sri Lanka). One case is still being investigated by Northern Sydney Public Health Unit staff.

The incidence of S. enteritidis in NSW has been low with no significant increase in the past decade, however because of the virulence of S. enteritidis PT4 and the potential of the organism to become a major pathogen and contaminant of raw shell eggs all notifications of S. enteritidis should be investigated urgently and with extreme thoroughness.

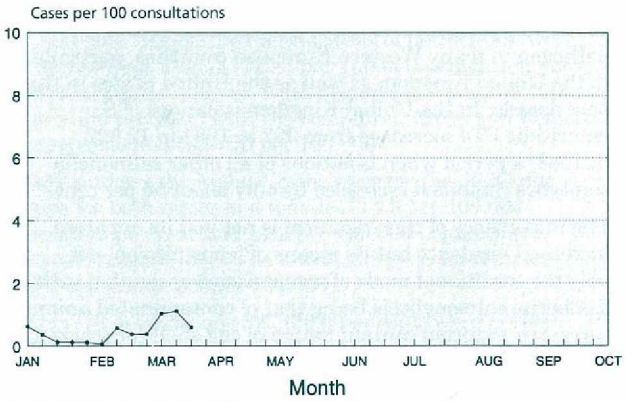
Edward Kraa, Policy Analyst, Foodborne Disease Surveillance

INFLUENZA SURVEILLANCE

Levels of Influenza-like illness (ILI) diagnosed by general practitioners in our sentinel GP network were low in March. No Area or Region has reported a level greater than two cases per 100 consultations this year. During March data were received from four PHUs.

FIGURE 2

INFLUENZA-LIKE ILLNESS NSW 1993



Source: NSW Sentinel GP Network

Prince of Wales laboratory has reported four diagnoses of influenza A and three of influenza B up to the end of February.

the unclassified category, the number of infections identified through hospital separations compared to passive surveillance still improved, with 72 per cent identified in 1989-1990, 84 per cent in 1990-1991 and 102 per cent in 1991-1992.

The cases of Hib identified by passive surveillance are presented only for 1991-1992, as this condition was not notifiable before this time (Table 15). One hundred and two cases of Hib meningitis were recorded by passive surveillance. This was 74 per cent of those recorded as hospital separations. Overall, 83 per cent of Hib infections were recorded in the passive surveillance system, compared to hospital separations.

Discussion

For the period 1988-1992 the rates for bacterial meningitis and meningococcal meningitis in adults have remained stable. The rate for meningococcal meningitis in children aged less than five years has fallen, but the overall rate of bacterial meningitis in children has risen, as a result of an apparent increase in the incidence of Hib meningitis.

Overseas reports indicate the incidence of both meningococcal and Hib meningitis is increasing[3,4,5]. Concern about a rise in the incidence of bacterial meningitis in NSW and Australia has been raised[6,7]. This study's findings do not support an increase in bacterial meningitis overall, but there is an apparent rise in the incidence of Hib meningitis, based on hospital separations for 1989-1992. Deaths from Hib meningitis have also risen, with four deaths reported by the Australian Bureau of Statistics in 1987-1989, and seven in 1991.

Previous studies have found the best methods to estimate the incidence of meningococcal disease were active surveillance and hospital separations. Active surveillance was considered to provide the most accurate timely information, but it is labour intensive, expensive and not a useful routine surveillance method[6]. The ISC is an existing data source which is simple and inexpensive to access, but provides an underestimation of true incidence of disease[7]. Passive surveillance in both these studies detected only 19 per cent[1] to 54 per cent[6] of the incident cases reported by other methods.

Passive surveillance underestimates the incidence of meningococcal disease by 26 per cent. This appears to be largely a result of the classifications of many cases into NOS before October 1991 when meningococcal infection was not required to be differentiated into meningitis and septicaemia. If all the meningococcal cases identified by the passive surveillance system, including those identified as NOS, are compared to the cases discharged from hospital, more cases are identified through the passive system.

The excess of notifications over cases in the ISC may be due to the spectrum of illness, from patients who die before being admitted to hospital, and at the other end of the spectrum, patients who are not sick enough to warrant admission to hospital and improve with oral antibiotics, but have positive blood cultures.

Only 70 per cent of the records for the two datasets could be matched because the passive system records onset of illness and ISC records hospital discharge. Furthermore, unavoidable data-entry errors led to inaccuracies.

It is clear from our results that passive surveillance of meningococcal meningitis using notifications to the NSW Health Department is improving since the introduction of the 1991 Public Health Act. This system now detects at least 75 per cent of the cases recorded as being discharged from hospital. With improving classification of meningococcal notifications, the percentage of cases which passive surveillance detects should equal and possibly exceed those detected using hospital separation data.

Cait Lonie, Michael Levy

TABLE 12

INCIDENCE OF MENINGITIS PER 100,000 NSW POPULATION

Type of meningitis	1988-89	1989-90	1990-91	1991-92
All bacterial	5.4[6]	5.1[6]	5.6[8]	5.5
Meningococcal	1.2[6]	1.4[6]	1.4[8]	1.3
Hib	1.9	2.0	2.1	2.3

TABLE 13

INCIDENCE OF MENINGITIS IN CHILDREN PER 100,000 CHILDREN AGED LESS THAN FIVE YEARS OF AGE

Type of meningitis	1989-90	1990-91	1991-92
Meningococcal	10.5[6]	11.2[8]	8.0
Hib	25.7*	26.3[8]	29.1
Bacterial meningitis	38.4	44.8	48.1

*Calculated in this study, but a previous study reported this rate at 13.6[6]

TABLE 14

MENINGOCOCCAL INFECTIONS — COMPARISON OF PASSIVE SURVEILLANCE (PS) WITH HOSPITAL SEPARATIONS (ISC), 1989-1992.

Disease type	1989-1990			1990-1991			1991-1992		
	PS	ISC	%est*	PS	ISC	%est*	PS	ISC	%est*
Meningitis	35	71	49	45	82	55	62	74	84
Septicaemia	7	22	32	15	25	60	15	24	63
NOS	27	3	900	31	1	3100	26	3	867
Total	69	96	72	91	108	84	103	101	102

*%est is the per cent of hospital separations estimated by passive surveillance

TABLE 15

HAEMOPHILUS INFLUENZAE TYPE B – COMPARISON OF PASSIVE SURVEILLANCE AND HOSPITAL SEPARATIONS, JULY 1991-JUNE 1992

	Passive surveillance	Hospital separations	Per cent estimated by passive surveillance (%)
Meningitis	102	137	74
Septicaemia	23	28	82
Epiglottitis	43	131	33
NOS	78	NA	NA
Total	246	296	83

1. Roberts C, Rubin G, Levy M. Improving infectious diseases control. *Public Health Bulletin* 1991; 2:86-90.
2. Australian Bureau of Statistics. Age and Sex Distribution of the Estimated Resident Population of State Local Government Areas: NSW 1989-1991. Cat. 3209.1.
3. Poolman JT, Lind I, Jonsdottir K, Froholm LO, Jones DM, Zanen HC. Meningococcal serotypes and serogroup B disease in North-West Europe. *Lancet* 1986; 555-557.
4. Broome C. Epidemiology of *Haemophilus influenzae* type b infections in the United States. *Pediatr Infect Dis J* 1987; 6:779-782.
5. Takala A, Eskola J, Peltola H, Makela P. Epidemiology of invasive *Haemophilus influenzae* type b disease among children in Finland before vaccination with *Haemophilus influenzae* type b vaccine. *Pediatr Infect Dis J* 1989; 8:297-302.
6. Levy M, Manning W, Rubin G. Bacterial meningitis makes a comeback. *Public Health Bulletin* 1991; 2:8-10.
7. Hargreaves J. Meningococcal Infection — National Notifiable Diseases Data. *Communicable Diseases Intelligence* 1992; 16:31-35.
8. Roberts C, Manning W, Chant K. Meningitis surveillance 1991. *Public Health Bulletin* 1992; 3:97-98,101.