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INVESTIGATION OF PATIENTS POTENTIALLY EXPOSED TO AN HIV-INFECTED HEALTH CARE WORKER

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This article describes the methods used in, and the results of, an investigation to determine whether there was evidence of transmission of human immunodeficiency virus (HIV) to patients from an HIV-infected health care worker who had performed exposure-prone procedures.

The health care worker (HCW) sustained a needlestick injury while working in the obstetric unit of a Sydney hospital. On the day of the injury, in the first half of 1994, routine baseline blood samples were taken from the HCW and the patient for HIV and hepatitis B serology. The results, which became available four days after the injury, showed the worker was HIV antibody positive, while the patient was HIV antibody negative. The HCW immediately ceased work.

An expert committee was convened to review the evidence for potential HIV transmission from the HCW to patients and advise on the optimal response. Because the HCW had been infected for an unknown period and had been performing exposure-prone procedures, the committee recommended that a "lookback" case-finding investigation be undertaken to determine the potential risk for former patients.

Exposure-prone procedures were defined as those "characterised by the potential for direct contact between the skin (usually finger or thumb) of the health care worker and sharp surgical instruments or needles in body cavities and confined sites"[1].

INVESTIGATION METHODS

Identifying the patients at risk

The period of risk was assessed by determining from the HCW and the HCW's physicians whether there were any previous documented HIV tests, evidence of a seroconversion illness, or clear episodes of exposure (occupational or otherwise) likely to have caused infection. The HCW was asked whether s/he had had blood samples taken for any reason since the last negative HIV test, in case any stored blood was available for testing. The HCW's initials and date of birth were cross-matched with the NSW HIV notification register.

The HCW had been HIV antibody negative at the beginning of 1992. While it was not possible to determine an exact date of infection, the HCW's specialist physician believed it was most likely to have occurred around mid-1992, based on current tests of immune function and a possible seroconversion illness at that time. A thorough exposure history did not suggest a likely date of infection. No match was found between the HCW's identifiers and the NSW HIV register.

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Potential HIV transmission

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The HCW's work history was determined from personnel records and checked by interviewing the HCW. The types of exposure-prone procedures which the HCW may have undertaken were listed by reviewing relevant chapters from the International Classification of Diseases and Causes of Death, 9th Revision, Clinical Modification[2], and interviewing the HCW and the HCW's department head. Relevant procedures, performed since June 1992, were perineal and vaginal repairs following delivery, and caesarean sections. If the HCW was the main operator, all such procedures were considered to be exposure-prone. If the HCW was operating as an assistant, they were considered exposure-prone only if the operation was an emergency, conducted after hours, or associated with excessive bleeding.

Computerised and paper hospital records were searched to identify patients who had had exposure-prone procedures in which the HCW was involved. A case-by-case review of medical records identified 149 women as having undergone an exposure-prone procedure that involved the HCW during the period of risk.

The HCW was also interviewed regarding his/her infection control practices.

Patient follow-up

Ten teams of senior nurses and experienced HIV counsellors were assembled to contact the 149 women by telephone and then in person. Staff from the Multicultural HIV Project were used for communication with patients whose main language was not English. An HIV test was offered to each woman at the time of contact, and arrangements were made with a large hospital laboratory so results could be obtained within hours of specimen collection.

Three days after this phase began, the investigation was publicised, advertisements were placed in all NSW newspapers and a telephone hotline was set up to assist in the effort to trace the patients. Other information sources were also used in the search for further contact details.

Results

Most of the effort to contact and offer tests to the 149 women took place between Friday, July 29 and Sunday, July 31, 1994. By the time of writing two weeks later, 136 (91 per cent) of the 149 patients had been contacted and 134 (90 per cent) had been tested for HIV. Of those tested, 133 were HIV antibody negative, and one was HIV antibody positive. Further testing of a stored specimen from the HIV antibody positive woman revealed she had been positive at the time of the obstetric procedure which involved the HCW.
Of the 136 women contacted, two refused HIV testing.

Thirteen women (9 per cent) could not be contacted, of whom six were known to be overseas. Efforts to contact the 13 women are continuing.

Discussion

It is reassuring that no instance of HCW-to-patient HIV transmission was observed in this instance. Further HIV testing of potentially exposed individuals was considered unnecessary because the time elapsed between the last possible exposure and the investigation was beyond the "window period".

Overseas experience indicates the risk of HCW-to-patient transmission of HIV is extremely small.[2,3,4,5,6,7,8] Despite this, several factors made this investigation imperative. These included the nature of the procedures performed by the HCW, the potentially high infectivity of the HCW, the potential for infection of infants through breast feeding, and the lack of Australian information on the risk to patients. In addition, the availability of good quality computerised and paper hospital records made the investigation feasible.

The investigation was costly, not only because of the personnel and laboratory work involved, but also because it created anxiety for a large number of women and potentially infringed the privacy of the HIV positive HCW.

The NSW Health Department is reviewing its guidelines in relation to HCWs and HIV infection in the light of this incident. Decisions about any investigations of this type in future should be based on an assessment of factors specific to each instance, including risks, costs and benefits.

Acknowledgments

Many people were involved in this investigation, from the NSW Health Department, the local Area Health Service, the State's HIV services and elsewhere. We thank all those who assisted, especially the counsellors, nurses and Multicultural HIV Project staff for their excellent face-to-face work with patients. Thanks are also due to John Beard, Acting Director, Public Health Policy and Programs, NSW Health Department, for his comments on the text.

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SUDDEN INFANT DEATH SYNDROME IN NSW, 1992

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In the period 1986 to 1992, deaths due to Sudden Infant Death Syndrome (SIDS) have almost halved in NSW. This is likely to be due to a combination of increased awareness of modifiable risk factors for SIDS and improved diagnosis. Infants who died from SIDS in NSW in 1992 were predominantly male (69 per cent) and less than 24 weeks of age (82 per cent). Of cases where the sleeping position of the infant at the time of death was recorded, 54 per cent were found in the prone position.

BACKGROUND

Sudden Infant Death Syndrome (SIDS) is the sudden death of any infant or young child, which is unexpected by history, and in which a thorough post-mortem examination fails to demonstrate an adequate cause of death[1].

SIDS is a notifiable condition under the Public Health Act 1991. Notifications are received and collated by the Epidemiology and Health Services Evaluation Branch of the NSW Health Department.

The aims of this review were to:

- describe recent trends in the incidence of SIDS in NSW;
- describe the characteristics of infants who died of SIDS in NSW in 1992; and
- determine the notification rate for SIDS in NSW.

METHOD

Under the Coroners Act 1980, the death of a person is examinable by a coroner only in certain circumstances; for example, if the person died a "violent or unnatural death" or "suddenly died of an unknown cause". The Glebe and Westmead Coroner's Courts in Sydney hold records of all deaths reviewed by coroners throughout NSW. Permission was obtained to review records of all deaths due to SIDS in 1992. Data were retrieved, entered onto a Microsoft ACCESS database and analysed using SAS software.

The number of infants who died of SIDS during 1992 and their characteristics were obtained through this review of coroners' records. The notification rate was determined by matching notified SIDS cases to coroners' records.

For the trend analysis, the numbers of deaths due to SIDS were obtained from Australian Bureau of Statistics (ABS) death registration data for 1986-1991, and from the review of coroners' records for 1992. Death rates were calculated per 1,000 livebirths, the denominator populations for which were obtained from ABS birth registration data. The statistical significance of the change in death rate due to SIDS was determined using a chi square test for linear trend.

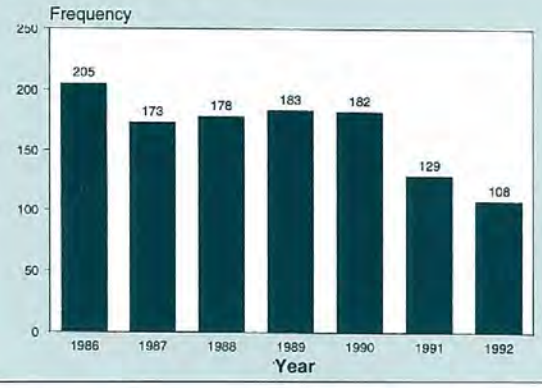
RESULTS

Recent trends in the incidence of SIDS

Between 1986 and 1992, the number of infant deaths due to SIDS each year decreased from 205 to 108 (Figure 1), and the death rate due to SIDS decreased from 2.5 to 1.2 per 1,000 (Table 1) ($p < 0.001$).

FIGURE 1

DEATHS DUE TO SUDDEN INFANT DEATH SYNDROME IN NSW, 1986-1992



Notification rate for SIDS

For 1992, 82 SIDS deaths were notified to the NSW Health Department compared with 108 which were identified through the review of coroners' records. All notified SIDS deaths were matched with deaths identified from the coroners' records. The notification rate for SIDS was therefore 75.9 per cent.

Of the 26 deaths which were not notified, 22 (84.6 per cent) occurred among non-Sydney residents. Deaths which occurred among non-Sydney residents were less likely to be notified: 42 of the 46 (91.3) deaths which occurred among Sydney residents were notified, compared with 40 of 62 (64.5 per cent) of deaths which occurred among non-Sydney residents.

Autopsies were carried out on all 108 infants. Of these, 106 (98.1 per cent) were carried out by the NSW Institute of Forensic Medicine at Glebe or the Institute of Clinical Pathology and Medical Research (ICPMR) at Westmead.

Characteristics of infants who died of SIDS

The sex of the infant was noted in all 108 cases. Seventy-five (69.4 per cent) deaths occurred among males and 33 (30.6 per cent) among females, giving a male to female ratio of 2.3:1.

The age of the infant at death was reported in all cases. Eighty-eight deaths (81.5 per cent) occurred among infants aged 0 to 24 weeks. One-quarter of deaths occurred in a four-week period from 5-8 weeks of age (Figure 2).

The month of death was reported for all deaths. The incidence of SIDS was highest in the cool months, with 58 cases (53.7 per cent) occurring between April and August. Other peak months included February with 10 cases (9.3 per cent) and October with 13 cases (12.0 per cent).

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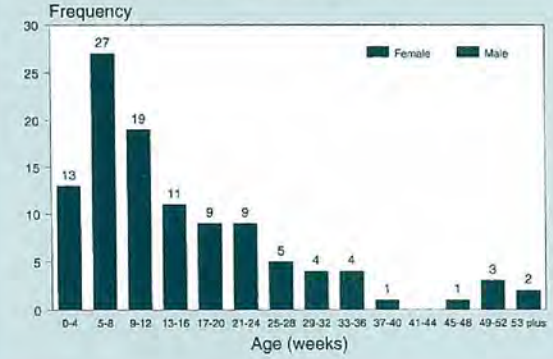
TABLE 1

INCIDENCE OF SUDDEN INFANT DEATH SYNDROME (SIDS) IN NSW, 1986-1992

	1986	1987	1988	1989	1990	1991	1992
SIDS incidence per 1,000 livebirths	2.5	2.1	2.1	2.1	2.1	1.5	1.2

FIGURE 2

DEATHS DUE TO SUDDEN INFANT DEATH SYNDROME IN NSW BY SEX AND AGE AT DEATH, 1986-1992



SIDS in NSW, 1992

► *Continued from page 85*

The address of death was reported in all 108 cases. Seventy-seven infants (71.3 per cent) died in their own homes while 18 (16.7 per cent) died in hospital. Thirteen deaths (12.0 per cent) occurred in homes other than the infant's home.

The time of discovery was reported in 103 cases (95.4 per cent). Of these, 13 cases (12.6 per cent) were found between 3am and 6am, 41 (39.8 per cent) between 6am and 9am, 19 (18.4 per cent) between 9am and midday, and 30 (29.1 per cent) between midday and 3am.

The position of the infant at the time of discovery was recorded in 72 cases (66.7 per cent). Of these, 39 (54.2 per cent) were found in a prone position, 20 (27.8 per cent) on their side and 13 (18.1 per cent) in the supine position.

Sixty-nine cases (63.9 per cent) reported the type of feeding. In 20 cases (29.0 per cent) breastfeeding was recorded while 49 cases (71.0 per cent) reported bottlefeeding.

For 90 cases (83.3 per cent) the place where the infant was found dead was reported. Fifty cases (55.6 per cent) were in their own cot, cradle, crib, bassinette or bed, and 30 cases (33.3 per cent) were sharing their parents' bed or mattress.

DISCUSSION

The cause or causes of SIDS remain unknown. However, several modifiable risk factors are recognised: prone sleeping position[2,3,4,5], maternal smoking[5,6], not breastfeeding[5], and infant overheating[1]. Observed decreases in the rate of SIDS in some areas have been attributed to a reduced prevalence of the prone sleeping position alone[7], or in combination with a reduced prevalence of infant overheating[8].

Other potentially modifiable risk factors for SIDS have been identified: smoking by the father and other household members in addition to the mother[9] and maternal substance abuse[10]. Other risk factors include young maternal age and low birthweight[5,1]. It has been suggested that sex differences in the development of sleep/wake patterns[11] and susceptibility to infection[12,13] may also play a role.

Despite the number of epidemiological and physiological factors which has been identified as increasing the risk of SIDS, current risk factors do not sufficiently discriminate high-risk infants to serve as a basis for screening as the majority of infants with risk factors do not die[14].

The characteristics of infants dying from SIDS in this study are consistent with studies elsewhere: infants who die from SIDS are predominantly male[5,15,16], SIDS deaths most commonly occur in the second to fourth months of life[17,15] and the peak incidence in the cold winter months[18,19,20].

Deaths due to SIDS in NSW have almost halved since 1986. This decrease is likely to be due, at least in part, to increased professional and community awareness of the modifiable risk factors for SIDS. To improve awareness of these risk factors further the NSW Health Department supported an information campaign for health professionals in 1991 and the Sudden Infant Death Association carried out a parent information campaign in 1992.

It is likely that improved diagnosis has also contributed to the decreased rate of SIDS. In 1991 the State Coroner recommended that all infant autopsies be carried out by forensic pathologists at Glebe or Westmead, though coroners retain the discretion to order that an infant autopsy be carried out locally. In 1991 40.0 per cent of autopsies for SIDS were performed outside these two centres[21] compared with only 2.0 per cent in 1992.

Of the 108 SIDS deaths in 1992 identified in the review of coroners' records, 82 (75.9 per cent) were notified to the NSW Health Department. This may be considered reasonable given that 1992 was the first full year for which SIDS was a notifiable condition. Most SIDS deaths which were not notified occurred outside Sydney and, for most of these, autopsies were carried out in Sydney.

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PREVENTING SUDDEN INFANT DEATH SYNDROME IN NSW: IMPACT OF HEALTH EDUCATION CAMPAIGNS

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In 1992, the NSW Health Department and the Sudden Infant Death Association of NSW (SIDA) conducted Statewide health education campaigns aiming to reduce the incidence of Sudden Infant Death Syndrome (SIDS). The campaigns were based on mounting epidemiological evidence indicating that the prone sleeping position was a risk factor for SIDS[1,2,3,4,5] and were supported by National Health & Medical Research Council recommendations that infants should generally be placed to sleep in the supine position or on their sides[6]. This report outlines the results of surveys carried out before and after the campaigns to assess their impact.

The Department's campaign was directed at health professionals, and included seminars and distribution of a circular detailing Departmental policy[7]. The SIDA campaign targeted the general community through television advertisements which went to air at peak viewing times.

The campaigns:

- promoted placing infants to sleep in the supine position or on their sides, and discouraged the prone position;
- promoted breastfeeding;
- drew attention to the importance of preventing infants from becoming too hot through over-wrapping; and
- recommended that infants should have a smoke-free environment.

To determine whether these campaigns influenced parental behaviour, the Department conducted two surveys, in 1991 and 1992 (before and after the campaigns respectively).

The surveys were done in Early Childhood Health Centres (ECHCs) in the former New England Region of NSW and in the Northern Sydney, South Western Sydney and Illawarra Health Areas. Sequential samples of parents attending the ECHCs were given a short self-administered questionnaire which sought information on the infant's age and sex, the language spoken in the home and the smoking status of household members. The respondent was asked in what position the infant was usually placed to sleep (on the back, on the stomach, or on the side).

One hundred questionnaires were sent to the ECHCs in the New England Region and each of the three Areas before the campaigns in 1991, and a second 100 in 1992. The number of questionnaires distributed to each ECHC was proportional to the catchment population.

A total of 367 parents completed questionnaires in 1991 (representing a 92 per cent response rate), and 437 questionnaires were returned in 1992 (additional copies were produced in and returned from the Illawarra Area). Only questionnaires referring to infants aged 3-6 months were included in this analysis (67 per cent of questionnaires distributed in 1991, and 63 per cent in 1992). Data were analysed using the Statistical Analysis System.

In the 1991 survey, 21 per cent of parents of infants aged 3-6 months reported that they placed their infants to sleep in the prone position. In the 1992 survey, the figure was 6 per cent ($p < 0.001$).

The change in the breastfeeding prevalence was not significant; 62 per cent of parents in 1991 and 59 per cent in 1992 reported that their infants were breastfed. The change in the proportion of homes where a household member smoked was also non-significant (30 per cent in 1991, and 25 per cent in 1992).

Elsewhere in this issue Guevarra and Taylor report a substantial decrease in the incidence of SIDS since 1990, when the rate was 2.1 per 1,000 livebirths; rates in 1991 and 1992 were 1.5 and 1.2 per 1,000 livebirths respectively[8]. This decrease paralleled campaigns promoting parental behaviour associated with a low risk of SIDS. The results presented here suggest the desired change in behaviour also paralleled the campaigns. This provides circumstantial evidence that the campaigns led to improved health outcomes, i.e. a reduction in the incidence of SIDS.

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WINTER SPORTS INJURIES

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Several hundred thousand people visit the Australian Alps in southern NSW and Victoria each winter. Many of these people participate in snow sports such as downhill skiing, cross-country skiing, snowboarding and tobogganing. The popularity of snow sports carries a significant risk of injury and possible disability[1,2,3,4,5,6,7] and as such is a focus of injury prevention action.

In Australia since the early 1960s records have been kept of snow sports injuries treated at the Perisher Valley Medical Centre, which provides a medical service for several of the major NSW snowfields. The centre's records have been used to provide information on the types and relative frequency of injury[8,9,10].

In 1992 the South Eastern Public Health Unit combined with the Perisher Valley Medical Centre to extend the scope of routine injury surveillance by capturing additional information on the causes and circumstances of snow sports injuries using the National Injury Surveillance Unit's Injury Surveillance Information System (ISIS) data collection form. The ISIS form collates information from the patient and attending health professional. The patient answers questions about when and where the injury occurred, what the person was doing at the time, what went wrong, what actually caused the injury and the use and functioning of equipment (see Figure 3). The health professional reports on the nature of the injury.

The surveillance initiative complemented changes made to the Inpatient Statistics Collection in 1989 which provide more detailed information on sports injuries, including those resulting from skiing.

This article takes advantage of these two recent enhancements in injury surveillance information and reports on the occurrence and outcomes of snow sports injuries in NSW since 1987. Rates will not be reported here because of the lack of a good denominator[11].

Three aspects of surveillance data are reported:

- the number and nature of snow sports injuries treated at the Perisher Valley Medical Centre between 1987 and 1992, and a small number of patients injured at Thredbo and Mt Selwyn resorts[12];
- the number and nature of skiing injuries treated in NSW hospitals between 1989 and 1993; and
- a review of downhill skiing injuries using data from the ISIS set up at Perisher Valley in 1992.

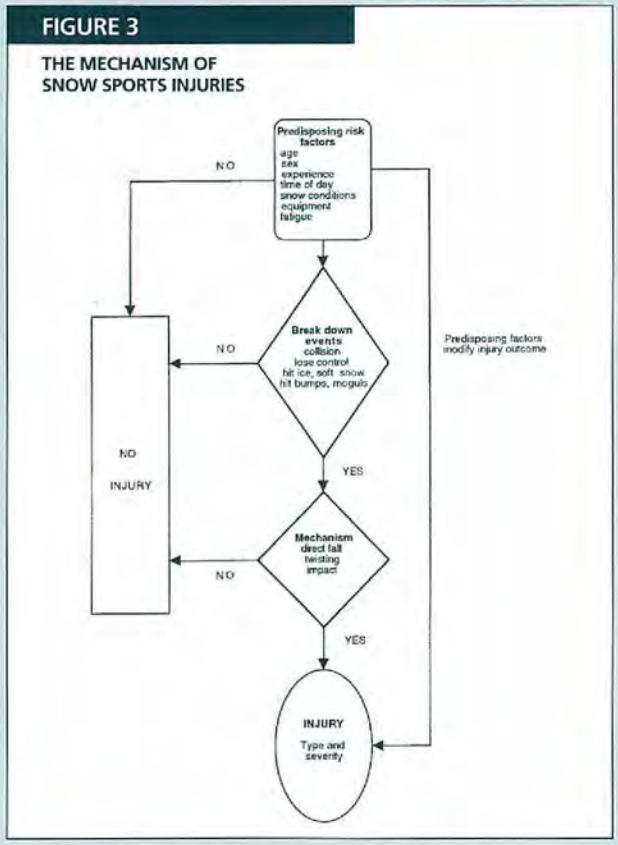
OUTPATIENT TREATMENT AT PERISHER VALLEY 1987-1992

During the six years 9,737 injuries were treated at the clinic – an average of 1,623 per season (range 1,451 to 1,834). The pattern of injury varied according to age and sex, with 48 per cent of injuries being sustained by men, 38 per cent by women and 14 per cent by children (i.e. under 14 years).

The nature of the snow sports injuries and body parts affected remained relatively stable over the six years.

FIGURE 3

THE MECHANISM OF SNOW SPORTS INJURIES



Knee sprain was the most common injury (31 per cent of cases), followed by general bruising/haematomas (10 per cent) and laceration to the head and face (8 per cent). There was a significant increasing trend in the proportion of knee injuries which were isolated anterior cruciate ligament (ACL) injuries ($x^2 = 4.76$; P = 0.03) and isolated ACL injuries were more likely to be rated as serious than any other single knee injury.

Each year there was an average of one skull fracture (from 35 head injuries), four cervical spine fractures and six fractures to other spinal vertebrae.

Most injuries (93 per cent) were related to downhill skiing, 3 per cent to tobogganing, 2 per cent to cross country skiing and 2 per cent to snowboarding. Snowboarding injuries increased over the period; the first three cases appeared in 1988, rising each year to reach 6 per cent of all cases in 1992.

Among those seeking treatment for downhill skiing injuries, knee injuries were most common, especially among women. Compared with adults, lower limb fracture and general bruising were more important for children. Men were more likely to have dislocated shoulders and lacerated legs than women or children (Table 2).

Women who rated themselves as experienced skiers had fewer knee sprains (25 per cent) and more thumb sprains (11 per cent) than all injured women (41 per cent and 6 per cent respectively).

Forty-three per cent of snowboarding injuries were fractures to the upper or lower limbs. For tobogganers, back and neck injuries were most prevalent (29 per

TABLE 2

INJURIES DUE TO DOWNHILL SKIING – 1987-1992

INJURY	MALES		FEMALES		CHILDREN		PEOPLE	
	No.	%	No.	%	No.	%	No.	%
Knee sprain	1093	24.8	1465	41.0	223	25.3	2781	31.4
Laceration head and face	428	9.7	197	5.5	75	8.5	700	7.9
Fracture lower limb	188	4.3	141	3.9	130	14.7	459	5.2
Sprained thumb	247	5.6	195	5.5	21	2.4	463	5.2
Fractured upper limb	170	3.8	182	5.1	48	5.4	400	4.5
Laceration to leg	313	7.1	47	1.3	18	2.0	378	4.3
Dislocated shoulder	292	6.6	80	2.2	3	0.3	375	4.2
Back/neck injury	173	3.9	159	4.4	28	3.2	360	4.1
Head injury/concussion	129	2.9	132	3.7	41	4.6	302	3.4
Shoulder sprain	191	4.3	106	2.9	7	0.8	304	3.4
Ankle sprain	86	1.9	90	2.5	40	4.5	216	2.4
General bruise /haematoma	368	8.3	369	10.3	141	16.0	878	9.9
Other	728	16.5	406	11.4	106	12.0	1240	14.0
Totals	4406	100.0	3569	100.0	881	100.0	8856	100.0

cent); one-third of toboggan injuries were sustained by children.

HOSPITALISATIONS IN NSW 1989-1993

Over a five-year period there were 1,444 admissions to NSW hospitals for skiing injuries, an average of 289 admissions a year. This probably underestimates the number of hospitalisations because of imprecise coding definitions for 'current' versus 'old' injuries related to E-codes. Men comprised 52 per cent, women 41 per cent and children 7 per cent of admissions. One in five patients was admitted to the nearest hospital — Cooma District Hospital. Almost one-third (31 per cent) were admitted to three private hospitals in Sydney which specialise in orthopaedic procedures.

The predominant injuries among hospitalised patients were sprains and strains (28 per cent), limb fractures (23 per cent), arthropathies and related disorders (15 per cent) and dislocations (11 per cent).

More than three-quarters (N = 1,127; 78 per cent) of patients required procedures. For these patients, the common procedures were repair of cruciate ligaments (25 per cent), reduction of fractures (24 per cent) and knee arthroscopy (16 per cent). Most procedures were related to knee (76 per cent) or lower leg (17 per cent) injuries.

REVIEW OF DOWNHILL SKIING INJURIES 1992

Many factors may influence skiing injury occurrence, type and severity, including experience, snow and weather conditions, fatigue, the use and functioning of equipment and the ski run environment[13]. We examined some of these factors in detail for the main injury-related activity, downhill skiing (90 per cent of the 1,491 injuries).

Knee sprains were the most common injury for males (23 per cent) and females (37 per cent). When they occurred, people were typically skiing downhill (77 per cent) or turning (8 per cent). They reported losing control (46 per cent) or colliding with a person or object (20 per cent). A twisting action caused 90 per cent of knee sprains.

Ski bindings are designed to release when a skier twists severely, reducing the risk of knee injuries. Failure of bindings to release was a contributing factor for 92 per cent of the women's knee injuries (for 63 per cent neither binding released) and 75 per cent of men's knee injuries (for 35 per cent neither released).

A direct fall was the second most important action resulting in injury (34 per cent of injuries). It was the main cause of upper limb fractures (men: 78 per cent; women: 79 per cent) and men's dislocated shoulders (85 per cent).

For children, the main injury was the same as for adults – knee sprain (27 per cent). However children were more likely (16 per cent) than adults (8 per cent) to sustain limb fractures, particularly lower limbs (1 in 10 children's injuries). The small numbers precluded further analysis of predisposing factors in children's injuries.

CONCLUSIONS

Historical data for Perisher Valley Medical Centre confirm there is a significant number of injuries associated with winter sports activities. While surveillance data cannot provide definitive answers to questions about how interacting factors cause injuries or even the relative contribution of those factors, it does provide information about relative changes in injury patterns, and suggests hypotheses about causal mechanisms and opportunities for intervention.

For example, the large and relatively stable proportion of knee injuries among skiers in their data reflects worldwide trends in skiing injury[14]. Similarly, the major contribution of knee injuries to hospital admissions and the increasing proportion of ACL injuries is in line with a continuing worldwide problem of severe ligament tears[1,14].

The more detailed 1992 surveillance data show that knee injuries occur when a skier twists after losing control during "normal" downhill skiing; bindings do not release to prevent the injury and this is particularly so for women. These data suggest several avenues for effective prevention:

Continued on page 90 ▶

► *Continued from page 89*

Equipment:

- redesign bindings and ski boots, especially for women;
- review currently used binding adjustment tables, especially for women;
- introduce mechanical testing for torque and adjustment of bindings[7,15,16] (mechanical testing is mandatory in US retail and rental outlets and is a widespread practice in Europe); and
- develop standards for ski equipment (at present no standards exist).

Skier behaviour:

- teach skiers what to do to minimise twisting[14] when they lose control or collide; and
- maximise fitness and muscle strength through training.

Skiing environment:

- control volume of use of ski runs; and
- remove obstacles on ski runs or make them more visible/less hazardous.

Skier attitudes:

- promote skiers' awareness of the importance of fitness, weather and fatigue.

The National Injury Surveillance Unit has included the data in its database of more than 700,000 injuries.

ACKNOWLEDGMENTS

We thank the following people for their time and assistance with the surveillance and analysis: staff at the Perisher Valley Medical Centre, especially Dr Louis Fenelon and Joan Bird; Dr Stephen Breathour and staff at the Thredbo Medical Centre; staff of the Emergency Departments at Cooma and Tumut District Hospitals; Mount Selwyn Resort, especially Tim Corkhill and Dave Wilson; and Dr James Harrison, National Injury Surveillance Unit, Adelaide.

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11. The number of lift tickets sold which is commonly used, does not take into account factors such as weather conditions or the number of hours spent skiing and it may not be relevant to other activities such as snowboarding and tobogganing. There is no usable data available on participation in winter sports activities.
12. Patients were from Perisher Valley, Charlotte Pass, Blue Cow/Guthega and Smiggins Hole. For 1992, it also included patients treated at Mt Selwyn, Cooma or Tumut Hospitals or who attended Thredbo Medical Centre between June 16 and September 23, 1992.
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INFECTIOUS DISEASES

NOTIFICATIONS

This month we highlight vaccine-preventable diseases, gonorrhoea, meningococcal diseases and influenza.

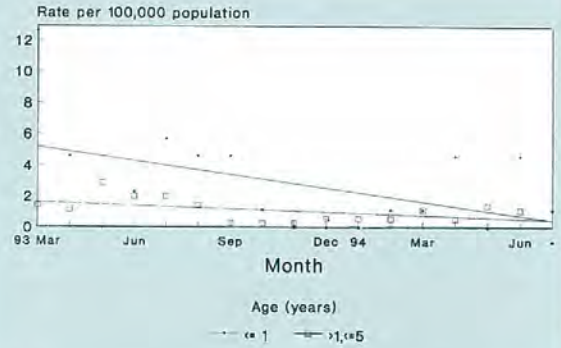
HAEMOPHILUS INFLUENZAE TYPE B (Hib)

A total of 45 notifications for Hib disease was received for the period January-July 1994, for a rate of 1.3/100,000 population. This compares with a notification rate of 2.2/100,000 for 1993.

For children aged less than five years, 28 notifications were received, compared with 82 for January-July 1993 (Figure 4). The notification rate has dropped from 23.9/100,000 population in 1993 to 10.8/100,000 population this year. This substantial decrease is directly attributable to the immunisation program for children under five years old.

FIGURE 4

HIB, NSW, <= FIVE YEARS OF AGE MARCH 1993-JULY 1994



* Provisional

PERTUSSIS (WHOOPING COUGH)

The notification rate for pertussis for January-July 1994 was 20.4/100,000 population, a decrease from 25.5/100,000 population for the same period in 1993.

Richmond Health District continued to receive a high rate of notifications, reaching 226.2/100,000 population.

In response to persistent high rates of notification of pertussis in the Richmond District, the North Coast Public Health Unit has advised immunisation providers to accelerate immunisation schedules and use chemoprophylaxis to minimise transmission of pertussis.

Children aged less than five years continued to account for 20 per cent of notifications. The mean age for notifications was 20.9 years (range one month to 87 years).

MEASLES

The notification rate for January-July was 8.9/100,000 population. This compares with a rate of 10.5/100,000 population for the same period in 1993.

The mean age for notifications remains at 8.2 years (range three months to 64 years). Fourteen per cent of notifications were for infants (≤ one year of age). Fifty-six per cent of notifications were for children over the age of five years, while 22 per cent were for people 12 years and older.

GONORRHOEA

A total of 178 notifications for gonorrhoea has been received this year, for a rate of 4.9/100,000 population.

Males accounted for 84 per cent of notifications. The male:female ratio was 4.8:1.

The age range for males was 13 to 62 years and for females 13 to 36 years. The mean age for males was 29.5 years (SD 9.6), while the mean age for females was 22.7 years (SD 5.2).

Only 30 per cent of notifications were for a specific site, with the lower genitourinary tract accounting for 22 per cent of all notifications and 72 per cent of site-specific notifications.

MENINGOCOCCAL DISEASE

A total of 53 notifications for meningococcal disease has been received, for a rate of 1.5/100,000 population. This compares with the rate of 2.5/100,000 population for 1993.

The age of people notified with meningococcal disease has ranged from three months to 91 years. The mean age was 17.5 years (SD 23.8).

INFLUENZA SURVEILLANCE

Figure 5 shows that in late July influenza activity was at its highest level so far this year and greater than at any stage last year.

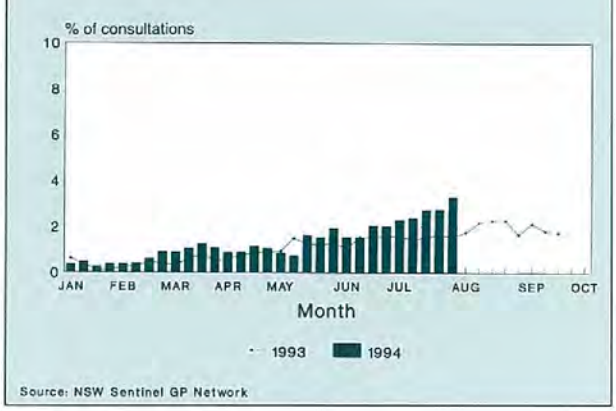
Reports of influenza-like illness (ILI) for July were received weekly in eight PHUs from a total of about 100 doctors and 13,000 patient consultations a week. The highest rate of ILI reports for NSW was 3.2 per cent of consultations in the latest reporting week, ending July 24, which is higher than the highest rate recorded last year of 2.3 per cent. The highest rate was reported from the South East PHU, with 5.2 per cent. In July Northern Districts and Central Coast PHUs reported increases to 4 per cent or more, and Western Sydney/Wentworth Areas have reported around 4 per cent since late May.

Surveillance of school absentee rates has intensified following the addition of four boarding schools to the sentinel network. Reports are now received from seven PHUs, covering 17 schools and more than 11,000 students. There is no clear upward trend in absentee rates.

Laboratory isolations of influenza virus and serological diagnoses increased during July. The Virology Laboratory of the Institute of Clinical Pathology and Medical Research (ICPMR) at Westmead Hospital has reported 13 isolations of influenza virus this year. All were influenza A (H3N2), a slight variant of the A Beijing/32/92 strain which is in the current vaccine. The ICPMR Serology Laboratory reported five recent serological diagnoses of influenza A, and the Prince of Wales Hospital Serology Laboratory reported increases of diagnoses of both influenza A and B.

FIGURE 5

INFLUENZA-LIKE ILLNESS NSW



Source: NSW Sentinel GP Network

SCHOOL ENTRY CERTIFICATE SURVEY NORTHERN SYDNEY AREA

Gay Rixon, Kris Hort, Jeannine Liddle
Northern Sydney Area Public Health Unit

The survey was conducted to determine the number of immunisation certificates marked as incomplete for medical contraindications. The first public school listed in the yellow pages from each of the 11 local government areas was selected (10.7 per cent of public schools). Each school was contacted by phone and asked to provide information from the immunisation certificates of children starting kindergarten for the first time in 1994.

All schools surveyed had difficulty in gaining access to the immunisation certificates and were unable to provide the required information during the first phone call. Problems identified included schools attaching the certificates to pupil records and then needing to sort the records according to the completeness of the certificates. This inability to access records quickly could cause problems during an outbreak.

Of concern is the large number of children whose parents had not given the school a certificate (Table 3). In an outbreak of disease these children would have been considered unimmunised. Schools indicated that a percentage of the children with no certificate were under five years of age and had not had their prior to school entry booster. They could be issued with a certificate when their immunisation was complete.

Most medical contraindications for incomplete immunisation were associated with reaction to triple antigen. A small number of incomplete certificates was issued because of conscientious objection to all, or some components of, the immunisation schedule.

TABLE 3

	FREQUENCY	PER CENT
Complete certificates	546	79
Incomplete due to medical contraindications	14	2
Incomplete certificates	18	3
No certificate provided to school	112	16
Total number enrolled in kindergarten in 11 schools surveyed	690[1]	100

1. Based on 1992 data this is about 13 per cent of kindergarten children in public schools in the Area.

TABLE 4

INFECTIOUS DISEASE NOTIFICATIONS FOR 1994 RECEIVED BY JULY 29, 1994

Condition	Freq	Percent
Adverse event after immunisation	20	0.2%
AIDS	175	1.7%
Arboviral infection	322	3.1%
Foodborne illness (NOS)	117	1.1%
Gastroenteritis (instit.)	108	1.0%
Gonorrhoea	178	1.7%
H influenzae epiglottitis	18	0.2%
H influenzae infection (NOS)	8	0.1%
H influenzae meningitis	10	0.1%
H influenzae septicaemia	9	0.1%
Hepatitis A – acute viral	289	2.8%
Hepatitis B – acute viral	51	0.5%
Hepatitis B – chronic/carrier	318	3.1%
Hepatitis B – unspecified	1,682	16.3%
Hepatitis C – acute viral	3	0.0%
Hepatitis C – unspecified	4,008	38.8%
Hepatitis D – unspecified	5	0.0%
Hepatitis, acute viral (NOS)	2	0.0%
HIV infection	24	0.2%
Hydatid disease	8	0.1%
Legionnaires' disease	34	0.3%
Leprosy	2	0.0%
Leptospirosis	10	0.1%
Listeriosis	4	0.0%
Malaria	118	1.1%
Measles	321	3.1%
Meningococcal infection (NOS)	6	0.1%
Meningococcal meningitis	31	0.3%
Meningococcal septicaemia	16	0.2%
Mumps	2	0.0%
Mycobacterial atypical	185	1.8%
Mycobacterial infection (NOS)	43	0.4%
Mycobacterial tuberculosis	144	1.4%
Pertussis	736	7.1%
Q fever	121	1.2%
Rubella	26	0.3%
Rubella – congenital	1	0.0%
Salmonella (NOS)	380	3.7%
Salmonella bovis morbificans	10	0.1%
Salmonella typhimurium	261	2.5%
Syphilis	514	5.0%
Tetanus	2	0.0%
Typhoid and paratyphoid	15	0.1%

TABLE 5

SELECTED INFECTIOUS DISEASE NOTIFICATIONS FOR 1994 FOR NOTIFICATIONS RECEIVED BY JULY 29, 1994 BY PUBLIC HEALTH UNIT

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NC	ND	WD	CW	SW	SE	U/K	Total
Adverse event after immunisation	–	–	1	2	4	3	–	1	–	–	2	–	–	–	3	4	–	20
H. influenzae epiglottitis	1	2	1	2	1	2	2	3	2	–	2	–	–	–	–	–	–	18
H. influenzae meningitis	–	–	–	4	2	–	1	–	–	–	1	–	–	2	–	–	–	10
H. influenzae septicaemia	–	–	–	1	1	–	1	1	–	1	2	–	1	–	–	1	–	9
H. influenzae infection (NOS)	–	–	–	–	1	–	1	3	1	–	1	–	–	–	1	–	–	8
Measles	27	8	10	22	26	28	18	3	9	24	76	30	21	12	1	6	–	321
Mumps	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	2
Pertussis	16	53	48	45	66	27	38	12	33	41	296	13	17	15	4	12	–	736
Rubella	–	–	2	–	7	1	4	1	–	–	4	4	1	–	2	–	–	26
Rubella – congenital	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Tetanus	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	2

TABLE 6

INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY JULY 29, 1994
BY PUBLIC HEALTH UNIT

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NC	ND	WD	CW	SW	SE	U/K	Total
Adverse event after immunisation	–	–	1	2	4	3	–	1	–	–	2	–	–	–	3	4	–	20
AIDS	26	8	60	8	27	14	11	2	6	1	9	2	–	1	–	–	–	175
Arboviral infection	–	3	2	–	–	–	6	3	5	34	188	50	19	1	9	2	–	322
Foodborne illness (NOS)	1	10	7	19	14	8	5	13	1	3	24	–	2	7	2	1	–	117
Gastroenteritis (instit)	23	2	–	3	18	19	1	1	–	1	10	–	–	30	–	–	–	108
Gonorrhoea	19	11	73	7	9	1	8	3	5	6	3	9	11	3	6	4	–	178
H. influenzae epiglottitis	1	2	1	2	1	2	2	3	2	–	2	–	–	–	–	–	–	18
H. influenzae meningitis	–	–	–	4	2	–	1	–	–	–	1	–	–	2	–	–	–	10
H. influenzae septicaemia	–	–	–	1	1	–	1	1	–	1	2	–	1	–	–	1	–	9
H. influenzae infection (NOS)	–	–	–	–	1	–	1	3	1	–	1	–	–	–	1	–	–	8
Hepatitis A – acute viral	15	8	29	34	23	5	20	3	3	15	29	33	4	14	53	1	–	289
Hepatitis B – acute viral	4	2	21	3	3	–	–	–	1	–	8	2	3	1	–	3	–	51
Hepatitis B – chronic/carrier	–	–	164	1	83	4	12	11	–	15	12	8	1	5	–	2	–	318
Hepatitis B – unspecified	237	256	52	521	211	12	242	13	36	37	27	7	4	2	21	4	–	1,682
Hepatitis C – acute viral	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	2	–	3
Hepatitis C – unspecified	410	233	747	391	340	79	380	137	185	245	476	77	21	81	107	99	–	4,008
Hepatitis D – unspecified	–	2	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	5
Hepatitis, acute viral (NOS)	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2
HIV infection	41	15	97	16	12	3	11	3	2	6	3	–	–	–	–	1	48	258
Hydatid disease	1	2	2	–	–	–	–	–	1	1	–	–	1	–	–	–	–	8
Legionnaires' disease	3	2	1	7	8	–	7	–	3	1	–	–	–	2	–	–	–	34
Leprosy	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Leptospirosis	1	–	–	–	–	–	–	–	–	3	3	2	–	–	1	–	–	10
Listeriosis	–	–	1	–	–	–	–	–	1	1	–	–	1	–	–	–	–	4
Malaria	11	7	12	9	9	2	30	2	5	4	7	7	–	2	4	7	–	118
Measles	27	8	10	22	26	28	18	3	9	24	76	30	21	12	1	6	–	321
Meningococcal meningitis	3	3	2	4	3	1	–	3	–	5	2	1	–	1	1	2	–	31
Meningococcal septicaemia	–	2	–	3	2	–	3	1	–	3	2	–	–	–	–	–	–	16
Meningococcal infection (NOS)	–	2	–	1	2	–	–	–	–	–	–	1	–	–	–	–	–	6
Mumps	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	2
Mycobacterial atypical	37	9	58	5	5	5	29	5	1	17	9	2	–	1	2	–	–	185
Mycobacterial tuberculosis	18	25	18	30	19	2	11	1	3	8	3	3	1	–	2	–	–	144
Mycobacterial infection (NOS)	4	2	3	–	2	1	21	1	–	1	4	–	1	–	3	–	–	43
Pertussis	16	53	48	45	66	27	38	12	33	41	296	13	17	15	4	12	–	736
Q fever	2	1	–	–	1	–	–	1	–	20	17	41	35	–	3	–	–	121
Rubella	–	–	2	–	7	1	4	1	–	–	4	4	1	–	2	–	–	26
Rubella – congenital	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Salmonella (NOS)	17	33	24	31	32	19	38	14	9	23	55	29	21	11	19	5	–	380
Salmonella bovis morbificans	–	1	1	1	1	1	2	–	1	2	–	–	–	–	–	–	–	10
Salmonella typhimurium	20	21	13	10	51	10	31	13	15	18	9	10	7	10	21	2	–	261
Syphilis	76	33	140	69	31	3	37	10	6	3	27	22	47	4	4	2	–	514
Tetanus	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	2
Typhoid and paratyphoid	3	2	2	–	1	1	–	–	–	–	1	3	–	–	–	2	–	15

TABLE 7

SURVEILLANCE OF NON-NOTIFIABLE SEXUALLY TRANSMITTED DISEASES
JANUARY-JULY 1994
(Diagnoses from sexual health centres unless otherwise stated in footnote)

* First diagnosis; 1. 01/01/94-30/04/94; 2. 01/01/94-31/01/94; 3. 01/01/94-31/03/94; 4. 01/01/94-31/07/94; 5. 01/01/94-30/06/94; 6. 01/01/94-31/05/94; 7. No SHC in Region; 8. Laboratory and SHC data 01/01/94-31/05/94; 9. No data yet received for 1994.

AHS Infection		CSA[1]	SSA[2]	ESA[1]	SWS[2]	WSA[3] + WEN	NSA[4]	CCA[4]	ILL[3]	HUN[6]	NC[5]	ND[5]	WD[6]	CW[7]	SW[8]	SE[9]	Total
Chlamydia trachomatis	Male	1	–	23	1	6	2	1	3	8	–	5	6	–	–	–	56
	Female	1	–	27	1	7	1	1	4	12	1	17	14	–	5	–	91
	Total	**2**	**–**	**50**	**2**	**13**	**3**	**2**	**7**	**20**	**1**	**22**	**20**	**–**	**5**	**–**	**147**
Donovanosis	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Total	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
*Genital herpes	Male	3	1	108	–	12	8	11	–	13	6	2	1	–	4	–	169
	Female	4	3	49	–	9	6	8	2	14	5	7	4	–	4	–	115
	Total	**7**	**4**	**157**	**–**	**21**	**14**	**19**	**2**	**27**	**11**	**9**	**5**	**–**	**8**	**–**	**284**
*Genital warts	Male	11	6	278	19	74	17	30	28	64	25	4	6	–	5	–	567
	Female	8	6	134	9	37	17	16	6	24	8	13	13	–	5	–	299
	Total	**19**	**12**	**412**	**28**	**111**	**34**	**46**	**34**	**88**	**33**	**20**	**19**	**–**	**10**	**–**	**866**
Nongonococcal urethritis	Male	3	1	215	12	55	11	22	9	35	12	6	5	–	3	–	389
	Female	–	–	–	–	3	2	–	–	–	–	–	2	–	2	–	9
	Total	**3**	**1**	**215**	**12**	**58**	**13**	**22**	**9**	**35**	**12**	**6**	**7**	**–**	**5**	**–**	**398**
Lymphogranuloma venereum	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Total	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**

TABLE 8

INFECTIOUS DISEASE NOTIFICATIONS FOR 1994 FOR NOTIFICATIONS RECEIVED BY JULY 29, 1994 BY SELECTED MONTH OF ONSET

Condition	Apr	May	Jun	Jul	Total
Adverse event after immunisation	5	2	2	–	9
AIDS	26	11	10	7	54
Arboviral infection	55	62	31	4	152
Foodborne illness (NOS)	65	16	8	–	89
Gastroenteritis (instit.)	48	15	21	3	87
Gonorrhoea	32	21	20	9	82
H influenzae epiglottitis	2	4	4	–	10
H influenzae meningitis	2	1	4	–	7
H influenzae septicaemia	2	1	2	1	6
H influenzae infection (NOS)	2	1	1	–	4
Hepatitis A – acute viral	48	36	40	13	137
Hepatitis B – acute viral	11	14	5	4	34
Hepatitis B – chronic/carrier	48	50	38	3	139
Hepatitis B – unspecified	259	331	252	60	902
Hepatitis C – acute viral	–	1	–	–	1
Hepatitis C – unspecified	562	662	656	160	2,040
Hepatitis D – unspecified	1	–	1	–	2
HIV infection	30	42	27	24	123
Hydatid disease	–	–	4	1	5
Legionnaires' disease	10	4	6	3	23
Leprosy	–	1	1	–	2
Leptospirosis	1	2	1	–	4
Malaria	14	10	18	7	49
Measles	14	20	16	11	61
Meningococcal meningitis	6	3	6	3	18
Meningococcal septicaemia	1	4	3	4	12
Meningococcal infection (NOS)	1	1	2	1	5
Mumps	–	–	1	–	1
Mycobacterial atypical	21	19	7	–	47
Mycobacterial tuberculosis	18	16	12	2	48
Mycobacterial infection (NOS)	8	9	9	2	28
Pertussis	90	143	58	23	314
Q fever	18	23	12	3	56
Rubella	1	5	–	–	6
Salmonella (NOS)	61	53	44	11	169
Salmonella bovis morbificans	2	1	–	–	3
Salmonella typhimurium	50	27	16	7	100
Syphilis	84	74	55	20	233
Tetanus	1	1	–	–	2
Typhoid and paratyphoid	3	–	2	–	5
Total	1,602	1,686	1,395	386	5,069

TABLE 9

SUMMARY OF NSW INFECTIOUS DISEASE NOTIFICATIONS JUNE 1994

Condition	Number of cases notified			
	Period		Cumulative	
	July 1993	July 1994	July 1993	July 1994
Adverse reaction	–	–	12	9
AIDS	33	7	222	54
Arboviral infection	10	4	595	152
Brucellosis	–	–	2	–
Cholera	–	–	–	–
Diphtheria	–	–	–	–
Foodborne illness (NOS)	4	–	82	89
Gastroenteritis (instit.)	17	3	275	87
Gonorrhoea	24	9	214	82
H influenzae epiglottitis	2	–	26	10
H influenzae B – meningitis	6	–	40	7
H influenzae B – septicaemia	2	1	17	6
H influenzae infection (NOS)	2	–	10	4
Hepatitis A	47	13	383	137
Hepatitis B	366	67	2,181	1,075
Hepatitis C	590	160	3,365	2,041
Hepatitis D	2	–	7	2
Hepatitis, acute viral (NOS)	1	–	5	–
HIV infection	56	24	346	258
Hydatid disease	–	1	1	5
Legionnaires' disease	2	3	44	23
Leprosy	–	–	1	–
Leptospirosis	1	–	10	4
Listeriosis	1	–	6	–
Malaria	10	7	109	49
Measles	87	11	407	61
Meningococcal meningitis	4	3	28	18
Meningococcal septicaemia	4	4	19	12
Meningococcal infection (NOS)	2	1	7	5
Mumps	–	–	1	1
Mycobacterial tuberculosis	51	2	251	48
Mycobacterial – atypical	27	–	239	47
Mycobacterial infection (NOS)	2	2	21	5
Pertussis	101	23	341	314
Plague	–	–	–	–
Poliomyelitis	–	–	–	–
Q fever	39	–	234	56
Rubella	62	–	272	169
Salmonella infection (NOS)	57	18	628	272
Syphilis	69	20	422	233
Tetanus	–	–	4	2
Typhoid and paratyphoid	–	–	18	5
Typhus	–	–	–	–
Viral haemorrhagic fevers	–	–	–	–
Yellow fever	–	–	–	–

Abbreviations used in this Bulletin:
CSA Central Sydney Health Area, SSA Southern Sydney Health Area, ESA Eastern Sydney Health Area, SWS South Western Sydney Health Area, WSA Western Sydney Health Area, WEN Wentworth Health Area, NSA Northern Sydney Health Area, CCA Central Coast Health Area, ILL Illawarra Health Area, HUN Hunter Health Area, NC North Coast Public Health Unit, ND Northern District Public Health Unit, WNSW Western New South Wales Public Health Unit, CW Central West Public Health Unit, SW South West Public Health Unit, SE South East Public Health Unit, OTH Interstate/Overseas, U/K Unknown, NOS Not Otherwise Stated.

Please note that the data contained in this Bulletin are provisional and subject to change because of late reports or changes in case classification. Data are tabulated where possible by area of residence and by the disease onset date and not simply the date of notification or receipt of such notification.