



SUICIDE MORTALITY IN NSW: GEOGRAPHIC VARIATIONS

Gavin Stewart, Jennifer Chipps and Geoffrey Sayer
Mental Health Epidemiology
Epidemiology Branch
Public Health Division, NSW Health Department

This is the first of a series of articles on the epidemiology of suicide in NSW. We examine pooled suicide mortality data for Area and District Health Services from the time of the introduction of the ICD9-CM cause of death coding in 1979 to the most current complete year for which death data are available (1992). The analysis serves as the basis for considering how NSW could establish appropriate local targets and corresponding monitoring processes.

Although suicide is a major cause of mortality, it is nevertheless a relatively rare event. Even with nationwide Australian data, it would be difficult to conclude, on conventional statistical grounds, that a 10 per cent change in the general population suicide rate is more than a chance fluctuation in a stable process¹. It may be just feasible to monitor progress towards the national mental health target² of a 15 per cent reduction in the expected Australian suicide rate over 10 years, and perhaps the more specific objectives for particular target groups, but only at the national level.

On the other hand, most of the action needed to achieve these objectives will take place at the State level, where the ability to monitor change, especially in States with smaller populations, is limited. In Western Australia the State Task Force "considered the question of whether it is reasonable to set specific goals for the reduction of suicide in the general population" and decided that "current knowledge and capacity to intervene preclude this course" given that "suicide is a final common outcome of diverse disorders, risk exposures and the availability of means, and given that many of these influences have their origin outside the health system"³. Within the decentralised health system in NSW, most of the program activity will be the responsibility of Area and District Health Services, many of which have quite small populations. How, then, are we to monitor the outcomes of this activity in NSW?

One standard approach to monitoring rare outcomes in small populations is to pool data over a longer period, so that enough "population years" of risk exposure can be accumulated to allow stable estimation of baseline rates. This report is designed to show the effects of applying that approach to NSW suicide rate data at the Area and District level.

Continued on page 50 ►

Contents

Articles

49 *Suicide mortality in NSW:
geographic variations*

53 *Public Health Abstracts*

56 *Infectious Diseases*

Correspondence

Please address all
correspondence and potential
contributions to:

The Editor,
NSW Public Health Bulletin,
Public Health Division,
NSW Health Department
Locked Bag No 961,
North Sydney NSW 2059
Telephone: (02) 391 9191
Facsimile: (02) 391 9029

Suicide mortality in NSW

► Continued from page 49

METHODS

Australian Bureau of Statistics suicide mortality data for Area and District Health Services were pooled over the period 1979-92 and indirectly standardised relative⁴ to the pooled data for NSW in the same period. Indirectly Standardised Mortality Ratios (SMRs) were scaled in the conventional way so that SMR=100 for NSW as a whole. This standardisation was adjusted for differences in the age-sex composition of the pooled population of that Area or District relative to the pooled NSW population. Thus an SMR of 120 for an Area or District means it had a pooled suicide rate which was 20 per cent higher than that for NSW as a whole over the same period.

Conventional 99 per cent confidence intervals were calculated for each SMR based on the usual assumption of Poisson-distributed events.

RESULTS

A total of 8,747 deaths in NSW was attributed to suicide over the 14-year period 1979-92, giving a crude pooled suicide mortality rate of 12/100,000 population a year. Data on age, sex and place of residence were complete for 8,731 deaths (99.8 per cent).

Figure 1 shows the SMRs for suicide in NSW by Health Areas and Districts and corresponding 99 per cent confidence interval error bars. The shaded area for $SMR \leq 90$ illustrates the general target range of a reduction of 10 per cent or more in the Statewide suicide rate.

Most of the SMRs fell within a fairly narrow range around that for NSW as a whole, and most of the 99 per cent confidence intervals include SMR=100, so for these Areas and Districts it cannot be concluded on conventional statistical grounds that their SMRs varied from the State average.

By contrast, Southern Sydney and South Western Sydney Area Health Services had SMRs detectably lower than that of the State as a whole, while Central Sydney and Eastern Sydney Area Health Services, as well as the Far West District, had detectably higher SMRs.

The slightly higher SMRs for Central Sydney and Eastern Sydney Area Health Services represented an average of 30 excess deaths a year in those two Areas, or about 5 per cent of the total State suicide mortality for the period 1979-92. The extremely high SMR in the Far West District, on the other hand, represents an average of 3.3 excess deaths a year, or only 0.5 per cent of the State total, since the average population of the District was 30,000 from 1979-92.

DISCUSSION

Clearly, even when 14 years of risk experience is accumulated by pooling data and conventional 99 per

cent confidence intervals are used to define random variation, the rarity of suicide makes it almost impossible to detect other than extreme variations in relatively small populations such as those of District Health Services. Even if another 14 years of pooled risk experience for, say, the period 1993-2006 were to be compared with the data shown here, only very large differences would be reliably detectable. In a single year of data, the confidence intervals would be almost four times the width of those shown in Figure 1. Thus observed changes in the annual suicide rate for an Area or District are unlikely to be useful outcome indicators for suicide prevention. It should be noted that this is equally true of other events which are similarly rare, for example motor vehicle accident deaths.

Pooling data in this way also changes the interpretation of the SMRs. The SMR estimates in Figure 1 reflect long-term influences over 14 years on the suicide rates rather than short-term factors. The excess mortality rates of Central and Eastern Sydney Area Health Services, for example, may be associated with typical chronic risk factors in inner-city areas, such as socioeconomic stresses, or a high concentration of people with disabling mental illness. Similarly, since all the Western Districts have higher than average rates, there may be common factors involved, such as isolation, and the rate of suicide in youth or Aboriginal populations would also need to be considered. There may be specific local factors contributing to the chronic high rate in the Far West District, since the bulk of the population lives in the city of Broken Hill.

In summary, the evidence presented serves to make a number of important points about ways of monitoring progress towards targets for reduction in the Statewide suicide rate. In general, it is unlikely that focusing on variation among Area and District Health Services in observed suicide rates will be a valid or useful approach. We therefore agree with the conclusion of the Western Australian Task Force on State Health Goals and Targets. Although there are particular problems which affect the populations of the three local health services, it is also clear that these are chronic, and unlikely to be easily changed. Moreover, in total they contribute only one-third of the reduction that would be required to meet the national target.

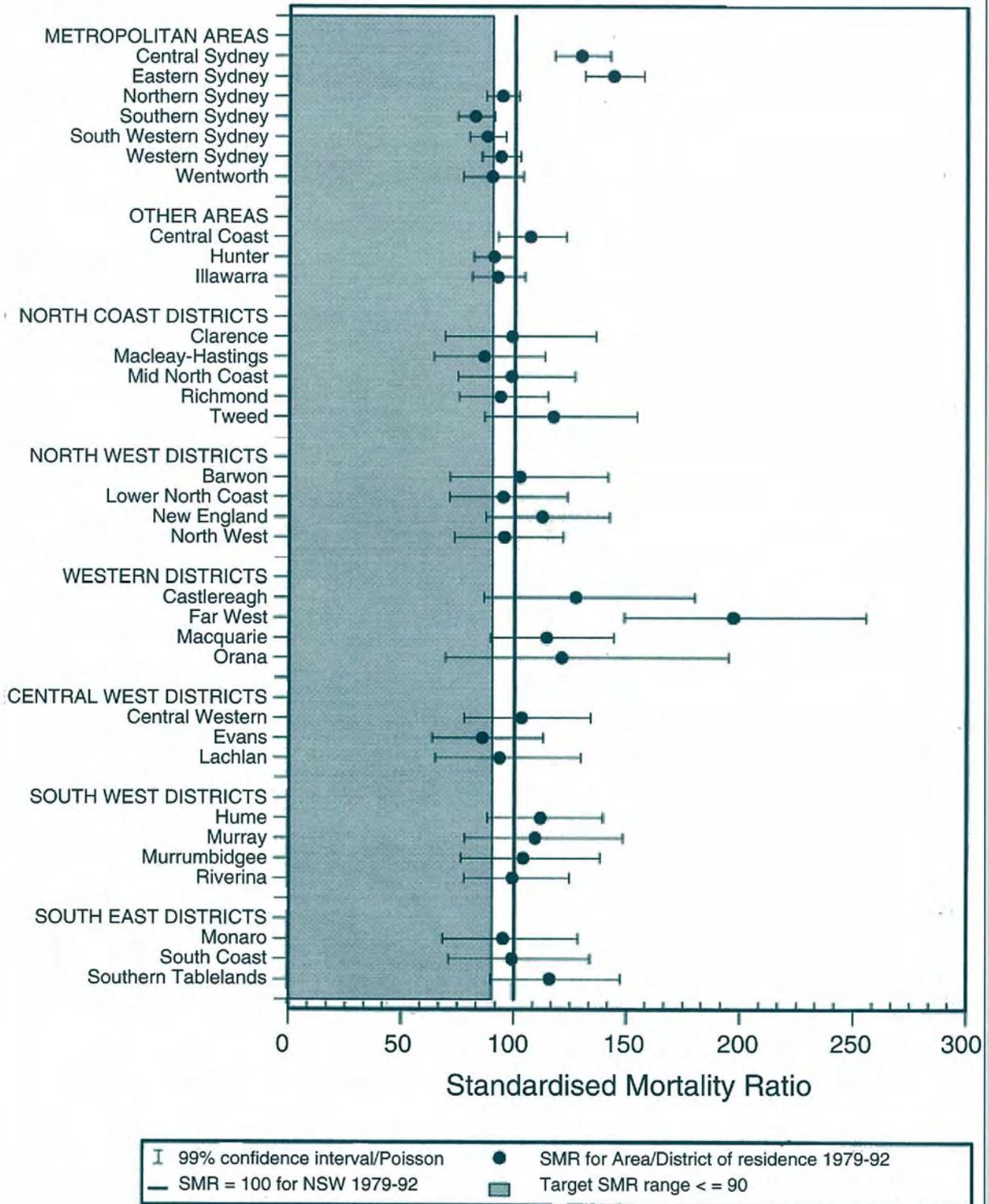
CONCLUSIONS AND RECOMMENDATIONS

The conventional approach of using 99 per cent confidence intervals around an outcome indicator to classify a particular service, or administrative unit, or population subgroup as showing "excessive" variation, is relatively useless when applied to rare events such as suicide. This is an important point, since it focuses attention on the need to find alternatives. We are considering the alternatives listed below and would

Continued on page 52 ►

FIGURE 1

**SMRs FOR SUICIDE
NSW POPULATION 1979-92**



Source: Epidemiology Branch, ABS deaths 1979-92, registered by 1993

Suicide mortality in NSW

► Continued from page 50

welcome comments and suggestions on any of the matters raised in this report.

Clinical audit

There are about 700 deaths by suicide each year in NSW. Ordinary data sources record very little information about these deaths, so the debate on prevention tends to repeat the same limited number of themes. The United States experience of setting goals and targets for specific population subgroups identified in this way is not encouraging. For example, in 1980 a target was set to achieve "a reduction in the rate of youth suicide to 11/100,000 from a baseline of 12.4/100,000 in 1978" but in reality "at the midpoint of this effort – 1985 – the youth suicide rate had increased to 12.9%". Very few of the interventions targeted at "youth" had been evaluated, or were known to be effective.

Setting up clinical audit for all suicide deaths in NSW, and exploring the immediately preceding histories to identify possible preventive approaches, has at least as much merit as other approaches to suicide. In addition, such an approach can be developed at the local level, can address local problems, and visibly meets community expectations that suicide deaths will be given serious attention.

Control charts

There are many sophisticated procedures for monitoring rare events, mainly developed for industrial process control⁵, and these can be adapted to monitor small area suicide data⁷. However, as a recent review article in the media has shown⁸, when four teenage deaths occur over a fortnight in a small area, the local population is unlikely to await, or even accept, a statistical evaluation before wanting to take action. To be effective as a monitoring tool, the control chart approach needs to be supplemented by others which allow a more timely response.

Mental health clients

Since April 1991 the Mental Health Services Branch of the NSW Health Department has operated an incident reporting system which obtains data on possible suicides of current and former clients of mental health services, as and when these become known to the service. A separate report on these data is being prepared. Although it is difficult to relate the data to well-defined population groups, service-based information of this kind

can be useful in identifying factors that may be relevant to a group at particularly high risk⁹.

Self-poisoning patients

The Self-Poisoning Patient Research Group from the departments of Psychiatry and Clinical Pharmacy and Toxicology at the Mater Misericordiae Hospital, Newcastle, has established a specialised service which has monitored self-poisoning incidents for many years. With funding from the NSW Health Outcomes Program, this work is being expanded. Extension of it to other settings provides one of many possibilities for monitoring non-fatal suicide attempts and initiating preventive action. With about 3,500 self-poisoning incidents a year in NSW, there is also some possibility of identifying change in smaller populations or over a shorter time period.

1. Gunnell D, Frankel S. Prevention of suicide: Aspirations and evidence. *Br Med J* 1994; 308:1227-33.

These authors note that the total (unmatched) sample size needed to have 80 per cent power to detect a 15 per cent change (with two-sided 5 per cent significance level) in the England and Wales general population suicide rate of 10/100,000 people a year is 12.9 million, concluding: "Controlled clinical trial must be used where possible, although the sample sizes required to demonstrate the effectiveness of population-based interventions, targeted at such a rare event, are very large."

2. Department of Health & Human Services. Better Health Outcomes for Australians: National Goals Targets and Strategies for Better Health Outcomes into the Next Century. Canberra: Australian Government Publishing Service, 1994.

3. Dobson SK, Penman AG and 2 others. Clinical Health Goals and Targets for Western Australia, Volume 1. First Report of the Western Australian Task Force on State Health Goals and Targets. Health Department of Western Australia, Perth, July 1994.

4. The standardisation program was adapted from a SAS routine supplied by Dr Tim Churches of the Health Informatics Unit.

5. National Committee for Injury Prevention and Control (US). Injury Prevention: Meeting the challenge. Published by Oxford University Press as a supplement to the *Am J Preventive Med* 1989; 5(3):255.

6. Montgomery DC. Introduction to statistical quality control, 2nd Ed. New York: John Wiley & Sons, 1991.

7. Gibbons RD, Clark DC, Fawcett J. A statistical method for evaluating suicide clusters and implementing cluster surveillance. *Am J Epidemiol* 1990; 132:S183-191 and commentary in *Am J Epidemiol* 1992; 135:1310-1314.

8. Bagnall D. Suicide Generation. *The Bulletin*, May 23, 1995, pp 16-19.

9. Goldacre M, Seagroatt V, Hawton V. Suicide after discharge from psychiatric inpatient care. *Lancet* 1993; 342:283-86.

EDITORIAL NOTE

The authors of this article have established a Mental Health Epidemiology Group (MHEG). Membership is open to people with a professional interest and expertise in mental health epidemiology and who contribute to the planning and publication of a series of publications and reports on important mental health topics. Articles are joint publications by the group as a whole, and authors are listed in order of their contribution to the particular report. The contact address is Mental Health Epidemiology Group, Public Health Division, NSW Department of Health, Locked Mail Bag 961, PO North Sydney 2059 (Fax: 391-9232, Internet email: gstew@gwsm.doh.health.nsw.gov.au).

PUBLIC HEALTH ABSTRACTS

Professor James S. Lawson, Professor and Head of the School of Health Services Management at the University of NSW, has prepared the following public health items from the literature.

HIGH DOSE METHADONE IMPORTANT FOR HEROIN ABSTINENCE

There is wide consensus that methadone maintenance treatment reduces drug use among opiate addicts. But standards for methadone dosages remain controversial. A study of programs in the US found that most use dosages well below 60mg a day and that doses above 70mg a day are necessary to prevent the ongoing use of heroin.

Hartel DM, Schoenbaum EE, Selwyn PA et al. Heroin use during methadone maintenance treatment: the importance of methadone dose and cocaine use. *Am J Public Health* 1995; 85:83-88.

DECLINE IN TOBACCO USE IN THE US SLOWS

Among adolescents the prevalence of smoking has fallen more rapidly from 1974 to 1980 (about 2 per cent a year) than from 1985 to 1991 (0 to 0.1 per cent). This is a similar trend to that experienced in Australia. Therefore, as few adults take up tobacco use, anti-tobacco programs should concentrate on young people.

Nelson DE, Giovino GA, Shopland DR et al. Trends in cigarette smoking among US adolescents, 1974 through 1991. *Am J Public Health* 1995; 85:34-40.

TEENAGE INITIATION FOR DRUG USE

Information about the natural history of drug use is scant, so a 20-year prospective study of drug use is of great value. The US study shows that with the exception of prescribed psychoactive medications, there is almost no initiation into alcohol and cigarettes and little into illicit drugs after the age of 29 years. The major risk for initiation into alcohol, cigarettes and marijuana is mostly over by age 20, with peaks at age 16 for cigarettes and 18 for alcohol and marijuana. The overall patterns of risk are very similar for men and women.

Chen K, Kandel DB. The natural history of drug use from adolescence to the mid-thirties in a general population sample. *Am J Public Health* 1995; 85:41-47.

WEAK EVIDENCE OF BIOLOGICAL INFLUENCES ON CRIMINAL BEHAVIOUR

For about 25 years researchers have reported correlations between a low cerebrospinal fluid concentration of a metabolite of the neurotransmitter, serotonin, and criminal behaviour. But meta analyses and gene studies do not confirm a direct association. The gene studies in a Dutch family show there are inherited learning disabilities which may lead to the abnormal behaviour rather than directly from

a genetic abnormality. Nevertheless, there have been suggestions that public policies should be developed from the supposed links between genetics and criminal behaviour, but this appears to be unjustified.

Alper JS. *Br Med J* 1995; 310:272-273.

HEPATITIS C IN AUSTRALIA

Diagnosis of hepatitis C has become possible only since 1989 with the cloning of the virus and the development of a serological assay for anti-HCV. The natural history of infection with hepatitis C is also not known with any confidence. Experiences in Melbourne have led to an increase in knowledge about the infection. Observations include that:

- Injecting drug use is the major risk factor for chronic HCV infection in Australia.
- Many carriers of the virus had chronic hepatitis.
- This hepatitis led to cirrhosis in many patients. Such cirrhosis was directly correlated with the time since first infection with the virus – a median time of 18 years.

Strasser SI, Watson KJR, Lee CS et al. Risk factors and predictors of outcome in an Australian cohort with hepatitis C virus infection. *Med J Aust* 1995; 162:355-358.

THE NEED TO IMPROVE STORAGE OF VACCINES

Vaccines lose their potency before their expiry date if storage conditions are not appropriate. For example, 12.5 per cent of vaccines have been found to be impotent in Australia when stored in adverse conditions. A review of storage conditions in general medical practices in Sydney has found that about 30 per cent of practices did not meet the required standards for storage. This has important implications as GPs provide about 70 per cent of all vaccinations.

Liddle LM, Harris MF. How general practitioners store vaccines. *Med J Aust* 1995; 162:366-368.

TOBACCO SMOKING AND FACIAL WRINKLING

Hard evidence has been missing to link tobacco with premature facial wrinkling. A substantial cross-sectional study in the US has confirmed there is an association between facial wrinkling and tobacco smoking. The increased risk of wrinkling is equivalent to about 1.4 years of ageing.

Ernster VL, Grady D, Muke R et al. Facial wrinkling in men and women by smoking status. *Am J Public Health* 1995; 85:78-82.

Continued on page 54 ►

► Continued from page 53

HIGH RISK OF SPREAD OF BLOODBORNE VIRUSES IN PRISONS

A study based in Victoria has shown that 46 per cent of prison entrants used injected drugs, 33 per cent had antibodies to hepatitis B, 64 per cent to hepatitis C and 0.5 per cent to HIV. As 36 per cent of prisoners in Australian prisons inject themselves and 12 per cent participated in anal intercourse there is a risk of bloodborne infection with viruses in prisoners.

Crofts N, Stewart T, Hearne P et al. Spread of blood borne viruses among Australian prison entrants. *Br Med J* 1995; 310:285-286.

LINKING RECORDS REVEALS VACCINE-RELATED ILLNESS

The main vaccine-related illness is convulsions. A British study has shown that by linking hospital records with vaccine records the incidence of convulsions related to a vaccination is about five times that previously identified. This linkage has practical implications when vaccine schedules are being changed and new vaccines introduced.

Farrington P, Pugh S, Colville A et al. A new method for active surveillance of adverse events from diphtheria/tetanus/pertussis and measles/mumps/rubella vaccines. *Lancet* 1995; 345:567-569.

CHLORINATION OF WATER SUPPLIES AND CANCER

Chlorine has been added to water supplies for more than 80 years and has contributed to the reduction in typhoid and other waterborne disease. But there is increasing evidence that chlorine interacts with organic matter in the water to produce carcinogenic chemicals. It is not proven that these chemicals produce an increase in cancer in humans but they do in experimental animals. Studies have also shown increased rates of bladder, colon and rectal cancers in human populations that consume chlorinated water. A study in Finland reported an increased rate of cancer of the bladder of 20 per cent and a 20-40 per cent increased risk for kidney cancer, associated with consumption of chlorinated water. The authors of the studies indicate the results should be treated with caution because they are based on aggregate populations.

Koivusalo M, Jaakkola JJK, Vartiainen T et al. Drinking water mutagenicity and gastrointestinal and urinary tract cancers: an ecological study in Finland. *Am J Public Health* 1994; 84:1223-1228.

FAILURE TO VACCINATE, NOT VACCINE FAILURE

Between June and December 1993 there was an outbreak of measles in Western Sydney that resulted in 900 cases being notified. A case control study has

shown that the effectiveness of the vaccine approached 95 per cent. The vaccination coverage in children aged 1-6 years in Western Sydney was about 85 per cent. This is below the level required for "herd" immunity (95 per cent) which is required to prevent outbreaks of communicable diseases such as measles. This is a reassuring finding, as there had been indications that 50 per cent of vaccinated children were sero negative for measles.

McDonnell LF, Jorm LR, Patel MS. Measles outbreak in Western Sydney. *Med J Aust* 1995; 162:471-475.

HELICOBACTER PYLORI – ITS ROLE IN PEPTIC ULCERS

It is 10 years since Marshall in Perth drank a broth of *Helicobacter pyloridis* and underwent gastroscopy by a colleague a few days later which showed some acute changes of gastritis. This dramatic experiment, in the best traditions of self-trials, may have obscured the need for proving the link between this infection and peptic ulcers as there has been no attempt to prove Koch's postulates. It may be that *helicobacter pylori* is an opportunist who operates only when there is already damage to the peptic mucosa and when there is high acid environment.

Graham JR. *Helicobacter pylori*: human pathogen or simply an opportunist. *Lancet* 1995; 345:1095-1097.

REINTRODUCTION OF AN EFFECTIVE TREATMENT FOR SCHIZOPHRENIA

In 1990 clozapine was reintroduced as a treatment for schizophrenia. It had been withdrawn in 1971 because of an association with agranulocytosis. The clinical benefits of clozapine are now apparent, with a tenfold reduction in suicide rates among a 6,300 cohort of individuals treated with this medication. There have been two deaths due to agranulocytosis. Clozapine is expensive but represents the most important treatment advance for schizophrenia for more than 20 years.

Kerwin RW. Clozapine: back to the future for schizophrenia research. *Lancet* 1995; 345:1063-1064.

CHANGES IN RISK FACTORS EXPLAIN TWO-THIRDS OF THE FALL IN STROKE

Mortality from stroke has been falling for 25 years in most economically developed countries. It is known that the most important risk factor for stroke is elevated blood pressure, and that a fall in the diastolic blood pressure of about 5mm Hg is associated with a 35-40 per cent fall in stroke mortality. Low serum cholesterol concentration is a risk factor for cerebral haemorrhage but not subarachnoid haemorrhage. A large study in Finland has shown that between 1972 and 1992 the mortality rate from stroke fell by 66 per cent in men and 60 per

cent in women. Two-thirds of this fall was attributed to lower blood pressure and lower smoking rates in both sexes, and to lower serum cholesterol in men.

Vartiainen E, Sarti C, Tuomilehto J et al. Do changes in cardiovascular risk factors explain changes in mortality from stroke in Finland? *Br Med J* 1995; 310:901-904.

EDUCATION PROTECTS AGAINST DEMENTIA

The prevalence of dementia increases exponentially with age. About two-thirds of dementia cases are of the Alzheimer's type and one-third of the vascular type. A Dutch study has shown that both forms of dementia are less common in individuals with higher levels of education. They have also shown that this finding is not due to the higher levels of cardiovascular disease in less-educated people. The reasons for the findings are not clear.

Ott A, Breteler MMB, van Harskamp F et al. Prevalence of Alzheimer's disease and vascular dementia: association with dementia. *Br Med J* 1995; 310:970-973.

FISH AND HEART DISEASE

Eating fish appears to confer some protection against heart disease, as does the consumption of red wine, perhaps aspirin and more certainly low-fat diets. The largest study to date has not confirmed the fish-heart disease link. But there may be some problems with the study population. In particular, many participants had increased their diet of fish before the study and may have done so because they may have been at greater risk of heart disease. There is probably some protection offered by having fish in the diet, but more fish is not necessarily better.

Katan MB. Fish and heart disease. *N Engl J Med* 1995; 332:1024-1025. Ascherio A, Rimm EB, Stamfer MJ et al. Dietary intake of marine n-3 fatty acids, fish intake, and the risk of coronary heart disease among men. *N Engl J Med* 1995; 332:977-82.

SUN INCREASES MELANOTIC NAEVI IN QUEENSLAND CHILDREN

Malignant melanoma is a major cause of death from cancer in Australia. The incidence rates rose substantially in the 1980s. Retrospective studies have linked melanoma with exposure to the sun in childhood, but this study is the first to record the high incidence of melanotic naevi, the precursors of melanoma, in a prospective study. The increased naevi in Queensland children observed in this study appear to be associated with direct sunlight and indirect sunlight. There is a risk of melanoma for fair-skinned people who live in Australia and more so for those who live in the north.

Harrison LS, MacLennan R, Speare R, Wronski I. Sun exposure and melanotic naevi in young Australian children. *Lancet* 1994; 344:1529-32.

PERSONALITY CHARACTERISTICS INFLUENCE SUCCESS OR FAILURE

A study of 50 senior health, welfare, education and research managers in Australia has shown the vital importance of "personality traits" to their success or failure. Most of the 50 were clever, hard-working and ambitious, and most – but not all – had the expertise required for the task. However, 25 per cent were not successful. About 15 per cent failed because of personality traits. The two most adverse traits were:

- self-centred behaviour which led to constant seeking of promotion without staying sufficiently long in the same place to achieve some success for the organisation; and
- untrustworthy behaviour, typically by managers who were sycophantic to their bosses but dictatorial to subordinates and who "played favourites" on an irregular basis.

The study showed that successful managers could have a range of personality characteristics. Some were extroverted and others introverted. But all had the virtues of trust, commitment to the organisation and to their colleagues, plus appropriate expertise.

Lawson JS. Success and failure among senior public administrators. The key role of personality. *Intern J Career Management* 1994; 6:10-13.

IODINE DEFICIENCY IN ENDEMIC CRETINISM

Endemic cretinism caused by severe iodine deficiency, particularly during pregnancy, is the world's most common preventable cause of mental retardation. Proof of the causal relation of iodine deficiency was provided by studies in Papua New Guinea. This conclusion has been given support by a new China-based study. It is possible that as many as 20 million people worldwide have preventable brain damage due to the effects of iodine deficiency on foetal brain development.

Hetzel BS. Iodine deficiency and foetal brain damage. *N Engl J Med* 1994; 331:1770-1771.

HODGKIN'S DISEASE – BOTH ENVIRONMENTAL AND GENETIC?

Mack et al in a study of twins have shown there is a significant genetic component to Hodgkin's disease. This does not exclude an environmental component such as the Epstein-Barr virus. There is an increasing body of knowledge which indicates that genetics is an important predisposing factor for many cancers.

Mack TM et al. Concordance for Hodgkin's disease in identical twins suggesting genetic susceptibility to the young-adult form of the disease. *N Engl J Med* 1995; 332:413-8.

INFECTIOUS DISEASES

STATEWIDE SENTINEL IMMUNISATION SURVEILLANCE

During 1995 Public Health Units (PHUs) are carrying out surveillance of immunisation status of children attending child care facilities. Under the Public Health Act 1991 directors of child care facilities are required to keep registers of the immunisation status of every enrolled child. A cluster sampling method has been developed, staggered throughout the year, to collect data on a total of 884 children aged 25-36 months – about 1 per cent of the NSW population in that age range. Any child with missing immunisation records is regarded as not immunised.

All children in the group were born before the introduction of *Haemophilus influenzae type b* vaccine on May 1, 1993 and were therefore not required to be immunised. However, a voluntary catch-up program was conducted for children under five years of age and 18 children in the sample (9.4 per cent) were fully immunised with Hib as a result.

Immunisation rates in the community appear to have improved markedly over the past five to six years. Table 1 shows immunisation rates of children up to six years of age in the 1989-90 National Health Survey for comparison. The differences in sampling should be noted when comparing immunisation rates: one is a cluster sample of two-year-old child care attendees using immunisation records to measure immunisation status, while the other comprises randomly selected children up to six years of age for whom immunisation records were available in less than 50 per cent of cases. Updated results from 1995 surveillance are published quarterly.

TABLE 1

IMMUNISATION RATES FOR NSW CHILDREN, 1989-90 AND 1995 (JAN-MAY)

	Vaccine	Per cent immunised
1995 (Jan-May) 2 years child care attendees (n=197)	DTP	82.2
	Sabin	90.1
	MMR	95.7
	All	79.7
1989-90 0-6 years National Health Survey	DTP	84.9
	Sabin	72.3
	Measles	84.6
	Mumps	78.2
	All	51.6

DTP: diphtheria, tetanus, pertussis

Sabin: polio

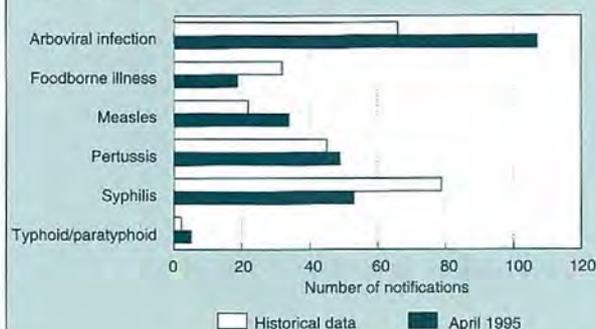
MMR: measles, mumps, rubella

TYPHOID AND PARATYPHOID

More notifications of cases of typhoid and paratyphoid infection have been received this year than for the same period in previous years (Figure 2, Table 4). All the 23 cases notified so far in 1995 were acquired overseas. Just over half (52 per cent, n=12) of the notifications were from either the Eastern Sydney or Southern Sydney Area. Of these, six patients had recently returned or arrived from Indonesia. The remaining patients had recently returned or arrived from other countries in Asia or the Middle East. Two cases occurred in members of a family from Southern Sydney and both individuals worked as food handlers. They were advised not to handle food until they were proven clear of infection by three consecutive negative stool cultures.

FIGURE 2

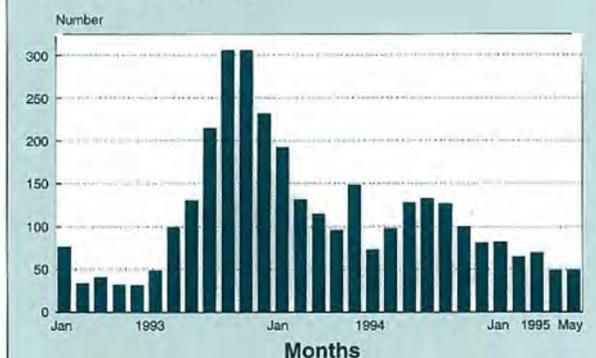
SELECTED INFECTIOUS DISEASES: APRIL 1995 COMPARED WITH HISTORICAL DATA



*Historical data: the average number of notifications diagnosed in the same month in the previous three years

FIGURE 3

PERTUSSIS NOTIFICATIONS, NSW JANUARY 1993-MAY 1995



Infectious Diseases Surveillance System

PERTUSSIS (WHOOPIING COUGH)

Notifications for pertussis continue at moderate levels throughout the State. The last peak in notifications was in September 1994. Notifications are being received at 46 per cent of the level for the same period in 1994, i.e. 26.4 notifications/100,000 population for the first five months of 1994, compared with 12.2 for the same period in 1995. Richmond District, on the north coast, has recorded the highest notification rate for NSW so far this year (85.2/100,000 population).

Nineteen per cent of notifications were for children aged less than five years. A further 42 per cent of notifications were for school-aged children, compared with 36 per cent for a similar period in 1994. The mean age for notifications was 21.1 years.

In June a six-week-old infant died of pertussis in the Hunter Area. This unfortunate incident highlights yet again the potential for *Bordetella pertussis* to produce serious, even fatal, illness.

MEASLES

Measles notifications continue to decrease from the peak of 350 a month reported in November 1994. The notification rate for the first five months of 1995 was 11.1/100,000 population. This compares with a rate of 24.2/100,000 population for 1994.

The Illawarra Area Health Service has received 47 measles notifications, a rate of 33.8/100,000 population.

FOODBORNE ILLNESS IN THE HUNTER

The increase in foodborne illness notifications in 1995 (253 cases) compared with the same period in 1994 (116 cases) has been largely due to outbreaks in the Hunter Area.

In January 1995 four people became ill with suspected scombroid poisoning after consuming tuna at a restaurant in the Hunter Area. Scombroid poisoning derives its name from Scombroidea, a suborder of larger, bony, marine fish that have oily flesh. This includes tunas, mackerels and bonito. The flesh of these fish may contain a toxic histamine-like substance which, if ingested, can cause the symptoms known as scombroid poisoning. The symptoms include epigastric pain, nausea, vomiting, headache, difficulty in swallowing, thirst, intense itching and urticaria. These symptoms usually subside within 12 hours of onset.

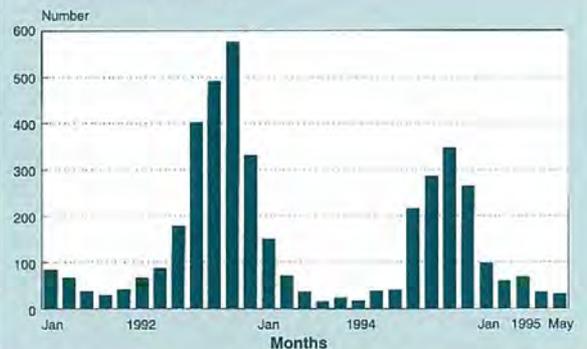
The Hunter PHU was notified of a suspected outbreak of food poisoning in February 1995. About 230 people attended four separate functions which were all catered jointly by three businesses. Foods varied for each function – two were provided with roast beef and pork, prepared salads and desserts. The other two were provided with roast beef. A total of 162 people were interviewed and the information was combined for analysis. Of those interviewed, 94 (58 per cent) had become ill. Symptoms of the illness were nausea, vomiting, abdominal cramps, watery diarrhoea and fever. The duration of illness was about 48 hours and the average time of the onset of symptoms was 38 hours after the meal was ingested.

Symptoms and incubation times of the illness suggested the causative organism was viral and the epidemic curve suggested a single point source of infection. It was determined that individuals who attended the two functions which were supplied with roast beef, pork, prepared salads and desserts experienced illness (70 per cent of people attending either function were ill). However, no food items were significantly implicated. The results of both the analysis of food samples and the inspections indicated the preparation of salads in the meat preparation area of a butcher shop and time/temperature abuse of the prepared salads were the likely causes of the outbreak. Food can become contaminated by coming into contact with surfaces that have been used to prepare uncooked meat. Further, if food handlers move between the preparation of uncooked meat and the handling of cooked foods or salads without washing their hands they are also a potential source of contamination.

A second outbreak occurred in the Hunter Area in February. This followed a meeting at an office attended by 30 staff. The meeting was catered for by a takeaway food shop. The Hunter PHU interviewed 24 of the staff members who became ill. Viral gastroenteritis was considered to be the likely cause of illness and the sandwiches supplied by the takeaway food shop the source of infection.

FIGURE 4

MEASLES NOTIFICATIONS, NSW
JANUARY 1993-MAY 1995



Infectious Diseases Surveillance System

SALMONELLA ON THE NORTH COAST

The North Coast PHU has had a high notification rate for *Salmonella* sp. so far this year, with 18.8 notifications/100,000 population in the first five months of the year compared with the State average of 9.7/100,000. Where the *Salmonella* species is recorded, 39 per cent were *S. Bredeney* and 19 per cent *S. typhimurium*. Data from follow-up questionnaires completed by individuals who became ill revealed no clear link between the cases except that they had consumed chicken. Contamination of food during its preparation at home is considered to be the likely cause of a large proportion of these cases. Once again, the cross-contamination of food between uncooked meats and cooked meats and salads is considered to be the primary mechanism of contamination. The PHU is planning a campaign to raise awareness about the hygienic preparation of food.

SURVEILLANCE OF OCCUPATIONAL EXPOSURE TO BLOODBORNE PATHOGENS

The NSW Health Department is establishing surveillance of occupational exposure to bloodborne pathogens in hospitals, as part of a national surveillance system.

The National Centre in HIV Epidemiology and Clinical Research (NCHECR) recently coordinated a substantial revision of the Epi Info based EPINet™ questionnaire for the Australian setting. This provides hospitals with a means to computerise surveillance, confidentially storing extensive information on the circumstances of an exposure, the management of the health care worker (HCW) and the serological testing results of the source patient and the HCW. The intention is to provide hospital infection control staff with an improved capacity to monitor their own hospitals and to compare their hospital with others. Full names are retained at the hospital and the remaining data are sent to the Department every six months. The Department forwards the data to NCHECR. Tabulations will be published in both the Bulletin and the HIV Surveillance Report. While information will include comparisons of the types of hospital, hospitals will not be identified in the comparisons.

EPINet™ has recently been distributed to about 30 NSW hospitals as the first step in establishing a Statewide surveillance system. EPINet™ is available without charge to hospitals that wish to participate in State and national

data collection. From early 1996 all hospitals will be encouraged to participate, but any additional hospitals wishing to begin this year would be welcome. Inquiries should be directed to Mr Rob Menzies, AIDS/Infectious Diseases Branch, ph (02) 391 9195.

INFLUENZA SURVEILLANCE

Influenza-like illness (ILI) activity in May was low, with moderate to high absentee rates in a few schools and high numbers of laboratory isolates of Respiratory Syncytial Virus (RSV).

Sentinel general practitioner surveillance for influenza was reported by eight PHUs up to the last week of May, representing about 70 doctors and 9,200 consultations a week. The consultation rates due to ILI have increased slowly since March. The rate for the first week of May was 1.3 per cent, while the rate for the third week of May was 2.5 per cent. Western Sydney and Wentworth Areas had the highest rates in April and May, with about 3 per cent of consultations being for ILI.

School absentee rates were reported by five PHUs, representing 13 schools and 9,200 pupils. The absentee rates in May were higher than in previous months (the average rate was 5 per cent). High absentee rates related to ILI were reported by the Western Sector PHU (which covers the Areas of Western Sydney and Wentworth) in the last three weeks of May. Central Western PHU, which monitors ILI in schools, reported high rates of ILI for two weeks in May.

Laboratories reported eight isolates of influenza A and

11 of influenza B by serology and one each of influenza A and influenza B by antigen detection for May. Twenty-one isolations of RSV and two of parainfluenza virus were reported for the last week of May. RSV is considered to be the predominant agent responsible for the increase in ILI cases in that period. The cumulative number of isolates of influenza virus, RSV and parainfluenza virus to the end of May was slightly higher than the number for the same period last year.

Outbreaks of the H1N1 influenza virus strain could be expected in Australia this year for the following reasons:

- increased circulation of the H1N1 subtype in the northern hemisphere and Asia;
- 1995 influenza activity in Australia began early in the season and spread quickly in the Northern Territory; and
- population immunity to H1N1 subtype is probably low since the last significant activity of this strain in Australia was in 1988.

Vaccination with the current influenza vaccine should protect individuals from the A/Texas/36/91-H1N1 like strain which is circulating in Australia. Individuals at risk of the severe complications of influenza infection, for example those over 65 years of age, the chronically ill or residents in chronic care facilities, should be immunised.

Revised NHMRC recommendations for influenza vaccination were described on page 33 of the April 1995 edition of the *Public Health Bulletin*.

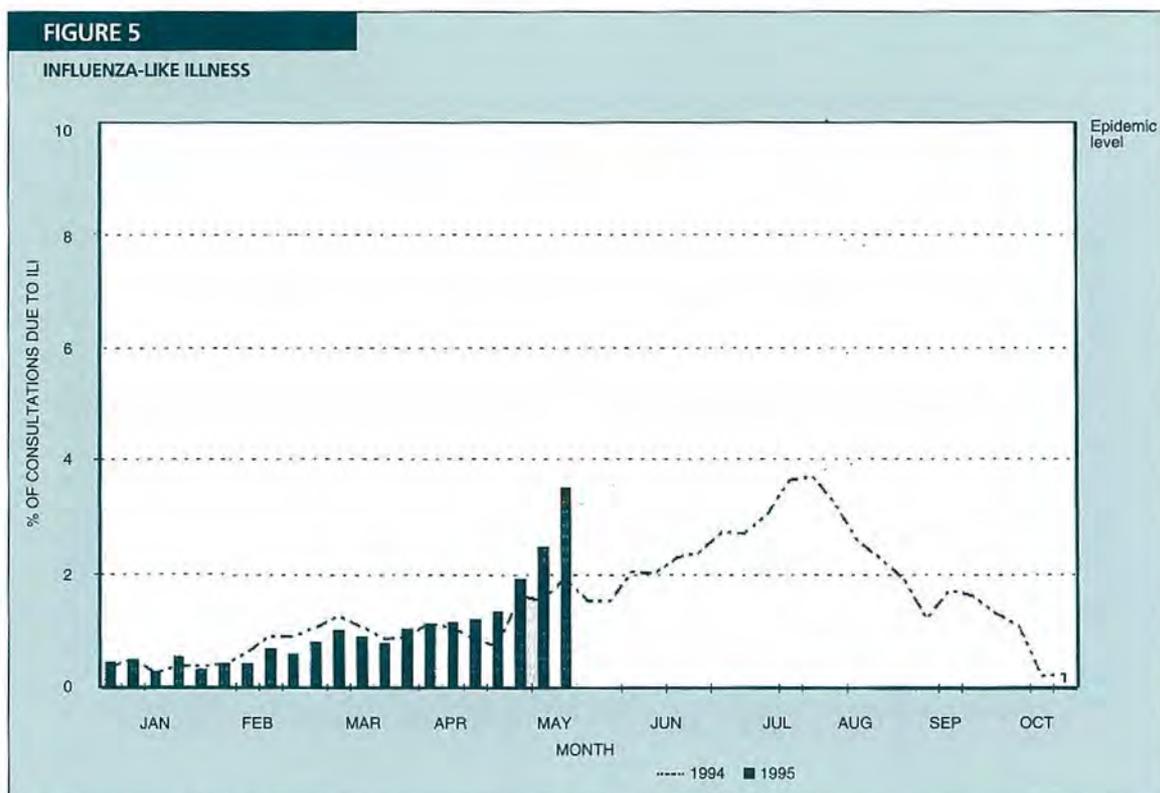


TABLE 2

INFECTIOUS DISEASE NOTIFICATIONS FOR 1995
BY SELECTED MONTH OF ONSET FOR NOTIFICATIONS
RECEIVED BY MAY 31, 1995

Condition	Feb	Mar	Apr	May	Total
Adverse event after immunisation	1	2	2	3	8
AIDS	23	23	14	5	65
Arboviral infection	29	178	107	43	357
Foodborne illness (> 2 related cases)	191	26	19	-	236
Gastroenteritis (instit.)	3	10	33	36	82
Gonorrhoea infection	37	39	29	11	116
H influenzae epiglottitis	-	1	2	-	3
H influenzae infection (NOS)	1	-	1	-	2
H influenzae meningitis	-	1	-	-	1
H influenzae septicaemia	1	2	-	1	4
Hepatitis A - acute viral	63	49	28	23	163
Hepatitis B - acute viral	3	8	7	-	18
Hepatitis B - chronic/carrier	38	42	31	11	122
Hepatitis B - unspecified	381	397	286	100	1,164
Hepatitis C - acute viral	9	7	3	1	20
Hepatitis C - unspecified	722	790	456	224	2,192
Hepatitis D - unspecified	4	-	2	-	6
Hydatid disease	-	3	-	-	3
HIV infection	52	49	31	35	167
Legionnaires' disease	7	11	1	1	20
Leptospirosis	-	-	1	-	1
Listeriosis	4	2	-	-	6
Malaria	2	3	3	4	12
Measles	59	66	34	31	190
Meningococcal infection (NOS)	1	2	2	1	6
Meningococcal meningitis	6	4	2	1	13
Meningococcal septicaemia	5	1	-	-	6
Mycobacterial atypical	35	32	3	2	72
Mycobacterial infection (NOS)	7	14	8	4	33
Mycobacterial tuberculosis	15	20	12	6	53
Pertussis	65	69	49	49	232
Q fever	21	9	9	5	44
Rubella	13	7	3	4	27
Salmonella (NOS)	201	119	95	40	455
Salmonella infection	1	-	-	-	1
Syphilis infection	61	76	53	37	227
Tuberculosis - non active	9	3	2	4	18
Typhoid and paratyphoid	12	2	5	-	19
Vibrio infection (non cholera)	1	-	-	-	1

TABLE 3

SUMMARY OF NSW INFECTIOUS DISEASE NOTIFICATIONS
MAY 1995

Condition	Number of cases notified			
	Period		Cumulative	
	May 1994	May 1995	May 1994	May 1995
Adverse reaction	3	3	19	11
AIDS	31	5	233	93
Arboviral infection	67	43	307	377
Brucellosis	-	-	-	-
Cholera	-	-	-	-
Diphtheria	-	-	-	-
Foodborne illness (NOS)	16	-	116	253
Gastroenteritis (instit.)	18	36	87	84
Gonorrhoea	24	11	158	147
H influenzae epiglottitis	4	-	14	3
H influenzae B - meningitis	1	-	6	3
H influenzae B - septicaemia	1	1	6	4
H influenzae infection (NOS)	1	-	7	2
Hepatitis A	39	23	244	237
Hepatitis B	446	111	1,842	1,703
Hepatitis C	784	225	3,600	2,981
Hepatitis D	3	-	11	8
Hepatitis, acute viral (NOS)	-	-	2	-
HIV infection	45	35	216	226
Hydatid disease	2	1	5	3
Legionnaires' disease	5	1	29	36
Leprosy	1	-	-	-
Leptospirosis	2	1	10	2
Listeriosis	-	-	4	6
Malaria	12	4	95	21
Measles	22	31	293	287
Meningococcal meningitis	3	1	22	15
Meningococcal septicaemia	4	-	10	7
Meningococcal infection (NOS)	2	1	4	9
Mumps	-	-	2	2
Mycobacterial tuberculosis	27	6	176	86
Mycobacterial - atypical	51	2	236	114
Mycobacterial infection (NOS)	6	4	19	45
Pertussis	148	49	682	314
Plague	-	-	-	-
Poliomyelitis	-	-	-	-
Q fever	29	5	133	62
Rubella	7	4	52	36
Salmonella infection (NOS)	82	40	680	601
Syphilis	88	37	469	313
Tetanus	1	-	-	-
Typhoid and paratyphoid	-	-	13	23
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, WN 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.

TABLE 4

**INFECTIOUS DISEASE NOTIFICATIONS FOR 1995
BY PUBLIC HEALTH UNIT FOR NOTIFICATIONS RECEIVED BY MAY 31, 1995**

Condition	CCA	CSA	CW	ESA	HUN	ILL	NC	ND	NSA	SE	SSA	SW	SWS	WEN	WN	WSA	U/K	Total
AIDS	-	25	-	29	5	1	8	-	10	-	8	-	3	3	-	1	-	93
Arboviral infection	4	2	-	5	6	23	145	26	2	139	3	9	-	1	12	-	-	377
Gonorrhoea infection	2	26	6	51	2	5	8	5	6	4	10	-	8	1	6	7	-	147
Hepatitis B - acute viral	-	3	-	2	-	-	1	2	-	1	1	-	2	1	5	1	-	19
Hepatitis B - chronic/carrier	11	-	5	97	-	-	3	7	-	-	3	-	-	4	6	36	-	172
Hepatitis B - unspecified	10	165	5	15	37	36	21	2	184	14	239	9	563	4	4	204	-	1,512
Hepatitis C - acute viral	-	-	-	2	-	-	-	-	-	1	-	-	-	2	14	1	-	20
Hepatitis C - unspecified	83	327	135	446	202	163	312	58	218	100	195	90	331	55	10	236	-	2,961
Hepatitis D - unspecified	-	-	-	1	-	-	3	-	-	-	1	-	3	-	-	-	-	8
Hydatid disease	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	3
HIV infection	1	16	1	49	2	1	7	-	6	-	8	-	6	3	-	4	122	226
Legionnaires' disease	-	1	-	1	6	5	-	1	4	-	-	-	2	1	-	15	-	36
Leptospirosis	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	2
Malaria	2	1	-	1	4	3	1	-	1	-	-	1	1	1	-	5	-	21
Meningococcal infection (NOS)	1	-	-	1	1	-	2	-	-	-	2	1	1	-	-	-	-	9
Meningococcal meningitis	1	1	1	-	2	3	1	1	1	1	2	-	1	-	-	-	-	15
Meningococcal septicaemia	-	2	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	7
Mycobacterial atypical	2	18	1	27	10	4	7	2	7	1	10	1	16	1	6	1	-	114
Mycobacterial infection (NOS)	3	2	-	-	2	-	4	-	9	-	1	-	22	-	-	2	-	45
Mycobacterial tuberculosis	-	10	-	3	5	2	1	2	16	1	14	-	6	2	1	23	-	86
Q fever	-	1	3	-	6	2	9	16	-	-	-	-	1	-	23	1	-	62
Syphilis	4	37	6	63	8	7	26	15	16	3	26	1	43	7	32	19	-	313

TABLE 5

**VACCINE PREVENTABLE AND RELATED CONDITIONS, NOTIFICATIONS FOR 1995
BY PUBLIC HEALTH UNIT, RECEIVED BY MAY 31, 1995**

Condition	CCA	CSA	CW	ESA	HUN	ILL	NC	ND	NSA	SE	SSA	SW	SWS	WEN	WN	WSA	Total
Adverse event after immunisation	-	-	-	-	-	-	-	2	-	1	1	5	-	2	-	-	11
H. influenzae epiglottitis	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	3
H. influenzae infection (NOS)	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2
H. influenzae meningitis	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
H. influenzae septicaemia	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	-	4
Measles	8	16	1	42	30	47	15	25	10	5	17	4	19	26	-	22	287
Mumps	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Pertussis	9	10	5	12	19	22	79	3	30	7	18	21	12	26	7	34	314
Rubella	-	-	-	2	-	-	6	1	1	-	7	-	-	4	1	14	36

TABLE 6

**FOODBORNE INFECTIOUS DISEASE NOTIFICATIONS FOR 1995
BY PUBLIC HEALTH UNIT, RECEIVED BY MAY 31, 1995**

Condition	CCA	CSA	CW	ESA	HUN	ILL	NC	ND	NSA	SE	SSA	SW	SWS	WEN	WN	WSA	Total
Foodborne illness (NOS) (> 2 related cases)	16	9	-	-	162	-	-	1	-	-	-	5	34	-	12	14	253
Gastroenteritis (instit.)	-	10	-	-	2	-	36	-	33	-	-	-	-	-	-	3	84
Hepatitis A - acute viral	7	36	30	57	10	5	13	-	16	-	16	9	19	2	3	14	237
Listeriosis	-	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-	6
Salmonella (NOS)	15	28	12	36	49	37	79	39	49	24	54	20	53	28	23	55	601
Typhoid and paratyphoid	-	1	-	7	-	-	1	-	2	-	5	-	3	1	-	3	23
Vibrio infection (non cholera)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1

PUBLIC HEALTH EDITORIAL STAFF

The editor of the Public Health Bulletin is Dr Michael Frommer, Director, Research and Development, NSW Health Department. Dr Lynne Madden is production manager.

The Bulletin aims to provide its readers with population health data and information to motivate effective public health action. Articles, news and comments should be 1,000 words or less in length and include a summary of the key points to be made in the first paragraph. References should be set out using the Vancouver style, the full text of which can be found in *British Medical Journal* 1988; 296:401-5.

Please submit items in hard copy and on diskette, preferably using WordPerfect, to the editor, NSW Public Health Bulletin, Locked Mail Bag 961, North Sydney 2059. Facsimile (02) 391 9029.

Please contact your local Public Health Unit to obtain copies of the NSW Public Health Bulletin.