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HOSPITAL-RELATED MORTALITY IN NSW
PRELIMINARY RISK-ADJUSTMENT

Paul Corben, Shing Chung (Simon) Fung, David Lyle
Epidemiology Branch
NSW Health Department

INTRODUCTION

This article reports on the analysis of in-hospital mortality using routinely collected data for rudimentary risk-adjustment. A previous article[1] presented crude in-hospital case fatality rates for NSW hospitals over the past five years and discussed the need for appropriate risk-adjustment before using such measures as indicators of the quality of hospital care.

Because the mortality outcomes of hospitals or clinical services are influenced by many factors other than the quality of medical care, adjustment for these factors is necessary before meaningful comparisons of mortality rates can be made between hospitals or over time. While routinely collected inpatient data in NSW do not contain measures of case severity or physiological status, other risk-stratifying data items are available. Such items include age, gender, source of referral (whether a routine or emergency admission), diagnoses and procedures performed during the inpatient episode. We report initial attempts to use such data in the development of hospital-related mortality indicators.

METHODS

We calculated in-hospital case fatality rates (CFRs) using pooled data from the NSW Inpatient Statistics Collection for financial years 1991-92 and 1992-93, excluding same day cases (i.e. those admitted and discharged home on the same calendar day). As in the previous article we used the following definition of CFR:

CFR (expressed as percentages) = 100* (No. inpatient deaths) / (No. hospital separations)

The number of deaths and separations was aggregated for each combination of hospital, Australian National Diagnosis Related Group (ANDRG), age group, gender and patient source of referral and CFRs calculated for each cell. Records were grouped to ANDRG Version 1[2] using ANDRG Version 2.0 software. All records assigned to an ANDRG which includes separation mode (died or transferred) in the decision tree (ANDRGs 244, 247, 700, 701, 702, 703, 704) were regrouped after recoding separation mode to "Other including discharged home". Records were assigned to one of 19 age groupings beginning with infants (under one year), one-four years, then in five-year age groups to 85 years and over. Patient source of referral categories were collapsed to two levels: "non-routine" admissions (including all admissions through Accident and Emergency units and transfers from other health care facilities) and other "routine" admissions (all other admissions). The resulting matrix contained 567,126 cells.

For use in indirect standardisation, average CFRs were calculated by aggregating deaths and separations across hospitals and across ANDRGs. We calculated three sets of indirectly standardised case fatality rates (ISCFRs) for hospitals. First, we applied the average overall CFR to hospital caseloads to calculate expected deaths and compared these results with observed deaths. Second, we calculated ISCFRs by applying average CFRs in age, gender and source of referral groups to hospital caseloads in these groupings. The third set of ISCFRs was calculated by applying average CFRs in ANDRG, age, gender and source of referral groups in a similar way.

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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 9218
Facsimile: (02) 391 9232

FIGURE 1

CASE FATALITY RATES IN NSW HOSPITALS ALL ANDRGs, 1991-92 – 1992-93 BY AGE AND SEX

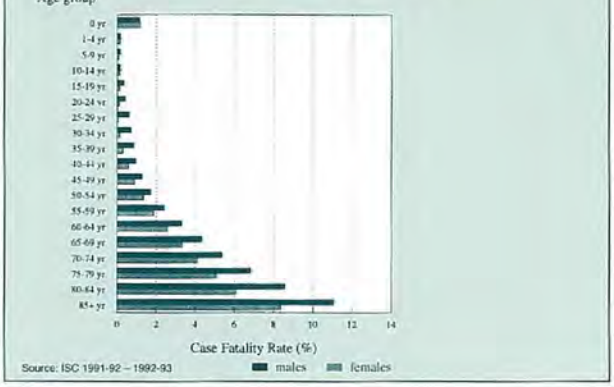


FIGURE 2

CASE FATALITY RATES IN NSW HOSPITALS MEDICAL ANDRGs, 1991-92 – 1992-93 BY AGE AND SEX

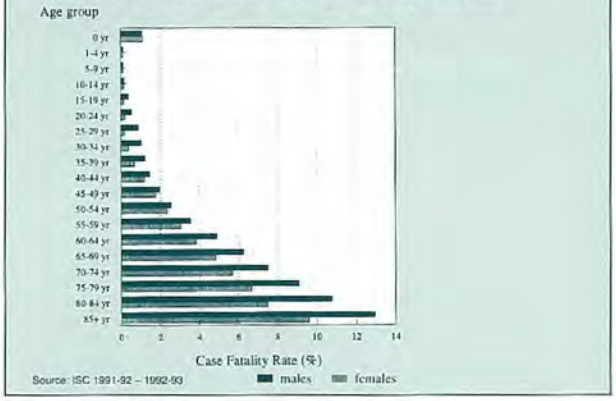
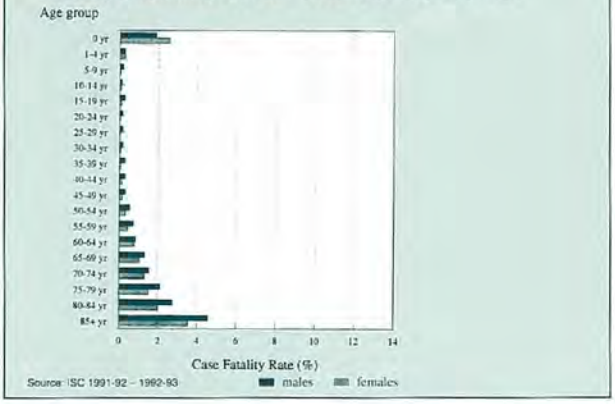


FIGURE 3

CASE FATALITY RATES IN NSW HOSPITALS OPERATIVE ANDRGs, 1991-92 – 1992-93 BY AGE AND SEX



Hospital-related mortality

► *Continued from page 71*

We estimated the systematic and random components of variance in the calculated ISCFRs using the variability index developed by Chan and Gibberd[3] and calculated approximate 95 per cent confidence intervals for the variability index using the normal approximation.

Hospitals were grouped according to a NSW Health Department classification which considers the level of services provided, casemix complexity and hospital size[4].

We used the SAS V6.08 PROC GLM procedure to estimate the proportion of variation in CFRs attributable to each of the main effect categorical variables: hospital, hospital service level, ANDRG, age group, gender and source of referral. CFR estimates were weighted according to the number of separations in the rate's denominator. We did not consider interactions of main effects.

We also calculated age-sex-adjusted ISCFRs for hospitals using separations from all public and private hospitals in NSW for financial year 1992-93 for the following conditions or procedures:

- acute myocardial infarction (AMI) (ICD-9CM code 410);
- cerebrovascular accident (CVA) (430-438);
- aortic aneurism (441);
- head injury (800, 801, 803, 804, 850-854);
- hip fracture (820); and
- coronary artery bypass grafts (CABG) (procedure code 36.1).

RESULTS

Over the two-year period 1991-92 and 1992-93, the NSW ISC reported approximately 1.96 million hospital separations (excluding same day cases) and 45,268 in-hospital deaths, for an overall CFR of 2.31 per cent. The vast majority (89.2 per cent) of deaths were classified to Medical ANDRGs, with 10.4 per cent within Operative ANDRGs and the balance (0.4 per cent) in Other ANDRGs. Over the same period about 1.14 million separations were assigned to Medical ANDRGs (58.0 per cent) and about 800,200 to Operative ANDRGs (40.8 per cent). The average CFR for Medical ANDRGs was 3.55 per cent while that for Operative ANDRGs was 0.57 per cent.

Overall, the CFR for males exceeded that for females (2.83 per cent v 1.90 per cent, $p < 0.0001$) and with the exception of the males in the infant group, CFR estimates for males exceeded those for females in all age groupings (Figure 1). The highest CFR for both males and females was found in the oldest age group, with CFRs of 11.06 per cent and 8.37 per cent respectively. Similar patterns were observed for age and sex groups for Medical and for Operative ANDRGs (Figures 2 and 3). The lowest CFR for males was in the 10-14 age group (0.15 per cent) and for females in the 25-29 age group (0.08 per cent).

After regrouping as described above, ANDRGs-specific CFRs varied over a wide range. Six ANDRGs showed CFRs above 40 per cent, no deaths were recorded for 86 ANDRGs and a further 64 ANDRGs had CFRs below 0.01 per cent. The highest CFR was 66.7 per cent (14 deaths) for ANDRG 912 (Extensive burns without Operating Room procedure) followed by ANDRG 705 (Neonate admission weight < 750 grams, CFR = 61.6 per cent, 215 deaths), and ANDRG 248 (Circulatory disorders with AMI without invasive cardiac investigative procedures, with complications/comorbidities,

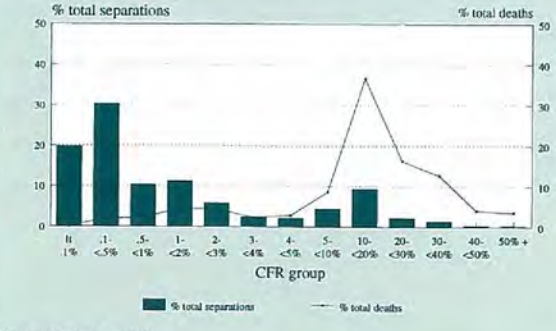
FIGURE 4

PERCENT OF TOTAL SEPARATIONS AND PERCENT OF TOTAL DEATHS FOR ALL ANDRGs BY CASE FATALITY RATE (CFR) GROUPING

Source: ISC 1991-92 – 1992-93

FIGURE 5

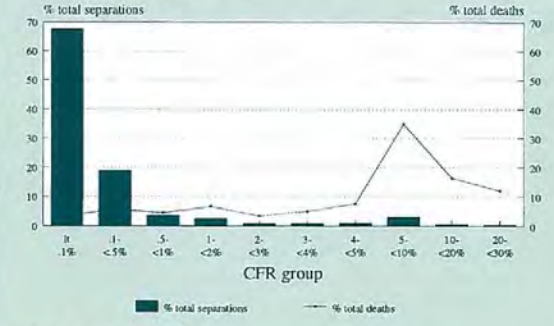
PER CENT OF TOTAL SEPARATIONS AND PER CENT OF TOTAL DEATHS FOR MEDICAL ANDRGs BY CASE FATALITY RATE (CFR) GROUPING



Source: ISC 1991-92 – 1992-93

FIGURE 6

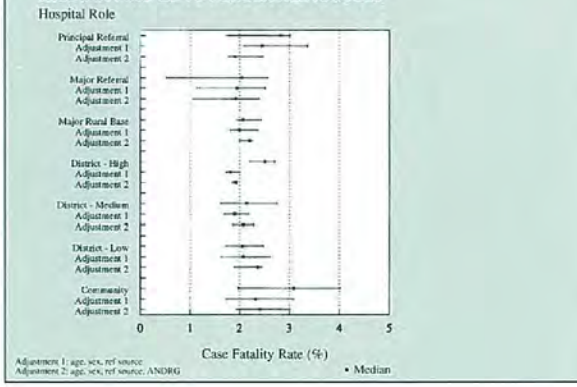
PER CENT OF TOTAL SEPARATIONS AND PER CENT OF TOTAL DEATHS FOR OPERATIVE ANDRGs BY CASE FATALITY RATE (CFR) GROUPING



Source: ISC 1991-92 – 1992-93

FIGURE 7

CRUDE AND ADJUSTED CASE FATALITY RATE NSW PUBLIC HOSPITALS, 1991-92 AND 1992-93 MEDIAN AND 25-75 PERCENTILE RANGES



CFR = 51.8 per cent, 1,195 deaths). The highest number of deaths was recorded in ANDRG 34 (Specific cerebrovascular disorders except transient ischaemic attack, CFR = 19.6 per cent, 3,578 deaths) and ANDRG 170 (Respiratory neoplasms, CFR = 32.2 per cent, 2,771 deaths).

We charted the proportion of cases within ANDRG-specific CFR ranges against the proportion of total deaths observed within these groups, overall (Figure 4) and for Medical (Figure 5) and Operative (Figure 6) ANDRGs. As the figures illustrate, most deaths occur in a relatively small number of clinical groupings. Overall, 79.5 per cent of deaths occur in ANDRGs with CFRs above 5 per cent, while these groups account for 12.2 per cent of total separations. For Medical ANDRGs, 81.8 per cent of deaths occur in ANDRGs with CFRs above 5 per cent, with these ANDRGs accounting for 18.0 per cent of Medical separations. Operative ANDRGs show 63.2 per cent of deaths occurring in ANDRGs with CFRs above 5 per cent while these account for only 4.2 per cent of Operative separations.

Using indirect standardisation, we calculated ISCFRs for hospitals within service role groupings (Figure 7). We plotted the 25-75 interquartile ranges of crude CFRs against ISCFRs after adjusting for age, sex and source of referral (Adjustment 1) and ANDRG, age, sex and source of referral (Adjustment 2). Adjustment 1 reduced the median CFR within each hospital service role grouping except the District-Low grouping and had some impact on the interquartile range. The figure also shows the impact of Adjustment 2, with adjusted rates generally showing narrower interquartile ranges and CFRs (crude and Adjusted 1) being revised down for the larger, referral hospitals and being revised up for other hospital categories. For example, the median crude CFR for the nine Principal Referral hospitals was revised from 2.83 to 2.45 per cent after adjustment for age, sex and source of referral and further reduced to 1.93 per cent after additional standardisation using ANDRGs. In contrast, the seven Major Rural Base hospitals showed a median crude CFR of 2.07 per cent, which was reduced to 1.99 per cent with Adjustment 1 but increased to 2.20 per cent with Adjustment 2.

The analysis of variance of CFRs indicated that, together, hospital service role, hospital, ANDRG, age group, gender and source of referral account for 33.98 per cent of the total

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variation (Figure 8). The remaining 66 per cent of variation not accounted for by these factors and includes unmeasured factors such as illness severity, other hospital-specific factors including quality and a component of random variation.

Using Pearson product-moment correlation coefficients we found no evidence of association between any of the calculated ISCFRs and hospital throughput. However, Spearman rank correlation coefficients indicated a statistically significant association ($r=0.41$, $p<0.0001$) between ISCFRs using only Operative ANDRGs and volume while those for Medical ISCFRs showed no such correlation ($r= 0.009$, $p=0.85$). For 11 hospitals showing significantly high overall ISCFR but low ISCFR using Adjustment 1 (age and sex), six recorded high ISCFRs for Medical groupings but low for Operative groupings, four were high for Medical groupings and average for Operative groupings and one showed an average Medical ISCFR and was significantly high for the Operative grouping. We found similarly complex inter-relationships for other hospital groups.

Using the Chan and Gibberd variability index, we estimated the systematic and random components of the variance of ISCFRs. When the overall average CFR (2.31 per cent) was applied to hospital caseloads to produce an expected number of deaths, the index estimated that 97.8 per cent of the variance in ISCFRs was non-random. Standardisation by age and gender (Adjustment 1) reduced this percentage to 91.6 per cent while Adjustment 2 across all patient types further reduced this estimate to 50.5 per cent. ISCFRs calculated for Operative ANDRGs showed 40.5 per cent of the variance as systematic variance while Medical ANDRGs showed 66.3 per cent systematic variance. We were unable to apply Chan and Gibberd's Chi-square approximation to obtain confidence limits for their variability index but used the normal approximation. The crude, Adjustment 1, and Adjustment 2 for Medical ANDRGs ISCFRs showed 95 per cent confidence intervals which did not include zero, indicating strong evidence for remaining systematic variation in the ISCFRs.

Examining the variance of crude and ISCFRs for each of the specific conditions and procedures listed earlier we noted strong evidence of systematic variance in:

- head injuries (both crude and age-sex adjusted); and
- cardiovascular disease (both crude and age-sex adjusted)

but not for aortic aneurisms, hip fractures, AMI or CABG.

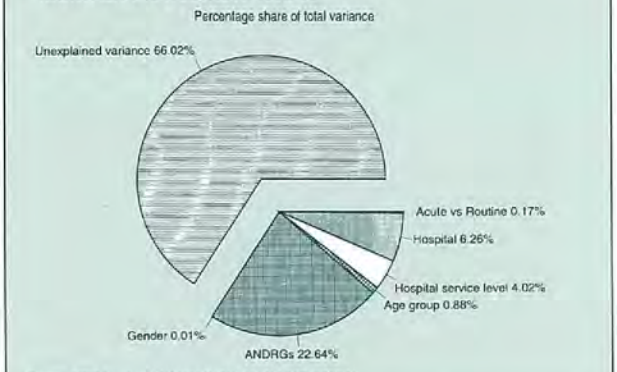
Discussion

In this preliminary analysis we examined some readily available risk-adjusting data items and demonstrated the impact of simple risk adjustment on in-hospital CFRs. The chosen variables were unable to explain more than about 34 per cent of observed variation in case fatality rates. More promising results have been reported elsewhere[5] for specific patient groups, using severity scores and severity surrogates.

The adjustments presented here do not include adjustment for patient severity of illness although, due to the ANDRG classification hierarchy, some account of complexity and complications is included. Nor did we attempt to include consideration of hospital or physician characteristics. Other investigators[6] have found that both hospital and physician characteristics are important but inconsistent predictors of in-hospital mortality.

FIGURE 8

SOURCES OF VARIATION IN IN-HOSPITAL MORTALITY RATES, NSW 1992-93



Source: NSW Inpatient Statistics Collection, 1992-93 (HOIST)

We have not attempted to identify individuals in our analyses and, in using hospital separations as the numerator for CFRs, we have under-estimated the mortality risk faced by individuals. In NSW we face considerable but not insurmountable technical difficulties in identifying individuals in administrative data systems. We aim to report on progress in this area this year.

Proposed changes[7] to health information systems in NSW would reduce the complexity of such analyses.

Many attempts[5,8] to use administrative data to assess patient outcomes have been reported. However, there is no consensus about the best choice of risk factors or adjustment methods. The one common thread of such articles is that the use of administrative data sets for outcomes research will place increasing demand on data collection mechanisms for the delivery of consistent and high quality data and inclusion of additional information useful to outcomes research. We may also expect that the patient (rather than treatment) focus[9] of outcomes research will have significant impact on the classification systems we develop. For example, existing classification schemes and information systems make it difficult to distinguish between complications of care and pre-existing comorbidities[10] and difficult consistently to apply comorbidity indices to administrative data.

This article emphasises the need for appropriate risk-adjustment when assessing patient outcomes and serves as a warning against the temptation to produce simplistic measures of the complex interaction of the many aspects of hospital care which influence outcomes. Our analysis also demonstrates the potential problems facing the development of a general index of mortality for hospitals rather than the analysis of particular procedures and conditions. This analysis may guide us in our identification of high- and low-risk patient groups for which focused study

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REFLECTIONS ON THE BEGINNINGS OF INFECTION CONTROL IN NSW

Greta Albera, Infection Control Sister (retired), Royal Alexandra Hospital for Children
Cathryn Murphy, Vice-president, Infection Control Association (NSW) Inc
Dr Julian Gold, Chair, Department of Clinical Epidemiology, Prince of Wales Hospital

The practice of infection control has become a major focus for health care workers in NSW, but the art and science of infection control has existed in this State for more than two decades. The Infection Control Association Inc. is the coordinating professional organisation for practitioners and interested health care staff and industry to share information and experiences. The history of this group reveals that many of the early problems and obstacles faced by infection control practitioners still exist.

Following international reports of nosocomial infection outbreaks in the 1960s, hospital authorities in NSW became increasingly aware of problems with nosocomial infection in their institutions and in 1965 began appointing trained nurses to monitor infection in hospital patients. The appointments were made on the hospital's own initiative.

The following list identifies the timing of the appointment and location of the pioneer Infection Control Sisters in the Sydney metropolitan area:

1965 Prince of Wales Hospital appointed the first Infection Control Sister
1967 Royal Alexandra Hospital for Children
1970 Concord Repatriation Hospital
1971 Sydney Hospital
1973 St George Hospital
1975 St Vincent's Hospital
1977 Royal Prince Alfred Hospital
1978 Liverpool Hospital
1978 Royal South Sydney Hospital
1978 Parramatta Hospital
1979 Manly District Hospital
1979 Blacktown Hospital
1979 Mona Vale District Hospital
1980 Westmead Hospital

The introduction of the Australian Council on Healthcare Standards Accreditation process in 1974 and NSW hospital participation in the process in 1977 led to a sharp rise in the number of Infection Control Sisters appointed. However, there were no official guidelines or policies outlining how to develop, coordinate and evaluate an infection control program. Practice was based largely on reviewing overseas literature and adopting the principles of other countries for NSW.

On October 16, 1973 four Sisters representing Sydney Hospital, St George Hospital, Royal Alexandra Hospital for Children and the host hospital, Royal North Shore, attended the first official meeting of Infection Control Sisters.

A second meeting held at the office of the NSW Nurses Association recommended that Infection Control Sisters should be responsible to the Director of Nursing for nursing issues and the Director of Microbiology for the technical aspects of the work and that a close liaison between medical and nursing staff should be established. This liaison remains an integral component of modern practice.

A November 1974 meeting discussed the establishment of an infection control committee for each hospital. The support and encouragement of policymakers was recognised at this early stage as being of crucial importance to all infection control practitioners.

In 1974, less than a handful of dedicated nurses formed the NSW Infection Control Group. The main objective of this group was to serve as a forum for sharing knowledge and experience in all aspects of infection control. The group was to be conducted under the auspices of the NSW College of Nursing. Meetings were held bimonthly and the meeting site rotated at venues offered by participating hospitals.

A March 1975 meeting of six Sisters established the following objectives of the group:

- To improve patient care by education of hospital personnel in cross-infection;
- To keep members informed of current medical and nursing literature on infection control; and
- To further education in subjects relating to the work of the Infection Control Sisters.

The group recognised the importance of providing information to regional hospitals and decided to circulate a newsletter, which also enabled contact to be made with interstate colleagues. The NSW Infection Control Journal is circulated to about 400 members in Australia and overseas.

The pharmaceutical and chemical industries were supportive and were able to join as associate members. Industry support in the early days enabled members of the group to travel overseas to conferences and remains a valuable resource.

The Royal Alexandra Hospital for Children has consistently supported the NSW Infection Control Association and, in the association's infancy, provided support for convening and coordinating the first seminar of the group on November 12, 1977.

The theme of the inaugural meeting – the battle against hospital-acquired infection – was explored by the 187 participants. The keynote speaker was Isobel Maurer, Principal Scientist at the Central Public Health Laboratories, London, and author of the book, Hospital Hygiene. Encouraged by the wide interest in the first Australia-wide infection control seminar, the group hoped to send a message not only to the few already converted, but further into the community.

The group's early office bearers believed infection control embraced a wider field than sterilisation and disinfection. Amalgamation with groups that focused solely on these areas was not pursued, but associate membership was offered and taken up by people working in related fields. Seminars were conducted annually as membership grew.

In January 1981 the Infection Control Group of NSW formulated its constitution and became the Infection Control Association NSW. The association was incorporated in 1990.

The extension of infection control to the private sector in the early 1980s and the distribution of a Health Commission circular – Role of the Infection Control Sister in the Hospital Setting – indicated the growing importance of this discipline.

The original Infection Control Sisters recall fighting battles not only against hospital-acquired infection but also for recognition within the hospital hierarchy. Some aspects of

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Infection control in NSW

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this battle pervade modern infection control practice and it is often only the well-publicised issues and more sensational stories about infection control that raise its profile.

In 1984 the Federal Government, through the Research and Development Grants Program (RADGA), provided $24,000 for setting up the first national survey of nosocomial infections. The association was a key participant in the study, which involved collecting data on 28,643 patients in 269 hospitals in July 1984. The survey provided benchmark nosocomial infection rates and has provided association members with useful comparative data for their institutions.

Gentamycin resistance was a problem in those days. For the first time, outbreaks of infection with gram-negative rods were noted. Disinfectants were also found to have become unsafe and growing bacteria. These findings had to be shared, yet there was a view that one should be loyal to one's workplace and not talk about any outbreaks.

The recognition of bloodborne diseases in the 1980s and 1990s has heralded a huge increase in the role and focus of infection control practice. Universal precautions, infection control committees, NSW Health policy and guidelines have become commonplace in today's health care setting. Despite the growth in information and resources relating to nosocomial infection, the problem of hospital-acquired infection persists and, in view of this, NSW Health is funding a Health Outcomes Project dealing with infection control. The project team is based at Prince of Wales Hospital.

This brief history indicates that, while the field is constantly growing and changing direction, basic skills are still required to function effectively. This is best summarised by the comment that involvement in infection controls needs ". . . a good knowledge of hygiene and the exercise of a lot of common sense and diplomacy in dealing with co-workers . . .".

In considering infection control today it should be remembered that the advanced position in NSW began with the efforts of a few dedicated nurses who fought for recognition.

EDITORIAL COMMENT

This is the first of an occasional series of articles on infection control issues. Contributions giving other perspectives on the history, development and practice of infection control in NSW are invited.

NEWS AND COMMENT

MENTAL HEALTH POSTER

In 1993 the Mental Health Branch produced a Directory of Mental Health Services in NSW to provide information on services. The directory was intended mainly for use by Health Department employees and non-government organisations.

It was found that for some individuals and groups such as general practitioners, police, probation and parole officers and some government departments a directory of all NSW services was not needed. The Mental Health Branch produced a simplified poster-format listing of local mental health services for each NSW Area and District. The poster shows:

- addresses and contact telephone numbers for Area chief executive officers, directors of psychiatry and Area coordinators, psychiatric hospitals, general hospital inpatient units, crisis/extended hours service, community mental health centres, child and adolescent inpatient services, rehabilitation/living skills services and authorised private hospitals;
- addresses and contact telephone numbers of non-government organisations providing mental health services; and
- multicultural services in each Area.

Contact the Mental Health Branch on (02) 391 9307 for posters.

LEAD IN PETROL

In response to Dr Donald Scott-Orr's letter published in the April 1994 *Public Health Bulletin*, we would like to make clear that the benzene content of leaded petrol is essentially the same as that of unleaded petrol in Australia, in contrast to the situation in Europe. Therefore the conversion of the pre-1986 leaded fleet to regular unleaded petrol (ULP) is not expected to have an effect on benzene emissions, despite the absence of catalytic converters in pre-1986 vehicles.

The use of premium unleaded petrol (PULP) is not encouraged on a wide scale as the use of PULP in non-catalyst vehicles would increase ambient benzene levels because of its greater benzene content. Sales of PULP are around 1.1 per cent of total petrol sales, and encouragement of its use has been recommended mainly in a small number of imported luxury vehicles. PULP costs significantly more than ULP (up to 10 cents/litre more) which precludes its use by the general market.

The Commonwealth Environment Protection Agency is using capital raised from the recently imposed excise differential on leaded fuel to fund studies to determine the best avenue to achieve further reduction of lead in leaded petrol, taking into account octane rating and additives to petrol. The Government is committed to making a decision on whether lead in leaded petrol in NSW will be reduced to 0.2 grams/litre at the end of 1994. This decision is mainly dependent on the capacity of the leaded fleet to operate satisfactorily on reduced-octane fuel.

Christine Cowie and Stephen Corbett,
Environmental Health, Food & Nutrition Branch
NSW Health Department

PUBLIC HEALTH ABSTRACTS

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

SMOKING REDUCES BONE DENSITY

Osteoporosis is an increase in bone fragility that accompanies aging. Bone density is an important determinant of bone strength and a predictor of fractures. Effective methods of minimising loss of bone during adulthood will prevent osteoporosis. The results of an American study among 41 pairs of female twins, of whom 21 were monozygotic pairs, has clearly demonstrated the harmful effect of smoking on bone density. The study demonstrated that women who smoked one packet of cigarettes a day throughout adulthood will, by the time of menopause, have an average deficit of 5-10 per cent in bone density – sufficient to increase the risk of fracture. These results were not confounded by measured lifestyle factors.

Hopper JL and Seeman E. *New Eng J of Med* 1994; 330:387-92.

TB IN INNER-SYDNEY CHILDREN

There is a high prevalence of non-contagious tuberculosis infection in children aged 12-14 years in Sydney. Ten per cent of 1,836 children were Mantoux positive. Only two of the children were found to have active tuberculosis. The Sydney-based authors argue for the development of an organised strategy as a consequence of this survey.

Alperstein G, Fett MJ, Reznik R et al. *Med J of Aust* 1994; 160:197-201.

PETROL SNIFFING AND BRAIN DAMAGE

Petrol sniffing is not uncommon among some disadvantaged Australian children. Chronic petrol sniffing is extremely dangerous, with a fatality ratio of 8 out of 20 patients admitted to hospital. The deaths and irreversible brain damage are due to the complex toxins in modern petrol. The long-term effects are probably due to lead poisoning. The authors suggest a need for local strategies for prevention, particularly as treatment outcomes are so disappointing.

Goodheart RS and Dunne JW. *Med J of Aust* 1994; 160:178-181.

RAPID RESUSCITATION AFTER SEVERE HEAD INJURY

One of the reasons for poor outcomes following severe head injury is catastrophic loss of blood pressure which leads to lack of oxygen to the brain. Patients at accidents should be resuscitated on the spot and then transported quickly to a major trauma centre. This approach requires doctors, paramedical personnel and well-equipped ambulances and helicopters on standby, which is expensive and difficult to achieve with scattered rural populations.

Wilden JN. *Lancet* 1993; 342:1378.

AIDS: THE THIRD WAVE

Three broad epidemiological patterns have unfolded with respect to the epidemic of Acquired Immune Deficiency Syndrome (AIDS). In regions associated with pattern one (US, Canada, Western Europe, Australasia) human immunodeficiency virus (HIV) has spread mainly among gay and bisexual men and injecting drug users. Those with heterosexually acquired infection form a small proportion of cases. In pattern two areas (sub-Sahara and Africa and South America) most people have acquired HIV heterosexually. A third pattern is found in the Asia-Pacific, Eastern Europe and the Middle East. Thailand is the best study and most chilling example of this third wave is the AIDS epidemic. HIV infection was first reported in Thailand in 1984. Subsequently, three groups of individuals have successively borne the brunt of the spreading epidemic: injecting drug users, female commercial sex workers and young heterosexual men. Asia's epidemic may dwarf all others in scope and impact.

Editorial, *Lancet* 1994; 343:186-88.

MULTIPLE SCLEROSIS IN AUSTRALIA

Although the precise cause of multiple sclerosis (MS) is not known, clearly some environmental and genetic factors are important. A major Australian study has confirmed that the frequency of the disease increases with distance from the equator. There are more cases in southern parts of Australia than in northern parts, and the condition is more common in white populations – particularly in people of Scottish descent. There appears to have been a small increase in the incidence of multiple sclerosis in Australia in recent decades. The reason for this is unknown. While MS is a relatively rare disease, the crude prevalence in Australia is 22.6/100,000 for males and 51.6/100,000 for females. The higher incidence in females has been long recognised but again the cause is unknown.

Mcleod JG, Hammond SR and Hallpike JF. Epidemiology of Multiple Sclerosis in Australia. *Med J of Aust* 1994; 160:117-122.

LINK BETWEEN AIR POLLUTION AND DEATH

An association between death rates and particulate air pollution has long been suspected. A large 15-year American study has demonstrated that the mortality rate ratio for the most polluted US cities compared with the least polluted was 1.26. This is significant. Air pollution was positively associated with death from lung cancer and cardiopulmonary disease but not with death from other causes. Mortality was most strongly associated with air pollution with fine particulates. Obvious confounding factors such as cigarette smoking were controlled.

Dockery DW, Pope CA, Xu X et al. *New Eng J Med* 1993; 329:1753-9.

LEFT-HANDED PEOPLE AND EARLY DEATH

The Dean of the Faculty of Arts at Deakin University, Geelong, Bryan Turner, has reviewed the extraordinary fact that being left-handed reduces the lifespan for 10 per cent of the population. This is explained in a number of ways. The most obvious is the high rate of injuries among left-handers which can lead to death, because most domestic and industrial appliances are designed for right-handers. There appear to be associated behavioural problems with being left-handed which can lead to alcoholism and suicide. A United States study has found the average age of death for right-handed baseball players was about 75, while that of left-handed baseball players was 66. The reasons were a product of differences of immunological disturbances,

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Public Health Abstracts

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behavioural differences and a much higher rate of accidents among the left-handed.

Turner BS. *Br Med J* 1993; 307:1578.

PELVIC INFLAMMATORY DISEASE

Pelvic inflammatory disease refers to infection of the uterus, fallopian tubes and adjacent pelvic structures that is not associated with surgery or pregnancy. This infection is almost always the consequence of sexually transmitted bacterial infections. Problems of infertility and ectopic pregnancy are the direct result of this medical, social and economic problem. The most important causative organisms are *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. More than half of all cases are caused by one or both of these sexually transmitted micro-organisms.

Prevention of sexually transmitted diseases, or vigorous treatment with antibiotics when they occur, is essential.

McCormack WM. *New Eng J Med* 1994; 330:115.

FLUORIDE POISONING

A disturbing report from Alaska has shown that excess added fluoride to public water systems was the cause of an outbreak of acute fluoride poisoning. The poisoning caused nausea, vomiting, diarrhoea and abdominal pain. Some 296 people were poisoned and one died. The fluoride concentration of the water samples from the implicated source was 150 milligrams per litre – about 150 times the standard level recommended. The greatly excessive fluoridation occurred because there were major electrical and mechanical defects in the fluoride pumping system. The fluoride pump worked four times faster than expected, which dramatically increased the fluoride concentration in the holding tank.

Gessner BD, Beller MD, Middaugh JP et al. *New Eng J Med* 1994; 330:95-9.

CHANGING ONSET OF THE MENARCHE

The menarche indicates the capacity to reproduce. It is the onset of menstruation in females. In the past century there has been a decrease in age toward earlier menarche of about three to four months a decade. The age of the menarche is determined by factors which act in combination, including genetics, socioeconomic conditions, health, nutrition and some types of exercise. The importance of genetic factors is illustrated by the similar age of menarche in members of an ethnic population and in mother-daughter pairs.

Studies in the United Kingdom and in Canada suggest the levelling out of the age of the menarche and indeed an increase in the age of the menarche which has been recently observed is probably a consequence of the fashion towards being slim and to undertake exercise.

Rees M. *Lancet* 1993; 342:1375.

ALCOHOL INTAKE AND MYOCARDIAL INFARCTION

The effects of alcohol consumption on cardiovascular disease are complex. Although heavy alcohol intake increases overall mortality and mortality due to cardiovascular diseases, moderate intake appears to exert a protective effect against coronary heart disease compared with drinking no alcohol. A large American study has confirmed these findings and identified that one of the mechanisms involved is that alcohol appears to increase levels of high density lipoprotein cholesterol – the "protective" cholesterols.

Gaziano JM, Buring JE, Breslow JL et al. *New Eng J Med* 1993; 329:1829-34.

Hospital-related mortality

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and monitoring would be fruitful. Case reviews conducted by expert committees[11] have classified 64 per cent of deaths reviewed as inevitable or fortuitous – a fact which underlines the need to develop finely tuned instruments to detect quality of care differences between institutions. A single measure is not appropriate for all conditions.

The next steps in our exploration of hospital-related mortality will include:

- evaluation of reported methods for using existing inpatient data in the measurement of comorbidity and severity of illness and in risk adjustment; and
- comparison of the use of routinely reported inpatient data and these algorithms against results derived from more comprehensive clinical databases, e.g. Trauma Registries.

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2. 3M Health Information Systems & Commonwealth Department of Health Housing & Community Services. Australian National Diagnosis Related Groups Definitions Manual Version 1.
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4. NSW Public Hospital Comparison Data 1991/92. NSW Health Department, State Health Department Publication No. (IC) 93-134.
5. US Congress, Office of Technology Assessment. The Quality of Medical Care: Information for Consumers, OTA-H-386 (Washington, DC; US Government Printing Office, June 1988) Chapter 4, pp 73ff.
6. Burns LR, Wholey DR. The effects of patient, hospital and physician characteristics on length of stay and mortality. *Medical Care Review* 1991; 29(3):251-271.
7. NSW Health Department. NSW Health Information Management Strategy Report Volume 1 (in press).
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9. Orchard C. Comparing healthcare outcomes. *Brit Med J* 1994; 308:1493-1496.
10. Romano PS, Roos LL, Jollis GJ. Response: Further evidence concerning the use of a clinical comorbidity index with ICD9-CM administrative data. *J Clin Epidem* 1993; 46(10):1085-1090.
11. Warden JC, Borton CL, Horan BF. Mortality associated with anaesthesia in New South Wales, 1984-1990. Unpublished.

INFECTIOUS DISEASES

NOTIFICATIONS

HAEMOPHILUS INFLUENZAE TYPE B (Hib)

A total of 40 notifications for Hib disease was received for the period January to June 1994 (1.3/100,000 population). This compares with a notification rate of 3.8/100,000 population for 1992 and 2.2/100,000 for 1993.

For children under five years, the notification rate has decreased from 24.1/100,000 population in 1993 to 11.3/100,000 population this year. This is directly attributable to the immunisation program for children less than five years of age.

PERTUSSIS (WHOOPING COUGH)

The notification rate for pertussis between January and June was 21.5/100,000 population, a decrease from 25.5/100,000 population for 1993.

Richmond Health District has received notifications at a rate of 222.2/100,000 population.

Twenty per cent of notifications were for children aged under five years. A further 41 per cent were for school-aged children. These proportions have not changed since the previous reporting period.

The mean age for notifications was 21.2 years (the range was one month to 87 years).

MEASLES

The notification rate for January to June was 9.7/100,000 population. This compares with a rate of 39.4/100,000 population for 1993.

The mean age for notifications was 8.2 years (the range was three months to 64 years). Seventeen per cent of notifications were for neonates and infants (<1 year of age). Fifty-six per cent were for children over the age of five years, while 25 per cent were for people 12 years and older.

Measles is notifiable by medical practitioners, laboratories and hospital chief executive officers under the Public Health Act 1991. For January to June, 61 per cent of notifications were made by medical practitioners, 15 per cent by hospital chief executive officers, 14 per cent by laboratories and 10 per cent by other agencies (e.g. childcare facilities).

GONORRHOEA

A total of 160 notifications for gonorrhoea has been received this year (5.2/100,000 population).

Only 33 per cent of notifications were for a specific site, with the lower genito-urinary tract accounting for 24 per cent of all notifications and 72 per cent of site-specific notifications.

Males accounted for 84 per cent of notifications.

The age range for males was 16-62 years and for females 13-36 years. The mean age for males was 29.5 years and for females 22.4 years.

MENINGOCOCCAL DISEASE

A total of 41 notifications for meningococcal disease has been received this year (1.3/100,000 population). This compares with the rate of 2.5/100,000 population for 1993.

The ages of people notified with meningococcal disease ranged from three months to 80 years. The mean age was 15.3 years.

FIGURE 9

INFLUENZA-LIKE ILLNESS NSW

(Source: NSW Sentinel GP Network)

INFLUENZA SURVEILLANCE

At the end of June influenza activity was moderate to low for this time of year.

Reports of influenza-like-illness (ILI) for June 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 2.1 per cent of consultations in late June, which was comparable to the rate at the same period last year, a relatively quiet year for influenza (Figure 9). The Western Sydney and Wentworth Areas reported the highest rate of ILI, with almost 4 per cent of consultations.

Reports of school absentee rates were received weekly in June from four PHUs which cover 12 schools with a total of about 7,000 students. There has been no clear trend in absentee rates. As school children are a more susceptible population than adults, during a substantial influenza outbreak school absentee rates would be expected to rise some weeks before GP consultation rates.

Laboratory isolations of influenza virus and serological diagnoses have continued at low levels for this time of year. Westmead ICPMR Virology reported six isolations of influenza A, Westmead ICPMR Serology reported no serological diagnoses, and Prince of Wales Serology reported six diagnoses of influenza A and seven of influenza B.

PERTUSSIS OUTBREAK IN A DAY CARE CENTRE

Desolie Lovegrove, Public Health Nurse, Illawarra Public Health Unit

On Wednesday, March 16, a local paediatrician notified the Illawarra PHU of two cases of clinical pertussis. The cases were siblings aged nine months and three years. Both had been coughing for two to three weeks. The nine-month-old had received only one dose of triple antigen, at two months. The three-year-old was fully immunised. The children attended a day care centre and had been at the centre on the day of the notification.

The director of the centre was informed of the situation. She was asked to provide a list of all children who were

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ANTIBIOTIC SENSITIVITY OF GONOCOCCI – SYDNEY

The number of strains examined in the October-December 1993 quarter (162) was substantially less than that examined in the corresponding quarter of 1992 when 203 isolates were analysed from similar sources.

The main trend in antibiotic resistance was the increase in strains relatively resistant to penicillin. In this quarter they comprised nearly 25 per cent of all isolates. Preliminary analysis of these strains indicated a single A/S Class accounting for at least half the isolates. PPNG now comprise only a small percentage of isolates, but when combined with the CMRNG, resistance to the penicillins was present in about 30 per cent of all isolates. Resistance to the other antibiotics used to treat gonorrhoea was either absent (cephalosporins – represented by cefriaxone and spectinomycin) or low (quinolones – represented by ciprofloxacin). In the latter case low-level resistance was seen in 2.5 per cent of strains, but no isolates possessed the higher levels of resistance seen in 1991.

PATTERNS IN 1993

It is usual to see lower numbers of isolates in colder months, but this trend was not the case in 1992 (Table 1). The 703 strains examined in 1992 represented the highest number seen for many years. In 1993, however, the total number of strains from the same sources declined to 6.1 (about a 15 per cent reduction), this reduction occurring mainly from July onwards. (Three hundred and eighty-three strains were seen in July-December 1992 and 289 in the same period in 1993 – a decrease of about 25 per cent, whereas the numbers in the first half of 1992 and 1993 were similar.)

Antibiotic resistance in gonococci changed little in 1993 with the exception of penicillin resistance. The number and percentage of PPNG peaked in the second quarter and fell in October-December. The remarkable increase in strains chromosomally resistant to penicillin in October-December is commented on above. All strains were sensitive to ceftriaxone and spectinomycin throughout the year. Low-level ciprofloxacin resistance remained at the level seen since 1984 – about 2-4 per cent – and no strains with high-level resistance were seen. High-level resistance to tetracycline (TRNG) was an infrequent finding.

TABLE 1

ANTIBIOTIC SENSITIVITY OF 611 GONOCOCCI FROM SYDNEY AND NSW JANUARY – DECEMBER 1993

Antibiotic	Quarter				Total	%
1. **Penicillin**	1	2	3	4		
Fully sensitive	53	50	44	62	209	34.2
Less sensitive	88	92	61	52	293	48
Relatively resistant	5	3	9	39	56	9.2
PPNG	11	20	13	9	53	8.6
2. Spectinomycin						
Sensitive	157	165	127	162	611	100
Resistant	0	0	0	0		
3. Ceftriaxone						
Sensitive	157	165	127	162	611	100
Resistant	0	0	0	0		
4. Ciprofloxacin						
Sensitive	151	159	123	158	591	96.7
Less sensitive	6	6	4	4	20	3.3
Resistant	0	0	0	0	0	0
5. Tetracycline						
TRNG only	3	3	0	2	8	1.3

Infectious Diseases

► *Continued from page 79*

not fully immunised against pertussis or who did not have documentation of age-appropriate immunisation.

Forty children, ranging in age from nine months to four years, were enrolled at the centre. Only 19 had immunisation records (Table 2). The director reported that she had requested this information from parents a number of times. Of the 19 children with immunisation records, two were not appropriately immunised (both had not received the 18-month booster, which the parents admitted was an oversight). Twenty-one children had no immunisation records (Table 2).

Parents of the 23 children (the two not fully immunised and the 21 without records) were told by the PHU that their children could not return to the centre without documentation of their immunisation status. Two more children were found not to have been appropriately immunised. One had not received the 18-month booster and the other had not been fully immunised for medical reasons.

TABLE 2

	DOCUMENTATION	NO DOCUMENTATION	**TOTAL**
FULLY IMMUNISED	17	19	**36**
PARTIALLY IMMUNISED	2	2	**4**
TOTAL	**19**	**21**	**40**

Letters explaining the situation and containing information about an exclusion period were provided for the parents.

Four children were excluded from the centre. The parents of three of the children chose to take them to a doctor for antibiotics and they returned to the centre five days later – Monday, March 21. The parents of the remaining child, who had not been fully immunised for medical reasons, decided to keep the child at home for the 14 days – until March 30. No further cases of pertussis were identified.

TABLE 3

**INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY JUNE 30, 1994
BY SELECTED MONTH OF ONSET**

Condition	Mar	Apr	May	Jun	Total
Adverse event after immunisation	1	4	2	–	7
AIDS	48	23	8	6	85
Arboviral infection	79	53	55	17	204
Foodborne illness (NOS)	6	65	17	8	96
Gastroenteritis (instit.)	9	46	10	16	81
Gonorrhoea	34	32	20	12	98
H influenzae epiglottitis	5	2	4	3	14
H influenzae meningitis	2	1	1	4	8
H influenzae septicaemia	1	2	1	1	5
H influenzae infection (NOS)	1	2	1	–	4
Hepatitis A – acute viral	49	48	35	22	154
Hepatitis B – acute viral	–	11	11	1	23
Hepatitis B – chronic/carrier	53	47	45	23	168
Hepatitis B – unspecified	302	257	326	73	958
Hepatitis C – acute viral	1	–	1	–	2
Hepatitis C – unspecified	679	559	637	259	2,134
Hepatitis D – unspecified	–	1	1	–	2
HIV infection	47	27	34	20	128
Hydatid disease	1	–	–	1	2
Legionnaires' disease	4	9	2	1	16
Leptospirosis	2	2	2	1	7
Malaria	19	14	10	12	55
Measles	34	14	20	6	74
Meningococcal meningitis	5	6	3	3	17
Meningococcal septicaemia	2	1	4	2	9
Meningococcal infection (NOS)	–	1	1	2	4
Mycobacterial atypical	46	16	9	2	73
Mycobacterial tuberculosis	24	17	5	4	50
Mycobacterial infection (NOS)	12	12	8	5	37
Pertussis	112	88	133	25	358
Q fever	19	16	16	3	54
Rubella	4	1	4	1	10
Salmonella (NOS)	76	61	49	23	209
Salmonella bovis morbificans	3	2	1	–	6
Salmonella typhimurium	56	50	26	4	136
Syphilis	104	82	68	17	271
Tetanus	–	1	1	–	2
Typhoid and paratyphoid	3	3	–	1	7
Total	1,843	1,576	1,571	578	5,568

TABLE 4

**SUMMARY OF NSW INFECTIOUS DISEASE NOTIFICATIONS
JUNE 1994**

Condition	Number of cases notified			
	Period		Cumulative	
	June 1993	June 1994	Jan-Jun 1993	Jan-Jun 1994
Adverse reaction	4	–	12	16
AIDS	29	6	195	156
Arboviral infection	24	17	585	294
Brucellosis	–	–	2	–
Cholera	–	–	–	–
Diphtheria	–	–	–	–
Foodborne illness (NOS)	12	8	78	118
Gastroenteritis (instit.)	155	–	258	93
Gonorrhoea	21	12	190	160
H influenzae epiglottitis	5	3	24	17
H influenzae B – meningitis	3	4	34	9
H influenzae B – septicaemia	1	–	15	7
H influenzae infection (NOS)	2	–	8	7
Hepatitis A	42	22	336	255
Hepatitis B	303	97	1,815	1,769
Hepatitis C	529	259	2,775	3,419
Hepatitis D	1	–	5	5
Hepatitis, acute viral (NOS)	1	–	4	2
HIV infection	45	20	290	215
Hydatid disease	1	–	1	3
Legionnaires' disease	2	1	42	23
Leprosy	1	–	1	–
Leptospirosis	–	1	9	10
Listeriosis	1	–	5	4
Malaria	20	12	99	105
Measles	65	6	320	300
Meningococcal meningitis	7	3	24	25
Meningococcal septicaemia	2	2	15	11
Meningococcal infection (NOS)	–	2	5	5
Mumps	–	–	1	1
Mycobacterial tuberculosis	36	4	200	112
Mycobacterial – atypical	38	2	212	156
Mycobacterial infection (NOS)	4	5	19	43
Pertussis	49	25	240	666
Plague	–	–	–	–
Poliomyelitis	–	–	–	–
Q fever	33	3	195	100
Rubella	32	1	210	27
Salmonella infection (NOS)	60	27	571	593
Syphilis	59	17	353	447
Tetanus	–	–	4	2
Typhoid and paratyphoid	–	1	18	14
Typhus	–	–	–	–
Viral haemorrhagic fevers	–	–	–	–
Yellow fever	–	–	–	–

TABLE 5

**FOODBORNE INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY JUNE 30, 1994
BY PUBLIC HEALTH UNIT**

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NC	ND	WNSW	CW	SW	SE	U/K	Total
Foodborne illness (NOS)	1	10	7	19	14	8	5	13	1	3	24	–	2	8	2	1	–	118
Gastroenteritis (Instit.)	19	2	–	3	18	19	–	1	–	1	–	–	–	30	–	–	–	93
Hepatitis A – acute viral	12	8	25	31	23	3	16	3	3	13	27	32	3	14	42	–	–	255
Listeriosis	–	–	1	–	–	–	–	–	1	1	–	–	1	–	–	–	–	4
Salmonella (NOS)	17	31	24	30	27	15	35	12	9	20	51	26	17	10	14	4	–	342
Salmonella bovis morbificans	–	1	1	1	1	1	2	–	1	2	–	–	–	–	–	–	–	10
Salmonella typhimurium	20	20	13	10	48	9	29	13	15	17	5	9	5	8	18	2	–	241
Typhoid and paratyphoid	3	2	2	–	1	1	–	–	–	–	–	3	–	–	–	2	–	14

Continued on page 82 ▶

TABLE 6

INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY JUNE 30, 1994
BY PUBLIC HEALTH UNIT

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NC	ND	WNSW	CW	SW	SE	U/K	Total
Adverse event after immunisation	–	–	1	2	4	3	–	1	–	–	1	–	–	–	2	2	–	16
AIDS	25	8	54	6	27	13	10	2	5	1	3	1	–	1	–	–	–	156
Arboviral infection	–	3	1	–	–	–	6	3	4	31	177	44	13	1	9	2	–	294
Gonorrhoea	19	10	66	6	7	1	8	3	5	5	3	8	10	2	4	3	–	160
H. influenzae epiglottitis	1	2	–	2	1	2	2	3	2	–	2	–	–	–	–	–	–	17
H. influenzae meningitis	–	–	–	4	2	–	1	–	–	–	–	–	–	2	–	–	–	9
H. influenzae septicaemia	–	–	–	–	1	–	–	1	–	1	2	–	1	–	–	1	–	7
H. influenzae infection (NOS)	–	–	–	–	1	–	1	3	1	–	1	–	–	–	–	–	–	7
Hepatitis B – acute viral	4	2	15	3	1	–	–	–	–	–	4	2	3	1	–	3	–	38
Hepatitis B – chronic/carrier	–	–	153	–	79	3	10	9	–	13	11	8	1	5	–	2	–	294
Hepatitis B – unspecified	218	215	27	450	182	12	206	13	29	34	20	7	4	2	16	2	–	1,437
Hepatitis C – acute viral	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	2	–	3
Hepatitis C – unspecified	378	209	622	335	291	68	323	112	147	211	394	64	15	79	81	87	–	3,416
Hepatitis D – unspecified	–	1	–	–	–	–	1	–	–	–	3	–	–	–	–	–	–	5
Hepatitis, acute viral (NOS)	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2
HIV infection	40	12	85	16	12	3	8	2	2	5	1	–	–	–	–	1	28	215
Hydatid disease	–	–	2	–	–	–	–	–	–	–	–	–	1	–	–	–	–	3
Legionnaires' disease	3	2	1	6	3	–	3	–	3	–	–	–	–	2	–	–	–	23
Leptospirosis	1	–	–	–	–	–	–	–	–	3	3	2	–	–	1	–	–	10
Malaria	11	6	11	6	7	2	26	2	4	4	7	7	–	2	4	6	–	105
Measles	25	6	10	21	22	26	18	3	8	21	74	29	21	12	1	3	–	300
Meningococcal meningitis	2	3	2	4	3	1	–	3	–	2	2	–	–	1	1	1	–	25
Meningococcal septicaemia	–	2	–	2	1	–	1	1	–	2	2	–	–	–	–	–	–	11
Meningococcal infection (NOS)	–	2	–	–	2	–	–	–	–	–	–	1	–	–	–	–	–	5
Mumps	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Mycobacterial atypical	32	8	52	4	6	4	23	4	–	12	6	2	–	1	2	–	–	156
Mycobacterial tuberculosis	16	22	12	19	15	2	9	1	4	5	3	1	1	–	2	–	–	112
Mycobacterial infection (NOS)	8	2	4	–	2	1	17	1	–	1	3	–	1	–	3	–	–	43
Pertussis	16	47	45	40	62	24	32	12	29	40	264	12	15	13	3	12	–	666
Q fever	2	–	–	–	1	–	–	–	–	15	16	35	28	–	3	–	–	100
Rubella	–	–	2	–	7	1	4	1	–	–	4	4	1	–	2	–	–	26
Rubella – congenital	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Syphilis	73	31	119	62	29	3	30	9	6	2	22	21	31	4	4	1	–	447
Tetanus	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	2
Typhoid & paratyphoid	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 7

SURVEILLANCE OF NON-NOTIFIABLE SEXUALLY TRANSMITTED DISEASES
JANUARY-JUNE 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. 01/01/94-31/05/94; 5. 01/01/94-30/06/94; 6. 01/01/94-28/02/94; 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[5]	ILL[6]	HUN[4]	NC[4]	ND[4]	WNSW[7]	CW[7]	SW[8]	SE[9]	Total
Chlamydia trachomatis	Male	1	–	23	1	6	1	1	2	8	–	4	6	–	–	–	53
	Female	1	–	27	1	7	1	1	2	12	1	11	12	–	4	–	80
	Total	**2**	**–**	**50**	**2**	**13**	**2**	**2**	**4**	**20**	**1**	**15**	**18**	**–**	**4**	**–**	**133**
Donovanosis	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Total	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
*Genital herpes	Male	3	1	108	–	12	7	10	–	13	5	2	1	–	1	–	163
	Female	4	3	49	–	9	5	5	–	14	4	6	3	–	2	–	104
	Total	**7**	**4**	**157**	**–**	**21**	**12**	**15**	**–**	**27**	**9**	**8**	**4**	**–**	**3**	**–**	**267**
*Genital warts	Male	11	6	278	19	74	12	25	11	64	20	4	6	–	2	–	532
	Female	8	6	134	9	37	13	13	4	24	7	15	9	–	2	–	281
	Total	**19**	**12**	**412**	**28**	**111**	**25**	**38**	**15**	**88**	**27**	**19**	**15**	**–**	**4**	**–**	**813**
Nongonococcal urethritis	Male	3	1	215	12	55	7	20	5	35	12	6	5	–	2	–	378
	Female	–	–	–	–	3	2	–	–	–	–	–	2	–	2	–	9
	Total	**3**	**1**	**215**	**12**	**58**	**9**	**20**	**5**	**35**	**12**	**6**	**7**	**–**	**4**	**–**	**387**
Lymphogranuloma venereum	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Total	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**

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.