HOSPITAL-RELATED MORTALITY IN NSW: PRELIMINARY RESULTS

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INTRODUCTION

The use of hospital mortality rates as indicators of the quality of hospital care has been considered for some time. Since the release of hospital mortality indicators by the US Health Care Financing Administration in 1984 and 1986[1], methods to improve their validity and reliability have developed, particularly in North America.

This article reports on a preliminary analysis of in-hospital mortality data and identifies the data needed to produce more valid and reliable versions of these indicators.

The mortality outcomes of hospitals or clinical services are influenced by many factors other than the quality of medical care. These include the patients' age, sex, clinical condition, illness severity, co-morbidity, treatment received before hospitalisation, hospital admission and discharge policies, and the type or role of the hospital. Adjustment for such factors is necessary before meaningful comparisons of mortality rates can be made among hospitals or across time for a given hospital. Information on many of these factors is not available from routine data systems.

As a first step in developing indicators of hospital-related mortality we examined deaths occurring in NSW hospitals over the past five years, focusing on the numbers and rates of in-hospital deaths, case-fatality rates (CFRs) for selected conditions, and variations in all-causes mortality within different categories of hospital. Only crude rates are presented here – there has been no attempt to adjust for even basic influences such as casemix, age and sex. The results of basic risk-adjusted analyses using available data will be reported in the near future. Our intention is to determine whether existing data will allow for the development of appropriate indicators or whether additional information is required.

METHODS

We analysed data on separations from all public and private hospitals in NSW over the five consecutive financial years between 1988-89 and 1992-93. The data source was the NSW Inpatient Statistics Collection. Analyses were based on the principal diagnosis or procedure, which was coded according to the *International Classification of Diseases and Causes of Death, 9th Revision, Clinical Modification*[2] (ICD-9 CM). The following conditions or procedures were selected for review:

- acute myocardial infarction (AMI) (ICD-9CM code N410);
- cerebrovascular accident (CVA) (430-438);
- aortic aneurysm (441);
- head injury (800, 801, 803, 804, 850-854);
- hip fracture (820); and
- coronary artery bypass grafts (CABG) (procedure code 361).

Hospitals were grouped according to a NSW Health Department classification which took into account the level of services provided, casemix complexity and hospital size[3]. Mortality trends were presented for seven public hospital groups:

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principal referral, major referral, major rural base, district – high, district – medium, district – low, and community.

CFRs (expressed as percentages) were calculated as follows:

CFR = (No. of inpatient deaths/No. of hospital separations) X 100

RESULTS

Between 1988-89 and 1992-93, the number of hospital inpatients (including day-only patients, i.e. patients admitted and discharged on the same day) increased by 27 per cent from 1,212,524 to 1,535,451. Most (74 per cent) of this increase was due to a growth in the number of day-only cases; there was an 84 per cent increase in day-only admissions over the five-year period, compared with a 9 per cent increase in the number of longer-stay patients. In view of the disproportionate growth in day-only patients, who are generally at low risk of dying in hospital, we excluded day-only cases from our analyses to improve the validity of comparisons across the period.

Excluding day-only patients, there were 1,010,324 separations from, and 23,201 deaths in, NSW hospitals in 1992-93, giving an overall in-hospital mortality rate of 2.3 per cent. This figure has remained relatively stable since 1988-89 (Table 1).

The risk of in-hospital death varied according to principal diagnosis as illustrated in Table 2. The CFR for patients presenting with an aortic aneurysm ranged between 20 and

TABLE 1			
UNADJUSTED ALL CAUSES IN-HOSPITAL MORTALITY, NSW 1988-89 TO 1992-93			
	Deaths	Total separations	CFR (%)
1988-89	21,318	926,769	2.30
1989-90	22,434	969,492	2.31
1990-91	22,014	984,269	2.23
1991-92	23,365	987,423	2.37
1992-93	23,201	1,010,324	2.29

Day-only cases excluded

22 per cent over the five years and for patients with AMI or CVA between 13 and 16 per cent. Among patients with proximal femoral fracture the rate remained around 4 per cent, while nearly 3 per cent of patients with head injury and around 2 per cent of patients having CABG surgery died as inpatients.
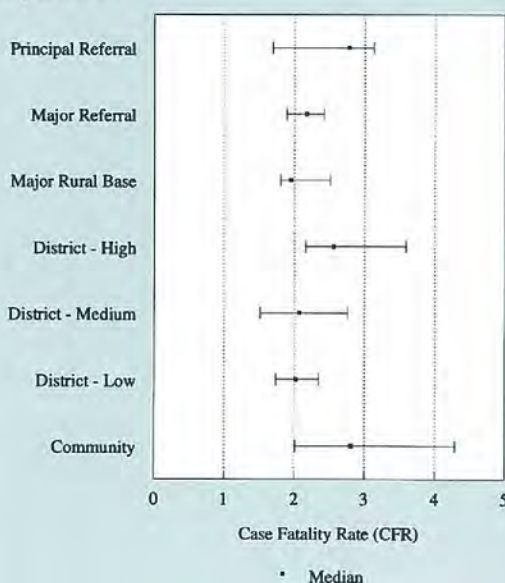
The average CFR within acute hospital role groups ranged from 2 to 3 per cent over the five-year period (Table 3). In contrast, much higher rates were reported for other hospital groups such as public nursing homes (17 per cent) and public subacute hospitals (19 per cent) which included hospices and rehabilitation centres.

Figure 1 depicts the variability of CFRs among public hospitals in 1992-93, displaying the median and interquartile range for each type of hospital. In the same year, the CFR in principal referral hospitals ranged from 1.0 per cent to 3.5 per cent, while for major rural base hospitals the range was between 1.8 per cent and 2.8 per cent, and for public hospitals it was from 0.4 per cent to 11.5 per cent.

DISCUSSION

Some 44,000 people die in NSW each year and just over half these deaths occur in hospital. In 1992-93 this translated into an all causes in-hospital mortality rate for NSW of 2.3 per cent. How does this compare with other States or countries? While it is of limited value to compare in-hospital mortality rates without adjusting for risk (i.e. using crude rates only), such a comparison does provide a context in which to place the NSW experience. For this purpose we selected the USA as an initial benchmark. In 1987[4] a survey of short-term, general, non-federal hospitals reported an all category mortality rate of 2.9 per cent, and the following CFRs for specific conditions: aortic aneurysm 20.6 per cent, CVA 10.5 per cent, AMI 14.9 per cent, hip fracture 4.2 per cent, and CABG 5.1 per cent. With the notable exception of CABG these figures are generally consistent with the aggregate results from all NSW hospitals. It cannot be concluded from these crude comparisons that outcomes for CABG are better in NSW than in the USA because the rates have not been adjusted for differences in patient characteristics and the impact these might have on outcomes. This draws attention to the importance of appropriate risk-adjustment to allow valid comparisons to be made.

FIGURE 1

CRUDE CFR FOR NSW PUBLIC HOSPITALS, 92/93 MEDIAN 25-75 PERCENTILE RANGES

Hospital Role

Case Fatality Rate (CFR)

• Median

TABLE 2

UNADJUSTED IN-HOSPITAL MORTALITY FOR SELECTED PATIENT GROUPS, 1988-89 TO 1992-93

	Deaths	Total separations	CFR (%)		Deaths	Total separations	CFR (%)
CVA				**AMI**			
1988-89	2,036	14,110	14.4	1988-89	1,650	10,534	15.7
1989-90	2,058	14,592	14.1	1989-90	1,632	10,829	15.1
1990-91	2,013	14,866	13.5	1990-91	1,630	11,008	14.8
1991-92	2,136	15,343	13.9	1991-92	1,605	11,235	14.3
1992-93	2,005	15,520	12.9	1992-93	1,587	11,192	14.2
Aortic aneurysm				**Head injury**			
1988-89	254	1,225	20.7	1988-89	214	7,355	2.92
1989-90	271	1,349	20.1	1989-90	213	7,469	2.85
1990-91	295	1,417	20.8	1990-91	212	6,931	3.06
1991-92	306	1,431	21.4	1991-92	211	6,710	3.14
1992-93	342	1,556	22.0	1992-93	182	6,593	2.76
Hip fracture				**CABG**			
1988-89	232	5,259	4.42	1988-89	82	3,809	2.15
1989-90	219	5,150	4.25	1989-90	81	4,474	1.81
1990-91	218	5,197	4.20	1990-91	122	4,836	2.52
1991-92	194	5,378	3.62	1991-92	107	5,178	2.07
1992-93	223	5,516	4.04	1992-93	108	5,602	1.93

Day-only cases excluded

TABLE 3

UNADJUSTED IN-HOSPITAL MORTALITY BY HOSPITAL ROLE, NSW 1988-89 TO 1992-93

Hospital role	Deaths	Total separations	CFR (%)	Hospital role	Deaths	Total separations	CFR (%)
Principal referral				**District – medium**			
1988-89	4,564	156,848	2.91	1988-89	4,214	181,291	2.32
1989-90	4,455	158,732	2.81	1989-90	4,524	195,282	2.32
1990-91	4,768	176,689	2.70	1990-91	4,084	191,108	2.14
1991-92	5,329	195,777	2.72	1991-92	3,967	187,860	2.11
1992-93	5,105	199,756	2.56	1992-93	4,021	191,191	2.10
Major referral				**District – low**			
1988-89	1,203	56,519	2.13	1988-89	1,614	80,522	2.01
1989-90	1,214	57,923	2.10	1989-90	1,664	82,660	2.01
1990-91	1,179	58,426	2.02	1990-91	1,802	85,687	2.10
1991-92	1,247	59,016	2.11	1991-92	1,856	81,248	2.28
1992-93	1,671	79,875	2.09	1992-93	1,797	79,731	2.25
Major rural base				**Community**			
1988-89	1,069	50,540	2.12	1988-89	1,313	51,028	2.57
1989-90	1,076	51,881	2.08	1989-90	1,391	53,958	2.58
1990-91	1,002	52,000	1.97	1990-91	1,367	54,959	2.49
1991-92	1,071	52,152	2.05	1991-92	1,613	55,830	2.89
1992-93	1,092	54,021	2.02	1992-93	1,629	57,453	2.83
District – high							
1988-89	2,367	85,214	2.78				
1989-90	2,667	91,792	2.91				
1990-91	2,530	88,238	2.87				
1991-92	2,547	86,150	2.96				
1992-93	2,645	90,183	2.93				

Day-only cases excluded

SHOULD WE SCREEN FOR COLORECTAL CANCER?

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INTRODUCTION

In NSW in 1991 colorectal cancer was the second most
common cancer affecting women and men, after breast and
prostate cancer, respectively[1]. Because of the burden of this
disease and because prevention is not possible, population-
based screening to detect and remove colorectal adenomas
and early asymptomatic cancers has been advocated by
some[2]. However, the decision to implement population-based
screening is a complex one. Early detection and treatment of
colorectal neoplasms (adenomas and cancers) must be
shown to be effective in reducing disease mortality and any
benefits of screening must outweigh potential morbidity
caused. Other considerations include the feasibility, cost and
acceptability of screening to Australians and the likelihood
of patient and physician compliance with a screening
program.
We examined the evidence about the effectiveness of
screening and related issues to inform screening policy.
This included a comprehensive and critical review of the
literature, preliminary economic analysis of screening
in the Australian health care setting and correspondence
with Australian investigators for information about local
research relevant to screening. A summary of this review
and its recommendations are presented below and in
Table 4. The full report, including the tabulated results of
the critical appraisal of the literature, is available from
the Epidemiology and Health Services Evaluation Branch.

IS SCREENING EFFECTIVE?

Whether screening is effective is the first and crucial
question to ask before embarking on a screening program.
Randomised controlled trials provide the best quality
evidence about screening effectiveness. There are five large
trials (one non-randomised) investigating the effectiveness
of screening using the faecal occult blood test (FOBT)
Hemoccult[3,4,5,6,7,8,9,10,11,12,13]. The New York trial[12,13] is evaluating
Hemoccult additional to sigmoidoscopy which was offered
to all study participants. The major characteristics and
mortality findings of the trials are given in Table 5. In all
trials, Hemoccult positive subjects were referred for further
investigation which was mainly colonoscopy, or
alternatively, sigmoidoscopy with double contrast barium
enema. Colorectal neoplasms detected were removed.

Three of the trials have reported mortality findings,
analysed by intention to treat[4,11,13]. Only the Minnesota trial[4]
has reported a statistically significant 33 per cent reduction
in colorectal cancer mortality with annual screening (Table
5). However, the findings of the Minnesota trial must be
viewed with caution for several reasons. There are
inconsistencies in the numbers of colorectal cancers

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While our development of risk-adjusted indicators is still at
an early stage, there are a few excellent examples of clinical
groups in NSW that have produced and implemented such
indicators to monitor the quality of their services. One such
example is the Australian and New Zealand Intensive Care
Society (ANZICS). ANZICS, partially funded by the NSW
Health Department's Health Outcomes Program, is
installing a standard clinical information system in
intensive care units throughout Australia to provide risk-
adjusted mortality data to the participating units. The
information from this system will allow individual units to
compare their overall performance and condition-specific
mortality to an international benchmark and facilitate
monitoring of trends in performance. The development of
such systems is complementary to the work being carried
out in the Epidemiology and Health Services Evaluation
Branch.

The next steps in our exploration of hospital mortality will
be to:

- recalculate in-hospital mortality rates adjusting
  for age, sex and casemix, and condition-specific
  mortality rates adjusting for age and sex;
- evaluate methods for using existing inpatient data
  in the measurement of co-morbidity and severity of
  illness and in risk adjustment;

- compare the use of routinely reported inpatient data
  and these algorithms against results derived from
  more comprehensive clinical databases, e.g. Trauma
  Registries;
- demonstrate the feasibility and usefulness of linking
  routinely reported inpatient data to mortality data
  to extend this analysis to include post-discharge
  deaths; and
- assess the usefulness of additional data items from
  existing hospital information systems and processes
  which may be of value in the measurement of co-
  morbidity, severity of illness and risk adjustment.
  This evaluation will determine whether suitable
  data items are captured by hospital records, the
  extent and consistency of recording across
  institutions and the feasibility of computerisation.

This work will be assisted by a grant from the
Commonwealth Government and will include collaboration
with the Victorian Department of Health and Community
Services.

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TABLE 4

SUMMARY OF REVIEW AND RECOMMENDATIONS ABOUT COLORECTAL CANCER SCREENING

1. Population screening is not recommended as screening effectiveness has not yet been adequately established. Follow-up continues in the major trials and review of this position will be necessary in a few years time when further information is available.

2. Although evidence for screening persons at high risk, such as those with a known genetic susceptibility for colorectal cancer, is also lacking, it seems prudent to screen such groups on the basis of the increased risk.

3. Further work is needed in Australia to determine the implications of introducing screening for health services planning and costs, to determine the most accurate and feasible screening test and the likely compliance of Australians with screening, and to determine and cater for the psychosocial consequences of screening.

reported, information about vital status for all study participants at follow-up is not given, there is no intermediate biennial screening benefit and about one-third of all people screened had colonoscopy with its attendant risks and costs. It is possible that using colonoscopy alone on a random sample of one-third of people from either group would have resulted in this mortality reduction.

The New York trial[13] has reported a borderline significant 43 per cent reduction in colorectal cancer mortality with annual screening in one of the subgroups examined (Table 5). But the New York trial was a non-randomised study and study groups were demonstrably not comparable, suggesting bias in the allocation of subjects to study groups. The Danish trial[11] has reported a non-significant 17 per cent reduction in colorectal cancer mortality with biennial screening (Table 5). Follow-up continues in four of the five trials. In the interim, evidence for the effectiveness of screening using Hemoccult remains inconclusive.

Screening using flexible sigmoidoscopy has been suggested[2]. The only evidence about screening effectiveness using sigmoidoscopy comes from two recent case-control studies[14,15]. The authors reported 60-80 per cent reductions in colorectal cancer mortality with sigmoidoscopic screening but these results must be interpreted cautiously because of the biases inherent in case-control studies to evaluate screening. In addition, sigmoidoscopy is more invasive and expensive than Hemoccult and has an estimated rate of bowel perforation of 0.02 per cent[16]. Randomised trials evaluating the effectiveness of screening using sigmoidoscopy are under way in the United Kingdom[17] and the United States[18]. There are no studies investigating the effectiveness of screening using colonoscopy. However, colonoscopy is probably unsuitable as a screening test as it is expensive, invasive, requires sedation and bowel preparation and has an estimated complication rate of perforation, haemorrhage and death of 0.17 per cent, 0.03 per cent and 0.02 per cent respectively.

FAECAL OCCULT BLOOD TESTS (FOBTS)

The major trials are evaluating screening using Hemoccult, an inexpensive guaiac-based FOBT which detects blood products in faeces. Estimates of the sensitivity of Hemoccult for detecting colorectal cancer in asymptomatic populations vary greatly (22-92 per cent[3,5-9,20]). More recent

immunochemical FOBTs appear to have greater sensitivity than Hemoccult without loss of specificity[21,22], but the newer tests need further evaluation in asymptomatic populations. The value of detection of colorectal **adenomas** with FOBTs in reducing mortality from colorectal cancer remains unclear although researchers from the Minnesota trial[4] suggest this may become clearer with further follow-up.

GROUPS AT INCREASED RISK OF COLORECTAL CANCER

People with a known genetic predisposition for colorectal cancer such as those with familial adenomatous polyposis or hereditary non-polyposis colorectal cancer (HNPCC) have a markedly increased risk of colorectal cancer: 50 per cent of the children of people affected with HNPCC are reported to develop colorectal cancer[23]. Thus, despite uncertainty about the trial evidence, screening seems prudent for these people in the light of their high risk. People with a family history of colorectal cancer with no known genetic basis have a two- to four-fold increased risk of colorectal cancer[23]. The decision to screen or not screen such people is less clear and should be left to the individuals and their medical practitioners.

WOULD AUSTRALIANS PARTICIPATE IN SCREENING?

Assuming that colorectal cancer screening is effective, compliance of the Australian population with screening would be critical to the ability of a screening program to reduce mortality rates. The notion of compliance is complex, encompassing initial and continued participation in screening and adherence to follow-up, treatment recommendations and post-treatment surveillance.

Compliance of screen-positive people with follow-up investigations is essential to maximise the effectiveness of screening. Compliance with follow-up was high in the major trials (77-93 per cent). However, the numbers of eligible people who choose to participate in screening will influence the public health impact of the screening program in its ability to reduce colorectal cancer mortality. Compliance with initial Hemoccult testing ranged from 53 per cent to 80 per cent in the major trials (Table 5) and was positively associated with younger age and female gender. Compliance with rescreening, where offered to all those in the screen group, not just previous compliers, was lower (20-58 per cent, Table 5). Personalised invitations to screening, reminder letters or telephone calls increased compliance in the trials and other studies[24,25]. Preliminary Australian research on compliance with colorectal cancer screening has been done[26,27,28] but more work is needed to assess barriers to screening participation and to test strategies for overcoming these barriers.

PSYCHOSOCIAL IMPACT OF SCREENING

In the major trials, screening with Hemoccult resulted in a positive predictive value for cancer ranging from 2 per cent to 18 per cent and 2 to 4 per cent if Hemoccult slides were rehydrated (Table 5). Therefore, more than 80 per cent of positives are false positives: such large numbers of people receiving falsely positive results is important since a positive result is not unexpectedly associated with distress[24,29]. All these people would require colonoscopy, an invasive procedure which, in addition to the physical risk, may cause pain and embarrassment[30] and significant anxiety[31]. There is also evidence from other screening programs that anxiety aroused by a false positive result

TABLE 5

SUMMARY OF CHARACTERISTICS AND MORTALITY RESULTS OF TRIALS OF HEMOCCULT SCREENING FOR COLORECTAL CANCER

	Minnesota, USA	Nottingham, England	Goteborg, Sweden	Funen, Denmark	New York, USA
Study population	46,551 Minnesota volunteers aged 50-80 years.	107,349 Nottingham subjects aged 50-74 yrs identified from GP records.	All 27,700 inhabitants of Goteborg, Sweden, aged 60-64 years.	61,938 inhabitants of the island of Funen, Denmark, aged 45-74 years.	21,756 clients attending New York medical clinic, aged 40 years and older.
Assignment to study groups	Volunteers randomly assigned to annual or biennial screen group or control group.	Subjects randomly allocated either to receive HO test packs with letter from GP or to control group.	All subjects randomly allocated to either receive HO tests, letter of instructions plus questionnaire or to control group.	Subjects identified from the Central Person Register were randomly allocated to biennial HO screening (tests, instructions plus questionnaire) or to control group.	Subjects presenting at clinic from 1975-1979 stratified into two groups according to clinic attendance and allocated to screen or control groups according to month of presentation. Both groups offered annual SG; screen gp also offered annual HO.
Screening test(s)	HO offered to screen groups. HO – most rehydr.	HO – unhydr.	HO – most rehydr.	HO – unhydr.	HO – most unhydr.
Screening and follow-up periods	Screening: 1975-1982 and 1986-1992. Follow-up continues.	Screening started 1981, offered biennially. Recruitment and follow-up continues.	Screening started 1982, rescreening offered to all screen group 16-22 months later. Follow-up continues.	Screening: 1985-1990, three screens done. Follow-up continues.	Authors state: 'Follow-up ceased 1984'.
Compliance with screening	Percent of screenings completed: **Annual gp:** 75.2% **Biennial gp:** 78.4%	(Rescreening offered only to compliers.) **1st round:** 53% completed HO test. **2nd round:** 77% completed tests.	**1st round:** 66% completed HO test and questionnaire. **2nd round:** 58% completed HO and questionnaire.	(Rescreening offered only to compliers.) **1st round:** 67% completed screening. **2nd round:** 93% completed tests.	Compliance with HO on first round: **Regular attenders:** 70% **First presenters:** 80% Compliance in next 2 rounds decreased to 20% and then 16% for first presenters.
Positive Predictive Value (PPV) of test for colorectal cancer	2.2% (rehydr HO) – 5.6% (unhydr HO).	(NB: Proportion of HO positives investigated not given.) **1st round:** ?10.2% **2nd round:** ?8.5%	**1st round:** (most unhydr) 5.0% **2nd round:** (all rehydr) 4.2%	**1st round:** 17.7% **2nd round:** 8.4%	Overall: 10.7%
Mortality findings reported	At 13 years follow-up: **CRC mortality/1000:** Annual: 5.9 (4.6-7.2)* Biennial: 8.3 (6.8-9.8) Control: 8.8 (7.3-10.4) **All cause mortality/1000:** Annual: 216 (209-222) Biennial: 218 (211-224) Control: 216 (210-223)	Mortality data not yet available. Follow-up continues.	Mortality data not yet available. Follow-up continues.	At 38 months follow-up: **CRC mortality/1000:** Screen gp: 2.4 Control gp: 2.9 (p=0.24) **All cause mortality/1000:** Screen gp: 86.2 Control gp: 89.6	At 9 years follow-up: **CRC mortality/1000/yr:** 'regular attenders': Screen gp: 0.47 Control gp: 0.41 'first presenters': Screen gp: 0.36 Control gp: 0.63 (p=0.053)

HO – Hemoccult II; CRC – Colorectal Cancer; SG – Sigmoidoscopy; rehydr – Rehydrated; unhydr – Unhydrated.
*95% Confidence Intervals in brackets.

Colorectal cancer

may be long term[32] and negative results may reassure people who then do not seek medical care for rectal bleeding[29]. Implementation of screening requires attention to the provision of appropriate information about its purpose and pitfalls. There also need to be support services for people receiving, and undergoing investigation for, positive test results.

ECONOMIC CONSIDERATIONS

The risks, benefits and costs are major factors in decisions about screening. Information on screening benefits in terms of survival with and without the disease remains unclear without conclusive randomised trial evidence but assumptions about survival, the natural history of the disease, the screening procedures and clinical history can be made to compare the costs and benefits of screening. In the US, Eddy[33] has evaluated three screening strategies which resemble proposed Australian screening guidelines[2,23]: annual FOBT, annual FOBT plus sigmoidoscopy every five years and annual FOBT plus colonoscopy every five years. The estimated cost-effectiveness ratio for each strategy was $US8,800, $US7,760 and $US20,700 per life year gained respectively. However, based on the findings of the Minnesota trial, the cost-effectiveness of FOBT screening may be considerably underestimated[34]. We have begun preliminary estimates of the cost-effectiveness of screening in an Australian context using Australian cancer incidence data and Australian health care costs. The results of this analysis will be reported when available.

CONCLUSION AND RECOMMENDATIONS

Contrary to the recommendations of The Gut Foundation[2], we recommend that screening for colorectal cancer should not be implemented on a population basis as there is not sufficient evidence of its effectiveness. This position will need review when further trial evidence becomes available. Screening for groups at high risk of colorectal cancer such as those with a known genetic predisposition seems prudent on the basis of the increased risk. If evidence accruing from the trials over the next few years warrants a decision to screen, it must be with the support of general practitioners, with quality control for FOBTs and with adequate linkage to ensure appropriate management and follow-up of people with positive results[23]. In addition, there must be monitoring and evaluation of the screening program's ability to detect early cancers and minimise the interval cancer rate. In the interim, further investigation in the areas of compliance, psychosocial impact and better screening tests, as well as more detailed economic evaluation, is needed.

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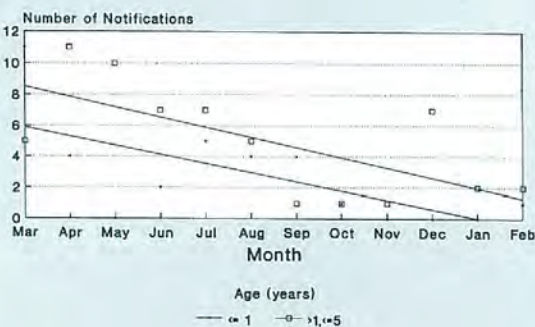
INFECTIOUS DISEASES

FIGURE 2

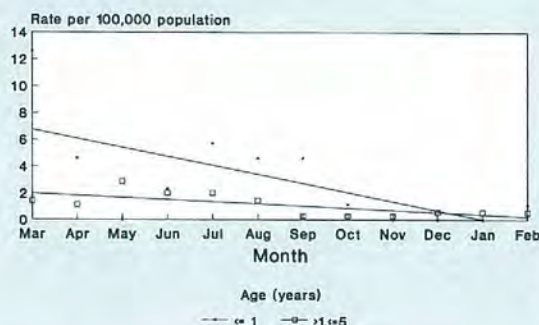### HAEMOPHILUS INFLUENZAE TYPE B, NSW
MARCH 1993-FEBRUARY 1994

Number of Notifications

Age (years)
<= 1   >1,<=5   >5

• Provisional

FIGURE 3

HIB, NSW, <= FIVE YEARS OLD
MARCH 1993-FEBRUARY 1994

Number of Notifications

Age (years)
<= 1   >1,<=5

• Provisional

FIGURE 4

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

Rate per 100,000 population

Age (years)
<= 1   >1,<=5

• Provisional

NOTIFICATIONS

HAEMOPHILUS INFLUENZAE TYPE B

The first notification in five months for Hib in a child under one year old has been received by the Central Coast Public Health Unit. The six-month-old child has been discharged from Gosford Hospital. The infant received a single dose of Hibtiter at the age of three months but did not receive routine boosters, as recommended.

The immunisation program against *Haemophilus influenzae* type B, introduced in July 1993, is already demonstrating excellent effect on the epidemiology of this infection. No notifications for *Haemophilus influenzae* type b have been received for the past three months for infants. Only three notifications were received for January, for a rate of 0.6/100,000 population. This compares with a notification rate of 2.0 per 100,000 population for January 1993.

MEASLES

The notification rate for the State is 16.2/100,000 population. This compares with a rate of 14.9 for 1993.

The North Coast Public Health Unit has received 47 notifications in February at a rate of 74.1/100,000 population. This compares with a rate of 66.3 per 100,000 population reported for January.

Measles notifications have been reported to the Western Sector Public Health Unit (Western Sydney and Wentworth Areas) for 1994 at a rate of 18.0/100,000 population. The infant measles immunisation schedule in the outbreak-affected areas (Blacktown and Penrith) reverted to 12 months of age on March 1.

The mean age for notifications was 8.0 years (range four months to 36 years). Fifteen per cent of notifications were for neonates and infants (≤ one year of age). Fifty-nine per cent of notifications were for children over the age of five years, while 24 per cent were for people 12 years and older.

From July 1 this year, it is anticipated that the schoolgirl rubella program will be replaced by a universal schoolchild measles-mumps-rubella program.

PERTUSSIS (WHOOPING COUGH)

The pertussis notification rate for the State for 1994 is 16.1/100,000 population. This compares with a rate of 24.6 for 1993.

Eighteen per cent of notifications were for children under five years of age. A further 43 per cent of notifications were for school-aged children.

North Coast Public Health Unit (PHU) has received 74 notifications at a rate of 116.8/100,000 population. The PHU has investigated all cases and advised contacts of appropriate measures to minimise risk of further spread of infection. Media releases have been made in community newspapers, and liaison between the PHU and the local Divisions of General Practice will promote the use of triple antigen.

FOODBORNE ILLNESS

A case of Salmonella enteritidis phage type 4 has been notified to Epidemiology Branch by the Microbiological Diagnostic Unit, University of Melbourne, which administers the National Salmonella Surveillance Scheme.

TABLE 6

**INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY FEBRUARY 25, 1994
BY MONTH OF ONSET**

Condition	Jan	Feb	Total
Adverse event after immunisation	2	1	3
AIDS	16	1	17
Arboviral infection	18	22	40
Foodborne illness (NOS)	11	–	11
Gastroenteritis (instit.)	1	2	3
Gonorrhoea	28	10	38
H influenzae epiglottitis	2	1	3
H influenzae meningitis	1	–	1
H influenzae septicaemia	1	1	2
H influenzae infection (NOS)	2	1	3
Hepatitis A – acute viral	36	12	48
Hepatitis B – acute viral	5	–	5
Hepatitis B – unspecified	273	53	326
Hepatitis C – acute viral	1	–	1
Hepatitis C – unspecified	491	159	650
Hepatitis D – unspecified	1	–	1
Hepatitis – acute viral (NOS)	1	1	2
HIV infection	30	30	60
Legionnaires' disease	2	1	3
Leptospirosis	1	–	1
Listeriosis	2	1	3
Malaria	5	2	7
Measles	136	23	159
Meningococcal meningitis	5	2	7
Meningococcal septicaemia	1	1	2
Mumps	1	–	1
Mycobacterial tuberculosis	14	–	14
Mycobacterial infection (NOS)	7	3	10
Pertussis	132	26	158
Q fever	11	2	13
Rubella	5	1	6
Salmonella bovis morbificans	1	–	1
Salmonella typhimurium	36	4	40
Salmonella (NOS)	58	17	75
Syphilis	68	10	78
Typhoid and paratyphoid	–	2	2
Total	**1,402**	**392**	**1,794**

TABLE 7

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

Condition	Period Feb 1993	Period Feb 1994	Cumulative Feb 1993	Cumulative Feb 1994
Adverse reaction	1	1	3	3
AIDS	29	1	69	17
Arboviral infection	251	22	307	40
Brucellosis	–	–	–	–
Cholera	–	–	–	–
Diphtheria	–	–	–	–
Foodborne illness (NOS)	7	–	12	11
Gastroenteritis (instit.)	12	2	36	2
Gonorrhoea	37	10	60	38
H influenzae epiglottitis	4	1	5	3
H influenzae B – meningitis	5	–	10	1
H influenzae B – septicaemia	3	1	4	2
H influenzae infection (NOS)	–	1	3	3
Hepatitis A	71	12	128	48
Hepatitis B	281	53	577	331
Hepatitis C	468	159	804	651
Hepatitis D	–	–	–	1
Hepatitis, acute viral (NOS)	–	1	–	2
HIV infection	38	30	128	60
Hydatid disease	–	–	–	–
Legionnaires' disease	5	1	12	3
Leprosy	–	–	–	–
Leptospirosis	4	–	4	1
Listeriosis	–	1	4	3
Malaria	22	2	38	7
Measles	65	23	147	159
Meningococcal meningitis	2	2	5	7
Meningococcal septicaemia	2	1	4	2
Meningococcal infection (NOS)	1	–	2	–
Mumps	–	–	–	1
Mycobacterial tuberculosis	35	–	71	14
Mycobacterial – atypical	26	–	49	–
Mycobacterial infection (NOS)	3	3	9	10
Pertussis	32	26	107	158
Plague	–	–	–	–
Poliomyelitis	–	–	–	–
Q fever	34	2	59	13
Rubella	24	1	92	6
Salmonella infection (NOS)	106	21	224	116
Syphilis	54	10	115	78
Tetanus	–	–	2	–
Typhoid and paratyphoid	2	2	9	2
Typhus	–	–	–	–
Viral haemorrhagic fevers	–	–	–	–
Yellow fever	–	–	–	–

The case is a two-year-old boy living in the Hunter Area. The case has a mixed salmonella infection with both Salmonella enteritidis phage type 4 and Salmonella montevideo being isolated in December 1993. Investigation to date has suggested this is a locally acquired infection. Notifications of S. enteritidis phage type 4 in Australia are generally acquired overseas (see NSW Public Health Bulletin 1993; 4(4):45-46). Hunter Area PHU is conducting an investigation in liaison with NSW Agriculture.

The Diagnostic Unit has also advised of a further 10 cases of Salmonella typhimurium phage type 9 following notification of a cluster of 13 cases in January.

Hunter Area PHU on February 14, 1994 received notification of an outbreak of gastroenteritis in a party of 120 students and teachers from a school in the Hunter Area who had visited a resort in the New England Area. An investigation is being conducted by the New England PHU with the Hunter PHU. Of the 72 students and teachers who responded to a questionnaire 59 (82 per cent) were ill with predominant symptoms of diarrhoea, nausea, abdominal cramps, headaches and vomiting. The investigation has not concluded, but untreated river water used for swimming, drinking purposes and food preparation is suspected as the vehicle of transmission of the infectious agent.

NON-NOTIFIABLE STD SURVEILLANCE

Lymphogranuloma venereum (LGV) is caused by infection of lymphatic tissue by particular strains of *Chlamydia trachomatis*. It is endemic to some countries of Africa, South America, South-East Asia, and India. LGV is usually diagnosed more frequently in men, as infection is more likely to be asymptomatic in women. It has been diagnosed only sporadically in Europe, North America and Australia. Sentinel surveillance indicates that these *C. trachomatis* strains are still extremely rare in NSW.

TABLE 8

INFECTIOUS DISEASE NOTIFICATIONS FOR 1994
FOR NOTIFICATIONS RECEIVED BY FEBRUARY 25, 1994
BY PUBLIC HEALTH UNIT

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NCR	NER	OFR	CWR	SWR	SER	U/K	Total
Adverse event after immunisation	–	–	–	–	1	1	–	–	–	–	1	–	–	–	–	–	–	3
AIDS	4	2	3	2	2	1	–	1	–	–	2	–	–	–	–	–	–	17
Arboviral Infection	–	–	–	–	–	–	2	–	1	2	29	1	4	–	1	–	–	40
Gonorrhoea	–	2	20	1	2	1	2	1	–	–	–	3	3	1	2	–	–	38
H. influenzae epiglottitis	1	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	3
H. influenzae meningitis	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
H. influenzae septicaemia	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	2
H. influenzae infection (NOS)	–	–	–	–	–	–	–	2	–	–	1	–	–	–	–	–	–	3
Hepatitis B – acute viral	1	–	3	–	–	–	–	–	–	–	1	–	–	–	–	–	–	5
Hepatitis B – unspecified	46	39	32	73	53	–	45	9	5	13	8	1	–	–	2	–	–	326
Hepatitis C – acute viral	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Hepatitis C – unspecified	76	34	158	39	47	10	66	20	30	49	90	5	1	3	16	6	–	650
Hepatitis D – unspecified	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Hepatitis – acute viral (NOS)	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2
HIV infection	4	3	27	2	1	1	1	–	–	–	2	–	–	–	–	–	19	60
Legionnaires' disease	–	1	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	3
Leptospirosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Malaria	1	–	3	–	–	–	1	–	–	–	–	–	–	–	2	–	–	7
Measles	15	4	5	8	15	12	10	2	3	14	47	3	13	6	–	2	–	159
Meningococcal meningitis	–	2	–	1	1	1	–	1	–	1	–	–	–	–	–	–	–	7
Meningococcal septicaemia	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	2
Mumps	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Mycobacterial tuberculosis	–	3	–	4	6	–	–	–	–	1	–	–	–	–	–	–	–	14
Mycobacterial infection (NOS)	7	–	–	–	1	–	1	–	–	1	–	–	–	–	–	–	–	10
Pertussis	1	9	6	9	11	3	14	5	6	10	74	–	3	1	2	4	–	158
Q fever	–	–	–	–	–	–	–	–	–	4	5	1	3	–	–	–	–	13
Rubella	–	–	1	–	2	–	1	–	–	–	–	–	–	–	2	–	–	6
Syphilis	13	7	29	9	5	–	4	2	–	–	6	–	2	–	1	–	–	78

TABLE 9

FOODBORNE INFECTIOUS DISEASE NOTIFICATIONS
FOR NOTIFICATIONS RECEIVED BY FEBRUARY 25, 1994
BY PUBLIC HEALTH UNIT

Condition	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NCR	NER	OFR	CWR	SWR	SER	U/K	Total
Foodborne illness (NOS)	1	–	4	4	2	–	–	–	–	–	–	–	–	–	–	–	–	11
Gastroenteritis (Instit.)	–	–	–	–	2	–	–	–	–	1	–	–	–	–	–	–	–	3
Hepatitis A – acute viral	4	1	8	2	7	–	4	2	1	3	7	4	2	1	2	–	–	48
Listeriosis	–	–	1	–	–	–	–	–	1	1	–	–	–	–	–	–	–	3
Salmonella (NOS)	5	13	7	1	5	2	7	3	1	9	7	2	7	1	5	–	–	75
Salmonella bovis morbificans	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Salmonella typhimurium	7	2	6	–	11	2	5	1	3	2	–	–	–	–	1	–	–	40
Typhoid and paratyphoid	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2

TABLE 10

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

* First diagnosis;   1. No data yet received for 1994;   2. 01/01/94-31/01/94;   3. 01/01/94-28/02/94;   4. No SHC in Region;   5. Laboratory and SHC data 01/01/94-31/01/94.

AHS Infection		CSA¹	SSA¹	ESA¹	SWS¹	WSA¹ + WEN	NSA³	CCA³	ILL¹	HUN¹	NCR²	NER³	OFR¹	CWR⁴	SWR⁵	SER¹
Chlamydia trachomatis	Male	–	–	–	1	–	–	–	–	–	–	3	–	–	–	
	Female	–	–	–	1	–	1	–	–	–	–	4	–	–	3	
	Total	–	–	–	2	–	1	–	–	–	–	7	–	–	3	–
Donovanosis	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*Genital herpes	Male	–	–	–	–	–	3	2	–	–	–	–	–	–	–	
	Female	–	–	–	–	–	2	1	–	–	1	5	–	–	–	
	Total	–	–	–	–	–	5	3	–	–	1	5	–	–	–	–
*Genital warts	Male	–	–	–	19	–	7	9	–	–	2	3	–	–	1	
	Female	–	–	–	9	–	1	2	–	–	1	9	–	–	1	
	Total	–	–	–	28	–	8	11	–	–	3	12	–	–	2	–
Nongonococcal urethritis	Male	–	–	–	12	–	2	8	–	–	3	2	–	–	1	
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	2	
	Total	–	–	–	12	–	2	8	–	–	3	2	–	–	3	–
Lymphogranuloma venereum	Male	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Female	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–