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THE NSW HEALTH OUTCOMES INITIATIVE

Diminishing resources and rapidly expanding and expensive health technologies are putting health systems under increasing pressure to improve cost-effectiveness in the delivery of health services. At the same time the general community continues to be confronted by a confusing array of health-related messages. Consumers are asked to make choices about their health care for which there may be little information about those interventions which will yield the best results. Governments remain unconvinced that health care is consistently good value and are cognisant of wide variations in practice styles between geographic areas, without corresponding differences in health outcomes. Providers are concerned that the fiscal imperatives underpinning government policy and decision-making will jeopardise the care of their patients.

In response to this climate and under the banner of the NSW Health Outcomes Initiative, the Health Department has turned its attention toward improving the health system's knowledge of the relative outcomes and costs of health services ranging from diagnosis and treatment to prevention. Within the framework of appropriate care, the Health Outcomes Initiative is designed to maximise the population's health and health service outcomes through prevention and clinical services provided within existing resources and in a way that is valued by those receiving care. Appropriate care is defined as that set of health services which maximises the potential health benefits and quality of life of individuals and the population after considering the likely outcomes and cost of each component of the service set[1]. Health care professionals must be willing to provide the set of services and it must be valued by the community.

The framework provides a model which takes account of the efficacy, effectiveness and efficiency of health interventions, empowers providers and patients to make decisions, and acknowledges that the health system is in a constant state of change or evolution. It also provides a means by which the equitable distribution of health services may be possible.

To facilitate development of the framework, it is proposed to establish a process whereby outcome goals and targets, progress indicators and appropriate practice guidelines are established for specified health streams and substreams[2].

This process will involve the establishment of a steering committee to oversight the implementation and coordination of the Health Outcomes Initiative, including the forming of small, limited-duration panels in the key health stream areas. The steering committee will comprise departmental, professional and consumer representatives. The working parties will comprise representatives of the Health Department and professional colleges as well as expert clinicians, a health economist, a consumer representative and other government departments (where appropriate). The panels will be responsible for the production of goals

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The NSW Health Outcomes Initiative

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and targets for the priority health streams and for the development of appropriate practice guidelines, goals and targets and progress indicators for key substreams. Both the steering committee and the working parties will be supported by a small secretariat and have recourse to a Health Economics Advisory Group for advice on measuring the marginal costs and benefits of health interventions under consideration.

This framework acknowledges that health service managers and providers are primarily concerned with the outcomes of the services for which they are responsible and that the achievement of health outcomes at the population level and many risk factors remain outside the direct control of the health system. The framework facilitates the development of outcome measures which are relevant at the service level (for example, condition-specific complication rates for particular interventions) and at the population level (Area/Region-specific and subgroup morbidity and mortality rates) and in the short and long term. Implementation of this framework will improve the accountability of providers and managers for the services for which they are responsible and the degree to which the quality of health care and overall outcomes of health and non-health services are monitored.

The Health Outcomes Initiative should be able to deliver many benefits to both service providers and their clients, including:

- improvements in health outcomes and increases in the level of appropriate services available to the population within existing resources;
- improvements in the information available to make decisions concerning the appropriate allocation of resources and balance of health services; and
- improvements in monitoring the use and quality of health services at the State and local level through quality assurance mechanisms;
- more informed choices about the comparative effectiveness and costs of health interventions by providers, managers and the community;
- consequent reductions in the use of unnecessary and less effective interventions resulting from the application of guidelines for hospital admissions and appropriate practice.

To stimulate discussion on the Health Outcomes process, the Health Department has identified ten possible health streams (listed below) which it believes worthy of initial consideration, with a further subset of five (with asterisks) which it believes should receive priority consideration:

- serious injury*
- chronic respiratory disease*
- adverse pregnancy outcomes and child development*
- infectious diseases*
- mental disorders*
- cardiovascular disease
- cancers
- poisoning
- diabetes
- chronic musculoskeletal conditions

These health streams essentially fall into the ICD9 rubrics and have been selected because they meet one or more of the following criteria:

- a common cause of suffering, premature death, disability or community concern;
- a major cost to the community, both directly and indirectly (e.g. road trauma through lost years of productive life); and
- an effective prevention or treatment method is available to prevent or control it, and refocusing resources is likely to achieve much.

As the former editor of the New England Journal of Medicine, Arnold Relman, recently stated: "[w]e can no longer afford to provide health care without knowing more about its successes and failures. The Era of Assessment and Accountability is dawning at last; it is the third[3] and latest — but probably not the last — phase of our efforts to achieve an equitable health care system, of satisfactory quality, at a price we can afford"[4].

Over the next few months, representatives of the Department will be consulting with health professional colleges and associations, consumer and community groups and other government departments about the proposed framework. The Health Outcomes Initiative is a long-term project whose success will require the commitment and cooperation of all those involved in the health system.

Further details on the Health Outcomes Initiative may be obtained from Alix Goodwin, Epidemiology and Health Services Evaluation Branch. Phone (02) 391 9216.

Alix Goodwin
Manager, Health Outcomes Initiative
Epidemiology and Health Services Evaluation Branch

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1. Harvey R. Making it Better. Strategies for improving the effectiveness and quality of health services in Australia. National Health Strategy Background Paper No.8. 1991; 12.
2. A health stream is a set of strategies, health interventions and resources aimed at improving health status in a particular area which is a common cause of suffering, premature death, disability or community concern such as cardiovascular disease and mental health.
3. Relman AS. Assessment and Accountability: The Third Revolution in Medical Care. *New Eng J Med* 1988; 1220-1222. The first revolution described by Relman was the Era of Expansion which began in the late 1940s and early 1950s and continued through the 1960s. The second revolution was the Era of Cost Containment.
4. Op. cit.

NEONATAL HEPATITIS B VACCINATION PROGRAM

Australia has a unique pattern of hepatitis B (HB) epidemiology in that the distribution of HB infection is not uniform. In general, Australia is considered to be a country of low HB virus prevalence, with a rate of infection of 5 per cent for the population at large[1]. However, there are certain subpopulations (e.g. some ethnic groups, Aborigines, intravenous drug users) with high carriage rates of HB in whom the risk of infection is somewhat greater. The carriage rate of HB virus in antenatal patients attending Sydney teaching hospitals was found to be 2-3 per cent[2].

The incidence of HB infection in Australia is rising[3]. This is largely due to changing immigration patterns, with increasing immigration of people from HB endemic areas. In 1986 almost half the immigrants to Australia came from Asia and Mediterranean countries[4].

Vertical or perinatal transmission is the spread of infection from mother to baby before, during or after birth. It is one of the most efficient methods of transmission of HB infection. If mothers are HBsAg positive, more than 40 per cent of their infants show evidence of infection during the first six months of life. Although occasionally the HB virus is transmitted through transplacental haemorrhage, 90-95 per cent of infants born to mothers who are carriers will be uninfected at birth[2]. If not immunised soon after birth, these infants have a very high chance of infection; up to 90 per cent if the mother has both HBsAg and "e" antigen[4]. More important, those who acquire the HB virus in the neonatal period are more likely to become chronic carriers and develop the chronic sequelae of HB infection; up to 90 per cent of those infected during the neonatal period become chronic HB virus carriers. In contrast, only 10 per cent of adults infected with the HB virus become chronic carriers[5].

Preventing perinatal transmission of HB infection is an important public health issue. Introduction of the Neonatal Hepatitis B Vaccination Program in 1987 by the Health Department was aimed at interrupting vertical transmission of the virus and thereby reducing the reservoir of HB infection in the community. At the time of conducting this evaluation the following Health Department policy was in place (Circular 89/163):

- all women should have antenatal screening for HBsAg;
- all neonates born to HBsAg positive mothers should receive Hepatitis B immunoglobulin in addition to a complete course of the HB vaccine;
- all neonates born into high-risk population groups should be offered the HB vaccine, even if the mother is HBsAg negative;
- hospitals should make arrangements or provide advice on the administration of the second and third doses; and
- community nurses or tuberculosis nurses should be responsible for the follow-up program.

This has since been updated (Circular 91/105) to include recommendations that:

- each hospital should designate one person as the hospital coordinator; and
- each Area/Region should designate one person as the Area/Regional coordinator.

During early 1991 the Northern Sydney Area (NSA) Public Health Unit examined the Neonatal Hepatitis B Vaccination Program (NHBVP) to assess the need for it in the Area and to ensure that high-risk neonates are being effectively vaccinated and that the program is meeting the guidelines set out in Circular 89/163.

METHOD

The review followed the principles of process evaluation; that is, determining the need for the program and whether it was reaching the target population. Initially an attempt was made to determine the proportion of neonates falling into the high-risk category requiring vaccination. There is no centralised recording of HB status, so information on the number of babies born to HBsAg positive mothers or born into households where there is a HBsAg carrier is not readily available. This meant that only an estimate of the "at risk" neonatal population, based on the number of infants born to mothers from high-risk ethnic population groups, was possible.

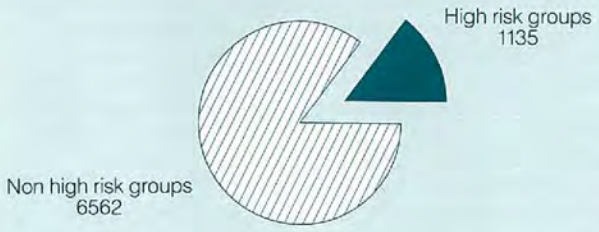
To review current practices, a questionnaire was distributed to each maternity unit in the Area and discussion with appropriate personnel was undertaken.

RESULTS

The "needs assessment" indicated that a significant proportion of the neonates born in the NSA are at high risk of acquiring HB infection by virtue of their ethnic background. There are an estimated 750,000 residents in the NSA. In 1988/89 there were 7696 deliveries for the Area; of these, 1135 (14.8 per cent) were from ethnic population groups with high HBsAg carrier rates, as illustrated in Figure 1. Taking into account that these figures probably underestimate the "at risk" neonatal population, at least 14.8 per cent of deliveries required HB vaccination.

FIGURE 1

DELIVERIES FOR NORTHERN SYDNEY RESIDENTS 1988/1989
Total = 7696



Population groups in which 2% or more individuals are HBsAg carriers

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FIGURE 2

DELIVERIES FOR NORTHERN SYDNEY RESIDENTS 1988/1989
High risk groups. Total = 1135

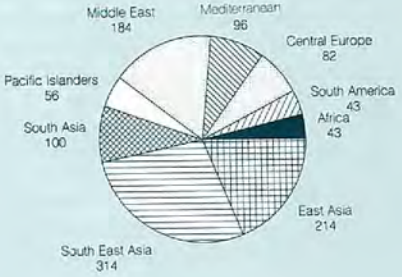

Figure 2 is a breakdown of deliveries from ethnic population groups with high HBsAg carrier rates. This figure does not include Australian Aborigines and New Zealand Maoris, for whom numbers were very small.

Discussion

As a result of the review, several problems with the program were identified. First, there were problems with identifying high-risk neonates in the non-hospital clinic attendants, most of whom were privately insured patients. Although all women should be screened for HBsAg in the antenatal period, it was difficult to verify this, particularly in the case of private patients.

Second, it became evident that insufficient records are being kept. Except for the maternity unit at Hornsby and Ku-ring-gai District Hospital, where an HB vaccination register was introduced recently, most units were unable to provide data on the number of neonates receiving the HB immunoglobulin and/or vaccine in 1990.

The third major problem which stemmed from this was the lack of sufficient follow-up after the infant received the first dose of the HB vaccine. As three doses of the vaccine are required for seroconversion or protection in 95 per cent of recipients, adequate follow-up is essential if the vaccination program is to be effective. Most hospitals were unsure of the rate of infants receiving the second and third doses, largely because all maternity units involved in the survey had allocated the responsibility of follow-up to the early childhood nurses. However, discussions with these nurses indicated that they did not know of this responsibility or did not have the resources to follow up all infants after their first immunisation, except at Hornsby and Ku-ring-gai District Hospital. Arrangements for follow-up were also inadequate for those neonates who are born in the NSA but live outside the Area. In most of these cases no arrangements had been made by the maternity units and the responsibility of follow-up was again designated to the early childhood nurses.

There are several problems confined to the private hospitals in the Area. In the private hospitals only those neonates born to HBsAg positive mothers received the HB immunoglobulin and vaccine. Neonates of mothers from high-risk population groups were not being routinely vaccinated, and no facilities were provided for the administration of the second and third doses of the vaccine as this was considered to be the realm of the paediatricians. Also, because staff members did not know the vaccine was provided free of charge for the NHBVP, the parents were paying for it.

Conclusions and Recommendations

In addition to identifying key deficiencies in the delivery of the NHBVP in the NSA and enabling valuable recommendations to be made, the study highlights the importance of undertaking process evaluation before the examination of impact or outcome of any program.

The following recommendations were made and are currently being implemented for a revised NHBVP for hospitals, both public and private, within the Northern Sydney Area:

- each hospital with a maternity unit designate one person to coordinate the program and ensure it is being run effectively in that hospital;
- written information stressing the importance of antenatal hepatitis B screening be given to all pregnant women at the time of booking into the maternity unit. The information should be available in different languages for the benefit of non-English speaking groups, to increase public awareness and ensure that all antenatal patients are being routinely screened;
- all maternity units maintain a record of each vaccination to enable adequate follow-up;
- each hospital develop a mechanism for adequate follow-up to ensure all three doses of the vaccine are given. This may require the involvement of the early childhood nurses;
- health care workers should determine if either the mother OR father comes from a high-risk population group; and
- high-risk groups should include not just people from certain ethnic population groups but also those at greater risk of acquiring hepatitis B because of their lifestyle (for example, health care workers and intravenous drug users). This is not the current practice, nor is it specified in Circular 89/163.

A revised NHBVP should be evaluated constantly to ensure it is meeting its objectives.

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The report was prepared while I was attached to the Public Health Unit while working in the Family Medicine Program. I would like to acknowledge the contributions by Lyn March, Donald Holt and Gay Rixon of the Northern Sydney Area's Public Health Unit.

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JARMAN 8: AN INDEX OF SOCIAL DISADVANTAGE

Relationships between social condition and health status continue to provide a focus for discussion of health care delivery. In particular, attention has focused on the use of indicators of socio-economic status which may appropriately measure social conditions and identify groups or areas of social disadvantage which may be associated with poor health. The Jarman 8 comprises one of several indices developed for this purpose, and has been the focus of a validation study conducted in Northern Sydney Area Health Service through the NSW Better Health Program.

The Jarman 8 is a census-based composite measure designed to identify underprivileged areas for purposes of health care resource allocation. The index was developed in England[1,2]. It comprises eight census elements considered most relevant to health care delivery on the basis of a national survey of general practitioners' perceptions of those characteristics most affecting their workloads. The index is used in England and Wales as the basis for special government payments to general practitioners working in socially deprived areas.

The index is calculated using eight variables from census data, which are then weighted (the figures shown in parentheses below) according to the average degree of importance given to them by the survey of general practitioners. The Jarman 8 index variables were recently adopted and validated in an Australian situation. The purpose of this study was to assess the index's links with health status[3,4].

The variables in the Australian version of the index are:

- percentage of the population aged over 60 years and living alone (6.62);
- percentage of the population under 5 years old (4.62);
- percentage of the population living in single parent families (3.01);
- percentage of the population employed as labourers and related workers (3.01);
- percentage of the economically active population unemployed (3.74);
- percentage of the population living in overcrowded conditions (2.88);
- percentage of the population that changed address in the previous year (2.68); and
- percentage of the population born overseas from non-English speaking countries (2.50).

The Jarman 8 index was validated against a range of morbidity and premature mortality indices for a pilot area in NSW, the Northern Sydney Area Health Region[4]. The calculations resulted in an association of between 54 and 60 per cent between census indicators and measures of health status. However, in recognition of the comparative social homogeneity of the region studied, there is a need for further validation of the index in wider and more socially heterogeneous settings.

The Jarman 8 study has been useful in raising discussion on the selection and use of socio-economic indicators which may be indicative of health status. Future work will assess the validity of the Jarman 8 index against other indices of socio-economic status.

The pilot study reported here suggests that the Jarman 8 index is a useful tool for strategic planning purposes through its ability to identify areas of disadvantage within broader regions.

The use of Jarman 8 as a composite measure of social disadvantage may also help dispel myths about the homogeneity of socio-economic and health status within broader NSW regions. This is especially true of more affluent health-advantaged regions, such as northern Sydney, where pockets of disadvantage are often overlooked. Being able to identify these pockets will ensure that the relative health advantage of the region as a whole is maintained by locating and focusing on those most in need of health-related programs.

TABLE 1

NORTHERN SUBURBS RANKED FOR SOCIAL ADVANTAGE

Most advantaged:	Bayview, Beecroft, Belrose, Carlingford, Forestville, Gordon, Killara, Lindfield, Pymble, St Ives.
More advantaged:	Castle Hill, Dural, Epping, Frenchs Forest, Hunters Hill, Northbridge, Pennant Hills, Roseville, Seaforth, Turramurra, Wahroonga.
Slightly above average:	Avalon Beach, Balgowlah, Brookvale, Church Point, Collaroy Plateau, Eastwood, Mt Colah, Palm Beach, Terrey Hills.
Slightly below average:	Asquith, Berowra, Berowra Heights, Collaroy Beach, Cowan, Lane Cove, Mt Kuring-Gai, Narrabeen, Newport Beach, North Ryde, Spit Junction.
Less advantaged:	Cammeray, Chatswood, Cremorne Junction, Crows Nest, Gladesville, Harbord, Mona Vale, North Sydney, Willoughby.
Least advantaged:	Artarmon, Dee Why, Fairlight, Hornsby, Manly, Milsons Point, Neutral Bay Junction, Ryde, West Ryde.

TABLE 2

NORTHERN SUBURBS RANKED FOR HEALTH STATUS

Highest status:	Asquith, Beecroft, Belrose, Cowan, Dural, Forestville, Killara, Lindfield, Mt Kuring-Gai, Warriewood.
High status:	Carlingford, Castle Hill, Cremorne Junction, Frenchs Forest, Gordon, Pymble, Roseville, Seaforth, Terrey Hills, Turramurra, Wahroonga.
Slightly above average:	Bayview, Berowra Heights, Brookvale, Eastwood, Epping, Mt Colah, Northbridge, Palm Beach, Spit Junction, Willoughby.
Slightly below average:	Avalon Beach, Gladesville, Hunters Hill, Hornsby, Lane Cove, Mona Vale, Narrabeen, Pennant Hills, St Ives, West Ryde.
Lower status:	Artarmon, Balgowlah, Cammeray, Chatswood, Collaroy Beach, Collaroy Plateau, Dee Why, Milsons Point, North Ryde, North Sydney, Ryde.
Lowest status:	Berowra, Church Point, Crows Nest, Fairlight, Harbord, Manly, Neutral Bay Junction, Newport Beach.

The project involving the piloting of the Jarman 8 index is available in two volumes from Pete Whitecross, Health Promotion Unit, Northern Sydney Area Health Service, phone (02) 438-7332.

Jim Forrest
Kevin McCracken
School of Earth Sciences, Macquarie University
Pete Whitecross,
Manager, Health Promotion Unit,
Northern Sydney Area Health Service

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CASES OF MALARIA NOTIFIED IN NSW IN 1990

Although malaria transmission has not been reported in NSW since World War II (except for induced cases used in the treatment of neurosyphilis), the disease is regularly imported by people arriving from malarious countries. Data on malaria cases in NSW and the ACT are collated by the Department of Parasitology, Centre for Infectious Diseases and Microbiology, Westmead Hospital. This information is valuable for those providing advice to travellers and is also included in the Australian Malaria Register, maintained by the Tropical Health Program, University of Queensland. The data are conveyed to the World Health Organisation as part of the statutory requirements for the continuation of Australia's standing as a malaria-free country.

Individual case details are obtained following confirmation of the original species diagnosis by the parasitology reference laboratory at Westmead Hospital. The confirmation of diagnosis is necessary because about 20 per cent of all original identifications are incorrect. It is hard to judge what proportion of cases is included but, as one of the largest hospitals in Sydney does not send slides for confirmation, it is clear that many cases are missed each year. Also missed are cases diagnosed by pathology laboratories operating in the north of the State which have their main laboratory in Brisbane.

With malaria to be included among the infections notifiable by laboratories, the proportion of diagnosed cases which will be included in the State register should rise. If all laboratories making malaria diagnoses were to send slides for confirmation, apart from an improvement in the reliability of the data in the register, the error rate should fall as more join the quality assurance program provided.

Overall there were 201 cases notified to the State register in 1990 but for four of those no blood slide was provided, so confirmation of the diagnosis was not possible. For the other cases the breakdown of species is shown in Table 3.

TABLE 3

SPECIES OF MALARIA DIAGNOSED IN NSW IN 1990

Species	Frequency	Percentage of total
Plasmodium vivax	142	72.1
Plasmodium falciparum	47	23.9
Plasmodium malariae	5	2.5
Plasmodium ovale	3	1.5
TOTAL	197	

This total is 54 more than for 1989 but the proportion of species is about the same for both years. There has been a steady increase in the proportion of *Plasmodium falciparum* infections since 1975, when they constituted 12 per cent of cases in this State. This rise has coincided with the spread of chloroquine-resistant *P. falciparum* and, more recently, with an increase in the number of Australians travelling to African countries, where *P. falciparum* predominates.

LAG IN DIAGNOSIS

On average there was a lag of 6.3 days between the onset of symptoms and the diagnosis of infection for *P. falciparum* and 7.7 days for *P. vivax*. Fourteen per cent of all infections were diagnosed on the day of onset. By three days 57 per cent of all *P. falciparum* and 49 per cent of *P. vivax* infections were diagnosed. The longest lag period was 76 days for a case of *P. vivax*.

Contrary to reports from other parts of Australia, particularly Queensland, Table 4 shows there is no clear-cut pattern of seasonality in the diagnosis of malaria in NSW.

TABLE 4

MONTH OF DIAGNOSIS

Month	P. vivax	P. falciparum	P. ovale	P. malariae	Total
Jan	11	4	0	0	15
Feb	13	8	1	0	22
Mar	12	7	0	1	20
Apr	8	3	1	2	14
May	12	5	0	0	17
Jun	12	4	0	0	16
Jul	11	5	2	0	18
Aug	9	2	1	0	12
Sep	9	3	0	0	12
Oct	18	5	0	0	23
Nov	10	0	0	0	10
Dec	14	1	0	0	15
TOTAL	139	47	5	3	194

GEOGRAPHICAL ORIGIN WITHIN NSW

The cases were widely distributed throughout NSW and the ACT, but the majority occurred in several health regions: 48 (24.2 per cent) in the Northern Sydney Region, 30 (15.2 per cent) in the Eastern Sydney Region, 26 (13.1 per cent) in the ACT, with the great majority of the rest being diagnosed in other regions in Sydney.

REASON FOR EXPOSURE

Eighty individuals (45 per cent) were exposed to infection while on holiday. Thirty-four (19 per cent) were residents of malarious countries visiting Australia and 12 (7 per cent)

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Cases of malaria in NSW in 1990

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were immigrants or refugees from such countries. Thirty (17 per cent) were infected while living in malarious countries for purposes of employment and 16 (9 per cent) while visiting on business. Two became infected while on military exercises.

CLASSIFICATION OF CASES

One hundred and ninety cases were imported into Australia and none was a relapse from previously imported infections. One of the relapses was the second suffered by the individual concerned.

TABLE 5

GEOGRAPHIC ORIGIN OF CASES

Region of origin	Number of cases	Percentage
Africa	18	9.4
Central America	1	0.5
South America	1	0.5
Southern Asia	26	13.6
South East Asia	44	23.0
South West Pacific	100	52.4
TOTAL	190	

The geographic regions of origin of the diagnosed cases of malaria are listed in Table 5. In keeping with past years the great majority of cases come from the countries of the South-West Pacific Region, Papua New Guinea (75), the Solomon Islands (13) and Vanuatu (11). One individual infected in the region had visited all three countries, so an exact country of origin was not determined. In this region 71 per cent of cases were *Plasmodium vivax* and 27 per cent *P. falciparum*.

Of the 44 cases imported from South East Asia, 31 were from Indonesia. Many of these are reported to have been acquired in Bali, but it is difficult to be sure the person has not also travelled to Lombok or some other part of the country. *Plasmodium vivax* infections totalled 75.6 per cent of infections from this region and *P. falciparum* 22 per cent.

All the cases imported from Southern Asia were *Plasmodium vivax*. Twenty-three (88.5 per cent) were from India, two from Pakistan and one from Sri Lanka.

Plasmodium falciparum (12 cases, 66.7 per cent) predominates in cases from African countries. There were equal numbers (three each) of *P. ovale* and *P. vivax* from this region.

ACCURACY OF DIAGNOSIS

For 151 (76.6 per cent) of the 197 blood slides submitted the original diagnosis was correct. With the other 46 (23.4 per cent) cases, the type of error varied. In 19 instances the diagnosis given was 'malaria'. Although that was basically true, because the proper clinical management of malaria depends on knowledge of the species involved, this diagnosis was classed as incorrect. There are some laboratories which seem to wait for the confirmed diagnosis from the reference laboratory before reporting to the referring doctor. This is a dangerous practice where *P. falciparum* is involved and in one instance recently, was partly responsible for a near fatality. If the 'malaria' category is not included in the calculations there is still an error rate in diagnosis of 14 per cent overall and of 16 per cent in cases involving *Plasmodium falciparum*. This is much higher than it was about 10 years ago and is cause for concern.

TABLE 6

AGE AND SEX OF CASES

Age group	Females	Males	Total
0-4	2	2	4
5-9	1	7	8
10-14	3	6	9
15-19	1	7	8
20-24	11	27	38
25-29	13	22	35
30-34	8	17	25
35-39	3	17	20
40-44	4	9	13
45-49	1	6	7
50-54	3	5	8
55-59	1	3	4
60-64	2	2	4
65-69	5	1	6
70-74	1	1	2
75-79	1	0	1
80-84	1	0	1
TOTAL	61	132	193

Details of the age and sex of 193 individuals were available and are shown in Table 6. The youngest person infected was a 1-year-old male who was a resident of Papua New Guinea and the oldest an 84-year-old woman who had recently emigrated from Vietnam. Both were infected with *P. vivax*. The 1-year-old also had *P. falciparum* diagnosed several months previously in Brisbane. The mean age for females was 35 years and the mean for males was 30 years.

PROPHYLAXIS

Because of the increasing problem of drug resistance it is becoming more difficult to give advice on malarial prophylaxis. The information available in this instance cannot help with making decisions about the efficacy of particular prophylactic regimens, because there is no information on how many individuals overall were using a particular drug or drugs. It is important for those advising travellers to stress that malaria prophylaxis will not prevent infection; it should prevent illness while the drug is still being taken but, with drug-resistant strains, even that can not be guaranteed.

Among those in whom malaria was diagnosed the most frequently used single drug was chloroquine (34 individuals) and the most common combination chloroquine and maloprim (39 individuals). Sixty people were taking no prophylaxis. There were significant national differences in the patterns of use of prophylaxis — 18.6 per cent of Australians, 66.7 per cent of Papua New Guineans and 91.7 per cent of Indians were not using any anti-malarial drugs.

In Papua New Guinea 70-80 per cent of all malaria cases (depending on the region) are caused by *P. falciparum*. The proportion of infections caused by that species in indviduals infected in PNG who were taking prophylaxis of some form was 20 per cent, but in those who were not taking prophylaxis the proportion was 48 per cent. Thus, there can be no doubt that some form of malaria prophylaxis is of value in preventing a proportion of *P. falciparum* infections which would otherwise occur.

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CRYPTOSPORIDIUM: A SUMMER-AUTUMN EPIDEMIC?

Human enteric infection with the protozoal parasite cryptosporidium was first reported in 1976[1] and since that time many reports have been published of cryptosporidiosis affecting adults and children. In otherwise well individuals, this pathogen generally causes a mild, self-limiting gastroenteritis with watery, offensive diarrhoea which may be accompanied by vomiting, abdominal pain and fever. Prodromal respiratory symptoms may be noted, including cough and rhinorrhoea[2]. In the immunocompromised, such as patients with AIDS[3], cryptosporidium can cause severe, protracted and life-threatening diarrhoea.

Cryptosporidium is usually transmitted directly from person to person via the faecal-oral route, and has been responsible for outbreaks of diarrhoea in child-care centres in this country and elsewhere[2,4]. The parasite also infects a variety of domestic animals, and human infection has been linked to calves and lambs with diarrhoea[5]. Rare point-source outbreaks have been documented overseas, and have been traced to contamination of water supplies[6].

The Eastern Sydney Public Health Unit laboratory surveillance program receives reports from microbiology laboratories serving public hospitals in the Eastern Sydney Area and The Children's Hospital, Camperdown, and from several private pathology services, some of which have specimen collection centres in many parts of the State. A feature of this laboratory-based surveillance program is that many non-notifiable infections are reported.

In January 1991, the laboratory surveillance system detected a sudden and unexpected rise in the number of reported cryptosporidium isolates. In the first four weeks of 1991, 21 cases were reported. The number of cases peaked at 85 during the third four-week period and returned to baseline levels in period six. This contrasted with the pattern during 1990, when a maximum of 12 cases each four-week period had been reported. Figure 3 shows the number of cryptosporidium reports by four-week periods for 1990 and 1991.

The age and sex distributions of cases from the first 17 weeks of 1991 are shown in Figure 4. Of the 180 cases, 95 (53 per cent) were in females and 85 (47 per cent) in males. Most diagnoses were made in children: 78 per cent of cases were in children aged less than 15 years, and most of these (54 per cent) occurred in the 1-4 age group. The geographical distribution of cases by Health Area/Region shows that cases occurred throughout NSW and the ACT.

In a two-year survey of diarrhoeal illness reported from Fairfield Infectious Diseases Hospital, Melbourne, cryptosporidium was the second most frequently isolated parasite after giardia[7]. In that study, 41 per cent of cases were among children under 15 years. Among white South African children and adults, cryptosporidium was the second most frequently identified pathogen after rotavirus, while 88 per cent of cases were in children under five years[8].

There is no obvious explanation for the sudden peak in cases of cryptosporidiosis detected by the laboratory surveillance program. Participating laboratories did not change their routines for screening stool specimens for the parasite, and there was no sudden rise in community interest in the infection which might have influenced ordering patterns among general practitioners. Previous reports from the southern hemisphere have suggested a seasonal increase in incidence of cryptosporidiosis during the late summer months[7-9].

FIGURE 3

REPORTED CASES BY FOUR-WEEK PERIOD FOR 1990 AND 1991

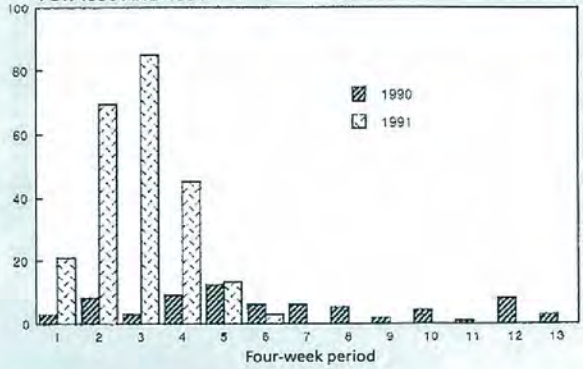
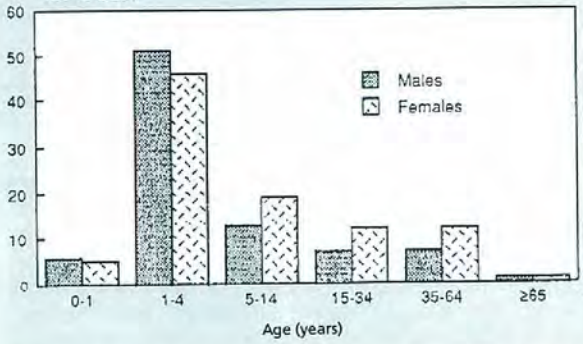


FIGURE 4

AGE-SEX DISTRIBUTION OF 180 CASES



A similar phenomenon was observed in South Australia, as evidenced by a recent report from Adelaide Children's Hospital that cryptosporidial oocysts were identified in almost 30 per cent of children presenting with diarrhoea during January and February 1991[10]. This observation and the present report together suggest that a widespread epidemic of cryptosporidiosis occurred during the summer-autumn months of 1991.

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Important note: This double-sided insert **replaces** the article on pages 33-34.

HIV IN NSW - CHANGING PATTERNS IN MAJOR RISK FACTORS

Concerns about confidentiality of clients having human immunodeficiency virus (HIV) tests and a range of other factors have made accurate determination of the true number of HIV infected people difficult. Our best estimate for the number of NSW residents who have been diagnosed with HIV infection to the end of February is 10,496[1]. Mechanisms are now in place to record more accurately the number of new diagnoses.

It is important to note that the number of diagnoses made in a year does not mean that this number of people became infected with HIV in that year. For example, a person diagnosed in 1991 may have been infected many years earlier. The yearly notifications to the Health Department are only of new diagnoses, and therefore probably overestimate the number of new infections occurring in that year.

Data on exposure and sex have not been collected for a large proportion of diagnoses, as shown in Table 7.

As HIV is principally a bloodborne virus[2], intravenous drug users who share injecting equipment (IVDUs) and people not practising safe sex[a] are groups at high risk for acquiring HIV infection.

Numbers of new diagnoses

From 1987 to 1991 the number of new diagnoses in males fell from 1769 to 648 (Figure 5). Most of the decline is attributable to a decrease in diagnoses of homosexually acquired infections which peaked in 1987. In 1984, 10 new diagnoses were reported in women (Figure 5). This rose to 68 in 1985, and in 1990 and 1991, 56 and 44 new diagnoses respectively, were reported in women. The high proportion of males has always been a feature of the epidemic. In 1984, 96 per cent of diagnoses where sex was recorded were male. In 1991, 94 per cent of diagnoses were male.

Male risk profile

The risk profile for HIV infection in males has altered significantly in the period 1984-1991 (Figure 6). Where exposure had been reported, 82 per cent of diagnoses that occurred in 1991 were attributed to homosexual/bisexual exposure, compared to 100 per cent before 1985. The number of males diagnosed with homosexually/bisexually acquired HIV increased from 143 in 1984 to 885 in 1987, and then decreased to 326 in 1991. The number diagnosed as attributable to intravenous drug usage (IVDU) rose to 34 in 1988 (Figure 7), and decreased to 17 in 1991. The number of diagnoses with combined exposures (IVDU and homo- or heterosexual) has displayed a similar trend, rising from 0 in 1984 to 25 in 1987, and falling to 12 in 1991.

Male heterosexual exposure

The number of males diagnosed with heterosexually acquired HIV increased from 0 in 1984 to 28 in 1991. In 1991 it accounted for 7.1 per cent of all reported diagnoses with known exposure. This is in contrast to the general decline in numbers of new diagnoses seen in other groups. The observed practice of young men in the 20-30 age group visiting Thailand, where HIV prevalence is high, with the thought they would engage in sexual activity while abroad[3], creates a potential for further increase in the size of this group. Such infections have been reported[4].

Female risk profile

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[a]Safe sex is a term used to describe modified behaviour, such as practising non-penetrative sex, and/or the use of protective equipment (for example condoms) designed to eliminate direct contact with seminal and vaginal fluids and blood.

A total of 414 females diagnosed with HIV have been reported from 1984 to 1991. Exposure was recorded for only 44 per cent of the 414 diagnoses. A maximum number of 68 diagnoses were recorded in 1985 (Figure 5). The annual number reported has remained fairly constant. If the heterosexuals and the IVDUs are considered together (Figure 8), it is possible to see a consistent increase from 1985 (11 diagnosed) to 1989, when 29 diagnoses were reported. After this the numbers declined again, with 19 and 12 diagnoses reported in 1990 and 1991 respectively.

IVDUs

The number of HIV diagnoses in IVDUs not attributable to sexual contact declined from 48 in 1988 to 20 in 1991. Where sexual contact was a cofactor a similar pattern was observed. In 1987 31 diagnoses were reported and in 1991, 14. Published data on HIV in IVDUs other than men who also report homosexual contact indicate low rates of infection in the range 0.5 to 5 per cent[5].

Missing data

The conclusions that have been made must be measured against the proportion of diagnoses for which no exposure data are given. The NSW Health Department is now making efforts to collect these data, for both new and historical notifications. Despite these limitations trends show decreases in reported diagnoses in IVDUs and homosexual males.

The observed decrease in male homosexual diagnoses is supported by the findings of other studies that have shown a significant decrease in the rate of new infections[6]. The Sydney AIDS Prospective Study has shown no new infections over the last two years in a cohort of more than 1,000 homosexual men[7]. Another cohort of 535 homosexual men studied in 1986/87 found that the vast majority had adopted safe sex behaviour[8]. A follow-up in late 1991 indicated an overall sustained level of safe behaviour, with a further increase in condom use and a decline in unprotected intercourse[9].

The reported increase in the number of diagnoses of heterosexually transmitted HIV infections in males indicates transmission to this group should be monitored closely.

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NOTIFICATIONS

Data in this *Public Health Bulletin* relate to Epiweeks 1 to 7. Table 10 lists the number of returns made to Epidemiology and Health Services Evaluation Branch this year. Public Health Units report to Epidemiology and Health Services Evaluation Branch weekly.

TABLE 10

NUMBER OF RETURNS TO E&HSEB THIS YEAR

PHU	Number	PHU	Number
Central/Southern Sydney	5	Illawarra	3
Eastern Sydney	3	Hunter	3
South Western Sydney	4	North Coast	5
Western Sector	6	New England	6
Northern Sydney	6	Orana & Far West	6
Central Coast	2	Central West	5
		South-West	6
		South-East	6

ARBOVIRAL INFECTION

Despite the heavy rains this summer arboviral activity has been lower this year than for the same period in 1991. High attack rates have been reported in the Northern Territory, Queensland and Western Australia.

FOODBORNE DISEASE

Foodborne diseases account for 18 per cent of notifications received in 1992.

A meeting between members of Epidemiology Branch and Food Branch recommended that Food Branch coordinate all intelligence activity arising from the identification of enteric pathogens by the Institute of Clinical Pathology and Medical Research, National Salmonella Surveillance System, Division of Analytical Laboratories and the Institute of Medical and Veterinary Science. Epidemiology Branch, through Public Health Units, should be responsible for surveillance of foodborne diseases through the established notification system. Members of Food Branch and Public Health Units are encouraged to collaborate at the local level to monitor foodborne diseases.

TABLE 11

RESPONSE TO QUESTIONNAIRE ON SURVEILLANCE OF NON-NOTIFIABLE STDs

Condition	CSA/SSA	ESA	SWS	WSA/WEN	NSA	CCA	ILL	HUN	NCR	NER	OFR	CWR	SWR	SER
Sexual Health Centre in Area Health Service?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Notifiable STDs being notified from SHC?	No	No	Yes	No	No	No	No	No	No	No	Yes	—	—	—
PHU able to provide aggregate data for non-notifiable STDs?	Yes	Yes	—	No May	—	March	No	Yes	Mar/Apr	—	Yes	—	—	—
Type of database in use by Sexual Health Centre	Macintosh/ OMNI	Sydney SHC dBASE	CRS	CRS Own dBASE	—	Sydney SHC dBASE	CRS	CRS	Sydney SHC dBASE	EHSEB IDDS	Epi-Info	—	—	—
PHU able to supply line data for non-notifiable STDs by JULY 1	Yes	Yes	Yes	Yes Yes	Yes	Yes	No	No	?	Yes	Yes	—	—	—

SURVEILLANCE OF STDs

Table 11 summarises the responses of the Public Health Units (PHUs) to a questionnaire on surveillance of sexually transmitted diseases (STDs). Seven PHUs will soon be able to provide information on the number of the non-notifiable STDs occurring in their Areas or Regions. Eight of the PHUs foresaw no problems in supplying individual record detail by July 1992.

Only two Sexual Health Centres (SHCs) are complying with Public Health Act requirements to notify syphilis.

In obtaining individual record data it is essential that PHUs are not confronted with an increased data entry load.

It is anticipated that most SHCs will supply the data to PHUs on floppy disk that can be read into IDSS. For SHCs with dBASE systems this is straightforward. Where CRS is used the transfer is more involved. To overcome this the Health Department will develop a program that can extract data from CRS in a form that can be imported into the Department's IDSS program.

It should be emphasised that this new data set relates only to **non-notifiable** diseases. The **notifiable** diseases — syphilis and AIDS — should be reported to PHUs, as required by the Public Health Act 1991. Gonorrhoea and HIV are notified by laboratory.

TABLE 12

INFECTIOUS DISEASE NOTIFICATIONS BY HEALTH AREA AND REGION FEBRUARY 1992

CONDITION	CSA	SSA	ESA	SWS	WSA	WEN	NSA	HUN	NCR	NER	OFR	SWR	SER	U/K	TOTAL
AIDS	1	–	–	–	–	–	3	–	–	–	–	–	–	–	4
Arboviral infection	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Foodborne illness (NOS)	1	–	3	–	–	1	–	–	–	–	–	–	–	–	5
Gonorrhoea	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
H. influenzae meningitis	–	–	–	–	–	1	1	–	1	–	–	–	1	–	4
H. influenzae infection (NOS)	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Hepatitis A – acute viral	3	1	–	–	–	–	–	1	–	1	–	–	–	–	6
Hepatitis B – chronic/carrier	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Hepatitis B – Unspecified	2	2	–	2	–	–	3	–	–	2	–	–	–	–	11
Hepatitis C – acute viral	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Hepatitis C – Unspecified	4	2	–	–	3	–	7	12	–	–	–	–	1	–	29
HIV	5	2	10	1	1	–	3	1	–	–	–	–	–	15	38
Malaria	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Measles	–	–	–	–	–	1	2	2	–	2	–	–	–	–	7
Meningococcal infection (NOS)	–	–	–	–	–	–	1	–	–	1	–	–	–	–	2
Mycobacterial atypical	–	–	–	–	1	1	1	–	–	–	–	–	–	–	3
Mycobacterial tuberculosis	–	–	–	–	1	–	1	–	–	–	–	–	–	–	2
Pertussis	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Rubella	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Salmonella infection (NOS)	–	–	1	2	1	–	–	–	–	1	1	1	–	–	7
Syphilis	1	–	–	2	–	–	–	–	–	1	–	–	–	–	4

TABLE 13

INFECTIOUS DISEASE NOTIFICATIONS BY HEALTH AREA AND REGION JANUARY 1 TO FEBRUARY 29, 1992

CONDITION	CSA	SSA	ESA	SWS	WSA	WEN	NSA	CCA	ILL	HUN	NCR	NER	OFR	CWR	SWR	SER	OTH	U/K	TOTAL
Adverse event after immunisation	–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–	–	–	3
AIDS	3	–	3	–	1	1	3	–	–	–	–	–	–	–	–	–	–	–	11
Arboviral infection	–	–	–	–	–	–	1	–	–	2	–	–	1	–	1	–	–	–	5
Foodborne illness (NOS)	1	–	18	1	16	3	–	5	–	3	–	2	2	–	1	–	–	–	52
Gastroenteritis (instit)	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	3
Gonorrhoea	4	–	10	2	–	–	–	–	2	1	–	1	1	–	–	2	–	–	23
H. influenzae epiglottitis	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	–	–	–	3
H. influenzae meningitis	–	1	–	–	–	2	1	–	–	2	2	–	–	–	1	1	–	–	10
H. influenzae septicaemia	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
H. influenzae infection (NOS)	1	–	1	–	1	–	1	–	–	–	–	–	–	–	–	1	–	–	5
Hepatitis A – acute viral	22	4	31	2	4	1	15	–	1	8	2	10	1	–	2	1	–	–	104
Hepatitis B – acute viral	1	1	–	–	–	–	6	–	–	–	–	–	3	–	–	–	–	–	11
Hepatitis B – chronic/carrier	–	–	–	1	7	2	–	–	–	9	–	1	1	–	–	–	–	–	21
Hepatitis B – Unspecified	30	16	7	39	15	1	30	1	2	5	2	7	1	1	3	1	2	–	163
Hepatitis C – acute viral	10	1	–	14	4	–	4	–	1	–	8	1	–	–	–	–	–	–	43
Hepatitis C – Unspecified	26	11	26	6	12	1	17	–	2	46	12	5	–	–	–	2	–	–	166
Hepatitis, acute viral (NOS)	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
HIV infection	10	3	29	2	3	1	4	1	–	2	2	–	1	–	–	1	–	33	92
Hydatid disease	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Legionnaires' disease	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	2
Leptospirosis	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	3
Malaria	–	–	–	1	1	–	2	–	–	–	–	–	–	–	–	1	–	–	5
Measles	3	4	3	7	1	2	3	3	2	11	4	3	–	1	–	2	–	–	49
Meningococcal septicaemia	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Meningococcal infection (NOS)	–	–	–	–	–	–	1	–	1	–	–	2	–	–	–	–	–	–	4
Mumps	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	3
Mycobacterial atypical	1	–	–	–	2	1	2	–	–	1	–	–	–	–	–	–	–	–	7
Mycobacterial tuberculosis	1	–	2	3	4	1	4	1	1	–	2	1	–	–	–	1	–	–	21
Mycobacterial infection (NOS)	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	2
Pertussis	–	3	–	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	6
Q fever	–	–	–	–	–	–	–	–	–	1	3	3	–	–	–	–	–	–	7
Rubella	–	–	–	–	1	–	1	–	–	–	2	–	–	–	–	–	–	–	4
Salmonella infection (NOS)	7	11	14	8	11	5	11	–	–	3	7	6	8	5	2	4	–	–	102
Syphilis	11	2	4	8	2	–	2	–	–	1	–	2	9	–	–	–	–	–	41
Tetanus	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Typhoid & paratyphoid	1	–	–	–	1	–	3	–	–	–	–	–	–	–	–	–	–	–	5

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, NCR North Coast Health Region, NER New England Health Region, OFR Orana & Far West Health Region, CWR Central West Health Region, SWR South West Health Region, SER South East Health Region, 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.