Pneumococcal disease in Australia

Summary of the Pneumococcal Disease in Australia: Epidemiology, Surveillance and Immunisation Workshop, convened by the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases, Royal Alexandra Hospital for Children, Sydney, 26-27 March 1999

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Abstract

The proceedings of the Pneumococcal Disease in Australia Workshop, held on 26-27 March 1999 are presented in this report. The world-wide epidemiology of the pneumococcus, with its predilection for the very young and the very old, differs between the developing and the developed world, and between indigenous and non-indigenous populations. Sources of data on pneumococcal disease in each of the Australian States, clinical aspects of invasive and non-invasive disease, and the role of the public health laboratory in surveillance of serotypes and antimicrobial sensitivity, both nationally and over time, were discussed at the Workshop. Polysaccharide pneumococcal vaccines are recommended for those over 65 years of age and for at-risk groups, but are supplied free of charge only in Victoria and for indigenous Australians over 50 years of age. Children will require conjugate vaccines, which are likely to be licensed in the United States of America early in 2000. In Australia indigenous children, especially in rural areas, will be the priority group for conjugate vaccines. *Commun Dis Intell*2000;24:89-92.

Keywords: pneumococcal disease, surveillance, immunisation, vaccination, epidemiology, antimicrobial resistance

World-wide epidemiology

Streptococcus pneumoniae (pneumococcus) is responsible for more deaths world-wide than any other single pathogen.[1] It causes meningitis, bacteraemia, pneumonia and otitis media, particularly affecting infants and children under 5 years of age, adults over 60 years of age, and

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those with chronic underlying medical conditions or immunosuppression.

Invasive pneumococcal disease (associated with a sterile site isolate) in infants differs between industrialised countries, where it is mostly bacteraemia and meningitis, and developing countries, where it is mostly pneumonia.[2] Indigenous populations in Australia and North America have very high rates of invasive disease, with those in Australian Aboriginal children the highest recorded in the world.[3] In adults over 65 years of age in Europe and the United States of America, the reported incidence ranges from 24–80/100,000 population; Australian rates are similar, with 17-30/100,000 population. It is also considered a huge problem in developing countries.

Non-invasive pneumococcal disease is much more common than invasive disease and also causes significant morbidity. In children otitis media predominates and in adults pneumonia predominates. The frequent use of antibiotics to treat respiratory tract infections, only a fraction of which are pneumonia or otitis media, is an important driving force in the world-wide development of pneumococcal resistance to penicillin, because of selection pressure on pneumococci colonising the upper respiratory tract.

There are over 90 known pneumococcal serotypes. Fortunately, 85-90% of adult infections are caused by one of the 23 serotypes whose purified capsular polysaccharide antigens are included in current vaccines. In children, because the number of serotypes causing disease is much less than in adults, conjugate vaccines containing 7-11 serotypes show great promise for preventing pneumococcal infection. These insights were amongst those shared by Dr Kim Mulholland, from the World Health Organization (WHO) in Geneva.

Epidemiology of pneumococcal disease in Australia

Data on the epidemiology of pneumococcal disease in indigenous and non-indigenous adults and children in various areas of Australia were presented by a number of speakers.

Non-indigenous populations

For non-indigenous adults, data from hospital discharges and laboratory data confirm that invasive pneumococcal infection primarily manifests as pneumonia and mainly affects adults over 60 years of age. Predisposing factors include malignancy and other causes of immunosuppression, diabetes, alcohol abuse, asplenia and chronic renal disease.

In non-indigenous children the incidence of invasive infection (mostly bacteraemia and meningitis) is highest in the first 2 years of life. Significant risk factors in these young children include attendance at child-care centres, parental smoking and recent otitis media. Pneumococcal meningitis causes significant morbidity, death (case-fatality rate, 10%) and long-term neurological sequelae.

Indigenous populations

In all age groups, indigenous rates of invasive pneumococcal infection are up to 75 times higher than in non-indigenous groups, and are caused by a broader range of serotypes. In Queensland, meningitis occurs earlier than in non-indigenous children (6 versus 12 months). Across northern Australia a striking difference is the high incidence of infection in younger indigenous adults (aged 15–50 years), as well as at the extremes of age, especially in those who have chronic lung, liver and kidney disease, with or without alcohol abuse. Roughly one-quarter of the serotypes involved are not covered by the 7-valent conjugate vaccine. As with Hib disease, the incidence of invasive pneumococcal disease in indigenous children is not uniform. Attack rates in northern Australia are lower than in Central Australia, and lower in urban regions than in rural/remote regions. Ear disease starts early and its pattern around the country varies; in remote areas otitis media is more likely to be associated with perforated tympanic membranes with purulent discharge.[4]

Sources of data on pneumococcal disease

The available sources of data differ widely among jurisdictions. These were outlined in presentations from each State and Territory.

In Victoria, the Victorian Hospital Pathogens Surveillance System, hospital discharge data, Australian Bureau of Statistics death data and annual surveys of vaccination coverage in adults over 65 years of age give a reasonably complete picture. In Western Australia specific studies by the Vaccine Impact Surveillance Network (Invasive Pneumococcal Study Group), which commenced in 1996, assessed the incidence, risk factors and serotypes responsible for invasive pneumococcal disease in Aboriginal and non-Aboriginal people. In Central Australia surveillance and monitoring of pneumococcal serotypes in Aboriginal people commenced in 1985. Fifty per cent of invasive disease occurs in children, much of it in the first year of life; the serotype data from these children show a pattern more like developed than developing countries.[5]

Invasive disease is notifiable in the Northern Territory where, prompted by high disease rates, an adult immunisation campaign was implemented in 1994. Although vaccination registers are patchy and incomplete, data are available on the distribution of free vaccine to at-risk indigenous groups. By 1998 about 50% of the older at-risk group had been covered. There was some impact on the incidence and mortality of invasive disease, though this was not evident in young adults. Of the 426 invasive pneumococcal cases in the period 1994-1998, 69% presented with pneumonia. Invasive pneumococcal disease is also notifiable in Queensland (since 1996), but not in any other State.

Overall in Australia, pneumococcal vaccine coverage is low, as measured by telephone surveys in Western Australia, South Australia, and Victoria. In 2000 data will be available from New South Wales.

Laboratory issues

The epidemiology of antimicrobial resistance

Antimicrobial resistance in pneumococci world-wide was reviewed by Associate Professor John Turnidge and in Australia by Associate Professor Peter Collignon.

World-wide, pneumococcal resistance to penicillin and to other antibiotics has been increasing since the 1960s.[6,7] The Surveillance Network in the United States of America in the period 1997–1998, showed that invasive isolates tended to

be less resistant than respiratory or superficial isolates, but multi-resistance is now common. The Alexander Project in Europe has shown rapid evolution and increasing levels of resistance to penicillin and other antibiotics.[8] There is a consistent relationship in studies world-wide between high usage of antibiotics and high levels of resistance, especially in isolates from respiratory tract infections.[9]

Any degree of resistance to penicillin is of clinical importance in central nervous system infections, but may be significant at other sites when high level resistance occurs. Resistance is serotype specific. The latest Australian data show 25% resistance (intermediate plus high level) to penicillin,[7] 16% to erythromycin (used for people allergic to penicillin) and varying levels to other antibiotics. Ongoing accurate surveillance with data on MICs (minimum inhibitory concentrations) and cephalosporins are important to monitor this. Prophylactic antibiotic use (as was seen when erythromycin was used for pertussis in Aboriginal communities) may increase resistance levels.

Resistance is particularly important for meningitis and otitis media in many developing countries, which have restricted access to antibiotics and poorly developed surveillance systems.

The role of public health laboratories

The role of public health laboratories in surveillance of serotypes and antimicrobial sensitivity, both nationally and over time, for different age groups and different disease patterns, was discussed by Professor Lyn Gilbert. Collaborative laboratory networks will be crucial in the monitoring of antibiotic susceptibility, and the spread of resistance genes between serotypes. Newer molecular methods for subtyping (such as multilocus sequence typing) will help define the distribution of serotypes, both before and after introduction of conjugate vaccines, so that vaccine efficacy can be assessed. The importance of using the information obtained through this surveillance to inform the prescribing patterns of doctors and medical students (future prescribers) was emphasised.

Pneumococcal vaccines

Polysaccharide vaccines

In Australia, 85% of pneumococcal disease is caused by serotypes contained in the current 23-valent unconjugated pneumococcal vaccine, which has been shown to protect against invasive disease in populations of adults with high attack rates (American recruits, Papua New Guineans). Trials in other countries, such as France, Finland and Sweden, have shown varying effectiveness in adults; estimates of effectiveness from case-control studies are in the order of 60% for prevention of invasive pneumococcal disease. In young children in Papua New Guinea the vaccine protected against bacteraemia, severe disease and mortality.

Pneumococcal vaccine is recommended for indigenous minorities, residents of institutions, at-risk immunocompetent people and the elderly, with revaccination every 5 years.[10] An as yet unpublished study of vaccine efficacy among HIV infected women in Uganda, showed lack of protection against disease.[11] These data have limited relevance for communities such as the Australian population, where highly active antiretroviral therapy is available. The WHO is seeking to coordinate results of all the unpublished studies of pneumococcal vaccination around the world.

In Victoria, free pneumococcal vaccine is provided for all adults over 65 years of age. In 3 years coverage has increased to 42%. Elsewhere vaccine is funded only for Aboriginal and Torres Strait Islanders over 50 years of age.

In Far North Queensland, vaccination of Aboriginal adults over 50 years and younger adults with risk factors has reduced the incidence of invasive disease from 120 to 75/100,000 (personal communication, Jeffrey Hanna). Further lowering the age of universal vaccination in Aboriginal adults in areas where incidence rates are high is being considered.

Conjugate vaccines

Because young children under 2 years of age do not respond well to polysaccharide vaccines, conjugate vaccines have been developed. Dr Dace Madore, from Lederle-Praxis Biologicals, New York, described the 7-valent pneumococcal CRM_{197} conjugate vaccine. Its first efficacy trial has been completed (but results are not yet published) in northern California, demonstrating 100% efficacy; serological correlates for protection are being studied. This vaccine is proving highly effective in preventing invasive disease due to the serotypes included in the vaccine, and its routine use should have a significant impact on childhood morbidity and mortality due to pneumococcal invasive disease. Kinetics of the immune response vary by serotype;[12] it does not interfere with other concomitantly administered childhood vaccines. Standardisation of serological methods is critical for comparing new vaccine formulations.

Will conjugate pneumococcal vaccines have a place in immunisation programs?

The results of the Californian trial suggest that the pneumococcal 7-valent conjugate vaccine will be highly effective in preventing invasive pneumococcal disease in children in the developed world. More recent results from this trial suggest important reductions in otitis media and pneumonia.[13]

Pneumococcal conjugate vaccines (7-valent, 9-valent and 11-valent) are in advanced stages of development, and are undergoing trials in different parts of the world. Determining endpoints of these pneumococcal trials is complicated by two factors. Firstly, the high carriage rates of the organism (in sub-Saharan Africa, ~90% of children carry pneumococci by 6 months of age frequently with multiple carriage of different types), and secondly, by the possibility of replacement (that is, reduction of carriage and disease by some serotypes resulting in replacement by other serotypes).[1] Phase III immunogenicity (as opposed to efficacy) trials, based on correlates of protective antibody levels, will be required to evaluate the efficacy of additional serotypes in pneumococcal conjugate vaccines. Accurate data about burden of disease, and careful regional and national economic analyses are essential for these expensive vaccines.

In the developing world issues of access and equity are particularly important.[14] Universal childhood immunisation narrowed the morbidity/mortality gap between children of rich and poor countries; the use of new expensive vaccines (for example, Hib) only in rich countries is again widening this gap. The arrival of effective pneumococcal conjugate

vaccines will directly challenge our existing concepts of new vaccine use. When 1-2 million children die each year in poor countries, having an effective vaccine that is not available because of cost, is intolerable. Pneumococcal vaccination regimens will need to be modified for developing countries, from the point of view of age, serotype coverage and affordability. One approach is maternal immunisation with a 23-valent unconjugated pneumococcal vaccine, to provide the neonate with passive protection from maternally transmitted antibodies. Another approach is neonatal vaccination with a conjugate vaccine. At present the pneumococcus remains a most significant cause of paediatric mortality in the world; the conjugate vaccine has not yet been extensively tested in children in the developing world, although the existing published data suggest it is protective.[15,16]

In Australia, conjugate vaccines are likely to be included in the infant schedule. Combination vaccines may impact on this, as may the need for boosting, either in childhood or adulthood. It is clear that there is an unequivocal need for conjugate pneumococcal vaccine to be delivered to remote communities where there are high attack rates of invasive disease and pneumonia. Indigenous Australians are the one population in the world who will most benefit from this scientific advance, because they have a lot of disease and we can afford the vaccine. Ear disease in indigenous children is more difficult; early colonisation and early onset of disease make it less likely that a vaccine started at 2 months of age will make a big difference. For otitis media, vaccination schedules starting at birth and maternal vaccination may need to be considered.

Conference speakers

Ross Andrews, Claire Caesar, Peter Collignon, Carolien Giele, Lyn Gilbert, Jag Gill, Robert Hall, Jeff Hanna, Geoff Hogg, Vicki Krause, Deborah Lehmann, Dace Madore, Peter McIntyre, Robert Menzies, Avner Misrachi, Kim Mulholland, Linda Selvey, Paul Torzillo, John Turnidge

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Legionnaires' disease outbreak in Victoria

The Victorian Department of Human Services has confirmed that as of 3 May 2000, the number of cases of Legionnaires' disease from an outbreak associated with the Melbourne Aquarium, has reached 58. Cases range in age from 26 to 89 years, and include two deaths. All except one had been at or near the Aquarium between the dates of April 11 and 21. One case had visited the Aquarium on 25 April. Of the 58 confirmed cases, 57 had visited the Aquarium and the other case had walked close by.

The Department is awaiting test results on a further 35 people who had been to the Aquarium and who have developed respiratory symptoms. These include two patients from New South Wales, four from Tasmania, one from Queensland, two from New Zealand and one from the United Kingdom. The Department established a Legionnaires' disease Hotline on 27 April; the first day that the outbreak was identified. This call centre has taken in excess of 5,000 calls, mainly from members of the public with concerns about the disease. The Hotline number is 1300 365 677.

Surveillance of pneumococcal disease in Australian States and Territories

Peter McIntyre,[1] Robert Menzies,[2] Vicki Krause,[3] Linda Selvey,[4] Robert Hall,[5] Avner Misrachi,[6] Ross Andrews,[7] Carolien Giele,[8] Jag Gill[8]

Abstract

Information on pneumococcal disease, including immunisation programs, and optimum future surveillance in each Australian State and Territory were discussed at the Pneumococcal Disease in Australia Workshop on 26-27 March 1999. Workshop participants further expanded on the surveillance aspects of the Workshop in this report. Most participants favoured notification by laboratories of pneumococcal isolates from sterile sites, to provide baseline surveillance data before immunisation programs are fully implemented. It was also thought that trends in antimicrobial resistance should be notified. *Commun Dis Intell* 2000;24:93-95.

Keywords: pneumococcal disease, surveillance, antimicrobial resistance

The available data on pneumococcal disease differ widely among jurisdictions in Australia. The situation was outlined by participants from each State and Territory at the Workshop. Workshop discussions about these data and optimum future surveillance for pneumococcal disease in Australia, have been expanded on and summarised below.

Data available in all jurisdictions

Hospital discharge data for ICD codes covering pneumococcal disease are available in all States and Territories. However, the system lacks timeliness, with a 12–18 month lag to the most recent completed data. Mortality data from the Australian Bureau of Statistics have similar limitations. The ICD code for pneumococcal pneumonia in particular is non-specific, but potentially useful for monitoring trends. Neither data source gives information about the serotype or antimicrobial susceptibility of pneumococcal isolates.

Data available in some jurisdictions

Invasive pneumococcal disease is currently notifiable in the Northern Territory (since 1994) and Queensland (since 1996). Some other jurisdictions have specific pneumococcal surveillance through voluntary laboratory networks coordinated locally (Victoria, Western Australia, metropolitan New South Wales). Thus only South Australia, Tasmania and the Australian Capital Territory have no current pneumococcal surveillance beyond hospital discharge and mortality data. The available data sources by State/Territory are shown in Table 1.

Pneumococcal immunisation programs

Indigenous populations

The three jurisdictions with the largest proportions of Aboriginal and Torres Strait Islander residents (Northern Territory, Queensland and Western Australia) all have current or past pneumococcal immunisation programs for some or all of their indigenous population. High rates of invasive pneumococcal disease have been most completely documented for the longest period in Central Australia[1] and subsequently the rest of the Northern Territory. The Northern Territory had an 'adults are at risk' campaign to promote adult immunisation, including pneumococcal immunisation, in 1994–95. Subsequently, project officers were employed (1995–97) to promote and distribute free pneumococcal vaccine to Aboriginal persons over 50 years of age or with risk factors. From vaccine distribution data, it was estimated that 50% of the target population was immunised; this has probably decreased since funding of project officers ceased. In Western Australia a number of regional pneumococcal immunisation programs were conducted in the north of the State from 1986, initially targeting children aged 2–15 years (Pilbara and parts of Kimberly) and more recently adults over 50 years of age. The impact of these initiatives is being evaluated by Dr Donna Mak from Kimberley Public Health Unit, but is hampered by lack of documentation. In Far North Queensland the Tropical Public Health Unit has implemented both pneumococcal surveillance and immunisation (personal communication, Jeffrey Hanna).

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Table 1. Sources of data for surveillance of pneumococcal disease, by jurisdiction

Jurisdiction	Data source			
			Serotyping	
	Notifications	Laboratory network	Data available	Performed locally
ACT	No	No	No	No
NSW	No	Yes[1]	Yes[1]	Yes
NT	Yes	Yes[2]	Yes[2]	No
Qld	Yes	No	Yes[3]	Yes
SA	No	No	Discontinued	No
Tas	No	No	No	No
Vic	No	Yes[4]	Yes[4]	Yes
WA	No	Yes[5]	Yes[5]	Yes

1. Metropolitan NSW Pneumococcal Study Group — voluntary.
2. Public microbiology laboratories refer isolates to Queensland Health Scientific Services.
3. Isolates forwarded by some laboratories only. Complete for Far North Queensland region.
4. Victorian Hospital Pathogen Surveillance Scheme — ongoing.
5. Vaccine Impact Surveillance Network — laboratory network funded by Health Department of Western Australia.

Non-indigenous populations

Victoria is the only jurisdiction to make pneumococcal vaccine available free of charge to non-indigenous adults over 65 years of age. The Victorian program was implemented in 1998, with an estimated increase in coverage in the over-65 year old population of 30%, giving a cumulative coverage of 42% by the end of 1998. The cost of the program, with 199,000 doses distributed, was estimated to be $5.74 million. Several other jurisdictions have estimated (by telephone survey) pneumococcal vaccine coverage in those over 65 years of age to be less than 10%.

Requirements for pneumococcal surveillance

The data required for adequate surveillance of pneumococcal disease relate to two main areas:

1. monitoring of antimicrobial resistance, with the aim of providing feedback to influence antimicrobial prescribing; and

2. monitoring the impact of pneumococcal immunisation programs, both for polysaccharide vaccines in at-risk adults and for conjugate pneumococcal vaccines when these become part of the routine schedule.

Requirements for surveillance were discussed at the Workshop by three groups with broad representation. There was general agreement that surveillance was necessary, and that this should be based on laboratory reporting of sterile site isolates. While recognising the differences between jurisdictions in legal frameworks for notifiable diseases, the majority thought that adequate surveillance would be best achieved by making invasive pneumococcal disease (defined by an isolate from a sterile site) notifiable. The variables required would be similar to those in the enhanced Hib Surveillance Scheme which requires, in addition to basic demographic data, information about Aboriginality, immunisation status and underlying disease/risk factors of notified cases. Laboratory data are required to determine the prevalence of resistance and serotypes. The serotype of the isolate is especially important information from immunised cases. Serotyping is currently being performed in Western Australia (VISN), Northern Territory (Menzies School), Queensland (Queensland Health Scientific Services), New South Wales (New Children's Hospital/ICPMR) and Victoria (MDU).

Recommendations

Notification

The majority of workshop participants and State/Territory representatives were in favour of pneumococcal isolates from sterile sites being notifiable to State/Territory health departments. Notification would be direct from the laboratory and would be facilitated by the development of electronic data transfer, as for other predominantly laboratory-notified conditions. Concern was expressed that introducing compulsory notification might adversely affect existing voluntary laboratory notification schemes. The public health action arising out of notifications would primarily relate to monitoring of immunisation programs, and would provide an important baseline for evaluation before immunisation programs are funded and fully implemented. The public health action could also include promotion of appropriate antibiotic use by monitoring trends in antimicrobial resistance.

Data required for notification

The primary role of monitoring immunisation programs means that Aboriginality, the presence of indications for immunisation as defined by the National Health and Medical Research Council (NHMRC), and immunisation status are important variables for this notification system. This will

need to be determined in line with the current review of data requirements for surveillance of vaccine preventable diseases.

Laboratory support

The Public Health Laboratory Network was seen as the most appropriate group to oversee laboratory data for pneumococcal disease. The high incidence of pneumococcal disease, the different serotype distribution and existing immunisation programs in Aboriginal compared with other populations, necessitates special attention to serotyping of all available isolates from this group. For the non-Aboriginal population, serotyping could be restricted to a sample of isolates to monitor trends.

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Food policy in the National Centre for Disease Control

In response to industry and consumer concerns relating to many food issues, the Commonwealth Department of Health and Aged Care recently formed a Food Policy Section within the National Centre for Disease Control of the Population Health Division (PHD). Under the direction of Dr Ian McKay, the Food Policy Section's brief includes:

- coordinating Commonwealth policy development in relation to food, with a focus on food safety;
- strengthening the evidence base for national and Commonwealth decision-making on food policy issues;
- fostering collaborative partnerships between government, consumers and the food industry; and
- promoting nationally consistent approaches to food policy regulation and action.

Food safety projects are a major part of the Food Policy Section's activities. These are to be conducted over the next two years with a funding allocation of $4.6 million over that period. These activities will provide reliable data to help industry introduce cost effective food safety management systems and to initiate studies to better estimate the incidence of, and reduce foodborne illness. As a starting point for this work, a meeting of key stakeholders, the Food Safety Forum, was held in mid-February. It is expected that the Forum will be convened on a regular basis, and will act as a consultative body.

The Forum was attended by representatives of Commonwealth, State and Territory Governments, the Australian and New Zealand Food Authority (ANZFA), scientists and representatives of consumer and industry groups. The projects comprising the two year program of work were discussed, and their scope and aims generally received support. Some of the intended projects are outlined below.

- A study examining the efficacy of food safety programs will track the introduction of food safety programs into food premises and subsequently observe food handling practices. Industry and State Government representatives have offered to collaborate on the project. Following the debate at the Forum, the terms of reference for the project have been broadened to include costs and benefits of the introduction of food safety programs, to businesses. A consultant will be commissioned to undertake this work within the next few months.
- A project involving the establishment of sentinel sites in rural and urban locations will collect data on foodborne illness. This attracted strong support from Forum participants. The activities will include establishing a network of epidemiologists/data managers to analyse outbreak data and issues related to better information transfer. The project will build on the work of the Hunter Public Health Unit, and provide robust evidence on the incidence of foodborne illness in Australia. The Commonwealth will fund each site for two years, in interested jurisdictions. The funding would cover employing an epidemiologist/data manager, travel, laboratory tests, specimen equipment, courier charges and interviewer fees. In making this offer, interested jurisdictions would be expected to contribute resources through provision of infrastructure requirements for the site such as working space, operational facilities such as computer, telephone and facsimile as well as support services as required. The Commonwealth will employ a project manager to coordinate the activities of the sites and to act as a central liaison and coordination point. Regular quarterly meetings between the epidemiologists and State/Territory and Commonwealth agencies will take place to ensure consistency of data collection and collation. A meeting of interested State/Territories, ANZFA and PHD was held in March to discuss the scope and activities to be undertaken. Contract negotiations are currently underway with interested jurisdictions.
- A project to examine food contamination in Australia will involve collaboration with ANZFA and State and Territory health authorities to implement new food surveillance initiatives. This will contribute to State and Territory initiatives of Senior Food Officers and ANZFA to put in place a systematic and coordinated approach to food surveillance.

Advertisements will appear in the national press shortly, seeking submissions for consultancies related to some of these projects. Future editions of *CDI* will include progress reports.

Communicable Diseases Surveillance

Presentation of NNDSS data

In the March issue an additional summary table was introduced. Table 1 presents 'date of notification' data, which is a composite of three components: (i) the true onset date from a clinician, if available, (ii) the date the laboratory test was ordered, or (iii) the date reported to the public health unit. Table 2 presents data by report date for information only. In Table 2 the report date is the date the public health unit received the report.

Table 1 now includes the following summary columns: total current month 2000 data; the totals for p revious month 2000 and corresponding month 1999; a 5 year mean which is calculated using previous, corresponding and following month data for the previous 5 years (MMWR Weekly Feb 25, 2000:49(07);139-146); year to date figures; the mean for the year to date figures for the previous 5 years; and the ratio of the current month to the mean of the last 5 years.

Highlights

Communicable Diseases Surveillance consists of data from various sources. The National Notifiable Diseases Surveillance System (NNDSS) is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) is a sentinel surveillance scheme. The Australian Sentinel Practice Research Network (ASPREN) is a general practitioner-based sentinel surveillance scheme. In this report, data from the NNDSS are referred to as 'notifications' or 'cases', whereas those from ASPREN are referred to as 'consultations' or 'encounters' while data from the LabVISE scheme are referred to as 'laboratory reports'.

Bloodborne diseases

There were 1,666 notifications of hepatitis C reported in March 2000 that were not already on the State and Territory notifiable disease systems. This was a decrease from February 2000 (2,169), and March last year (1,952) but an increase from the mean of the last 5 years (1,324). Of these, 20 were identified to be incident cases. The majority of the incident notifications were in the 15-34 year old age group (95%) and the male to female ratio was 1:3.

Gastrointestinal diseases

There were 672 notifications of salmonellosis in March 2000. This was an increase from February 2000 (639), but a decrease from March last year (1,309) and the mean of the last 5 years (798) (Figure 1). Thirty-seven per cent (250 cases) were in the 0-5 year age group with an overall male to female ratio of 1:1.

There were 7 notifications of typhoid in March 2000. Of the 4 States reporting SLTEC/VTEC there were 4 cases, all from South Australia. There were also 2 cases of HUS in Victoria; both in the 0-4 year age group.

Quarantinable diseases

There were no cases of cholera, plague, rabies, yellow fever or viral haemorrhagic fever in March 2000.

Sexually transmissible diseases (STDs)

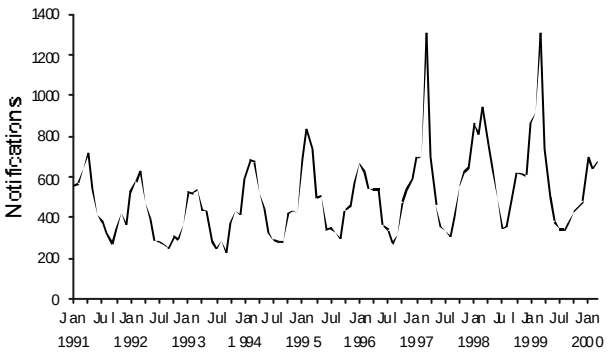
There were 1,889 notifications of sexually transmissible diseases in March 2000, which is similar to February 2000 (1,857) and March last year (1,982) but is greater than the mean for the last 5 years (1,393). The increase in notifications of sexually transmitted diseases again is mainly due to the increased notifications for chlamydial infection (ratio 1.5) and gonococcal infection (ratio 1.2).

Vectorborne diseases

There were 25 notifications of dengue in March 2000, which was a decrease from February 2000 (59), but an increase from March last year (14) and the mean for the last 5 years (18). The notifications were in all age groups with a male to female ratio of 1:1. The cases were mainly reported from Queensland (12) and Northern Territory (9) (Figure 2).

There were 602 notifications of Ross River virus infection in March 2000, which was a decrease from February 2000

Figure 1. Notifications of salmonellosis, January 1991 to March 2000, by date of notification



(624), from March last year (1,000) and the mean for the last 5 years (990). The majority of notifications were in Queensland (37%) and Western Australia (23%), and in the 25-49 year age group (63%) with a male to female ratio of 0.9:1.

There were 83 notifications of malaria in March 2000, which was a decrease from February 2000 (90) but an increase from March last year (64) and from the mean for the last 5 years (73) (Figure 3). The cases were due to the following species of *Plasmodium*: 57 *P. vivax*, 14 *P. falciparum* , 2 *P. ovale,* 1 *P. malariae* and 1 *P. falciparum/P. vivax*. Most notifications were from Queensland (52) and all cases were imported. The majority of notifications were in the 15-29 year age group (61%) with a male to female ratio of 3.8:1.

Vaccine preventable diseases (VPDs)

The total number of notifications for the different VPDs reached the lowest level since 1993 (Figure 4), with 213 notifications in March 2000. This was mainly the result of a continuing decline in notifications of pertussis.

There were no notifications of diphtheria or poliomyelitis. There was one case of *Haemophilus influenzae* type b reported from Queensland in a girl under 5 years of age with an unknown immunisation status. One case of tetanus was reported from New South Wales in a 76 year old female who was partly immunised. There was a slight increase in notifications of mumps in this notification period (16), compared with February 2000 (15), March 1999 (12) and the mean of the last five years (13). Most mumps cases occurred in the 20-24 year age group (44%), and the cases were evenly distributed between gender.

There were 9 cases of measles in March 2000, a decrease from February 2000 (12), March 1999 (75) and the mean of the last five years (51). Two cases were in the under 5 year age group (22%). The overall male to female ratio was 2:1. The immunisation status was unavailable for all the cases. Similarly, there was a decrease in rubella notifications in March 2000 (8), compared with February 2000 (17), March

Figure 2. Notifications of dengue, January 1999 to March 2000, Northern Territory, Queensland and Australia, by date of notification

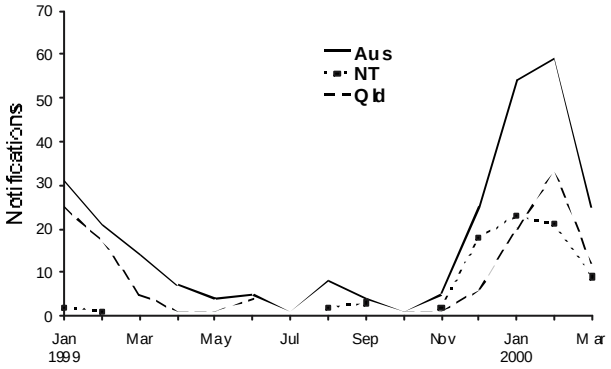


Figure 3. Notifications of malaria, January 1999 to March 2000, Northern Territory, Queensland, New South Wales and Australia, by date of notification

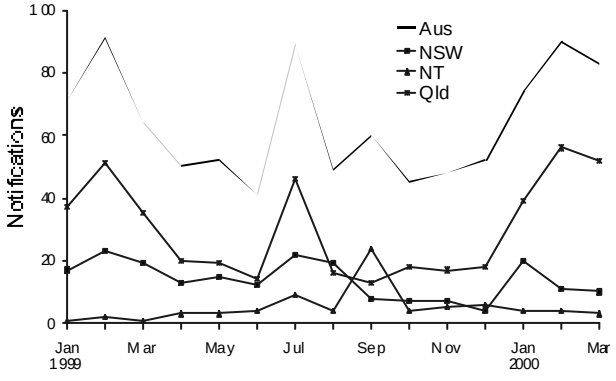


Figure 4. Notification trends of vaccine preventable diseases, January 1993 to March 2000

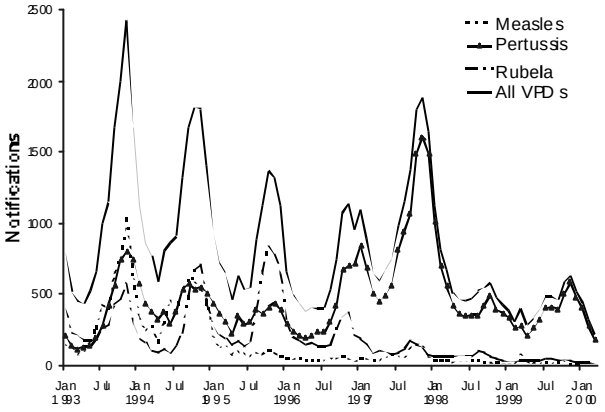
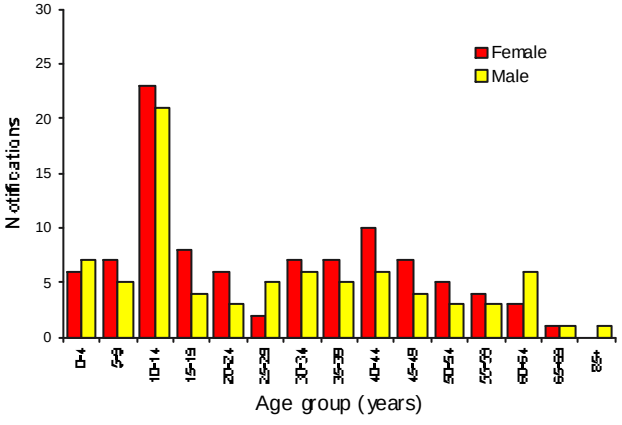


Figure 5. Notifications of pertussis, March 2000, by age group and sex



1999 (29) and the mean of the last five years (109). Most rubella cases were evenly distributed between decade age groupings up to 44 years of age with a male to female ratio 1.7:1.

A total of 178 pertussis notifications were received with a notification date in March 2000. This was the lowest number since June 1993. Most pertussis cases occurred in the 10-14 year age group (44/178; 25%), with an overall male to female ratio 0.8:1 (Figure 5). Immunisation status was only provided for 20 pertussis notifications with 5 cases fully immunised, 11 partly immunised and 4 not immunised.

Other diseases

There were 25 notifications of legionellosis in March 2000, with the majority again being in Victoria (60%) (please note Victorian outbreak report for April on page 92). This was less than for February 2000 (29) and for March last year (32) but was more than for the mean for the last 5 years (20).

There were 23 notifications of meningococcal infection in March 2000, with the majority again being in New South Wales (43%) and Victoria (35%). This was similar to that for February 2000 (22) and for the mean of the last 5 years (23), but less than for March last year (33). The majority of cases were either in the under 5 year age group (30%) or the 15-24 year age group (39%) (Figure 6). The overall male to female ratio was 1:1. Serotype information was provided for 48% (11/23) of the cases, with 45% serotype B (n=5) and 55% serotype C (n=6).

Echovirus 30 reports 1990-2000

The Virology and Serology Laboratory Reporting Scheme (LabVISE) is a voluntary scheme that receives reports from sentinel laboratories around Australia. LabVISE received 529 reports of echovirus 30 between January 1990 and January 2000. Victoria and New South Wales reported most activity (Figure 7). Victoria recorded a peak in the summer of 1994 and an increase in activity in December 1999, which continued into January 2000. New South Wales reported summer peaks in both 1994 and 1995 and a smaller winter peak in 1998. The majority of reports (51%) were received in late spring and summer. Other States reported a low level of activity over this period.

The age distribution of cases from whom echovirus 30 was isolated is shown in Figure 8. Over the 10 year period, 29% of reports were from children aged 0-9 years and 25% were in the 30-39 years age group. The male to female ratio was 1.04:1.

A clinical diagnosis was recorded for 73% (n=387) of reports. Of these, the most common clinical diagnosis was meningitis (87%).

The most common site of isolation of echovirus 30 was cerebrospinal fluid (64%) followed by respiratory tract (17%) and faeces (14%). All echovirus 30 isolates were diagnosed by viral culture techniques and confirmed by neutralisation or molecular techniques.

Figure 7. LabVISE reports of echovirus 30, Victoria and New South Wales, 1990-2000

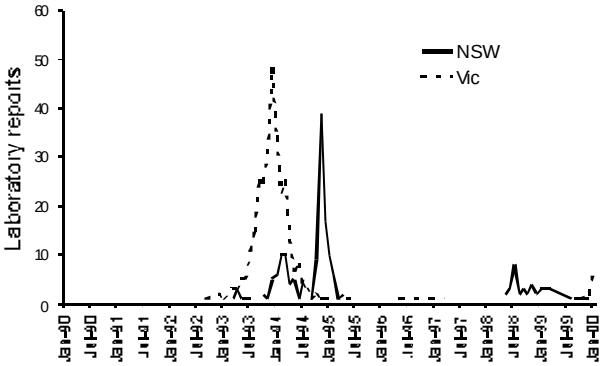


Figure 6. Notifications of meningococcal infection, January to March 2000, by age group and sex

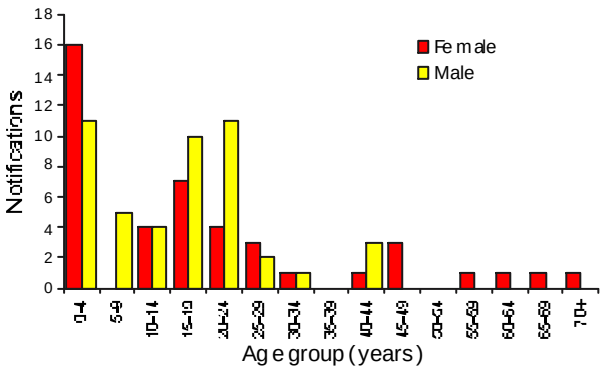
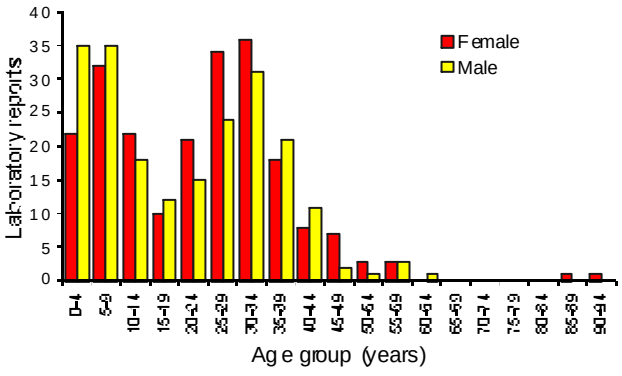


Figure 8. LabVISE echovirus 30 reports by age group and sex, 1990-2000



Tables

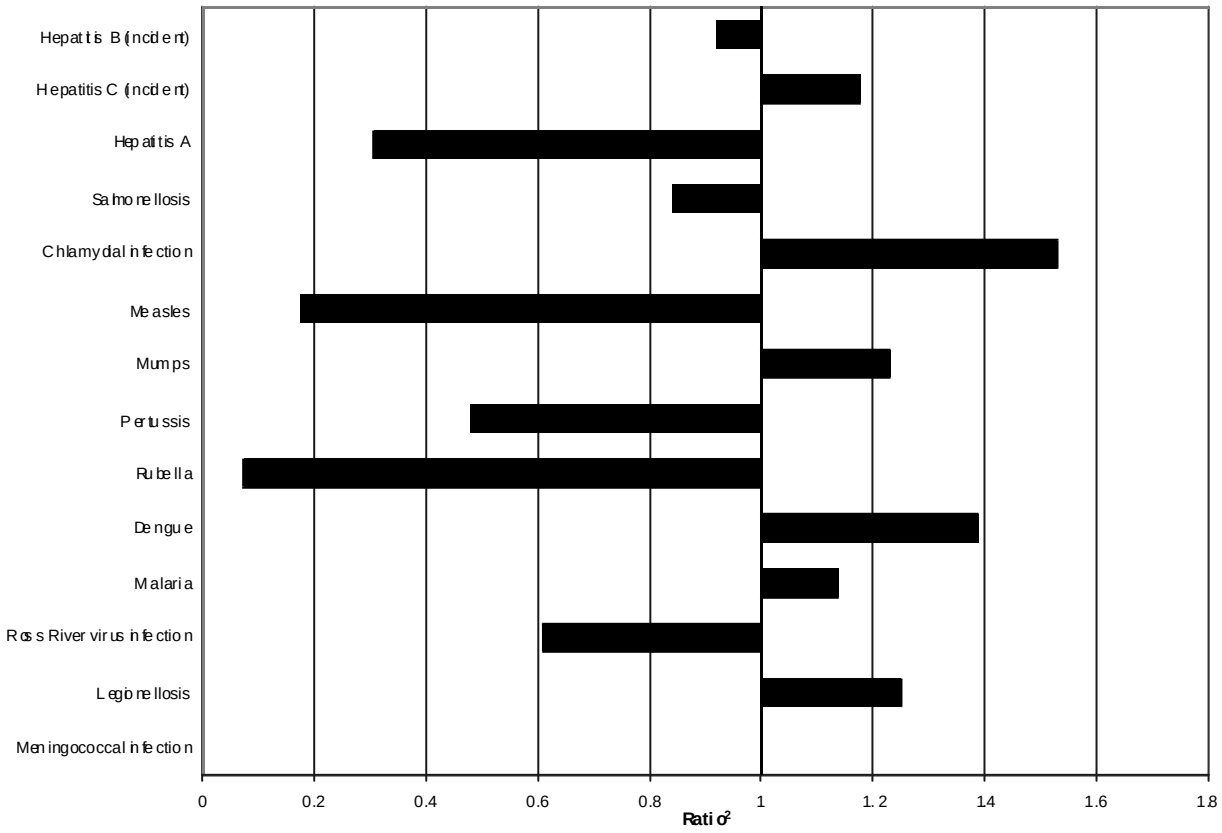
There were 7,136 notifications to the National Notifiable Diseases Surveillance System (NNDSS) with a notification date in March 2000 (Table 1). Data by date of report for weeks 9 to 12 ending 26 March 2000, are included in this issue of *CDI* (Table 2). The number of reports for selected diseases[1] have been compared with a 5 year mean, calculated using February to April data for the previous 5 years* (Figure 9).

There were 1,330 reports received by the *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) in the period, 1 to 31 March 2000 (Tables 3 and 4).

The Australian Sentinel Practice Research Network (ASPREN) data for weeks 9 to 12, ending 26 March 2000, are included in this issue of *CDI* (Table 5).

Surveillance data for these three schemes is now presented by calendar month rather than 4-weekly period.

Figure 9. Selected[1] diseases from the National Notifiable Diseases Surveillance System, comparison of provisional totals for the period 1 to 31 March 2000 with historical data[2]



1. Selected diseases are chosen each calendar month according to current activity
2. Ratio of current month total to mean of last 5 years as defined above*

Table 1. Notifications of diseases received by State and Territory health authorities in the period 1 March to 31 March 2000, by date of notification#

Disease	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total Mar 2000[1]	Total Feb 2000[1]	Total Mar 1999[1]	Last 5 years mean	Year to date 2000	Last 5 years YTD mean	Ratio*
Bloodborne															
Hepatitis B (incident)	0	2	2	3	0	3	8	5	23	22	29	25	74	75	0.9
Hepatitis B (unspecified)[2]	9	176	0	92	0	7	183	61	528	535	699	586	1,655	1,736	0.9
Hepatitis C (incident)	3	1	0	-	9	0	1	6	20	34	30	17	72	44	1.2
Hepatitis C (unspecified)[2]	18	524	10	325	52	36	563	118	1,646	2,135	1,922	1,307	5,352	3,941	1.3
Hepatitis D	0	0	0	3	0	0	0	0	3	0	1	2	3	4	1.5
Gastrointestinal															
Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Campylobacterosis[3]	23	-	23	316	134	16	345	145	1,002	1,025	1,200	929	3,172	2,999	1.1
Haemolytic uraemic syndrome	NN	0	0	0	0	0	2	0	2	1	2	3	4	2	0.7
Hepatitis A	0	16	0	10	7	1	21	15	70	103	160	229	297	735	0.3
Hepatitis E	0	0	0	0	0	0	0	0	0	0	0	*	0	1	0.0
Listeriosis	0	0	2	0	1	1	1	2	7	7	4	6	24	21	1.2
Salmonellosis	7	96	42	220	77	22	110	98	672	639	1,309	798	2,005	2,502	0.8
Shigellosis[3]	0	-	9	11	3	0	8	10	41	44	72	66	128	211	0.6
SLTEC,VTEC[4]	NN	0	0	NN	4	0	NN	NN	4	5	2	3	13	4	1.3
Typhoid	0	6	0	0	0	0	0	1	7	6	6	8	21	30	0.9
Yersiniosis[3]	2	-	0	8	1	0	1	0	12	9	20	21	29	85	0.6
Quarantinable															
Cholera	0	0	0	0	0	0	0	0	0	1	0	*	1	1	0.0
Plague	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Viral haemorrhagic fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
YellowFever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Sexually transmissible															
Chancroid	0	0	0	0	0	0	0	0	0	0	0	*	0	1	0.0
Chlamydial infection[5]	27	181	92	472	69	37	241	160	1,279	1,287	1,294	836	3,725	2,471	1.5
Donovanosis	0	0	0	1	NN	0	0	0	1	0	1	4	6	14	0.3
Gonococcal infection[6]	0	63	105	110	10	4	68	110	470	445	496	404	1,433	1,165	1.2
Lymphogranuloma venereum	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0.0
Syphilis[7]	0	37	20	81	0	0	0	1	139	125	191	147	394	439	0.9

Disease	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total Mar 2000[1]	Total Feb 2000[1]	Total Mar 1999[1]	Last 5 years mean	Year to date 2000	Last 5 years YTD mean	Ratio*
Vaccine preventable															
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Haemophilus influenzae type b	0	0	0	1	0	0	0	0	1	0	2	4	4	14	0.3
Measles	0	3	0	4	0	0	0	2	9	12	75	5	29	181	0.2
Mumps	1	7	0	0	0	0	3	5	16	15	12	13	44	40	1.2
Pertussis	6	69	0	43	9	13	37	1	178	271	277	37	847	1,403	0.5
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ns
Rubella[8]	0	2	0	5	0	0	1	0	8	17	29	109	43	400	0.1
Tetanus	0	1	0	0	0	0	0	0	1	1	1	1	3	2	1.0
Vectorborne															
Arbovirus infection NEC	0	0	0	0	0	0	10	1	11	8	13	9	22	29	1.2
Barmah Forest virus infection	0	12	1	39	0	0	2	6	60	61	65	100	173	266	0.6
Dengue	0	2	9	12	1	0	1	0	25	59	14	18	138	74	1.4
Malaria	3	10	3	52	3	2	9	1	83	90	64	73	247	246	1.1
Ross River virus infection	2	67	5	233	68	3	85	139	602	624	1,000	950	1,794	2,662	0.6
Zoonoses															
Brucellosis	0	0	0	1	1	0	0	0	2	0	4	3	4	9	0.7
Hydatid infection	0	NN	0	1	0	0	3	1	5	4	3	3	11	7	1.7
Leptospirosis	0	4	0	29	0	0	0	0	33	11	55	21	63	55	1.6
Ornithosis	0	NN	0	NN	0	0	3	2	5	5	4	7	15	20	0.7
Q Fever	0	8	0	46	0	0	1	2	57	44	44	41	140	124	1.4
Other															
Legionellosis	2	4	0	2	1	0	15	1	25	29	32	20	79	61	1.3
Leprosy	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0.0
Meningococcal infection	0	10	0	4	0	0	8	1	23	22	33	33	90	65	1.0
Tuberculosis	0	17	0	4	5	1	31	6	63	78	90	80	229	262	0.8
Total	103	1,318	323	2,128	455	146	1,761	902	7,136	8,090	9,671	7,864	23,353	24,445	

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
2. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the numbers of tests being carried out.
3. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
4. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC).
5. WA: genital only.
6. NT, Qld, SA, Vic and WA: includes gonococcal neonatal ophthalmia.
7. Includes congenital syphilis.
8. Includes congenital rubella

\# Date of notification = a composite of three components: (i) the true onset date from a clinician, if available, (ii) the date the laboratory test was ordered, or (iii) the date reported to the public health unit.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

na Not applicable

* Ratio = ratio of current month total to mean of last 5 years calculated as described above.

Table 2. Notifications of diseases received by State and Territory health authorities for weeks 9 to 12, by date of report*, March 2000

Week number	9	10	11	12	Year to
Week ending on	5 March 2000	12 March 2000	19 March 2000	26 March 2000	date total
Disease[1]					
Bloodborne					
Hepatitis B (incident)	6	12	7	7	81
Hepatitis B (unspecified)[2]	113	156	138	113	1,709
Hepatitis C (incident)	7	6	5	9	80
Hepatitis C (unspecified)[2]	424	411	377	380	5,230
Hepatitis D	0	0	0	2	2
Gastrointestinal					
Botulism	0	0	0	0	0
Campylobacterosis[3]	240	228	248	257	0
Haemolytic uraemic syndrome	0	0	1	0	3,051
Hepatitis A	24	26	21	16	3
Hepatitis E	0	0	0	0	306
Listeriosis	0	1	1	1	20
Salmonellosis	157	154	156	163	1,920
Shigellosis[3]	16	6	11	8	116
SLTEC,VTEC[4]	3	2	0	1	15
Typhoid	0	0	1	3	23
Yersiniosis[3]	2	4	1	2	25
Quarantinable					
Cholera	0	1	0	0	1
Plague	0	0	0	0	0
Rabies	0	0	0	0	0
Viral haemorrhagic fever	0	0	0	0	0
Yellow Fever	0	0	0	0	0
Sexually transmissible					
Chancroid	0	0	0	0	0
Chlamydial infection[5]	292	298	289	313	3,562
Donovanosis	2	0	1	1	7
Gonococcal infection[6]	116	77	123	102	1,338
Lymphogranuloma venereum	0	0	0	0	0
Syphilis[7]	19	51	35	26	410
Vaccine preventable					
Diphtheria	0	0	0	0	0
Haemophilus influenzae type b	0	0	0	0	4
Measles	1	3	4	3	29
Mumps	6	0	1	4	39
Pertussis	55	63	44	59	1,007
Poliomyelitis	0	0	0	0	0
Rubella[8]	6	3	1	1	44
Tetanus	0	0	0	1	3
Vectorborne					
Arbovirus infection NEC	4	2	1	2	16
Barmah Forest virus infection	14	16	15	13	166
Dengue	24	12	15	10	143
Malaria	32	13	17	17	227
Ross River virus infection	148	147	145	173	1,703

Table 2. Notifications of diseases received by State and Territory health authorities for weeks 9 to 12, by date of report*, March 2000 (continued)

Week number	9	10	11	12	Year to
Week ending on	5 March 2000	12 March 2000	19 March 2000	26 March 2000	date total
Disease[1]					
Zoonoses					
Brucellosis	0	0	1	0	4
Hydatid infection	1	1	1	2	9
Leptospirosis	0	0	9	9	51
Ornithosis	3	1	2	0	20
Q Fever	8	6	16	9	133
Other					
Legionellosis	6	8	6	8	76
Leprosy	0	0	0	0	0
Meningococcal infection	5	5	8	2	93
Tuberculosis	21	20	22	11	251
Total	1,755	1,733	1,723	1,728	21,917

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
2. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the numbers of tests being carried out.
3. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
4. Infections with *Shiga*-like toxin (verotoxin) producing *E Coli* (SLTEC/VTEC).
5. WA: genital only.
6. NT, Qld, SA , Vic and WA: includes gonococcal neonatal ophthalmia.
7. Includes congenital syphilis.
8. Includes congenital rubella

* Date of report is the date the public health unit received the report.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 1 to 31 March 2000, and total reports for the year[2]

	State or Territory[1]								This period 2000	This period 1999	Year to date 2000[3]	Year to date 1999
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA				
Measles, mumps, rubella												
Measles virus	0	0	0	0	0	0	1	2	3	76	12	85
Mumps virus	0	0	0	0	0	0	1	5	6	6	20	15
Rubella virus	0	0	1	1	0	0	1	1	4	9	13	20
Hepatitis viruses												
Hepatitis A virus	0	0	0	1	3	0	0	4	8	38	49	116
Arboviruses												
Ross River virus	0	3	3	29	42	0	3	78	158	295	520	592
Barmah Forest virus	0	0	1	13	0	0	0	1	15	17	61	44
Dengue type 3	0	0	0	0	0	0	0	2	2	0	3	3
Dengue not typed	0	3	7	0	0	0	0	9	19	7	117	15
Flavivirus (unspecified)	0	0	1	2	0	0	3	0	6	4	29	16
Adenoviruses												
Adenovirus type 1	0	0	0	0	0	0	1	0	1	0	2	1
Adenovirus type 3	0	0	0	0	2	0	1	0	3	2	9	8
Adenovirus type 4	0	0	0	0	1	0	1	0	2	1	4	5
Adenovirus type 40	0	0	0	0	0	0	0	7	7	5	19	14
Adenovirus not typed/pending	0	2	2	0	12	0	12	21	49	87	256	249
Herpes viruses												
Cytomegalovirus	0	6	1	16	19	0	24	4	70	128	307	316
Varicella-zoster virus	3	6	0	9	10	1	38	21	88	118	392	433
Epstein-Barr virus	0	9	0	47	45	1	7	20	129	234	533	673
Other DNA viruses												
Molluscum contagiosum	0	0	0	0	0	0	0	1	1	0	5	3
Parvovirus	0	1	0	0	0	0	6	10	17	24	83	95
Picorna virus family												
Echovirus type 30	0	0	0	0	0	0	14	0	14	3	40	6
Rhinovirus (all types)	0	16	0	0	3	0	0	6	25	39	76	84
Enterovirus not typed/pending	0	0	0	2	0	0	115	13	130	88	249	196
Ortho/paramyxoviruses												
Influenza A virus	4	3	1	2	10	0	2	9	31	44	179	116
Influenza B virus	0	1	0	0	5	0	0	4	10	11	25	28
Parainfluenza virus type 1	0	12	0	0	1	0	2	12	27	4	44	9
Parainfluenza virus type 2	0	0	0	2	1	0	0	1	4	7	6	12
Parainfluenza virus type 3	0	1	0	0	3	0	2	2	8	42	66	129
Respiratory syncytial virus	0	22	0	29	6	0	10	30	97	117	219	212
Other RNA viruses												
Rotavirus	1	10	0	0	6	0	2	5	24	60	121	156

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The system coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC). Notifications of these diseases are made to State and Territory health authorities under the provisions of their respective public health legislations. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 2000;24:6.

LabVISE is a sentinel reporting scheme. Currently 17 laboratories contribute data on the laboratory identification of viruses and other organisms. This number may change throughout the year. Data are collated and published in Communicable Diseases Intelligence every four weeks. These data should be interpreted with caution as the number and type of reports received is subject to a number of biases. For further information, see CDI 2000;24:10.

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 1 to 31 March 2000, and total reports for the year[2] (continued)

	State or Territory[1]								This period 2000	This period 1999	Year to date 2000[3]	Year to date 1999
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA				
Other												
Chlamydia trachomatis not typed	11	21	28	67	29	5	6	54	221	259	810	754
Chlamydia psittaci	0	0	0	0	0	0	3	2	5	0	21	13
Chlamydia species	0	1	0	0	0	0	0	0	1	4	3	6
Mycoplasma pneumoniae	0	2	0	16	4	0	13	5	40	81	146	284
Coxiella burneti i (Q fever)	1	0	0	0	0	0	1	1	3	16	22	46
Streptococcus group A	0	2	9	18	0	0	0	0	29	0	109	0
Bordetella pertussis	0	0	0	1	2	1	18	1	23	76	157	171
Legionella pneumophila	0	0	0	0	0	0	0	1	1	4	2	12
Legionella longbeachae	0	0	0	0	2	0	0	3	5	3	16	13
Leptospira species	0	0	0	3	0	0	0	0	3	0	8	0
Treponema pallidum	0	0	19	20	0	0	0	0	39	6	128	6
Entamoeba histolytica	0	0	0	1	0	0	0	0	1	0	8	0
Echinococcus granulosus	0	0	0	0	0	0	0	1	1	0	3	0
Total	20	121	73	279	206	8	287	336	1,330	1,915	4,892	4,956

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.
2. From January 2000 data presented are for reports with report dates in the current period. Previously reports included all data received in that period.
3. Totals comprise data from all laboratories. Cumulative figures are subject to retrospective revision, so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.

\- No data received this period.

Table 4. Virology and serology laboratory reports by contributing laboratories for the reporting period 1 to 31 March 2000[1]

State or Territory	Laboratory	This period	Total this period[2]
Australian Capital Territory	The Canberra Hospital	0	0
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	27	67
	New Children's Hospital, Westmead	41	86
New South Wales	Repatriation General Hospital, Concord	0	0
	Royal Prince Alfred Hospital, Camperdown	43	59
	South West Area Pathology Service, Liverpool	0	0
Queensland	Queensland Medical Laboratory, West End	324	596
	Townsville General Hospital	26	33
South Australia	Institute of Medical and Veterinary Science, Adelaide	208	473
Tasmania	Northern Tasmanian Pathology Service, Launceston	7	12
	Royal Hobart Hospital, Hobart	0	0
Victoria	Monash Medical Centre, Melbourne	2	4
	Royal Children's Hospital, Melbourne	71	119
	Victorian Infectious Diseases Reference Laboratory, Fairfield	229	348
Western Australia	PathCentre Virology, Perth	329	491
	Princess Margaret Hospital, Perth	35	88
	Western Diagnostic Pathology	9	9
Total		1,351	2,385

1. The complete list of laboratories reporting for the 12 months, January to December 2000, will appear in every report from January 2000 regardless of whether reports were received in this reporting period. Reports are not always received from all laboratories.
2. Total reports include both reports for the current period and outstanding reports to date.

Table 5. Australian Sentinel Practice Research Network reports, weeks 9 to 12, 2000

Week number	9		10		11		12	
Week ending on	5 March 2000		12 March 2000		19 March 2000		26 March 2000	
Doctors reporting	71		66		70		69	
Total encounters	8,855		7,969		8,917		8,325	
Condition	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters
Influenza	25	2.8	20	2.5	19	2.1	32	3.8
Chickenpox	9	1.0	9	1.1	9	1.0	4	0.5
Gastroenteritis	81	9.1	61	7.7	67	7.5	80	9.6
Gastroenteritis with stool culture	12	1.4	16	2.0	12	1.3	14	1.7
ADT immunisations	68	7.7	51	6.4	61	6.8	57	6.8

ASPREN currently comprises about 120 general practitioners from throughout the country. Between 7,000 and 8,000 consultations are reported each week, with special attention to 14 conditions chosen for sentinel surveillance in 2000. CDI reports the consultation rates for five of these. For further information, including case definitions, see CDI 2000;24:7-8.

Additional Reports

Rotavirus Surveillance

The National Rotavirus Reference Centre (NRRC) undertakes surveillance and characterisation of rotavirus strains causing annual epidemics of severe diarrhoea in young children throughout Australia.

There are currently fourteen laboratories contributing data and rotavirus specimens for the characterisation of representative rotavirus serotypes.

The NRRC is happy to give and receive notifications of rotavirus outbreaks Australia-wide. The NRRC can be contacted at the Department of Gastroenterology and Clinical Nutrition, Royal Children's Hospital, Flemington Road, Parkville, Victoria 3052. Telephone: (03) 9345 5069, Facsimile: (03) 9345 6240,
Email: masendyp@cryptic.rch.unimelb.edu.au. For more information see CDI 2000;24:10.

June – December 1999

The last report (*CDI* 1999;23:315) presented data collected retrospectively for the period January to July 1999. Active rotavirus surveillance began in June 1999. From June to December 1999 over 1,300 rotavirus specimens were collected from 14 centres Australia-wide. Most centres reported rotavirus seasons, with Sydney experiencing a 'big season' (over 200 specimens). In contrast, Hobart reported only 7 rotavirus positives for the same period. Serotype analysis of representative specimens has shown serotype G1 to be the dominant infecting serotype Australia-wide. This result is consistent with previous findings in Australia.[1,2]

Serotype G9 rotaviruses appeared in Australia for the first time in Sydney in June 1999.[3] The G9 rotaviruses appeared in Sydney, Melbourne and Brisbane initially, and were considered a random occurrence and exclusive to the three cities. However, ongoing serotyping analysis has shown G9 rotaviruses to be the second most common serotype. They were detected in (in order of chronological appearance) Alice Springs, Narrabri, Perth, Adelaide and Newcastle. The serotyping EIA results were confirmed by northern hybridisation analysis and/or reverse transcriptase/ polymerase chain reaction (RT/PCR) assay, using G9 specific oligonucleotide primers for the outer capsid viral protein, VP7.

The G9 viruses displayed genetic variation with three different RNA electrophoretic migration patterns. Differing reactivities with the G9-specific monoclonal antibody, suggests that they are antigenically different viruses. Sequence analysis has shown that one of the viruses resembles a G9 strain from India.[3] The detection of G9 rotaviruses in the United States of America (USA),[4] Bangladesh,[5] India,[6] the United Kingdom,[7,8] Malawi,[9] and Nigeria[10] suggests that G9 viruses may be emerging as important human pathogens. G9 rotaviruses isolated in the USA have been shown to display more than one subgroup specificity.[11] To date, the G9 viruses reported in Australia have been limited to only one subgroup. Further analysis of these specimens is warranted.

Retrospective RT/PCR analysis of specimens that were previously unable to be assigned a serotype, has shown that G9 rotaviruses were present in Perth and Melbourne in 1997 and 1998. These were isolated incidents, and do not appear to be as important as those seen in 1999. The virus took 3 months to cross the country, and appeared simultaneously in Melbourne and Sydney in June 1999. The extent of the spread shows the importance of this pathogen. The appearance of G9 viruses coincides with the diminishing prevalence of serotype G4 viruses, which share some serological similarities with the G9 virus. This leads us to believe there are active selective pressures on circulating rotavirus serotypes. This observation is limited to the 1999 sampling period and requires further investigation.

The National Rotavirus Reference Centre welcomes notifications of rotavirus outbreaks and receipt of rotavirus positive specimens from those outbreaks wherever possible.

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11. Griffin DD, Kirkwood CD, Parashar UD et al. A comparison of three consecutive rotavirus seasons in the United States and the identification of a rare strain (in press).

HIV and AIDS Surveillance

National surveillance for HIV disease is coordinated by the National Centre in HIV Epidemiology and Clinical Research (NCHECR), in collaboration with State and Territory health authorities and the Commonwealth of Australia. Cases of HIV infection are notified to the National HIV Database on the first occasion of diagnosis in Australia, by either the diagnosing laboratory (ACT, New South Wales, Tasmania, Victoria) or by a combination of laboratory and doctor sources (Northern Territory, Queensland, South Australia, Western Australia). Cases of AIDS are notified through the State and Territory health authorities to the National AIDS Registry. Diagnoses of both HIV infection and AIDS are notified with the person's date of birth and name code, to minimise duplicate notifications while maintaining confidentiality.

Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting interval indicated, to allow for reporting delay and to incorporate newly available information. More detailed information on diagnoses of HIV infection and AIDS is published in the quarterly Australian HIV Surveillance Report, and annually in HIV/AIDS and related diseases in Australia Annual Surveillance Report. The reports are available from the National Centre in HIV Epidemiology and Clinical Research, 376 Victoria Street, Darlinghurst NSW 2010. Telephone: (02) 9332 4648; Facsimile: (02) 9332 1837; http://www.med.unsw.edu.au/nchecr.

HIV and AIDS diagnoses and deaths following AIDS reported for 1 to 30 November 1999, as reported to 29 February 2000, are included in this issue of CDI (Tables 6 and 7).

Table 6. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 30 November 1999, by sex and State or Territory of diagnosis

										Totals for Australia			
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999	Year to date 1998
HIV diagnoses	Female	0	3	1	0	0	0	1	2	7	11	70	87
	Male	0	27	1	7	1	0	10	3	49	61	554	585
	Sex not reported	0	0	0	0	0	0	0	0	0	1	3	6
	Total[1]	0	30	2	7	1	0	11	5	56	73	627	678
AIDS diagnoses	Female	0	1	0	0	0	0	0	0	1	1	14	16
	Male	0	4	0	3	0	0	3	0	10	14	113	254
	Total[1]	0	5	0	3	0	0	3	0	11	15	127	270
AIDS deaths	Female	0	0	0	0	0	0	0	0	0	0	3	8
	Male	0	2	0	0	0	0	4	0	6	12	88	135
	Total[1]	0	2	0	0	0	0	4	0	6	12	92	143

1. Persons whose sex was reported as transgender are included in the totals.

Table 7. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 30 November 1999, by sex and State or Territory

		State or Territory								
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
HIV diagnoses	Female	25	603	11	145	61	6	212	113	1,176
	Male	192	10,764	108	1,956	672	79	3,864	902	18,537
	Sex not reported	0	259	0	0	0	0	24	0	283
	Total[1]	217	11,645	119	2,108	733	85	4,113	1,018	20,038
AIDS diagnoses	Female	8	182	0	47	25	3	68	26	359
	Male	86	4,612	36	811	345	44	1,603	345	7,882
	Total[1]	94	4,806	36	860	370	47	1,678	373	8,264
AIDS deaths	Female	3	113	0	31	15	2	47	16	227
	Male	65	3,165	24	564	230	28	1,260	246	5,582
	Total[1]	68	3,286	24	597	245	30	1,313	263	5,826

1. Persons whose sex was reported as transgender are included in the totals.

Childhood Immunisation Coverage

Tables 8 and 9 provide the latest quarterly report on childhood immunisation coverage from the Australian Childhood Immunisation Register (ACIR).

The data show the percentage of children fully immunised at age 12 months for the cohort born between 1 October and 31 December 1998 and at 24 months of age for the cohort born between 1 October and 31 December 1997, according to the Australian Standard Vaccination Schedule.

A full description of the methodology used can be found in CDI 1998;22:36-37.

Table 8. Percentage of children immunised at 1 year of age, preliminary results by disease and State for the birth cohort 1 October to 31 December 1998; assessment date 31 March 2000.

	State or Territory								
Vaccine	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Total number of children	1,046	21,322	808	11,233	4,527	1,610	15,524	6,179	62,249
Diphtheria, Tetanus, Pertussis (%)	92.4	88.3	85.5	90.4	90.5	90.1	90.7	87.8	89.5
Poliomyelitis (%)	92.4	88.3	85.5	90.4	90.5	90.1	90.7	87.8	89.5
Haemophilus influenzae type b (%)	92.1	87.4	88.4	90.6	89.4	89.1	90.1	86.9	88.9
Fully immunised (%)	91.8	86.6	83.0	89.7	89.1	88.3	89.4	85.8	88.1
Change in fully immunised since last quarter (%)	+2.0	+1.9	-0.8	-0.2	+1.1	+0.1	+1.4	-0.1	+1.1

Table 9. Proportion of children immunised at 2 years of age, preliminary results by disease and State for the birth cohort 1 October to 31 December 1997; assessment date 31 March 2000[1]

	State or Territory								
Vaccine	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Total number of children	1,055	22,021	843	11,867	4,568	1,536	15,667	6,146	63,703
Diphtheria, Tetanus, Pertussis (%)	85.8	82.8	77.3	86.6	84.2	84.6	84.0	79.8	83.6
Poliomyelitis (%)	85.8	82.8	77.3	86.6	84.2	84.6	84.1	79.9	83.7
Haemophilus influenzae type b (%)	85.6	82.0	85.6	86.9	83.0	84.4	83.8	79.4	83.4
Measles, Mumps, Rubella (%)	90.5	87.8	87.4	90.7	91.3	92.2	91.8	87.8	89.7
Fully immunised (%)[2]	82.6	73.8	73.0	81.5	77.9	78.7	77.7	73.3	76.7
Change in fully immunised since last quarter (%)	0.1	+2.8	+3.4	+2.1	+0.2	+4.7	+0.9	+0.3	+1.8

1. The 12 months age data for this cohort was published in *CDI* 1999;23:110.
2. These data relating to 2 year old children should be considered as preliminary. The proportions shown as "fully immunised" appear low when compared with the proportions for individual vaccines. This is at least partly due to poor identification of children on immunisation encounter forms.

Acknowledgment: These figures were provided by the Health Insurance Commission (HIC), to specifications provided by the Commonwealth Department of Health and Aged Care. For further information on these figures or data on the Australian Childhood Immunisation Register please contact the Immunisation Section of the HIC: Telephone 02 6124 6607.

Bulletin Board

Australian Infection Control Association
First Biennial Conference
Infection Control Beyond 2000
3-5 May 2000
Hilton Adelaide International, South Australia
Contact: AICA 2000 Secretariat
PO Box 1280 , Milton, Queensland 4064
Phone: 07 3369 0477
Fax: 07 3369 1512
Email: aica2000@im.com.au
Website: http://www.aica.org.au/aica2000.htm

Australian School of Environmental Studies
Arbovirus Research in Australia
3-7 July 2000
Couran Cove Nature Resort, Gold Coast, Queensland
Contact Dr Michael Brown
Queensland Institute of Medical Research
PO Box Royal Brisbane Hospital
Herston, Queensland, 4029
Website: http://www.mcaa.org.au

National Centre for Epidemiology and Population Health
International Short Course in Advanced Communicable Diseases Epidemiology
17-28 July 2000
Innovations Building, Mills Road
The Australian National University, ACT
Contact: Ros Hales
Phone: 02 6249 2790
Fax: 02 6249 0740
Email: Ros.Hales@anu.edu.au

Public Health Association of Australia
7th National Public Health Association of Australia Immunisation Conference
2-3 August 2000
Gold Coast International Hotel
Gold Coast, Queensland
Contact: Annette Mellick
Phone: 02 6285 2373
Fax: 02 6282 5438
Email: conference@phaa.net.au
Website: http://www.phaa.net.au

Royal North Shore Hospital
Outpatient Parenteral Therapy - beyond 2000
17-22 September 2000
Fairmont Resort
Leura, New South Wales
Phone: 02 9956 8333
Fax: 02 9956 5154
Email: confact@conferenceaction.com.au

The Australasian Society for HIV Medicine
12th Annual Conference
16-19 November 2000
The Carlton Crest, Melbourne, Victoria
Phone: 02 9382 1656
Fax: 02 9382 3699
Email: B.Pearlman@unsw.edu.au

The CDI Bulletin Board is provided as a service to readers. Every effort has been made to provide accurate information, but readers are advised to contact the relevant organisation for confirmation of details. Information about the availability of resources is included when space allows. Inclusion of a resource on the Bulletin Board does not imply endorsement of the resource by either the Communicable Diseases Network Australia New Zealand or the Commonwealth Department of Health and Aged Care.

Contributions to the Bulletin Board are invited from those organisations with forthcoming events relevant to communicable disease control.

Overseas briefs

Source: World Health Organization (WHO)
This material has been summarised from information on the WHO Internet site. A link to this site can be found under 'Other Australian and international communicable diseases sites' on the CDI homepage.

Viral haemorrhagic fever/Marburg in Democratic Republic of Congo

Final confirmation of Marburg infection has been received in 4 of the 6 patients previously reported. These confirmations yield a revised total of 16 cases since November 1999. Twelve have had the diagnosis confirmed by virological tests and 4 are classified as suspect cases as no clinical samples were available. Disease activity is continuing in the area, and enhanced prevention and control measures are being implemented.

Imported case of Lassa fever in Germany

An imported fatal case of Lassa fever has been reported in Germany. The patient was a Nigerian national, working in Nigeria, who had been transferred to Germany by air ambulance for medical treatment. Contacts of the patient are being traced, and will be followed up by the public health authorities.

Tularemia in Kosovo

The Institute of Public Health, Pristina, has now identified 699 suspected cases, 56 laboratory confirmed. The problem is widespread with the majority of municipalities reporting cases. Surveillance is being enhanced across the whole territory. Tularemia (*Francisella tularensis*) is also known as rabbit fever, deer-fly fever, Ohara disease or Francis disease and is endemic in many parts of the world, including north America, eastern Europe, China, Japan and Scandinavia. It is a bacterial disease normally transmitted to humans via ticks, drinking water contaminated by rats or handling of under-cooked infected meat from host animals, such as rabbits, and through contaminated soil. It has a variety of clinical manifestations.

There have been no reports of death. Investigations are continuing to identify the mode of transmission and source in the current outbreak and control measures are being instituted.

Meningococcal disease

Sudan

A total of 2,549 cases of which 186 were fatal, was reported to the national health authorities between 1 January and 31 March 2000. The national task force in Khartoum has coordinated and led epidemic response activities. A total of 70,000 people were vaccinated in early March.

Ethiopia

In the Amhara region the health authorities have confirmed a revised total of 70 cases (with 3 deaths) in Kobo Woreda (northern Wollo) between 1 January and 31 March 2000. All 29 specimens analysed yielded *Neisseria meningitidis* serogroup C sensitive to chloramphenicol, penicillin, erythromycin and tetracycline. Part of the response strategy included vaccination of the target population aged 2-35 years; 36,500 people were vaccinated between 28 February and 12 March. No further cases have been reported. In the Tigray region, up to 12 March 2000, a total of 47 cases (with 6 deaths) was reported (case-fatality rate, 12%). Specimens analysed have yielded *N. meningitidis* serogroup C. In all, 35,200 people aged 2-35 years were vaccinated in early March. The Gambella region has reported 32 cases (with 5 deaths) due to *N. meningitidis* serogroup A. Vaccinations are proceeding. The national health authority has prepared a plan for preparedness and response to the epidemic and is discussing it with all partners.

Hajj travellers

There have been a number of cases of meningococcal disease which are associated with returnees from the Hajj and their close contacts. WHO recommends that chemoprophylaxis be given to close contacts of the cases. In most countries rifampicin is recommended. Immunisation against meningococcal disease A+C has been an entry requirement by Saudi Arabia for pilgrims travelling to the Hajj. However, the meningococcal A+C vaccine does not protect against group W135 infection.

Editorial note

Meningococcal vaccines available in Australia (Mencevax, SmithKline Beecham and Menomune, CSL Limited) protect against serogroups A, C, Y and W135.

France

The number of cases of meningococcal disease associated with pilgrims who have travelled to the Hajj has increased, and the total number of cases to date is 14, including 4 deaths. Eleven of the confirmed cases were of meningococcal serogroup W135.

United Kingdom

The number of cases of meningococcal disease linked to pilgrims has increased, and is now 22 with 4 deaths. Twenty of the confirmed cases are of meningococcal serogroup W135 and 1 of *N. meningitidis* serogroup A. The onset of the last case of meningococcal disease reported to date (in a contact) was on 11 April.

Oman

There have been 12 cases to date, all have recovered. Of these, 3 were pilgrims (2 males aged 40 and 55 years and 1 female aged 60 years) returning from the Hajj, and 9 cases were close contacts of those returned from the Hajj. The ages of these patients ranged from 6 months to 80 years. The date of onset of the first case was 20 March, and the most recent case was reported on 6 April. Seven of the confirmed cases are of meningococcal serogroup W135 and 2 of *N. meningitidis* serogroup A.

Saudi Arabia

Health authorities have reported a revised total of 225 cases, including 57 deaths since the Hajj last month. Bacterial investigations have now confirmed *N. meningitidis* serogroup A in 54 cases, serogroup W135 in 50 cases, and serogroup B in 1 case. The situation is being closely monitored by the health authorities, with case management and contact tracing in place.

Netherlands

There have been 2 confirmed cases of *N. meningitidis* serogroup W135 (onset dates 5 and 6 April) and 2 probable cases, including 1 death reported. Case management and contact tracing are also being carried out.

United States of America

As of 20 April, 3 confirmed cases of serogroup W135 meningococcal disease have been reported by the New York City Communicable Disease Program. One case is a returning pilgrim with as yet unconfirmed vaccination status, and 1 is a household contact of a returning pilgrim. The third patient did not participate in the Hajj and is not known to have close contacts among pilgrims who travelled to Mecca. In the United States, W135 accounts for only 3%-4% of sporadic cases of meningococcal disease.

Subscriptions

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Website

http://www.health.gov.au/pubhlth/cdi/cdihtml.htm

Contributions

Contributions covering any aspects of communicable diseases are invited. All contributions are subject to the normal refereeing process. **Instructions to authors can be found in *CDI* 2000;24:5**.

Contacts other than subscriptions

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