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CONTENTS

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HAEMOPHILUS INFLUENZAE TYPE B VACCINATION COVERAGE IN THE AUSTRALIAN CAPITAL TERRITORY FOR CHILDREN AGED NINE MONTHS AND TWO YEARS

Eddie O'Brien[1] *and Ann Kempe*[2]

Abstract

Haemophilus influenzae type b (Hib) infection is an important cause of morbidity and mortality, particularly in children under five years of age. Immunisation can significantly reduce the impact of the disease. In order to allow for adequate public health planning, it is necessary to know the rate of immunisation in the population at risk. The Australian Capital Territory maintains a database which records the majority of vaccination events occurring in the Territory. Examination of these data allows accurate estimation of children's immunisation status. Using criteria based on the National Health and Medical Research Council's *Australian Immunisation Procedures Handbook*, 68% of nine month old children and 34% of two year old children were considered to be fully immunised at 31 March 1995. The Australian Childhood Immunisation Register should allow similar accurate estimation of immunisation rates in the future.

Introduction

Prior to the widespread availability of vaccines, Hib was a major cause of morbidity and mortality in children under five years of age[1]. In 1993 the National Health and Medical Research Council (NHMRC) published recommendations concerning the use of Hib vaccines in Australian children. The number of reports and notification rates for Hib in Australia and in the Australian Capital Territory have fallen markedly in the last four years (Table 1)[2]. This fall can also be seen in the 0-4 years age group (table 2) (National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia-New Zealand, personal communication, 1996).

This article presents an estimate of Hib vaccine uptake in the Australian Capital Territory between 1 April 1994 and 31 March 1995, based on the Australian Capital Territory's central vaccination register.

Methods

The Australian Capital Territory uses a system of 'vaccines for data' whereby general practitioners are provided with free vaccines in exchange for their provision of vaccination data to the Immunisation Section of the Australian Capital Territory Department of Health and Community Care (ACT Health). Ninety-seven per cent of Australian Capital Territory general practices are supplied with their vaccines through this scheme. The private sector administers 30% of all childhood vaccines in the Australian Capital Territory and community nursing staff in Australian Capital Territory government health centres administer the remaining 70%.

All vaccine data from both these sources are sent to ACT Health and recorded in the central vaccination database. The Australian Capital Territory immunisation data for Hib vaccine administration were imported from the central register into a relational database for processing.

Definitions

Age

All vaccination data to 31 March 1995 have been entered into the database. This study uses these data to provide an estimate of vaccination status of the children born between 1 July 1993 and 30 June 1994. These children had therefore attained the age of nine months in the year to 31 March 1995. The study also provided data on children who were born between 1 April 1992

Table 1. Number and rates of *Haemophilus influenzae* type b infection for all age groups, in Australia and the Australian Capital Territory by year, 1991-1995

	Number of notifications (rate per 100,000) by year				
Area	1991	1992	1993	1994	1995
Australia	549 (3.5)	501 (3.0)	396 (2.2)	169 (1.0)	78 (0.43)*
ACT	10 (3.5)	10 (3.4)	9 (3.0)	1 (0.3)	1 (0.3)

* preliminary figure

1. Communicable Disease Control Unit, ACT Department of Health and Community Care, GPO Box 825, Canberra ACT 2601
2. Child and Youth Health (South Australia), formerly Immunisation Section, ACT Department of Health and Community Care

Table 2. Number and rates of *Haemophilus influenzae* type b infection in children aged 0-4 years, in Australia and the Australian Capital Territory, 1991-1995

Number of notifications (rate per 100,000) by year, children aged 0-4 years					
Area	1991	**1992**	**1993**	**1994**	**1995**
Australia	420 (33.0)	431 (33.7)	320 (24.9)	103 (7.99)	52 (4.0)*
ACT	10 (44)	8 (35)	7 (31)	1 (4)	1 (4)

* preliminary figure

and 31 March 1993 and who had reached two years of age in the year to 31 March 1995.

Immunisation status

Children whose receipt of vaccine is recorded on the database may be fully or partially immunised. In the context of this paper, fully immunised means immunised according to the current NHMRC schedule and does not make any statement about serological status. 'Age appropriate' may be a better description than 'fully immunised'. *The Australian Immunisation Procedures Handbook* describes various vaccination schedules depending on the type of vaccine used and the age of the child[3]. Depending on the age at first vaccination, a nine month old child must have had one, two or three doses of vaccine to be considered age-appropriately immunised. A child who reached nine months of age in the early part of the year of interest (April to June 1994) would have reached 18 months of age by the end of the year and would therefore have been due for the booster vaccination. Children in the two year age group may require up to four doses for full immunisation. In addition, we applied the criteria that the child must have been aged at least 45 days (1.5 months) at the time of receiving the first dose and that there should be no less than 30 days between doses.

Children who are outside the defined age ranges are excluded. Children whose dose schedule falls outside the criteria for fully immunised, through too few doses or incorrectly timed doses, are counted as partially immunised. Any child who is included on the database has had at least one Hib vaccination and is therefore at least 'partially' immunised.

To estimate proportions of immunisation, denominator data were obtained from the estimates of the number of births in each year and the population in each age group, as published by the Australian Bureau of Statistics for the year ended 30 June 1993[4].

Results

The database includes 36,238 records, representing vaccinations given to 18,352 children. Excluded from the analysis were records which appear to have erroneous information (n=2), children whose postcode of residence is outside the Australian Capital Territory (n=482) and children outside the age ranges of interest (n=9,827).

Using the criteria outlined above, 3,170 children in the nine-months age group were considered to be fully immunised and 1,449 children were partially immunised. In the group turning two during the period of interest, 1,751 were considered to be fully immunised and 1,671 were partially immunised. Of those described as partially immunised in each age group, more than 96% were classified thus because of too few vaccinations rather than having vaccinations which were too closely spaced or given at too early an age.

The estimated number of children who turned nine months old in the period of this study is 4,485. The number of two year old children is estimated at 4,690 (at 30 June 1993). An estimate of the number of migrations into and out of the Australian Capital Territory by children in the age groups of interest was obtained from the Australian Bureau of Statistics (T. Power, personal communication, 1995). The migrating children may have received vaccination and are therefore included in the denominators. We were thus able to calculate numbers and proportions for fully and partially immunised children (Table 3).

Discussion

The figures presented here represent a minimum estimate of the number of children in the nine months and two years age groups immunised against Hib in the Australian Capital Territory during the 12 months to 31 March 1995. It represents an underestimate of the number of children immunised for several reasons. A small

Table 3. Estimates of *Haemophilus influenzae* type b immunisation coverage by age at 31 March 1995, Australian Capital Territory

Age group	Number of children in population	Fully immunised Number (proportion)	Partially immunised Number (proportion)
9 months old	4660	3170 (68%)	1449 (31.1%)
2 years old	5130	1751 (34.1%)	1671 (32.6%)

number of general practitioners do not take part in the 'vaccines for data' scheme; the database does not contain records for children receiving vaccination from these practitioners. In addition, children who migrated into or out of the Australian Capital Territory during the period of interest may have been immunised in another area and their vaccination history would not be fully represented on the database.

Earlier estimates of coverage for vaccination against Hib have been published for several regions in Australia. A telephone survey in the Australian Capital Territory in 1993 estimated that 17% of children under five years of age had been vaccinated against Hib[5]. In February 1995, C*ommunicable Diseases Intelligence* carried articles that gave estimates of the vaccine coverage in the Northern Territory and South Australia[6, 7]. These estimates were based on a sample survey of parents and, for South Australia, audits of vaccines given at two months of age. The Northern Territory estimated 73% coverage for children aged eight months to two years. South Australia reported first-dose coverage in infants aged up to two months of age as 75%.

A survey carried out in Sydney estimated the proportion of children vaccinated in August 1993 at 48% for those under 18 months and 45% for children aged 19-60 months[8]. Statistical techniques were used to show that the decrease in the incidence of Hib seen then was an effect of vaccination. In Australia generally, and the Australian Capital Territory in particular, the notification rate for Hib disease continues to fall as vaccination coverage improves.

In April 1995, the Australian Bureau of Statistics carried out a survey throughout Australia to obtain information on children's immunisation[9]. The Australian Bureau of Statistics survey found that 68.9% of Australian Capital Territory children were fully immunised against Hib at one year old. This compares well with this study's estimate that 68.0% of nine month old children are fully immunised. The Australian Bureau of Statistics survey estimated the proportion of fully immunised children at two years of age to be 55.6%, whereas this study estimates that 34.1% of two year old children are fully immunised.

There may be several reasons to explain this difference. This study uses a conservative estimate for the population, which includes an allowance for migration (thus inflating the denominator) but does not have data relating to vaccines given outside the Australian Capital Territory to migrating children (data missing from the numerator). The Australian Bureau of Statistics survey included such external vaccination data by reference to the parents' memory or vaccination record card. There may be some overestimate of the completeness of vaccination by parents who are relying on memory. When asked what vaccinations the child had completed, a common response was 'all of them' (B. Richings, Australian Bureau of Statistics, personal communication, 1996). Lastly, the Australian Bureau of Statistics used a small sample (approximately 40 children) for the Australian Capital Territory survey which has a relatively large associated standard error.

The method described here to calculate Hib immunisation rates uses data which represent a virtual census of vaccines given in the Australian Capital Territory. The system of providing a reward to general practitioners in exchange for notification is an efficient method of compiling high quality surveillance data. A similar system has now been implemented on an Australia-wide basis as the Australian Childhood Immunisation Register, administered by the Health Insurance Commission.

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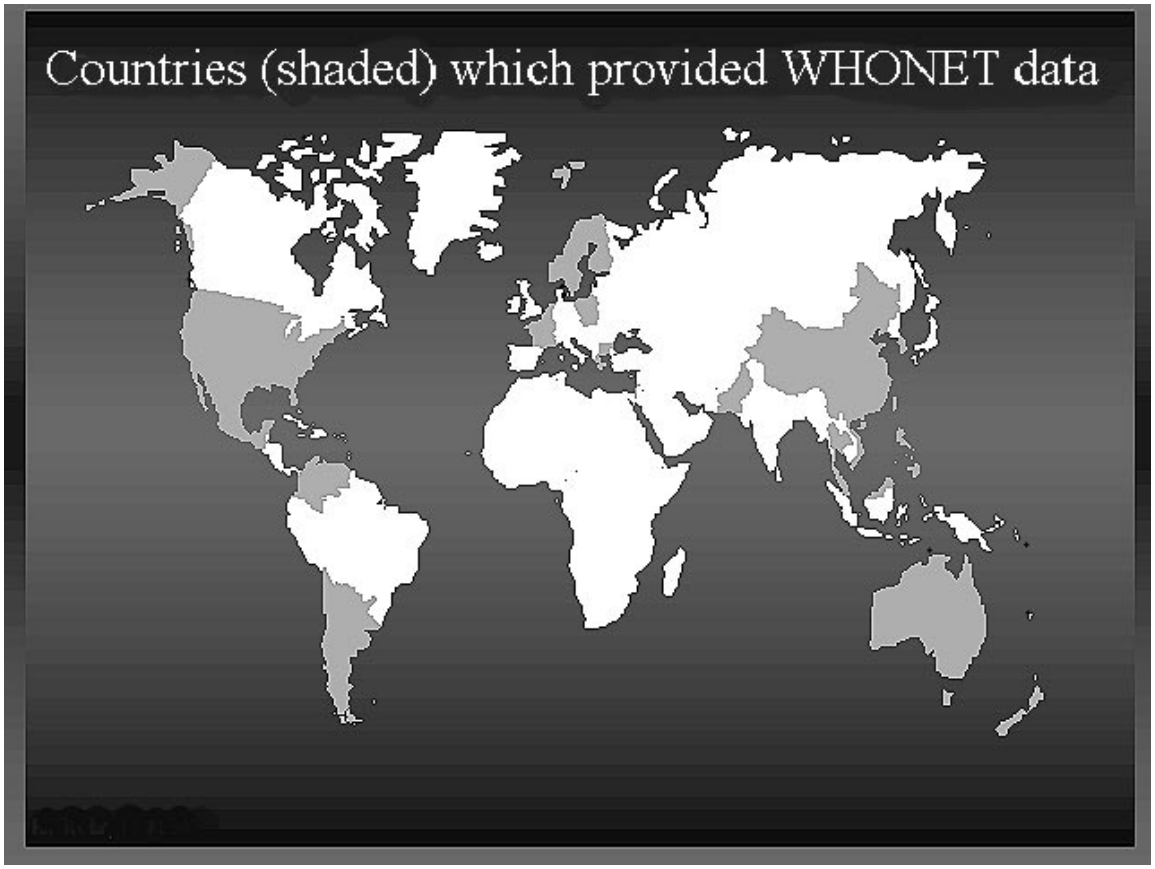
NETWORK ON ANTIMICROBIAL RESISTANCE MONITORING

Adapted from World Health Organization world wide web site (http://www.who.ch/programmes/emc/) Emerging and Other Communicable Diseases Surveillance and Control Programme (EMC).



With the establishment of the Division of Emerging and other Communicable Diseases Surveillance and Control, World Health Organization (WHO) will strengthen national and international capacity in surveillance, prevention and control of communicable diseases, in particular those that represent new, emerging and re-emerging public health problems. In this context, WHO is reinforcing its activities to establish a system for monitoring resistance of selected bacteria to specific antimicrobial agents at local, national and global levels. WHO already coordinates other international efforts for antimicrobial susceptibility surveillance, particularly in the fields of respiratory diseases, malaria and tuberculosis.

Although many countries have individual antimicrobial resistance surveillance systems, the results of epidemiological analysis are often not passed on to local physicians in a way that helps them choose the best antibiotic therapy for their patients. Locally accrued results on antimicrobial resistance testing are seldom fed back to the source laboratory or used to assess national or regional trends.

Better disease surveillance coupled with better communications systems will help physicians to use antibiotics more effectively, which in turn will facilitate detecting local and regional trends in antimicrobial resistance and control the spread of deadly bacterial infections.

In collaboration with the WHO Collaborating Centre for Surveillance of Resistance to Antimicrobial Agents in Boston, and the Nosocomial Pathogens Laboratory Branch of Centres for Disease Control (CDC) in Atlanta, WHO will strengthen the network of laboratories which collect, analyse and distribute data and results on antimicrobial resistance in bacteria of public health importance.

Over 160 laboratories in 32 countries use computer software called WHONET (developed by the WHO Collaborating Centre, Boston) to process and analyse results of antimicrobial resistance testing and provide data to the WHO Network on Antimicrobial Resistance Monitoring.

Local computer analysis of antibiotypes is the foundation for the regional and global monitoring system.

Laboratories can detect local problems in antimicrobial resistance testing, and the examination of their data will delineate the spread of drug-resistant strains. This facilitates infection control. It also explains and helps to correct the occurrence of certain types of drug resistance at selected sites. However, imbalance in the geographical distribution of the participating laboratories, problems in the supply of data, and different standardisation techniques used by the various laboratories, complicate comparison of results and the extrapolation of trends at regional and national levels.

Within the next two years, WHO plans to establish a core of about 30-50 laboratories worldwide to generate internationally verified, standardised results on trends in the susceptibility of important bacteria to specific antimicrobials. It will also encourage the use of WHONET in public health and hospital laboratories to strengthen their ability to screen bacteria for antibiotic resistance with standardised methods.

Laboratories will be assisted in conducting quality assurance and external proficiency testing - a prerequisite for collecting standardised, comparable results to detect trends and the emergence of multi-drug resistant bacteria. Training courses are planned in nine countries in Africa and Asia in 1996 and 1997. Manuals are to be produced to help microbiologists in analysing and reporting their local microbial resistance findings to physicians. Computer programs will be developed that use the antibiotic resistance data collected through WHONET to guide local decisions on the use of antibiotics.

Key regional reference laboratories will receive data from public health and hospital laboratories and develop regional summaries of trends in antibiotic resistance. WHO headquarters, in close collaboration with the regional offices and collaborating centres, will coordinate these activities. A global data bank will be established to help identify antimicrobial resistance problems of local, regional and global priority. Consensus on how to tackle these problems will be sought. These centres will initiate and coordinate appropriate control and containment measures.

The WHO network will be complemented by another WHO effort aimed at coordinating and extending the activities of several key laboratories in different parts of the world which collect, analyse and distribute gonococcal susceptibility data worldwide.

The long-term goals of these activities are to strengthen the capacities of WHO member countries to detect and contain the emergence of major multi-drug resistant bacteria and to improve standardisation of interpretation of antibiotic resistance data throughout the world..

HAEMORRHAGIC FEVERS IN AFRICA

Based on World Health Organization Fact Sheet 111 of March 1996

Infection with the haemorrhagic fever viruses is an important cause of human illness and a public health problem of global dimension. Twelve distinct viruses are associated with haemorrhagic fevers in humans. Most of them are zoonoses with the possible exception of the four dengue viruses, which may continually circulate among humans.

Haemorrhagic fever viruses are found in both temperate and tropical habitats, although the problem is of particular concern on the African continent, as shown by the recent outbreaks of yellow fever and Ebola haemorrhagic fever. They generally infect both sexes and all age groups.

Transmission to humans is frequently by the bite of an infected tick or mosquito or through aerosol transmission from infected rodent hosts. Mammals, especially rodents, appear to be important natural hosts for many haemorrhagic fever viruses. The transmission cycle for each haemorrhagic fever is distinct and is dependent on the characteristics of the primary vector species and the possibility of its contact with humans.

Apart from yellow fever, Ebola haemorrhagic fever, and dengue fever (which touches only limited parts of Africa), the major haemorrhagic fevers in Africa are:

Lassa fever, a disease that first came to light in the late 1960s after an outbreak at a mission hospital in Nigeria, during which several persons died. The natural host of the virus is a rodent that is very common in many parts of the continent, but Lassa fever appears to be restricted to West Africa. Transmission to humans is primarily by aerosol means, from rodents, or by close contact with an infected individual. It is a seasonal disease, with the incidence highest during the dry season. Nosocomial outbreaks have been especially significant in the history of Lassa fever, but recent studies indicate that relatively simple nursing precautions can eliminate most risks to hospital personnel.

Rift Valley fever, found in many areas in sub-Saharan Africa. It is normally associated with excessively heavy rainfall. The mosquito species most frequently associated with Rift Valley fever often breed in water lying in natural depressions on the African savanna and transmit the virus to vertebrates that use these sources of water. Human disease may result from either feeding

by an infected mosquito vector or by aerosol transmission, usually associated with slaughter of sick animals.

Crimean-Congo haemorrhagic fever, a disease caused by a virus which is found in many parts of Africa, the Middle East and parts of the former Soviet Union and China. This virus is transmitted primarily by ticks. Small mammals and birds are hosts of the larval and nymphal ticks, and large mammals are hosts of the adult ticks. Humans may be exposed to the virus through the bite of infected ticks or during the slaughter of infected animals. Human infection appears to be seasonal, with most cases occurring in the spring or autumn. The populations at greatest risk of infection with the virus are ranchers, shepherds, veterinarians and others who may be exposed to sick animals, and medical staff in endemic regions who may encounter acutely ill patients.

Marburg haemorrhagic fever, caused by a virus closely related to the Ebola virus. Marburg virus was first recognised during an outbreak of a severe haemorrhagic disease associated with the importation of African green monkeys from East Africa to Germany. Subsequent, isolated human cases have been reported, primarily from sub-Saharan Africa, but virtually nothing is known of the epidemiology of this disease, apart from the fact that nosocomial transmission may occur, especially after close or intimate contact.

Haemorrhagic fevers in Africa do not usually cause major epidemics. However, localised outbreaks do occur, and may have devastating effects on the local community and cause widespread concern. In addition to having high fatality rates, some also cause permanent disability, such as hearing loss following Lassa fever, or blindness following Rift Valley fever. The Division of Emerging and other Communicable Diseases, Surveillance and Control, newly established at WHO headquarters, along with the WHO Regional Office for Africa and collaborating organisations, have recognized the importance of African haemorrhagic fever viruses. Together these organisations are developing improved methods to recognise outbreaks early and thus prevent widespread infections.

POSSIBLE RESERVOIR HOST OF EQUINE MORBILLIVIRUS IDENTIFIED

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Investigations by a team from the Queensland Department of Primary Industries (DPI) into the reservoir of equine morbillivirus has produced evidence that a related virus (bat paramyxovirus) is present in two of four *Pteropus* species of fructivorous bats with an antibody prevalence of about 20%. Insufficient samples have been examined to date from the other two species to determine if they also have antibody.

Equine morbillivirus has been associated with two separate incidents involving fatal disease in humans and horses[1,2]. The first incident occurred in August 1994 in Mackay, Queensland. Two horses were infected and died after a severe, acute illness. Transmission apparently occurred to one human who developed recurring encephalitis resulting in death about 12 months later.

The second incident occurred in September 1994 in Brisbane, about 1,000 kilometres south of Mackay. In this incident, 21 horses were infected of which 14 died or were euthanased. Transmission occurred to two humans, one of whom died after a short illness. A paramyxovirus was isolated from lungs of two Brisbane horses. An identical virus was also isolated by the Australian Animal Health Laboratory (AAHL) which was subsequently described as equine morbillivirus[3]. In spite of intensive investigations, no connection has been established between the two incidents.

Work at AAHL has shown that the virus obtained from horses in the Brisbane and Mackay incidents are identical, indicating a common source[3,4].

In the DPI's considerations of possible reservoir hosts, the following criteria were applied to prioritise species for investigation:

- the species should be present in both the Brisbane and Mackay areas;
- the species should be capable of migrating between these areas, and
- contact with horses should be possible.

The two groups of animals which readily fitted this description were birds and bats. Because EMV is a mammalian virus and because transmission of paramyxoviruses from birds to mammals is uncommon, bats were given a higher priority than birds.

In addition to focussing on bats, considerable time and effort has been devoted to serological surveys of domestic animals and wildlife. To date, 5,264 sera from 46 species have been tested, including 263 samples from 34 species of wildlife. None of these animals has shown any indication of antibody to the test antigen, indicating that infection is uncommon.

Examination of a relatively small sample of fruit bats has shown a seroprevalence of the bat virus of about 20% (11 positive of 55 tested). Serology has been carried out using an ELISA (enzyme-linked immunosorbent assay) and confirmed by neutralisation tests at the AAHL.

Speculation about how the bat paramyxovirus might be introduced to other species, including horses and humans, assumes that there is a connection between the two viruses. One possibility is that infection of horses in Brisbane and Mackay may have only occurred after a very unusual event, or that a change in the bat virus resulted in a virus which was more virulent for horses, or perhaps both conditions were necessary.

Our next tasks are to isolate virus from as many species and locations as possible and to describe the natural history of infection in bats. When more is known about how the virus behaves in its natural host, it may be possible to devise testable hypotheses about how infection of other species may occur.

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OVERSEAS BRIEFS

In the past fortnight the following information has been provided by the World Health Organization (WHO).

Cholera

Malaysia: On 10 May 1996, ten people were hospitalised in Penang Hospital with diarrhoea. The first case of cholera was confirmed on 11 May. Since then a total of 1,089 cases have been confirmed in the whole country, of which the majority were in Penang. Laboratory tests have confirmed that the patients were infected with *Vibrio cholerae* biotype El Tor, serotype Ogawa.

Epidemiological investigation indicates that all the reported cases in the other states were among people who had visited Penang recently and consumed food there. The Ministry of Health of Malaysia has taken stringent measures to control the oubreak. Visitors to the area should follow normal recommendations regarding food, water and hygiene to avoid any risks of contracting the disease. Penang (Island) State is considered an infected area.

Niger and Senegal have reported cholera cases in the last week.

Suspected Lassa fever

Reports of 14 deaths due to suspected Lassa fever have been received from Kenema, Sierra Leone. On 9 May a team from the Ministry of Health and Sanitation and the World Health Organization was sent to investigate the outbreak. Seventy-six respected cases were identified, with 46 deaths from 1 January to 10 May in the Kenema districts (mainly Tongo, Panguma and Segbwema), Eastern Region. Most cases were in adolescent females. The outbreak occurred in an area where Lassa fever is endemic and coincided with an unprecedented increase in the rat population in the affected towns. A special task force has been established for control activities. As the hospitals in Kenema lack the capacity for safe barrier nursing, an isolation ward of 24 beds has been made available for patient management at the Government Hospital. Blood specimens collected by the investigating team will be shipped to the Centers for Disease Control and Prevention in the United States of America for investigation.

Meningitis

An increased number of cases of meningococcal meningitis have been registered in Mali since the beginning of February 1996. By the end of March, 2,347 cases had been notified, of which 319 died. On 13 March the health authorities declared an epidemic in the district of Bamako. On 15 March a vaccination program was initiated for all age groups between 1 and 25 years. The vaccination campaign has since been extended to other affected regions, in particular Segou, Mopti and Sikasso.

COMMUNICABLE DISEASES SURVEILLANCE

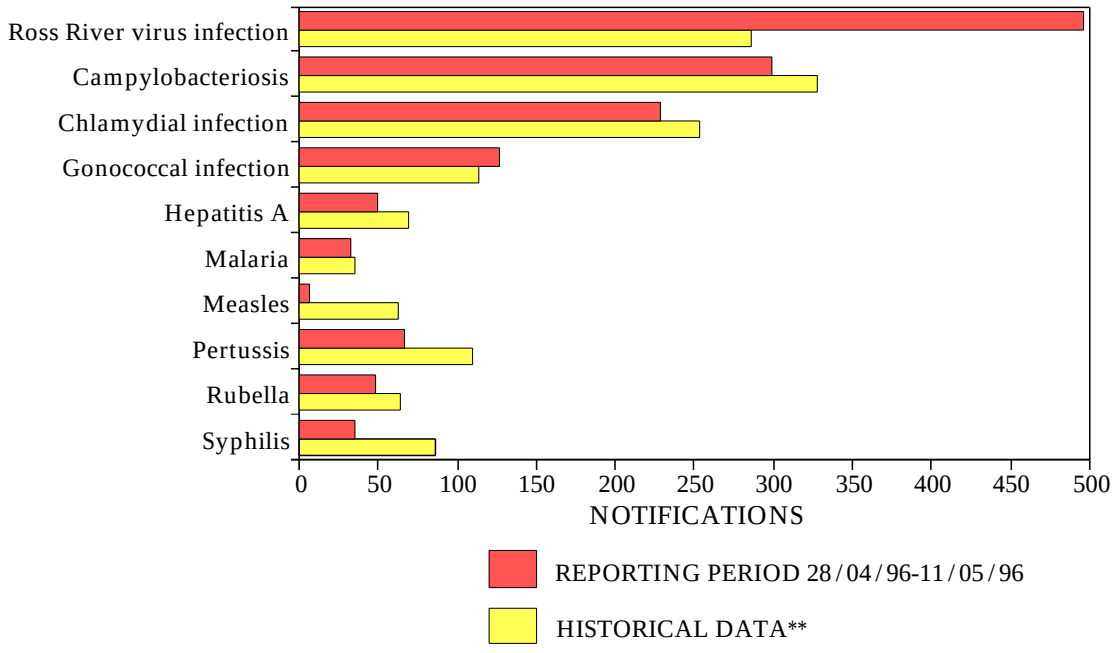
National Notifiable Diseases Surveillance System, 28 April to 11 May 1996

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia-New Zealand. The System coordinates the national surveillance of 41 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 legislation. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination.

There were 2,098 notifications received for this two week period (Tables 1, 2 and 3). The number of reports for selected diseases have been compared with averaged data for previous years (Figure 1). No reports were received from Victoria for the current period. This should be taken into account in interpreting the figure.

Since the approval of the Hib vaccine in 1992 there has been a marked and sustained decline in the numbers of reported cases of ***Haemophilus influenzae* type b infection** in children under five years of age (Figure 2). Of the 114 cases in this age group with reported onset in the last two years, 41 (36%) were less than one year old. The number of case reports in persons five years or older has also declined. There has been a decrease from 77 cases in this age group in 1993 to 27 cases in 1995.

Figure 1. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



1. The historical data are the averages of the number of notifications in 9 previous 2-week reporting periods: the corresponding periods of the last 3 years and the periods immediately preceding and following those.

The number of notifications of **pertussis** has remained stable in recent months (Figure 3). There has been a peak in notifications reported each Spring with the highest number of reports in November 1993. The highest number of cases is in the 5-9 years age group. There were also high numbers of cases in the 35-39 years age group (Figure 4). Of the 5,336 cases reported since the beginning of 1995, 32% have been reported from New South Wales and 30% from Queensland.

Figure 2. *Haemophilus influenzae* type b notifications for 0-4 years age group, 1993 to 1996, by month of onset

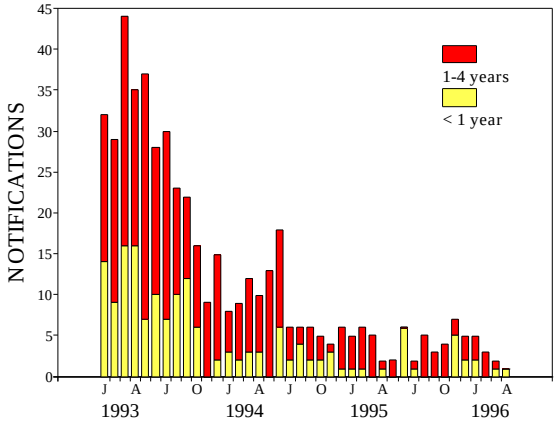


Figure 3. Pertussis, notifications, 1993 to 1996, by month of onset

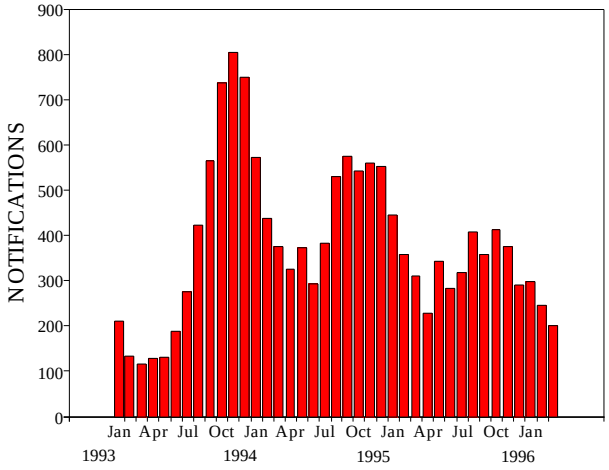


Figure 4. Pertussis notifications, 1995 to 1996, by age group and sex

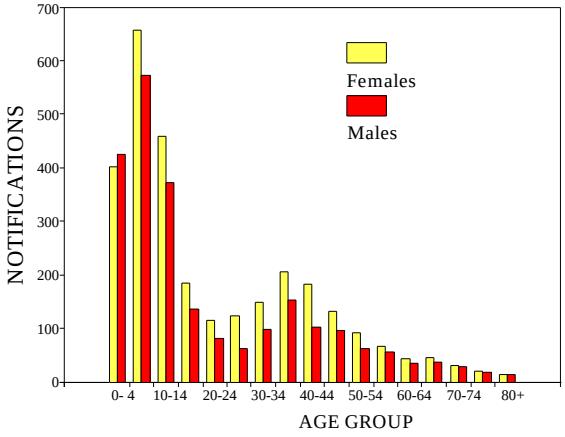


Table 1. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 28 April to 11 May 1996

DISEASE	ACT	NSW	NT	Qld	SA	Tas	WA	TOTALS FOR AUSTRALIA[1]			
								This period 1996	This period 1995	Year to date 1996	Year to date 1995
Diphtheria	0	0	0	0	0	0	0	0	0	0	0
Haemophilus influenzae type b	0	1	0	0	0	0	0	1	1	21	34
Measles	0	3	0	2	0	0	1	6	40	169	703
Mumps	0	0	0	NN	0	0	0	0	7	46	47
Pertussis	0	24	1	25	17	0	0	67	113	1042	1638
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0
Rubella	3	6	0	32	5	1	1	48	64	1101	965
Tetanus	0	0	0	0	0	0	0	0	0	1	2

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.

NN Not Notifiable.

Table 2. Notifications of other diseases[1] received by State and Territory health authorities in the period 28 April to 11 May 1996

DISEASE	ACT	NSW	NT	Qld	SA	Tas	WA	TOTALS FOR AUSTRALIA[2]			
								This period 1996	This period 1995	Year to date 1996	Year to date 1995
Arbovirus Infection (NEC)[3,4]	0	36	1	7	0	0	1	45	44	257	270
Barmah Forest virus	0	0	-	54	0	0	-	54	20	363	173
Ross River virus	0	43	1	416	1	-	36	497	231	6261	1286
Dengue	0	1	0	1	0	-	0	2	1	19	8
Campylobacteriosis[5]	11	-	9	100	105	17	56	298	393	4126	3834
Chlamydial infection (NEC)[6]	0	NN	33	133	0	18	45	229	236	2475	2320
Donovanosis	0	NN	0	0	NN	0	0	0	9	19	37
Gonococcal infection[7]	0	12	25	46	0	0	42	125	154	1269	1135
Hepatitis A	1	23	3	18	1	0	4	50	68	902	657
Hepatitis B incident	0	3	1	3	0	0	0	7	14	88	138
Hepatitis B unspecified	4	0	0	64	0	4	14	86	47	549	639
Hepatitis C incident	0	0	0	0	0	0	0	0	0	6	29
Hepatitis C unspecified	10	0	4	132	0	11	29	186	298	3185	2949
Hepatitis (NEC)	0	0	0	0	0	0	NN	0	1	9	11
Legionellosis	0	1	0	0	1	0	1	3	6	65	83
Leptospirosis	0	1	0	6	0	0	0	7	1	92	44
Listeriosis	0	0	0	0	1	0	0	1	0	20	34
Malaria	1	8	3	18	1	0	2	33	16	301	218
Meningococcal infection	0	4	0	5	0	0	1	10	13	92	111
Ornithosis	0	NN	0	1	0	0	1	2	3	35	60
Q fever	0	11	0	7	0	0	0	18	9	167	155
Salmonellosis (NEC)	0	30	12	142	14	8	20	226	254	2589	3039
Shigellosis[5]	0	-	2	7	2	0	7	18	26	243	335
Syphilis	1	13	8	13	0	1	0	36	96	523	712
Tuberculosis	1	12	2	6	6	0	1	28	51	403	432
Typhoid8	0	0	0	0	0	0	0	0	2	34	31
Yersiniosis (NEC)[5]	0	-	0	6	2	0	0	8	10	102	152

1. For HIV and AIDS, see *CDI* 1996;20:247. For rarely notified diseases, see Table 3 .
2. 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.
3. Tas: includes Ross River virus and dengue.
4. WA, NT and Vic: includes Barmah Forest virus.
5. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
6. WA: genital only.
7. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
8. NSW, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

Table 3. Notifications of rare[1] diseases received by State and Territory health authorities

DISEASES	Total this period	Reporting States or Territories	Year to date 1996
Botulism	0		0
Brucellosis	3	Qld	12
Chancroid	0		1
Cholera	0		2
Hydatid infection	3	ACT 1, NSW2	16
Leprosy	1	NSW	6
Lymphogranuloma venereum	0		0
Plague	0		0
Rabies	0		0
Yellow fever	0		0
Other viral haemorrhagic fevers	0		0

National Influenza Surveillance 1996

Australian Sentinel Practice Research Network; Communicable Diseases Intelligence Virology and Serology Reporting Scheme Contributing Laboratories, New South Wales Department of Health; Victorian Department of Health; World Health Organization Collaborating Centre for Influenza Reference and Research.

National Influenza Surveillance is conducted from May to September each year. Data are combined from a number of sources to provide an indication of influenza activity. Included are sentinel general practitioner surveillance data, absenteeism data from a national employer, and laboratory data from the LabVISE scheme and the World Health Organization Collaborating Centre for Influenza Reference and Research. For further information, see *CDI* 20 1996, pages 9-12.

The consulation rates for influenza-like illness recorded by sentinel general practitioners continues to rise (Figure 5). The absenteeism rate for a national employer remains stable (Figure 6). With respect to laboratory based surveillance there were three reports of influenza A received this fortnight. A total of 40 reports (Figure 7) have been received for the year to date, which is below average for the time of year. A single report of sub-type H_3N_2 and no reports of H_1N_1 have been received so far this year.

Only five reports of influenza type B have been received so far for the year to date (Figure 8).

Figure 5. Sentinel general practitioner influenza reports per 1,000 encounters, 1996, by week

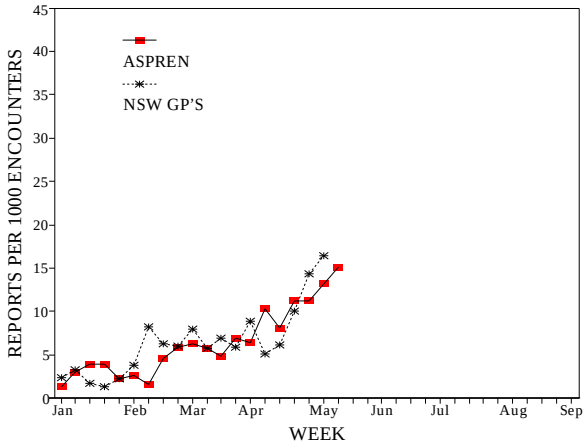


Figure 6. Absenteeism reports, 1996, by week

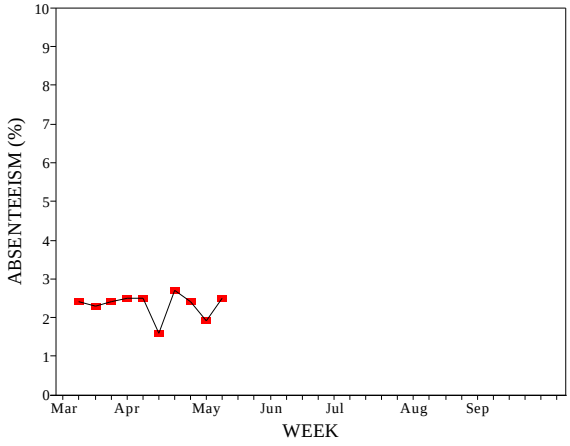


Figure 7. Influenza A laboratory reports, 1996, by method of diagnosis and week of specimen collection

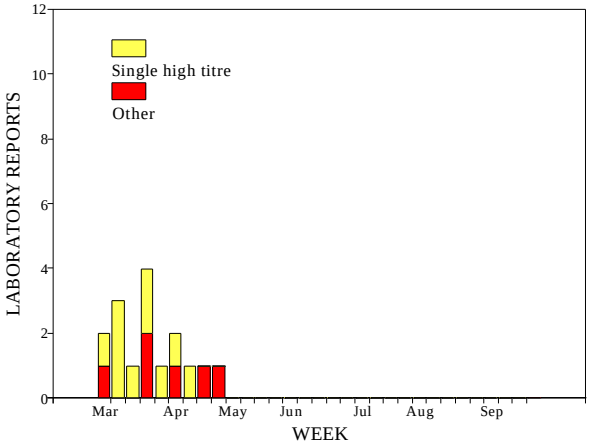


Figure 8. Influenza B laboratory reports, 1996, by method of diagnosis and week of specimen collection

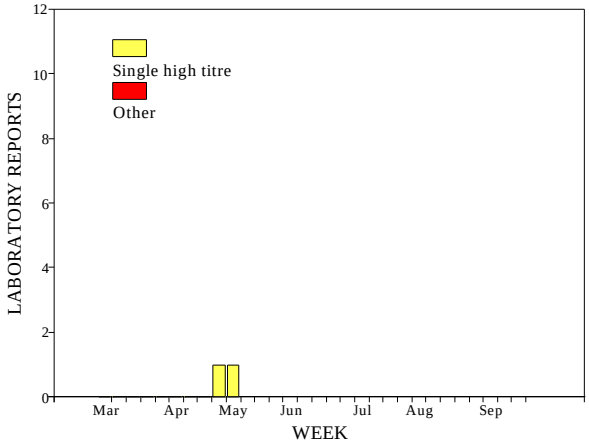


Table 4. Australian Sentinel Practice Research Network, weeks 17, 18 and 19, 1996

Condition	Week 17, to 28 April 1996		Week 18, to 5 May 1996		Week 19, to 12 May 1996	
	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters	Reports	Rate per 1000 encounters
Influenza	87	11.2	145	13.1	156	15.1
Rubella	3	0.4	8	0.7	4	0.4
Measles	2	0.3	0	0	0	0
Chickenpox	18	2.3	23	2.1	25	2.4
Pertussis	0	0	3	0.3	2	0.2
Gastroenteritis	108	13.9	235	21.3	192	18.6

Australian Sentinel Practice Research Network

The data for weeks 17, 18 and 19 ending 28 April, 5 May and 12 May 1996 respectively are included in this issue of *CDI* (Table 4). The rate of reporting of influenza-like illness rose to 15.1 per 1,000 consultations for week 19, the highest rate recorded by the scheme this year.

HIV and AIDS Surveillance

Correction: In *CDI* 1996;20:249 the headings for the HIV / AIDS Tables were transposed. Table 4 was cumulative diagnoses and Table 5 was new diagnoses.

Surveillance of Serious Adverse Events Following Vaccination

The Serious Adverse Events Following Vaccination Surveillance Scheme is a national surveillance scheme which monitors the serious adverse events which occur rarely following vaccination. More details on the Scheme were published in *CDI* 1995:19;273-274.

Acceptance of a report does not imply a causal relationship between administration of the vaccine and the medical outcome, or that the report has been verified as to the accuracy of its contents.

It is estimated that 250,000 doses of vaccines are administered every month to Australian children under the age of six years.

Results for the reporting period 14 April to 11 May 1996

There were three reports of serious adverse events following vaccination for this reporting period. Reports were received from Queensland (one) and the Northern Territory (2).

All three reports were of persistent screaming and were associated with DTP vaccine alone or DTP in combination with OPV and Hib. One report noted that a general practitioner had diagnosed clinical pertussis in a child the day following immunisation. An older sibling had had a similar illness at the time of immunisation, diagnosed as pertussis or pertussis syndrome.

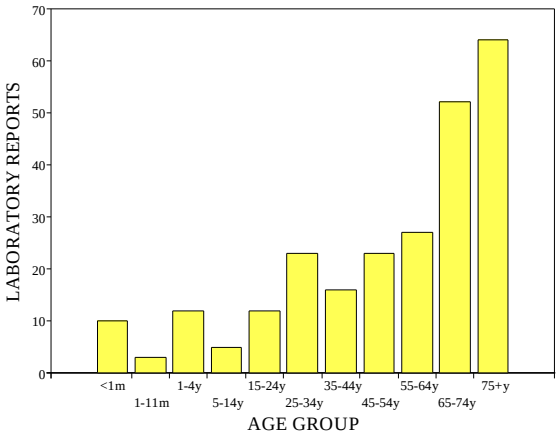
Two events were associated with the first dose of vaccine(s) and one event was associated with the second dose. None of the children were hospitalised and all had recovered at the time the initial report was sent in.

Sterile Sites Surveillance (LabDOSS)

LabDOSS is a passive surveillance scheme that reports on significant bacterial and fungal isolates from normally sterile sites. Twenty laboratories currently forward reports of sterile site isolates to the Department of Health and Family Services. LabDOSS is published in alternate issues of *CDI*. Data from the LabDOSS scheme should be interpreted with caution. There is a potential for geographical, testing and referral pattern biases. In addition, risk factors and clinical information are not consistently provided by laboratories.

Data for this four weekly period have been provided by 8 laboratories. There were 268 reports of significant sepsis:

Figure 9. LabDOSS reports of blood isolates, by age group



New South Wales: Royal North Shore Hospital 40; Prince of Wales Hospital 45.
Tasmania: Royal Hobart Hospital 29; Northern Tasmania Pathology Service 9.
Queensland: Sullivan and Nicholaides Partners 49.
Western Australia: Princess Margaret Hospital for Children 15; Sir Charles Gairdner Hospital 72.
Australian Capital Territory: Woden Valley Hospital 9.

Organisms reported five or more times from blood are detailed in Table 5. Other blood isolates not included in Table 5 were:

Gram-positive: 1 *Bacillus cereus*, 1 *Bacillus* species, 1 *Lactobacillus* species, 1 *Micrococcus* species, 2 *Micrococcus mucilaginosus*, 2 *Streptococcus* Group A, 3 *Streptococcus* Group B, 4 *Streptococcus* Group G, 2 *Streptococcus* 'milleri' and 4 *Streptococcus sanguis.*

Gram-negative: 1 *Citrobacter diversus*, 3 *Citrobacter freundii*, 1 *Enterobacter aerogenes*, 1 *Enterobacter* species, 1 *Haemophilus influenzae*, 4 *Klebsiella oxytoca, 1 Pasteurella* species, 1 *Pseudomonas testosteroni*, 1 *Salmonella* species, 1 *Salmonella typhi*, 2 *Serratia marcescens* and 1 *Xanthomonas maltophilia.*

Anaerobes: 3 *Bacteroides fragilis*, 1 *Propionibacterium acnes* and 2 *Propionibacterium* species.

Fungi: 3 *Candida species*, 2 *Candida albicans* and 1 *Rhodotorula glutinis.*

There were 116 (43% of total) blood isolates reported for patients over the age of 65 years (Figure 9).

Meningitis and/or CSF isolate reports

There were 12 reports of meningitis and/or CSF isolates (Table 6). Included were 5 *Streptococcus pneumoniae* (including 3 patients aged less than 12 months) and two *Staphylococcus* coagulase negative.

Table 5. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical information						Risk factors					Total[1]
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal	
Acinetobacter species						1	1	1		1		5
Enterobacter cloacae				1				1	1	1		5
Enterococcus faecalis			1	2		2	1			1		6
Escherichia coli		2		1	13	1	2	6	1	5	1	45
Klebsiella pneumoniae		2			1	1		4	1	1		10
Proteus mirabilis						4		4		2		7
Pseudomonas aeruginosa		1			1	2	1	5		1		12
Staphylococcus aureus	2	1			1	12	4	7	5	14		48[2]
Staphylococcus coagulase negative							1	1			1	20
Staphylococcus epidermidis						4	3	3	1	4		20
Streptococcus pneumoniae		6										9
Streptococcus species		1	2					2				7

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 4.

Table 6. LabDOSS reports of meningitis and/or CSF isolates, by organism and age group

	< 1 month	1-11 months	1-4 years	5-14 years	15-24 years	25-34 years	55-64 years	65-74 years	Total
Cryptococcus neoformans						1			1
Cryptococcus neoformans var. *gattii*								1	1
Cryptococcus neoformans var. *neoforms*						1			1
Neisseria meningitidis				1					1
Staphylococcus aureus			1						1
Staphylococcus coagulase negative					1		1		2
Streptococcus pneumoniae	1	2	1				1		5

Isolates from sites other than blood or CSF

Joint fluid: Two reports were received this period involving *Staphylococcus aureus.*

Peritoneal dialysate: Five reports were received this period. Included was 1 *Staphylococcus aureus,* 1 *Enterococcus faecalis,* 2 *Escherichia coli,* and 1 *Pseudomonas aeruginosa.*

Other: A total of two reports were received. Included was 1 *Candida* species and 1 *Klebsiella* species.

Virology and Serology Reporting Scheme

The Virology and Serology Reporting Scheme, LabVISE, is a sentinel reporting scheme. Twenty-one laboratories contribute data on the laboratory identification of viruses and other organisms. Data are collated and published in *Communicable Diseases Intelligence* each fortnight. 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* 20 1996, pages 9-12.

There were 2,421 reports received in the *CDI* Virology and Serology Reporting Scheme this period (Tables 7, 8 and 9).

Ross River virus was reported for 540 patients this fortnight. Diagnosis was by IgM detection (481), single high titre (41) and fourfold change in titre (18). Four hundred and fifty-three of the patients (84%) were aged between 25 and 64 years. Reports have continued to decline since the peak in February. The number of reports received so far for 1996 is the highest recorded for any year of the scheme (Figure 10).

Thirty-one reports of **Barmah Forest virus** were reported this period. Diagnosis was by IgM detection (30) and fourfold change in titre (one). Included were 19 males and 12 females. Twenty-five reports (81%) were from Queensland, 4 from Western Australia, one from New South Wales and one from the Northern Territory. The number of reports is average for the time of year.

Parainfluenza virus type 1 was reported for nine patients this period. Diagnosis was by antigen detection (6) and virus isolation (3). All patients were below the age of four years. Reports have continued to increase in recent months (Figure 11).

Repiratory syncytial virus was reported for 41 patients this period. Diagnosis was by antigen detection (27), virus isolation (11), single high titre (2) and fourfold change in titre (one). Thirty-nine patients were below the age of four years. Reports for 1996 are above average for the time of year (Figure 12).

Seven reports of **Norwalk agent** were received this fortnight, all were diagnosed by antigen detection. Included were six females and one male. All the reports came from Victoria.

Figure 10. Ross River virus laboratory reports, 1982 to 1996, by year of specimen collection

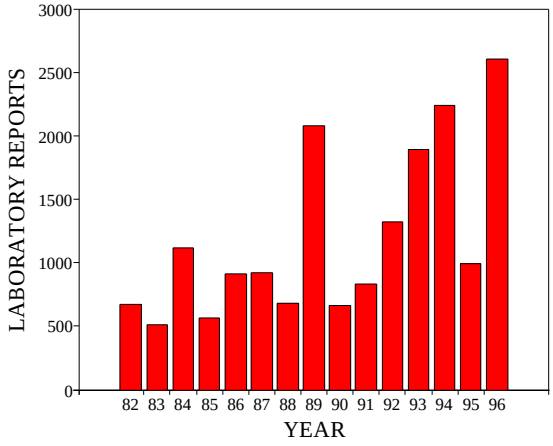


Figure 11. Parainfluenza virus types 1, 2 and 3 laboratory reports, 1996, by month of specimen collection

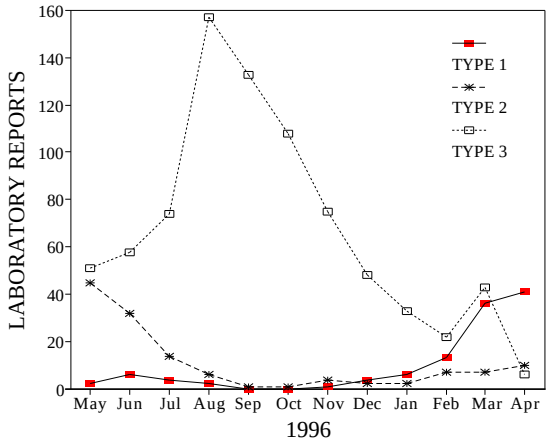


Figure 12. Respiratory syncytial virus laboratory reports, 1991 to 1995 average and 1996, by month of specimen collection

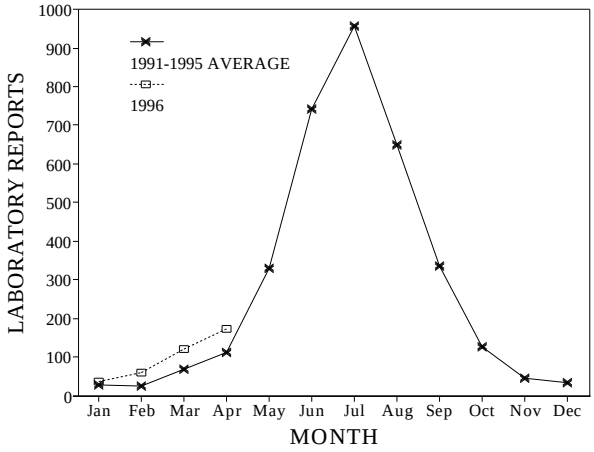


Table 7. Virology and serology laboratory reports by State or Territory[1] for the reporting period 2 May to 15 May 1996, historical data[2], and total reports for the year

	State or Territory [1]							Total this fortnight	Historical data 2	Total reported this year
	NSW	NT	Qld	SA	Tas	Vic	WA			
MEASLES, MUMPS, RUBELLA										
Measles virus							1	1	46.5	27
Mumps virus			1					1	5.3	19
Rubella virus			33				1	34	19.0	256
HEPATITIS VIRUSES										
Hepatitis A virus	3	6	12			1	5	27	18.2	223
Hepatitis B virus	2	5	75			13	14	109	118.2	562
Hepatitis C virus	14	19	109		12	24	118	296	254.2	1,316
ARBOVIRUSES										
Ross River virus	23	3	459		1	3	51	540	131.8	2,633
Barmah Forest virus	1	1	25				4	31	20.5	125
Kunjin virus							1	1	.0	4
Flavivirus (unspecified)			1					1	2.0	20
ADENOVIRUSES										
Adenovirus type 3						2		2	2.5	55
Adenovirus type 5							1	1	.3	2
Adenovirus type 7						2		2	.3	17
Adenovirus type 40							6	6	.0	11
Adenovirus not typed / pending	2		3			4	4	13	55.0	612
HERPES VIRUSES										
Herpes simplex virus type 1	5	2	128	1	3	54	50	243	185.7	2,652
Herpes simplex virus type 2	5	11	145		2	45	79	287	220.5	2,633
Herpes simplex not typed / pending	3		4			3	1	11	61.5	275
Cytomegalovirus	3	2	21		2	16	7	51	79.0	692
Varicella-zoster virus	4	1	28		2	19	9	63	50.5	563
Epstein-Barr virus	12	3	89	1		10	19	134	71.2	871
OTHER DNA VIRUSES										
Parvovirus	1		2			5	2	10	1.5	54
PICORNA VIRUS FAMILY										
Coxsackievirus A16						1		1	1.5	1
Rhinovirus (all types)			2			9	2	13	31.7	269
Enterovirus not typed / pending	1	1	9			3	11	25	39.5	390
ORTHO / PARAMYXOVIRUSES										
Influenza A virus		1	1			1		3	42.3	78
Influenza B virus						2		2	6.8	25
Parainfluenza virus type 1	1		3			5		9	30.7	106
Parainfluenza virus type 3			1			2		3	22.5	276
Respiratory syncytial virus	4		5		1	22	9	41	119.2	586
Paramyxovirus (unspecified)						2		2	.0	3
OTHER RNA VIRUSES										
HIV-1	1	1	11			1		14	5.5	65
Rotavirus	3				2	1	2	8	38.5	331
Calici virus						1		1	.0	5
Norwalk agent						7		7	.3	28
OTHER										
Chlamydia trachomatis not typed	8	111	97		2	10	47	275	98.5	1,512
Chlamydia psittaci						6		6	6.0	58
Mycoplasma pneumoniae			14			10	5	29	26.2	233
Coxiella burnetii (Q fever)	3		1					4	20.2	59
Streptococcus group A	2	12	37					51	15.8	202
Bordetella pertussis						16	4	20	11.2	215

Table 7. Virology and serology laboratory reports by State or Territory[1] for the reporting period 2 May to 15 May 1996, historical data[2], and total reports for the year, continued

	State or Territory [1]							Total this fortnight	Historical data 2	Total reported this year
	NSW	NT	Qld	SA	Tas	Vic	WA			
Bordetella species			8					8	3.0	137
Legionella pneumophila						1		1	.0	4
Cryptococcus species			1					1	1.7	4
Leptospira interrogans			2					2	.0	2
Leptospira species	1		3					4	3.2	21
Treponema pallidum	1	2	3			2		8	16.5	134
Entamoeba histolytica						1		1	1.0	12
Toxoplasma gondii						1		1	9.0	11
Schistosoma species						6	10	16	1.5	151
Echinococcus granulosus							1	1	2.7	2
TOTAL	103	181	1333	2	27	311	464	2,421	1,898.5	18,542

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.
2. The historical data are the averages of the numbers of reports in 6 previous 2 week reporting periods: the corresponding periods of the last

Table 8. Virology and serology laboratory reports by contributing laboratories for the reporting period 2 May to 15 May 1996

	Encephalitis	Other CNS	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	TOTAL
MEASLES, MUMPS, RUBELLA											
Measles virus						1					1
Mumps virus										1	1
Rubella virus						4				30	34
HEPATITIS VIRUSES											
Hepatitis A virus					8					19	27
Hepatitis B virus					19					90	109
Hepatitis C virus					50					246	296
ARBOVIRUSES											
Ross River virus						38		179		323	540
Barmah Forest virus			1			1		4		25	31
Kunjin virus										1	1
Flavivirus (unspecified)										1	1
ADENOVIRUSES											
Adenovirus type 3							2				2
Adenovirus type 5										1	1
Adenovirus type 7									1	1	2
Adenovirus type 40				4						2	6
Adenovirus not typed/pending			2	4			2			5	13
HERPES VIRUSES											
Herpes simplex virus type 1		1	6			122	12		64	38	243
Herpes simplex virus type 2						85			164	38	287
Herpes simplex not typed/pending				1		2			2	6	11
Cytomegalovirus			6	2	2			2		39	51
Varicella-zoster virus	1					34				28	63

Table 8. Virology and serology laboratory reports by contributing laboratories for the reporting period 2 May to 15 May 1996, continued

	Encephalitis	Other CNS	Respiratory	Gastrointestinal	Hepatic	Skin	Eye	Muscle/joint	Genital	Other/unknown	TOTAL
Epstein-Barr virus			22		4	2				106	134
OTHER DNA VIRUSES											
Parvovirus						2		2		6	10
PICORNA VIRUS FAMILY											
Coxsackievirus A16						1					1
Rhinovirus (all types)			6							7	13
Enterovirus not typed / pending			5	8		2				10	25
ORTHO / PARAMYXOVIRUSES											
Influenza A virus										3	3
Influenza B virus			2								2
Parainfluenza virus type 1			8							1	9
Parainfluenza virus type 3			2							1	3
Respiratory syncytial virus			35							6	41
Paramyxovirus (unspecified)			2								2
OTHER RNA VIRUSES											
HIV-1										14	14
Rotavirus				8							8
Calici virus				1							1
Norwalk agent				7							7
OTHER											
Chlamydia trachomatis not typed							2		199	74	275
Chlamydia psittaci			3							3	6
Mycoplasma pneumoniae	1		15							13	29
Coxiella burnetii (Q fever)										4	4
Streptococcus group A								1		50	51
Bordetella pertussis			18							2	20
Bordetella species			7							1	8
Legionella pneumophila			1								1
Cryptococcus species										1	1
Leptospira interrogans										2	2
Leptospira species										4	4
Treponema pallidum						1				7	8
Entamoeba histolytica										1	1
Toxoplasma gondii										1	1
Schistosoma species										16	16
Echinococcus granulosus										1	
TOTAL	2	1	141	35	83	295	18	188	430	1228	2421

Table 9. Laboratory reports by contributing laboratory for the reporting period 2 May to 15 May 1996

STATE OR TERRITORY	LABORATORY	REPORTS
New South Wales	Royal Prince Alfred Hospital, Camperdown	21
Queensland	Queensland Medical Laboratory, West End	1471
Tasmania	Northern Tasmanian Pathology Service, Launceston	1
	Royal Hobart Hospital, Hobart	23
Victoria	Microbiological Diagnostic Unit, University of Melbourne	4
	Monash Medical Centre, Melbourne	51
	Royal Children's Hospital, Melbourne	78
	Unipath Laboratories	24
	Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital	153
Western Australia	PathCentre Virology, Perth	300
	Western Diagnostic Pathology	295
TOTAL		2421

Contributions covering any aspects of communicable disease are invited. Instructions to authors can be found in *CDI* 1995;20:13.

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