Australia's notifiable diseases status, 1997

Annual report of the National Notifiable Diseases Surveillance System

Eddie O'Brien,[1] *Rennie D'Souza,*[1,2] *Nicole Gilroy,*[1,2] *Margaret Burgess,*[3] *Susan Lister,*[3] *Peter McIntyre,*[3] *Siranda Torvaldsen,*[3] *Kim Moser,*[1] *Alison Milton*[1]

Abstract

In 1997 there were 89,579 notifications to the National Notifiable Diseases Surveillance System. A notable feature of 1997 was the pertussis outbreak which peaked towards the end of the year and resulted in 10,668 cases being notified. The highest number of notifications received was for hepatitis C (unspecified) with 19,692 notifications; this is the first year for which data have been reported for New South Wales and South Australia for this disease category. The number of measles cases rose after the low number reported in 1996 but is still well below the number reported in the outbreak years of 1993 and 1994. Rubella notifications continued to decline in 1997. Notifications of *Haemophilus influenzae* type b appeared to have stabilised at a low rate, having declined markedly after introduction of the conjugated vaccine in 1992. The number of cases of campylobacteriosis remained steady after having risen for several years. Notifications of hepatitis A cases rose considerably, much of this being due to one outbreak in New South Wales. The number of cases of salmonellosis rose while shigellosis numbers dropped slightly. Notifications for chlamydial infection and gonococcal infection continued to rise, whilst those for syphilis continued to fall. *Commun Dis Intell* 1999;23:1-27

1. National Centre for Disease Control, Department of Health and Aged Care, for the Communicable Diseases Network Australia New Zealand
2. National Centre for Epidemiology and Population Health
3. National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases

ISSN 0725-3141
Volume 23
Number 1
21 January 1999

Contents

Australia's notifiable diseases status, 1997 - contents

Introduction

Notification of communicable diseases is an important public health activity. It prompts investigation and the use of interventions to control the spread of diseases. Notification also enables the monitoring of the effectiveness of existing control activities. Many communicable disease control activities are conducted at local government or State level. This requires local and State-based surveillance. National surveillance combines data from the State and Territory-based systems. National surveillance is necessary for control activities in outbreaks which affect more than one jurisdiction, to monitor the need for, and impact of, national control programs and to guide national policy development. National surveillance also describes the epidemiology of rare diseases for which there are only a few notifications in each State. It also assists in quarantine activities and facilitates agreed international collaborations such as reporting to the World Health Organization.

The National Notifiable Diseases Surveillance System (NNDSS) was established in its current form in 1991, under the auspices of the Communicable Diseases Network Australia New Zealand (CDNANZ). The CDNANZ monitors the incidence of an agreed list of communicable diseases in Australia and New Zealand; only Australian data are regularly published in *Communicable Diseases Intelligence (CDI)* at this time. This is achieved through the national collation of notifications of these diseases received by health authorities of the States and Territories. More than forty diseases or disease categories are included, largely as recommended by the NHMRC.[1] Annual reports of the NNDSS have been published since 1991.[2,3,4,5,6,7]

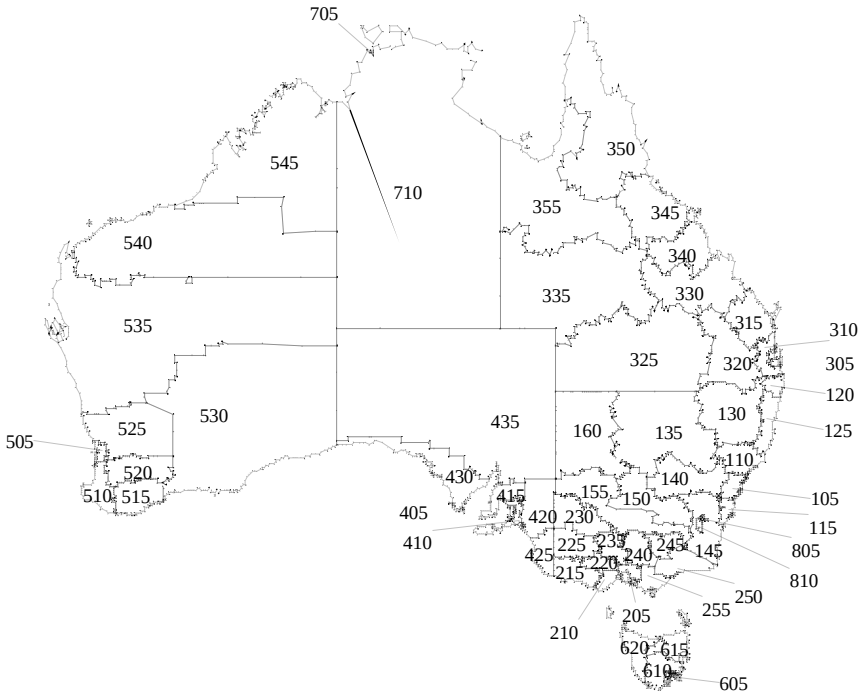
Methods

Notifications of communicable diseases were collected during 1997 by the States and Territories under their public health legislations. These were collated and analysed fortnightly by the Department of Health and Aged Care and published to the Web fortnightly and in *CDI* every four weeks. Final data sets for cases reported in 1997 were provided by the States and Territories between June and November 1998. Missing data and apparent errors were corrected where possible, and duplicate records deleted, in consultation with the States and Territories. For the purposes of the NNDSS, where a patient being treated in one jurisdiction was diagnosed in another, notifications were made according to the State or Territory of the diagnosing medical practitioner.

The national data set included fields for: a unique record reference number; the disease; age, sex, Aboriginality; postcode of residence of the case; the date of onset of the disease and date of report to the State or Territory health authority; and the confirmation status of the report. Aboriginality was not included in the analyses due to incomplete reporting of this information.

Population notification rates were calculated using 1997 mid-year estimates of the resident population supplied by

Map 1. Australian Bureau of Statistics Statistical Divisions



Statistical Division		Population
Australian Capital Territory		
805	Canberra	309,462
810	ACT - balance	332
New South Wales		
105	Sydney	3,934,717
110	Hunter	561,829
115	Illawarra	377,117
120	Richmond-Tweed	203,711
125	Mid-North Coast	265,212
130	Northern	177,196
135	North Western	117,407
140	Central West	172,541
145	South Eastern	179,848
150	Murrumbidgee	149,085
155	Murray	110,813
160	Far West	24,894
Northern Territory		
705	Darwin	84,264
710	NT - balance	102,868
Queensland		
305	Brisbane	1,548,346
310	Moreton	639,024
315	Wide Bay-Burnett	227,822

Statistical Division		Population
Queensland continued		
320	Darling Downs	200,287
325	South West	26,202
330	Fitzroy	179,567
335	Central West	12,387
340	Mackay	122,636
345	Northern	193,509
350	Far North	215,518
355	North West	35,934
South Australia		
405	Adelaide	1,083,074
410	Outer Adelaide	106,021
415	Yorke & Lower North	44,201
420	Murray Lands	67,520
425	South East	62,839
430	Eyre	33,100
435	Northern	83,051
Tasmania		
605	Greater Hobart	195,468
610	Southern	34,645
615	Northern	133,710
620	Mersey-Lyell	109,678

Statistical Division		Population
Victoria		
205	Melbourne	3,321,666
210	Barwon	240,906
215	Western District	100,125
220	Central Highlands	135,443
225	Wimmera	52,027
230	Mallee	87,590
235	Loddon-Campaspe	158,656
240	Goulburn	184,141
245	Ovens-Murray	89,698
250	East Gippsland	81,002
255	Gippsland	153,894
Western Australia		
505	Perth	1,318,974
510	South West	172,121
515	Lower Great Southern	50,697
520	Upper Great Southern	19,729
525	Midlands	51,706
530	South Eastern	57565
535	Central	59,602
540	Pilbara	41,225
545	Kimberley	26,510
TOTAL AUSTRALIA		18,529,112

Table 1. National Notifiable Diseases Surveillance System notifications, 1997, by State or Territory and disease

Disease[1]	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Arbovirus infection (NEC)	0	0	2	4	0	0	8	4	18
Barmah Forest virus infection	1	190	42	359	4	0	38	70	704
Brucellosis	0	4	0	34	0	0	3	0	41
Campylobacterosis[2]	261	-	206	4,057	1,939	361	3,612	1,412	11,848
Chancroid	0	0	0	0	0	0	0	1	1
Chlamydial infection (NEC)	142	NN	655	3,447	1,006	263	2,029	1,584	9,126
Cholera	0	2	0	0	0	0	1	0	3
Dengue	1	15	7	168	1	1	3	14	210
Diptheria	0	0	0	0	0	0	0	0	0
Donovanosis	0	NN	31	2	NN	0	0	12	45
Gonococcal infection[3]	21	633	1,143	906	299	8	386	1,293	4,689
H*aemophilus influenzae* type b	0	18	4	15	2	2	6	6	53
Hepatitis A	53	1,455	92	894	94	3	363	122	3,076
Hepatitis B - incident	2	50	19	40	16	1	119	0	247
Hepatitis B - unspecified[4]	113	4,015	1	858	0	31	1,793	303	7,114
Hepatitis C - incident	2	19	1	-	48	2	9	0	81
Hepatitis C - unspecified[4]	318	8,924	341	2,953	838	236	4,940	1,139	19,689
Hepatitis (NEC)[5]	0	20	0	3	0	1	5	NN	29
Hydatid infection	0	6	0	12	1	2	31	9	61
Legionellosis	2	38	2	11	39	2	29	38	161
Leprosy	0	1	2	5	1	0	2	3	14
Leptospirosis	0	33	1	56	2	2	27	5	126
Listerosis	0	21	0	9	6	1	15	19	71
Lymphogranuloma venereum	0	0	0	0	0	0	0	0	0
Malaria	17	168	38	374	22	5	90	32	746
Measles	79	260	11	261	29	38	91	83	852
Meningococcal infection	9	221	15	73	22	8	99	52	499
Mumps	7	29	10	14	26	3	66	36	191
Ornithosis	0	NN	0	0	4	0	39	3	46
Pertussis	115	4,094	24	1,785	1,689	119	1,679	1,163	10,668
Q fever	0	275	0	275	8	0	24	11	593
Ross River virus infection	9	1,642	223	2,382	660	14	1,057	696	6,683
Rubella	32	161	7	576	199	17	371	83	1,446
Salmonellosis (NEC)	72	1,706	347	1,835	570	116	1,785	573	7,004
Shigellosis[2]	5	-	169	207	107	4	79	228	799
Syphilis	8	563	273	309	23	7	20	101	1,304
Tetanus	0	4	0	2	0	1	1	0	8
Tuberculosis	10	446	34	115	54	15	270	64	1,008
Typhoid[6]	1	28	2	9	3	0	22	12	77
Yersiniosis (NEC)[2]	2	-	3	181	43	1	15	0	245
TOTAL	1,282	25,044	3,705	22,231	7,755	1,264	19,127	9,171	89,576

NN Not notifiable

NEC Not elsewhere classified.

- Elsewhere classified.

1. No notifications have been received during 1997 for the following rare diseases: botulism (foodborne), plague, rabies, yellow fever, or other viral haemorrhagic fevers.
2. New South Wales: only as 'foodborne disease' or 'gastroenteritis in an institution'.
3. Northern Territory, Queensland, South Australia and Victoria includes gonococcal neonatal ophthalmia.
4. Unspecified numbers should be interpreted with some caution as the magnitude may be the reflection of the numbers of testing being carried out.
5. Includes Hepatitis D and E.
6. Includes paratyphoid in New South Wales and Victoria, and Queensland.

Table 2. National Notifiable Diseases Surveillance System notification rates per 100,000 population, 1997, by State or Territory and disease

Disease[1]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total
Arbovirus infection (NEC)	0.0	0.0	1.1	0.1	0.0	0.0	0.2	0.2	0.1
Barmah Forest virus infection	0.3	3.0	22.4	10.6	0.3	0.0	0.8	3.9	3.8
Brucellosis	0.0	0.1	0.0	1.0	0.0	0.0	0.1	0.0	0.2
Campylobacterosis[2]	84.2	-	110.1	119.3	131.0	76.2	78.4	78.5	96.7
Chancroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Chlamydial infection (NEC)	45.8	NN	350.0	101.3	68.0	55.5	44.1	88.1	74.5
Cholera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dengue	0.3	0.2	3.7	4.9	0.1	0.2	0.1	0.8	1.1
Diptheria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Donovanosis	0.0	NN	16.6	0.1	NN	0.0	0.0	0.7	0.4
Gonococcal infection[3]	6.8	10.1	610.8	26.6	20.2	1.7	8.4	71.9	25.3
Haemophilus influenzae type b	0.0	0.3	2.1	0.4	0.1	0.4	0.1	0.3	0.3
Hepatitis A	17.1	23.2	49.2	26.3	6.4	0.6	7.9	6.8	16.6
Hepatitis B - incident	0.6	0.8	10.2	1.2	1.1	0.2	2.6	0	1.3
Hepatitis B - unspecified[4]	36.5	64	0.5	25.2	0	6.5	38.9	16.9	38.4
Hepatitis C - incident	0.6	0.3	0.5	-	3.2	0.4	0.2	0.0	0.5
Hepatitis C - unspecified[4]	102.6	142.2	182.2	86.8	56.6	49.8	107.3	63.3	106.3
Hepatitis (NEC)[5]	0.0	0.3	0.0	0.1	0.0	0.2	0.1	NN	0.2
Hydatid infection	0.0	0.1	0.0	0.4	0.1	0.4	0.7	0.5	0.3
Legionellosis	0.6	0.6	1.1	0.3	2.6	0.4	0.6	2.1	0.9
Leprosy	0.0	0.0	1.1	0.1	0.1	0.0	0.0	0.2	0.1
Leptospirosis	0.0	0.5	0.5	1.6	0.1	0.4	0.6	0.3	0.7
Listerosis	0.0	0.3	0.0	0.3	0.4	0.2	0.3	1.1	0.4
Lymphogranuloma venereum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaria	5.5	2.7	20.3	11.0	1.5	1.1	2.0	1.8	4.0
Measles	25.5	4.1	5.9	7.7	2.0	8.0	2.0	4.6	4.6
Meningococcal infection	2.9	3.5	8.0	2.1	1.5	1.7	2.1	2.9	2.7
Mumps	2.3	0.5	5.3	0.4	1.8	0.6	1.4	2.0	1.0
Ornithosis	0.0	NN	0.0	NN	0.3	0.0	0.8	0.2	0.4
Pertussis	37.1	65.2	12.8	52.5	114.1	25.1	36.5	64.7	57.6
Q fever	0.0	4.4	0.0	8.1	0.5	0.0	0.5	0.6	3.2
Ross River virus infection	2.9	26.2	119.2	70.0	44.6	3.0	23.0	38.7	36.1
Rubella	10.3	2.6	3.7	16.9	13.4	3.6	8.1	4.6	7.8
Salmonellosis (NEC)	23.2	27.2	185.4	54.0	38.5	24.5	38.8	31.9	37.8
Shigellosis[2]	1.6	-	90.3	6.1	7.2	0.8	1.7	12.7	6.5
Syphilis	2.6	9.0	145.9	9.1	1.6	1.5	0.4	5.6	7.0
Tetanus	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Tuberculosis	3.2	7.1	18.2	3.4	3.6	3.2	5.9	3.6	5.4
Typhoid[4]	0.3	0.4	1.1	0.3	0.2	0.0	0.5	0.7	0.4
Viral haemorrhagic fever (NEC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yersiniosis (NEC)[2]	0.6	-	1.6	5.3	2.9	0.2	0.3	0.0	2.0

NN Not notifiable

NEC Not elsewhere classified

- Elsewhere classified

1. No notifications have been received during 1997 for the following rare diseases: botulism (foodborne), plague, rabies, yellow fever, or other viral haemorrhagic fevers.
2. New South Wales: only as 'foodborne disease' or 'gastroenteritis in an institution'.
3. Northern Territory, Queensland, South Australia and Victoria includes gonococcal neonatal ophthalmia.
4. Unspecified numbers should be interpreted with some caution as the magnitude may be the reflection of the numbers of testing being carried out.
5. Includes Hepatitis D and E
6. Includes paratyphoid in New South Wales and Victoria, and Queensland.

Table 3. National Notifiable Diseases Surveillance System notifications and rates, 1993 to 1997, by year[1] and disease

Disease[1,2]	Notifications					Rate per 100,000 population				
	1993	1994	1995	1996	1997	1993	1994	1995	1996	1997
Arbovirus infection (NEC)	578	587	67	52	18	3.3	3.3	0.4	0.3	0.1
Barmah Forest virus infection	-	-	756	837	704	-	-	4.7	4.6	3.8
Brucellosis	20	34	29	38	41	0.1	0.2	0.2	0.2	0.2
Campylobacteriosis	8,111	10,117	10,933	12,158	11,848	69.6	85.8	91.6	100.4	96.7
Chancroid	1	0	2	3	1	0.0	0.0	0.0	0.0	0.0
Chlamydial infection (NEC)	6,500	6,159	6,411	8,420	9,126	55.8	55.3	53.7	69.6	74.5
Cholera	6	3	5	4	3	0.0	0.0	0.0	0.0	0.0
Dengue	690	17	34	43	210	4.5	0.1	0.2	0.2	1.1
Diphtheria	1	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Donovanosis	67	117	85	50	45	0.7	1.1	0.8	0.5	0.4
Gonococcal infection	2,811	2,971	3,259	4,173	4,689	15.9	16.7	18.1	22.8	25.3
Haemophilus influenzae type b	396	169	74	51	53	2.2	1.0	0.4	0.3	0.3
Hepatitis A	2,006	1,894	1,601	2,150	3,076	11.4	10.6	8.9	11.7	16.6
Hepatitis B - incident	278	327	321	225	247	2.2	1.9	1.8	1.2	1.3
Hepatitis B - unspecified	NPR	NPR	NPR	NPR	7,114	NPR	NPR	NPR	NPR	38.4
Hepatitis C - incident	30	43	69	72	81	0.4	0.6	0.8	0.8	0.5
Hepatitis C - unspecified[3]	7,542	8,898	9,601	9,489	19,689	73.9	86.2	91.8	89.3	106.3
Hepatitis (NEC)	72	42	55	36	29	0.5	0.3	0.3	0.2	0.2
Hydatid infection	32	56	46	45	61	0.2	0.3	0.3	0.2	0.3
Legionellosis	178	179	160	192	161	1.0	1.0	0.9	1.0	0.9
Leprosy	15	11	7	10	14	0.1	0.1	0.0	0.1	0.1
Leptospirosis	178	123	148	227	126	1.0	0.7	0.8	1.2	0.7
Listeriosis	53	34	58	70	71	0.3	0.2	0.3	0.4	0.4
Lymphogranuloma venereum	1	2	1	0	0	0.0	0.0	0.0	0.0	0.0
Malaria	688	703	625	849	746	3.9	3.9	3.5	4.6	4.0
Measles	4,536	4,895	1,324	498	852	25.7	27.4	7.3	2.7	4.6
Meningococcal infection	378	383	382	426	499	2.1	2.2	2.1	2.3	2.7
Mumps	28	94	153	128	191	0.2	0.5	1.0	0.9	1.0
Ornithosis	98	85	176	85	46	0.8	0.7	1.5	0.7	0.4
Pertussis	3,990	5,633	4,297	4,031	10,668	22.6	31.6	23.8	22.0	57.6
Q fever	889	667	473	555	593	5.0	3.7	2.6	3.0	3.2
Ross River virus infection	5,428	3,974	2,602	7,823	6,683	31.6	22.9	14.4	42.7	36.1
Rubella	3,812	3,315	4,380	2,845	1,446	21.6	18.6	24.3	15.5	7.8
Salmonellosis (NEC)	4,731	5,283	5,895	5,819	7,004	26.8	29.6	32.7	31.8	37.8
Shigellosis	708	724	734	676	799	6.1	6.1	6.1	5.6	6.5
Syphilis	2,305	2,324	1,854	1,523	1,304	13.1	13.0	10.3	8.3	7.0
Tetanus	10	15	7	2	8	0.1	0.1	0.0	0.0	0.0
Tuberculosis	1,071	1,024	1,073	1,067	1,008	6.1	5.7	5.9	5.8	5.4
Typhoid[4]	72	50	69	84	77	0.4	0.3	0.4	0.5	0.4
Yersiniosis (NEC)	459	414	306	268	245	3.9	3.5	2.6	2.2	2.0
TOTAL	60,745	61,726	58,074	65,382	89,576					

NEC Not Elsewhere Classified.

NN Not notifiable.

- Elsewhere classified.

1. No notifications have been received during 1993 to 1997 for the following rare diseases: botulism (foodborne), plague, rabies, yellow fever, or other viral haemorrhagic fevers.
2. Not all diseases were notifiable in every State and Territory every year.
3. Data from SA and NSW included for the first time in 1997.
4. Includes paratyphoid in New South Wales and Victoria, and from July 1996 in Queensland

NPR Not previously reported.

the Australian Bureau of Statistics. In cases where a disease was not notifiable in a State or Territory an adjusted rate was calculated using a denominator which excluded the population of that State or Territory. Maps were produced using postcode of residence of the case.

Analyses were based on cases with report dates in 1997. The data included some notifications with onset dates before 1997, and excluded notifications with report dates in 1998 (even if the onset date was in 1997). For analysis of seasonal trends, notifications were reported by month of onset.

Notifications were allocated to the Australian Bureau of Statistics Statistical Divisions for mapping using postcodes of residence of the cases (Map 1). The two Statistical Divisions which make up the Australian Capital Territory were combined, as the population for one division is very small. Notifications for Darwin and the remainder of the Northern Territory were also combined to calculate rates for the Northern Territory as a whole. For South Australia, data for sexually transmissible diseases were combined for the whole state. In general, notification rates for Statistical Divisions were depicted in maps or discussed in the text only where the number of notifications was sufficiently large for these to be meaningful.

Notes on interpretation

The notifications compiled by the NNDSS may be influenced by a number of factors which should be considered when interpreting the data. Due to under-reporting, notified cases mostly represent only a proportion of the total number of cases which occurred. This proportion may vary between diseases, between States and Territories and with time. Methods of surveillance vary between jurisdictions, each with different requirements for notification by medical practitioners, laboratories and hospitals. In addition, the list of notifiable diseases and the case definitions may vary between jurisdictions.

Postcode information was well reported but, as it is usually the postcode of residence, it may not necessarily represent the place of acquisition or diagnosis of the disease, or the area in which public health actions were taken in response to the notification. Duplicate checking between the State data sets was not possible, so there may be duplicate reports if patients moved from one jurisdiction to another and were notified in both. Some Statistical Divisions have small populations (Map 1), so small numbers of cases may result in high notification rates in these areas.

The data are limited as they do not include risk factor information other than age, sex, and postcode of residence. Other risk factor information is compiled in data sets supplementary to the NNDSS, for *Haemophilus influenzae* type b infection,[8] tuberculosis and non-tuberculosis mycobacterial infection,[9,10] and are reported separately.

National HIV and AIDS surveillance is conducted by the National Centre in HIV Epidemiology and Clinical Research, which reports separately.[11] The non-tuberculosis mycobacterial infection notifications are included in the National Mycobacterial Surveillance System which also reports separately.[10]

Results

Some general comments on the numbers of notifications is provided here in this introduction, while data on individual notifiable diseases are described and discussed in disease groups below.

There was a total of 89,579 communicable disease notifications for 1997 (Table 1). Notification rates per 100,000 population for each disease by State or Territory are described in Table 2. Comparative data for 1997 and the preceding four years are shown in Table 3. There was an increase of 37 per cent in total notifications compared with 1996. Forty per cent of the increase is accounted for by the inclusion of hepatitis C (unspecified) data for New South Wales and SA for the first time; 27 per cent of the increase is due to the large number of pertussis notifications.

Many diseases show a fairly constant number of notifications in each year, with tuberculosis being notable in this group. The epidemic of pertussis in the later months of 1997 is reflected in the figures shown here. Notifications of gonococcal infection have increased steadily for several years and hepatitis A and salmonella notifications are higher than seen previously. The number of meningococcal infections notified is higher than in previous years. Notifications of syphilis have fallen steadily over recent years and rubella notifications were low in 1997.

Data were missing from some fields in some records. Information was missing in the field for sex for 847 notifications (0.9%), age for 679 (0.8%), and postcode of residence for 2,441 (2.7%). The proportion of reports with missing data in these fields varied by State or Territory, and also by disease.

Surveillance reports

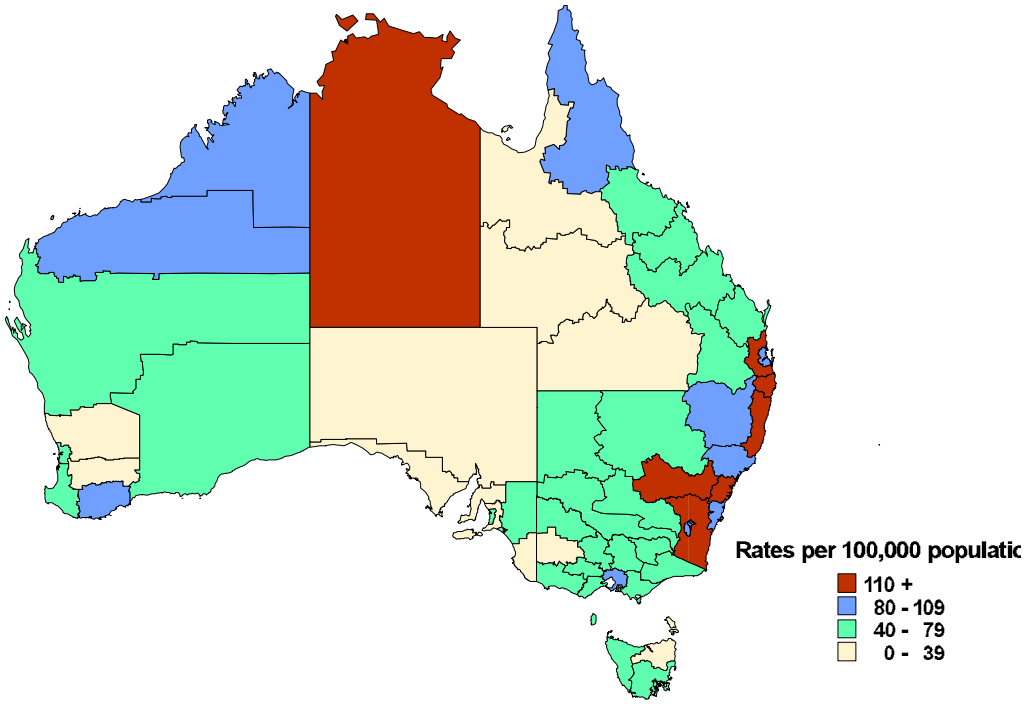
Bloodborne diseases

Bloodborne diseases which are reported by State and Territory Health Services to the National Notifiable Diseases Surveillance System (NNDSS) include hepatitis C, hepatitis B and hepatitis D. All newly diagnosed cases of HIV are reported to the National Centre in HIV Epidemiology and Clinical Research (NCHECR) and reports of these for 1997 have been published separately in the 1998 surveillance report from NCHECR.[11] The NCHECR website is: http://www.med.unsw.edu.au/nchecr/.

National case definitions for incident hepatitis B and hepatitis C require the presence of current illness together with serological evidence of infection or alternatively, specific serological evidence of recent infection or seroconversion.[1] Notifications for hepatitis B or hepatitis C which are not accompanied by evidence of recent infection are classified as “unspecified”.

In 1997, the bloodborne hepatitides accounted for 30 per cent of all notifiable diseases. Hepatitis C, both incident and unspecified, accounted for more notifications than any other notifiable disease. The bloodborne hepatitides, in particular hepatitis C, have had the highest age specific notification rates in the 20 to 40 year age groups, making them a major public health concern in young adults.

Map 2. Notification rate of hepatitis C (unspecified), 1997, by Statistical Division of residence

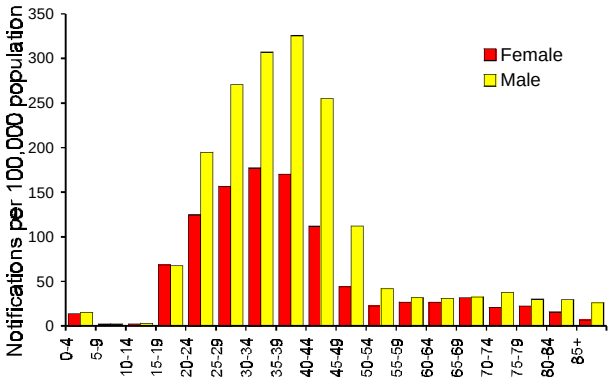


Hepatitis C

For 1997 all states, excepting New South Wales and South Australia, reported unspecified cases of hepatitis C to the NNDSS on a monthly basis. Data from both South Australia and New South Wales have been retrospectively collated and incorporated into the current report (Map 2).

For 1997, 81 cases of incident hepatitis C were reported, and rates of infection were 0.5 per 100,000. Unspecified hepatitis C accounted for 19,692 notifications, of which 45 per cent were reported from New South Wales. National rates of hepatitis C (unspecified) were 106 per 100,000. Sixty-six per cent of all hepatitis C notifications were in the 20 to 44 year age group (Figure 1).

Figure 1. Notification rate of hepatitis C (unspecified), 1997, by age group and sex



In 18,610 notifications the sex was reported. Of these 11,858 (64%) were male and 6,752 (36%) female.

Hepatitis B

Since 1994, all States and Territories have distinguished incident hepatitis B in data provided to the NNDSS.

There were 247 cases of hepatitis B (incident) reported in 1997. This corresponds to a notification rate of 1.3 per 100,000 which is consistent with the rate of 1.2 per 100,000 reported in 1996. The highest rates of incident hepatitis B were reported from the Northern Territory (10.2 per 100,000) and Victoria (2.6 per 100,000). The male to female ratio for hepatitis B notifications is 1.6:1.

Age specific notification rates were highest in the 20 to 24 year age group at 4 per 100,000. Rates of incident hepatitis B increased markedly over the age of 14 years and declined over the age of 40. In 1997 there were 9 notifications of hepatitis B in children under the age of 15 years. Two notifications were reported in children in the 0 to 4 year age group (Figure 2).

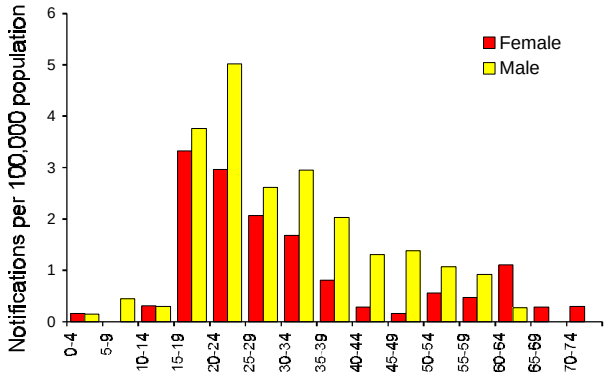
Hepatitis D

There were 13 cases of hepatitis D in 1997. The male to female ratio was 5.5:1. All reports were in adults aged between 20 and 50 years of age.

Discussion

Although primarily bloodborne, hepatitis C can be vertically transmitted while sexual transmission occurs rarely, if at all. The spectrum of illness caused by hepatitis C includes acute infection, chronic asymptomatic infection, chronic disease, cirrhosis and hepatocellular carcinoma. Acute hepatitis C often goes unrecognised, as the symptoms can be mild. In the absence of symptoms, the diagnosis can

Figure 2. Notification rate of incident hepatitis B, 1997, by age group and sex



only be confirmed by documentation of prior testing and seroconversion. Incident hepatitis C is not separated from unspecified notifications of the disease in Queensland. As such it is under reported in the National data set.

Of those exposed to hepatitis C, 70 per cent can be expected to develop chronic infection, and 20 to 30 per cent of these will develop cirrhosis. The clinical severity of acute illness does not relate to progression to chronic disease. Outcomes of hepatitis C exposure relate to many factors including HCV subtype, virus titre in the infective source, age at infection, duration of disease, mode of acquisition, coinfection with hepatitis B, or HIV, host immunity and alcoholism.[12] Hepatitis A superinfection can also predispose to fulminant hepatitis, and therefore a worse prognosis in those with pre-existing hepatitis C.[13]

The highest risk group for transmission of HCV in Australia is injecting drug users (IDUs). Rates of seroconversion in IDUs have been reported between 15 and 40 per 100 person years.[14] Tattooing and the health care setting are other potential sources of bloodborne transmission. Prior to 1990 transfusion related hepatitis C figured as a significant risk factor in transmission. Since 1990, the screening of blood products for hepatitis C has been routine. The relative contributions of risk factors in the transmission of hepatitis C in Australia is not able to be ascertained from NNDSS data.

The potential for hepatitis B to be sexually and vertically transmitted is greater than is reported to occur with hepatitis C.[12] Higher rates of hepatitis B occur in Indigenous Australians, migrants from Asian countries, IDUs, homosexual males and household contacts of known hepatitis B cases.[15] Vertical transmission is increased if the mother is known to be HBeAg positive. The risk of becoming a hepatitis B carrier is almost two-fold higher if the disease is acquired between the ages of 0 to 4 years as compared to 5 to 12 years.[15] This underscores the importance of screening and vaccination of high risk infants born to mothers in the above mentioned risk categories.

Hepatitis D can only occur in a person with preexisting hepatitis B. It must be assumed therefore that all cases of hepatitis D occurred as an acute co-infection with hepatitis B, or as a superinfection in a person with chronic hepatitis B infection. Hepatitis B is an obligate risk factor for this disease, and hepatitis D control is inextricably linked to public health efforts to control hepatitis B.

Gastrointestinal diseases

Gastrointestinal diseases are an important cause of illness in Australia. However, data from the NNDSS are likely to underestimate the incidence of disease caused by gastrointestinal pathogens. A number of diseases such as cryptosporidiosis are not nationally notifiable while haemolytic uraemic syndrome (HUS) and infections with Shiga-like toxin (verotoxin) producing E. coli (SLTEC/VTEC) did not become nationally notifiable until late 1998. In addition, only a small proportion of cases come to the attention of physicians, and diagnostic tests to establish an aetiology are only used in a small proportion of these. Moreover, current laboratory testing protocols may not include tests for all significant gastrointestinal pathogens (for example not all laboratories routinely test for Yersinia species) or the tests may not have sufficient sensitivity.

Botulism

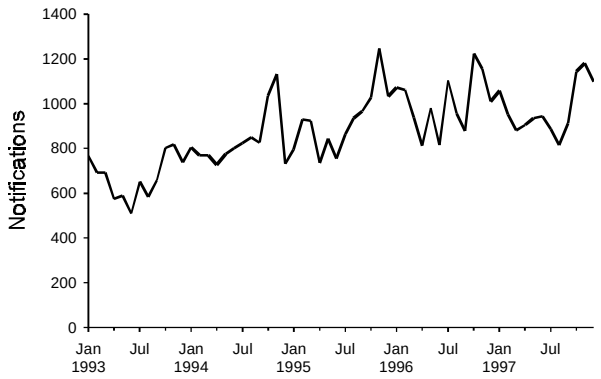
There were no cases of botulism reported in 1997. There have been no notifications of this disease reported since the NNDSS began in its present form in 1991.

Campylobacteriosis

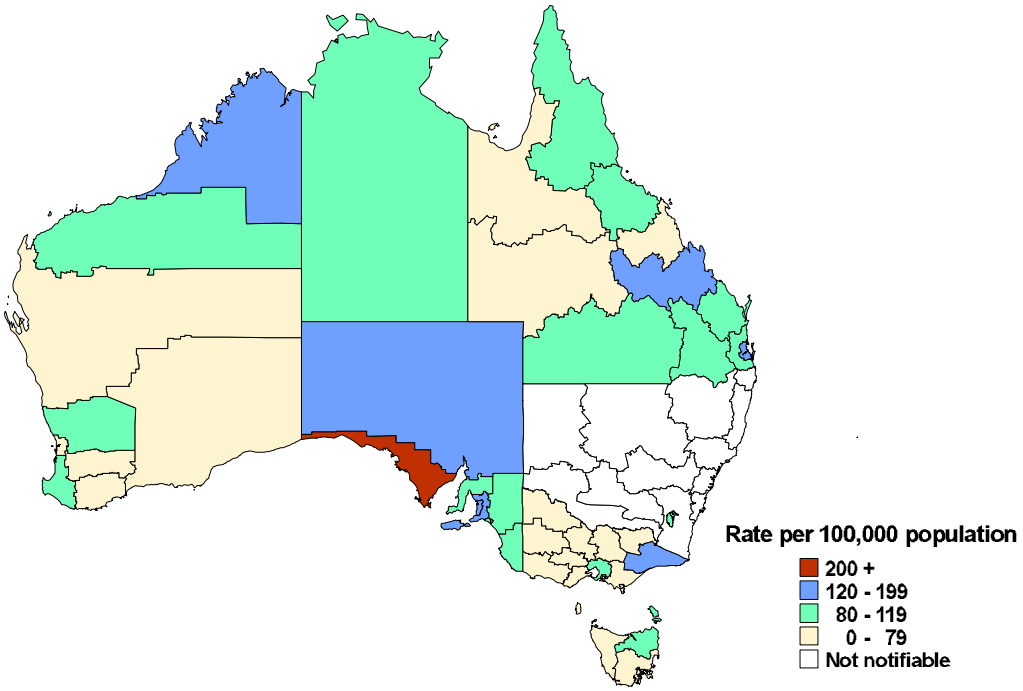
There were 11,848 cases of campylobacteriosis reported in 1997, a 2.5 per cent decrease from the number reported for 1996. The rate of notification of campylobacteriosis rose steadily from 1992 to 1996 (Table 3). In 1997, it had the highest annual adjusted rate of notification (100.4 per 100,000 population) for any notified disease, with the exception of hepatitis C (unspecified). In New South Wales, campylobacteriosis was only notifiable as 'foodborne disease in two or more related cases' or 'gastroenteritis in an institution' and therefore was not included for this State.

Campylobacteriosis was reported from all jurisdictions where it was notifiable. Notifications were quite high throughout the year, although higher in the warmer months

Figure 3. Notifications of campylobacteriosis, 1993-1997, by month of onset



Map 3. Notification rate of campylobacteriosis, 1997, by Statistical Division of residence



(October through February) (Figure 3). The highest rate was reported in South Australia, 131 cases per 100,000 population (Map 3). Overall the male:female ratio was 1.2:1. The highest rates of notification were seen in the 0 to 4 years age group (males 227 per 100,000 and females 166 per 100,000 population).

Hepatitis A

There were 3,076 notifications of hepatitis A infection during 1997, a 30 per cent increase on 1996 and a rate of 16.6 per 100,000 population; both number and rate are the highest in the NNDSS since it started in 1991. Although the largest number of reports was from New South Wales (1,455), the highest notification rates were seen in the Northern Territory (49.2 per 100,000 population).

There has been no apparent seasonal distribution for hepatitis A infection notifications in recent years, although in 1997 a very high number were reported in February as a result of the outbreak associated with the consumption of oysters from Wallis Lake (Figure 4). The male:female ratio was 1.5:1. Age group specific notification rates were highest for males aged 20 to 39 years (Figure 5).

Listeriosis

There were 71 notifications for listeriosis in 1997, which is similar to that in previous years. The Australian Capital Territory and the Northern Territory had no reports. The

Figure 4. Notifications of hepatitis A, 1993-1997, by month of onset

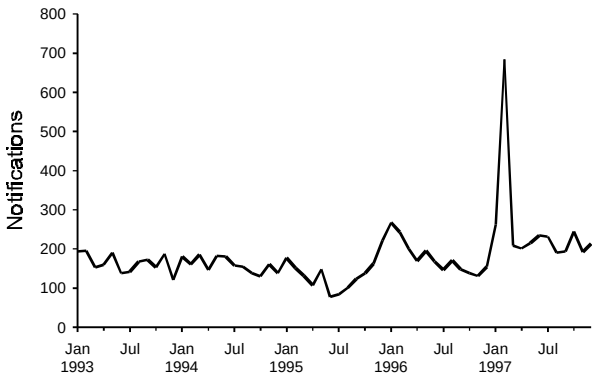
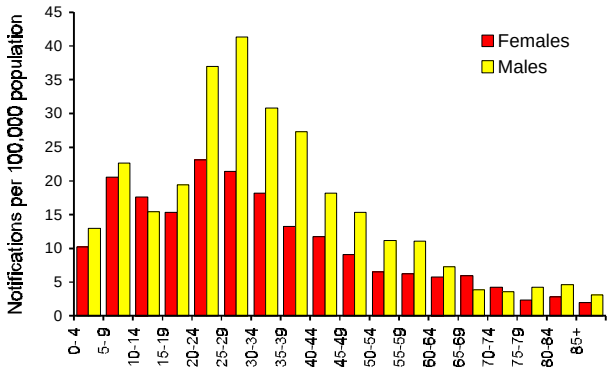
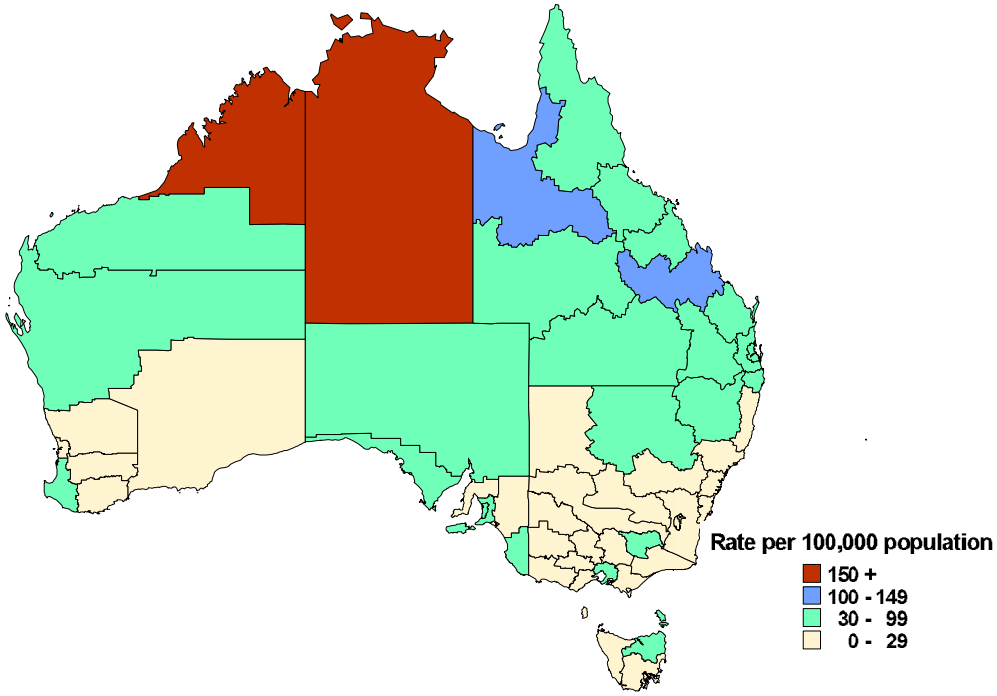


Figure 5. Notification rate of hepatitis A, 1997, by age group and sex



Map 4. Notification rate of salmonellosis, 1997, by Statistical Division of residence



notification rate was 0.4 per 100,000 population which is consistent with the rates for the period 1992 to 1996.

Salmonellosis - not elsewhere classified

A total of 7,004 cases of salmonellosis (not elsewhere classified) was reported in 1997, an increase of 17 per cent compared with 1996. The annual notification rate of 37.8 per 100,000 population being the highest for the NNDSS since 1991 (Table 3). Disproportionately high rates, over 100 cases per 100,000 population, were reported for residents of the Northern Territory and parts of Western Australia and Queensland (Map 4).

As in previous years, a seasonal trend was noted, with a higher number of notifications reported with month of onset in the warmer months, November through April (Figure 6). A large peak in notifications early in the year was related to five outbreaks in Victoria caused by five separate serovars.[16] The highest rates of notification were seen in the 0 to 4 years age group (males 200 and females 180 per 100,000 population respectively) (Figure 7).

Shigellosis

Shigellosis was notified for 799 persons in 1997, from all States and Territories except New South Wales, where it was only notifiable as 'foodborne disease in two or more related cases' or 'gastroenteritis in an institution'. The

Figure 6. Notifications of salmonellosis, 1993-1997, by month of onset

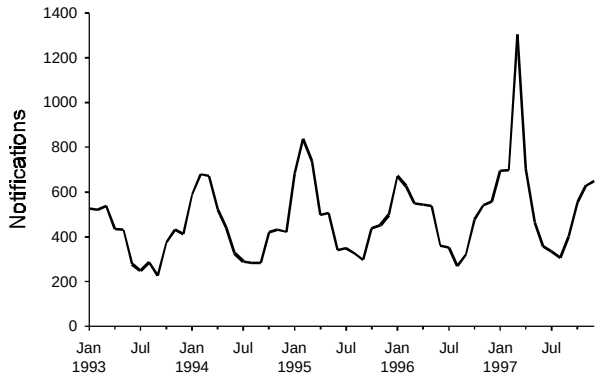


Figure 7. Notification rate of salmonellosis, 1997, by age group and sex

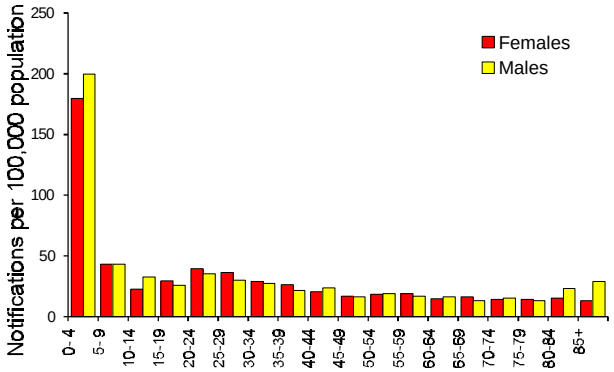


Figure 8. Notifications of shigellosis, 1993-1997, by month of onset

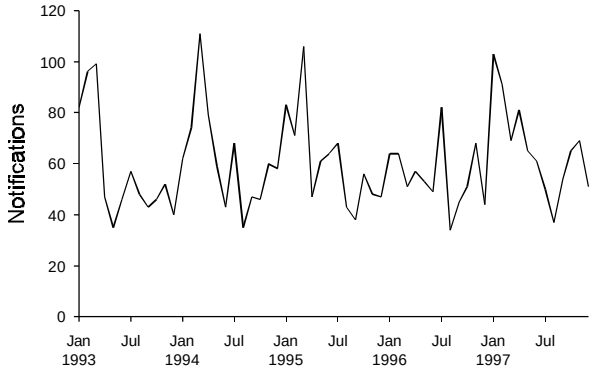
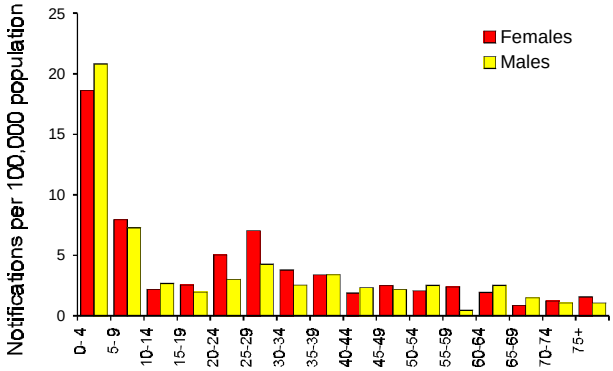


Figure 9. Notification rate of shigellosis, 1997, by age group and sex



notification rate, 4.3 per 100,000 population, was less than the rates for each of the years 1992 to 1996. The highest rate was seen for residents of the Northern Territory (90 per 100,000 population).

Notifications were slightly higher in the first four months of the year, reflecting the expected higher numbers in warmer months (Figure 8). The highest age group specific numbers and rates occurred in the 0 to 4 years age group for both (males 20.8 and females 18.6 per 100,000 population, respectively) (Figure 9).

Typhoid and paratyphoid

There were 77 cases of typhoid and paratyphoid notified in 1997, the notification rate being 0.4 per 100,000 population. All States and Territories provided notifications and there was no apparent seasonal trend.

Yersiniosis

There were 245 notifications for yersiniosis in 1997, from all States and Territories except New South Wales, where it was only notifiable as 'foodborne disease in two or more related cases' or 'gastroenteritis in an institution'. Reports of yersiniosis have steadily decreased since 1992. The majority of reports were received from Queensland and South Australia (Table 1).

The male:female ratio was 1.4:1. The highest age group specific numbers and rates occurred in the 0 to 4 years age group for both males and females (Figure 10) with 27 per cent of all cases notified being in this age group. Slightly higher numbers were reported in the first three months of the year compared with later months (Figure 11).

Discussion

Campylobacteriosis and non-typhoidal salmonellosis are the predominant enteric pathogens reported to the NNDSS. These trends are similar to those recorded in other developed countries such as the United States of America and the United Kingdom.[17] In the case of salmonellosis, however, Australia differs, as we have not yet seen widespread disease due to Salmonella enteritidis. This pathogen is the main cause of foodborne disease in North America and parts of Europe, with hens' eggs the main source of human infection.

Figure 10. Notification rate of yersiniosis, 1997, by age group and sex

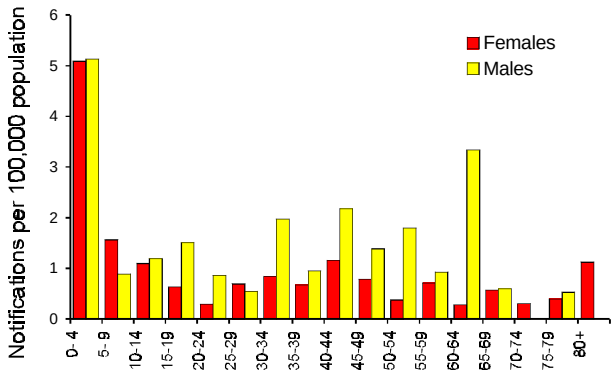
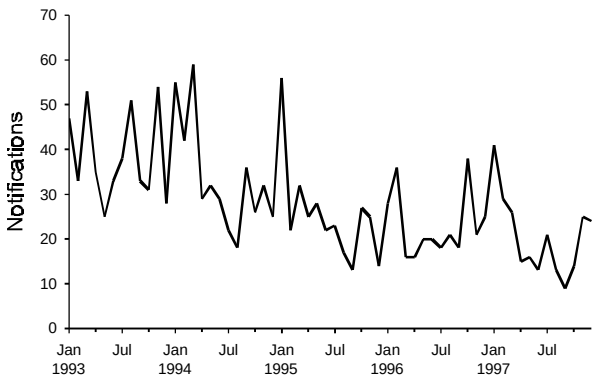


Figure 11. Notifications of yersiniosis, 1993-1997, by month of onset



The continued huge numbers of notifications of campylobacteriosis is of considerable public health concern. More knowledge is needed on the epidemiology of this disease to help determine the major sources of, and risk factors for, the transmission of Campylobacter species. Public health interventions may then be developed to reduce the incidence of disease.

Of the remaining enteric pathogens described in this report, transmission is thought to be mainly via food for Salmonella, Listeria and Yersinia species. However, hepatitis A virus and Shigella species are often spread from one person to another.[18] With the exception of hepatitis A infection, shigellosis and salmonellosis, notifications have either remained steady (campylobacteriosis and listeriosis) or have decreased (yersiniosis) in recent years. Outbreaks of hepatitis A in young homosexual men due to person-to-person transmission frequently occur, and the age and sex distribution of the reported cases during 1997 suggest that such outbreaks occurred during 1997. The oyster-associated outbreak of hepatitis A infection centred in the Wallis Lake region of New South Wales in 1997[19] however, is a reminder that this and other potential foodborne pathogens may cause large and widespread disease outbreaks if food safety measures are inadequate.

Quarantinable diseases

In Australia, the diseases which are currently considered to be of human quarantine importance are cholera, plague, rabies, yellow fever and a group of viral haemorrhagic fevers (VHFs). The VHFs include disease due to Ebola, Marburg, Lassa fever, and Crimean-Congo haemorrhagic fever viruses. Cholera, plague and yellow fever are defined as quarantinable in the current World Health Organization (WHO) International Health Regulations (IHRs).[20] Although not a signatory to the IHRs, Australia complies with the WHO requirements for reporting these diseases. The VHFs were not recognised at the time that the current IHRs were developed, but are considered to be quarantinable in many countries, and generally reported to the WHO. Rabies is a disease of both human and animal quarantine importance in Australia, which has status with WHO as a rabies-free country.

The diseases are notified to the NNDSS by all States and Territories except for rabies which is not notifiable in New South Wales. However, all cases of quarantinable diseases are formally notified to the National Centre for Disease Control by all States and Territories as they occur, regardless of whether they are notified to the NNDSS.

Cholera

Three reports of cholera were received in 1997, two from New South Wales and one from Victoria. All cases were acquired overseas (from India and the Philippines).

Plague, rabies, yellow fever and other viral haemorrhagic fevers

There were no cases of these diseases notified in 1997.

Discussion

Cases of cholera in Australia usually occur in individuals who have been infected whilst travelling overseas, often in Asia. Travellers are advised to take appropriate precautions when travelling to endemic areas.[21]

The WHO is drafting new International Health Regulations, which are expected to be released in the near future for comment. In Australia, a review of the human quarantine aspects of the Quarantine Act 1908 is underway. Changes to the list of quarantinable diseases may result from these processes.

Sexually transmissible diseases

Diseases generally classified as sexually transmissible under surveillance in the NNDSS are chancroid, chlamydial infection, donovanosis, gonococcal infection, lymphogranuloma venereum and syphilis.[22] An additional national laboratory based surveillance system, the Australian Gonoccocal Surveillance Programme (AGSP), documents the antibiotic sensitivity of gonococcal isolates, together with some clinical and demographic data.[23]

National data on HIV and AIDS are collected and reported separately by the National Centre in HIV Epidemiology and Clinical Research. This centre also reports on trends in sexually transmissible diseases. The data presented in this section are more recent than the data presented in the Annual Surveillance Report, 1998, HIV/AIDS and related diseases in Australia.[11] This accounts for the difference in numbers and rates of diseases in this section.

Several other important diseases are commonly or usually spread by sexual contact, but are not subject to national surveillance through the NNDSS. These include genital herpes (herpes simplex virus types I and II), genital warts (human papilloma virus, several types), trichomoniasis, and parasitic infestations such as pubic lice and scabies.[24, 25]

Chancroid

Only one case of chancroid was reported in 1997, from Western Australia. The case was a male in the 45 to 49 year age group.

Chlamydial infection

Chlamydial infection was not notifiable in New South Wales in 1997. It can be assumed that most of the 9,126 cases reported from the other seven States and Territories in 1997 were genital infections classified in accordance with the NHMRC case definition. However, it is likely that many of the cases reported in young children, particularly among the 42 cases reported in children less than 1 year of age, were cases of chlamydial conjunctivitis.

The adjusted rate for 1997 (74.5 per 100,000 population) was one of the highest (4th highest) reported for a notifiable disease and the highest among the STD's. This rate was 7 per cent higher than the rate reported for 1996 (Table 3). No seasonal trend was apparent.

Among notified cases the male:female ratio was 1:1.87. For both males and females, the highest rates of disease were recorded for the 20 to 24 age group; 38 per cent of cases in females and 33 per cent of cases in males, were in this age group (Figure 12).

High notification rates were reported across northern Australia, including rates over 300 per 100,000 in the Statistical Division of Kimberley in Western Australia, The

Figure 12. Notification rate of chlamydial infection, 1997, by age group and sex

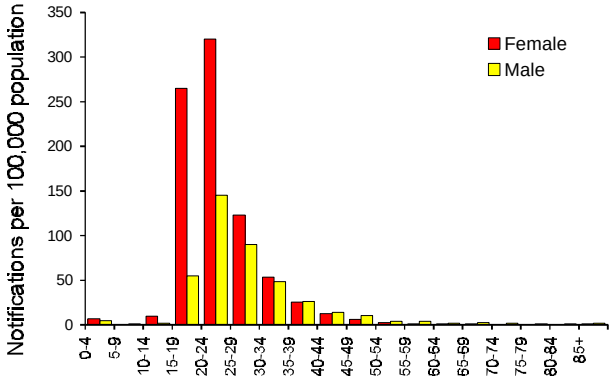
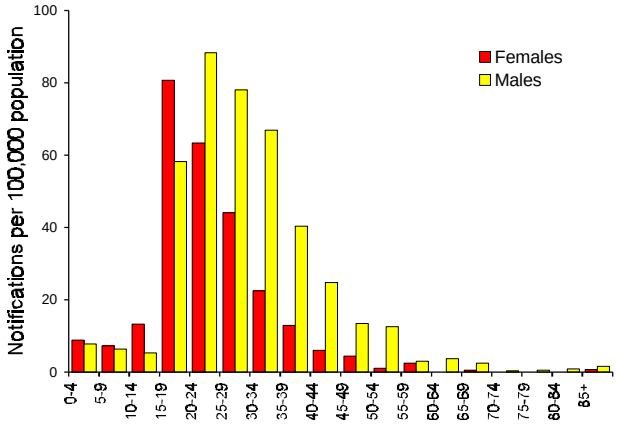


Figure 13. Notification rate of gonococcal infection, 1997, by age group and sex



Northern Territory and the Statistical Division of Far North Queensland (Map 5).

Donovanosis

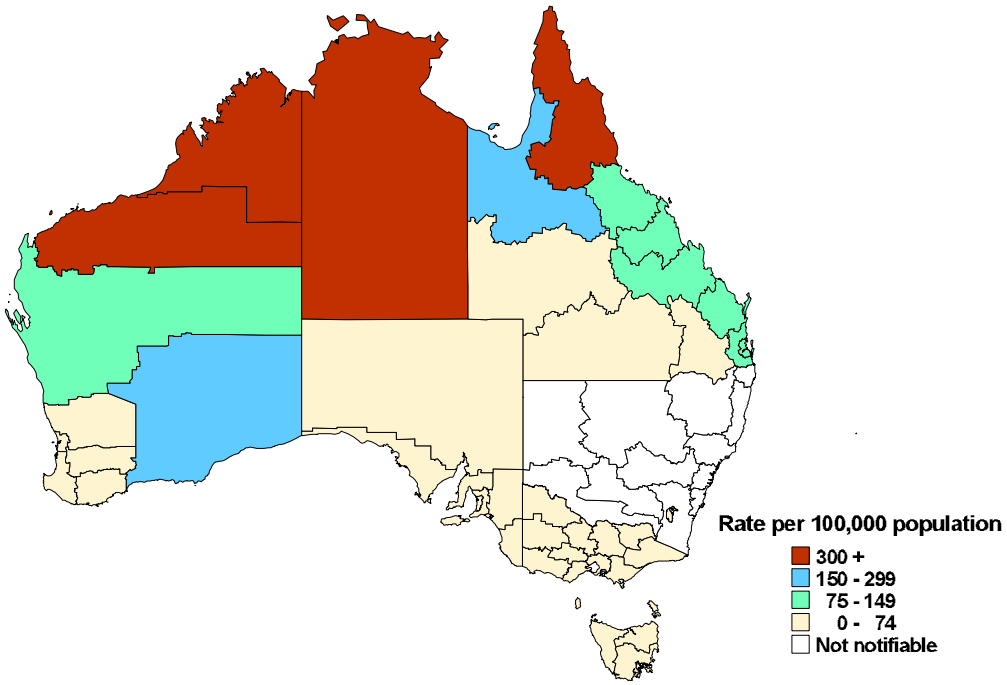
Donovanosis was not notifiable in New South Wales or South Australia in 1997. A total of 45 notifications were received from Northern Territory, Queensland and Western Australia (Table 1); none were received from the other States and Territories. The cases reported from Queensland and Western Australia were from the Statistical Divisions in the tropical north of those States.

The male:female ratio was 1:2.8. Eighty-four per cent of the cases were reported in persons in the 15 to 44 years age range.

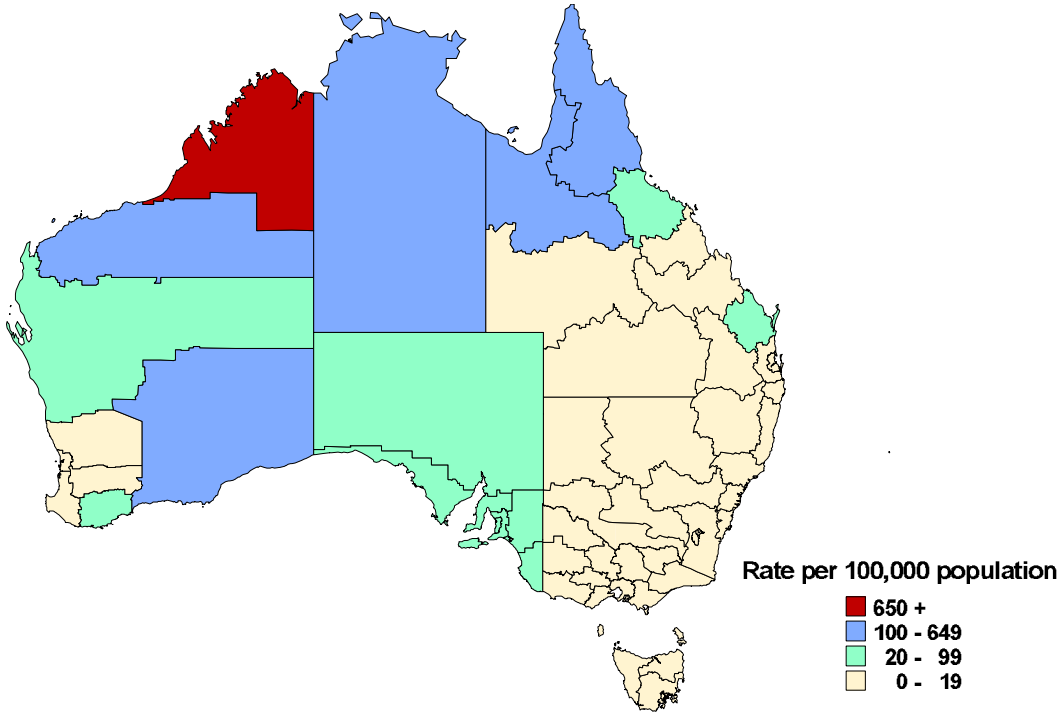
Gonococcal infection

In 1997, a total of 4,689 notifications of gonococcal infection were received from all States and Territories (Table 1). The notification rate of 25.3 per 100,000 was higher than in recent years (Table 3). However this rate remains far below the very high rates recorded in the 1970s and early 1980s, which peaked at 84.4 per 100,000 population in 1982.[26] No seasonal trend was apparent in 1997.

Map 5. Notification rate of chlamydial infection, 1997, by Statistical Division of residence



Map 6. Notification rate of gonococcal infection, 1997, by Statistical Division of residence



There was a wide geographical variation in the rate of notification of gonococcal infection (Table 2, Map 6). The highest rate (above 2,000 per 100,000) was reported from the Statistical Division of Kimberley. Rates above 250 per 100,000 population were reported from the Statistical Division of the Pilbara and South Eastern in Western Australia and the Northern Territory. The rates in the Statistical Division of Far North in Queensland were below 170 per 100,000 which is less than the rate reported for 1996.

The male:female ration of 1.6:1 was lower than those reported in recent years. This change, together with the increase in the number of notifications, may reflect increased levels of diagnosis rather than increased incidence of infection. However, notification rates remain higher in males than females in all adult age groups (Figure 13). Of the 107 notifications in children under 5 years, 25 (23%) were in infants under 1 year of age, 51 per cent of the cases were females.

Lymphogranuloma veneruem.

Lymphogranuloma veneruem was not notifiable in New South Wales, Western Australia, and South Australia in 1997. No cases were reported from the remaining States and Territories.

Figure 14. Notifications of syphilis, 1970-1997

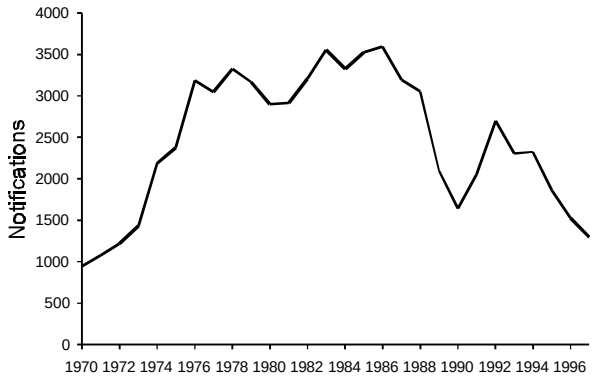
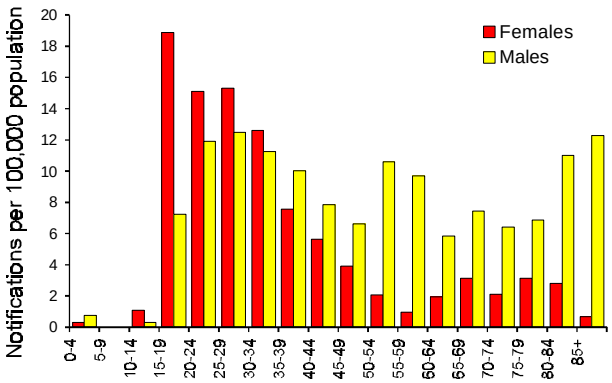


Figure 15. Notification rate of syphilis, 1997, by age group and sex



Syphilis

A total of 1,304 notifications of syphilis was received in 1997 (Table 1) a rate of 7 per 100,000 population. This was the lowest rate observed in Australia for over 20 years (Figure 14).

There was wide geographical variation in the notification rate (Table 2, Map 7). High notification rates were reported for the Western Australian Statistical Division of Kimberley, the Northern Territory, and the Queensland Statistical Divisions of North West and South West. There was a decrease in the rate observed in Far North Queensland as compared to last year.

The male:female ratio was 1:1.1. Among younger persons, notification rates were higher in females, and among older persons, rates were higher in males (Figure 15). In 1997, 11 cases of congenital syphilis were reported including six infants under 1 year of age, and five adults over 40 years of age. There were 8 further cases of syphilis reported in children under 10 years of age, of which seven were infants under one year of age, and one was a child aged 3 years.

Caution should be exercised in interpreting syphilis surveillance data, which may include a mixture of new infections, old infections and treated cases in some jurisdictions.

Discussion

The number of notifications of syphilis in Australia has continued to decline in recent years. However, the notifications of chlamydial and gonococcal infection were considerably higher in 1997 than recent years.This may reflect increased case finding activity in some states using PCR-based methods for screening urine specimens. Notification procedures, completeness of notifications and changing diagnostic tests can influence these numbers. Further discussion on HIV, AIDS and other sexually transmissible diseases is presented separately.[11]

Vaccine preventable diseases

The childhood immunisation schedule remained unchanged from August 1994, (when a fifth dose of pertussis-containing vaccine was substituted for childhood diphtheria tetanus (CDT) vaccine at 4 to 5 years of age) to the final quarter of 1998 when the second dose of MMR vaccine moved from 10 to16 years of age to school entry (4 to 5 years of age), following the 1998 measles control campaign. This section summarises the national notification data for diseases targeted by the current routine childhood immunisation schedule. Other diseases for which vaccines are available but which are not incorporated in the immunisation schedule (hepatitis A, hepatitis B, pneumococcal disease, influenza, some serotypes of meningococcal disease) and potentially vaccine preventable diseases (varicella, rotavirus) are not discussed here. The National Influenza Surveillance Scheme published a report of the 1997 influenza data in an earlier edition of *CDI*.[27] Coverage estimates at 12 months of age for the vaccines given in the first year of life from the Australian Childhood Immunisation Register (ACIR) are included for the first time.

Diphtheria

There were no cases of diphtheria reported in 1997. The last diphtheria notification was in 1993.

Map 7. Notification rate of syphilis, 1997, by Statistical Division of residence

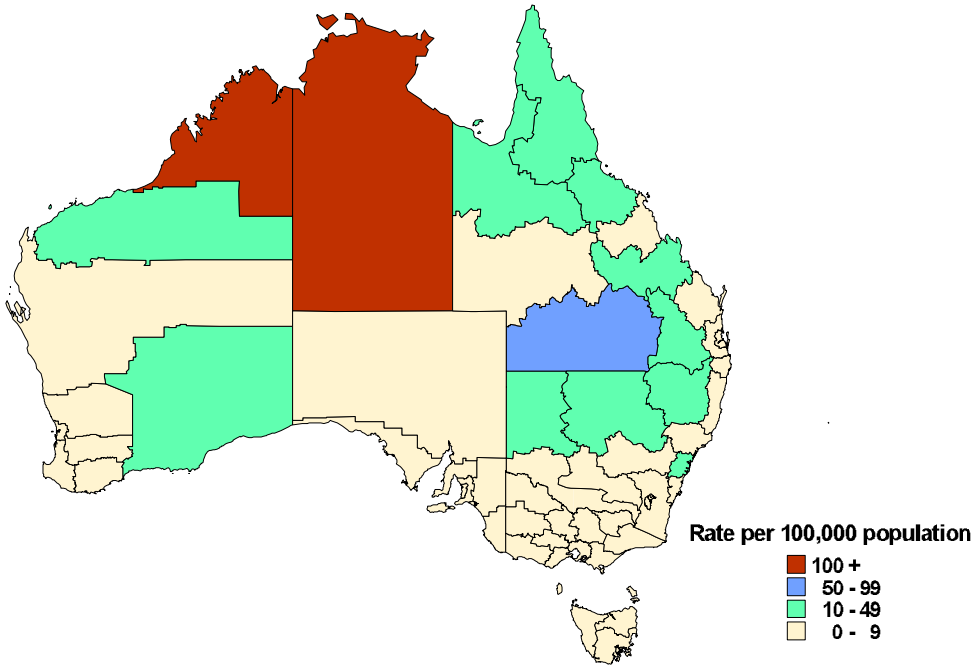


Figure 16. Notification rate of *Haemophilus influenzae* type b infection, 1997, by age

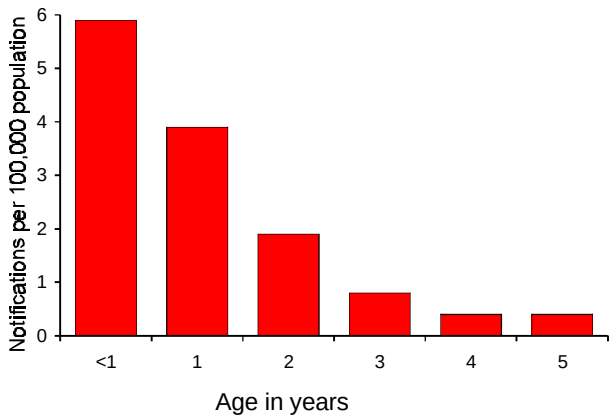
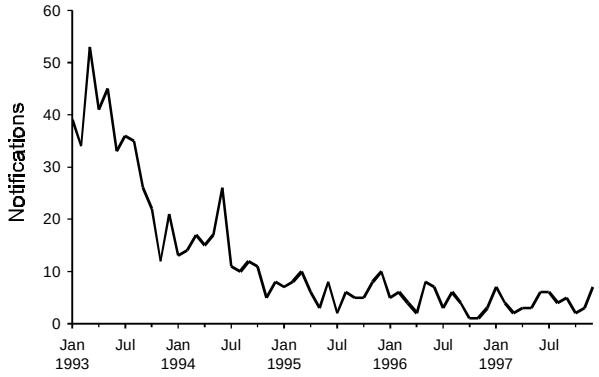


Figure 17. Notifications of *Haemophilus influenzae* type b infection, 1993-1997, by month of onset



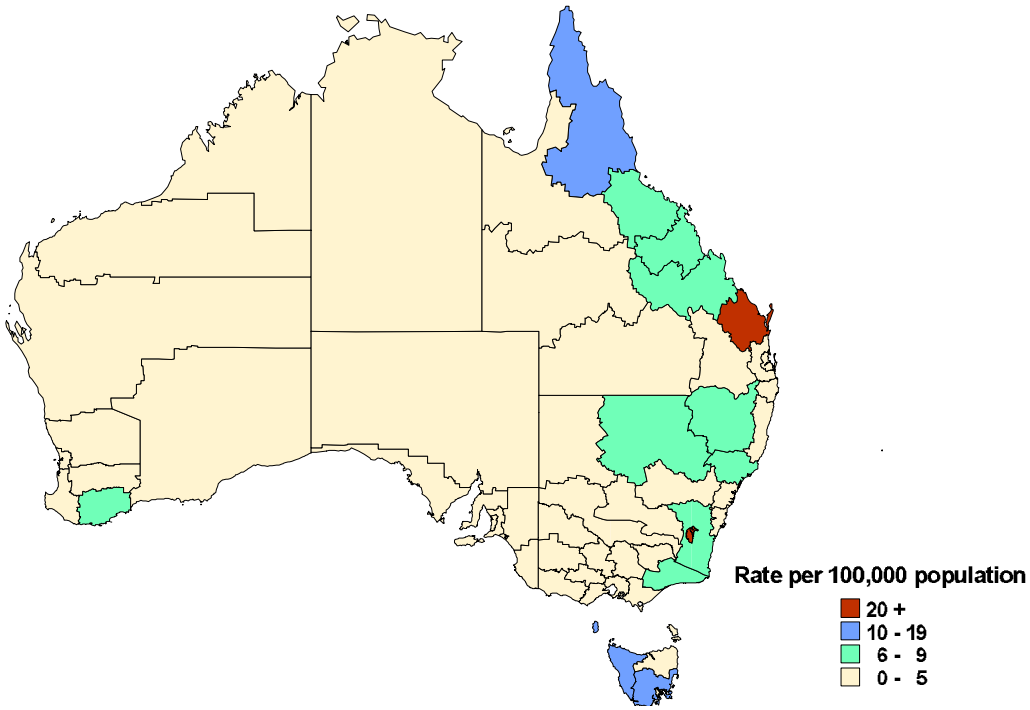
Haemophilus influenzae type b infection

Notifications of *Haemophilus influenzae* type b (Hib) infection have remained low since 1995. There were 53 cases of Hib infection notified in 1997, of whom 33 (62%) were under 5 years of age. The overall notification rate per 100,000 population was 0.3, compared with 2.6 for the 0 to 4 year age group. The highest notification rate was in children less than 2 years of age, declining to very low rates in children over 4 years of age (Figure 16). These rates are similar to those in 1996, suggesting that the notification rate is now stabilising following the introduction of conjugate Hib vaccines in 1992 (Figure 17).

Measles

Notifications of measles increased in the second half of 1997 but remained well below the epidemic years of 1993 and 1994. There were 852 cases reported to the NNDSS in 1997, an annual notification rate of 4.6 per 100,000 population. The highest notification rate was in the Australian Capital Territory (25.5 per 100,000) followed by Tasmania (8.0) and Queensland (7.7). Notifications were highest in the months from September to November when outbreaks occurred in Queensland (Far North, Fitzroy and Wide Bay-Burnett), northern New South Wales and the Australian Capital Territory.[28] These outbreaks are

Map 8. Notification rate of measles, 1997, by Statistical Division of residence



reflected in the map of measles incidence shown by statistical division (Map 8).

As in previous years, the highest notification rate (27.2 per 100,000 population) was for children 0 to 4 years of age. Within this age group, the highest rates of notification were for children less than 2 years of age. However, cases 5 to 29 years of age accounted for 50 per cent of total measles notifications. The male to female ratio was 1:1.1.

Mumps

In 1997 there were 191 cases of mumps reported to the NNDSS, an annual notification rate of 1.0 per 100,000 population. The highest notification rates were in the Northern Territory (5.3 per 100,000), the Australian Capital Territory (2.3 per 100,000) followed by Western Australia (2.0) and South Australia (1.8).

Children less than 10 years of age accounted for 44 per cent of all cases, a similar pattern to 1996. Children 0 to 4 year age group had a notification rate of 2.9 per 100,000 and children 5 to 9 year age group a rate of 3.5 per 100,000. The number of cases was evenly divided between males and females.

Pertussis

1997 was an epidemic year for pertussis, with a record number of 10,668 cases notified, compared with 4,031 in 1996. The national notification rate was 57.6 per 100,000 persons, but with substantial regional variation. The notification rate in South Australia was 114.1 and rates of over 100 per 100,000 were also seen in the south west of Western Australia, the Hunter region of New South Wales and southern Queensland (Map 9). As in previous years the number of notifications peaked in the spring and summer months (Figure 18).

Notification rates more than doubled in all age groups compared with 1996, with the greatest increase in notifications and the highest rates found among school aged children (5 to 14 years) for whom notification rates trebled compared with 1996 (Figure 19). Children in the 5 to 14 year age group accounted for 45 per cent of all notifications. Although notification rates were relatively low in persons aged 20 years and over, this group accounted for 36 per cent of the total notifications. The notification rate for females was greater than males for all age groups, with an overall male to female ratio of 1:1.2.

Polio

No cases of polio were reported in 1997. There have been no cases of polio due to the wild type virus since 1978, although vaccine associated cases were reported in 1986 and 1995.[29]

Rubella

Rubella notifications have continued to decline from the elevated levels of 1992 to 1995, with 1,446 cases notified in 1997 (Figure 20). Queensland and South Australia reported the highest notification rates of rubella at 16.9 and 13.4 per 100,000 respectively, compared with the overall notification rate of 7.8 per 100,000. Seasonal variation was apparent with a marked increase in cases with onset dates between September and October, consistent with previous years.

As in previous years, the highest notification rate (45.5 per 100,000) was for males in the 15 to 19 year age group, followed by those in the 20 to 24 year age group (24.4 per

Map 9. Notification rate of pertussis, 1997, by Statistical Division of residence

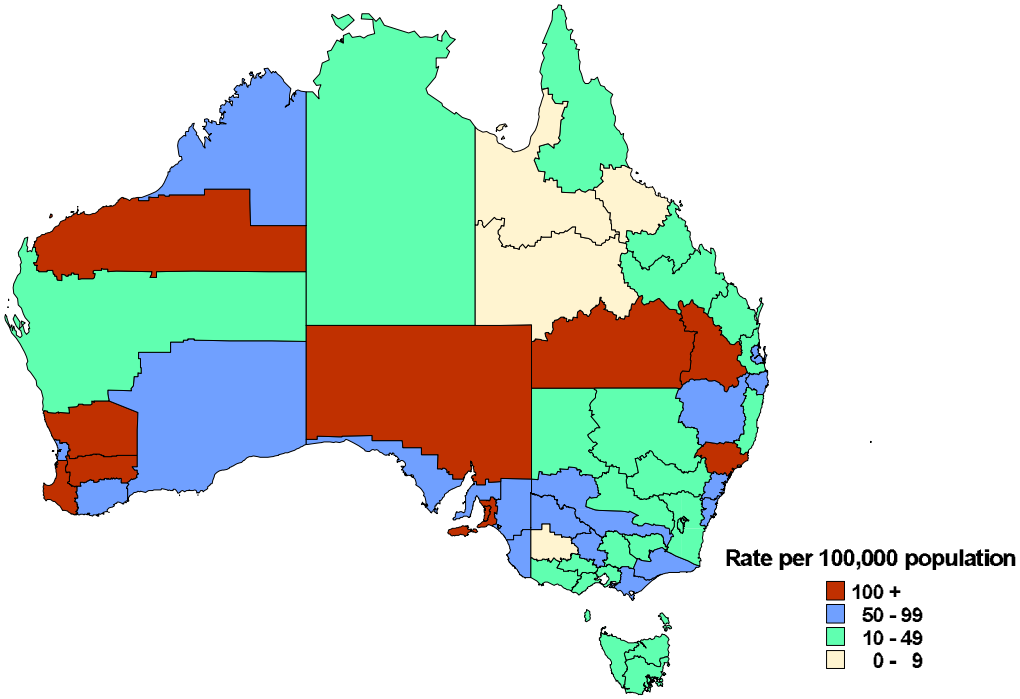


Figure 18. Notifications of pertussis, 1993-1997, by month of onset

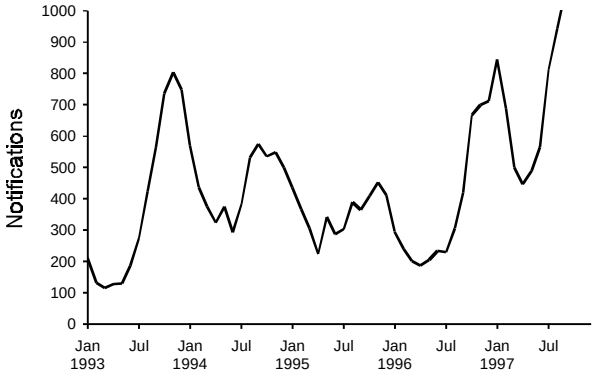
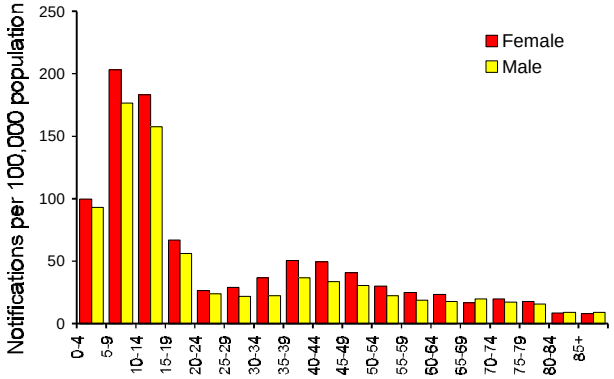


Figure 19. Notification rate of pertussis, 1997, by age group and sex



100,000) (Figure 21). Young males in the 15 to 24 year age group accounted for 33 per cent of all rubella notifications, and the overall male:female ratio was 1.9:1.

Tetanus

There were eight notifications of tetanus in 1997 (1 male, 7 females), a four-fold increase from 1996. Four of these notifications were from New South Wales, two were from Queensland, and one each was from Tasmania and Victoria. All cases were aged over 44 years and seven cases were older than 60 years.

Childhood immunisation coverage reports

The Australian Childhood Immunisation Register commenced operation on 1 January 1996 and records details of vaccination of children up to 7 years of age. Immunisaton coverage at 12 months of age is estimated by the cohort method and assumes that all doses have been given if the last in the series is recorded.[30] The proportion of Australian children fully immunised with each of the vaccines (DTP, OPV and Hib) listed in the Australian Standard Vaccination Schedule and the proportion immunised with all vaccines at 1 year of age are shown in Table 4.[31] These figures represent the four 3-month birth cohorts of 1996 who were assessed at 1 year of age in 1997.

Discussion

The striking feature of the 1997 NNDSS data is the very high notification rate for pertussis. This increased notification rate is probably related to both increases in the underlying incidence of pertussis over historical figures and improvements in detection and/or reporting of cases. The highest notification rate was recorded by South Australia where a recent, more detailed analysis suggested that increasing use of diagnostic tests, particularly serology in the older age groups, had contributed to increased detection and reporting of pertussis.[32] However, increased testing alone cannot explain these high notification rates, especially amongst infants of less than 1 year of age in whom morbidity is most severe and serology is not diagnostic. This is highlighted by the nine deaths in Australia between October 1996 and November 1997, compared with a total

Figure 20. Notifications of rubella , 1993-1997, by month of onset

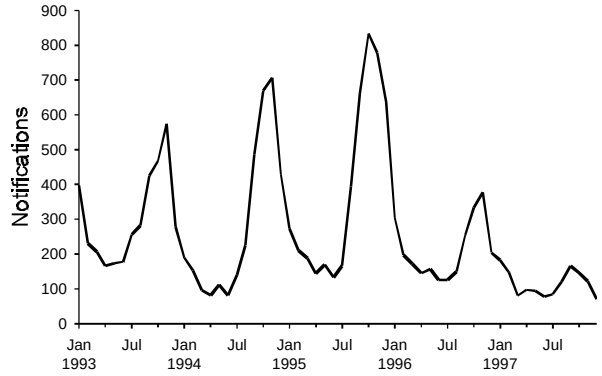


Figure 21. Notification rate of rubella , 1997, by age group and sex

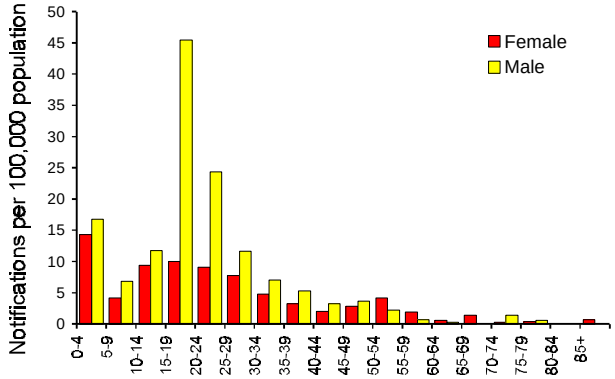


Table 4. Proportion of Australian children born in 1996 immunised at one year of age

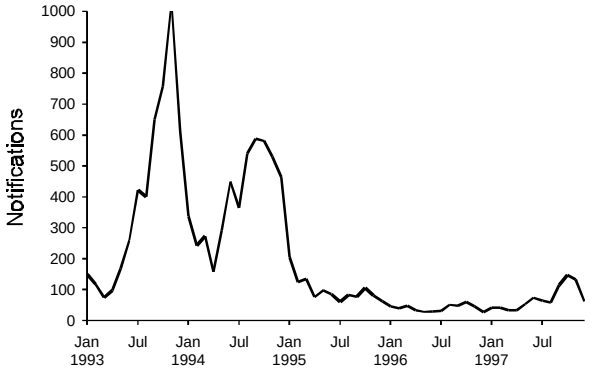
	Birth date			
Vaccine group	1/1/96 - 30/3/96 %	1/4/96 - 30/6/96 %	1/7/96 - 30/9/96 %	1/10/96 - 31/12/96 %
DTP	77.4	78.2	78.9	80.7
OPV	77.2	78.4	78.9	80.7
Hib	77.2	78.4	79.0	80.7
Fully immunised	74.9	75.8	76.7	78.6

of 21 deaths in the 20 years from 1976 to 1995.[33] There is evidence of the impact of immunisation, with the lowest notification rates in the most highly immunised group in the population (1 to 4 year olds) and a trend towards lower rates in the age group eligible for the fifth dose of DTP at 4 to 5 years of age (5 and 6 year olds).[34] Analysis of pertussis notification data to the end of 1998 is planned to confirm this trend, particularly in view of the high proportion of school aged children in the 1997 pertussis notifications.

Following the measles outbreaks in 1993 and 1994 (Figure 22) Australia was in an interepidemic measles trough until a number of outbreaks occurred in late 1997.[28] Data suggesting that further major outbreaks were likely in 1998-99 was confirmed by seroepidemiologic data from New South Wales, Victoria and South Australia, showing a high proportion of susceptibles.[35]

The likelihood that a measles epidemic, similar to the one which occurred in New Zealand,[36] was imminent prompted the establishment of the Measles Elimination Advisory Committee. The Committee recommended a National Measles Control Program consisting of four elements: the Measles Control Campaign, moving the second dose of measles vaccine (MMR2) to age 4 years from age 12 years, increasing uptake of MMR1 and MMR2 to 95 per cent, and improved surveillance. The Measles Control Campaign was primary school-based (1.75 million children, aged 5 to 12 years in 7000 schools) and held between August and November 1998. In addition, the parents of the 160,000 children under the 5 years of age who were eligible for MMR1 vaccination but who, according to the Australian Childhood Immunisation Register, were unimmunised were sent a letter urging them to make sure that their child's MMR immunisation was up to date. More than 1.3 million of the 2 million eligible children had been vaccinated by the end of November 1998, and regular campaign updates have been included in *CDI*.[37]

Figure 22. Notifications of measles, 1993-1997, by month of onset



It is expected that this campaign will help interrupt measles transmission, lengthen the interepidemic cycle, and allow time to increase uptake of the 2-dose MMR schedule to at least 95 per cent. However, continuing disease activity may be expected in teenagers and young adults. The importance of enhanced surveillance continues to be emphasised, and each jurisdiction has agreed to the National Surveillance Strategy, which sets out the importance of laboratory confirmation of cases, uniform case definition, collection of minimal data set including fields for vaccination status and laboratory confirmation. It is only by such national cooperation that measles will eventually be eliminated.

Poliomyelitis has been eliminated from Australia and work is continuing toward fulfilling the criteria for the Global Commission for Certification of Poliomyelitis Eradication, which requires proof beyond doubt that polio has been eradicated in Australia.[38] No vaccine associated polio has been reported since 1995 and Australia is pursuing enhanced surveillance of acute flaccid paralysis cases to prove that such paralysis is not caused by polio virus.[38]

Notifications for invasive Hib disease are likely to accurately reflect the true incidence as cases are all diagnosed in hospital laboratories and almost all jurisdictions have compulsory laboratory reporting. Notifications have also decreased in older persons with rates remaining highest in children less than 2 years of age. There is no evidence of an increase in invasive Hib disease in older children who have not been eligible for Hib immunisation.

Like other diseases, notification data for vaccine preventable diseases are sensitive to changes in diagnostic and reporting practices and must be interpreted with caution. Gaps in NNDSS data, including lack of information on the method of diagnosis and vaccination status, have been identified previously.[34,7] Date of birth of cases, rather than age in years, has been recorded nationally since the beginning of 1997, allowing calculation of disease specific notification rates for children under 1

year of age which will be included in the 1998 NNDSS annual report.

Estimates of immunisation coverage at 12 months of age have continued to increase, although the ACIR still under-reports true coverage. Initiatives have been implemented to improve reporting to the ACIR. These include the General Practice Immunisation Incentives and the requirement of ACIR documentation in order to receive childcare assistance, both of which should improve immunisation coverage and reporting to the ACIR. With improvements in both the reporting of immunisation status of cases of vaccine preventable diseases and immunisation status of all children, Australia will be much better placed to monitor the performance of its immunisation program.

Vectorborne diseases

Arthropod borne viruses which are able to replicate in arthropod vectors and in vertebrate hosts are collectively referred to as arboviruses. The nationally notifiable vectorborne diseases include several arboviruses and malaria. Although there are over 70 types of arboviruses in Australia, only a small proportion of these are capable of causing disease in humans.[39]

The NNDSS collects information on:

- **Alphaviruses**: Barmah Forest virus and Ross River virus.
- **Flaviviruses**: Dengue virus, and Arboviruses (not elsewhere classified) which include Murray Valley Encephalitis (MVE), Kunjin virus, Japanese Encephalitis (JE), Kokabera, and Stratford virus.
- **Malaria:** *Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, Plasmodium ovale.*

Ross River virus (RRV) and Barmah Forest virus (BFV) are endemic in Australia. Although RRV has been reported in all states of Australia, BFV has not been reported in Tasmania to date. Since the inception of the NNDSS in 1991, RRV has accounted for the largest number of notifications of arboviral disease. Dengue virus, though not endemic in Australia, has been associated with several outbreaks in far North Queensland since 1990. These outbreaks have occurred when travellers have imported dengue infection from abroad. The disease has then propagated via the mosquito vector *Aedes egypti*, which is currently localised to North Queensland.

Murray Valley encephalitis is enzootic in parts of Northern Australia and activity of the virus is monitored throughout Australia with sentinel chicken flocks. Whereas significant activity has been detected in chicken flocks in Northern Western Australia and the Northern Territory since 1990, no activity has been evident in chicken flocks in New South Wales and Victoria over the same time period.[39] Kunjin virus disease, a milder form of encephalitis, is confined mainly to Queensland with occasional spread into areas of south-east Australia.

Barmah Forest virus infection

In 1997, 704 notifications of Barmah Forest virus were reported. In keeping with past years, no cases were reported from Tasmania and the lowest rates of disease were reported in Victoria, the Australian Capital Territory and South Australia (Map 10). The Northern Territory had the highest rate of 22.4 per 100,000, followed by Queensland with a rate of 10.6 per 100,000.

Map 10. Notification rate of Barmah Forest virus infection, 1997, by Statistical Division of residence

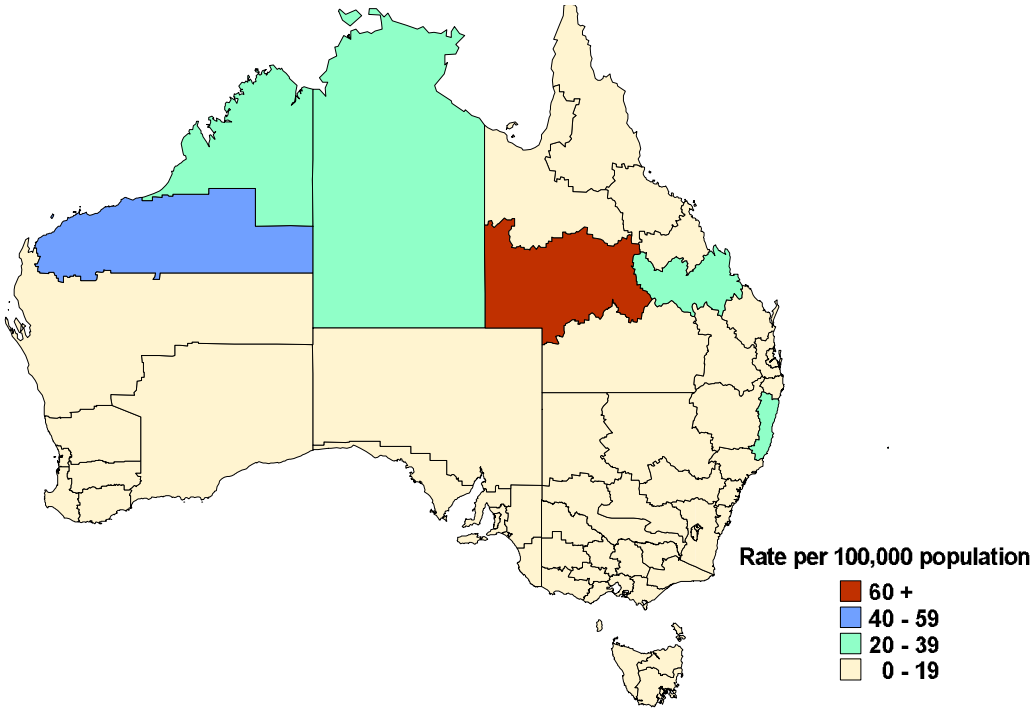


Figure 23. Notifications of Barmah Forest virus infection, 1995-1997, by month of onset

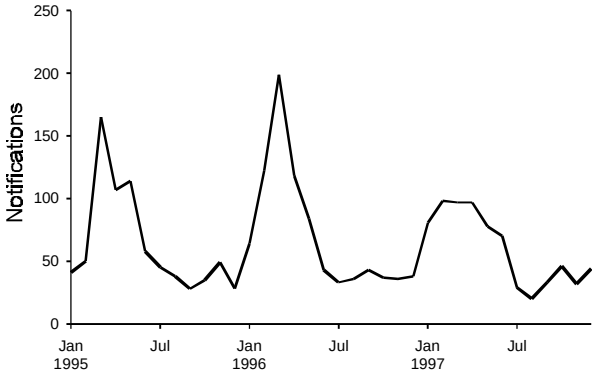
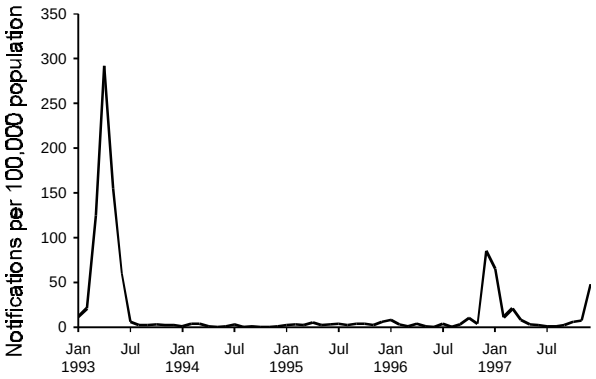


Figure 24. Notifications of dengue, 1993-1997, by month of onset



Males accounted for 402 (57%) of notifications and females for 300 (43%). Highest age-specific rates were in the 45 to 49 year age group at 7.7 per 100,000.

Peak activity was reported from February through to April (Figure 23).

Dengue

There were 210 notifications of dengue virus for 1997, and 80 per cent of these were reported from Queensland. Notifications for the year peaked in January and then again in December (Figure 24).

More dengue cases were notified in 1997 than in all years since 1993. Sex was reported for all but one case, and the male to female ratio was 1.04:1. Peak age specific rates were in the 30 to 34 year age group at 1.75 per 100,000. Eight cases of dengue were reported in children less than 10 years of age.

Ross River virus infection

Of the 6,683 notifications in 1997, 2,382 (35%) were reported in the state of Queensland. The areas of Australia with the highest rates of disease included the Mallee region of New South Wales, the Northern region of South Australia, the Pilbara and Kimberley regions of Western Australia, and the Central West and South West regions of Queensland (Map 11). Of the 6,663 notifications for which sex was reported, 3,266 (49%) were female and 3,397 (51%) male. The highest age-specific rates were reported in the 35 to 39 year age group at 63.7 per 100,000. The lowest rates of disease were reported in children less than 10 years of age at 3.3 per 100,000 (Figure 25).

The most frequent months for disease onset were February, March and April. This is in keeping with seasonal trends observed in previous years (Figure 26).

Arboviruses (Not elsewhere classified)

Altogether there were 18 notifications of arboviruses that were not elsewhere classified. No cases were reported from New South Wales. In the Northern Territory there were 2 notifications of Kunjin virus, and Western Australia reported 2 Kunjin and 2 cases of Murray Valley

Figure 25. Notification rate of Ross River virus infection, 1997, by age group and sex

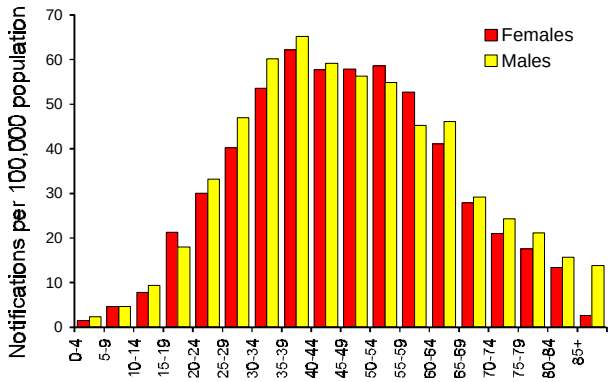
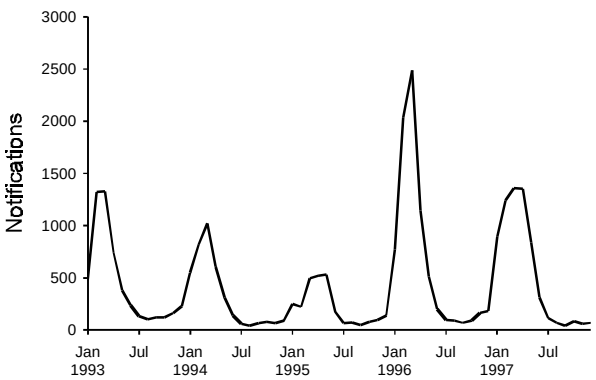
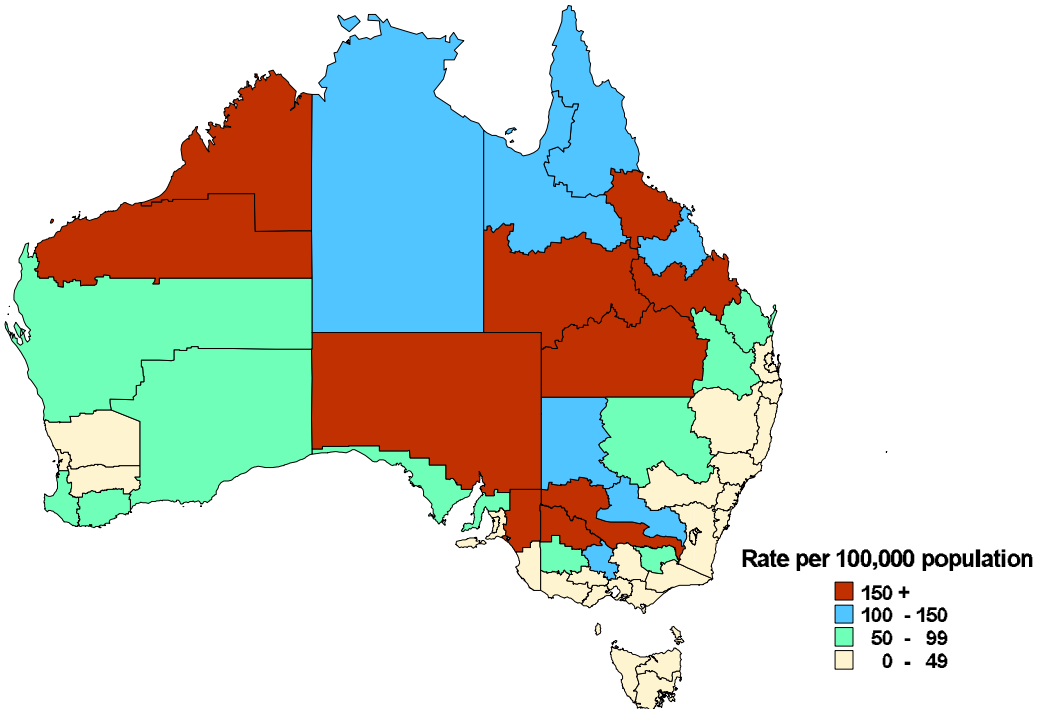


Figure 26. Notifications of Ross River virus infection, 1993-1997, by month of onset



Map 11. Notification rate of Ross River virus infection, 1997, by Statistical Division of residence



Encephalitis. The identitification of the remaining 12 arboviruses was not reported.

Malaria

There were 746 notifications of malaria in Australia in 1997. In 571 (76%) the species was reported. *P.vivax* accounted for 344 (60.3%), *P.falciparum* 197 (34.5%), *P.malariae* 7 (1.2%) *P.ovale* 4 (0.7%) and *P.falciparum/ P.vivax* co-infection 19 (3.3%). Half of all notifications were in people aged between 20 and 40 years. Twenty-nine cases were reported in children aged between 0 and 4 years. Of these, 16 cases were *P.vivax* , 7 *P. falciparum*, 3 *P.falciparum/vivax* coinfections and 4 unknown.

Male to female notifications occurred at 2.3:1.

Discussion

Ross River virus is the most common arboviral infection in Australia and has a wide geographic distribution. Barmah Forest virus, the other cause of epidemic polyarthritis, is less widely distributed and less frequent in occurrence. Both alphaviruses show the same seasonal pattern of occurrence. In 1997, BFV activity was down on what it had been in the previous two years. Ross River virus notification rates were lower than those reported in 1996, but still higher than all years dating back to 1993. Heightened awareness of epidemic polyarthritis has lead to increased testing and diagnosis over time.

In 1996-97 and in 1997-98 there were two outbreaks of dengue fever in Australia. Most laboratory confirmed dengue type 2 cases notified in early 1997 were from the Torres Strait.[39] In December of 1997 an outbreak of dengue type 3 occurred in Cairns.[40] The dengue strain in this latter outbreak was thought to have originated from South-East Asia. The outbreak continued into 1998.

Only 4 arboviruses not elsewhere classified were identified in the NNDSS. The 2 MVE and 2 Kunji were sporadic cases, and the former cases were notified from Western Australia.

The observation of increased malaria rates in young adults, who are predominantly male, is in keeping with observations over previous years. The occurrence of malaria in 29 children less than 4 years of age, including 3 mixed *P. vivax/falciparum* and 7 *P.falciparum* infections, highlights the vulnerability of younger age groups to this disease.

No notifications of Japanese Encephalitis were reported in 1997. The first outbreak to have occurred was on the island of Badu in the Torres Strait in 1995. Seroconversion in sentinel pigs on the island of Saibai occurred in 1996 and 1997,[39] indicating that Japanese Encephalitis virus activity remains enzootic and the risk to human health therefore persists.

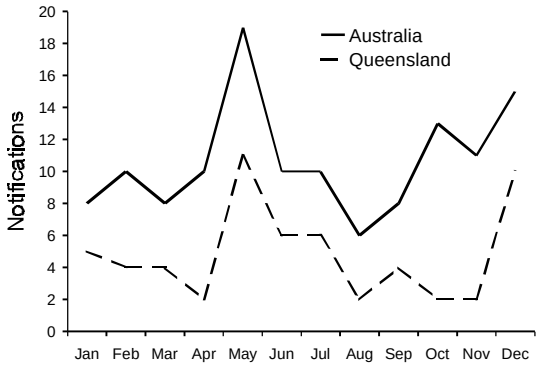
Zoonoses

Zoonoses are diseases and infections which are naturally spread between vertebrate animals and humans. Although there are more than 60 recognised zoonoses in Australia,[41] only a subset of these with increased epidemic potential and occupational risk are reported to the NNDSS. All notifiable zoonoses can produce non-specific clinical signs and symptoms and therefore a definitive diagnosis depends on appropriate laboratory investigation.

Brucellosis

There were 41 notifications of brucellosis in 1997 and rates were 0.2 per 100,000 nationally. This is unchanged for all years dating back to 1994. Thirty-five (85%) notifications were in males, and age-specific rates were highest in the

Figure 27. Notifications of leptospirosis, 1997, by month of onset



25 to 29 year age group at 0.62 per 100,000. Two reports were in children less than 10 years of age.

Of the 41 notifications, 34 (83%) were from Queensland, 4 (10%) from New South Wales, and 3 (7%) from Victoria. The highest rates of disease were reported in Southern Queensland. Brucella species was not indicated in any of the notifications.

Hydatid infection

Sixty-one cases of hydatid disease were reported for 1997. Thirty-one (51%) were reported from Victoria, where 14 cases were reported in 1996. The National rate was 0.3 per 100,000, which is similar to previous years.

The highest age-specific rates were in the 55 to 59 year age group at 0.82 per 100,000.

Male to female ratio of disease was 1.14:1

Highest rates of disease were reported in the South West statistical Division of Queensland.

Leptospirosis

A total of 126 cases of leptospirosis were reported for 1997 with a corresponding rate of 0.7 per 100,000. The Australian Capital Territory was the only jurisdiction to have had no reported cases for the year. The peak onset was in May and December (Figure 27). This bimodal distribution was most marked in Queensland which accounted for 56 (44%) of all notifications. Thirty-three cases were notified from New South Wales and 27 cases from Victoria.

The highest age specific rates were in the 20 to 24 year age group, at 1.89 per 100,000.

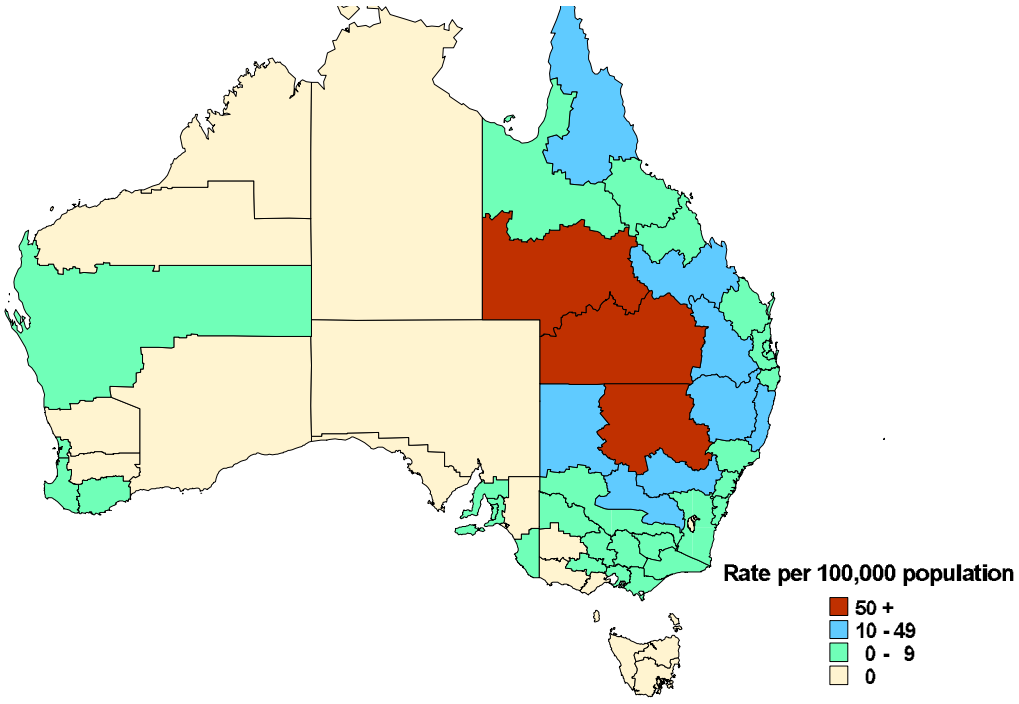
Males accounted for 108 (86%) of cases.

The highest rates of disease were localised to the Far North Statistical Division of Queensland and the Western District of Victoria, where 19 and 8 cases were reported for the year respectively.

Ornithosis

Ornithosis, or *Chlamydia psittaci* infection, is notifiable in all states except New South Wales and has not been notifiable in Queensland since 1996. Forty-six cases were notified for the year and 39 (85%) of these were from the state of Victoria. The only other states to have notified cases were South Australia (4 notifications) and Western Australia (3 notifications).

Map 12. Notification rate of Q fever, 1997, by Statistical Division of residence



The highest age-specific rates of 0.69 per 100,000 were reported in the 60 to 64 year age group. Females accounted for 54 per cent of cases.

The rate of 0.4 per 100,000 was lower than has been reported in previous years.

Q fever

Notifications of Q fever, or *Coxiella burnetii*, for 1997 numbered 593. Rates of disease were consistent with those reported in 1996. Australian rates were 3.2 per 100,000. Queensland and New South Wales each accounted for 275 notifications. The highest rates of disease were reported in Queensland at 8.1 per 100,000 and New South Wales at 4.4 per 100,000 (Map 12).

The highest age-specific notification rate of 5.7 per 100,000 was reported in the 20 to 24 year age group.

The male to female ratio was 5.7:1.

Discussion

The highest rates of notifiable zoonotic infections reported for 1997 occurred in the eastern states. Whereas Q fever and brucellosis rates were highest in the state of Queensland, Victoria accounted for the highest notification rates for ornithosis and hydatid disease. Leptospirosis was more widely distributed, with peak rates being reported in the Far North of Queensland and the South West Division of Victoria.

Q fever is the most important of all zoonotic diseases in terms of reported numbers of cases, and is the only disease for which an effective vaccine is available. It has long been associated with outbreaks in abattoirs and among animal handlers who predominantly work with sheep, cattle and feral goats.[42] The disease tends to be quiescent in animal hosts.

Brucellosis due to *B. abortus* is an uncommon disease in Australia due to effective eradication programs in cattle.[43] The reporting of brucella species to the NNDSS is poor. Earlier case series have confirmed the dominance of *B.suis* as a human pathogen in Queensland, especially among occupational groups who hunt and slaughter feral pigs.[44]

Reported rates of ornithosis are highest in the older age groups which may reflect increased investigation and laboratory testing for atypical community acquired pneumonia in this group. Previously reported outbreaks have been associated with aviaries, pet shops or poultry processing plants, although an outbreak investigation in rural Victoria in 1995 showed no association with direct bird handling but rather lawn mowing and gardening in areas with high numbers of native birds.[45] Shedding of *C. psittaci* into the environment by sick birds and subsequent inhalation of aerosolised dust and bird excreta was postulated as the mechanism of human infection.

Hydatid disease is under-reported in Australia.[46] Symptoms occur in the advanced stages of disease, and infection may remain quiescent for many years. Infection acquired in childhood will usually manifest in adulthood. The disease is distributed widely in rural Australia and disease occurring in urban dwellers is more common in the overseas born. Disease in the Australian born occurs typically in rural settings where humans become infected by the ingestion of eggs passed in the faeces of dogs, dingoes or foxes. Wallabies, wombats, feral pigs, sheep and kangaroos are all intermediate hosts that act as reservoirs of the disease. Dogs and foxes, feeding off the offal or other remains of these animals become infected, and can carry the disease into rural communities, or to the periphery of urban settlements.[47]

Other diseases

Legionellosis

This classification includes notifications of infections caused by all *Legionella* species. There were 161 notifications received in 1997 with an annual rate of 0.9 per 100,000 population. This rate is similar to previous years.

The highest numbers of notifications were reported by South Australia (39), Western Australia (38) and New South Wales (38). More males (113) were reported than females (48) resulting in a male:female ratio of 2.4:1 (Figure 28). Fifty per cent of reports were in the 60 to 80 year age range (Figure 29).

Figure 28. Notifications of legionellosis, 1997, by State

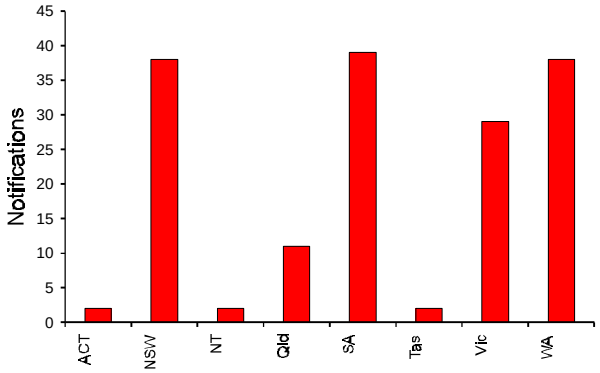


Figure 29. Notification rate of legionellosis, 1997, by age group and sex

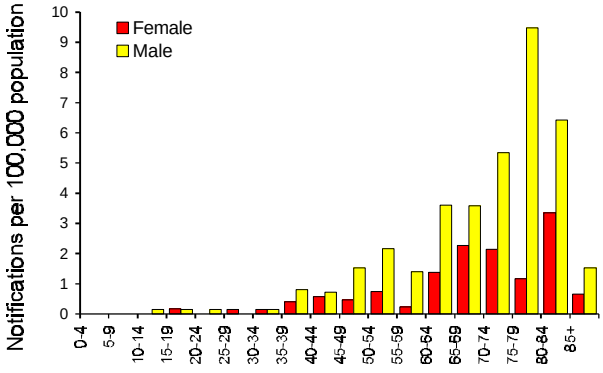
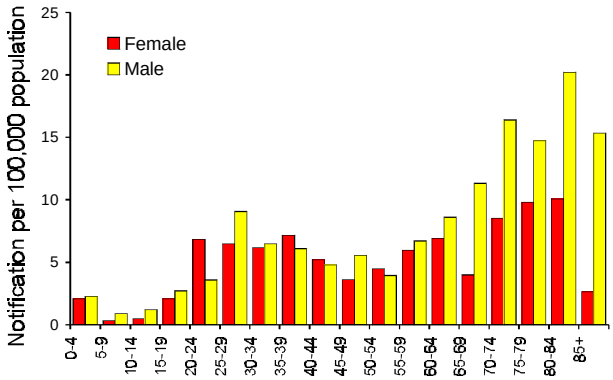


Figure 31. Notifications of tuberculosis, 1997, by age group and sex



The reported species were *Legionella pneumonphila* (58 notifications) and *Legionella longbeachae* (47 notifications). Six cases were reported as other species; the remaining 50 were not reported separately by some States and Territories.

For the States and Territories reporting Legionellosis by species breakdown, Victoria reported the highest number of *L. pneumophila* (24 cases), followed by New South Wales (18), South Australia (11) and Queensland (5). The profile is different for *L. longbeachae* with the highest number being reported from South Australia (27) followed by New South Wales (14), Queensland (5) and Victoria (1). Generally, the epidemiology for each species of Legionella is different with *L. pneumophila* being reported to peak in autumn and *L. longbeachae* being reported to peak in spring. The 1997 notifications for *L. pneumophila* reflect this trend, however the highest reporting of *L. longbeacheae* occurs over the summer months.

For notifications of *L. pneumophila*, 42 were male and 16 were female, giving a male:female ratio of 2.6:1. Notifications of *L. longbeachae*, 32 were male and 15 were female giving a male:female ratio of 2.1:1.

Leprosy

There were 14 reports of leprosy in 1997 from six States and Territories (five of which were from Queensland), and a notification rate of 0.1 per 100,000 population, the same as last year. Four reports were received for females and ten for males.

Meningococcal infection

There were 499 notifications of meningococcal infection in 1997, a rate of 2.7 per 100,000 compared with 2.3 per 100,000 in 1996. The Australian Meningococcal Surveillance Programme (AMSP) recently published a detailed report for 1997 to which readers are referred.[48]

Tuberculosis

There are 3 national surveillance systems through which tuberculosis (TB) notifications are handled.

The NNDSS provides the most timely information on national TB notifications, but demographic information is limited. The National Mycobacterial Surveillance System (NMSS), a surveillance system dedicated to tuberculosis and atypical mycobacterial notifications, is used to produce an annual report on TB notifications with detailed information on risk factors, diagnostic methods, drug therapy and relapse status. The 1997 annual report for the NMSS will be published in 1999. The Australian Mycobacterial Reference Laboratory Network (MRLN) maintains national data on drug susceptibility profiles, site of disease, age, sex and laboratory method of diagnosis for all mycobacterial isolates. These data are published annually in conjunction with the NMSS surveillance report.

In 1997, 1,008 notifications of TB were reported nationally, and the corresponding rate was 5.4 per 100,000. The highest disease rates of 18.2 per 100,000 were reported in the Northern Territory. These data are consistent with those reported since 1991.

Rates of TB were highest in males over the age of 65 years and females over the age of 70 years. A smaller peak in age-specific rates was reported in the 25 to 29 year age group (Figure 30).

Males accounted for 542 (54%) of the 1,005 notifications in which sex was reported.

Discussion

TB rates in Australia have been stable over the last decade. Published surveillance reports, based on data collected by the NMSS have consistently identified elderly Australian born persons, migrants from high prevalence countries, and Indigenous Australians as those at increased risk of TB disease.[49]

Acknowledgments

The Communicable Diseases Network Australia New Zealand appreciates the contributions of clinicians, laboratory and hospital staff, and the staff in State and Territory health departments who have submitted or processed the notifications which are the basis of this report.

The members of the Network participating in the NNDSS are Robert Hall (South Australian Department of Human Services), Tony Watson (Health Department of Western Australia), Jeremy McAnulty (New South Wales Department of Health), Irene Passaris (Australian Capital Territory Department of Health and Community Care), Avner Misrachi and David Coleman (Tasmanian Department of Health and Human Services), Vicki Krause (Territory Health Services), John Carnie (Victorian Department of Human Services) and Linda Selvey (Queensland Health).

References

1. National Health and Medical Research Council. *Surveillance case definitions*. Canberra: National Health and Medical Research Council, 1994.
2. Ponnuthurai A, Hall R and the Communicable Diseases Network - Australia. Annual report of the National Notifiable Diseases Surveillance System, 1991. *Commun Dis Intell* 1992;16:334-346.
3. Hall R and the Communicable Diseases Network - Australia. Annual report of the National Notifiable Diseases Surveillance System, 1992. *Commun Dis Intell* 1993;17:466-487, 502-511.

4. Longbottom H, Evans D, Myint H, Hargreaves J. Annual report of the National Notifiable Diseases Surveillance System, 1993. *Commun Dis Intell* 1994;18:518-548.
5. Hargreaves J, Longbottom H, Myint H *et al.* Annual report of the National Notifiable Diseases Surveillance System, 1994. *Commun Dis Intell* 1995;19:542-574.
6. Herceg A, Oliver G, Myint H, *et al.* Annual report of the National Notifiable Diseases Surveillance System, 1995. *Commun Dis Intell* 1996;20:440-464.
7. Curran M, Harvey B, Crerar S, *et al.* Annual report of the National Notifiable Diseases Surveillance System, 1996. *Commun Dis Intell* 1997;21:281-307.
8. Herceg A. The decline of *Haemophilus influenzae* type b disease in Australia. *Commun Dis Intell* 1997;21:173-176.
9. Dawson D. Tuberculosis in Australia: Bacteriologically confirmed cases and drug resistance, 1994 and 1995. *Commun Dis Intell* 1997;21:245-249.
10. Oliver G and Harvey B. Tuberculosis Notifications in Australia, 1995. *Commun Dis Intell* 1997;21:261-269.
11. National Centre in HIV Epidemiology and Clinical Research. *HIV/AIDS and related diseases In Australia, Annual Surveillance Report*, 1998.
12. MacDonald M, Crofts N and Kaldor J. Transmission of Hepatitis C virus: Rates, Routes and Cofactors. *Epidemiol-Rev* 1996;18:137-148.
13. Vento S, Garofano T , Renzini C et al. Fulminant Hepatitis associated with Hepatitis A virus superinfection in patients with chronic Hepatitis C. *N Engl J Med* 1998; 338: 286-290.
14. Crofts N, Jolley D, Kaldor J et al. Epidemiology of Hepatitis C virus infection among injecting drug users in Australia *J Epidemiol Community Health* 1997 Dec; 51: 692-697.
15. Kaldor JM, Plant JP, Thompson S et al. The incidence of hepatitis B in Australia: an epidemiological review *Med J Aust* 1996; 165: 322-326.
16. Lester R, Carnie J, McLennan L, et al. Salmonella in Victoria, 1997: the story so far. *Commun Dis Inte*l 1997;21:120-121.
17. Sharp JCM and Reilly WJ. Recent trends in foodborne infections in Europe and North America. *British Food Journal* 1994;96:25-34.
18. Public Health Laboratory System Salmonella Committee. The prevention of human transmission of gastrointestinal infections, infestations and bacterial intoxications *Commun Dis Rep* 1995;5:R158-171.
19. NSW Public Health Bulletin January/February 1997, Vol 8, Numbers 1-2, page 1.
20. World Health Organization. International Health Regulations, 1969 Third annotated edition, WHO, Geneva, 1983.
21. Anon, A case of Cholera. *Commun Dis Intell* 1998;22:154.
22. National Health and Medical Research Council. *Surveillance case definitions*. Canberra: National Health and Medical Research Council. 1994.
23. Australian Gonococcal Surveillance Programme. Annual Report of the Australian Gonococcal Surveillance Programme 1997. *Commun Dis Intell* 1998; 21;189-192.
24. Benenson, AS (Ed). Control of Communicable Diseases manual (16th edition). American Public Health Association, Washington DC; 1995.
25. Venerology Society of Victoria. National management guidelines for sexually transmissible diseases and genital infections. VSV, Carlton, Victoria; 1997.
26. Hall R, Notifiable Disease Surveillance, 1917 to 1991 *Commun Dis Intell* 1993;17:226-236.28.
27. Curran M, Hampson A. National Influenza Surveillance, 1997. *Commun Dis Intell* 1998; 22:69-74.
28. National Centre for Disease Control. Communicable diseases surveillance: Measles notifications increasing. *Commun Dis Intell* 1997; 21:338-339.
29. Sullivan A, Boyle RS, Whitby PM. Case report - Vaccine-associated paralytic poliomyelitis. *MJA* 1995; 163:423-424.
30. O'Brien ED, Sam GA, Mead C. Methodology for measuring Australia's childhood immunisation coverage. *Commun Dis Intell* 1998; 22:36-37.
31. National Health and Medical Research Council. The Australian Immunisation Handbook, 6th Ed., 1997.
32. Scheil W, Cameron S, Roberts C, Hall R. Pertussis in South Australia 1893 to 1996. *Commun Dis Intell* 1998; 22:76-80.
33. National Centre for Disease Control. Communicable diseases surveillance: Pertussis epidemic continues. *Commun Dis Intell* 1997; 21:359-360.
34. Andrews R, Herceg A, Roberts C. Pertussis notifications in Australia. *Commun Dis Intell* 1997; 21:145-148.
35. Chan S, Escott R, Dickenson D, Gilbert G. Measles and rubella sero-epidemiology survey of New South Wales, 1997, Australian Society for Microbiology 1998 Annual Scientific Meeting and Exhibition, Hobart, Tasmania, 1998.
36. Tobias M, Christie S, Mansoor O. Predicting the next measles epidemic. *NZ Public Health Rep* 1997; 4:1-3.
37. National Centre for Disease Control. Communicable diseases surveillance: Measles Control Campaign Update. *Commun Dis Intell* 1998; 22:270.
38. D'Souza R, Watson C, Kennett M. Australia's contribution to global polio eradication initiatives, Immunisation Beyond 2000, 6th National Public Health Association Immunisation Conference, Melbourne, 1998.
39. Mackenzie JS, Broom AK, Hall R et al. Arboviruses in the Australian region, 1990 to 1998. *Commun Dis Intell* 1998; 22: 93-100.
40. Hanna JN, Ritchie SA, Merritt AD et al. Two contiguous outbreaks of dengue type 2 in north Queensland. *Med J Aust* 1998; 168: 221-225.
41. Stevenson WJ & Hughes KL. Synopsis of zoonoses in Australia, 1995. AGPS, 1998, vii.
42. Garner MG, Longbottom HM, Cannon RM et al. A review of Q fever in Australia 1991-1994. *Aust N Z J Public Health.* 1997; 21: 722-30.
43. Gilbert GL Brucellosis: continuing risk. *Med J Aust* 1993; 159: 147-48.
44. Robson JM, Harrison MW, Wood RN. Brucellosis: re-emergence and changing epidemiology in Queensland *Med J Aust* 1993; 159: 153-58.
45. Williams J, Tallis G, Dalton C et al. Community outbreak of psittacosis in a rural Australian town *Lancet* 1998; 351: 1697-99.
46. Jenkins DJ, Power K. Human hydatidosis in New South Wales and the Australian Capital Territory, 1987-1992 *Med J Aust* 1996; 164:18-21.
47. Jenkins DJ, Craig NA. The role of foxes *Vulpes vulpes* in the epidemiology of *Echinococcus granulosis* in urban environments. *Med J Aust* 1992;157: 754-56.
48. The Australian Meningococcal Surveillance Programme. Annual report of the Australian meningococcal surveillance programme, 1997. *Commun Dis Intell* 1998; 22:205-210.
49. Gilroy NM, Oliver G, Harvey B. Tuberculosis notifications in Australia, 1996. *Commun Dis Intell* 1998; 22: 173-183.

Communicable Diseases Surveillance

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'.

Vaccine Preventable Diseases

Notifications of all vaccine preventable diseases are lower in this period than for the same period last year. In particular pertussis notifications are lower than those seen in the epidemic of late 1997 and early 1998. A rise in pertussis notifications is seen regularly in spring and, after a small rise in that period of 1998, notifications have fallen to levels which are the lowest since 1992 for this time of the year.

Arboviruses

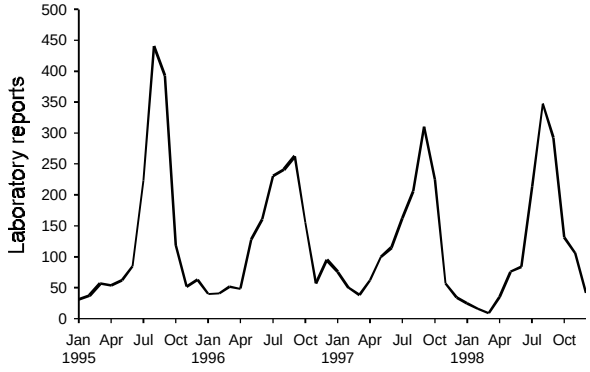
Notifications for Dengue continue to be high with most notifications coming from Queensland. The male to female ratio is 2.25:1.

Ross River virus notifications are high as can be expected in the warmer months of the year, although this period's notifications are considerably higher than for the same period last year. The highest numbers of notifications are in NSW and Qld, the male to female ratio is 1:1.1 and most cases (77%) are in persons in the 20 to 59 year age groups.

Rotavirus

The number of reports of rotavirus continued to decline after peaking in August 1998 (Figure 1); this is characteristic of the annual trend. There were 106 reports received this period. New South Wales received the highest number of laboratory reports (52) followed by South Australia (47). The male to female ratio was 1:1.3, with 86 per cent of reports for children in the 1-4 year age group.

Figure 1. Rotavirus laboratory reports, 1995 to 1998, by month of specimen collection



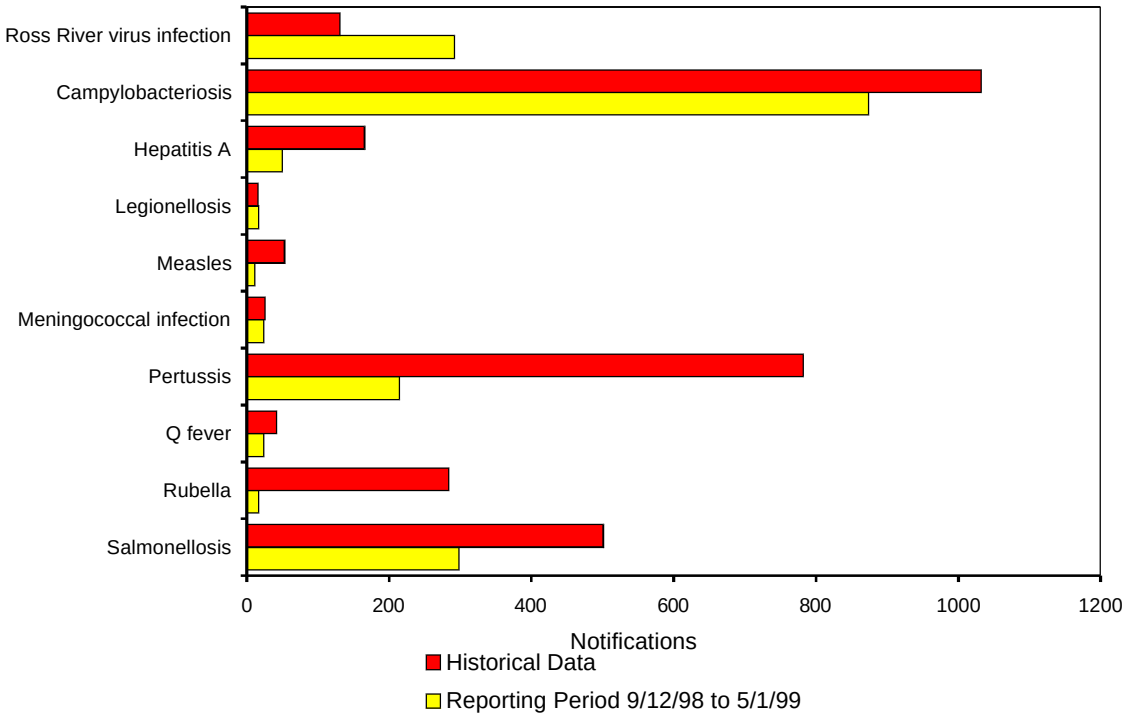
Tables

There were 4,122 notifications to the National Notifiable Diseases Surveillance System (NNDSS) in the four week period, 9 December 1998 to 5 January 1999 (Tables 1 and 2). The numbers of reports for selected diseases have been compared with historical data for corresponding periods in the previous three years (Figure 2).

There were 1,307 reports received by *the* CDI Virology and Serology Laboratory Reporting Scheme (LabVISE) in the four week period, 3 to 30 December 1998 (Tables 3 and 4).

The Australian Sentinel Practice Research Network (ASPREN) data for weeks 44 to 47, ending 29 November 1998, are included in this issue of *CDI* (Table 5).

Figure 2. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



1. The historical data are the averages of the number of notifications in the corresponding 4 week periods of the last 3 years and the 2 week periods immediately preceding and following those.

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 9 December 1998 to 5 January 1999

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1998/99	This period 1997/99	Full year 1998	Full year 1997
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
H. influenzae type b infection	0	0	0	0	0	0	0	0	0	7	33	53
Measles[3]	3	1	0	1	0	1	3	2	11	67	225	852
Mumps	0	1	0	2	0	0	4	4	11	9	176	191
Pertussis	20	58	0	71	20	0	41	5	215	1,237	5,696	10,668
Rubella[4]	0	3	1	4	0	0	6	3	17	56	765	1,446
Tetanus	0	0	0	0	0	0	0	0	0	1	4	8

NN. Not Notifiable

1. No notification of poliomyelitis has been received since 1986.
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. The total number of measles notifications for 1998 has been revised downwards because of a reclassification of 79 cases previously notified as measles by Victoria. These cases have been reclassified as not measles following results of serology.
4. Includes congenital rubella.

Table 2. Notifications of diseases received by State and Territory health authorities in the period 9 December 1998 to 5 January 1999

Disease[1,2,3,4]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1998/99	This period 1997/98	Full year 1998[5]	Full year 1997
Arbovirus infection (NEC)	0	0	0	5	0	0	10	0	15	3	84	18
Barmah Forest virus infection	0	9	0	14	0	0	1	0	24	29	555	704
Brucellosis	0	0	0	2	0	0	0	0	2	4	45	41
Campylobacteriosis[6]	27	-	8	221	234	25	265	94	874	875	13,137	11,848
Chlamydial infection (NEC)7	4	NN	14	223	65	9	3	95	500	534	8,797	9,126
Chancroid	0	0	0	0	0	0	0	0	0	0	1	1
Cholera	0	0	0	0	0	0	0	0	0	0	5	3
Dengue	0	2	1	51	1	0	0	1	56	5	558	210
Donovanosis	0	NN	0	0	NN	0	0	0	0	9	36	45
Gonococcal infection[8]	4	80	31	87	15	0	1	54	272	367	5,274	4,689
Haemolytic uraemic syndrome[9]	NN	0	NN	0	1	0	NN	0	1	1	11	4
Hepatitis A	0	24	0	12	3	0	4	7	50	174	2,420	3,076
Hepatitis B incident	0	1	0	0	0	0	4	0	5	9	228	247
Hepatitis B unspecified[10]	8	98	0	52	0	0	149	12	319	335	6,716	7,114
Hepatitis C incident[11]	1	1	0	-	5	0	1	6	14	9	341	81
Hepatitis C unspecified[5,10]	22	305	16	173	66	28	160	65	835	1,246	19,599	19,689
Hepatitis (NEC)	0	0	0	0	0	0	0	NN	0	1	2	6
Hydatid infection	0	0	0	0	0	0	4	0	4	2	46	61
Legionellosis	1	0	0	0	8	0	7	1	17	16	260	161
Leprosy	0	0	0	0	1	0	0	0	1	3	2	14
Leptospirosis	0	3	0	8	0	0	2	0	13	9	190	126
Listeriosis	0	1	0	0	0	0	3	1	5	3	54	71
Malaria	2	9	0	7	1	3	8	2	32	39	688	746
Meningococcal infection	0	6	0	5	3	0	6	4	24	34	421	499
Ornithosis	0	NN	0	0	0	0	6	0	6	3	56	46
Q Fever	0	7	0	12	0	0	4	1	24	35	578	593
Ross River virus infection	0	104	11	77	23	0	46	31	292	107	3,074	6,683
Salmonellosis (NEC)	3	0	26	111	19	9	85	45	298	389	5,895	7,004
Shigellosis[6]	1	-	4	6	2	0	1	11	25	43	604	799
SLTEC, VTEC[12]	NN	0	NN	NN	2	0	NN	NN	2	3	16	20
Syphilis[13]	0	24	4	73	0	0	0	4	105	91	1,570	1,293
TTP[14]	0	0	0	0	0	0	0	0	0	0	1	0
Tuberculosis	2	9	0	4	6	1	12	5	39	79	829	1,008
Typhoid[15]	0	0	0	1	0	0	2	0	3	6	72	77
Yersiniosis (NEC)[6]	0	-	0	6	4	1	0	0	11	10	208	245

1. Diseases preventable by routine childhood immunisation are presented in Table 1.
2. For HIV and AIDS, see Tables 7 and 8.
3. 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.
4. No notifications have been received during 1998 for the following rare diseases: botulism (foodborne), lymphogranuloma venereum, plague, rabies, yellow fever, or other viral haemorrhagic fevers.
5. Data from Victoria for 1998 are incomplete.
6. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
7. WA: genital only.
8. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
9. Nationally reportable from August 1998.
10. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the numbers of tests being carried out.
11. Includes hepatitis D and E.
12. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC) became nationally reportable in August 1998.
13. Includes congenital syphilis.
14. Thrombotic thrombocytopaenic purpura became nationally reportable in August 1998.
15. NSW, Qld, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

NA Not applicable, as reporting for this condition did not commence until 1998.

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 3 to 30 December 1998, and total reports for the year

	State or Territory[1]								Total this period	Total reported in *CDI* in 1999
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA		
Measles, mumps, rubella										
Measles virus		1			1		1		3	3
Rubella virus				1	3			1	5	5
Hepatitis viruses										
Hepatitis A virus			3		12			7	22	22
Arboviruses										
Ross River virus		1	6		19	1	1	20	48	48
Barmah Forest virus			2					3	5	5
Flavivirus (unspecified)							1		1	1
Adenoviruses										
Adenovirus type 1		1			5		3		9	9
Adenovirus type 2					1		1		2	2
Adenovirus type 3					3		4		7	7
Adenovirus type 4					1				1	1
Adenovirus type 6					3				3	3
Adenovirus type 40								2	2	2
Adenovirus not typed/pending		44			40	1		17	102	102
Herpes viruses										
Cytomegalovirus		2			22		9	2	35	35
Varicella-zoster virus	2	14			46	2	7	22	93	93
Epstein-Barr virus			6		152	1	10	48	217	217
Other DNA viruses										
Contagious pustular dermatitis (Orf virus)								1	1	1
Parvovirus		2			6		4	6	18	18
Picorna virus family										
Coxsackievirus B4					2				2	2
Coxsackievirus B5							1		1	1
Echovirus type 4		2							2	2
Echovirus type 6		2							2	2
Echovirus type 9	1	8			1				10	10
Echovirus type 11	1	12							13	13
Echovirus type 14		1							1	1
Echovirus type 17		1							1	1
Echovirus type 18		7							7	7
Echovirus type 22		6							6	6
Echovirus type 30		10							10	10
Poliovirus type 1 (uncharacterised)		1			1				2	2
Poliovirus type 2 (uncharacterised)		5			1				6	6
Poliovirus type 3 (uncharacterised)		2							2	2
Rhinovirus (all types)	1	28			7		2	5	43	43
Enterovirus not typed/pending		7	2				3	23	35	35
Ortho/paramyxoviruses										
Influenza A virus		54			39		1	1	95	95
Influenza B virus		1			5				6	6
Parainfluenza virus type 1					4				4	4
Parainfluenza virus type 3	1	12			41		3	5	62	62
Respiratory syncytial virus		4			42	1		10	57	57

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 3 to 30 December 1998, and total reports for the year (continued)

	State or Territory[1]								Total this period	Total reported in *CDI* in 1999
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA		
Other RNA viruses										
HTLV-1								1	1	1
Rotavirus		52		1	47	2	1	3	106	106
Norwalk agent							1		1	1
Small virus (like) particle								1	1	1
Other										
Chlamydia trachomatis not typed		12	1		70	2		39	124	124
Chlamydia psittaci							3		3	3
Mycoplasma pneumoniae		3			65		24	4	96	96
Mycoplasma hominis		1							1	1
Coxiella burnetii (Q fever)					1		1	1	3	3
Salmonella species								1	1	1
Bordetella pertussis		4					13	2	19	19
Legionella pneumophila					1				1	1
Legionella longbeachae					7			2	9	9
TOTAL	6	300	20	2	648	10	94	227	1,307	1,307

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.

Table 4. Virology and serology laboratory reports by contributing laboratories for the reporting period 3 to 30 December 1998

State or Territory	Laboratory	Reports
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	230
	New Children's Hospital, Westmead	45
	Royal Prince Alfred Hospital, Camperdown	30
South Australia	Institute of Medical and Veterinary Science, Adelaide	648
Tasmania	Northern Tasmanian Pathology Service, Launceston	6
	Royal Hobart Hospital, Hobart	4
Victoria	Royal Children's Hospital, Melbourne	46
	Victorian Infectious Diseases Reference Laboratory, Fairfield	50
Western Australia	PathCentre Virology, Perth	158
	Western Diagnostic Pathology	90
TOTAL		1,307

Table 5. Australian Sentinel Practice Research Network reports, weeks 44 to 47, 1998

Week number	44		45		46		47	
Week ending on	8 November 1998		15 November 1998		22 November 1998		29 November 1998	
Doctors reporting	53		57		58		53	
Total encounters	6560		7401		6854		6546	
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	17	2.6	9	1.2	16	2.3	14	2.1
Rubella	2	0.3	3	0.4	1	0.1	0	0.0
Measles	0	0.0	0	0.0	0	0.0	0	0.0
Chickenpox	13	2.0	13	1.8	15	2.2	14	2.1
Pertussis	0	0.0	0	0.0	0	0.0	0	0.0
HIV testing (patient initiated)	7	1.1	10	1.4	12	1.8	10	1.5
HIV testing (doctor initiated)	2	0.3	7	0.9	3	0.4	0	0.0
Td (ADT) vaccine	41	6.3	51	6.9	39	5.7	45	6.9
Pertussis vaccination	43	6.6	56	7.6	54	7.9	36	5.5
Reaction to pertussis vaccine	1	0.2	1	0.1	1	0.1	2	0.3
Ross River virus infection	1	0.2	0	0.0	1	0.1	2	0.3
Gastroenteritis	85	13.0	98	13.2	103	15.0	86	13.1

Correction: This table has been reprinted as the columns were misaligned in *CDI* 1998:22;13

No Australian Sentinel Practice Research Network report is available for the current period.

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 1998;22:4-5.

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 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 1998;22:8.

ASPREN currently comprises about 100 general practitioners from throughout the country. Up to 9,000 consultations are reported each week, with special attention to 12 conditions chosen for sentinel surveillance in 1998. CDI reports the consultation rates for all of these. For further information, including case definitions, see CDI 1998;22:5-6.

Additional Reports

Serious Adverse Events Following Vaccination Surveillance Scheme

The Serious Adverse Events Following Vaccination Surveillance Scheme is a national surveillance scheme which monitors the serious adverse events that occur rarely following vaccination. More details of the scheme were published in CDI 1997:21;8.

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 2 September 1998 to 31 January 1999.

There were 320 reports of serious adverse events following vaccination for this reporting period (Table 6). Onset dates were from 1995 to 1998, the majority (92%) being in 1998. Reports were received from Australian Capital Territory (25), New South Wales (38), Northern Territory (9), Queensland (63), South Australia (11), Victoria (43) and Western Australia (131). No reports were received from Tasmania for this period. The majority of reports received from Western Australia were from 1998 (88%).

The most frequently reported events following vaccination were persistent screaming (170 cases, 53%), followed by other reactions (56 cases, 17.5%), temperature of 40.5° C or more (34 cases, 10.6%) and hypotonic/hyporesponsive episodes (38 cases, 11.9%). One death within 30 days of immunisation was reported from Victoria. The cause of death was unclear according to the coroner's report.

Of the 38 reactions associated with MMR vaccine, 37 were since August 1998 when the measles immunisation campaign was initiated. The reports associated with the measles campaign will be published in CDI at a later date.

Forty of the 320 cases were hospitalised. There were 6 cases that had not recovered at the time of reporting while 303 cases had recovered. There was incomplete information on follow-up on 11 cases.

Two hundred and fifty (78%) cases were associated with Diptheria-Tetanus-Pertussis (DTP), vaccine either alone or in combination with other vaccines. Of these, 60 per cent of reports were associated with the first dose of DTP and 28 per cent with the second dose.

Table 6. Adverse events following vaccination reported in the period 2 September 1998 to 31 January 1999

Event	Vaccines: DTP	DTP/Hib	DTP/OPV/Hib	DTP/OPV/MMR	DTP/OPV	DTP/OPV/Hib/ Hep B	MMR	Hep B	Other[1]	Reporting States or Territories[2]	Total reports for this period[2]
Persistent screaming	82	2	73		2	4			6	ACT, NSW, Qld, Vic, WA	170
Hypotonic/hyporesponsive episode	10	2	21			2	1	1	1	ACT, NSW, Qld, Vic, WA	38
Temperature of 40.5°C or more	26		5			1	2			ACT, Qld, WA	34
Convulsions	1	1	3				4		2	ACT, NSW, Qld, SA, Vic, WA	12
Anaphylaxis			1				3			NSW, NT	4
Shock							1	1		NT, Vic	2
Death			1							Vic	1
Other	3	2	6	2			27	6	7	ACT, NSW, NT, Qld, SA, Vic, WA	56
Not stated											
TOTAL	122	7	110	2	2	7	38	8	16		317[3]

1. Includes influenza, DTPa, CDT, OPV, Hepatitis B, pneumococcal, BCG and ADT vaccines and rabies immunoglobulin (HRIG).
2. Includes 1 event for each of the following vaccines: Hib/other (convulsions), OPV/Hib (persistent screaming), Hib, Hep/other, OPV (other).
3. 3 cases have missing events

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, 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.

HIV and AIDS diagnoses and deaths following AIDS reported for 1 to 31 August 1998, as reported to 30 November 1998, are included in this issue of *CDI* (Tables 7 and 8).

Table 7. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 31 August 1998, by sex and State or Territory of diagnosis

										Totals for Australia			
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1998	This period 1997	Year to date 1998	Year to date 1997
HIV diagnoses	Female	0	4	0	1	0	0	2	1	8	6	60	46
	Male	0	25	1	2	0	0	13	2	43	52	425	483
	Sex not reported	0	0	0	0	0	0	0	0	0	0	6	11
	Total[1]	0	29	1	3	0	0	15	3	51	58	491	541
AIDS diagnoses	Female	0	0	0	0	0	0	0	0	0	1	7	20
	Male	0	4	0	2	0	0	3	0	9	31	120	217
	Total[1]	0	4	0	2	0	0	3	0	9	32	127	237
AIDS deaths	Female	0	0	0	1	0	0	0	0	1	0	6	9
	Male	0	2	0	0	1	0	3	0	6	19	64	160
	Total[1]	0	2	0	1	1	0	3	0	7	19	70	170

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

Table 8. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 31 August 1998, by sex and State or Territory

		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
HIV diagnoses	Female	22	563	7	131	54	4	197	95	1,073
	Male	183	10,396	99	1,841	637	77	3,699	866	17,798
	Sex not reported	0	259	0	0	0	0	24	0	283
	Total[1]	205	11,237	106	1,978	691	81	3,933	964	19,195
AIDS diagnoses	Female	8	160	0	45	20	2	64	23	322
	Male	82	4,392	32	768	323	41	1,554	337	7,529
	Total[1]	90	4,563	32	815	343	43	1,625	362	7,873
AIDS deaths	Female	2	113	0	29	15	2	46	16	223
	Male	62	3,063	23	533	220	27	1,216	241	5,385
	Total[1]	64	3,183	23	564	235	29	1,268	258	5,624

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

Childhood Immunisation Coverage

Tables 9 and 10 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 July and 30 September 1997 and at 24 months of age for the cohort born between 1 July and 30 September 1996, according to the Australian Standard Vaccination Schedule (Tables 9 and 10).

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

Table 9. Percentage of children immunised at 1 year of age, preliminary results by disease and State for the birth cohort 1 July to 30 September 1997; assessment date 30 September 1998.

	State or Territory								
Vaccine	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Total number of children	1,055	22,820	889	12,522	4,771	1,610	15,738	6,438	65,843
DTP (%)	89.1	84.5	80.1	88.3	87.5	85.8	86.9	85.4	86.1
OPV (%)	89.5	84.2	79.3	87.2	87.6	86.1	87.1	85.4	85.9
Hib (%)	89.0	83.8	83.2	88.6	87.5	85.8	86.8	85.4	86.0
Fully Immunised (%)	88.6	82.5	75.3	85.9	86.6	85.1	86.0	84.3	84.5
Change in fully immunised since last quarter (%)	+3.6	+0.2	-0.7	+0.1	+1.3	-1.1	-0.2	+1.1	+0.2

Table 10. Proportion of children immunised at 2 years of age, preliminary results by disease and State for the birth cohort 1 July to 30 September 1996; assessment date 30 September 1998.[1]

	State or Territory								
Vaccine	ACT	NSW	NT[1]	Qld	SA	Tas	Vic	WA	Australia
Total number of children	1,135	22,836	929	12,623	4,864	1,753	15,987	6,624	66,751
DTP (%)	82.2	79.3	66.3	84.0	80.6	78.7	80.4	77.6	80.2
OPV (%)	87.4	83.3	77.1	89.1	85.7	85.9	86.6	79.1	85.0
Hib (%)	80.4	79.4	71.6	84.0	80.8	79.2	80.7	77.9	80.4
MMR (%)	85.9	83.0	77.4	89.5	83.9	84.8	86.9	80.6	85.0
Fully Immunised (%)[2]	75.4	66.8	54.8	75.9	67.2	67.7	70.0	61.6	68.8
Change in fully immunised since last quarter (%)	+5.7	+3.0	+4.1	+3.1	+1.6	+0.7	+2.3	+2.4	+2.7

1. The 12 months age data for this cohort was published in *CDI* 1998;22:123.
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 6203 6185.

Sentinel Chicken Surveillance Programme

Sentinel chicken flocks are used to monitor flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin which cause the potentially fatal disease Australian encephalitis in humans. Currently 26 flocks are maintained in the north of Western Australia, seven in the Northern Territory, nine in New South Wales and ten in Victoria. The flocks in Western Australia and the Northern Territory are tested year round but those in New South Wales and Victoria are tested only from November to March, during the main risk season.

Results are coordinated by the Arbovirus Laboratory in Perth and reported bimonthly. For more information see CDI 1998;22:7

AK Broom,[1] J Azuolas,[2] JS Mackenzie,[3] L Melville,[4] DW Smith[5] and PI Whelan[6]

1. Department of Microbiology, The University of Western Australia
2. Veterinary Research Institute, Victoria
3. Department of Microbiology, The University of Queensland
4. Berrimah Agricultural Research Centre, Northern Territory
5. PathCentre, Western Australia
6. Department of Health and Community Services, Northern Territory

NOVEMBER-DECEMBER 1998

Sentinel chicken serology was carried out for 24 of the 27 flocks in Western Australia in November and December 1998. There were no seroconversions to flaviviruses recorded during this period.

Serum samples from 5 of the 7 Northern Territory sentinel chicken flocks were tested in our laboratory in October and November 1998. Samples from four flocks were tested in December 1998. There were no seroconversions to flaviviruses recorded during this period.

The sentinel chicken programme in Victoria commenced at the beginning of November 1998. There were no seroconversions to flaviviruses recorded in November or December 1998.

*Details of the locations of all chicken flocks are given in *CDI* **22**(1): 7-8.(1998).

Overseas briefs

Source: World Health Organization (WHO)
This material has been condensed from information on the WHO internet site. A link to this site can be found under 'Related sites' on the CDI homepage.

Influenza in China

According to analysis performed at the China National Influenza Centre, Chinese Academy of Preventive Medicine, the strain currently circulating in the country is similar to the influenza A(H3N2) Sydney strain which was circulating at the end of the season in 1998, and which is covered in the current recommended vaccine. Further characterization of the isolates will be carried out at the WHO collaborating laboratory at the Centers for Disease Control and Prevention (United States). Detailed analysis of the viruses is expected to be completed within 2-3 weeks.

Meningococcal meningitis in Sudan

An outbreak of meningococcal meningitis has been reported in the Northern Darfur region. The first cases were reported on 12 December 1998, and the total of 126 for December 1998 is 5 times higher than the number reported for the same month in 1997. Cases have continued to be reported at an increasing rate, reaching a total of 169 by 6 January. Over 20 deaths have been reported.

The organism has been identified as *Neisseria meningitidis* serogroup A, and tests indicate that it is sensitive to first-line antibiotics. Sudan lies in the so-called meningitis belt of sub-Saharan Africa. A large epidemic last occurred in 1988-1989, with over 40 000 cases and 7 500 deaths.

WHO is sending a team to assist with the assessment of the epidemiological situation and needs. Other international partners, such as UNICEF, *Médecins sans frontières* and the International Federation of Red Cross and Red Crescent Societies, are also making plans to support control of the outbreak.

Cholera, Mozambique (update)

Mozambique, where cholera is endemic, has been suffering an ongoing epidemic since August 1997. At the end of July 1998, the total number of cases officially reported to WHO was 26 738 with 619 deaths. Although the national cholera committee of the Ministry of Health made every effort to ensure epidemic preparedness in the northern provinces of Cabo Delgabo and Nampula which were not yet affected, cholera has been reported in these provinces, with a major increase in cases since November 1998. The neighbouring provinces of Niassa, Tete and Zambezia have also started to report cholera cases. At mid-December 1998, the cumulative figures were 34 621 cases and 985 deaths. The disease has spread rapidly to several districts, and the situation remains critical.

Yellow fever in Burkina Faso

Two yellow fever cases have been reported in Burkina Faso, one of which has been confirmed. Both cases occurred in a village in Batie District, Gaoua Region in the south of the country near the border with Côte d'Ivoire. The cases were one adult male of 35 years and a 14 year old boy of the same family. The adult case had onset on 18 November and died on 24 November before a blood sample could be taken. The boy had onset on 29 November, was hospitalized on 4 December and is now improving. The *Centre Muraz* in Bobo Dioulasso tested serum from the boy and reported that it was positive for IgM yellow fever antibody. The Ministry of Health has a stock of approximately 200,000 doses of yellow fever vaccine, of which 30,000 have been sent to the region for an emergency vaccination campaign.Yellow fever was last reported in Burkina Faso in the early 1980's when a large outbreak occurred in 1983.

Editorial and Production Staff

Rennie D'Souza, Nicole Gilroy, Alison Milton, Kim Moser, Eddie O'Brien

Acknowledgement

Claire Caesar, Cathy Mead, for comments on the manuscript.

CDI is produced every four weeks by the National Centre for Disease Control, Department of Health and Aged Care, GPO Box 9848, Canberra ACT 2601; Fax: (02) 6289 7791, Phone: (02) 6289 7240; email: cdi.editor@health.gov.au.

This journal is indexed by *Index Medicus* and Medline.

Subscriptions

Canberra Mailing, PO Box 650, Fyshwick ACT 2609, Fax (02) 6269 1212

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 refereering process. Instructions to authors can be found in *CDI* 1998;22:11.