Australia's notifiable diseases status, 2002

Annual report of the National Notifiable Diseases Surveillance System

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Communicable Diseases Network Australia and subcommittees

Australian Childhood Immunisation Register

Australian Gonococcal Surveillance Programme

Australian Meningococcal Surveillance Programme

Australian Sentinel Practice Research Network

Australian Quarantine Inspection Service

National Centre in HIV Epidemiology and Clinical Research

National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases

National Enteric Pathogens Surveillance Scheme

National Rotavirus Research Centre

Sentinel Chicken Surveillance Programme

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Abstract

There were 57 infectious diseases notifiable at the national level in Australia in 2002. States and territories reported 100,278 cases of infectious diseases to the National Notifiable Diseases Surveillance System (NNDSS), a fall of 4 per cent compared to the number of notifications in 2001. In 2002, the most frequently notified diseases were, sexually transmitted infections (31,929 reports, 32% of total notifications), gastrointestinal infections (26,708 reports, 27% of total notifications) and bloodborne infections (23,741, 24%). There were 11,711 (12% of total) cases of vaccine preventable diseases, 3,052 (3% of total) cases of vectorborne diseases, 1,155 (1% of total) cases of zoonotic infections, two cases of quarantinable diseases (*Vibrio cholerae* O1) and 1,980 cases of other bacterial diseases, notified to NNDSS. Compared to 2001, notifications of sexually transmitted infections increased by 16 per cent and gastrointestinal infections by 2 per cent while bloodborne infections fell by 18 per cent. The number of notifications of chlamydial infection and Q fever were the highest since 1991 and 1995 respectively. By contrast, the number of notification for hepatitis A and measles were the lowest since 1991. For other notifiable diseases, the number of notifications was within the range of the five years between 1997 and 2002 (range = five-year mean plus or minus two standard deviations). This report also includes 2002 summary data on communicable diseases from other surveillance systems including the Laboratory Virology and Serology Reporting Scheme and sentinel general practitioner schemes. *Commun Dis Intell* 2004;28:6–68.

Keywords: communicable diseases, epidemiology, surveillance

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Maps

Abbreviations used in this report

ABL	Australian bat lyssavirus
ACIR	Australian Childhood Immunisation Register
AIDS	Acquired immune deficiency syndrome
ASPREN	Australian Sentinel Practice Research Network
BF	Barmah Forest virus
CDI	Communicable Diseases Intelligence
CDNA	Communicable Diseases Network Australia
DoHA	Australian Government Department of Health and Ageing
Hib	*Haemophilus influenzae* type b
HIV	Human immunodeficiency virus
HUS	Haemolytic uraemic syndrome
ICD10-AM	International Classification of Diseases, version 10, Australian Modification
IPD	Invasive pneumococcal disease
JE	Japanese encephalitis virus
LabVISE	Laboratory Virology and Serology Reporting Scheme
MVE	Murray Valley encephalitis virus
NNDSS	National Notifiable Diseases Surveillance System
NCHECR	National Centre in HIV Epidemiology and Clinical Research
NCIRS	National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases
NEC	Not elsewhere classified
NHMRC	National Health and Medical Research Council
NN	Not notifiable
PCR	Polymerase chain reaction
RR	Ross River virus
SD(s)	Statistical Division(s)
SLTEC	Shiga-like toxin producing *Escherichia coli*
STI(s)	Sexually transmitted infection(s)
TB	Tuberculosis
VPD(s)	Vaccine preventable disease(s)
VTEC	Verotoxigenic *Escherichia coli*
WHO	World Health Organization

Introduction

Surveillance of communicable diseases is vital to the control of communicable diseases, to identify and assess the relative burden of diseases and to monitor trends over time. It is also required for the guidance of policy making.

Communicable disease surveillance in Australia exists at the national, state and local levels. Primary responsibility for public health action lies with the state and territory health departments and with local health authorities.

The role of communicable disease surveillance at a national level includes:

- identifying national trends;
- guidance for policy development at a national level and resource allocation;
- monitoring the need for and impact of national disease control programs;
- coordination of response to national or multi-jurisdictional outbreaks;
- description of the epidemiology of rare diseases, that occur infrequently at state and territory levels;
- meeting various international reporting requirements, such as providing disease statistics to the World Health Organization (WHO), and;
- support for quarantine activities, which are the responsibility of the national government.

Methods

Australia is a federation of six states (New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia) and two territories (the Australian Capital Territory and the Northern Territory). State and territory health departments collect notifications of communicable diseases under their public health legislation. The Australian Government Department of Health and Ageing (DoHA) does not have any legislated responsibility for public health apart from human quarantine. States and territories have agreed to forward data on a nationally agreed set of communicable diseases to DoHA for the purposes of national communicable disease surveillance.

Fifty-five communicable diseases (Table 1) agreed upon nationally through the Communicable Diseases Network Australia (CDNA) are reported to the National Notifiable Diseases Surveillance System (NNDSS). The system is complemented by other surveillance systems, which provide information on various diseases, including some that are not reported to NNDSS.

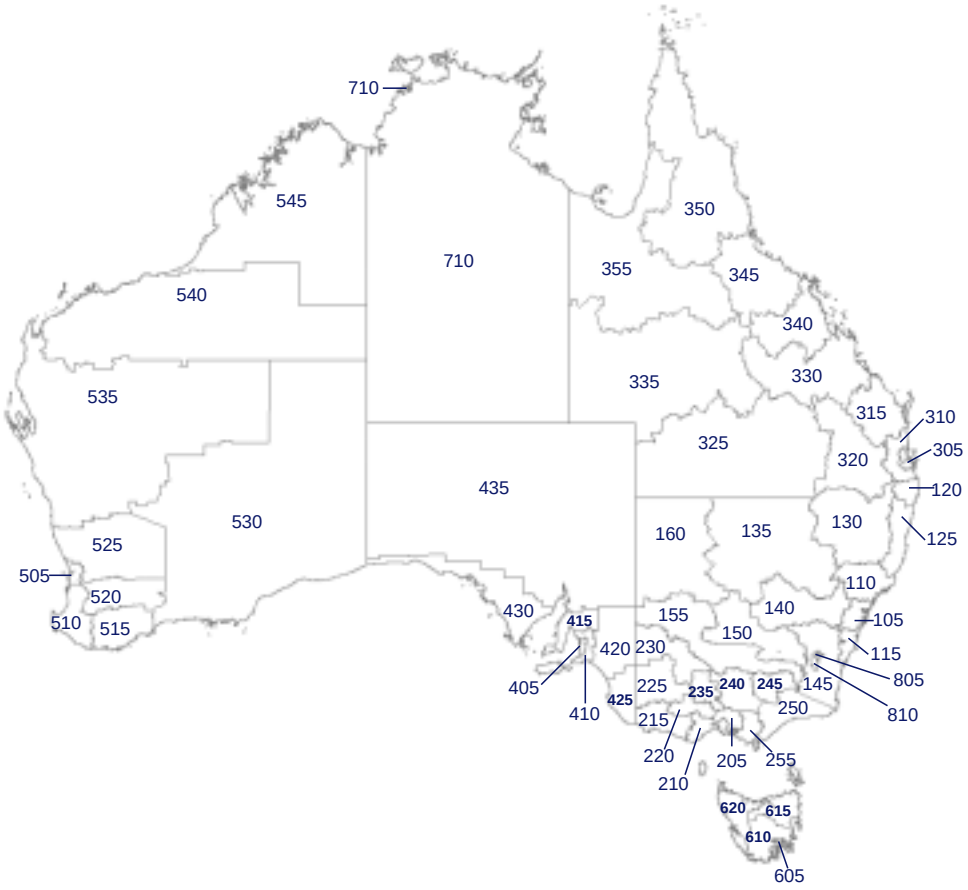
The national dataset included fields for unique record reference number; notifying state or territory; disease code; age; sex; Indigenous status; postcode of residence; date of onset of the disease; and date of report to the state or territory health department. Additional information was available on the species and serogroups isolated in cases of salmonellosis, legionellosis, meningococcal disease and malaria, and on the vaccination status in cases of childhood vaccine preventable diseases. While not included in the national dataset, additional information concerning mortality and specific health risk factors for some diseases was obtained from states and territories. The Australian Institute of Health and Welfare supplied hospital admission data for the financial year 2001–02.

Notification rates for each notifiable disease were calculated using 2002 mid-year resident population supplied by the Australian Bureau of Statistics (Appendix 1). Where diseases were not notifiable in a state or territory, adjusted rates were calculated by excluding the population of that jurisdiction from the denominator. As in previous years, we report age-standardised notification rates of sexually transmitted infections (STIs) in Indigenous and non-Indigenous Australians based on data from the Northern Territory, South Australia and Western Australia.

The geographical distribution of selected diseases was mapped using MapInfo software. Maps were based on the postcode of residence of each patient aggregated to the appropriate Statistical Division (Map 1). Rates for the different Statistical Divisions were ordered into six groups — the highest value, the lowest value above zero, those equal to zero, and the intermediate values sorted into three equal-sized groups. The two Statistical Divisions that make up the Australian Capital Territory and the Northern Territory were combined to calculate rates for each territory as a whole.

Information from communicable disease surveillance is disseminated through several avenues of communication. Fortnightly teleconferences of the Communicable Diseases Network Australia provide the most up-to-date information on topics of immediate interest. The *Communicable Diseases Intelligence* (*CDI*) quarterly journal publishes surveillance data and reports of research studies on the epidemiology and control of various communicable diseases. The Communicable Diseases Australia website publishes disease surveillance summaries from the NNDSS. The annual report of the NNDSS, *Australia's notifiable diseases status*, provides yearly summaries of notifications.

Map 1. Australian Bureau of Statistics Statistical Divisions, and population by Statistical Division



Statistical Division		Population
Australian Capital Territory		
805	Canberra	321,441
810	ACT – balance	378
New South Wales		
105	Sydney	4,170,927
110	Hunter	595,030
115	Illawarra	405,007
120	Richmond-Tweed	219,034
125	Mid-North Coast	284,513
130	Northern	180,449
135	North Western	119,624
140	Central West	178,586
145	South Eastern	195,898
150	Murrumbidgee	153,045
155	Murray	114,064
160	Far West	24,178
Northern Territory		
705	Darwin	107,373
710	NT – balance	90,640
Queensland		
305	Brisbane	1,689,100
310	Moreton	747,364
315	Wide Bay-Burnett	239,746

Statistical Division		Population
Queensland continued		
320	Darling Downs	212,942
325	South West	26,987
330	Fitzroy	183,515
335	Central West	12,550
340	Mackay	139,647
345	Northern	193,964
350	Far North	227,309
355	North West	34,051
South Australia		
405	Adelaide	1,114,285
410	Outer Adelaide	116,312
415	York & Lower North	44,542
420	Murray Lands	68,634
425	South East	62,780
430	Eyre	34,215
435	Northern	79,474
Tasmania		
605	Greater Hobart	198,026
610	Southern	34,687
615	Northern	133,595
620	Mersey-Lyell	106,417
910	*Other Territories*	2,592

Statistical Division		Population
Victoria		
205	Melbourne	3,524,103
210	Barwon	259,549
215	Western District	100,894
220	Central Highlands	143,179
225	Wimmera	51,364
230	Mallee	91,170
235	Loddon-Campaspe	169,088
240	Goulburn	196,545
245	Ovens-Murray	94,264
250	East Gippsland	81,178
255	Gippsland	161,204
Western Australia		
505	Perth	1,413,651
510	South West	198,968
515	Lower Great Southern	53,794
520	Upper Great Southern	18,723
525	Midlands	53,559
530	South Eastern	54,855
535	Central	60,626
540	Pilbara	39,441
545	Kimberley	33,705
Total Australia		19,662,781

Notes on interpretation

The present report is based on 2002 'finalised' annual data from each state and territory. States and territories transmitted data to DoHA each fortnight and the final dataset for the year was agreed upon in July 2003. The finalised annual dataset represents a snap shot of the year after duplicate records and incorrect or incomplete data have been removed. Therefore, totals in this report may vary slightly from the totals reported in *CDI* quarterly publications.

Analyses in this report were based on the date of disease onset in an attempt to estimate disease activity within the reporting period. Where the date of onset was not known however, the date of presentation to a medical practitioner or date of specimen collection, whichever was earliest, was used. As considerable time may have lapsed between onset and report dates for hepatitis B (unspecified) and hepatitis C (unspecified) notifications, these were analysed by report date.

Under-reporting is an important factor that should be considered when interpreting NNDSS data. Figure 1 shows the steps necessary for an episode of illness in the population to reach the NNDSS. Each step contributes to under-reporting resulting in only a proportion of notifiable diseases reaching the surveillance system. Due to under-reporting, notified cases can only represent a proportion (the 'notified fraction') of the total incidence. Moreover, the notified fraction varies by disease, by jurisdiction and by time.

Methods of surveillance can vary between states and territories, each with different requirements for notification by medical practitioners, laboratories and hospitals. Some diseases were not notifiable in some jurisdictions (Table 1). The case definitions for surveillance vary among jurisdictions. In addition, changes to surveillance practices may be introduced in some jurisdictions and not in others, making comparison of data across jurisdictions difficult. To inform the interpretation of data in this report, states and territories were asked to report any changes in surveillance practices including changes in case definition, screening practices, laboratory practices, and major disease control or prevention initiatives undertaken in 2002.

Postcode information usually reflects the residential location of the case, but this does not necessarily represent the place where the disease was acquired. As no personal identifiers are collected in NNDSS, duplication in reporting may occur if patients move from one jurisdiction to another and were notified in both.

The completeness of data in this report is summarised in Appendix 2. The patient's sex was not stated in 0.5 per cent of notifications (n=468) and patient's age was not stated in 2.3 per cent of notifications (n=3,268). Indigenous status was reported for 41.9 per cent (n=54,243) of notifications nationally. The proportion of reports with missing data in these fields varied by state and territory and by disease.

Figure 1. Communicable diseases notification fraction

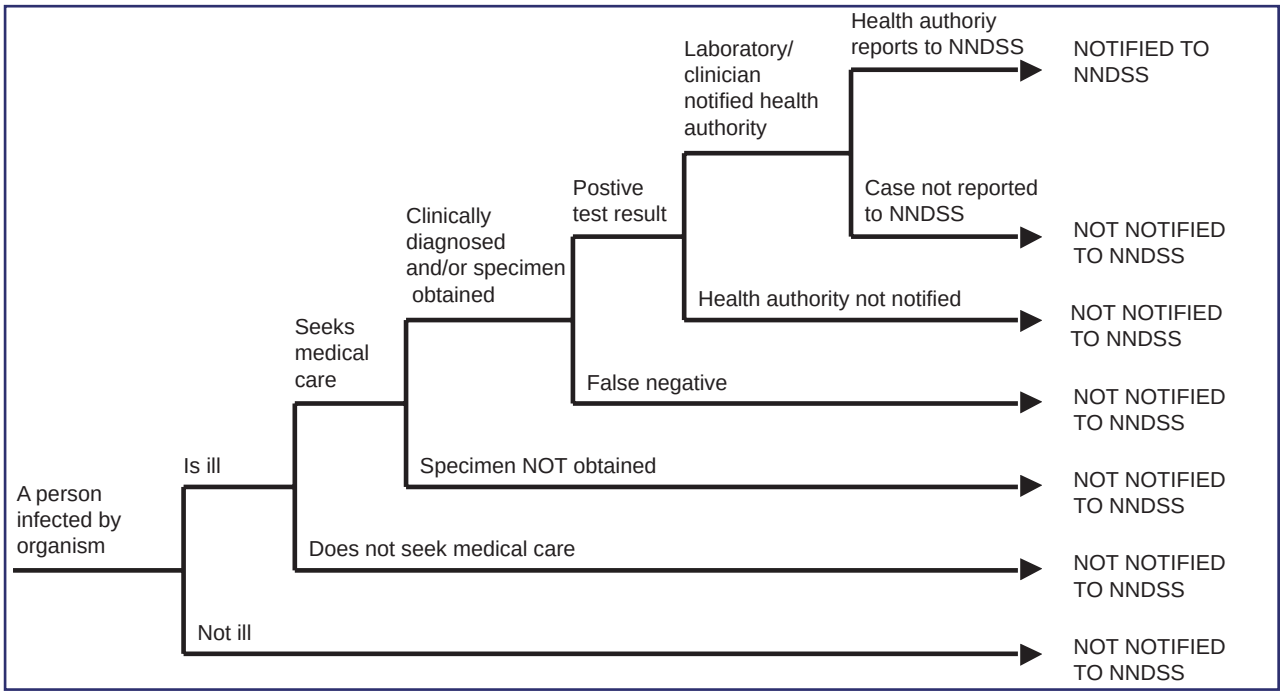


Table 1. Diseases notified to the National Notifiable Diseases Surveillance System, Australia, 2002*

Disease group	Disease	Reported by
Bloodborne diseases	Hepatitis B (incident)	All jurisdictions
	Hepatitis B (unspecified)	All jurisdiction, except NT
	Hepatitis C (incident)	All jurisdictions except Qld
	Hepatitis C (unspecified)	All jurisdictions
	Hepatitis D	All jurisdictions
	Hepatitis (NEC)	All jurisdictions
Gastrointestinal diseases	Botulism	All jurisdictions
	Campylobacteriosis	All jurisdictions except NSW
	Cryptosporidiosis	All jurisdictions
	Haemolytic uraemic syndrome	All jurisdictions
	Hepatitis A	All jurisdictions
	Hepatitis E	All jurisdictions
	Listeriosis	All jurisdictions
	Salmonellosis	All jurisdictions
	Shigellosis	All jurisdictions
	SLTEC, VTEC	All jurisdictions
	Typhoid	All jurisdictions
Quarantinable diseases	Cholera	All jurisdictions
	Plague	All jurisdictions
	Rabies	All jurisdictions
	Viral haemorrhagic fever	All jurisdictions
	Yellow fever	All jurisdictions
Sexually transmitted infections	Chlamydial infection	All jurisdictions
	Donovanosis	All jurisdictions
	Gonococcal infection	All jurisdictions
	Syphilis	All jurisdictions
Vaccine preventable diseases	Diphtheria	All jurisdictions
	Haemophilus influenzae type b	All jurisdictions
	Invasive pneumococcal disease	All jurisdictions
	Laboratory-confirmed influenza	All jurisdictions
	Measles	All jurisdictions
	Mumps	All jurisdictions
	Pertussis	All jurisdictions
	Poliomyelitis	All jurisdictions
	Rubella	All jurisdictions
	Tetanus	All jurisdictions
Vectorborne diseases	Arbovirus infection NEC	All jurisdictions
	Barmah Forest virus infection	All jurisdictions
	Dengue	All jurisdictions
	Japanese encephalitis	All jurisdictions
	Kunjin virus infection	All jurisdictions except ACT†
	Malaria	All jurisdictions
	Murray Valley encephalitis	All jurisdictions†
	Ross River virus infection	All jurisdictions

Table 1. Diseases notified to the National Notifiable Diseases Surveillance System, Australia, 2002,* continued

Disease group	Disease	Reported by
Zoonoses	Anthrax	All jurisdictions
	Australian bat lyssavirus	All jurisdictions
	Brucellosis	All jurisdictions
	Leptospirosis	All jurisdictions
	Ornithosis	All jurisdictions
	Other lyssaviruses (NEC)	All jurisdictions
	Q fever	All jurisdictions
Other bacterial infections	Invasive meningococcal infection	All jurisdictions
	Legionellosis	All jurisdictions
	Leprosy	All jurisdictions
	Tuberculosis	All jurisdictions

* Jurisdictions may not yet have been reporting a disease either because legislation had not yet made that disease notifiable in that jurisdiction, or because notification data for that disease were not yet being reported.

† In the Australian Capital Territory, infections with Murray Valley encephalitis virus and Kunjin virus are combined under Murray Valley encephalitis.

NEC Not elsewhere classified.

Discussions and comments of CDNA members and state and territory epidemiologists have informed the present report and their contribution to the accuracy of these data is gratefully acknowledged.

Results

Summary of 2002 data

There were 100,278 communicable disease notifications received by NNDSS in 2002 (Table 2). Notification rates per 100,000 population for each disease by state or territory are shown in Table 3. Trends in notifications and rates per 100,000 population for the period 1998 to 2002 are shown in Table 4.

During 2001 nine diseases were added to the list of nationally notifiable diseases while four were removed. Although the first full-year of notifications of the newly added diseases was received in 2002, the total number of notifications was lower by 4 per cent than in 2001 (Figure 2).

In 2002, sexually transmitted infections were the most frequently notified diseases (31,929 reports, 32% of total notifications) followed by gastrointestinal diseases (26,708 reports, 27% of total notifications) and bloodborne diseases (23,741, 24%) (Figure 3). By contrast, in 2001, bloodborne diseases were the most frequently notified diseases.

Figure 2. Trends in notifications received by the National Notifiable Diseases Surveillance System, Australia, 1991 to 2002

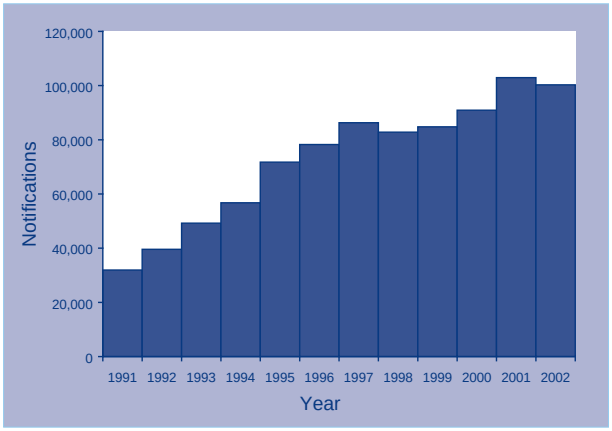
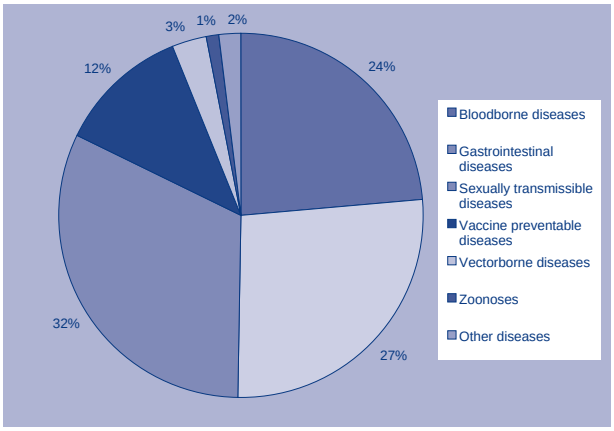


Figure 3. Notifications to the National Notifiable Diseases Surveillance System, Australia, 2002, by disease category*



* Excluding quarantinable diseases (n=5)

Table 2. Notifications of communicable diseases, Australia, 2002, by state or territory

Disease	State or territory								Aust
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	
Bloodborne diseases									
Hepatitis B (incident)	0	84	10	54	11	19	175	35	390
Hepatitis B (unspecified)†,‡	82	3,492	NN	742	267	40	1,891	402	6,916
Hepatitis C (incident)	6	149	NN	NN	42	15	87	135	434
Hepatitis C (unspecified)†,‡,§	226	6,675	193	2,699	641	381	4,092	1,074	15,981
Hepatitis D	0	10	0	1	0	0	9	0	20
Hepatitis (NEC)	0	0	0	0	0	0	0	0	0
Gastrointestinal diseases									
Botulism	0	0	0	0	0	0	0	0	0
Campylobacteriosis‖	356	NN	208	3,885	2,441	606	5,020	2,089	14,605
Cryptosporidiosis	36	303	217	2,026	121	47	290	215	3,255
Haemolytic uraemic syndrome	0	7	1	1	0	0	4	0	13
Hepatitis A	4	146	47	68	15	4	74	30	388
Hepatitis E	1	6	0	1	0	2	2	0	12
Listeriosis	0	11	0	20	2	2	13	11	59
Salmonellosis (NEC)	92	2,036	330	2,673	504	165	1,251	705	7,756
Shigellosis	0	83	103	93	25	1	67	124	496
SLTEC, VTEC¶	0	0	0	5	37	0	5	4	51
Typhoid	1	24	0	12	4	0	22	10	73
Quarantinable diseases									
Cholera	0	1	0	0	0	0	1	0	2
Plague	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0
Viral haemorrhagic fever	0	0	0	0	0	0	0	0	0
Yellow fever	0	0	0	0	0	0	0	0	0
Sexually transmissible diseases									
Chlamydial infection (NEC)	460	5,527	1,451	6,449	1,741	478	4,972	2,961	24,039
Donovanosis	0	0	9	5	0	0	0	2	16
Gonococcal infection**	15	1,400	1,530	935	192	14	820	1,341	6,247
Syphilis††	12	625	414	341	31	16	27	161	1,627
Vaccine preventable diseases									
Diphtheria	0	0	0	0	0	0	0	0	0
Haemophilus influenzae type b	0	10	3	6	2	0	2	6	29
Invasive pneumococcal disease	30	841	65	437	174	63	454	207	2,271
Laboratory-confirmed influenza	19	1,002	56	1,153	289	5	598	543	3,665
Measles	0	8	0	8	1	0	14	0	31
Mumps	0	29	1	6	10	0	10	13	69
Pertussis	50	1,863	37	1,852	453	41	884	208	5,388
Poliomyelitis	0	0	0	0	0	0	0	0	0
Rubella‡‡	3	35	1	190	5	1	16	4	255
Tetanus	0	0	0	2	0	0	0	1	3

Table 2. Notifications of communicable diseases, Australia, 2002, by state or territory, *continued*

Disease	State or territory								Aust
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	
Vectorborne diseases									
Arbovirus infection (NEC)	0	15	0	5	0	0	2	0	22
Barmah Forest virus infection	0	389	23	388	3	0	57	36	896
Dengue	3	66	32	81	7	1	11	18	219
Japanese encephalitis	0	0	0	0	0	0	0	0	0
Kunjin virus infection	NN	0	0	0	0	0	0	0	0
Malaria	13	104	24	205	14	16	64	26	466
Murray Valley encephalitis	0	0	0	0	0	0	0	2	2
Ross River virus infection	0	178	63	887	41	117	38	123	1,447
Zoonoses									
Anthrax	0	0	0	0	0	0	0	0	0
Australian bat lyssavirus	0	0	0	0	0	0	0	0	0
Brucellosis	0	2	0	35	0	0	2	1	40
Leptospirosis	0	36	3	91	2	2	18	3	155
Ornithosis	0	143	2	3	3	1	42	5	199
Other lyssavirus (NEC)	0	0	0	0	0	0	0	0	0
Q fever	0	292	1	339	27	0	83	19	761
Other bacterial infections									
Invasive meningococcal infection	6	213	9	123	31	26	210	66	684
Legionellosis	3	42	1	44	66	0	107	55	318
Leprosy	0	0	1	0	0	0	1	1	3
Tuberculosis	15	433	38	122	39	10	270	48	975
Total	1,433	26,280	4,873	25,991	7,241	2,073	21,705	10,684	100,278

* Analyses in this report were based on date of onset, (except for hepatitis B and hepatitis C unspecified, where date of report of disease was used). Where the date of onset was not available the earliest date of the date of specimen collection or the date of report by the notifying agent, was used.

† Unspecified hepatitis includes cases with hepatitis in whom the duration of illness cannot be determined.

‡ The analysis was performed by report date.

§ Includes hepatitis C incident in Northern Territory and Queensland.

‖ Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

¶ Infections with Shiga-like toxin (verotoxin) producing *Escherichia coli* (SLTEC/VTEC).

** Northern Territory, Queensland, South Australia, Victoria and Western Australia: includes gonococcal neonatal ophthalmia.

†† Includes 14 cases of congenital syphilis, one from New South Wales and 13 from the Northern Territory.

‡‡ Includes congenital rubella.

NN Not notifiable.

NEC Not elsewhere classified.

Table 3. Notification rates of communicable diseases, Australia, 2002, by state or territory (per 100,000 population)

Disease	State or territory								Aust
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	
Bloodborne diseases									
Hepatitis B (incident)	0.0	1.3	5.1	1.5	0.7	4.0	3.6	1.8	2.0
Hepatitis B (unspecified)†,‡	25.5	52.6	NN	20.0	17.6	8.5	38.8	20.9	35.5
Hepatitis C (incident)	1.9	2.2	NN	NN	2.8	3.2	1.8	7.0	2.8
Hepatitis C (unspecified)†,‡,§	70.2	100.5	97.5	72.8	42.2	80.6	84.0	55.7	81.3
Hepatitis D	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Hepatitis (NEC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gastrointestinal diseases									
Botulism	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Campylobacteriosis‖	110.6	NN	105.0	104.8	160.6	128.2	103.0	108.4	112.2
Cryptosporidiosis	11.2	4.6	109.6	54.7	8.0	9.9	6.0	11.2	16.6
Haemolytic uraemic syndrome	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.0	0.1
Hepatitis A	1.2	2.2	23.7	1.8	1.0	0.8	1.5	1.6	2.0
Hepatitis E	0.3	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.1
Listeriosis	0.0	0.2	0.0	0.5	0.1	0.4	0.3	0.6	0.3
Salmonellosis (NEC)	28.6	30.7	166.7	72.1	33.2	34.9	25.7	36.6	39.4
Shigellosis	0.0	1.2	52.0	2.5	1.6	0.2	1.4	6.4	2.5
SLTEC, VTEC¶	0.0	0.0	0.0	0.1	2.4	0.0	0.1	0.2	0.3
Typhoid	0.3	0.4	0.0	0.3	0.3	0.0	0.5	0.5	0.4
Quarantinable diseases									
Cholera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plague	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Viral haemorrhagic fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sexually transmissible diseases									
Chlamydial infection (NEC)	142.9	83.2	732.8	174.0	114.5	101.1	102.0	153.9	122.3
Donovanosis	0.0	0.0	4.5	0.1	0.0	0.0	0.0	0.1	0.1
Gonococcal infection**	4.7	21.1	772.7	25.2	12.6	3.0	16.8	69.6	31.8
Syphilis††	3.7	9.4	209.1	9.2	2.0	3.4	0.6	8.4	8.3
Vaccine preventable diseases									
Diphtheria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haemophilus influenzae type b	0.0	0.2	1.5	0.2	0.1	0.0	0.0	0.3	0.1
Invasive pneumococcal disease	9.3	12.7	32.8	11.8	11.4	13.3	9.3	10.7	11.5
Laboratory-confirmed influenza	5.9	15.1	28.3	31.1	19.0	1.1	12.3	28.2	18.6
Measles	0.0	0.1	0.0	0.2	0.1	0.0	0.3	0.0	0.2
Mumps	0.0	0.4	0.5	0.2	0.7	0.0	0.2	0.7	0.4
Pertussis	15.5	28.1	18.7	50.0	29.8	8.7	18.1	10.8	27.4
Poliomyelitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rubella‡‡	0.9	0.5	0.5	5.1	0.3	0.2	0.3	0.2	1.3
Tetanus	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0

Table 3. Notification rates of communicable diseases, Australia, 2002, by state or territory (per 100,000 population), *continued*

Disease	State or territory								Aust
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	
Vectorborne diseases									
Arbovirus infection (NEC)	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Barmah Forest virus infection	0.0	5.9	11.6	10.5	0.2	0.0	1.2	1.9	4.6
Dengue	0.9	1.0	16.2	2.2	0.5	0.2	0.2	0.9	1.1
Japanese encephalitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kunjin virus infection	NN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaria	4.0	1.6	12.1	5.5	0.9	3.4	1.3	1.3	2.4
Murray Valley encephalitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Ross River virus infection	0.0	2.7	31.8	23.9	2.7	24.8	0.8	6.4	7.4
Zoonoses									
Anthrax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Australian bat lyssavirus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brucellosis	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.1	0.2
Leptospirosis	0.0	0.5	1.5	2.5	0.1	0.4	0.4	0.2	0.8
Ornithosis	0.0	2.2	1.0	0.1	0.2	0.2	0.9	0.3	1.0
Other lyssavirus (NEC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Q fever	0.0	4.4	0.5	9.1	1.8	0.0	1.7	1.0	3.9
Other bacterial infections									
Invasive meningococcal infection	1.9	3.2	4.5	3.3	2.0	5.5	4.3	3.4	3.5
Legionellosis	0.9	0.6	0.5	1.2	4.3	0.0	2.2	2.9	1.6
Leprosy	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.0
Tuberculosis	4.7	6.5	19.2	3.3	2.6	2.1	5.5	2.5	5.0

* Analyses in this report were based on date of onset, (except for hepatitis B and hepatitis C unspecified, where date of report of disease was used). Where the date of onset was not available the earliest date of the date of specimen collection or the date of report by the notifying agent, was used.

† Unspecified hepatitis includes cases with hepatitis in whom the duration of illness cannot be determined.

‡ The analysis was performed by report date.

§ Includes hepatitis C incident in Northern Territory and Queensland.

‖ Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

¶ Infections with Shiga-like toxin (verotoxin) producing *Escherichia coli* (SLTEC/VTEC).

** Northern Territory, Queensland, South Australia, Victoria and Western Australia: includes gonococcal neonatal ophthalmia.

†† Includes 14 cases of congenital syphilis, one from New South Wales and 13 from the Northern Territory.

‡‡ Includes congenital rubella.

NN Not notifiable.

NEC Not elsewhere classified.

Table 4. Notifications and notification rates (per 100,000 population) of communicable diseases, Australia, 1998 to 2002, by state or territory

Disease	Notifications					Rate per 100,000 population				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Bloodborne diseases										
Hepatitis B (incident)	265	303	398	424	390	1.4	1.6	2.1	2.2	2.0
Hepatitis B (unspecified)†,‡	6,562	7,164	7,908	8,424	6,916	35.3	38.1	41.6	43.7	35.5
Hepatitis C (incident)	350	396	391	600	434	2.3	2.6	2.5	3.8	2.8
Hepatitis C (unspecified)†,‡,§	18,075	18,653	19,647	19,586	15,981	96.4	98.3	102.2	100.5	81.3
Hepatitis D	–	19	27	21	20	–	0.1	0.2	0.1	0.1
Hepatitis (NEC)	4	0	1	2	0	<0.1	<0.1	<0.1	<0.1	0.0
Gastrointestinal diseases										
Botulism	1	0	2	2	0	<0.1	0.0	<0.1	<0.1	0.0
Campylobacteriosis‖	13,433	12,657	13,602	16,124	14,605	108.3	100.9	107.1	125.2	112.2
Cryptosporidiosis	–	–	–	1,615	3,255	–	–	–	8.3	16.6
Haemolytic uraemic syndrome	–	23	16	3	13	–	0.1	0.1	0.0	0.1
Hepatitis A	2,497	1,554	813	530	388	13.3	8.2	4.2	2.7	2.0
Hepatitis E	–	9	10	10	12	–	0.1	0.1	0.1	0.1
Listeriosis	55	64	66	62	59	0.3	0.3	0.3	0.3	0.3
Salmonellosis (NEC)	7,613	7,147	6,227	7,045	7,756	40.6	37.6	32.4	36.2	39.4
Shigellosis	599	547	496	562	496	4.8	4.4	3.9	2.9	2.5
SLTEC, VTEC¶	–	52	38	49	51	–	0.4	0.3	0.3	0.3
Typhoid	60	68	60	84	73	0.3	0.4	0.3	0.4	0.4
Quarantinable diseases										
Cholera	4	3	1	4	2	<0.1	<0.1	<0.1	<0.1	<0.1
Plague	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rabies	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Viral haemorrhagic fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Yellow fever	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Sexually transmissible diseases										
Chlamydial infection (NEC)	11,490	14,046	17,018	20,026	24,039	92.7	74.0	88.5	102.8	122.3
Donovanosis	36	18	21	33	16	0.2	0.1	0.1	0.2	0.1
Gonococcal infection**	5,469	5,644	5,801	6,158	6,247	29.2	29.7	30.2	31.6	31.8
Syphilis††	1,683	1,849	1,791	1,421	1,627	9.0	9.7	9.3	7.3	8.3
Vaccine preventable diseases										
Diphtheria	0	0	0	1	0	0.0	0.0	0.0	<0.0	<0.1
Haemophilus influenzae type b	35	40	28	26	29	0.2	0.2	0.1	0.1	0.1
Invasive pneumococcal disease	–	–	–	1,681	2,271	–	–	–	8.6	11.5
Laboratory-confirmed influenza	–	–	–	1,286	3,665	–	–	–	7	18.6
Measles	288	238	107	141	31	1.5	1.3	0.6	0.7	0.2
Mumps	182	184	214	114	69	1.0	1.2	1.4	0.6	0.4
Pertussis	5,791	4,417	5,964	9,515	5,388	30.9	23.3	31.0	48.8	27.4
Poliomyelitis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rubella‡‡	753	377	323	263	255	4.0	2.0	1.7	1.3	1.3
Tetanus	8	2	6	3	3	0.0	0.0	0.0	0.0	0.0

Table 4. Notifications and notification rates (per 100,000 population) of communicable diseases, Australia, 1998 to 2002, by state or territory, *continued*

Disease	Notifications					Rate per 100,000 population				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Vectorborne diseases										
Arbovirus infection NEC	88	62	55	36	22	0.5	0.3	0.3	0.2	0.1
Barmah Forest virus infection	529	638	644	1,141	896	2.8	3.4	3.3	5.9	4.6
Dengue	579	132	216	176	219	3.1	0.7	1.1	0.9	1.1
Japanese encephalitis	–	–	–	0	0	–	–	–	–	0.0
Kunjin virus infection	–	–	–	4	0	–	–	–	<0.1	0.0
Malaria	660	732	962	712	466	3.5	3.9	5.0	3.7	2.4
Murray Valley encephalitis	–	–	–	6	2	–	–	–	<0.1	0.0
Ross River virus infection	3,152	4,417	4,225	3,219	1,447	16.8	23.3	22.0	16.5	7.4
Zoonoses										
Anthrax	–	–	–	0	0	–	–	–	0.0	0.0
Australian bat lyssavirus	–	–	–	0	0	–	–	–	0.0	0.0
Brucellosis	45	52	27	19	40	0.2	0.3	0.1	0.1	0.2
Leptospirosis	202	323	245	245	155	1.1	1.7	1.3	1.3	0.8
Ornithosis	64	84	103	131	199	0.7	0.9	1.1	0.7	1.0
Lyssavirus (NEC)	–	–	–	0	0	–	–	–	0.0	0.0
Q fever	560	515	579	696	761	3.0	2.7	3.0	3.6	3.9
Other bacterial infections										
Invasive meningococcal infection	480	590	622	677	684	2.6	3.1	3.2	3.5	3.5
Legionellosis	262	249	474	307	318	1.4	1.3	2.5	1.6	1.6
Leprosy	3	6	4	5	3	<0.1	<0.1	<0.1	<0.1	0.0
Tuberculosis	960	1,146	1,052	989	975	5.1	6.0	5.5	5.1	5.0
Total	82,836	84,420	90,184	104,187	100,278					

* Analysis by date of onset, except for hepatitis B and hepatitis C unspecified, where analysis is by report date. Date of onset Analyses in this report were based on date of onset, (except for hepatitis B and hepatitis C unspecified, where date of report of disease was used). Where the date of onset was not available the earliest date of the date of specimen collection or the date of report by the notifying agent, was used.

† Unspecified hepatitis includes cases with hepatitis in whom the duration of illness cannot be determined.

‡ The analysis was performed by report date.

§ Includes hepatitis C incident in the Northern Territory and Queensland.

‖ Notified as 'foodborne disease' or 'gastroenteritis in an institution' in New South Wales.

¶ Infections with Shiga-like toxin (verotoxin) producing *Escherichia coli* (SLTEC/VTEC).

** Northern Territory, Queensland, South Australia, Victoria and Western Australia: includes gonococcal neonatal ophthalmia.

†† Includes 14 cases of congenital syphilis, one from New South Wales and 13 from the Northern Territory.

‡‡ Includes congenital rubella.

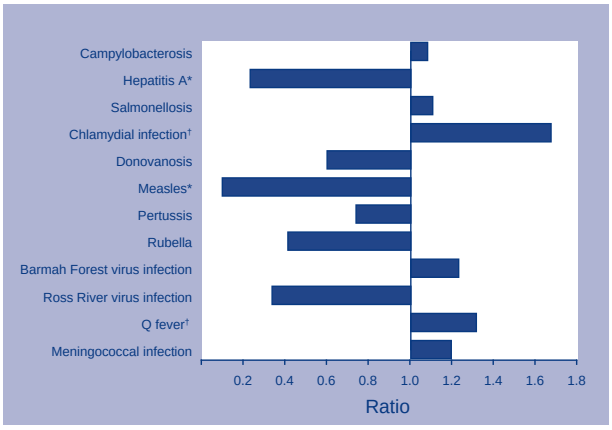
NN Not notifiable.

NEC Not elsewhere classified.

– Elsewhere classified

The major changes in communicable disease notifications in 2002 are shown in Figure 4, as the ratio of notifications in 2002 to the mean number of notifications for the previous five years. Chlamydial infection and Q fever infection notifications in 2002 were highest since 1997 and surpassed the expected range (5-year mean plus two standard deviations). Notifications of hepatitis A and measles infections in 2002 were the lowest since 1997 and were below the expected range (5-year mean minus two standard deviations). Notifications for the remaining diseases were within the historical range.

Figure 4. Comparison of total notifications of selected diseases reported to the National Notifiable Diseases Surveillance System in 2002, with the previous five-year mean



* Notifications below the 5-year mean minus two standard deviations

† Notifications above the 5-year mean plus two standard deviations

In the financial year 2001–02, there were 91,911 hospital separations in Australian hospitals with a primary diagnosis of infectious diseases (International Classification of Diseases, version 10, Australian Modification (ICD10–AM) codes A01–B99, Australian Institute of Health and Welfare). This represents 1.4 per cent of all hospital separations in that period. A further 62,917 separations were recorded with a principal diagnosis of influenza or pneumonia (ICD10–AM J10–J18).

Bloodborne diseases

In 2002, bloodborne viruses reported to the NNDSS included hepatitis B, C, and D. Human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) diagnoses are reported directly to the National Centre in HIV Epidemiology and Clinical Research (NCHECR). Information on national HIV/AIDS surveillance can be obtained through the NCHECR website at www.med.unsw.au/nchecr.

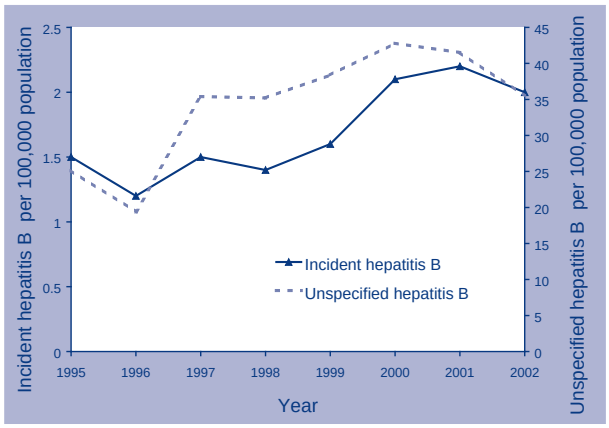
When reported to NNDSS, newly acquired hepatitis C and hepatitis B infections (incident) were differentiated from those where the timing of disease acquisition was unknown (unspecified). As considerable time may have elapsed between onset and report date for chronic hepatitis infections, the analysis of unspecified hepatitis B and unspecified hepatitis C infections in the following sections is by report date, rather than by onset date.

Hepatitis B

Incident hepatitis B notifications

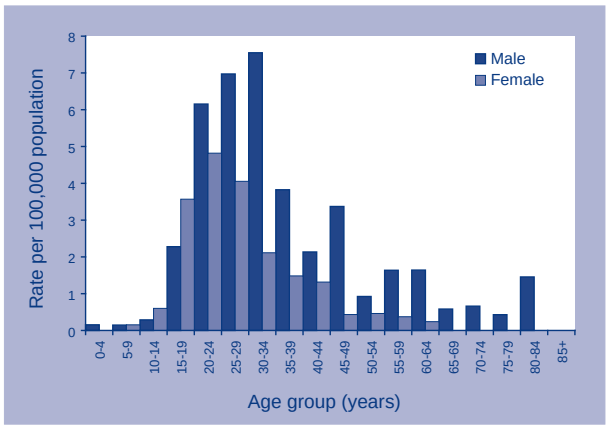
Since 1995, all jurisdictions have reported incident cases of hepatitis B to the NNDSS. The rate of incident hepatitis B notifications between 1994 and 2000 ranges around 1–2 cases per 100,000 population (Figure 5). In total, 400 incident cases were reported to the NNDSS with an onset date in 2002, giving a national notification rate of 2.0 cases per 100,000 population for this year. In 2002, the highest rates were reported from the Northern Territory (5.1 cases per 100,000 population) and Tasmania (4.0 cases per 100,000 population).

Figure 5. Trends in notification rates of incident and unspecified hepatitis B infections, Australia, 1995 to 2002



The highest rates of incident hepatitis B notifications were in the 30–34 year age group for males and the 20–24 year age group for females (Figure 6). The highest notification rate for men was 7.6 cases per 100,000 population, while the highest notification rate for women was 4.8 cases per 100,000 population. Overall, infections in males exceeded those in females, with a male to female ratio of 1.9:1.

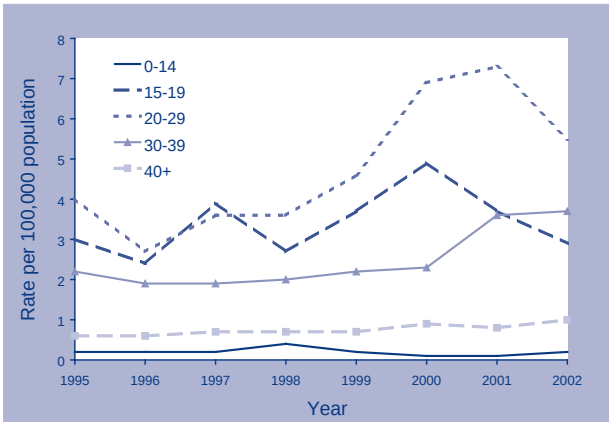
Figure 6. Notification rate for incident hepatitis B infections, Australia, 2002, by age group and sex



Trends in the age distribution of incident hepatitis B infections are shown in Figure 7. Rates in children aged 0–14 years and adults over 40 years have remained relatively stable. The increase in rates of incident hepatitis B in the 20–29 year age range was reversed in 2002 with the first decline in rates since 1996. Declines in rates continued in 2002 in the 15–19 year age group, while the rate of increase in the 30–39 year age range slowed.

Risk factor information for incident hepatitis B virus infection was available from all states and territories except New South Wales, Western Australia and Queensland (Table 5). There were no cases reported from Australian Capital Territory.

Figure 7. Trends in notification rates of incident hepatitis B infections, Australia, 1995 to 2002, by age group



Unspecified hepatitis B notifications

Hepatitis B notifications have been reported to the NNDSS since 1991 by all jurisdictions except the Northern Territory, with unspecified cases separately notified from incident cases in most jurisdictions since 1994. The notification rate ranged from 20 to 40 cases per 100,000 population between 1991 and 2002 (Figure 5). In 2002 there were 6,916 unspecified hepatitis B cases notified to NNDSS, a rate of 35.5 cases per 100,000 population. The male to female ratio for unspecified hepatitis B cases was 1.2:1. By jurisdiction, the highest rates of notification were in New South Wales (52.6 cases per 100,000 population) and

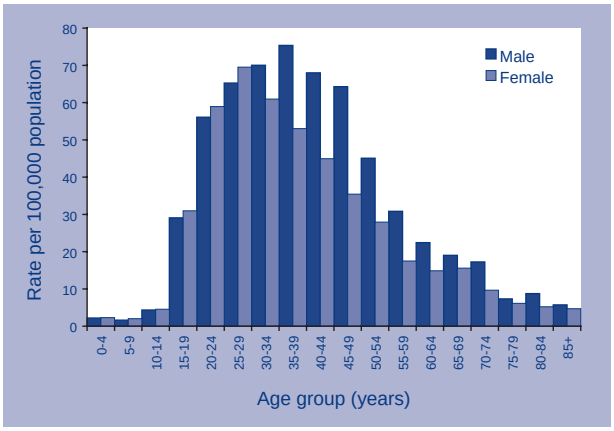
Table 5. Risk factors identified in notifications of incident hepatitis B virus infection, Australia, 2002, by reporting state or territory

Risk factor	NT	SA	Tas	Vic
Injecting drug use	3	1	9	87
Sexual contact with hepatitis B case	0	3	3	48
Household/other contact with hepatitis B	1	1	0	11
Overseas travel	0	1	0	6
Other risk factors	2	1	2	3
No risk factors identified	1	4	3	20
No information available	3	0	2	0
Total	10	11	19	175

Victoria (38.8 cases per 100,000 population). The highest rates were in the 35–39 year age group for men (75.3 cases per 100,000 population) and the 25–29 year age group for women (69.5 cases per 100,000 population) (Figure 8).

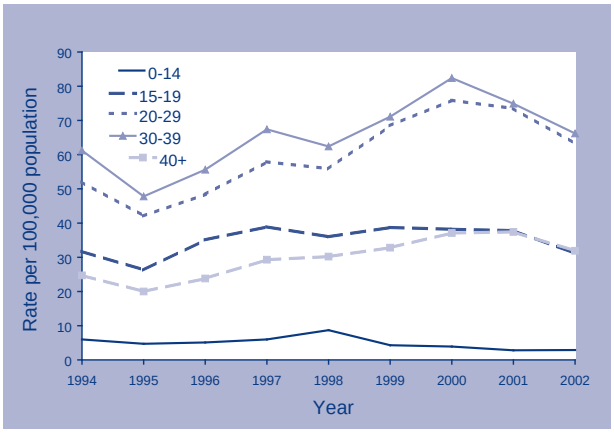
Trends on the age distribution of unspecified hepatitis B infections are shown in Figure 9. There were declines in the rates in all age groups in 2002.

Figure 8. Notification rate for unspecified hepatitis B infections, Australia, 2002, by age group and sex*



* By report date.

Figure 9. Trends in notification rates of incident hepatitis B infections, Australia, 1995 to 2002, by age group*



* By report date.

Infant hepatitis B immunisation was introduced in the Northern Territory in 1988 for Indigenous infants and then for all infants in this jurisdiction in 1990. Universal infant hepatitis B immunisation was introduced in the rest of Australia in May 2000. The effect of vaccination may take a number of years to be evident in childhood rates of hepatitis B infection. Vaccination coverage provided by the Australian Childhood Immunisation Register (ACIR) indicates approximately 95 per cent of infants are currently receiving hepatitis B vaccination in Australia.

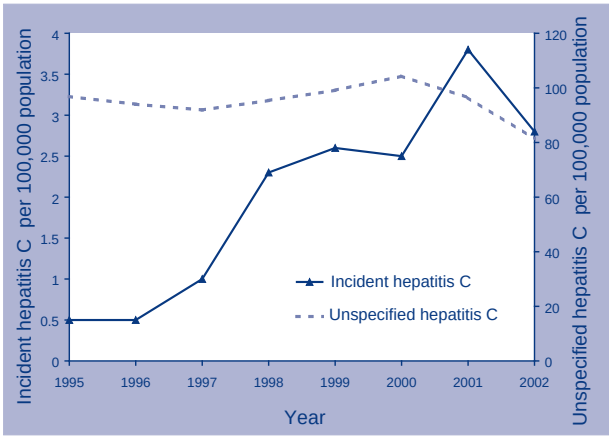
There were 23 cases of unspecified hepatitis B infection in children in the 0–4 year age group reported from Western Australia, New South Wales, Victoria, South Australia, the Northern Territory and the Australian Capital Territory. Seven of these children were not vaccinated with hepatitis B vaccine and the vaccination status of the remainder was unknown.

Hepatitis C

Unspecified hepatitis C notifications

Hepatitis C infection has been notifiable in all Australian jurisdictions since 1995. While the rate of unspecified hepatitis C notifications has remained relatively stable since 1997 (Figure 10), 2001 represented the first year since 1997 where the number of notifications has decreased, a trend that was continued in 2002. Improved surveillance practice, such as better classification of incident cases and increased duplicate checking may account for some of the decrease in unspecified hepatitis C notifications. Whether the decrease represents the fact that there is a smaller pool of infected individuals who have not been previously diagnosed will only become more apparent over the next few years.

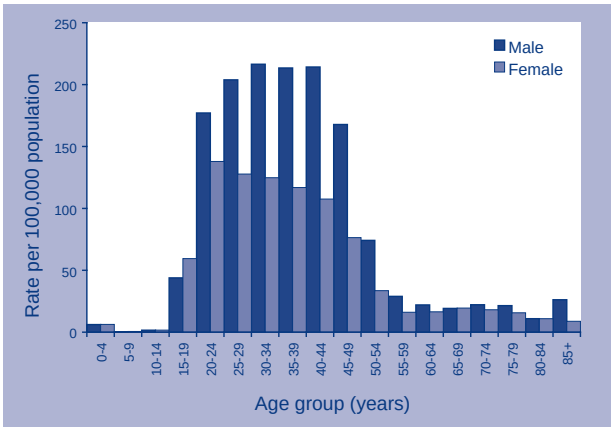
Figure 10. Trends in notification rates, incident and unspecified hepatitis C infection, Australia, 1995 to 2002



In 2002, there were 15,981 unspecified hepatitis C infections reported to NNDSS, a notification rate of 81.3 per 100,000 population. Of the total notifications of unspecified hepatitis C, 42 per cent of the notifications were from New South Wales, which also had the highest notification rate (100.5 cases per 100,000 population). Nationally, the male to female ratio was 1.6:1. The highest notification rate was in the 30–34 year age group for males (216.4 cases per 100,000 population), although there was little variation across the 29–44 year age range, from 203 to 269.1 cases per 1000,000 population. The highest notification rate for females (137.9 cases per 100,000 population) was in the 20–24 year age group (Figure 11).

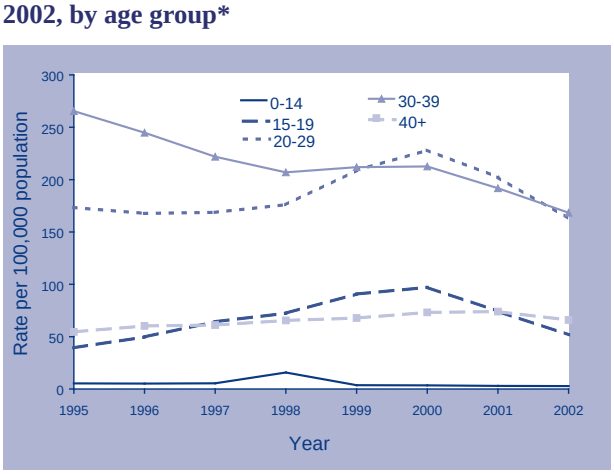
Trends on the age distribution of unspecified hepatitis C infections are shown in Figure 12. Overall, the highest rates were in the 20–39 year age range. Rates fell in the 15–39 year age range in 2002.

Figure 11. Notification rate for unspecified hepatitis C infections, Australia, 2002, by age group and sex*



* By report date.

Figure 12. Trends in notification rates of unspecified hepatitis C infections, Australia, 1995 to 2002, by age group*



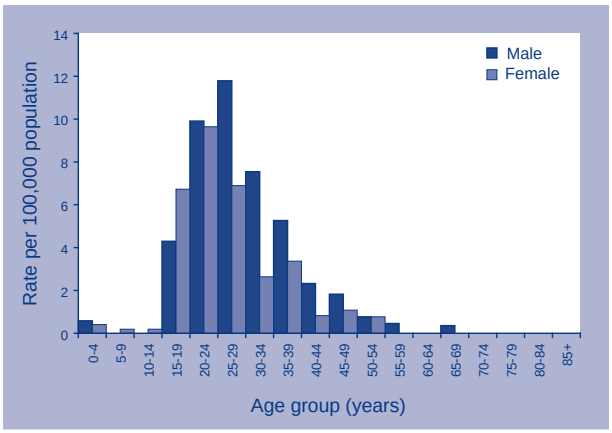
* By report date.

Incident hepatitis C notifications

Reporting of incident hepatitis C notifications from New South Wales and Western Australia commenced in 1993, from the Australian Capital Territory in 1994, from South Australia and Tasmania in 1995 and from Victoria in 1997. Incident hepatitis C cases are not differentiated from unspecified cases in notifications received from Queensland or the Northern Territory. As the introduction of reporting was staggered, for the purposes of this report, only cases from 1997 are included.

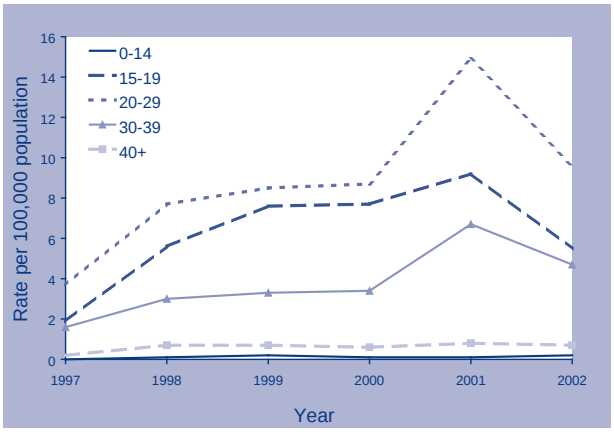
In total there were 434 incident cases of hepatitis C reported with an onset date in 2002, giving a rate of 2.8 cases per 100,000 population. While this represents a decrease in cases relative to 2001, these data should be interpreted with caution as the numbers may be affected by changes in surveillance practices. The proportion of all hepatitis C notifications that were known to be incident cases was 2.6 per cent in 2001. The highest rates of incident hepatitis C infection were reported from Western Australia (7.0 cases per 100,000 population). The highest rates of incident hepatitis C notifications were in the 20–24 year age group for females (9.6 per 100,000 population) and the 25–29 year age group for males (11.8 per 100,000 population) (Figure 13). Overall, the male to female ratio was 1.4:1.

Figure 13. Notification rate for incident hepatitis C infections, Australia, 2002, by age group and sex



Trends in the age distribution of incident hepatitis C infections are shown in Figure 14. While rates in the 0–14 and over 40 year age groups have remained stable, increases observed in the 15–39 year age range between 2000 and 2001 were reversed in 2002.

Figure 14. Trends in notification rates of incident hepatitis C infections, Australia, 1997 to 2002, by age group



Hepatitis D

Hepatitis D is a defective single-stranded RNA virus that requires the hepatitis B virus to replicate. Hepatitis D infection can be acquired either as a co-infection with hepatitis B or as a superinfection of persons with chronic hepatitis B infection. People co-infected with hepatitis B and hepatitis D may have more severe acute disease and a higher risk of fulminant hepatitis compared with those infected with hepatitis B alone. The modes of hepatitis D transmission are similar to those for other blood borne viruses, and in countries with a low hepatitis B prevalence, intravenous drug users are the main risk group.

There were 20 notifications of hepatitis D to the NNDSS in 2002 at a notification rate of 0.1 cases per 100,000 population. Of the 21 notifications, 10 were reported from New South Wales, 9 from Victoria, and one from Queensland. The majority (18/20, 90%) of cases were males, with the highest rate reported in the 20–24 year age group (0.6 cases per 100,000 population).

Gastrointestinal diseases

Gastrointestinal diseases are a considerable burden on the community and the healthcare system in Australia. Foodborne pathogens alone are estimated to cause about 4.2 million cases of gastroenteritis per year.[1] Surveillance is vital in gathering information on pathogen specific gastrointestinal illnesses. Surveillance data however, highly underestimate the true incidence of pathogen specific gastrointestinal diseases (Figure 1). For example, the probability of a patient with gastroenteritis in the community having a stool test, depends on whether a doctor is consulted or is available, whether the doctor orders a test, patient's age, the severity and duration of illness. Even when stools are collected from patients with gastroenteritis, about 60 per cent of samples have no pathogen identified.[2,3]

In 2002, gastrointestinal diseases that were notified to NNDSS were: botulism, campylobacteriosis, cryptosporidiosis, haemolytic uraemic syndrome (HUS), hepatitis A, hepatitis E, listeriosis, salmonellosis, shigellosis, shiga-like toxin producing *Escherichia coli*/verotoxigenic *E. coli* (SLTEC/VTEC) infections and typhoid. Notification of gastrointestinal diseases increased marginally by 2 per cent, from 26,086 in 2001 to 26,708 in 2002. Compared with 2001, increases occurred in the number of notifications of cryptosporidiosis, salmonellosis and HUS. The increase in salmonellosis notifications may be due to improved surveillance and outbreak investigations conducted by OzFoodNet. Cryptosporidiosis became nationally notifiable in 2001, however 2002 was the first full-year of notifications of this disease from all jurisdictions. The number of notifications of HUS in 2002 was higher relative to 2001 notifications, when only three notifications were received, but was otherwise comparable to other years. There were no other changes of significance in the other notifiable gastrointestinal diseases.

In this section reference will be made to OzFoodNet 2002 annual report of foodborne diseases.[4] This report was used as a resource for additional information on foodborne disease outbreaks in Australia in 2002.

Botulism

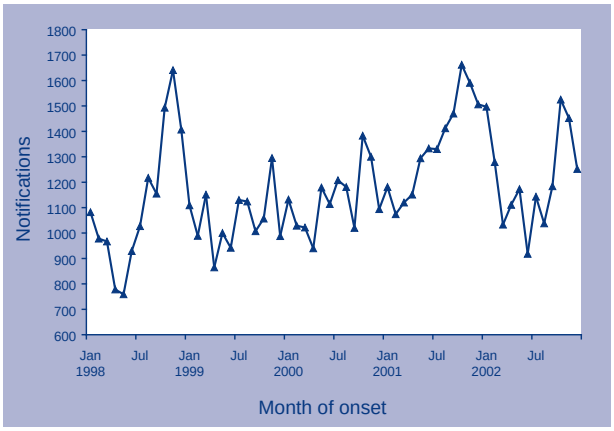
No cases of botulism were reported to NNDSS in 2002. While no classic foodborne botulism has been reported in Australia since the commencement of notifications in 1992, there have been five cases of infant botulism reported between 1998 and 2002.

Campylobacteriosis

There were 14,605 notifications of campylobacteriosis in Australia in 2002. All jurisdictions, except New South Wales, reported cases of campylobacteriosis. Campylobacteriosis is not notifiable in New South Wales. The national rate of notifications in 2002 was 112 cases per 100,000 population; a 10 per cent decrease compared with 125 cases per 100,000 population reported in 2001. South Australia had the highest notification rate (160.6 cases per 100,000 population) for the second consecutive year (Table 3), but this was 9 per cent lower than reports in this state in 2001.

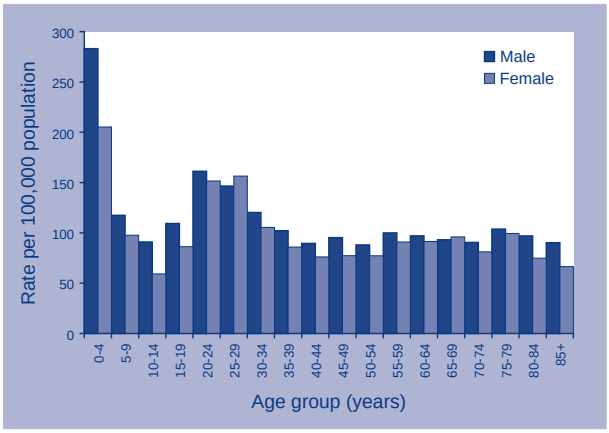
Monthly notifications of campylobacteriosis in 2002, was consistent with previous years (1998 to 2002), with the number of notifications peaking in the third quarter of the year (Figure 15). In 2002, OzFoodNet reported only one campylobacteriosis outbreak, in Far North Queensland, which affected 24 persons and resulted in six hospitalisations.[4]

Figure 15. Trends in notifications of campylobacteriosis, Australia, 1998 to 2002, by month of onset



The highest notification rate of campylobacteriosis was among children aged 0–4 years (Figure 16). In this age group notification rates were higher in males (283 cases per 100,000 population) than in females (205 cases per 100,000 population). The overall male to female ratio, as in previous years, was 1.2:1.

Figure 16. Notification rates of campylobacteriosis, Australia, 2002, by age group and sex

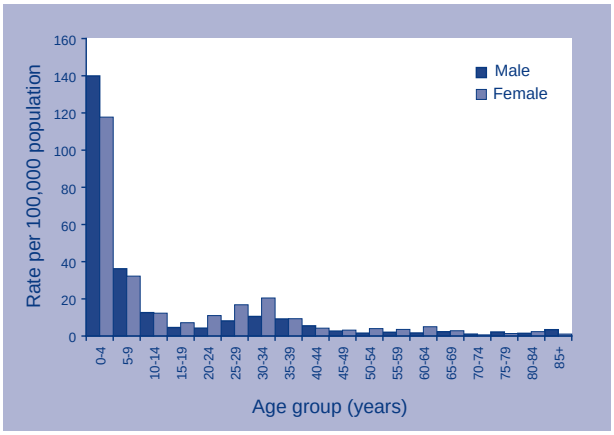


Cryptosporidiosis

Cryptosporidiosis became nationally notifiable in 2001 and in 2002 NNDSS received the first full-year report from all jurisdictions. A total of 3,255 cases were reported to NNDSS, a notification rate of 16.6 cases per 100,000 population. Although Queensland reported 62 per cent (n=2,026) of all cryptosporidiosis notifications received by NNDSS, the Northern Territory had the highest notification rate at 109.6 cases per 100,000 population.

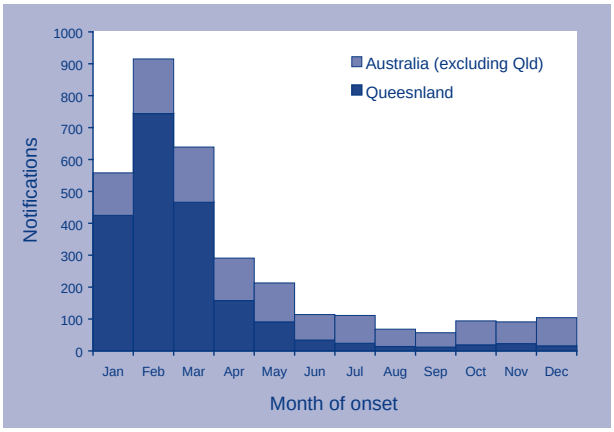
Children under the age of four had the highest notification rate of cryptosporidiosis (129 cases per 100,000 populations) (Figure 17). Notification rates of cryptosporidiosis decreased sharply at the age of 5 to 9 years for both males and females. Among those older than 10 years, females in the 30–34 year age group had the highest notification rate (20 cases per 100,000 population).

Figure 17. Notification rates of cryptosporidiosis, Australia, 2002, by age group and sex



Sixty-five per cent (n=2,112) of cryptosporidiosis notifications in 2002 occurred in the first quarter of the year, of which 77 per cent (n=1,635) were from Queensland (Figure 18). Public health authorities in Queensland noted an increase in cryptosporidiosis above historical levels. Infections through swimming pools, particularly pools hosting 'learn to swim classes', were identified as sources of exposure. Public health authorities issued health alerts where they recommended measures for avoiding infection and advised the swimming pool industry to ensure that persons with diarrhoea did not use public swimming pools.

Figure 18. Notifications of cryptosporidiosis, Australia (excluding Queensland) and Queensland, 2002, by month of onset



Hepatitis A

There were 388 cases of hepatitis A reported to NNDSS in 2002, a notification rate of two cases per 100,000 population. The number of notifications of hepatitis A has been steadily decreasing for the last decade, and compared to 2001, there was a decrease of 27 per cent in 2002 (Figure 19).

Compared to 2001, hepatitis A notification rates decreased in all jurisdictions except in the Northern Territory, where it increased by 21 per cent (from 19 to 23.7 cases per 100,000 population). The notification rate in the Northern Territory was 12 times the national average.

Males had a higher notification rate of hepatitis A (2.4 cases per 100,000 population) than females (1.5 cases per 100,000 population). The highest age specific rate of hepatitis A notifications among males was in the 20–24 year age group (4.5 cases per 100,000 population) and among females in the 35–39 year age group (2.7 cases per 100,000 population) (Figure 20).

Figure 19. Trends in notifications of hepatitis A, Australia, 1991 to 2002, by month of notification

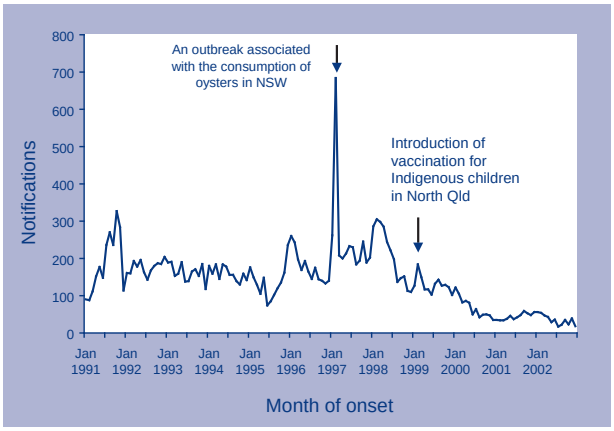
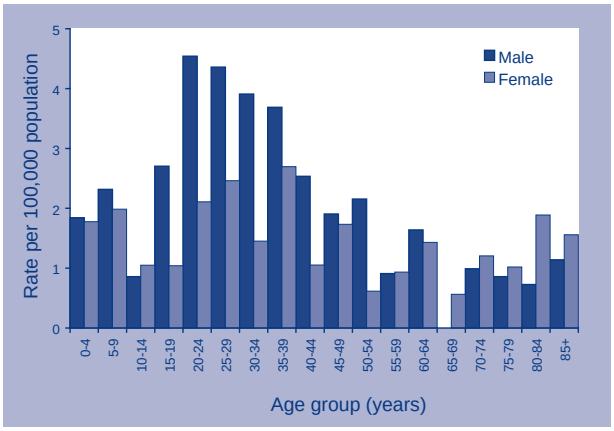


Figure 20. Notification rates of hepatitis A, Australia, 2002, by age group and sex



Hepatitis A is commonly spread from person to person via close contact or from food or water that had been inadvertently contaminated by infected persons. The risk exposures among 214 cases of hepatitis A infection (55% of all notifications) showed that in 2002 the three frequently reported risk exposures identified were (in order of importance): overseas travel, homosexual contact, and household or close contact with confirmed cases (Table 6).

Hepatitis E

There were 12 cases of hepatitis E reported to NNDSS in 2002, two cases more than in 2001. Six cases were reported in New South Wales, two cases each in Tasmania and Victoria and a case each in the Australian Capital Territory and Queensland. There were nine males and three females, all aged between 20 and 54 years. Data on travel history were available for six cases and showed that all had travelled overseas.

Listeriosis

In 2002, 59 cases of listeriosis were reported to NNDSS, a rate of 0.3 cases per 100,000 population. Listeriosis notifications have been stable at this rate since 1998. In 2002, 60 per cent of listeriosis cases were aged over 60 years, with the highest notification rate among males in the 80–84 year age group (Figure 21). There was a preponderance of infections in men (male to female ratio of 2.2:1) in contrast with 2001 when the male to female ratio was 0.7:1.

In 2002, OzFoodNet reported 10 deaths among patients with non-pregnancy related listeriosis, which is equivalent to a 17 per cent case fatality rate. Two maternal-foetal *Listeria* infections were reported, resulting in one foetal death. In 2001, six cases of maternal-foetal listeriosis, including three foetal deaths, were reported. No common-source outbreaks of listeriosis were investigated by OzFoodNet in 2002.[4]

Figure 21. Notification rates of listeriosis, Australia, 2002, by age group and sex

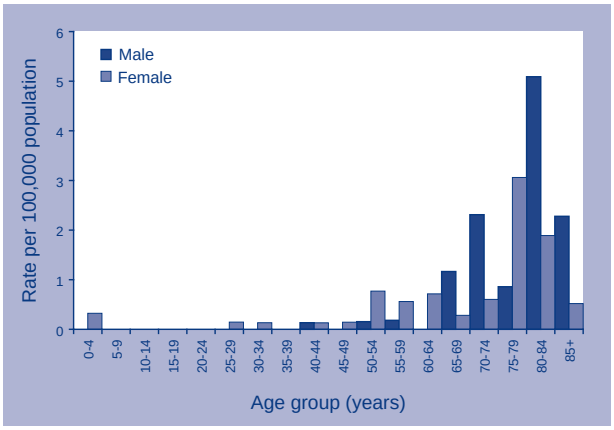


Table 6. Risk exposures associated with infection with hepatitis A virus, Australia, 2002, by state or territory*

Exposure†	State or territory					
	ACT	NSW	Qld	SA	Tas	Vic
Overseas travel	1	32	19	3	4	19
Homosexual contact	–	18	6	2	0	7
Childcare	–	3	3	0	0	13
Household/close contact of case	–	10	5	1	0	1
Injecting drug use	–	9	0	2	0	2
Sex worker	–	–	–	0	0	0
Other	–	189‡	–	0	–	0
Total with risk factors identified	1	92	68	7	4	42
Unknown	3	54	0	8	0	27
Total	4	146	68	15	4	74

* The Northern Territory and Western Australia did not report risk factors.

† Exposures are not mutually exclusive hence more than one exposure per person possible.

‡ Includes 19 cases who ate at a gathering and 51 regular restaurant/takeaway consumers.

– Data were not collected.

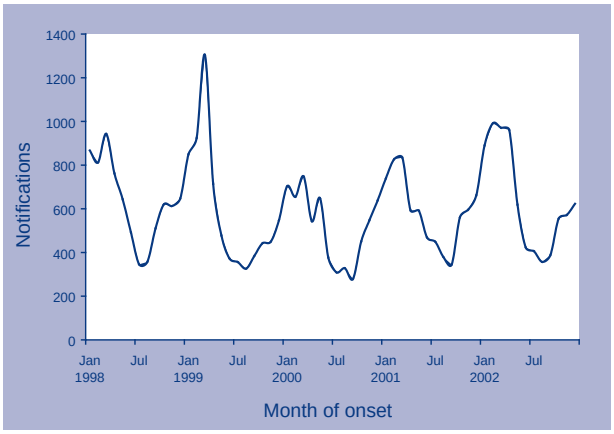
Salmonellosis (non-typhoidal)

A total of 7,756 salmonellosis cases were reported to NNDSS in 2002, a rate of 39.5 cases per 100,000 population and a 9 per cent increase from the rate reported in 2001 (36.2 cases per 100,000 population). During the five year period 1998–2001, the highest national notification rate was 40.6 cases per 100,000 population in 1998.

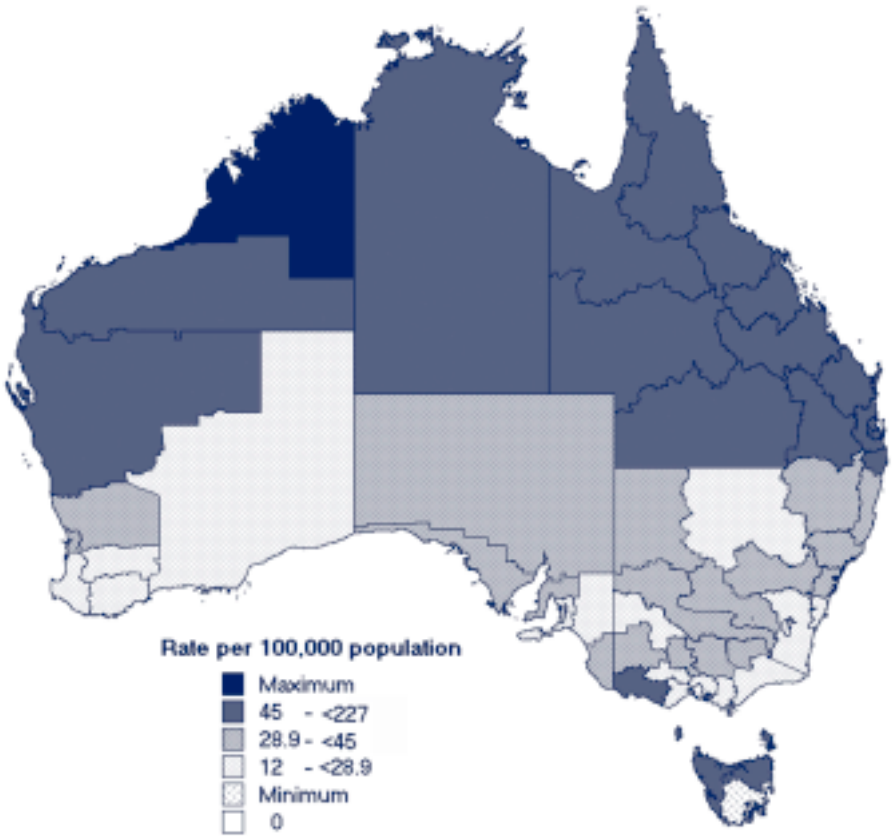
All jurisdictions reported cases of salmonellosis. The highest rates were in jurisdictions in the northern part of the country with the Northern Territory and Queensland reporting rates that were four times and two times the average national notification rate, respectively (Table 2). Notification rates of salmonellosis also varied by Statistical Division (Map 2), with the Kimberley in northern Western Australia having the highest notification rate of 320 cases per 100,000 population.

As in previous years, reports of salmonellosis peaked during summer (January to March). Thirty-six per cent of salmonellosis notifications in 2002 were notified during this period (Figure 22).

Figure 22. Trends in notifications of salmonellosis, Australia, 1998 to 2002, by month of onset

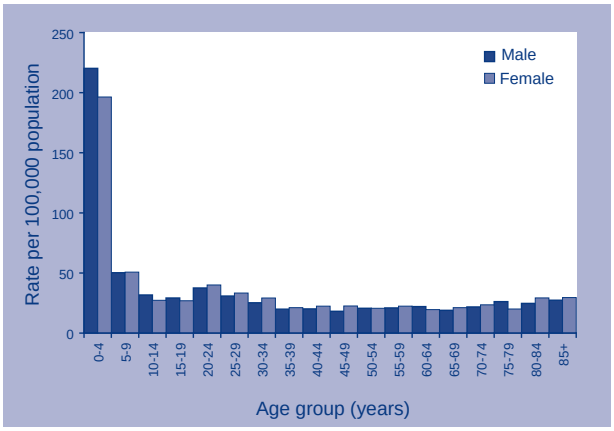


Map 2. Notification rates of salmonellosis, Australia, 2002, by Statistical Division of residence



Age specific notification rates of salmonellosis show a distribution consistent with previous years with children aged less than five years having the highest rate (210.6 cases per 100,000 population) (Figure 23).

Figure 23. Notification rates of salmonellosis, Australia, 2002, by age group and sex



The National Enteric Pathogens Surveillance Scheme reported serovars for 7,701 isolates;[5] representing 99 per cent of notified cases of salmonellosis (n=7,756) in 2002. The 10 most frequently isolated serovars and phage types of *Salmonella,* which accounted for 43.2 per cent of all isolates, are shown in Table 7. Nationally, as in the previous year, the most commonly reported *Salmonella* serovar or phage type was *Salmonella* Typhimurium 135. Three *Salmonella* types: *S.* Typhimurium 170, *S.* Hvittingfoss, and *S.* Muenchen, were not among the top 10 serovars as in 2001 but were among the top 10 serovars reported in 2002. The distribution of *Salmonella* serovars varied across jurisdictions. The most commonly reported serovars in Queensland, Tasmania, and the Northern Territory were *S*. Virchow (10%), *S*. Mississippi (48%) and *S*. Ball (15%), respectively. *S.* Typhimurium was the most commonly reported serovar in the rest of the jurisdictions, accounting for 34 per cent of cases in the Australian Capital Territory, 28 per cent in New South Wales, 60 per cent in South Australia, 66 per cent in Victoria and 15 per cent in Western Australia.

Salmonellosis outbreaks

The most common cause of gastroenteritis outbreaks in Australia in 2002 was *Salmonella,* accounting for 28 per cent of gastroenteritis outbreaks investigated.[4]

S. Typhimurium alone accounted for 23 per cent of gastroenteritis outbreaks investigated by OzFoodNet in 2002, affecting 471 persons including 61 hospitalisations and two deaths. There were five significant outbreaks of salmonellosis in 2002, four of which occurred in South Australia (*S*. Typhimurium phage types 8, 99,135 and 126) and one in New South Wales (*S*. Montevideo).[4]

S. Typhimurium phage type 8 was identified as the agent for a disease outbreak that affected 78 persons including 15 hospitalisations in South Australia. The pathogen was isolated from several ingredients of a Caesar salad including; salad dressing, anchovies, and Parmesan cheese. The outbreaks of *S*. Typhimurium phage types 99, 135 and 126 affected between 20 and 50 persons each. An outbreak of *S*. Typhimurium phage type 99 was associated with the consumption of cakes sold in a bakery. Investigators found that the same piping bag was used to dispense sausage meat

Table 7. Top 10 isolates of *Salmonella*, Australia, 2002

Organism	State or territory									
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Aust	Total %
S. Typhimurium 135	11	238	8	117	14	18	178	91	675	8.8
S. Typhimurium 9	16	268	0	77	24	12	151	44	592	7.7
S. Typhimurium 170	5	161	0	135	1	1	152	3	458	5.9
S. Saintpaul	0	37	20	225	11	2	44	44	383	5.0
S. Virchow 8	0	21	0	268	0	0	11	2	302	3.9
S. Birkenhead	0	95	3	134	4	0	8	1	245	3.2
S. Typhimurium 126	1	62	2	28	39	4	61	8	205	2.7
S. Chester	1	29	16	82	11	2	5	32	178	2.3
S. Hvittingfoss	1	17	6	110	3	1	13	2	153	2.0
S. Muenchen	0	20	12	55	9	3	9	24	132	1.7
Other	60	1,136	248	1,354	405	117	588	470	4,378	56.8
Total	95	2,084	315	2,585	521	160	1,220	721	7,701	100.0

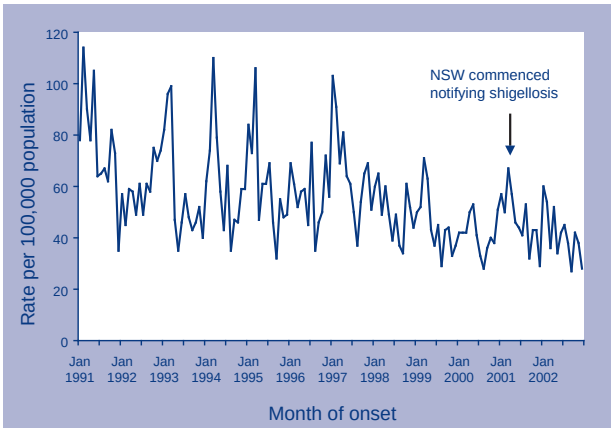
and cream for cakes. Outbreaks of *S*. Typhimurium phage type 135 and 126 were both associated with the consumption of Vietnamese rolls containing pork and/or beef.

In New South Wales, an outbreak of gastroenteritis associated with the consumption of food from a kebab shop affected at least 47 persons. Several sesame seed containing products in the shop, including tahini and hommus, were contaminated with *S*. Montevideo. Further investigation of unopened jars of the same products found contamination with *S*. Montevideo and *S*. Tennessee. These products were imported from Egypt and as a result of the investigation a nationwide consumer and trade recall of the imported products was initiated.

Shigellosis

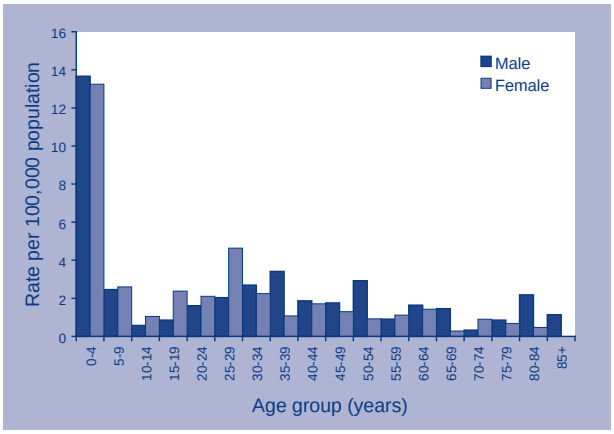
In 2002, 496 cases of shigellosis were reported to NNDSS, a notification rate of 2.5 cases per 100,000 population and a decrease of 13 per cent from the 2.9 cases per 100,000 population reported in 2001. The Northern Territory had the highest notification rate at 52 cases per 100,000 population. Although notification of shigellosis from New South Wales began in 2001, notifications of the disease continued to decline (Figure 24).

Figure 24. Trends in notifications of shigellosis, Australia, 1991 to 2002, by month of onset



Thirty-four per cent of notified cases of shigellosis were children under the age of four and this age group had the highest notification rate (14.1 cases per 100,000 population) (Figure 25). Despite the overall decrease in the number of notifications of shigellosis, there was an increase of 28 per cent in the 0–4 year age group compared to 2001. In the Northern Territory children under the age of four accounted for 64 per cent of shigellosis notifications in that jurisdiction.

Figure 25. Notification rates of shigellosis, Australia, 2002, by age group and sex



Shiga-like toxin producing *Escherichia coli*/verotoxigenic *Escherichia coli*

There were 51 cases of SLTEC/VTEC reported to NNDSS in 2002. With a notification rate of 0.3 cases per 100,000 population the rate of SLTEC/VTEC notifications remained stable relative to the previous year. Seventy-three per cent of cases were notified in South Australia (2.4 cases per 100,000 population), where bloody stools are routinely tested by polymerase chain reaction (PCR) for genes coding for shiga toxin. In South Australia, there was a 37 per cent increase in SLTEC/VTEC notifications compared with 2001. No cases were notified from the Australian Capital Territory, New South Wales, the Northern Territory or Tasmania. OzFoodNet reported that among typed *E. coli*, subtype O157 remains the main subtype (41% of total).

Haemolytic uraemic syndrome

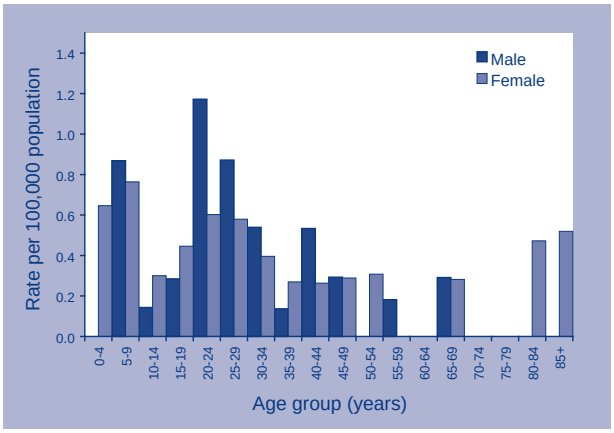
In 2002, 13 cases of HUS were reported to NNDSS, a rate of 0.1 cases per 100,000 population. No HUS cases were notified in the Australian Capital Territory, South Australia, Tasmania or Western Australia. Although there was a fourfold increase in HUS notifications compared to 2001, it was comparable with the three year mean (surveillance of HUS commenced in 1999; three year mean=14). The lowest number of HUS notifications (n=3) since HUS surveillance commenced were received by NNDSS in 2001.

Among the 13 cases of HUS notified in 2002, six were males. The median age among males was 53 years (range 13–62 years) and among females the median age was 21 years (range 0–62 years). OzFoodNet reported that STEC was isolated in six cases of HUS of which three were *E. coli* O157, including one *E. coli* O157:H7.[4]

Typhoid

The notification rate of typhoid has been stable for the last five years. In 2002, there were 73 notifications of typhoid, a rate of 0.4 cases per 100,000 population. This represented a decrease by 14 per cent from the rate reported in 2001. The male to female ratio was 1:1 and the highest notification rates were in males aged 20–24 years (1.2 cases per 100,000 population) and in females aged 5–9 years (0.8 cases per 100,000 population) (Figure 26). The National Enteric Pathogen Surveillance Scheme identified 58 *Salmonella typhi* isolates, 45 of which were from Australian residents and 13 from overseas visitors, including students. Of the 45 Australian residents, 36 had travelled to South and South-east Asian and African countries, but nine had no travel history recorded.

Figure 26. Notification rates of typhoid, Australia, 2002, by age group and sex



Quarantinable diseases

Human diseases covered by the *Quarantine Act 1908,* and notifiable in 2002 were cholera, plague, rabies, yellow fever, and four viral haemorrhagic fevers (Ebola, Marburg, Lassa and Crimean-Congo). In 2002, cholera was the only quarantinable disease notified in Australia, with two cases notified to NNDSS. The first case was a one-year-old female with *Vibrio cholerae* O1 reported in New South Wales and had contracted the infection in Pakistan. The second case was a 71-year-old male with *Vibrio cholerae* O1– bv EL TOR, reported in Victoria and is believed to have been infected in Vietnam.

Cholera, plague, rabies, yellow fever, and viral haemorrhagic fevers are of international public health importance and are notified to the World Health Organization. Although no local transmission had been reported in Australia, these diseases continue to occur around the world. Travellers are advised to seek information on the risk of contracting these diseases in their destinations and take appropriate measures. Information on quarantinable diseases can be found on the DoHA website at: http://www.health.gov.au/pubhlth/strateg/quaranti/index.htm.

Sexually transmitted infections

Sexually transmitted infections reported to NNDSS in 2002 were chlamydial infection, donovanosis, gonococcal infections and syphilis. Congenital syphilis was reported separately. All states and territories conducted surveillance of these infections.

Other surveillance systems that monitor STI in Australia are specialist laboratory networks, such as the Australian Gonococcal Surveillance Programme. The National Centre in HIV Epidemiology and Clinical Research also collates and analyses data on STI, including data from NNDSS, for its annual surveillance report.[6]

The number of notifications and notification rates of STI reported to the NNDSS between 1998 and 2002 are shown in Table 4. In interpreting these data it is important to note that changes in notifications over time may not indicate changes in disease prevalence. Increases in screening and the use of more sensitive screening tests for STI as well as periodic public awareness campaigns may explain the change in the number of notifications across years. Comparisons of STI notifications between males and females and Indigenous and non-Indigenous status have to be interpreted cautiously by taking into account that data from STI screening are biased towards high risk groups.

Chlamydial infection

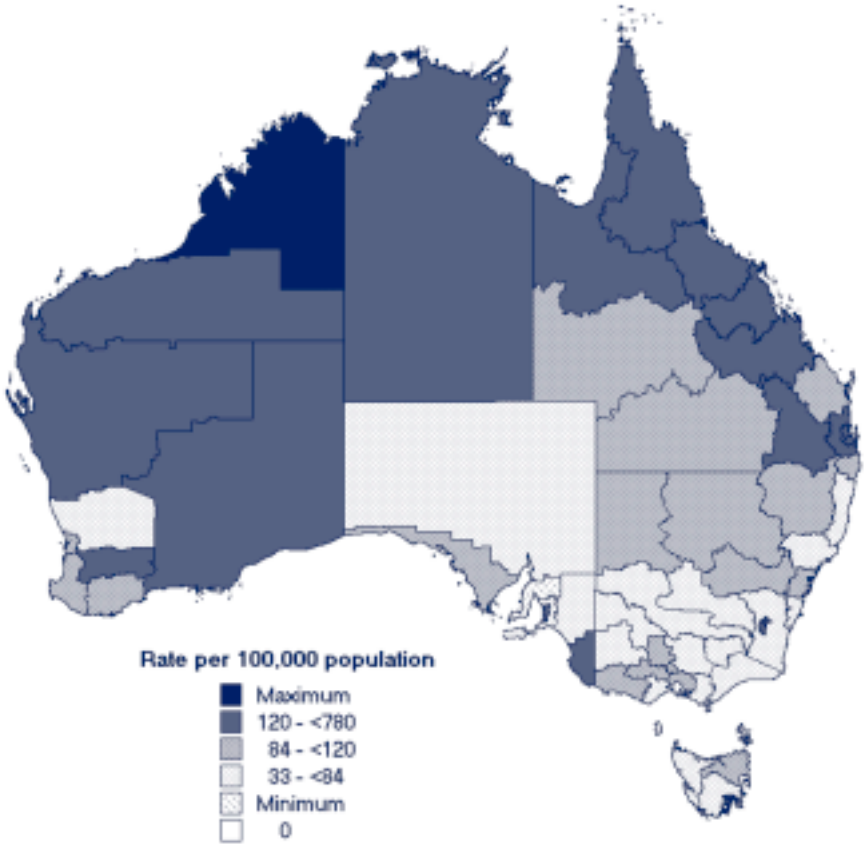
In 2002, a total of 24,039 notifications of chlamydial infection were received by NNDSS, a rate of 122.3 cases per 100,000 population. This rate represents an increase of 19 per cent compared with the rate reported in 2001 (102.8 cases per 100,000 population). From 1998 through 2002, notification rates of chlamydial infection increased annually at an average rate of 11.3 per cent (range 14.5–22.1%). Between 1998 and 2002, notification rates of chlamydial infection increased from 92.7 to 122.3 cases per 100,000 population (Table 4).

Chlamydial infection notification rates were above the national average in the Northern Territory (732 cases per 100,000 population), Queensland (174 cases per 100,000 population), Western Australia (153.9 cases per 100,000 population) and the Australian Capital Territory (142.9 cases per 100,000 population). Compared to 2001, the Australian Capital Territory had the largest percentage increase in the chlamydial infection notification rate in 2002 (54%), most likely, as a result of contact tracing and awareness raising campaigns.

At the regional level, the Kimberley region of Western Australian (1,199 cases per 100,000 population) the Northern Territory (776 cases per 100,000 population), and Far North Queensland (545.5 cases per 100,000 population) had the highest notification rates (Map 3).

Increase in the notification of chlamydial infection was higher in males. Compared to 2001, notification rates increased by 22.2 per cent among males (from 82.1 to 99.4 cases per 100,000 males) and by 18.8 per cent among females (from 122.3 to 144.2 cases per 100,000 females). Although higher rates among women suggest that a greater number of women were screened for the disease, the higher increase among men likely reflects a trend that they are increasingly being diagnosed with *Chlamydia*. Contact tracing of sex partners of women with chlamydial infection, chlamydial infection awareness campaigns, and the availability of non-invasive tests increase the number of men diagnosed with *Chlamydia*. For example, in the Australian Capital Territory (the jurisdiction with the highest increase in notification rates in 2002), where contact tracing was conducted, chlamydial infection notifications increased among males in all age groups, while in females increase occurred only in the 15–29 year age group.

Map 3. Notification rates of chlamydial infection, Australia, 2002, by Statistical Division of residence



Adolescents and young adults continue to have the highest notification rate of chlamydial infection. In 2002, 76 per cent of notified cases were in the 15–29 year age range. The 20–24 year age group accounted for 31.7 per cent of all notifications among males, and 36.3 per cent of all notifications among females. The male to female ratio in this age group was 0.6:1. The highest notification rate occurred among females in the 20–24 year age group (782 cases per 100,000 population), followed by females in the 15–19 year age group (640.8 cases per 100,000 population). Among males, the highest notification rate occurred among the 20–24 year age group (449.9 cases per 100,000 population) (Figure 27). The trend in notification rates of chlamydial infection from 1995 to 2002 shows a steady increase in all age groups in the 15–29 year age range. In 2002, the largest percentage increase from the previous year occurred among females in the 25–29 year age group (26.3% increase) and among males in the 20–24 year age group (23.7% increase) (Figure 28).

Figure 27. Notification rates of chlamydial infections, Australia, 2002, by age group and sex

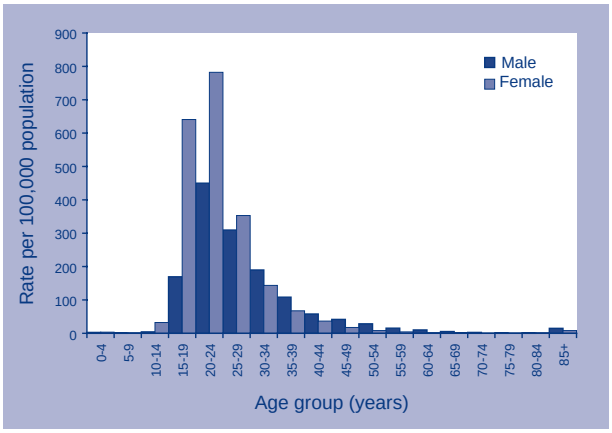
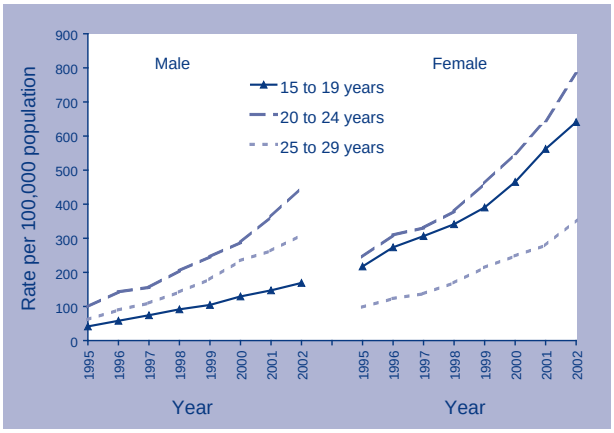


Figure 28. Trends in notification rates of chlamydial infection in persons aged 15–29 years, Australia, 1995 to 2002, by sex

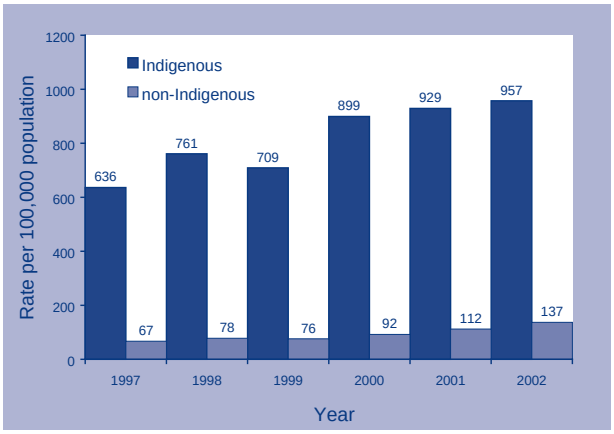


Whether the increase reported in 2002 was the result of changes in surveillance or a true increase in prevalence could not be determined from surveillance data. NNDSS data need to be considered in the context of public health and surveillance activities in states and territories. In 2002, *Chlamydia* awareness programs were carried out in the Australian Capital Territory and in Victoria. In the Australian Capital Territory, as noted above, contact tracing of all notifications of chlamydial infection was carried out in cooperation with diagnosing general practitioners. In Victoria, the *Chlamydia* awareness campaign was the first phase of *The Chlamydia Strategy for Victoria (2001 to 2004)* prepared by the Victorian Department of Human Services.[7] The focus of this first phase was prevention through education targeted at young people less than 24 years of age, through schools and health services. In Queensland, the 'notification period' for chlamydial infection, that is, the exclusion period beyond which subsequent positive laboratory test for a case is counted as a newly acquired infection, was reduced from two months to one. In Tasmania, there was a 14 per cent increase (from 7,020 in 2001 to 7,976 in 2002) in *Chlamydia* testing.

The extent to which public health initiatives, changes in surveillance practices and increases in testing for *Chlamydia* contributed to an increase in reporting is unknown. The pattern observed in surveillance data, that is, increase overtime across gender, age and jurisdictions, signals a need for research to determine the true prevalence of chlamydial infection in the population.

Indigenous status was reported for 88.7 per cent of the Northern Territory notifications, 99.4 per cent in South Australia and 51.3 per cent in Western Australia. These jurisdictions together reported 6,159 cases of chlamydial infection (25.5% of all chlamydial infection notifications received by NNDSS in 2002) of which 1,678 cases were Indigenous, 2,862 non-Indigenous, and 1,619 were of unknown Indigenous status. Based on these data, the age standardised notification rate of chlamydial infection was 957 cases per 100,000 population among Indigenous people, and 137 cases per 100,000 population among non-Indigenous people, a ratio of 7:1 (Figure 29).

Figure 29. Trends in age standardised notification rates of chlamydial infection the Northern Territory, South Australia and Western Australia (combined), 1997 to 2002, by Indigenous status



Source : National Centre in HIV Epidemiology and Clinical Research HIV/AIDS Annual report, 2003.

Note that cases with missing Indigenous status were added to non-Indigenous population.

Donovanosis

Donovanosis is a sexually transmitted infection characterised by a chronic ulcerative genital disease. Although relatively uncommon, it is a disease of public health importance in Australia because it predominantly occurs in Indigenous communities, it has been identified as a potential co-factor in HIV transmission, and it is preventable.[8,9] In 2001, donovanosis was targeted for elimination from Australia within three years through the donovanosis elimination project. The centrepiece of this project is the activity of project officers, located in Cairns (Queensland), Perth (Western Australia), and Darwin and Alice Springs (Northern Territory), and includes active case follow up, case ascertainment and treatment through primary health care and raising community and medical practitioner awareness of ulcerative STI.[10] In 2002, South Australia commenced surveillance of donovanosis, while Queensland, the Northern Territory and Western Australia continued the enhanced surveillance of donovanosis as part of the donovanosis elimination project.

In 2002, 16 cases of donovanosis, six males and 10 females, were reported to NNDSS. Compared to 2001, the number of notifications decreased by 52 per cent. In 2001, following the implementation of enhanced surveillance for the elimination of donovanosis in Queensland, the Northern Territory and Western Australia, donovanosis notifications had increased by 57 per cent (Figure 30).

Donovanosis cases reported in 2002 were four females and one male from Far North and Northern Queensland respectively, two males from Western Australia (one each from Central and the Kimberley region) and, three males and six females from the Northern Territory from areas other than Darwin and Alice Springs. All but two cases notified in the Northern Territory were Indigenous people. The majority of cases were in the 15–39 year age range (Figure 31).

Figure 30. Number of notifications of donovanosis, Australia 1998 to 2002, by sex

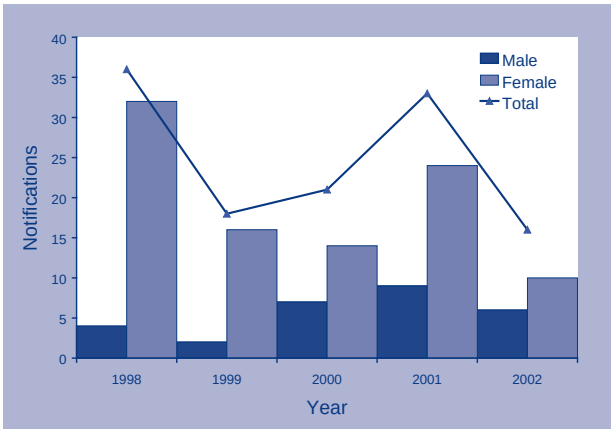
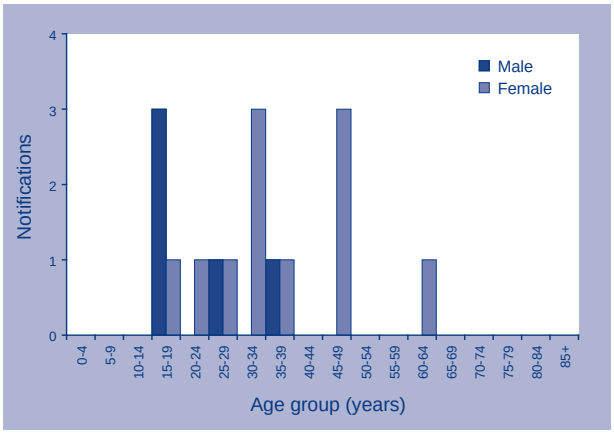


Figure 31. Notifications of donovanosis, Australia 2002, by age group and sex



Gonococcal infection

In 2002, 6,247 notifications of gonococcal infection were received by NNDSS. This represents a rate of 31.8 cases per 100,000 population, a marginal increase (0.6%) from the rate reported in 2001 (31.6 cases per 100,000 population). Increases occurred in the Northern Territory (9%), New South Wales (4%), and Victoria (17%) while there were decreases in all other jurisdictions. Despite enhanced gonococcal infection surveillance in southern Queensland including Brisbane and the Gold Coast, the notification rate in Queensland decreased by 16 per cent compared to 2001 (From 30 to 25 cases per 100,000 population).

Gonococcal infection notification rates were higher than the national level in the Northern Territory (772.7 cases per 100,000 population) and Western Australia (69.6 cases per 100,000 population). In the Northern Territory, supplementary PCR for the diagnosis of gonococcal infection was not available for a period of five months in 2002, possibly resulting in over reporting since culture negative but PCR positive samples were notified during the period.

The highest notification rates in 2002 occurred in the Kimberley Statistical Division (1,383 per 100,000 population), the Northern Territory (773 per 100,000 population) and the Pilbara Statistical Division (634 per 100,000 population), (Map 4).

The notification rates of gonococcal infection in 2002, were 43 cases per 100,000 population for males and 21 cases per 100,000 population for females. The male to female ratio was 2:1, the same rate as reported in 2001. As in previous years, the notification rate of gonococcal infection in females was higher in the 10–14 and 15–19 year age groups, with a male to female ratio of 0.2:1 and 0.7:1, respectively. Higher rates were observed in males compared to females in all other adult age groups (Figure 32).

The trends in the notification rate of gonococcal infection (Figure 33) show that among males, after an overall decrease in 2001, there was an increase among persons aged 20–39 years while rates in the 15–19 year age group fell slightly. The reason for the decrease observed in males in 2001 is not clear and does not appear to be characteristic of the long-term trend. Among females, notification rates declined in the 15–19 year age group, remained unchanged among the 20–24 and 25–29 year age groups and increased in the 30–39 year age group.

Map 4. Notification rates of gonococcal infection, Australia, 2002, by Statistical Division of residence

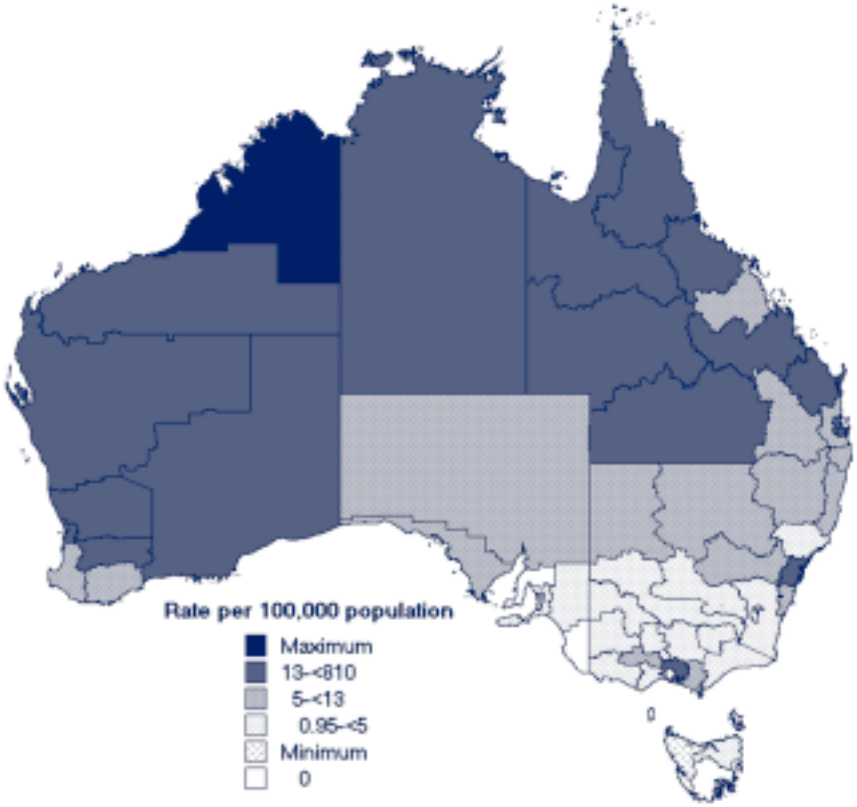


Figure 32. Notification rates of gonococcal infection, Australia, 2002, by age group and sex

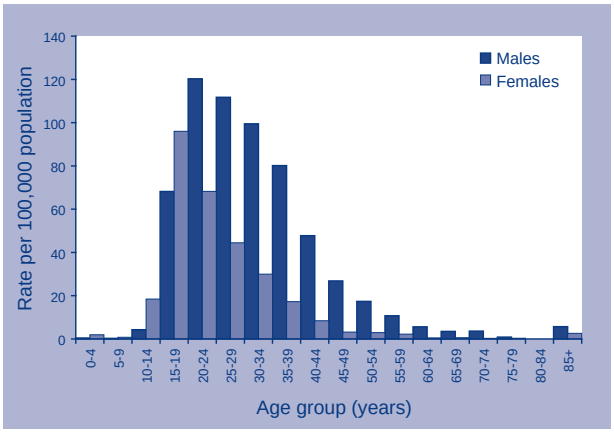
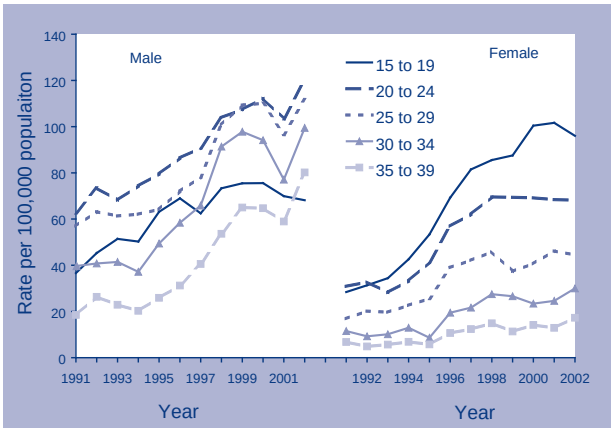
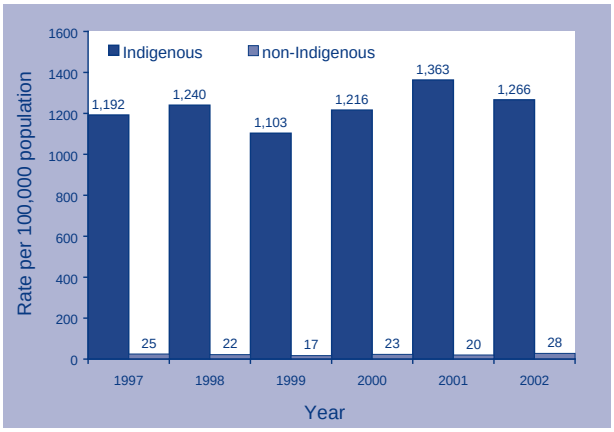


Figure 33. Trends in notification rates of gonococcal infection in persons aged 15–39 years, Australia, 1991 to 2002, by sex



In 2002, Indigenous status was reported in 91.4 per cent of cases of gonococcal infection in the Northern Territory, 100 per cent in South Australia and 82.2 per cent in Western Australia. The combined number of notifications of gonococcal infection in these jurisdictions was 3,063 cases, representing 49.0 per cent of all gonococcal infection notifications received by NNDSS. Of these cases, 2,117 were identified as Indigenous, 585 non-Indigenous and 362 of unknown Indigenous status. Based on these data, the age standardised notification rate of gonococcal infection was 1,266 cases per 100,000 Indigenous population and 28 cases per 100,000 non-Indigenous population, a ratio of 45:1 (Figure 34).

Figure 34. Trends in the age standardised notification rates of gonococcal infection, the Northern Territory, South Australia and Western Australia (combined), 1997 to 2002, by Indigenous status



Source: National Centre in HIV Epidemiology and Clinical Research HIV/AIDS Annual report, 2003.

Note that cases with missing Indigenous status were added to non-Indigenous population.

Other surveillance activities for gonococcal infections

The Australian Gonococcal Surveillance Program is the national laboratory-based surveillance system that monitors the antibiotic susceptibility of gonococcal isolates. A network of reference laboratories in each state and territory contribute to the program, using an agreed and standardised methodology to quantitatively determine susceptibility of the organism to a core group of antibiotics.

The annual results of the Australian Gonococcal Surveillance Programme for 2002 have recently been published.[11] A total of 3,951 gonococcal isolates were analysed by the Australian Gonococcal Surveillance Programme, an increase of 7 per cent on the total isolates analysed in 2001. For males, the most common anatomical site from which isolates were obtained was the urethra (78%) and for females, the cervix (92%). Rectal isolates were only obtained from males, and comprised 13 per cent of all isolates. Of the total number of isolates, 84 per cent were from men, a proportion that has remained unchanged since 2000.

Table 8 shows trends in the proportion of isolates resistant to penicillin, quinolones and tetracycline. In 2002, the proportion of isolates resistant to penicillin by chromosomally-mediated resistance decreased by 56 per cent (from 15.3% of all isolates in 2001 to 10.9 per cent in 2002). The level of quinolone resistance in gonococci remains unacceptably high although the rate decreased by 39.6 per cent compared to the previous year. Quinolone resistance is of special concern in Australia because it continues to spread among sub-populations with high rates of STI, and because rates of resistance are high in countries in South East Asia and West Pacific Region, which are the source of cases imported to Australia.[12]

Syphilis

In 2002, 1,613 cases of syphilis infections were reported to NNDSS, a notification rate of 8.3 cases per 100,000 population (Table 3). This represents an increase of 14.1 per cent compared with the notification rate of 7.3 cases per 100,000 population reported in 2001. Small increases in the notification rates occurred in the Australian Capital Territory, New South Wales, Queensland, South Australia and Victoria. In Western Australia the syphilis notification rate fell by 23 per cent while in the Northern Territory it remained stable.

Increases in New South Wales, Queensland and Victoria could be the result of public health activities that were under taken in 2002. In Victoria, active HIV and STI testing had been carried out at selected sex-on premise venues. In New South Wales, a targeted syphilis campaign was carried out to coincide with the Gay Games in Sydney in 2002. In Queensland, a syphilis registry was established in July 2001 and was fully operational in 2002. The registry collects laboratory results for syphilis regardless of test positivity to assess and classify cases. The registry also had the task of reviewing all past syphilis notifications, a task which was ongoing in 2002.

Map 5 displays notification rates of syphilis in 2002, by Statistical Division. The highest rates of syphilis notification occurred in the Kimberley Statistical Division of Western Australia, (338 cases per 100,000 population), the Northern Territory (208 cases per 100,000 population), and North-west Queensland (132 cases per 100,000 population).

The sex specific notification rates for 2002 were 9.8 cases per 100,000 population for males and 6.6 cases per 100,000 population for females. Compared to 2001, these represent an overall increase of 16.6 per cent among males and of 11 per cent among females. An exception to this trend was the Northern Territory, where syphilis notification rates among males fell by 9 per cent (from 211 to 193.8 cases per 100,000 population), but rose among females by 15.6 per cent (from 181 to 212 cases per 100,000 population). Nationally, the male to female notification ratio was 1.5:1, with the highest male to female notification ratio reported in Victoria (4:1) followed by New South Wales (2.3:1).

In 2002, the age specific notification rates among females had a bimodal distribution, with the first peak occurring in the 15–19 and 20–24 year age groups (17.2 and 16.4 cases per 100,000 population respectively) and the second peak in the 80–84 year age group (8.5 cases per 100,000 population). Seventy-two per cent of the cases in this female age group were notified in New South Wales. None of the cases had primary or secondary syphilis confirming that these are cases with late manifestations of syphilis. Manifestations of the disease may continue 5 to 20 years after initial infection or throughout life.[13]

Among males, the peak age specific notification rate shifted from the 20–24 year age group in 2001, to the 30–34 year age group, with a notification rate of 17 cases per 100,000 population (Figure 35). There were three cases of genital syphilis in children under the age of one year, all in northern Queensland.

Table 8. Proportion of gonococcal isolates showing antibiotic resistance, Australia, 1998 to 2002

	Penicillin resistance (% resistance)		Quinolone resistance % resistance)	High level tetracycline (% resistance)
	Plasmid mediated	Chromosomally mediated		
1998	5.3	21.8	5.2	NR
1999	7.4	14.3	17.2	7.9
2000	8.7	10.6	17.8	9.1
2001	7.5	15.3	17.5	9.4
2002	7.1	10.9	10.0	11.4

Source: Australian Gonococcal Surveillance Programme, Annual report 2002.

NR Not recorded.

Map 5. Notification rates of syphilis infection, Australia, 2002, by Statistical Division of residence

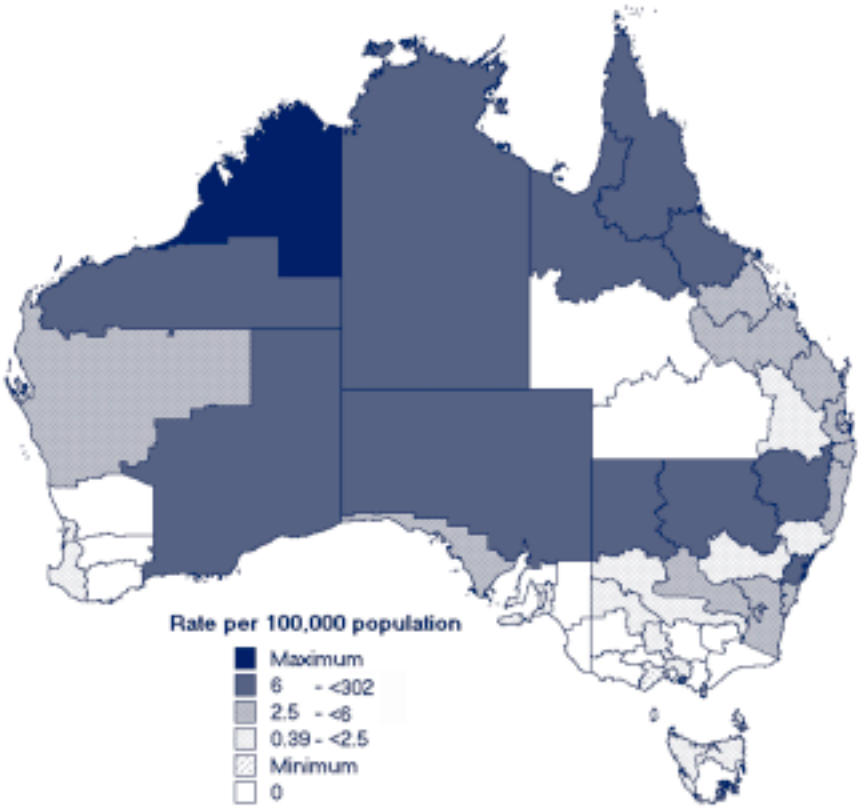
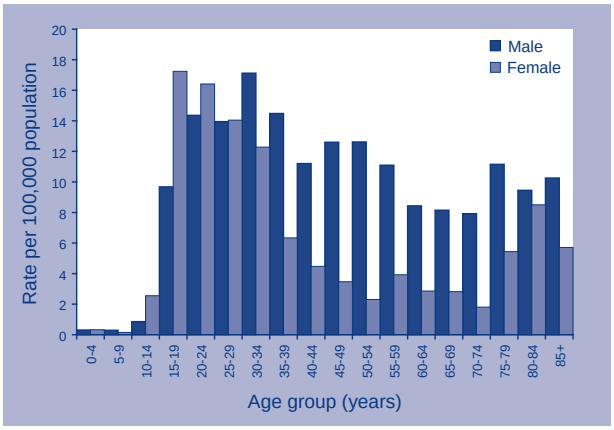
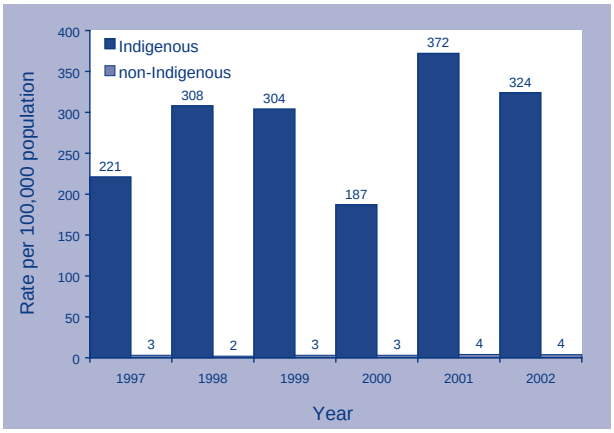


Figure 35. Notification rates of syphilis, Australia, 2002, by age group and sex



Data on Indigenous status in 2002 were available for 85 per cent of notified cases of syphilis from the Northern Territory, 84 per cent from South Australia and 64 per cent from Western Australia. The combined number of notifications of syphilis infections from these jurisdictions was 593 cases, 36.8 per cent of all notifications of syphilis infections received by NNDSS. Of these, 468 cases were Indigenous, 60 non-Indigenous and 65 did not state their Indigenous status. Based on these data, the age standardised notification rate was 324 cases per 100,000 population among Indigenous and four cases per 100,000 population among non-Indigenous populations. The ratio of Indigenous to non-Indigenous cases was 85:1 compared to 93:1 in 2001 (Figure 36).

Figure 36. Trends in age standardised notification rates of syphilis, the Northern Territory, South Australia and Western Australia (combined), 1997 to 2002, by Indigenous status



Source: National Centre in HIV Epidemiology and Clinical Research HIV/AIDS Annual report, 2003.

Note that cases with missing Indigenous status were added to non-Indigenous population.

Congenital syphilis

There were 14 notifications of congenital syphilis reported to NNDSS in 2002, seven males, six females and one for whom gender was not stated. All reported cases were under one year of age, except one case in a 2-year-old female. All cases were from the Northern Territory, except for one case in New South Wales. In 2001, there were 21 cases of congenital syphilis notified.

Vaccine preventable diseases

This section summarises the national notification data for laboratory-confirmed influenza and diseases targeted by the standard childhood vaccination schedule in 2002. This includes diphtheria, *Haemophilus influenzae* type b infection, measles, mumps, pertussis, invasive pneumococcal disease, poliomyelitis, rubella and tetanus. There were no changes to the Australian Standard Vaccination Schedule in 2002.

There were 11,711 notifications of vaccine preventable diseases (VPDs) with onset dates in 2002; 11.6 per cent of the total notifications to NNDSS. Pertussis was the most commonly notified VPD (5,388 cases or 46% of all VPD notifications). Numbers of notifications and notification rates for vaccine preventable diseases in Australia are shown in Tables 2 and 3.

Diphtheria

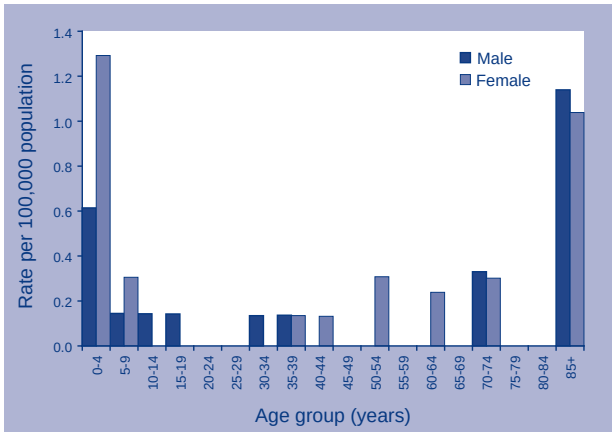
There were no cases of diphtheria reported in 2002. A single case of cutaneous diphtheria in 2001 was the first case reported since 1993.[14]

Haemophilus influenzae type b disease

Notifications of *Haemophilus influenzae* type b (Hib) have fallen more than 30-fold since 1991 due to the impact of Hib conjugate vaccines.[15]

There were 29 notifications of Hib disease in 2002, a rate of 0.1 cases per 100,000 population. This is a similar rate to that reported in 2001, when the lowest number of notifications was recorded since national surveillance began in 1991. Twelve cases (41% of total cases) were in children aged less than five years of age and six were infants aged less than one year (Figure 37). There continued to be more cases reported in females than males, (male:female ratio 0.7:1) in 2002. The Northern Territory had the highest notification rate (1.5 per 100,000 population, three cases) although most cases (10/29, 34%) were from New South Wales. Of the 24 cases with

Figure 37. Notification rate of *Haemophilus influenzae* type b infection, Australia, 2002, by age group and sex

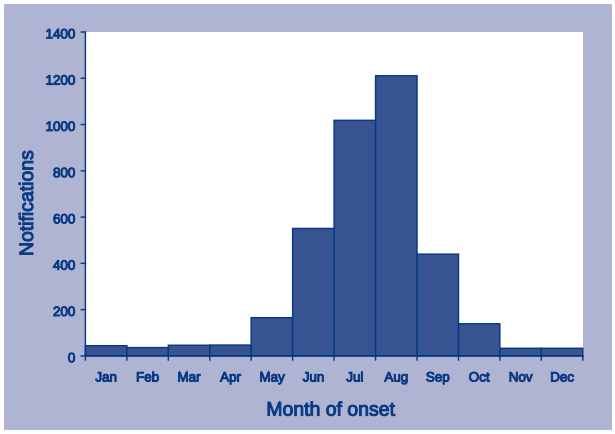


a known Indigenous status, 11 were Indigenous and 13 were non-Indigenous. Nine of the cases in Indigenous people occurred in children aged less than 5 years (17 cases per 100,000 population) compared with 3 cases in non-Indigenous children (0.2 cases per 100,000 population). Although there has been a significant decline in Hib disease, Indigenous children make up a greater proportion of cases than in the pre-immunisation era.[15]

Laboratory-confirmed influenza

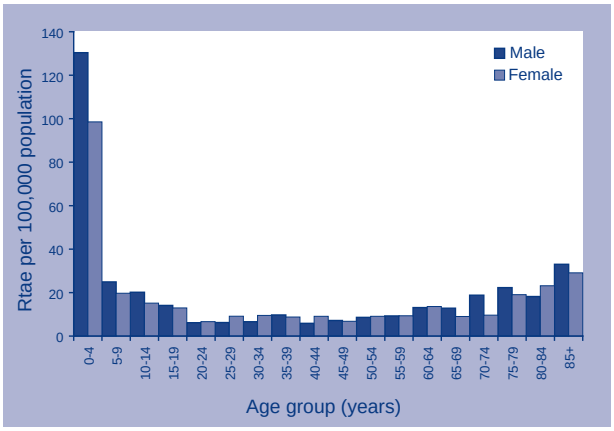
There were 3,665 reports of laboratory-confirmed influenza in 2002, a rate of 18.6 cases per 100,000 population. In 2002, data were available from all jurisdictions for the full year, in contrast to 2001, when reporting was incomplete. Notifications of influenza showed a peak in August (late winter) (Figure 38).

Figure 38. Notifications of laboratory-confirmed influenza, Australia, 2002 by month of onset



The highest rates of influenza were in children aged less than 5 years (Figure 39). This may reflect not only the high incidence of influenza in children, but also that children are more likely to undergo virological testing for respiratory viruses on presentation to hospital. The male to female ratio was 1.2:1.

Figure 39. Notification rate of laboratory-confirmed influenza, Australia, 2002, by age group and sex

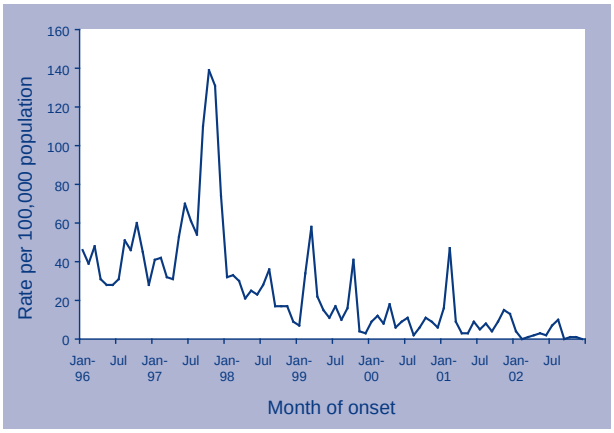


In 2002, influenza A was the dominant type, 99 per cent of which were subtype H3N2 with only a single H1N2 isolate. The influenza A (H3N2) isolates analysed were closely related to the vaccine strains A/Moscow/10/99 and the A/Panama/2007/99. Influenza B accounted for 21 per cent of all isolates and most of these were of the B/Victoria lineage, which has not been seen in Australia for a decade. This strain had a haemagglutinin closely related to the B/HongKong/330/2001 reference strain and a neuraminidase similar to the B/Sichuan/379/99-like viruses, indicating that a genetic reassortment event had occurred. These new B/Hong Kong/330/2001-like viruses were associated with two outbreaks in school groups.[16] Although the 2002 influenza vaccine was not directed against the new strain, a proportion of asymptomatic vaccinees who had received the 2002 influenza vaccine showed protective antibody titres.[16] In 2002, 77 per cent of the over 65 year age group in Australia received influenza vaccination.[17]

Measles

There were 31 confirmed measles cases in 2002, a national rate of 0.2 cases per 100,000 population. This is a steep decline in numbers compared with 2001 when 141 cases were notified, and is the lowest annual rate for Australia since national surveillance began in 1991 (Figure 40). The highest rate was in Victoria with 0.3 cases per 100,000 population (14 cases) (Tables 1 and 2).

Figure 40. Notification rate of measles, Australia, 1996 to 2002, by month of onset



All age groups had the lowest rates on record in 2002. Rates were highest in the 0–4 year age group (0.6 cases per 100,000 population), followed by the 20–24 year age group (0.5 cases per 100,000 population) and the 15–19 year age group (0.4 cases per 100,000 population). Of the eight cases in the under 5 year age group two were aged less than one year. There was only a single case reported in each of the 5–9 and 10–14 year age groups. This illustrates the ongoing impact of the Measles Control Campaign (which involved the mass vaccination of primary school aged children in 1998) and lowering the age for the second dose of measles, mumps, rubella vaccine to age four years. As a result of improved immunity in children and a residual cohort of susceptible adults born in the late 1970s and early 1980s, the proportion of cases in young adults has increased since 1998. In 2002, 35 per cent of the reported cases were aged 20–29 years, where as between 1993 and 1998 only 8 per cent of cases were in this age range.

Of the 31 cases reported in 2002, nine were recorded as having acquired their infection outside Australia. The vaccination status was recorded for 21 cases: two were fully vaccinated for age and 19 were unvaccinated. There were a number of outbreaks of measles in Australia in 2002. In Victoria in May and June a cluster of measles in three young adults was identified. The cases were unvaccinated and had no recent history of travel. In New South Wales in the second quarter of 2002 there were two linked cases of measles. The first was an unvaccinated 1-year-old child who had recently travelled in Pakistan and the second, a vaccinated 1-year-old child contact. An outbreak in the Whitsunday region of north Queensland occurred in July and August 2002 in unvaccinated children with exposure to an infected overseas traveller. Secondary cases occurred in New South Wales as well. This outbreak had two generations of transmission and resulted in a total of seven cases from four families.[18]

Mumps

In 2002, there were 69 notifications of mumps, a rate of 0.4 cases per 100,000 population. This is a decrease of 39 per cent on the 114 cases reported in 2001 and the lowest rate since all states and territories began notifying the disease in 1996. There were notifications from all age groups under 75 years (Figure 41) with the majority (n=48, 70%) from people aged 15 years or more. The highest notification rate (0.6 cases per 100,000 population) was in the 0–4 year age group. As in most years, there was a preponderance of cases in males (male: female ratio 1.5:1).

Pertussis

Pertussis continues to be the most common vaccine preventable illness in Australia, with periodic epidemics occurring at intervals of three to five years on a background of endemic circulation (Figure 42).[19] In 2002, there were 5,388 cases notified (27.4 cases per 100,000 population), a 43 per cent decrease on the epidemic year of 2001 when 9,515 cases were notified.

The highest notification rates were among children aged less than one year (117.4 cases per 100,000 population) and those aged 10–14 years (85.3 cases per 100,000 population) (Figures 43 and 44). The notification rate in children aged less than one year exceeded that for the 10–14 year age group for the first time since 1998 (Figure 43). This may reflect the impact of the fifth dose of the pertussis vaccine, given to 4-year-olds since 1994, and the resultant cohort effect. The overall male to female ratio was 0.9:1.

Figure 41. Notification rate for mumps, Australia 2002, by age group and sex

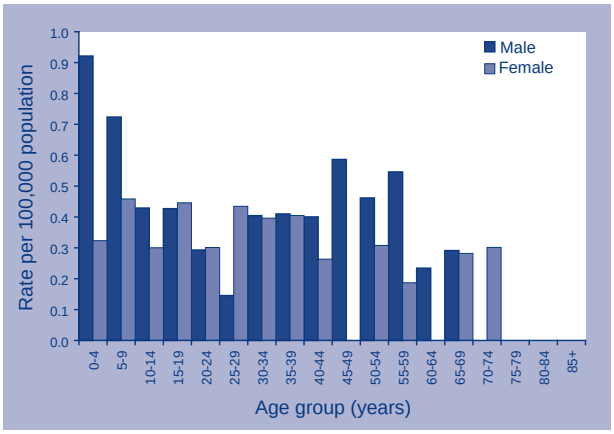


Figure 42. Notifications of pertussis, Australia, 1991 to 2002, by month of onset

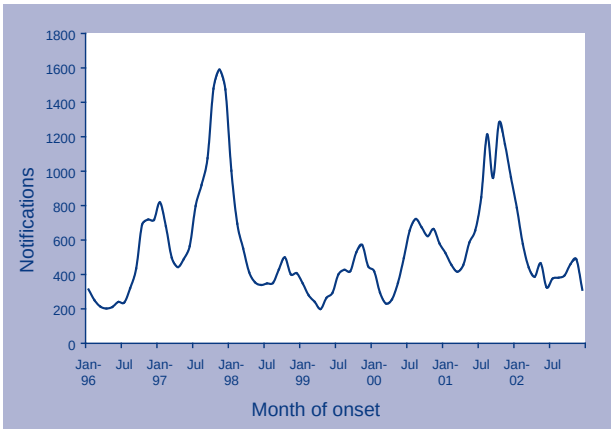
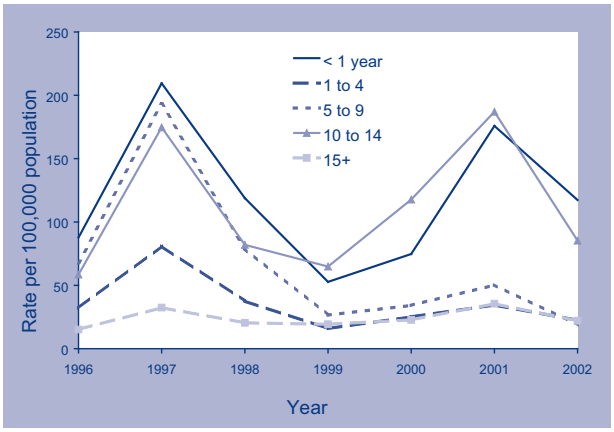


Figure 43. Notification rates for pertussis, Australia, 1996 to 2002, by age group



Notification rates of pertussis varied considerably by geographic location (Map 6). The highest rate was in Queensland (50 cases per 100,000 population) and the lowest rate was in Tasmania (8.7 cases per 100,000 population).

Map 6. Notification rates of pertussis, Australia, 2002, by Statistical Division of residence

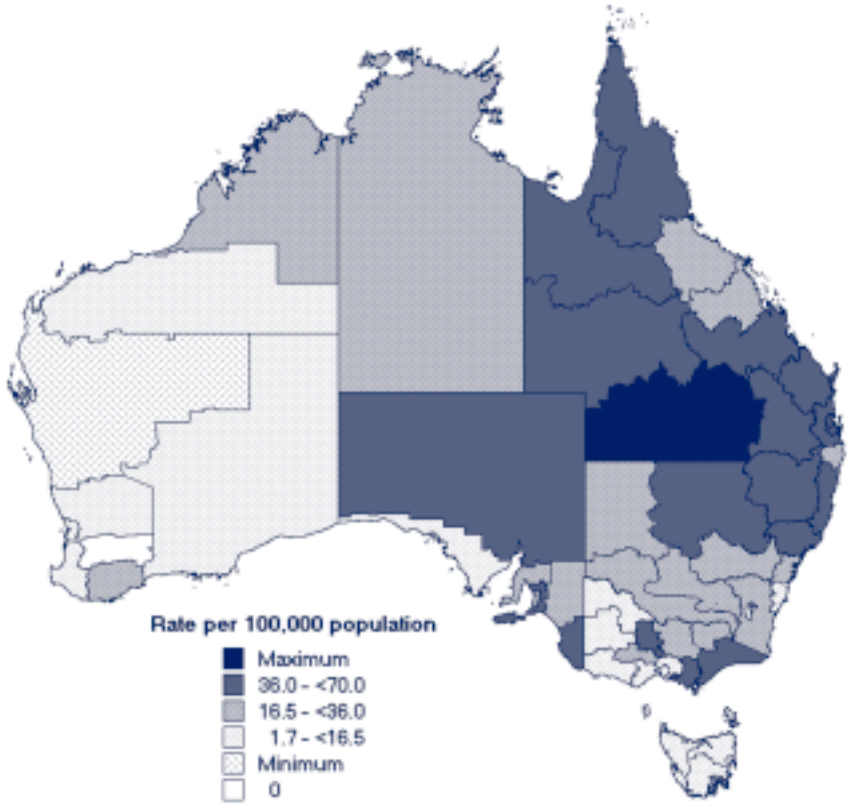
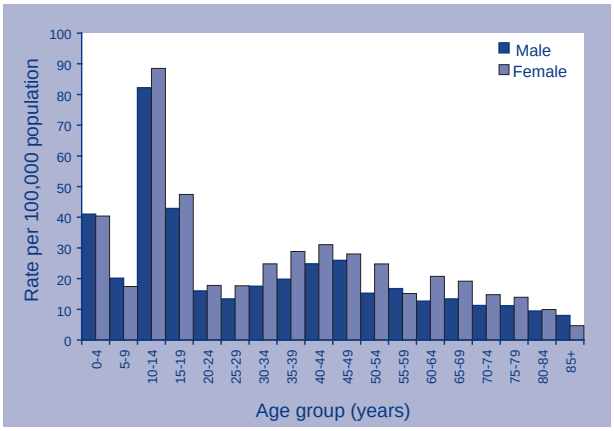


Figure 44. Notification rates for pertussis, Australia, 2002, by age group and sex

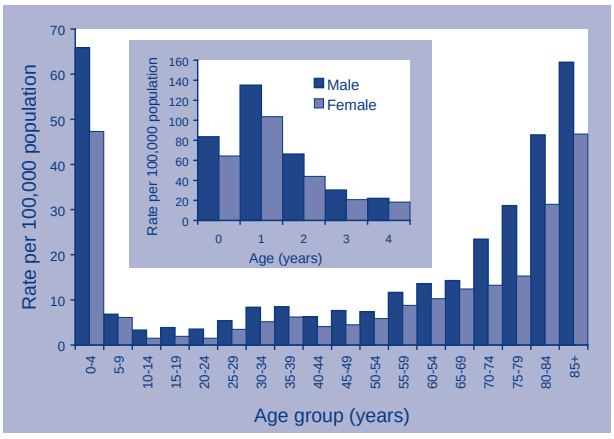


Pneumococcal disease (invasive)

There were 2,271 notifications of invasive pneumococcal disease (IPD) in Australia in 2002 giving a rate of 11.5 cases per 100,000 population. While the largest numbers of cases were reported from New South Wales, Queensland and Victoria (Table 1), the highest rate was in the Northern Territory (32.8 cases per 100,000 population). The geographical distribution of IPD varied within states and territories, with the highest rates in Central and northern Australia.

IPD was largely a disease of the very young and very old. The highest rates of disease were among children aged less than 5 years (56.8 cases per 100,000 population) and adults aged more than 85 years (51.7 cases per 100,000 population) (Figure 45). There were more cases among males,

Figure 45. Notification rate for invasive pneumococcal disease, Australia, 2002, by age and sex



with a male to female ratio of 1.3:1. IPD notifications peaked in late winter and early spring with the largest number of notifications in August.

Additional data were collected on cases of invasive pneumococcal disease in all Australian jurisdictions during 2002. Analyses of these data have recently been published.[21]

Poliomyelitis

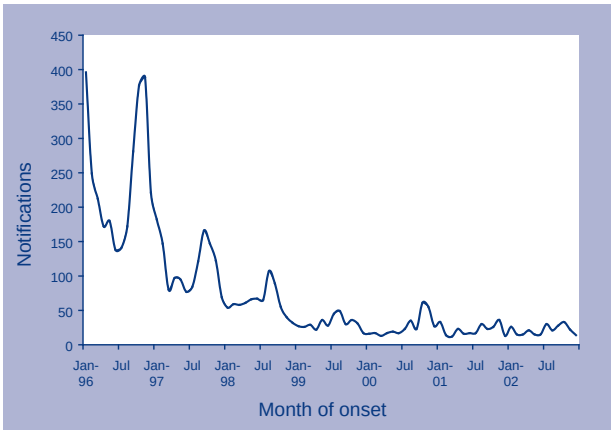
No cases of poliomyelitis were reported in Australia in 2002.

There were 46 cases of acute flaccid paralysis reported in 2002. Of these, 33 occurred in children aged less than 15 years of age; this represents 83 per cent of the WHO indicator target for acute flaccid paralysis. Testing of faecal specimens identified poliovirus Sabin vaccine-like type 3 in a single acute flaccid paralysis case, who was fully vaccinated. The conclusion of the expert review committee was that this was an incidental finding in a case of acute focal neuropathy.[22]

Rubella

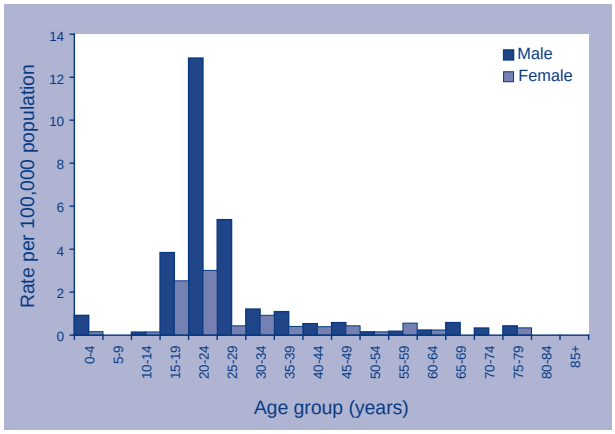
In 2002, there were 254 notifications of rubella, a notification rate of 1.3 cases per 100,000 population. This rate is slightly lower than in 2001 (1.4 cases per 100,000 population) and is the lowest rate recorded since national reporting of rubella commenced (Figure 46).

Figure 46. Notifications of rubella, Australia, 1996 to 2002, by month of onset



As in the past two years, notification rates were highest in males aged 20–24 years (12.9 cases per 100,000 population) (Figure 47). The male to female ratio of notified cases has been increasing since 1999 due to this residual cohort of susceptible young adult males and improved childhood immunity. In 2002 the male:female ratio was 3:1.

Figure 47. Notification rate for rubella, Australia, 2002, by age and sex



In contrast to the rest of Australia, rates of rubella in Queensland have been increasing since 2000, especially amongst young adult males aged 15–29 years and females aged 15–24 years. In 2002, Queensland accounted for 75 per cent of all notified cases of rubella (notification rate 5.1 cases per 100,000 population).

There were 56 cases of rubella notified from women of child-bearing age (15–49 years) in 2002, eight more than in 2001 when the lowest number on record was reported. A single notification of congenital rubella was received in 2002, which occurred in a child infected outside Australia (Australian Paediatric Surveillance Unit report, 2002). Ongoing transmission in Queensland has resulted in two locally acquired cases of congenital rubella syndrome in 2003.[23,24]

Tetanus

Since 1995, less than 8 cases of tetanus have been notified each year. In 2002, there were three reported cases (two female, one male). All three cases were adults aged 64 years or above. This is consistent with the age distribution of notifications in recent years, and indicates that tetanus has become a disease of older adults.

Childhood vaccination coverage reports

Estimates of vaccination coverage both overall and for individual vaccines for children at 12 months, 24 months and 6 years of age in 2002 are shown in Tables 9, 10 and 11 respectively.

Table 9. Percentage of Australian children born in 2001 vaccinated according to data available on the Australian Childhood Immunisation Register, estimate at one year of age

Vaccine	Birth date			
	1 Jan–31 Mar 2001	1 Apr– 30 Jun 2001	1 Jul–30 Sep 2001	1 Oct–31 Dec 2001
Diphtheria, tetanus, pertussis (%)	91.8	92.5	92.7	92.6
Poliomyelitis (%)	91.7	92.4	92.6	92.5
Haemophilus influenzae type b (%)	93.7	94.7	94.9	94.7
Hepatitis B (%)	94.0	94.9	95.1	95.0
Fully vaccinated (%)	90.2	91.2	91.7	91.4

Table 10. Percentage of Australian children born in 2000 vaccinated according to data available on the Australian Childhood Immunisation Register, estimate at two years of age

Vaccine	Birth date			
	1 Jan–31 Mar 2000	1 Apr–30 Jun 2000	1 Jul–30 Sep 2000	1 Oct–31 Dec 2000
Diphtheria, tetanus, pertussis (%)	90.3	90.9	91.4	91.2
Poliomyelitis (%)	94.2	94.7	94.8	94.9
Haemophilus influenzae type b (%)	95.0	94.3	94.0	94.0
Measles, mumps, rubella (%)	93.2	93.8	94.2	94.2
Fully vaccinated (%)	88.1	88.8	89.4	89.0

Table 11. Percentage of Australian children born in 1996 vaccinated according to data available on the Australian Childhood Immunisation Register, estimate at six years of age

Vaccine	Birth date			
	1 Jan–31 Mar 1996	1 Apr–30 Jun 1996	1 Jul–30 Sep 1996	1 Oct–31 Dec 1996
Diphtheria, tetanus, pertussis (%)	83.7	84.1	84.5	84.3
Poliomyelitis (%)	84.0	84.4	84.7	84.5
Measles, mumps, rubella (%)	82.4	83.1	83.7	83.6
Fully vaccinated (%)	80.6	81.4	82.2	82.2

Vectorborne diseases

There were 3,052 notifications of arboviral infection and malaria reported to NNDSS during 2002 (3% of all notifications to NNDSS). The viral diseases notified include those caused by alphaviruses (Barmah Forest virus infection and Ross River virus infection) and flaviviruses (the viruses causing dengue, Japanese encephalitis, Kunjin virus, and Murray Valley encephalitis). Aspects of the ecology of these viruses and the clinical features of the disease they cause have previously been described.[14] This section also reports on malaria notifications.

Alphaviruses

Barmah Forest virus infection and Ross River virus infection

There were 896 cases of Barmah Forest virus (BF) infection notified to NNDSS in 2002. Eighty-seven per cent of these were reported from New South Wales (389 cases) and Queensland (388 cases). The highest rates of notification occurred in the Northern Territory (11.6 cases per 100,000 population) and Queensland (10.5 cases per 100,000 population). The national notification rate was 4.6 cases per 100,000 population.

A total of 1,447 cases of Ross River virus (RR) infection were notified to NNDSS in 2002. There were 887 notifications reported from Queensland, and 178 from New South Wales. The highest rate was reported in the Northern Territory (31.8 cases per 100,000 population). During 2002 an unusually large number of RR infections were reported from Tasmania.

The national notification rates for both RR and BF infections are less than those observed in 2001. For BF the rate lies within the range observed since reporting began in 1995. The rate for RR, however, is the lowest recorded in the 11 years of data reported to NNDSS (Figure 48).

The age and sex distribution of the BF and RR cases notified are shown in Figures 49 and 50. The notification rates of both diseases were highest in the 45–54 year age range (BF 8.9 cases per 100,000 population; RR 13.6 cases per 100,000 population). The male-to-female ratio for BF was 1:1, and for RR, 0.9:1.

An outbreak of BF infection occurred in the Gippsland region of eastern Victoria with 50 cases notified between January and May 2002.

Figure 48. Notifications of Ross River virus infections, Australia, 1991 to 2002

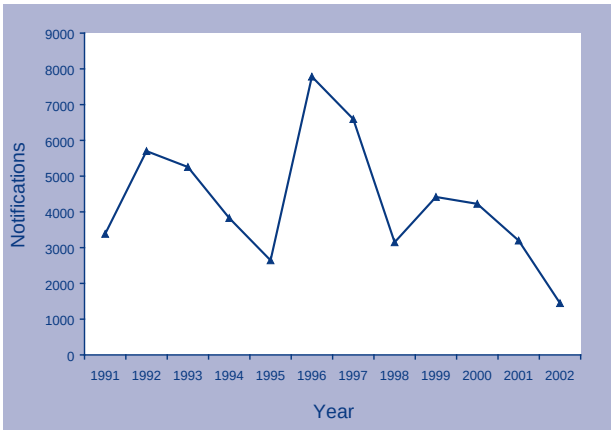


Figure 49. Notification rates of Barmah Forest virus infections, Australia, 2002, by age group and sex

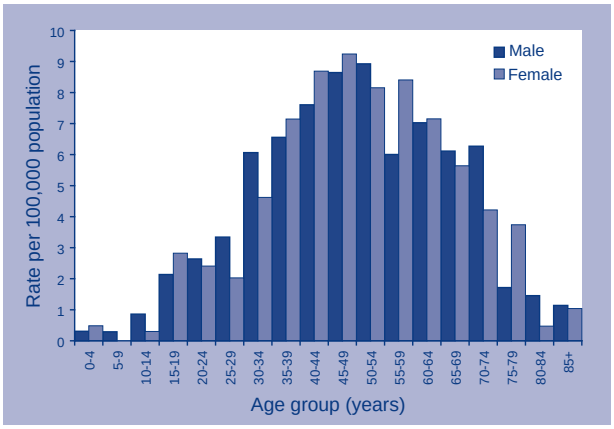
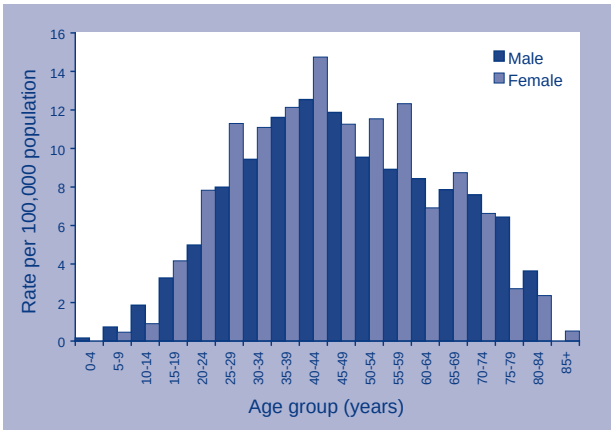


Figure 50. Notification rates of Ross River virus infection, Australia, 2002, by age group and sex



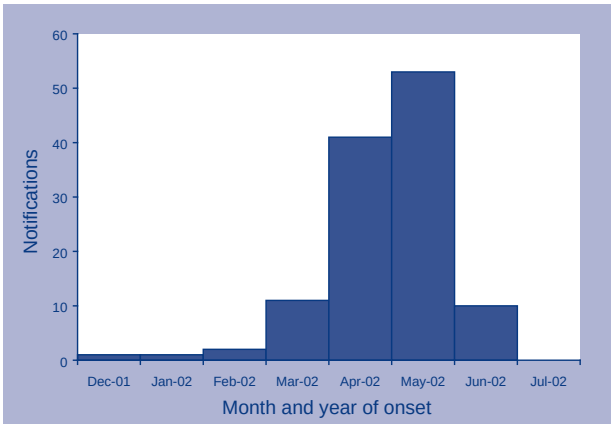
An outbreak of RR occurred in Tasmania with 117 cases notified, a rate of 24.8 cases per 100,000 population (Figure 51). The first cases were notified in November 2001, but most were notified during March and April 2002. The majority of cases (n=68) resided around salt flats in two coastal local government areas to the east of Hobart.

These two outbreaks were notable for occurring outside northern Australian and the eastern seaboard regions, the areas where both diseases are most likely to occur. Indeed, the rate of BF infection in East Gippsland (52 cases per 100,000 population), was the highest rate observed in Australia for 2002 (Map 7). The highest rate for RR infection occurred in the Kimberley Statistical Division of Western Australia (201 cases per 100,000 population) (Map 8).

Flaviviruses

Flaviviruses are single-stranded RNA viruses associated with epidemic encephalitis throughout the world. In Australia, flaviviruses of public health importance are those causing dengue, Japanese encephalitis, Kunjin virus and Murray Valley encephalitis.

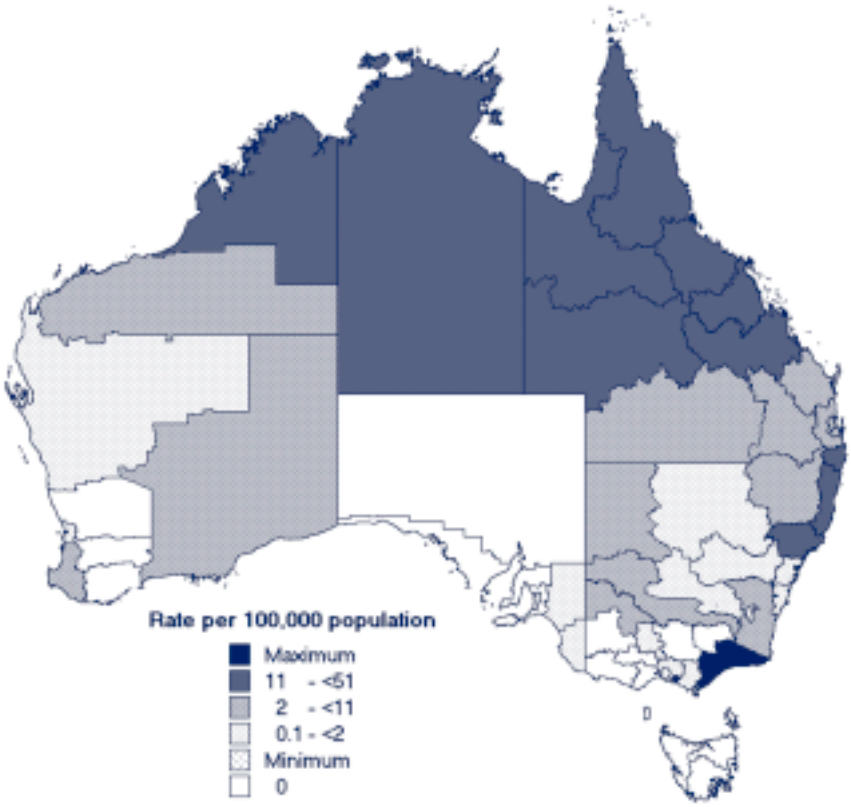
Figure 51. Epidemic curve for outbreak of Ross River virus infection, Tasmania, 2002



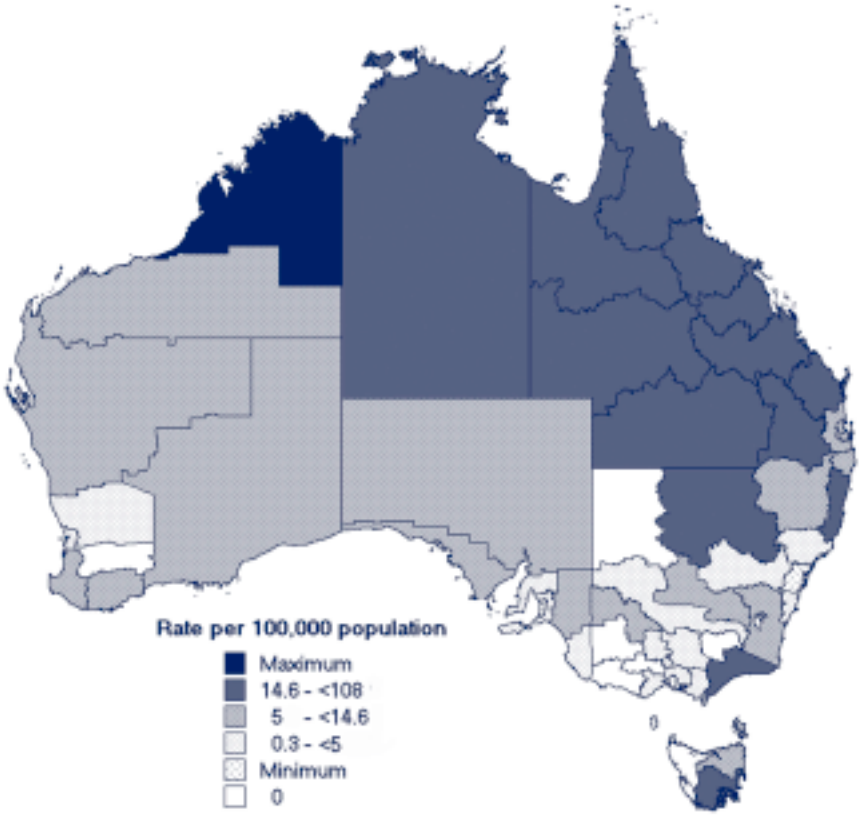
Arboviruses — Not elsewhere classified

Twenty-two notifications were categorised as 'Arbovirus — not elsewhere classified' in 2002. These may include unspecified flavivirus infections (e.g. Murray Valley encephalitis or Kunjin virus), where serology is unable to differentiate the different viruses, or infections caused by other arboviruses which are not separately notifiable (e.g. Sindbis).

Map 7. Notification rates of Barmah Forest virus infection, Australia, 2002, by Statistical Division of residence



Map 8. Notification rates of Ross River virus infection, Australia, 2002, by Statistical Division of residence



Dengue

Dengue is locally transmitted within Australia only in northern Queensland, where the vector mosquito *Aedes aegypti* is endemic. Cases in other parts of Australia not originating from Queensland are therefore all acquired overseas.

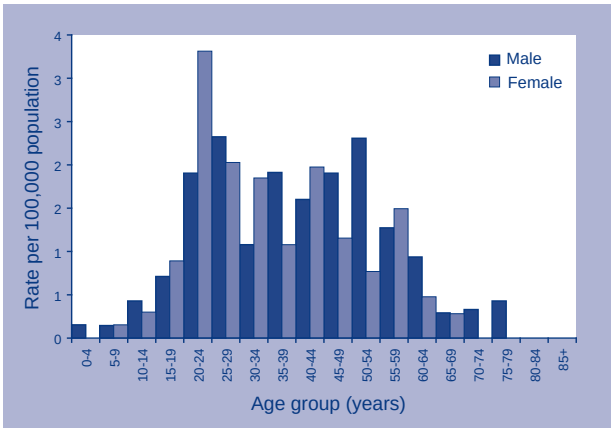
There were 219 cases of dengue notified during 2002. Most cases were reported from Queensland (81 cases, 10.5 cases per 100,000 population) and New South Wales (66 cases, 5.9 cases per 100,000 population), and the highest rate was observed in the Northern Territory (32 cases, 16.2 cases per 100,000 population).

The age and sex distribution of dengue notifications is shown in Figure 52. The male:female ratio was 1.1: 1. Most cases in males occurred in the 25–29 year age group (2.3 cases per 100,000 population), and in females in the 20–24 year age group (3.3 cases per 100,000 population).

In 2002, 25 cases of dengue were locally acquired.[25] These occurred in three outbreaks in north Queensland, in March (21 cases), April (2 cases) and May (2 cases). The dengue serotypes were 2, 1 and 4 respectively. The last outbreak was also the first recorded occurrence of dengue serotype 4 in Queensland. No reports of dengue haemorrhagic fever and no deaths were reported.

Dengue has emerged as a disease of global importance.[26,27,28] Increasing urban populations and ineffective mosquito control efforts are expected to result in sustained increases in the number of cases of dengue worldwide. Computer models suggest that the effects of climate change will increase the number of people living in areas of higher dengue risk, from 1.5 billion in 1990 to over seven billion in 2085.[29]

Figure 52. Notification rates of dengue, Australia, 2002, by age group and sex



Japanese encephalitis

Incursions of Japanese encephalitis (JE) into the Torres Strait Islands in 1995 and mainland Australia in 1998 have earlier been described.[14] Since 1998 no further infections in mainland Australia have been identified, and there were no cases reported in 2002. A number of sentinel pig herds in northern Queensland and the Northern Territory are serologically tested at regular intervals to identify any new incursion of the JE virus into mainland Australia.

Seroconversions in the sentinel pig herds on the Torres Strait islands have detected the presence of JE virus each year from 1995 to 2003, with the exception of 1999. Evidence for the presence of the virus from sentinel pigs on the mainland has only occurred in 1998, the same year in which the human infections occurred.

Outside Australia, there is a strong likelihood that the JE virus is now endemic on the island of Papua New Guinea. Genetic analysis of mosquitoes collected from Papua New Guinea and Far North Queensland has shown that the two are not isolated, suggesting the spread of the virus by wind-blown mosquitoes, which has been postulated to lie behind the outbreak in northern Queensland in 1998.[30] A review of the emergence of JE in the Australasian region describes the potential for JE to be introduced to Australia and how any incursion should be controlled.[31]

Kunjin virus and Murray Valley encephalitis

There were no cases of Kunjin infection reported in 2002.

Murray Valley encephalitis (MVE) is normally restricted to north-western and northern Australia. Incursions of the Murray Valley encephalitis virus to south-eastern Australia, under appropriate weather conditions, have in the past resulted in several epidemics. The last of these, in which 58 persons developed MVE, occurred in 1974 in the Murray Valley region.

During 2002 only two cases of Murray Valley encephalitis were notified. These were both adult males (aged 26 and 23 years) who most likely acquired their infections in the Kimberley region. The first, a Northern Territory resident who had camped near Kununurra, was notified in January 2002, and the second, a Broome resident, was notified in March 2002.

The small number of MVE notifications and absence of Kunjin in 2002 have coincided with continued widespread drought conditions in south-eastern Australia.

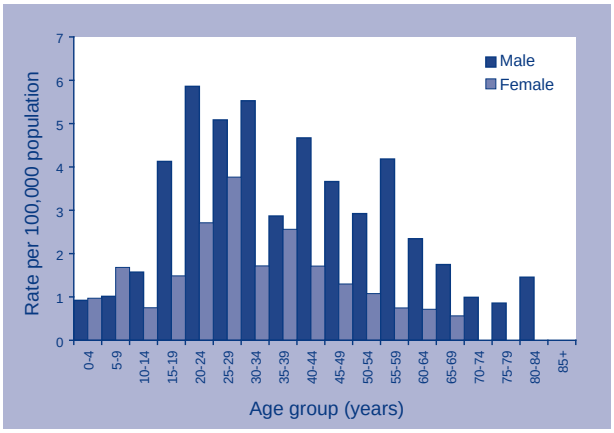
The massive inland bird populations of south-eastern Australia, that gathered with favourable weather conditions in the river red-gum forests of the Murray River valley and other flood-plain habitats, have substantially declined over recent decades. These dense bird populations are believed to have provided the necessary conditions for amplification of the MVE virus and then infecting mosquito populations. It was from these that the virus was then transmitted to human populations. The reduction in the bird populations has been attributed to habitat loss and degradation of the red-gum forests,[32,33] which in turn were caused by altered flooding regimes and increased salinity of the river system.

Malaria

In 2002 there were 466 notifications of malaria, compared with 699 in 2001, a 33 per cent decrease. Most cases were from Queensland (n=205, 5.5 cases per 100,000 population), and 104 were notified from New South Wales (1.6 cases per 100,000 population). The highest rate occurred in the Northern Territory, with 24 notifications (12.1 cases per 100,000 population). The malaria cases notified from New South Wales in 2002 included 26 cases with relapses that were recorded in the New South Wales malaria register (John Walker, personal communication).

The maximum notification rate of malaria occurred in males in the 20–24 year age group (5.9 cases per 100,000 population), and in females in the 25–29 year age group (3.9 cases per 100,000 population) (Figure 53). The male to female ratio was 2.2:1.

Figure 53. Notification rates of malaria, Australia, 2002, by age group and sex



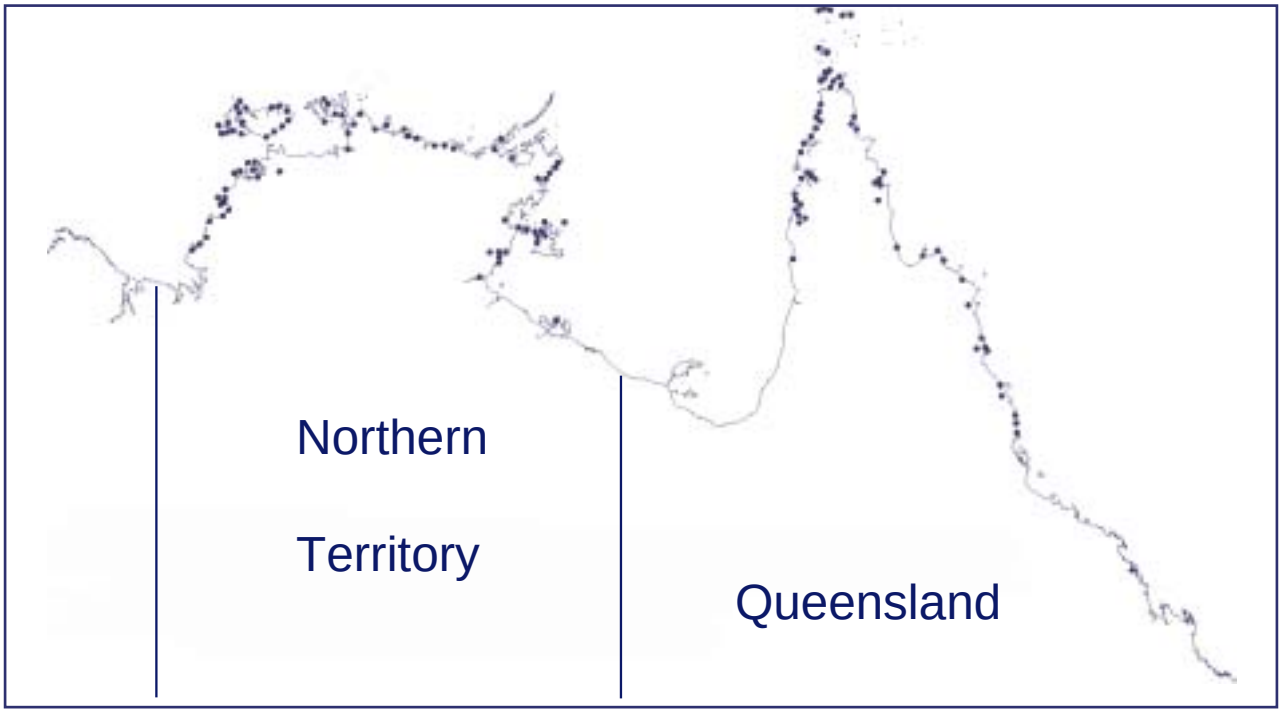
In Australia, the mosquito *Anopheles farauti*, which occurs near the coast in the Northern Territory and north of the 18th latitude in Queensland, is the most significant potential vector for malaria. The mosquito distribution is shown in Figure 54.

An outbreak involving local transmission of *Plasmodium vivax* malaria by *An. farauti* occurred in Far North Queensland in September and October 2002. Ten people were affected, including several overseas visitors. The source of the outbreak was a traveller who probably became infected when visiting Indonesia or Africa during 2001 or 2002.[34]

The outbreak occurred in the same area (Cape Tribulation) as the last previously recorded episode of local malaria in October and November 1986. In this outbreak seven cases of *P. vivax* were identified. The index case had probably acquired malaria in the Solomon Islands.[35]

There are varying clinical severities associated with infection with the different *Plasmodium* spp. The majority of cases in Australia are infected with *P. vivax* (Table 12).

Figure 54. Distribution of *Anopheles ferrati s.s.* in northern Australia



Source: Australian Government Department of Defence, Queensland Office

Table 12. Distribution of malaria cases by infecting *Plasmodium* spp.

Malaria species	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Plasmodium falciparum	3	39	3	52	7	11	23	10	147
Plasmodium vivax	10	60	21	144	7	4	42	7	294
Plasmodium ovale	0	2	0	7	0	0	1	0	10
Plasmodium malariae	0	1	0	3	0	1	0	0	5
Species unknown	–	2	–	–	–	–	–	9	11
Total	13	104	24*	206	14	16	66†	26	470

* One person had a dual infection, of *Plasmodium falciparum* and *Plasmodium vivax*.

† Two people had dual infections, of *Plasmodium falciparum* and *Plasmodium vivax*.

Zoonoses

Zoonoses are diseases transmitted to humans from animals that are the primary host. The zoonotic diseases that were nationally notifiable in 2002 were anthrax, Australian bat lyssavirus or lyssavirus (unspecified) infection, brucellosis, leptospirosis, ornithosis and Q fever. A total of 1,155 notifications (1.1% of total notifications) were made during 2002. More detailed descriptions of these diseases were provided in the 2001 NNDSS annual report.[14]

Anthrax

Following the deliberate release of anthrax spores in the United States of America in 2001, anthrax became a notifiable disease in Australia. During 2002, no cases of anthrax were notified. The last human case of cutaneous anthrax in Australia, which occurred in a knackery worker, was reported in 1997.[36]

Certain rural areas in New South Wales and Victoria are associated with recurring cases of anthrax in cattle and sheep. In these areas stock can be protected with vaccination. Despite this, a number of outbreaks of anthrax in livestock were reported during 2002. Three outbreaks involving sheep and cattle occurred in New South Wales, and two involved cattle in Queensland. Anthrax in stock in Queensland is considered rare, and these two outbreaks were the first recorded since 1993. Three sporadic cases in cattle occurred in northern Victoria.[37]

Australian bat lyssavirus and lyssavirus (unspecified)

No cases of either Australian bat lyssavirus (ABL) or lyssavirus (unspecified) disease were notified during 2002. Two cases of infection with Australian bat lyssavirus, in 1996 and 1998, occurred following close contact between bat-handlers and infected bats. Both resulted in the death of the infected person.

Molecular biological research into the genetic sequences of lyssaviruses isolated from different groups of bats suggests that the virus has been associated with bats in Australia for more than 1,500 years.[38] That is, the virus was well established before European colonisation, and its recent 'emergence' is more to do with changes in human behaviour and encroachment on bat habitats.

The ABL virus was isolated from one bat in Queensland showing clinical signs. Other animal surveillance data released in 2002 indicated that the ABL virus is taxonomically and geographically more widespread in Australian microchiroptera than previously recognised.

A human case of the related European bat lyssavirus 2 (EBL–2) infection occurred in Scotland in late 2002. Because of the case's occupational exposure as a bat-handler, the link to a lyssavirus infection was able to be made. The man was admitted to hospital with an acutely progressing neurological illness, and died. This was the first human rabies-like infection to occur in the United Kingdom since 1902. There have been 630 human cases of European bat lyssavirus infections in Europe between 1977 and 2000.[39]

Brucellosis

There were 40 cases of brucellosis notified to NNDSS during 2002, a rate of 0.2 cases per 100,000 population. This number of notifications lies within the range observed (13–52 notifications) over the previous 11 years, but was an increase compared to the number reported in 2001, when 19 cases were notified. In 2002 most cases were notified from Queensland (35 notifications, 87 per cent), and two each from New South Wales and Victoria.

Most cases were male (n=34, male:female ratio 5.7:1), and of these, 23 were aged between 20 and 39 years. Bovine brucellosis (*Brucella abortus*) was eradicated from Australia in 1989, and most human cases occurring now are due to other *Brucella* species. Among notified cases, five were identified as *Br. melitensis*, and four as *Br. suis*.

Leptospirosis

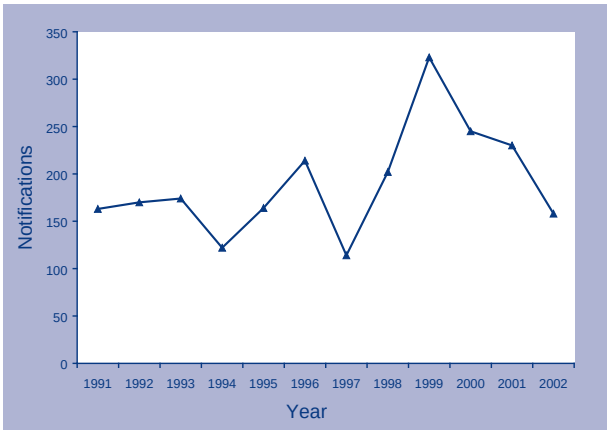
Leptospirosis is caused by the spirochaete *Leptospira*. Nationally, 155 notifications of leptospirosis were received during 2002. This is relatively low compared to the count of previous years (Figure 55) and represents a downward trend since a peak in 1999.

In 2002, the notification rate was highest in Queensland (n=91 notifications, 2.5 cases per 100,000 population). The next highest rates occurred in the Northern Territory (3 notifications, 1.5 cases per 100,000 population) and New South Wales (36 notifications, 0.5 cases per 100,000 population). More males were affected than females (male: female ratio, 8.1:1). The largest rates of notifications, for both sexes, were in the 20–34 year age range. The distribution of leptospirosis notifications by Statistical Division is shown in Map 9.

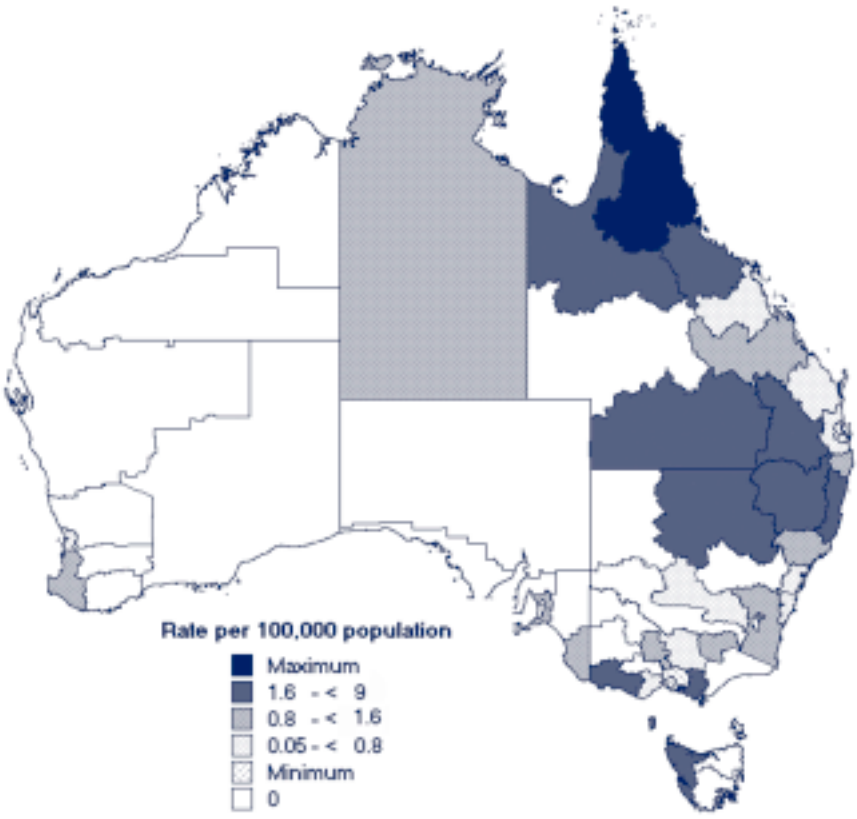
The annual report by the National Leptospirosis Reference Laboratory (www.health.qld.gov.au/qhpss/qhss/lepto_home.htm) provides details of *Leptospira* serovars causing infections in 2002. Of the 128 isolates serotyped, 74 per cent were identified as one of three serovars: *Leptospira interogans* var. *hardjo* (33%); var. *zanoni* (22%); and var. *australis* (19%).

The report identifies a strong association between leptospirosis infection and working in the Queensland banana industry. More specifically, work on banana farms in the Innisfail region is particularly associated with the *Leptospira zanoni* serovar. Butchery in the meat industry was another risk factor identified.

Figure 55. Trends in notifications of leptospirosis, Australia, 1991 to 2002



Map 9. Notifications rates of leptospirosis infection, Australia, 2002, by Statistical Division of residence



Ornithosis

During 2002, 205 notifications of ornithosis were reported to NNDSS (1.0 cases per 100,000 population), compared with 131 notifications in 2001. New South Wales had the highest number of notifications with 148 cases (2.2 cases per 100,000 population). In 2002, the total number of ornithosis notifications was the highest yet observed (Figure 56). Most notifications were males aged 50–54 years (n=25 cases, rate 3.85 cases per 100,000 population), and females aged 60–64 year (n=11 cases, rate 2.62 cases per 100,000 population) (Figure 57).

Figure 56. Trends in notifications of ornithosis, Australia, 1991 to 2002

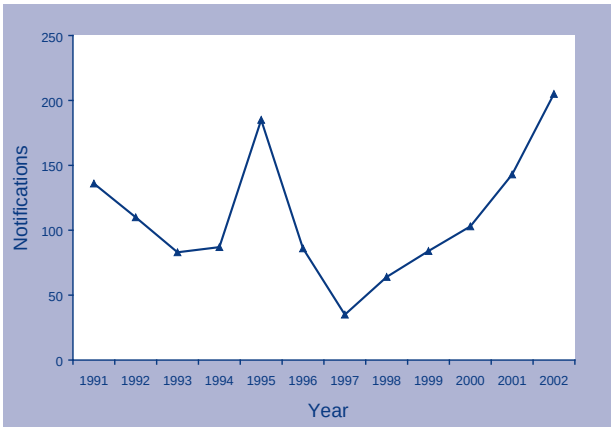
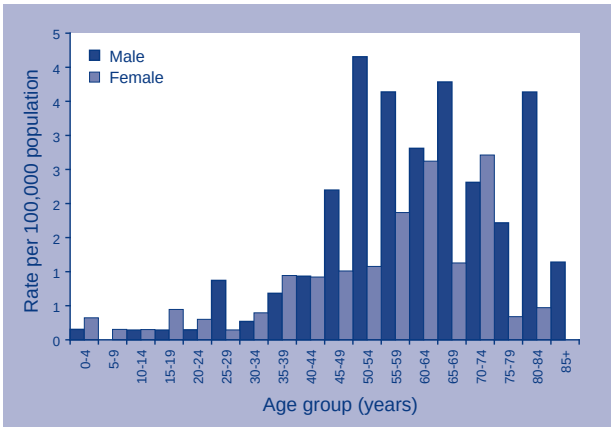


Figure 57. Notification rates of ornithosis, Australia, 2002, by age group and sex

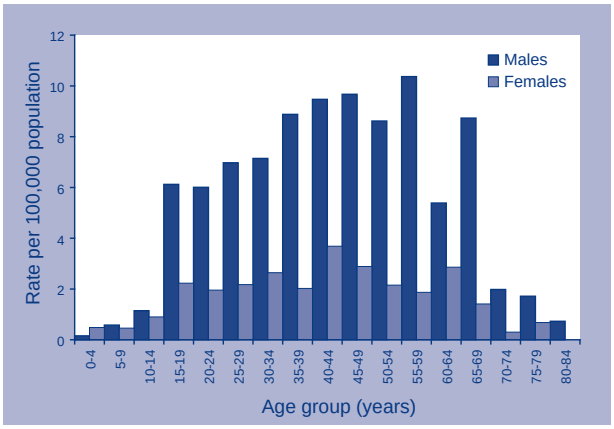


An outbreak of 60 confirmed cases of ornithosis—the largest yet recorded in Australia—occurred in the Blue Mountains, west of Sydney, during 2002. The cases occurred between March and June and involved mostly males aged between 50 and 65 years. The outbreak was identified following the unusual presentations of men to the Blue Mountains Hospital, with atypical pneumonia. A case-control study identified the main risk factors as contact with wild birds or lawn-mowing.[40] The ornithosis outbreak is thought to be linked to the large areas of the Blue Mountains being burnt out in the bushfires of previous summers. This is likely to have led to food shortages for native bird populations and a consequent utilisation of residential gardens.

Q fever

There were 761 cases of Q fever notified to NNDSS during 2002, an increase of 10 per cent from 2001. Notifications have increased each year since 1999, when 515 cases were notified. The largest numbers were from Queensland (n=339, 9.1 per 100,000 population) and New South Wales (n=292, 4.4 per 100,000 population). The highest rate observed for males was 10.4 cases per 100,000 population, in those aged 55–59 years, and for females, 3.7 cases per 100,000 population, in the 40–44 year age group (Figure 58). The male:female ratio was 3.2:1.

Figure 58. Notification rates of Q fever, Australia, 2002, by age group and sex



Two clusters of Q fever were identified in 2002. In South Australia, seven cases were notified between August and September from a rural community. While two were related to occupational exposure, no other exposures could be identified for the remaining five, apart from the presence in the community of meat and livestock industry.

In the second cluster, cases associated with a Victorian abattoir led to screening of the workforce and detection of more cases. In total 28 cases were identified. The abattoir's workforce had been screened two years previously, but following this a large number of new employees had been recruited.

In October 2000, the Australian Government announced funding for the National Q Fever Management Program. The Program aims to reduce the burden of disease associated with Q fever, through a targeted screening and vaccination program.

At a cost of $10.6 million over three years, Phase 1 of the Program commenced in 2001 and is industry-focussed, targeting abattoir workers, those contracted to abattoirs, and sheep shearers. Commencing in 2002 and costing $8 million over three years, Phase 2 of the Program is targeting sheep, dairy and beef cattle farmers, their employees and unpaid family members working on farms.

Reasons for the increase in Q fever notifications in 2002 may include increased suspicion of Q fever as a diagnosis by general practitioners delivering the vaccination campaign, and individual screening for previous exposure to Q fever prior to vaccination. The longer-term results of the campaign will be of much interest, as Australia is the only country in the world to vaccinate against Q fever, despite the worldwide distribution of the disease.[41,42]

Other bacterial infections

Legionellosis, leprosy, meningococcal infection and tuberculosis were notifiable in all states and territories in 2002 and classified as 'other bacterial infections' in NNDSS. A total of 1,980 notifications were included in this group in 2002, which accounted for 1.9 per cent of all the notifications to NNDSS.

Legionellosis

Legionellosis includes notifications of infections caused by all *Legionella* species. There were 318 notifications of legionellosis reported in 2002 giving a national rate of 1.6 cases per 100,000 population. The annual trend since 1991 (Figure 59) shows a marked increase in notifications in 2000 because of the Melbourne aquarium outbreak.[43] Between 1991 and 2000, there was a significant increase in the national legionellosis notification rate, even after excluding cases related to outbreaks.[43] In 2002, the highest rates of legionellosis were reported in South Australia (4.3 cases per 100,000 population) and Western Australia (2.9 cases per 100,000 population). Legionellosis notifications showed a peak in reports in autumn and spring.

Men accounted for 205 of 318 (64%) cases of legionellosis resulting in a male to female ratio of 1.8:1. Cases occurred in almost all age groups, with the highest rates in the 75–79 year age group for men (9.9 cases per 100,000 population) and the 60–64 year age group for women (4.5 cases per 100,000 population) (Figure 60).

Figure 59. Trends in notification rates of legionellosis, Australia, 1991 to 2002, by month of onset

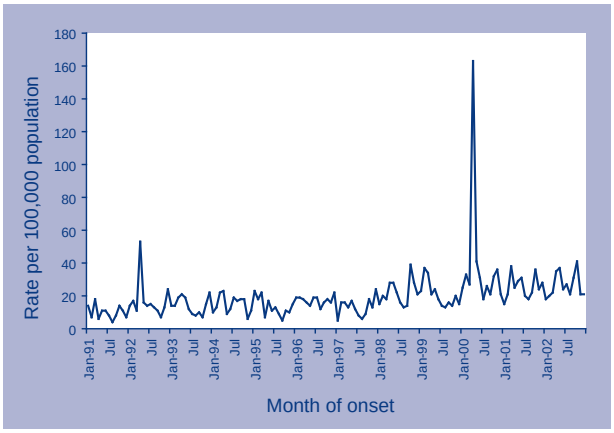
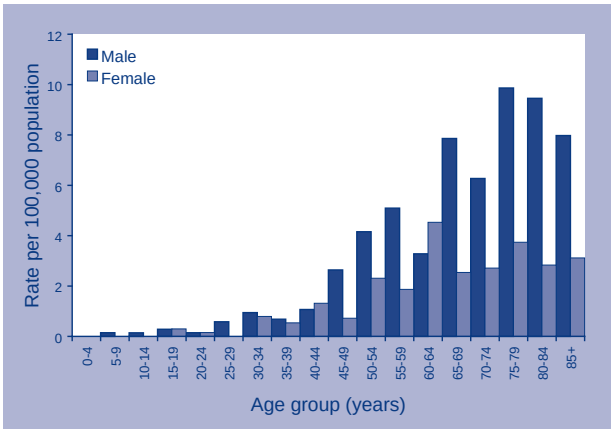


Figure 60. Notification rates of legionellosis, Australia, 2002, by age group and sex



Data on the causative species was available for 304 (96%) of the legionellosis cases. Of these, 118 (39%) cases were identified as *Legionella pneumophila*, 151 (50%) were *L. longbeachae* and 36 (11%) were other species (*L. micdadei* or *L. bozemannii*) (Table 13).

There were several outbreaks of legionellosis reported in 2002. Two outbreaks of *L. pneumophila* in Victoria, one involving eight cases and the other three cases, were associated with water cooling towers contaminated with *L. pneumophila* serogroup 1. No source was identified in another two outbreaks in Victoria in 2002. A cluster of *L. longbeachae* infection cases in New South Wales in July was attributed to use of potting mix. There was one death (Table 14). There were also two linked cases identified in Queensland, but no source of infection was identified

In all there were 14 deaths identified as due to legionellosis in Australia in 2002, giving a case fatality rate of 4.3 per cent. The break down of deaths by jurisdiction and infecting *Legionella* species is shown in Table 14. The case fatality rate for infections with *L. pneumophila* (6/119, 5%) was not significantly higher than for *L. longbeachae* infections (7/154, 4.5%) in contrast to 2001, where the case fatality rate for *L. pneumophila* infections was significantly higher.[14] All deaths reported to be caused by legionellosis occurred in older adults.

Leprosy

Leprosy is a chronic infection of the skin and peripheral nerves with the bacterium *Mycobacterium leprae*. Despite being eliminated in most countries, the disease remains as a major public health problem in six major endemic countries. Leprosy is a rare disease in Australia, with the majority of cases occurring among migrants to Australia from leprosy-endemic countries and in Indigenous communities.

In 2002, three leprosy cases were notified compared with five in 2001. The cases in 2002 occurred in Victoria, the Northern Territory and Western Australia. Two were male and one female and the age range was 25 to 34 years. Two cases were in Indigenous Australians (from the Northern Territory and the Kimberley region of Western Australia) and the third case was initially diagnosed in India.

Table 13. Notifications of legionellosis, 2002, by species and state or territory*

Species	State or territory							
	ACT	NSW	NT	Qld	SA	Vic	WA	Total
Legionella longbeachae	1	20	1	16	60	17	36	151
Legionella pneumophila	0	21	0	26	6	58	7	118
Other species†	0	1	0	2	0	32	0	35
Unknown species	2	0	0	0	0	0	12	14
Total	3	42	1	44	66	107	55	318

* No reports from Tasmania.

† Other includes species of *Legionella micdadei* and *Legionella bozemannii*.

Table 14. Deaths due to legionellosis by species, 2002, by state or territory

	State or territory							
	ACT	NSW	NT	Qld	SA	Vic	WA	Total
L. longbeachae	0	1	0	1	2	0	3	7
L. pneumophila	0	0	0	0	1	3	2	6
Other species*	0	0	0	0	0	0	1	1
Total	0	1	0	1	3	3	6	14

Invasive meningococcal disease

Meningococcal serogroups A, B, C, Y and W–135 are the major human pathogens. In Australia, serogroups B and C are the major cause of invasive meningococcal disease. Internationally, WHO estimated that there are at least 500,000 invasive meningococcal cases and 50,000 deaths every year.[44] In 2002 there were 684 notifications of invasive meningococcal disease in Australia, a small increase on the 677 reported in 2001. The national notification rate remained at 3.5 per 100,000 population. The highest rate was reported from Tasmania (5.5 per 100,000 population) as a result of an outbreak which began in September 2001 and continued into early 2002. The largest number of cases nationally occurred in winter (85 cases in July and 90 in August) (Figure 61).

The highest age specific rate was in children aged 0–4 years (13.6 cases per 100,000 population) and in the 15–19 year age group (10.3 cases per 100,000 population). There was a small excess of cases among males (male to female ratio 1.3:1), with the largest difference in rates between the sexes in the 15–19 year age group (male to female ratio 1.5:1) (Figure 62).

Among the 684 meningococcal cases, 563 (82%) were serogrouped. Of these, 299 (53%) were serogroup B, 222 (39%) were serogroup C, and 42 (7%) were serogroup W135 or serogroup Y (Table 15).

Figure 61. Trends in notification rates of meningococcal infection, Australia, 1991 to 2002, by month of onset

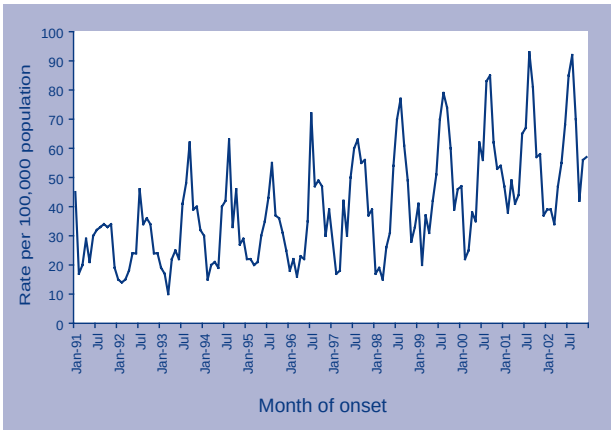


Figure 62. Notification rates of meningococcal infection, Australia, 2002, by age group and sex

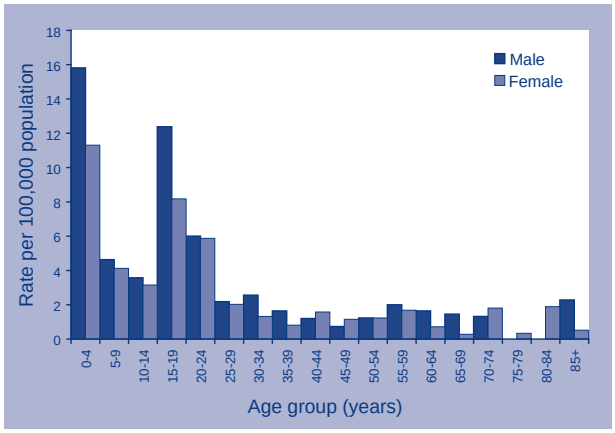


Table 15. Notifications of meningococcal infection by serogroups, 2002, by state or territory

	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total
Serogroup B	1	105	7	59	16	9	56	46	299
Serogroup C	4	54	1	46	8	17	87	5	222
Other serogroups*	0	5	0	11	1	0	10	15	42
Unknown serogroup	1	49	1	7	6	0	57	0	121
Total	6	213	9	123	31	26	210	66	684

* Other includes serogroups Y and W135.

In 2002, there were 43 deaths due to meningococcal disease giving a crude case fatality rate of 6.2 per cent. The breakdown of deaths by jurisdiction and serogroup are shown in Table 16. The case fatality rate for infections with meningococcal group C (26/221, 11.7%) was significantly higher than for meningococcal group B infections (15/299, 5%, chi-square=7, p<0.01).

Several clusters and outbreaks of meningococcal disease were reported in 2002. In January 2002 two passengers from a cruise ship, one from New South Wales and the other from South Australia, were diagnosed with meningococcal disease after disembarking. One case subsequently died. Over 1,000 passengers had travelled on the cruise ship. Close contacts of the two patients were given antibiotic prophylaxis and there were no further cases. Three clusters of meningococcal disease serogroup C were reported in Victoria, one in a university, one in a child-care centre, and the third was community based. Two clusters comprised only two cases each, while the community outbreak involved four cases. Contacts were given antibiotic prophylaxis and meningococcal group C vaccination. Vaccination was also important in controlling a community outbreak in a rural town in Queensland. In this instance there were three cases and 2,300 residents in the community were vaccinated with the tetravalent polysaccharide meningococcal vaccine. A report on surveillance of meningococcal disease in Queensland has recently been published.[45] In response to community concerns about increases in meningococcal disease in Australia, the Australian Government approved the National Meningococcal C vaccination program, which commenced in January 2003.[46]

Laboratory based meningococcal surveillance

The Australian Meningococcal Surveillance Programme was established in 1994 for the purpose of monitoring and analyses of isolates of *Neisseria meningitidis* from cases of invasive meningococcal disease in Australia. The program is undertaken by a network of reference laboratories in each state and territory, using agreed standard methodology to determine the phenotype (serogroup, serotype and serosubtype) and the susceptibility of *N. meningitidis* to a core group of antibiotics. The results of the surveillance in 2002 have recently been published.[47]

In 2002, a total of 393 isolates of *N. meningitidis* was analysed by the program, an increase from the 338 isolates analysed in the previous year. Serogroup B continues to be the predominant strain for the disease (210 isolates, 53%) nationally, followed by serogroup C (162 isolates, 41%). However, there was mix in the phenotypes circulating in the different states and territories. Serogroup C strains predominated in the Australian Capital Territory (80%), Tasmania (70%) and Victoria (56%).

The pattern of age distribution for meningococcal infection varied by the phenotype. Serogroup B was more frequently reported in the 0–4 year age group (40%). In contrast, serogroup C commonly occurred in the 15–19 year age group (29.6%).

In 2002, about two-thirds of all the isolates showed decreased susceptibility to the penicillin group of antibiotics (Minimum Inhibitory Concentration 0.06 to 0.5 mg/L). All isolates tested were susceptible to third generation cephalosporins and to the prophylactic antibiotics, rifampicin and ciprofloxacin.

Table 16. Deaths due to meningococcal infection by serogroups, 2002, by state or territory

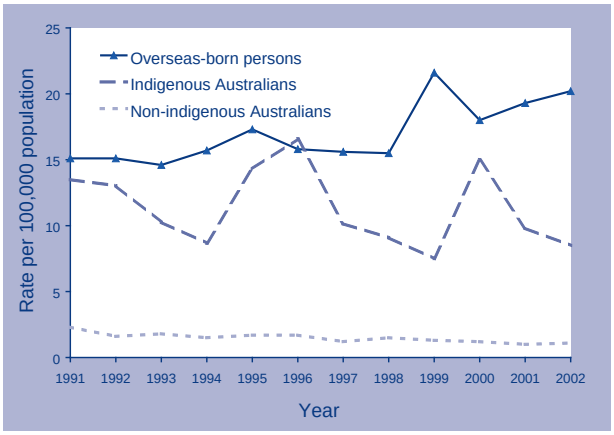
	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total
Serogroup B	0	8	0	2	3	0	2	0	15
Serogroup C	1	10	0	2	1	2	10	0	26
Other serogroups*	0	1	0	0	0	0	0	1	2
Unknown serogroup	0	0	0	0	0	0	0	0	0
Total	1	19	0	4	4	2	12	1	43

* Other includes serogroup Y and W.

Tuberculosis

While Australia has one of the lowest rates of tuberculosis (TB) in the world the disease remains a public health problem in the overseas-born and Indigenous communities (Figure 63). In 2002, 975 TB notifications were received by NNDSS, a rate of 5.0 cases per 100,000 population a similar number and rate to 2001. The notification rates of TB were lower than the national average in the Australian Capital Territory, Queensland, South Australia, Tasmania and Western Australia as in previous years. The highest rate was reported in the Northern Territory (19.2 cases per 100,000 population).

Figure 63. Trends in tuberculosis notification rates, Australia, 1991 to 2002, by Indigenous status and country of birth



In 2002, the male to female ratio was 0.9:1. Tuberculosis cases occurred in all age groups, with the highest age-specific rates reported in the 80–84 year age group (14.6 cases per 100,000 population). Detailed analyses of TB in Australia has recently been published.[48]

Other communicable disease surveillance

Laboratory Virology and Serology Reporting Scheme

The Laboratory Virology and Serology Reporting Scheme (LabVISE) is a passive surveillance scheme based on voluntary reports of infectious agents from sentinel virology and serology laboratories around Australia. LabVISE provides data on diagnoses of a number of infectious viruses, parasites and fungi. Interpretation of data from LabVISE is limited by uncertainties regarding its representativeness, lack of denominator data to calculate positivity rates, variable reporting coverage over time and lack of consistent case definitions. LabVISE has an important role in supplementing information of diseases under surveillance in NNDSS and in monitoring infectious agents that are not reported by other surveillance systems.

In 2002, a total of 14 laboratories reported 26,052 infectious agents to LabVISE. This represents a 7 per cent increase from reports received in the previous year (Table 17). The top three reporting laboratories were from South Australia (24%), Western Australia (25%) and Queensland (18%). The two jurisdictions with the largest populations, New South Wales and Victoria, contributed 17 per cent and 12 per cent respectively, to the total reports received by LabVISE (Table 17).

Sixty-six per cent (n=17,251) of all reports received by LabVISE were viral infectious agents, and the remaining 34 per cent (n=8,809) were bacterial or other infectious agents. Among viruses, ortho/paramyxoviruses (influenza, parainfluenza and respiratory syncytial virus) were the most commonly reported (33%; 6,276) followed by herpes viruses (24%; 4,642). Measles, mumps and rubella contributed 11 per cent of reports of viral infections (Figure 64). Among non-viral infectious agents, *Chlamydia trachomatis* (43%, 3,859), *Treponema pallidum* (16%, 1,396) and *Mycoplasma pneumoniae* (13%, 1,232) were the most commonly reported pathogens.

Figure 64. Reports of viral infections to the Laboratory Virology and Serology Reporting Scheme, 2002, by viral group

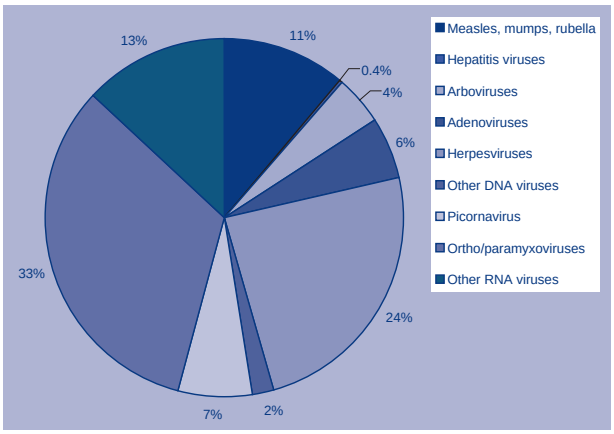


Table 17. Infectious agents reported to the Laboratory Virology and Serology Reporting Scheme, Australia, 2002, by state or territory

Organism	State or territory									
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total 2002	Total 2001
Measles virus	0	0	0	2	0	0	13	1	16	123
Mumps virus	0	2	1	1	0	0	6	6	16	32
Rubella virus	1	4	1	63	6	0	13	4	92	84
Hepatitis A virus	0	3	11	20	18	0	3	15	70	81
Hepatitis D virus	0	0	0	1	3	0	3	0	7	11
Hepatitis E virus	0	0	1	0	0	2	5	1	9	5
Ross River virus	0	7	26	247	31	11	7	94	423	863
Barmah Forest virus	0	11	6	152	4	1	6	23	203	269
Dengue	1	1	118	3	3	0	1	41	168	221
Murray Valley encephalitis virus	0	0	0	0	0	0	1	6	7	7
Kunjin virus	0	0	0	0	0	0	0	3	3	9
Flavivirus (unspecified)	0	0	3	26	0	1	13	0	43	26
Adenoviruses	3	177	20	44	344	0	125	357	1,070	1,205
Herpesviruses	62	512	119	1,173	1,349	19	347	1,061	4,642	4,849
Other DNA viruses	6	7	16	39	131	0	72	89	360	441
Picornavirus	8	523	34	10	46	10	55	623	1,309	1,519
Ortho/paramyxoviruses	9	1,570	24	381	1,585	38	500	2,169	6,276	4,618
Other RNA viruses	82	497	5	5	667	83	789	409	2,537	1,891
Chlamydia trachomatis not typed	26	555	173	1,133	860	39	20	1,053	3,859	3,404
Chlamydia pneumoniae	14	2	2	0	0	0	0	14	32	7
Chlamydia psittaci	0	0	2	1	5	2	37	15	62	77
Mycoplasma pneumoniae	7	118	10	202	317	29	401	148	1,232	966
Mycoplasma hominis	0	2	0	0	0	0	0	0	2	1
Coxiella burnetii (Q fever)	3	19	2	57	66	0	52	50	249	162
Rickettsia species	0	0	0	0	0	0	1	8	9	105
Streptococcus group A	85	32	44	269	0	0	95	0	525	399
Streptococcus group B	119	5	3	0	0	0	1	0	128	20
Yersinia enterocolitica	0	6	1	2	0	0	0	0	9	5
Brucella abortus	0	0	0	0	0	0	1	1	2	1
Brucella species	0	0	0	4	0	0	1	0	5	5
Bordetella pertussis	5	79	12	275	273	2	238	58	942	1,662
Legionella pneumophila	0	3	1	0	3	0	107	6	120	67
Legionella longbeachae	0	3	0	0	16	0	30	29	78	37
Legionella species	0	0	0	0	0	0	15	0	15	15
Cryptococcus species	0	3	1	9	17	0	0	0	30	21
Leptospira species	0	2	1	12	2	0	0	1	18	39
Borrelia burgdorferi	0	0	0	0	2	0	0	0	2	–
Treponema pallidum	0	152	362	389	421	0	8	64	1,396	1,119
Entamoeba histolytica	0	0	1	3	0	0	12	12	28	11
Toxoplasma gondii	2	9	0	0	6	1	8	2	28	35
Echinococcus granulosus	0	0	0	0	17	0	4	9	30	33
Total	433	4,304	1,000	4,523	6,192	238	2,990	6,372	26,052	24,445

Australian Sentinel Practice Research Network

The Research and Health Promotion Unit of the Royal Australian College of General Practitioners operates the Australian Sentinel Practice Research Network (ASPREN). ASPREN is a national network of general practitioners who report each week on a number of conditions selected annually. The data provide an indicator of the burden of disease in the primary care setting and allows trends in consultation rates to be detected.

In 2002, influenza-like illnesses, acute cough (with chest and systemic signs or with chest signs only or with systemic signs only or without signs) and gastroenteritis were the clinical conditions related to communicable diseases, which were reported to ASPREN. Approximately 66 general practitioners from all states and territories participated in the scheme. Seventy-five per cent of these were located in metropolitan areas and the remainder in rural areas. Each week, on average 51 general practitioner practices (with an average capacity of 5,674 consultations per week) reported to the scheme.

Acute cough, without chest or systemic signs, was the most reported condition with a mean weekly consultation rate of 17 cases per 1,000 consultations. Consultation rates for influenza-like illnesses and acute cough reached their peak in mid-July to mid-August (Figures 65 and 66). During this peak period consultation rates per week were 17 cases per 1,000 consultations for influenza-like illnesses, and 27 cases per 1,000 consultations for acute cough without chest or systemic signs. Consultation rates per week for the other categories of acute cough were 13 cases per 1,000 consultations for acute cough with chest signs and eight cases per 1,000 consultation for both acute cough with systemic signs and acute cough with chest and systemic signs. For gastroenteritis consultation rate peaked in December at 14 cases per 1,000 consultation per week (Figure 67).

Figure 65. Consultation rates for influenza-like illness, ASPREN 2002, by week of report

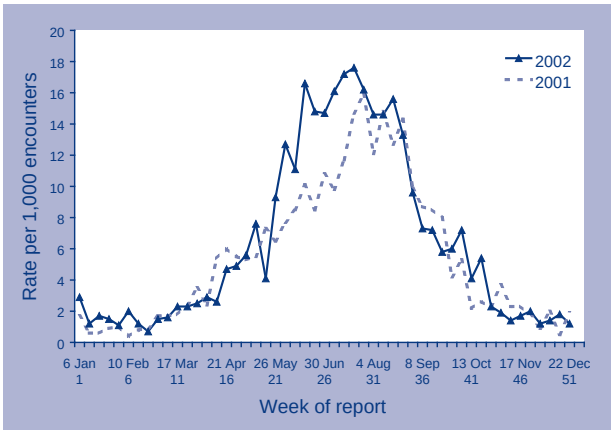


Figure 66. Consultation rates for acute cough, ASPREN, 2002, by week of report

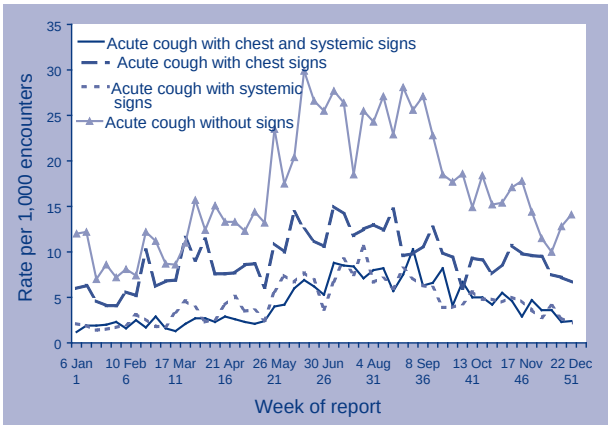
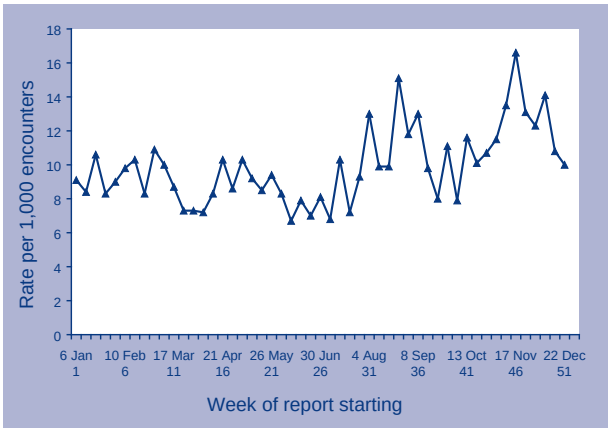


Figure 67. Consultation rates for gastroenteritis, ASPREN, 2002, by week of report



Appendices

Appendix 1. Australian Bureau of Statistics estimate of Australian mid-year population data, 2002, used in the calculation of rates

Australian population by state or territory and sex

Sex	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Male	158,723	3,296,998	103,693	1,843,078	751,753	232,788	2,401,089	964,313	9,753,818
Female	163,096	3,343,357	94,320	1,864,097	768,489	239,937	2,471,449	963,009	9,908,963
Total	321,819	6,640,355	198,013	3,707,175	1,520,242	472,725	4,872,538	1,927,322	19,662,781

Australian population by state or territory and age group

Age group	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
0–4	20,611	431,333	17,647	247,496	90,639	30,671	306,526	125,291	1,270,421
5–9	21,716	450,700	17,094	264,380	98,264	33,048	325,682	134,253	1,345,413
10–14	22,570	455,835	16,182	267,738	100,719	34,079	328,883	139,884	1,366,161
15–19	24,657	454,306	14,840	267,003	104,218	34,019	333,521	142,747	1,375,472
20–24	27,515	445,075	15,885	256,985	97,525	28,688	339,049	135,958	1,346,811
25–29	25,614	470,636	17,727	258,640	97,063	27,479	347,997	133,644	1,378,959
30–34	25,818	505,495	18,521	277,369	109,128	31,795	383,901	147,186	1,499,403
35–39	24,529	498,109	16,907	273,907	111,363	32,946	369,042	146,965	1,474,007
40–44	25,015	508,912	15,723	283,110	117,102	36,670	371,643	150,898	1,509,294
45–49	23,550	459,189	13,598	257,826	108,260	34,155	337,899	140,424	1,375,138
50–54	22,737	432,313	12,225	247,911	104,384	32,442	316,976	130,790	1,299,961
55–59	17,447	366,056	8,362	208,887	88,484	27,948	264,243	103,716	1,085,254
60–64	11,802	287,815	5,548	159,740	68,784	22,647	210,025	80,023	846,486
65–69	8,584	242,566	3,060	125,906	58,970	18,583	176,848	63,530	698,101
70–74	7,113	223,812	2,140	111,299	56,098	16,856	162,277	55,287	634,905
75–79	5,975	185,912	1,267	90,626	49,337	13,897	136,186	44,129	527,337
80–84	3,825	124,301	709	60,770	33,157	9,259	88,804	28,437	349,273
85+	2,741	97,990	578	47,582	26,747	7,543	73,036	24,160	280,385
Total	321,819	6,640,355	198,013	3,707,175	1,520,242	472,725	4,872,538	1,927,322	19,662,781

Appendix 2. Completeness of National Notifiable Diseases Surveillance System data, received from states and territories, 2002

	State or territory								
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Total notifications	1,433	26,280	4,873	25,991	7,244	2,073	21,705	10,690	100,291
Sex									
Number missing	9	86	4	28	2	3	312	24	468
% complete	99.4	99.7	99.9	99.9	100.0	99.9	98.6	99.78	99.54
Age									
Number missing	3	71	20	0	2,922	9	225	18	3,268
% complete	99.8	99.7	99.6	100.0	59.7	99.6	99.0	99.83	96.74
Indigenous status									
Number missing	1,340	13,080	488	19,486	1,214	1,799	11,965	4,871	54,243
% complete	6.5	50.2	90.0	25.0	83.2	13.2	44.9	54.43	45.91

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