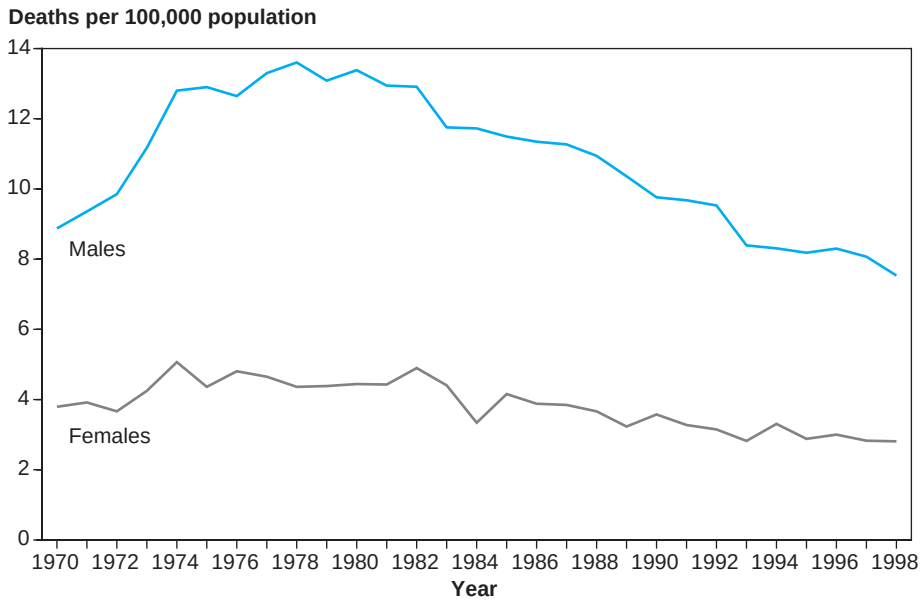


Source: AIHW National Mortality Database.

Figure 2.47: Death rates for cirrhosis of the liver, 1970 to 1998

2.5 Communicable diseases

Communicable or infectious diseases are illnesses due to specific infectious agents or their toxic products. Bacteria cause diseases such as pertussis (whooping cough) and tuberculosis; viruses cause diseases such as measles, influenza and Ross River virus infection; fungi are responsible for conditions such as tinea; protozoan parasites cause diseases including malaria; and bacterial toxins are responsible for conditions such as some forms of food poisoning. Infestations of larger parasites such as head lice are also regarded as communicable diseases.

This section provides an overview of communicable diseases in Australia, including notifications and deaths, and discusses the associated burden of disease, hospitalisation and health system costs. Information on communicable diseases in general, including pneumonia, influenza and meningitis, is presented first, followed by notifiable diseases such as blood-borne diseases, gastrointestinal diseases, sexually transmitted diseases, vector-borne diseases, tuberculosis and vaccine-preventable diseases.

Information on the occurrence of communicable diseases in this section is derived mainly from disease notifications, hospital separations and deaths data. Self-reports from the National Health Surveys, data on visits to general practitioners, data from the Australian Paediatric Surveillance Unit, laboratory investigations and special surveys are other sources of information useful for the surveillance of communicable diseases in Australia.

Communicable diseases were responsible for considerable morbidity and mortality in Australia in the early part of the twentieth century. However, the incidence and death rates for communicable diseases have been much reduced, with improvements in hygiene (building on advances begun in the nineteenth century), the introduction of antibiotics and mass immunisations making major contributions (see chapter 8 for an overview of changing patterns of disease in Australia over the twentieth century).

In 1998, there were 85,096 notifications of communicable diseases to the National Notifiable Diseases Surveillance System, representing a slight decrease from the 89,576 notifications in 1997 (Thomson et al. 1999). The most commonly notified diseases were blood-borne diseases, followed by gastrointestinal and sexually transmitted diseases. For a brief description of communicable disease notifications in Australia, see Box 2.13.

In 1997–98, there were 79,156 hospital separations with a principal diagnosis of infectious and parasitic diseases. In addition, there were 67,683 hospital separations for pneumonia and influenza, and 924 hospital separations for meningitis (AIHW 1999b).

There is much variation in the epidemiology, distribution and mortality associated with various communicable diseases. Management of these diseases and the approaches available to control them also vary considerably. The following provides brief overviews of the epidemiology of some of the high profile communicable diseases in terms of notifications, hospital separations and deaths.

Box 2.13: Disease notification

A disease may be made notifiable to State and Territory health authorities if there is potential for its control. Information on more than forty notifiable communicable diseases is available from the National Notifiable Diseases Surveillance System.

Surveillance of communicable diseases varies between jurisdictions, as each State/Territory has specific requirements under their public health legislation for notification by medical practitioners, laboratories and hospitals. The notifiable diseases and the case definitions may also vary between jurisdictions. However, Australia is working towards a model public health legislation that will standardise the approach to communicable disease surveillance.

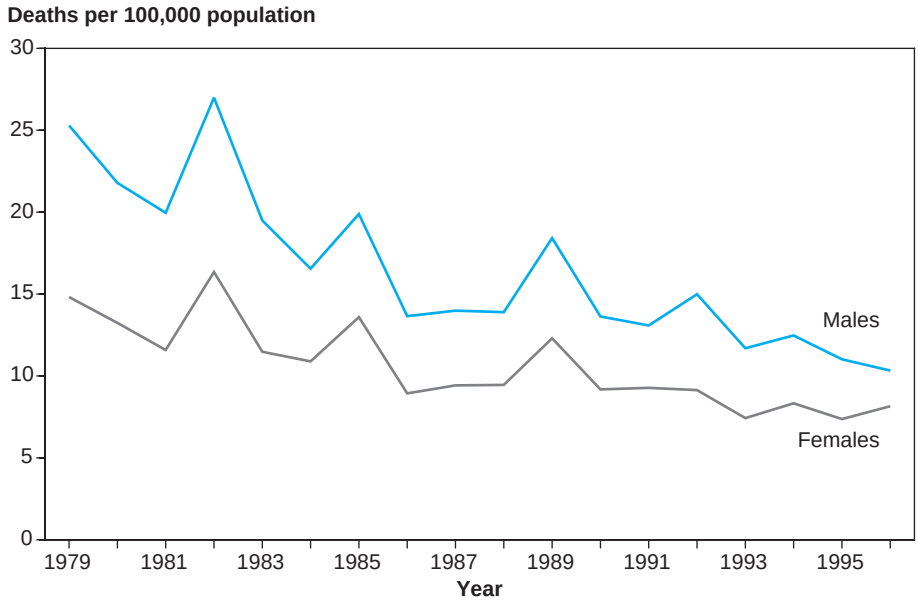
Newly diagnosed HIV infection and AIDS are notifiable conditions in every State and Territory. The National Centre in HIV Epidemiology and Clinical Research compiles HIV/AIDS notifications.

Acute respiratory infections

Acute respiratory infections (ARI) are usually divided into upper respiratory tract infections (URTI) and lower respiratory tract infections (LRTI). These infections are responsible for much morbidity and mortality. It is estimated that in 1996 there were 43 million new cases of URTI, and 7 million cases of LRTI.

Mortality. ARIs contribute significantly to mortality. Pneumonia alone was responsible for 4,459 deaths (2,000 males and 2,459 females) in 1998, the third largest cause of death among females and the eighth largest cause of death among males. Deaths are concentrated among males and females aged 70 years and over.

Both male and female death rates for ARI decreased over the period 1979 to 1996. However, the male death rate was consistently higher than the female rate. The male death rate fell from 25 per 100,000 in 1979 to 10 per 100,000 in 1996. For females, the death rate decreased from 15 per 100,000 in 1979 to 8 per 100,000 in 1996 (Figure 2.48).



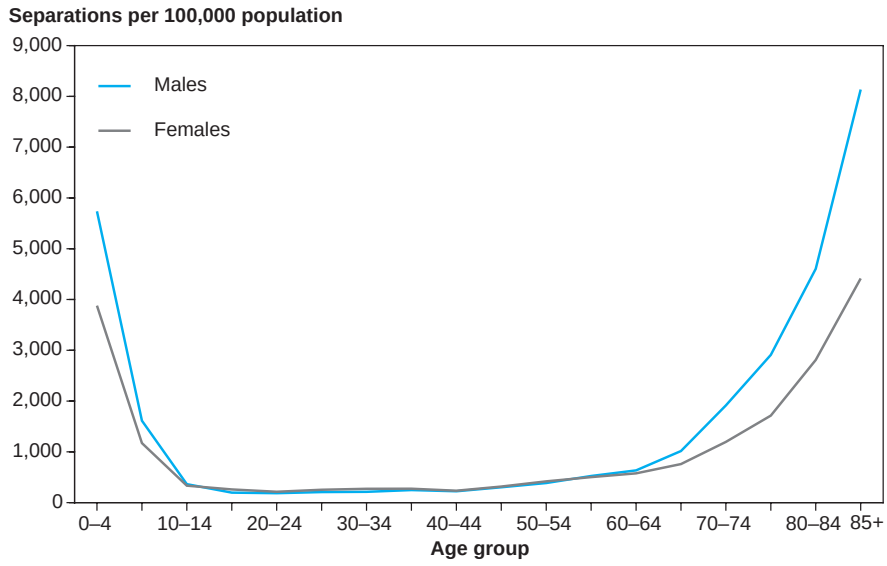
Note: Data for 1997 and 1998 are not included as they are not comparable with previous years following the introduction of automatic coding of deaths data in 1997.

Source: AIHW National Mortality Database.

Figure 2.48: Trends in death rates for acute respiratory infections, 1979 to 1996

Hospitalisations. In 1997–98, there were 155,960 hospital separations with the principal diagnosis of ARI. Of the three groups of respiratory conditions considered in this report (asthma, COPD and ARI), ARI had the highest rate of hospitalisation but the shortest average length of stay (1.4 days).

Hospitalisations are concentrated among the elderly and the young. Again, rates are higher for males than females. In the age group 0–4 years, hospital separation rates in 1997–98 were 5,700 per 100,000 for males and 3,900 per 100,000 for females. From age group 50–54 years onwards the rates rose sharply from around 400 per 100,000 to peak in the age group 85 years and over with rates of 8,100 per 100,000 males and 4,400 per 100,000 females (Figure 2.49).



Source: AIHW National Hospital Morbidity Database.

Figure 2.49: Age-specific hospital separations with a principal diagnosis of acute respiratory infection, 1997–98

Burden of disease. The burden from ARI is almost equally divided between premature mortality (YLL) and years of equivalent 'healthy' life lost due to disability (YLD). As with the other major respiratory categories, the burden is similar for both the sexes but is higher among the young and the elderly.

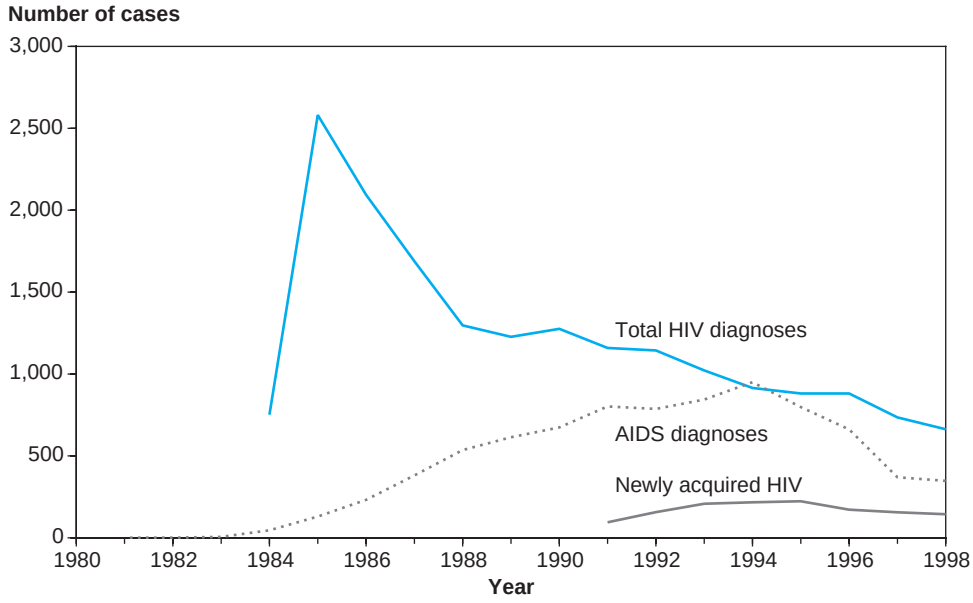
Blood-borne diseases

Blood-borne diseases are diseases spread via blood, blood products and body fluids, although there are other modes of transmission, including sexual contact. They include HIV infection, hepatitis B, hepatitis C and hepatitis D. Initial HIV infection may cause a transitory illness similar to glandular fever. The infection goes on to damage the immune system with AIDS developing as the patient's susceptibility to infections and cancers increases. Hepatitis B, hepatitis C and hepatitis D are viral infections characterised by inflammation of the liver, jaundice, anorexia, vague abdominal discomfort, nausea and vomiting and/or fever. Severity can range from unapparent cases, detectable only through laboratory tests, to fatal cases. Some people may become persistently infected and develop chronic hepatitis, and/or cirrhosis and/or liver cancer.

HIV/AIDS. At the end of 1998, there were around 11,800 people living with HIV. By then, the cumulative number of HIV infections in Australia was estimated to be about 17,600. Most cases of HIV infection (85%) were transmitted by sexual contact between males, with relatively little transmission through other sources of exposure (NCHECR 1999).

The number of HIV diagnoses in Australia has declined, from a peak of over 2,500 in 1985 to just over 660 in 1998 (Figure 2.50). These include both newly acquired (and diagnosed) infections and new diagnoses of infections acquired some time in the past (Box 2.14, page 114). Around 20–25% of the total HIV diagnoses recorded each year since 1993 have been in persons who are considered to have newly acquired the disease.

New diagnoses of AIDS in Australia, after adjustment for reporting delay, peaked in 1994 with an estimated 950 diagnoses. The number is estimated to have declined to 348 new diagnoses in 1998 (Figure 2.50). This decrease in the number of AIDS diagnoses, in addition to reductions in new infections, is due to the use of effective drug therapies for the treatment of HIV infection. It is estimated that there were 1,090 fewer AIDS diagnoses between 1995 and 1998 than would have been expected if the use of these therapies had not delayed the progression from HIV to AIDS. A total of 2,430 persons were estimated to be living with AIDS in 1998 (NCHECR 1999).



Note: Age standardised to the Australian population at 30 June 1991.
Source: AIHW National Mortality Database.

Figure 2.50: Diagnoses of HIV infection and AIDS, 1980 to 1998

Comparison of HIV/AIDS hospital separations over time is made difficult by the change in coding practice for HIV/AIDS from ICD-9-CM (US version) to ICD-9-CM (Australian version) in July 1995. Therefore, only data since 1995–96 are reported here. Over the period 1995–96 to 1997–98, there were 904 hospital separations with the

Box 2.14: HIV and AIDS diagnosis

Newly diagnosed HIV: *Total number of cases of HIV infection newly diagnosed in a particular year. Includes both newly acquired HIV and older cases of HIV that have only just been diagnosed.*

Newly acquired HIV: *Newly diagnosed HIV infection with a negative or indeterminate HIV antibody test result, or a diagnosis of HIV seroconversion illness, within 1 year of HIV diagnosis.*

Seroconversion illness: *Characteristic clinical findings that reflect the first interaction of HIV with the host immune system (i.e. primary HIV infection).*

HIV antibody test: *The test detects the presence of HIV antibodies that are produced by the immune system in response to infection by the virus. Antibodies to HIV are usually detected within the first 2 to 6 weeks of illness.*

AIDS: *AIDS diagnosis is based on a positive HIV antibody test along with the presence of any one of the conditions associated with severe immune deficiency.*

principal diagnosis of HIV/AIDS and 36,116 separations with HIV/AIDS as an additional diagnosis. Most of the separations were of males (95%), and the majority (63%) were of persons in the age group 30–44 years.

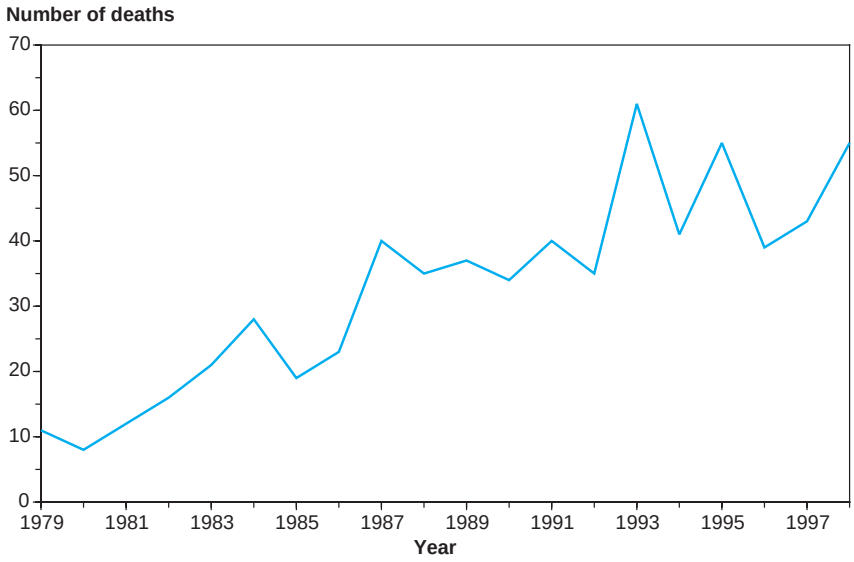
There has also been a considerable reduction in the number of AIDS-related deaths in recent years. There were 170 AIDS-related deaths in 1998, almost one-fifth of the 735 deaths recorded in 1994 (NCHECR 1999).

Hepatitis B. The number of notifications of incident (new) cases of hepatitis B has remained fairly consistent since 1994. The National Notifiable Diseases Surveillance System received notification of 247 cases in 1997 (1.3 per 100,000) and 261 in 1998 (1.4 per 100,000).

Over the period 1993–94 to 1997–98, there were 2,247 hospital separations with the principal diagnosis of acute or chronic hepatitis B and 16,314 separations with hepatitis B as an additional diagnosis. Hospital separations for hepatitis B were more common among males (64%) than females (36%), and the majority (62%) were of persons in the age group 25–49 years.

Over the past two decades, the number of deaths from hepatitis B has been rising. Between 1979 and 1998, there were 653 deaths with an underlying cause of hepatitis B, rising from 11 deaths in 1979 to 55 deaths in 1998 (Figure 2.51).

Hepatitis C. The numbers of hepatitis C cases notified (incident and unspecified) in 1997 and in 1998 were similar, 19,770 and 19,604 respectively. However, notifications of incident cases of hepatitis C increased from 81 in 1997 (0.5 per 100,000) to 343 in 1998 (2.0 per 100,000). This change may be due mainly to surveillance efforts to distinguish between new and old infections.



Source: AIHW National Mortality Database.

Figure 2.51: Hepatitis B deaths, 1979 to 1998

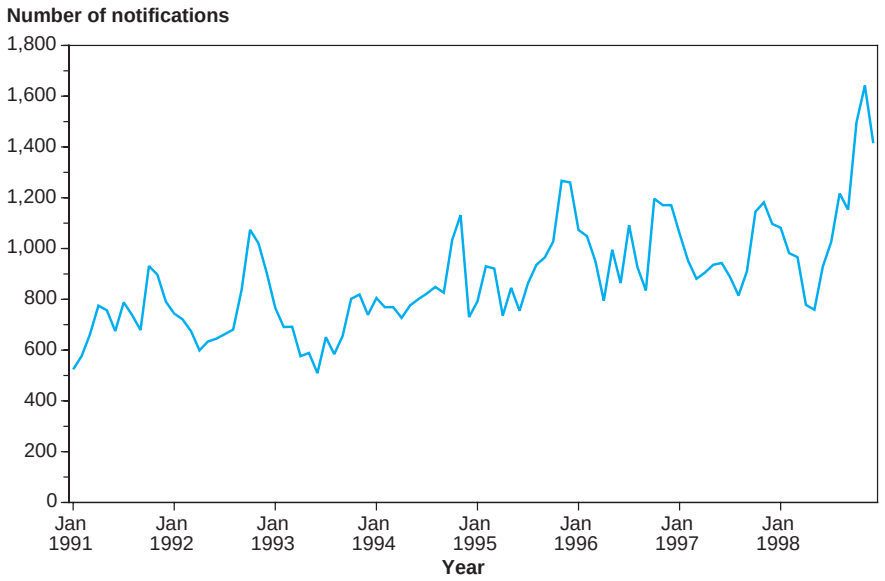
Over the period 1993–94 to 1997–98, there were 8,485 hospital separations with the principal diagnosis of acute or chronic hepatitis C and 45,367 separations with hepatitis C as an additional diagnosis. Hospital separations for hepatitis C were more common among males (61%) than females (39%), and the majority (65%) were of persons in the age group 25–44 years.

Hepatitis D. There were 13 notifications of hepatitis D in 1997 and 14 in 1998.

Gastrointestinal infections

The diseases currently classified as gastrointestinal for the National Notifiable Disease Surveillance System include hepatitis A, salmonellosis, campylobacteriosis, yersiniosis, listeriosis, shigellosis, botulism, typhoid and paratyphoid (Table S20, page 384). Haemolytic uraemic syndrome (HUS) became nationally notifiable in late 1998.

Campylobacteriosis. Campylobacteriosis accounts for more than 50% of all gastrointestinal notifications in Australia. The infection is transmitted mainly by food or by drinking untreated or poorly treated water. It usually causes diarrhoea for a few days, including abdominal pain, malaise, fever, nausea and vomiting. There were 11,848 notifications of campylobacteriosis in 1997 (96.7 per 100,000) and 13,439 in 1998 (108.3 per 100,000). Since 1991, campylobacteriosis notifications have trended upwards (Figure 2.52, page 116). The disease shows a seasonal pattern, with peak notifications in the spring and summer months.



Source: National Notifiable Diseases Surveillance System.

Figure 2.52: Notifications of campylobacteriosis, by month of onset, 1991 to 1998

Haemolytic uraemic syndrome. HUS is a potential complication of gastrointestinal infection with shiga-toxin-producing *Escherichia coli*. Acute renal failure and death are potential consequences of infection. The Australian Paediatric Surveillance Unit has reported 108 confirmed cases of HUS for the period July 1994 to December 1998, including 20 from the outbreak in South Australia in 1995 that was attributed to a type of smallgood (APSU 1999).

Over the period 1994–95 to 1997–98, there were 332 hospital separations with the principal diagnosis of HUS, an annual average of 83 hospital separations. The number increased from 84 in 1994–95 to 122 in 1997–98. The majority of hospital separations (60%) were of children aged 0–4 years.

Sexually transmitted diseases

Chancroid, chlamydial infection (not elsewhere classified), donovanosis, gonococcal infection, lymphogranuloma venereum and syphilis are the sexually transmitted diseases (STDs) monitored by the National Notifiable Diseases Surveillance System. There were 15,165 STD notifications in 1997 and 18,554 STD notifications in 1998.

Chlamydial infection. Chlamydial notifications have increased in the 1990s. There were 9,126 notifications of chlamydial infection in 1997 (74.5 per 100,000) and 11,405 notifications in 1998 (87.7 per 100,000).

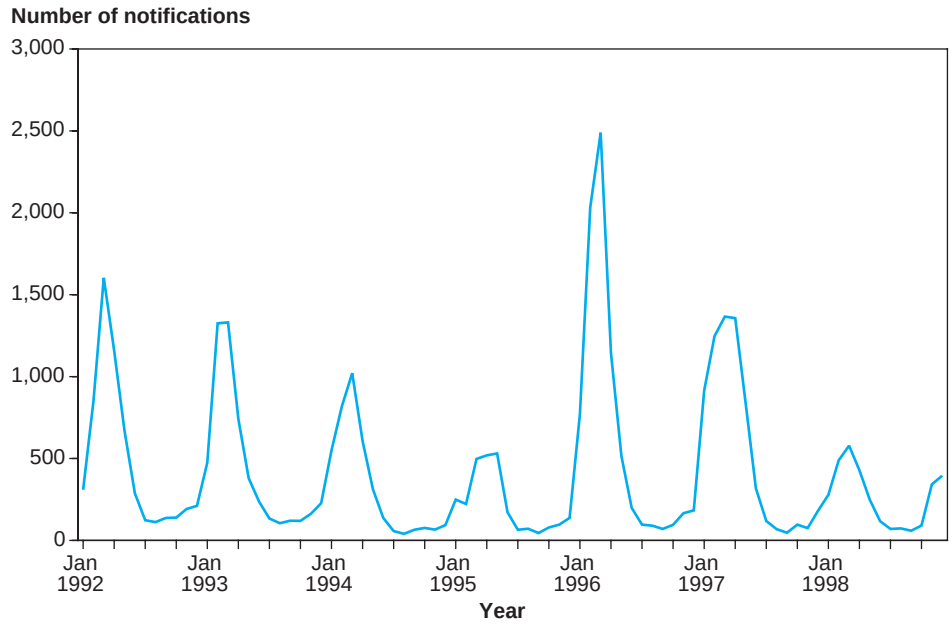
Gonococcal infection. NNDSS received 4,689 notifications of gonococcal infection in 1997 (25.3 per 100,000) and 5,428 notifications in 1998 (29.0 per 100,000). Notifications for gonococcal infection increased by more than 98% between 1991 and 1998. However, this increase may reflect improved diagnosis rather than any real increase in incidence.

Notifications of chancroid, lymphogranuloma venereum and syphilis have remained steady in recent years, whereas notifications of donovanosis have decreased.

Vector-borne diseases

The nationally notifiable vector-borne diseases include several mosquito-borne viral diseases and malaria. The viral diseases include infections caused by Barmah Forest virus and Ross River virus, which cause epidemic polyarthritis. Also included are Australian encephalitis (caused by Murray Valley encephalitis and Kunjin viruses), Japanese encephalitis and dengue fever.

Ross River virus. The Ross River virus infection was the most commonly notified vector-borne disease in Australia in 1998, with 3,094 cases (16.5 per 100,000). The infection shows a seasonal pattern, with peak notifications in the wet season or summer months (Figure 2.53).



Source: National Notifiable Diseases Surveillance System.

Figure 2.53: Notifications of Ross River virus infection, by month of onset, 1992 to 1998

Barmah Forest virus. Notifications of Barmah Forest virus infection have decreased in recent years. There were 558 notifications in 1998 (3.0 per 100,000), down from the 704 notifications in 1997 (3.8 per 100,000).

Dengue fever. Only a small number of cases of dengue fever were notified between 1993 and 1996. However, outbreaks of locally acquired disease in far north Queensland resulted in a large number of cases in 1997 and 1998. In 1997, 210 cases were notified (1.1 per 100,000), but 557 cases were notified in 1998 (3.0 per 100,000). Over 80% of these notifications were from Queensland.

Over the period 1993–94 to 1997–98, there were 205 hospital separations with the principal diagnosis of dengue fever. The numbers have increased consistently from 24 in 1993–94 to 68 separations in 1997–98. The majority of hospital separations (58%) were of persons between the ages of 15 and 34 years, and there was a greater proportion of males (62%) than females (38%). Almost 40% of the hospital separations were in Queensland. No deaths have been attributed to dengue fever as the underlying cause of death since 1967.

Japanese encephalitis. Following outbreaks in the Torres Strait in 1995, the first case of Japanese encephalitis acquired on the Australian mainland was reported in Queensland in March 1998. Around the same time, a further case of Japanese encephalitis was confirmed in the Torres Strait.

Malaria. Australia has been certified malaria-free since 1981. Recent cases are all imports—travellers returning from endemic areas. Malaria notifications remained stable in the period 1994 to 1998.

Over the period 1993–94 to 1997–98, there were 2,515 hospital separations with the principal diagnosis of malaria, 37% of which occurred in Queensland. This corresponds to an average of 503 hospitalisations per year. The majority of hospital separations (52%) were of persons between the ages of 15 and 34 years, and 71% were males.

During the period 1979 to 1998, there were 22 deaths from malaria, on average about one death every year. The number of malaria deaths has shown little change over the past 20 years. There were no malaria deaths reported in 1998.

Tuberculosis

Australia has one of the lowest rates for tuberculosis notification internationally, with little change in the number of notifications over the last 10 years. From 1986 to 1997, between 863 and 996 new tuberculosis cases (5.2 to 5.7 per 100,000) have been notified annually.

In 1997, a total of 954 new cases (5.2 per 100,000) were notified. Most of the cases were in the older age groups, and were slightly more common among males (5.5 per 100,000) than females (4.8 per 100,000). The majority of notified new cases (71%) were of those born overseas (Gilroy et al. 1999).

Over the period 1993–94 to 1997–98, there were 4,689 hospital separations with the principal diagnosis of tuberculosis, an annual average of 938 hospital separations. There were more hospital separations for males (54%) than females (46%).

A total of 1,807 tuberculosis deaths were recorded between 1979 and 1998. The number decreased from 95 in 1979 to 62 in 1998, with a high of 118 in 1981. Tuberculosis deaths occurred more frequently in the older ages, with 1,547 deaths (86%) of persons aged 55 years or more.

Vaccine-preventable diseases

Vaccine-preventable diseases are the communicable diseases for which the National Health and Medical Research Council schedule recommends routine vaccination/immunisation for children in Australia. These are pertussis (whooping cough), tetanus, diphtheria, poliomyelitis, invasive *Haemophilus influenzae* type b (Hib) disease, measles, mumps and rubella. There have been a number of important changes to the vaccination/immunisation schedule in the last few years, which are outlined in Box 2.15.

Despite a reduction in their incidence, vaccine-preventable diseases remain a problem in Australia. Table 2.18 (page 122) shows recent notifications, hospital separations and deaths for these diseases.

Box 2.15: Recent changes to the vaccination/immunisation schedule

Recent changes to the vaccination schedule are:

- *a fifth dose of diphtheria, tetanus, pertussis (DTP) vaccine for children aged 4–5 years in 1994;*
- *the introduction in 1994–95 of the second dose of measles, mumps, rubella (MMR) vaccine for both sexes at age 10–16 years, and subsequent change in 1998 for this dose to be given between age 4 and 5 years;*
- *from 1 May 2000, the second dose of MMR and fifth dose of DTP was scheduled for 4 years;*
- *the introduction of* Haemophilus influenzae *type b vaccination in 1993; and*
- *the introduction of acellular pertussis vaccine, replacing whole-cell pertussis vaccine, as boosters in 1997 and for the primary schedule in 1999.*

The full immunisation schedule is contained in the NHMRC Australian Immunisation Handbook *(NHMRC 1997b).*

Pertussis. Pertussis remains the most frequently reported vaccine-preventable disease, and cyclic epidemics of pertussis continue to occur. The most recent peak occurred in 1997 with 10,668 notifications (57.6 per 100,000). In 1998, there were a total of 6,432 notifications (34.3 per 100,000), with the highest number of cases in children under 1 year of age. A large number of cases also occurred in children aged 5–9 years and 10–14 years.

Over the period 1993–94 to 1997–98, there were 4,031 hospital separations with the principal diagnosis of pertussis, an average of 806 hospital separations per year. The majority of hospital separations (60%) were of children aged less than 1 year of age.

During the period from 1979 to 1998, there were 26 deaths with pertussis as the underlying cause of death. In 1997, there were 6 pertussis deaths, reflecting the 1997 outbreak, but there were no deaths from pertussis recorded in 1998.

Tetanus. Tetanus cases remain rare in Australia. Only 7 notifications of tetanus were received in 1998.

Over the period 1993–94 to 1997–98, there were 101 hospital separations with the principal diagnosis of tetanus, an annual average of 20 separations. The majority of hospital separations (56%) were of persons aged 60 and older, and there was a greater proportion of females (59%) than males (41%). There were an additional 3 hospital separations for cases of tetanus among newborns over this period.

Although uncommon, tetanus deaths continue to occur. During the period from 1979 to 1998, there were 42 deaths with an underlying cause of tetanus, an average of about 2 deaths every year. There has been little change in the numbers of tetanus deaths over the past 20 years.

Diphtheria. No cases of diphtheria have been notified since 1993. Over the period 1979 to 1998, there were only 3 deaths with an underlying cause of diphtheria.

Polio. There have been no notifications of community-acquired (wild-type) polio since 1978 but a few possible cases of vaccine-related polio have been reported, the last one in 1995 (Burgess & McIntyre 1999). As a necessary part of the process for Australia to be declared polio-free, an enhanced polio surveillance has been undertaken over the past few years to supplement the notification system for this disease. No cases have been detected through these surveillance activities, which have included the active surveillance program for acute flaccid paralysis by the Australian Paediatric Surveillance Unit (APSU 1999).

Haemophilus influenzae type b (Hib). The number of reported cases of invasive infections likely to be due to Hib has declined following the introduction in April 1993 of a free Hib vaccine for children under 5 years of age. There were 35 cases (0.2 per 100,000) reported in 1998, the lowest annual number of notifications since national surveillance began in 1991. Most cases were of children under 5 years of age, in particular children under 2 years of age.

Hib is the agent most likely to cause *Haemophilus influenzae* meningitis and acute epiglottitis. Virtually all cases of epiglottitis in young children are caused by *Haemophilus influenzae* type b. From 1993–94 to 1997–98, there were 1,309 hospital separations with the principal diagnosis of acute epiglottitis or *Haemophilus influenzae* meningitis, an average of 262 hospital separations every year. The number decreased consistently over the period, from 436 in 1993–94 to 201 in 1997–98. There was a greater proportion of hospital separations for males (58%), and 54% of these separations were of children under the age of 10. Acute epiglottitis accounted for 72% of separations and *Haemophilus influenzae* meningitis for 28%.

Deaths from acute epiglottitis and *Haemophilus influenzae* meningitis have also been falling. During the period from 1979 to 1998, there were 251 deaths with these underlying causes, decreasing from 14 in 1979 to 3 in 1998. There was a high of 21 deaths in 1987.

Measles. There were 306 measles notifications in 1998, at a rate of 1.6 per 100,000 population. This was the lowest annual rate since national surveillance began in 1991. The highest notification rate in 1998 was in the age group 0–4 years (15.6 per 100,000), and there were slightly more notifications for males than females.

Over the period 1993–94 to 1997–98, there were 1,863 hospital separations with the principal diagnosis of measles, an annual average of 373 hospital separations. There was an 85% decrease in the number of measles hospital separations over this period, from 917 in 1993–94 to 133 in 1997–98. More than half of the hospital separations were in Queensland. Over half of the hospital separations were of children under the age of 10 years (55%), and a further 16% of children aged 10–14 years.

During the period from 1979 to 1998, there were 74 deaths attributed to measles. The trend shows a decrease from 11 in 1979 to none in 1995 through to 1998. Measles, including the impact of the Measles Control Campaign, is discussed further in the section on vaccination status (chapter 3, page 157).

Subacute sclerosing panencephalitis. Subacute sclerosing panencephalitis (SSPE) is a late complication of measles causing progressive brain damage and finally death, usually 10 to 15 years after the initial measles episode (NHMRC 1997b). In the period from 1995 to 1998, there were six cases of SSPE, with an incidence rate of 0.02 per 100,000 (APSU 1999).

Over the period 1993–94 to 1997–98, there were 55 hospital separations with the principal diagnosis of SSPE. The number of SSPE hospital separations declined consistently over this period from 19 in 1993–94 to 3 in 1997–98. Males (83%) were more likely to be hospitalised than females (17%), and the majority of hospital separations (74%) were of those in the age group 10–19 years.

During the period from 1979 to 1998, there were 79 deaths with an underlying cause of SSPE, an average of about 4 per year. There has been a general decrease in mortality due to SSPE over the period, from 3 in 1979 to none in 1998. There was a high of 9 deaths in 1981, with the last two deaths occurring in 1996.

Mumps. Annual notifications of mumps have remained stable since it became notifiable in all States and Territories in July 1996. In 1998, a total of 183 cases (1.0 per 100,000) were reported, with the highest notification rates in the age groups 5–9 years (3.1 per 100,000) and 0–4 years (2.6 per 100,000).

Over the period 1993–94 to 1997–98, there were 190 hospital separations with the principal diagnosis of mumps, an annual average of 38 hospital separations. A large proportion of the hospital separations (42%) were of children under the age of 14 years.

During the period from 1979 to 1998, there were 10 deaths from mumps, with an average of less than 1 per year. No mumps deaths have been reported since 1995.

Rubella. Notification rates for rubella have fallen from 4,380 notifications in 1995 (24.2 per 100,000) to a low of 772 cases (4.1 per 100,000) in 1998. Males aged 15–19 years continue to have the highest notification rate (15.8 per 100,000 in 1998), although this rate has declined since 1994–95 when the second dose of the measles, mumps and rubella vaccine was introduced for both sexes at age 10–16 years.

Over the period 1993–94 to 1997–98, there were 305 hospital separations with the principal diagnosis of rubella, decreasing from 73 in 1993–94 to 29 in 1997–98. There were more hospital separations of males (63%) than females (37%), and 50% were of children under the age of 5 years. The last recorded rubella death was in 1988, the only death from rubella during the 20-year period from 1979 to 1998.

The major burden of rubella on the community is children born with congenital abnormalities due to maternal rubella during pregnancy. In the period between May 1993 and December 1997, 26 children were born with congenital rubella infection (APSU 1999). Anomalies were identified in 21 children, with 17 having multiple defects. No cases were identified among children born in 1998.

Table 2.18: Notifications, hospital separations and deaths for the main vaccine-preventable diseases

Disease	ICD-9/ICD-9-CM codes	Notifications (1998)	Hospital separations (1997–98)	Deaths (1998)
Pertussis	033	6,432	989	0
Tetanus	037, 771.3	7	20	2
Haemophilus influenzae type b[(a)]	320.0, 464.3	35	201	3
Measles	055	306	133	0
Mumps	072	183	36	0
Rubella	056, 771.0	772	29	0

(a) *Haemophilus influenzae* cases were classified using the codes 320.0 (*Haemophilus influenzae* meningitis) and 464.3 (acute epiglottitis) as *Haemophilus influenzae* by type is not specified in the ICD-9 coding system.

Sources: National Notifiable Diseases Surveillance System; AIHW National Hospital Morbidity Database; AIHW National Mortality Database.

Burden of communicable diseases

Despite major reductions in mortality, and the overall success of vaccination, communicable diseases are responsible for considerable burden of disease and health system costs. In 1996, infectious and parasitic diseases, along with acute respiratory infections including pneumonia and influenza, represented 3% of the total disease burden in Australia. HIV/AIDS represented about one-fifth of the total burden of communicable diseases in 1996 (AIHW: Mathers et al. 1999a). The burden of communicable diseases was 30% higher among males than females. This difference was largely due to the greater burden of HIV/AIDS among males and its consequent premature mortality.

Infectious and parasitic diseases accounted for 2.7% ($849 million) of the total health system costs in 1993–94 (AIHW: Mathers et al. 1998a).

Issues and problems

Over the last few years, there has been a re-emergence of some of the infectious diseases previously thought to have been conquered, and the emergence of 'new' diseases. These have been associated with the increase in international travel, the development of resistance to antimicrobials and changes in the environment, and the way in which the

population interacts with new infections. In addition, better understanding of disease epidemiology and new diagnostic methods have led to the recognition of 'new' communicable diseases.

Recently recognised emerging diseases include bat paramyxovirus, which causes respiratory disease in humans and horses, in Queensland (Selvey & Sheridan 1994), and a lyssavirus that causes neurological symptoms in humans (Allworth et al. 1996). Factors that may contribute to the emergence of new agents of disease are medical and animal husbandry practices and population movements. In addition, existing diseases such as dengue fever and Japanese encephalitis have spread more widely, as well as increased in incidence in the northern regions of Australia. These problems emphasise the need for continued control and active surveillance of these diseases.

The emergence of antibiotic-resistant bacteria has been recognised as an important indicator of inappropriate use of antibiotics in human medicine and in food-producing animals. Infections with multiresistant *Staphylococcus aureus* and more recently vancomycin-resistant enterococci pose an increasing threat to health, particularly in the hospital setting. Strategies to encourage prudent use of antimicrobials and better infection control are important in reducing the incidence of resistance (Turnidge et al. 1996; McAlister et al. 1999).

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