

Part II

HOW HEALTHY ARE AUSTRALIA'S CHILDREN?

Childhood, particularly early childhood, is a period in which the foundations for children's health and wellbeing are established. During this period, children acquire a vast range of skills and behaviours and, together with biological factors, these early experiences have a considerable influence on their physical and psychological health, their behaviour and their educational achievements.

Information on patterns and trends in child health, including which conditions represent the greatest disease burden, whether things are improving or getting worse, and the inequality between subpopulations within Australia, is essential to assess the health of Australia's children. This information helps to shape health policy, plan health service delivery and create strategies for improving the health of Australia's children.

Part II focuses predominantly on the presence or absence of disease, or activity and participation restrictions; however, it is well known that health needs to be defined more broadly. The World Health Organization (WHO) defines health as a 'state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity' (WHO 2006). This broader view of health is reflected in this report, with Parts III–VI

examining the health behaviours that place children at either risk or protection from serious illness, as well as the wider social, community and economic contexts in which Australian children are growing up.

The aim of *Part II* is to provide a comprehensive picture of the health of Australia's children using general measures of health status. *Part II* looks at the following areas:

- mortality
- chronic conditions (asthma, diabetes, cancer)
- disability
- congenital anomalies
- mental health.

In 2003, the leading broad causes of disease burden among Australian children were mental disorders, chronic respiratory conditions (including asthma) and neonatal causes (Begg et al. 2007). Each of these is discussed in *Part II*.

The following table shows how children fare across the indicators presented in *Part II*, and whether there has been any improvement over time.

Indicator	Value	Trend
Mortality	Infant mortality rate (2006)	4.7 per 1,000 ✓
	Sudden infant death syndrome (SIDS) rate (2006)	24 per 100,000 ✓
	Death rate for children aged 1–14 years (2006)	13 per 100,000 ✓
Morbidity	Children aged 0–14 years with asthma as a long-term condition (2004–05)	12% ~
	New cases of insulin-dependent diabetes for children aged 0–14 years (2006)	23 per 100,000 ✗
	New cases of cancer for children aged 0–14 years (2001–2005)	14 per 100,000 ..
Disability	Children aged 0–14 years with severe or profound core activity limitations (2003)	4.3% ✗
	Rate of selected congenital anomalies among infants at birth (1998–2003):	
Congenital anomalies	neural tube defects	4.5 per 10,000 ..
	Down syndrome	11 per 10,000 ..
	abdominal wall defects	4.4 per 10,000 ..
	orofacial clefts	17 per 10,000 ..
Mental health	Children aged 4–14 years with mental health problems (2004–05)	No recent data available ..
	Children aged 6–14 years with mental health disorders (ADHD, depressive disorder, conduct disorder)	No recent data available ..

Key: ✓ = favourable trend; ✗ = unfavourable trend; ~ = no change or clear trend; .. = no trend data presented.

4 Mortality

Infant and child death rates provide insight into the social and environmental conditions in which Australia's children grow and develop.

Death rates have halved for Australian infants and children over the last two decades. However, rates among Indigenous children and children from remote areas remain much higher than the national rate.

Mortality rates and causes of mortality are key indicators of the health of a population. They not only reflect circumstances around the time of death but also provide insight into changes in social and environmental conditions, medical interventions, lifestyles and trends in underlying risk factors.

Globally, deaths of children under 5 years have reached a record low, falling below 10 million per year in 2006 from almost 13 million in 1990. Much of the progress is a result of the widespread adoption of basic health interventions, such as early and exclusive breastfeeding, immunisation against once-common and deadly childhood infectious diseases, and improved nutrition (UNICEF 2007a). Australia has also shown significant progress in reducing infant and child deaths, particularly as a result of the work of neonatal intensive care units, increased community awareness of the risk factors for sudden infant death syndrome (SIDS), and reductions in vaccine-preventable diseases through national childhood immunisation programs.

High rates of infant and child mortality are strongly associated with social and economic disadvantage (Collison et al. 2007; CSDH 2008; Freemantle et al. 2006; Marmot & Wilkinson 2006; Yu 2008). Socioeconomic status affects infant and child survival through a number of proximate determinants including maternal factors (such as age, parity, birth interval), environmental contamination, nutritional deficiency, injury, personal preventive measures and access to medical treatment (Mosley & Chen 2003).

Australia's overall death rate compares well to other OECD countries, ranking 3rd lowest out of 25 countries in 2003 (AIHW 2008b). However, Australian children rank in the bottom third of OECD countries for infant and under 5 mortality, and Aboriginal and Torres Strait Islander children experience significantly worse

health outcomes compared to non-Indigenous children (ABS & AIHW 2008; Leeds et al. 2007). In 2008, the Australian Government committed to halve the gap between Indigenous and non-Indigenous mortality rates for 5 year olds within a decade (Rudd 2008).

Improvements in both access to quality antenatal healthcare and maternal health through improved nutrition and reduction in risk behaviours during pregnancy (such as alcohol and tobacco use), as well as annual health checks for children, may serve to reduce the risk of poor health outcomes among Indigenous children (AHMAC 2008; AIHW 2009a; CDC 2006; Drevenstedt et al. 2008).

This chapter looks at mortality differentials and the main causes of death of Australian infants and children.

INFANT MORTALITY

A child's risk of death is greatest around the time of birth and in the first year of life. The infant mortality rate—the number of deaths of infants less than 1 year of age in a given year, expressed per 1,000 live births in the same year—reflects the impact of structural factors on population health more broadly (Reidpath & Allotey 2003).

For these reasons, the infant mortality rate is used internationally as a key measure of population and child health and has been endorsed by the AHMC, CDSMC and the AESOC as a Children's Headline Indicator priority area (see *Part X* for further information and state and territory data).

Headline Indicator: Mortality rate for infants less than 1 year of age

The infant mortality rate almost halved between 1986 and 1998 (from 8.8 to 4.7 deaths per 1,000 live births), but has remained comparatively stable to 2006 (Figure 4.1). In 2006:

- There were 1,262 infant deaths—a rate of 4.7 per 1,000 live births (5.3 and 4.1 for males and females, respectively). Infant deaths comprised 1% of all deaths, but almost three-quarters of deaths among children (0–14 years).
- Two-thirds of infant deaths occurred in the neonatal period (first 28 days after birth), and 60% of these occurred on the day of birth. The neonatal death rate has declined by 40% between 1986 and 2006—from 5.4 to 3.2 per 1,000 live births, respectively.
- Deaths of male infants accounted for more than half (58%) of all infant deaths. The predominance of male deaths is related to the greater number of male births—there are around 106 male live

births for every 100 female live births—but also reflects the greater vulnerability of male infants to infections and conditions related to prematurity and development (Drevenstedt et al. 2008).

CAUSES OF INFANT DEATH

Between 1997 and 2006, the three leading causes of infant death have remained unchanged—perinatal conditions, congenital anomalies, and symptoms, signs and abnormal findings (which includes SIDS).

Among infants in 2006:

- Perinatal conditions were the leading cause of death, accounting for half of all infant deaths. Of these perinatal conditions, one-fifth each were related to short gestation and low birthweight, and maternal complications during pregnancy (Figure 4.2).
- Congenital anomalies accounted for around one-fifth of all infant deaths. Of these deaths, the leading condition was congenital malformations of the circulatory system, accounting for 6% of all infant deaths.
- Symptoms, signs and abnormal findings was the third leading cause of death (10%), with half of these due to SIDS.
- The death rate was higher for male than for female infants for almost all leading causes of death.

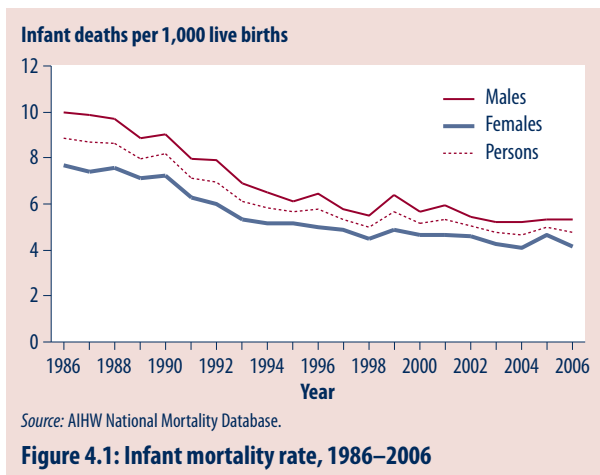


Figure 4.1: Infant mortality rate, 1986–2006

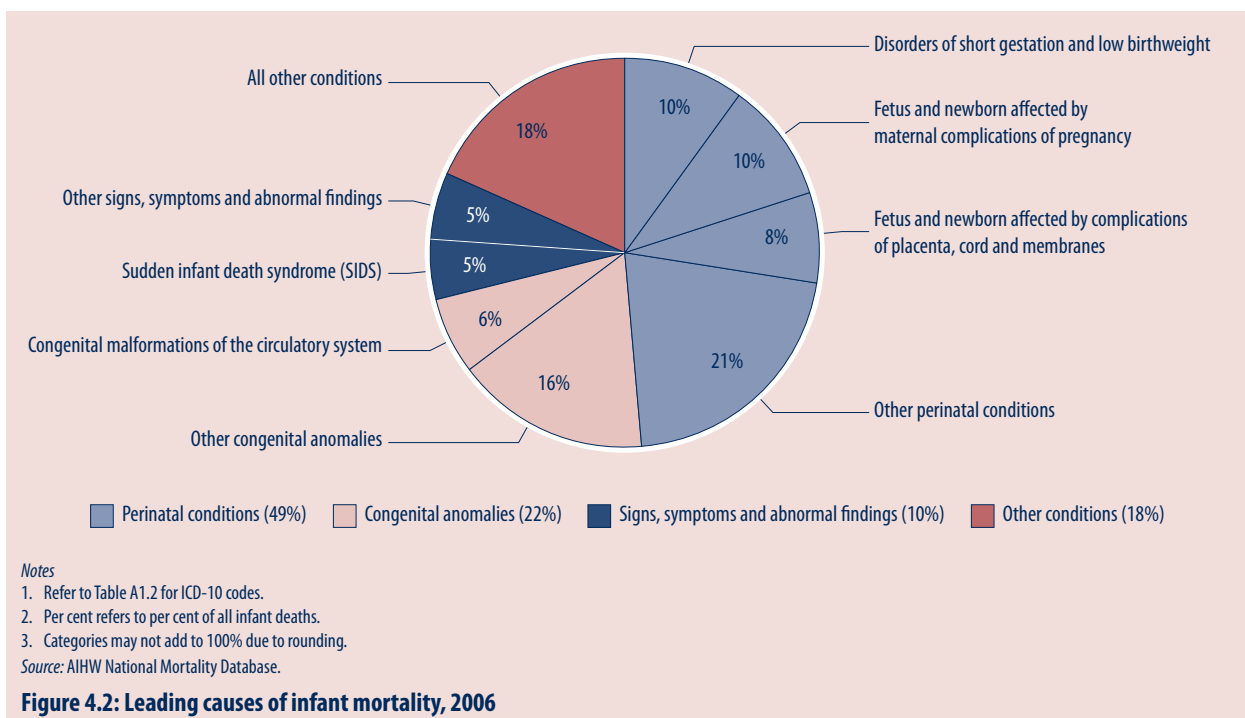


Figure 4.2: Leading causes of infant mortality, 2006

Sudden infant death syndrome (SIDS)

SIDS refers to the sudden and unexpected death of an infant under 1 year of age during sleep, that remains unexplained after a thorough investigation (SIDS and Kids 2004). The incidence of SIDS peaks around 2–4 months of age, and affects more boys than girls (Moon et al. 2007).

The SIDS death rate—the number of SIDS deaths per 100,000 live births—has been shown to decline with public education campaigns about risk factors associated with SIDS. Risk factors for SIDS include front and side sleeping positions, soft sleeping surfaces and loose bedding, overheating, smoking and bed sharing (ABS & SIDS and Kids 2003; Byard 2001; Hunt & Hauck 2006). The reduction of SIDS deaths in Australia, since the beginning of national education campaigns in 1991, has been a major public health success (Figure 4.3). However, disparities between Indigenous and non-Indigenous infants show the potential for further reductions among Indigenous infants.

It is important to note that due to differences in the investigation and reporting of SIDS over time, the decline in SIDS deaths may not be as profound as this data indicates (ABS & SIDS and Kids 2003; Freemantle et al. 2005). This means that the number of SIDS deaths may be higher than reported. In 2004, a consensus was reached on the definition and investigation of SIDS deaths in Australia in response to this issue (SIDS and Kids 2004).

Key national indicator: Sudden infant death syndrome (SIDS) rate

In 2006, among infants aged less than 1 year:

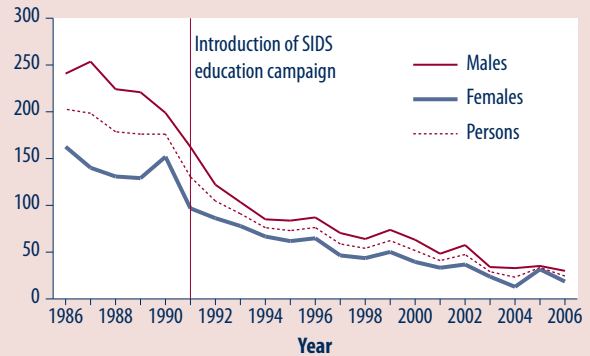
- There were 65 deaths due to SIDS—a rate of 24 deaths per 100,000 live births, and accounting for 5% of all infant deaths (Figure 4.3).
- Around 88% of SIDS deaths occurred in the post-neonatal period (between 29 and 364 days after birth). SIDS was the second leading cause of death in the post-neonatal period after deaths due to unknown causes (ICD-10 codes R95 and R96–R99, respectively).
- Males accounted for 63% of SIDS deaths.

Between 1986 and 2006:

- There was an 8-fold decrease in the SIDS death rate—from 203 per 100,000 live births to 24, representing an 88% reduction in the rate (Figure 4.3). Similar decreases were seen for male and female infants.

- The difference in the SIDS rate was statistically significantly higher for males than for females before 1993; however, in recent years the difference has not been statistically significant.

Infant deaths per 100,000 live births



Notes

1. Refer to Table A1.2 for ICD-10 codes.
2. A comparability factor of 0.94 has been applied to years 1986–1996 to align ICD-9 and ICD-10 coding practices.

Source: AIHW National Mortality Database.

Figure 4.3: Trends in deaths due to sudden infant death syndrome, 1986–2006

CHILD MORTALITY

Child mortality is measured as the number of deaths of children aged 1–14 years per 100,000 children of the same age. Death rates among Australian children are declining, but further gains are possible for preventable causes of death such as injuries (28% of deaths were caused by transport accidents or other injuries between 2004 and 2006).

Key national indicator: Death rate for children aged 1–14 years

In 2006, among children aged 1–14 years:

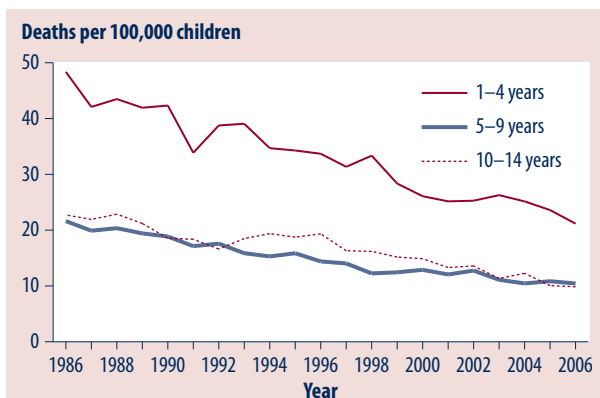
- There were 498 deaths—a rate of 13 per 100,000 children (15 and 12 deaths per 100,000 for boys and girls, respectively).
- The death rate for 1–4 year olds (21 per 100,000 children) was twice the rate for 5–9 and 10–14 year olds (each 10 per 100,000 children).
- Boys accounted for 56% of deaths.

Between 1986 and 2006, among children aged 1–14 years:

- Death rates halved from 30 to 13 deaths per 100,000 children, representing a 55% decrease.

This is largely due to a decrease in transport accident death rates over this period.

- The decline in death rates occurred across all three age groups: 1–4, 5–9 and 10–14 years (56%, 52% and 57% decline, respectively) (Figure 4.4).
- The death rate for boys decreased by a greater amount than for girls (58%, compared with 51%, respectively); however, the rate for boys remained between 20% and 60% higher.



Source: AIHW National Mortality Database.

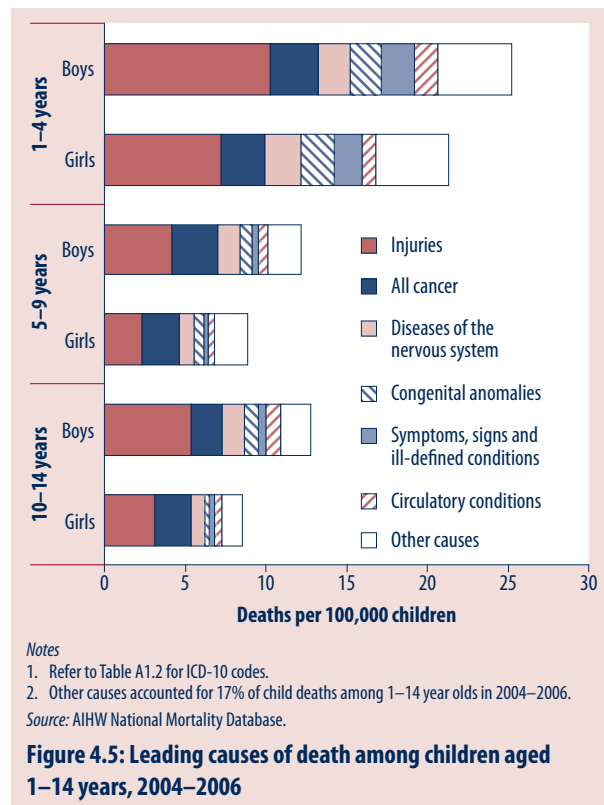
Figure 4.4: Death rates for children aged 1–14 years, 1986–2006

CAUSES OF CHILD DEATH

Between 1997 and 2006, the three leading causes of child death have remained the same: injuries, cancer and diseases of the nervous system (see *Chapter 32* for further information on childhood injuries).

In 2004–2006, among children aged 1–14 years:

- The leading causes of death were injuries (37%), cancer (17%) and diseases of the nervous system (10%)—rates of 5.1, 2.6 and 1.4 per 100,000 children, respectively.
- Children aged 1–4 years had higher rates of injury, cancer and diseases of the nervous system than children aged 5–9 and 10–14 years (Figure 4.5).
- The injury death rate among boys was 60% higher than for girls.



Notes

1. Refer to Table A1.2 for ICD-10 codes.
2. Other causes accounted for 17% of child deaths among 1–14 year olds in 2004–2006.

Source: AIHW National Mortality Database.

Figure 4.5: Leading causes of death among children aged 1–14 years, 2004–2006

How do rates of infant and child mortality vary across population groups?

While infant and child mortality rates are very low nationally, these rates mask significantly higher rates of mortality among some population groups within Australia, in particular Indigenous children and those living in remote areas and socioeconomically disadvantaged areas. The higher mortality rates experienced among these population groups are the result of a multitude of factors, but largely reflect increased disease prevalence due to reduced access to health care services, higher rates of disability and behavioural risk factors, and high levels of socioeconomic disadvantage (AIHW 2008b).

Aboriginal and Torres Strait Islander infants and children

Closing the gap between Indigenous and non-Indigenous mortality rates for under 5 year olds within a decade is a key priority for the Australian Government (Rudd 2008). In 2002–2006, based on deaths in Queensland, Western Australia, South Australia and the Northern Territory only:

- Infant mortality rates were 3 times as high for Indigenous infants than for non-Indigenous infants (12.5 and 4.3 deaths per 1,000 live births, respectively).

- Indigenous infants were significantly more likely to die of SIDS than non-Indigenous infants—the death rate was 5.4 times as high as for non-Indigenous infants (106 and 20 per 100,000 live births, respectively).
- Indigenous children aged 1–14 years were 2.9 times as likely to die as non-Indigenous children (39 deaths per 100,000 children compared with 13).

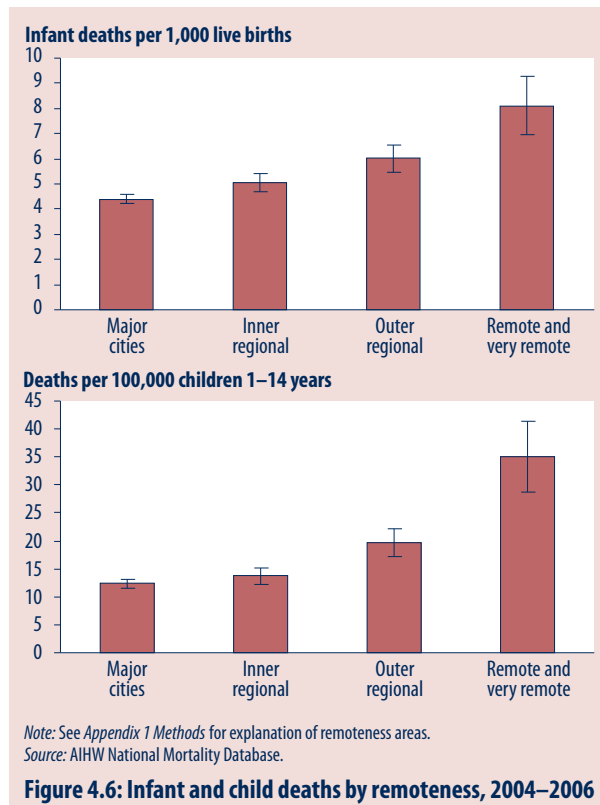
Refer to *Part IX* for further information on deaths among Indigenous infants and children.

Remoteness

Infants and children living in *Remote and very remote* areas had significantly higher death rates than their peers in *Major cities* (Figure 4.6). This may be partly explained by the high proportion of Indigenous children living in *Remote and very remote* areas (38% of all children aged 0–14 years in these areas were Indigenous in 2006), and the higher death rates among these children.

In 2004–2006, when comparing *Remote and very remote* areas with *Major cities*:

- Death rates among infants were almost twice as high (8.1 and 4.4 per 1,000 live births, respectively).
- Among children aged 1–14 years, death rates were around 3 times as high (35 and 12 per 100,000 children).

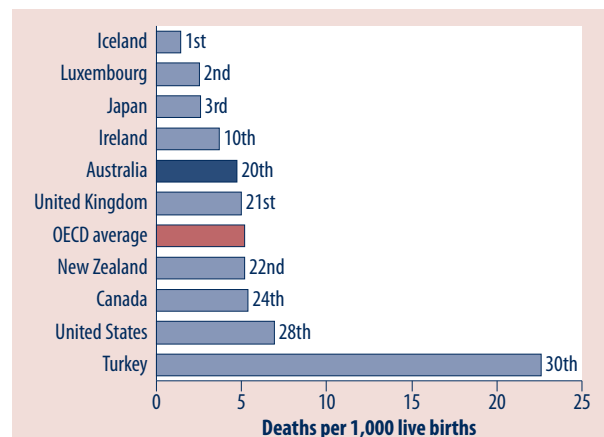


How do Australia’s mortality rates for infants and under 5 year olds compare internationally?

Infant mortality

Australia’s infant mortality rate ranked in the lowest third of Organisation for Economic Cooperation and Development (OECD) countries in 2006 (20th out of 30 countries). With a rate of 4.7 infant deaths per 1,000 live births in 2006, Australia performed slightly better than the OECD average (5.2), but had a rate 3 times as high as Iceland, the best performing country (1.4), and twice as high as Luxembourg (2.5) and Japan (2.6) (OECD 2008b) (Figure 4.7).

Excluding Indigenous infant mortality, Australia still ranked 18th among OECD countries with a rate of 4.4 per 1,000 live births.



Notes
1. Data for Canada and the United States of America are for 2005.
2. Based on data from 30 OECD countries, using the most recent year of available data.
Source: OECD 2008b.

Figure 4.7: Infant mortality rates among selected OECD countries, 2006

Mortality of under 5 year olds

Australia’s child mortality rate for under 5 year olds ranked equal 21st out of 30 OECD countries in 2006. With a rate of 6 deaths per 1,000 live births, Australia performed slightly better than the OECD average (7). Finland and Iceland, the best performing countries, had rates half that of Australia (both 3 deaths per 1,000 live births) (WHO 2008c).

5 Chronic conditions

Chronic conditions account for a large proportion of the burden of disease among children and can affect normal growth and physical, social and emotional development processes.

Asthma hospitalisations and visits to general practitioners are declining and cancer survival continues to improve; however, the incidence of Type 1 diabetes is rising.

Australia's children continue to grow and develop in an environment where death and communicable disease rates are in decline. However, chronic conditions continue to pose a significant challenge to the health and wellbeing of Australian children. A chronic condition is an ongoing impairment characterised by a physical or mental condition, functional limitation, and service use or need beyond routine care (AIHW 2007c). Chronic conditions can disrupt the normal growth and development processes of children either directly, or indirectly as a result of treatment. Chronic conditions can also affect the social and emotional development of children, for example, through fear of stigmatisation, school absences or inability to participate in age-appropriate activities, and through physical pain and suffering that can negatively affect future functioning (Dell'Api et al. 2007).

Chronic conditions can place children and their families under social, psychological and economic pressure. The impact depends on the severity of the condition, its effects on daily living, and how well it can be managed or treated. Mild to moderate asthma, for example, may be easily managed through preventive drug treatment, and is rarely fatal. Childhood cancer, on the other hand, requires intensive treatment, and may result in death.

This chapter focuses on three chronic conditions affecting Australia's children—asthma, diabetes and cancer. These conditions are National Health Priority Areas, due to their impact on health, the potential to reduce their burden and community concern. These conditions

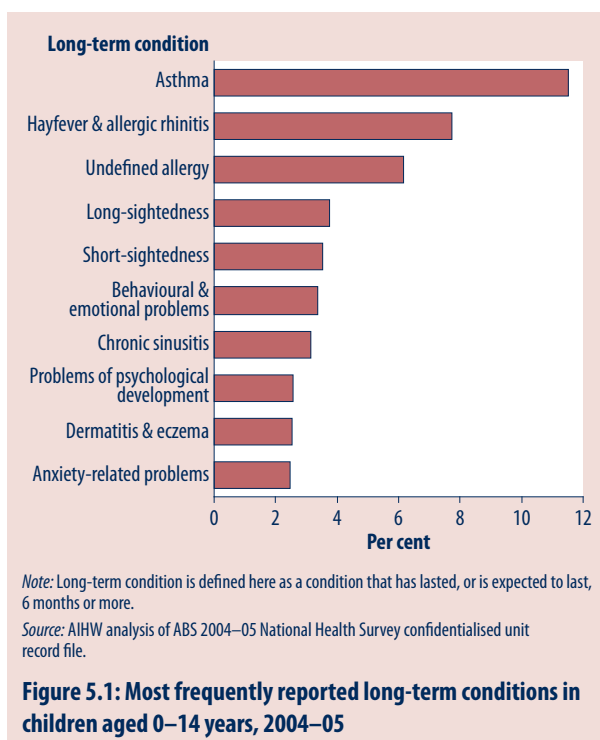
accounted for 20% of the burden of disease among children aged 1–14 years in 2003 (Begg et al. 2007). Other chapters in this report relating to chronic conditions are *Chapter 6 Disability* and *Chapter 8 Mental health*.

This chapter uses a variety of data sources, including hospital, mortality and survey data. Please refer to *Appendix 1* and *Appendix 2* for technical issues and information regarding these sources.

HOW MANY AUSTRALIAN CHILDREN HAVE CHRONIC CONDITIONS?

According to the 2004–05 National Health Survey of the Australian Bureau of Statistics (ABS) (ABS 2006), among children aged 0–14 years:

- Forty-one per cent (1.6 million) were estimated to have at least one long-term condition, that is, a condition that has lasted, or is expected to last, 6 months or more.
- Boys were more likely to report a long-term condition than girls (55% and 45%, respectively).
- Asthma was the most frequently reported long-term condition (12%), followed by hayfever and allergic rhinitis (8%), and undefined allergies (6%) (Figure 5.1). Asthma and allergic rhinitis both occur more commonly in people with hypersensitivity to allergens. Hence, people with asthma have a relatively higher risk of also having allergic rhinitis, and vice versa.



Asthma

Asthma is the most common long-term condition among Australian children. The disease is characterised by recurrent episodes of wheeze, chest tightness, cough and shortness of breath caused by narrowing of the airways and obstruction to airflow (GINA 2005). The underlying causes of asthma are still not well understood, but environmental and lifestyle factors, as well as a hypersensitivity to allergens, may increase the risk of developing asthma. A number of factors can trigger airway narrowing and asthma symptoms, including physical activity, viral infections, irritants, cold weather, specific allergies and certain food preservatives.

In 1999, asthma was made the sixth National Health Priority Area. This has resulted in activities to improve asthma management and care, and the monitoring of asthma in Australia. The National Asthma Strategy 2006–2008 provides a framework for a collaborative approach towards improving asthma care in Australia (AHMC 2006). For the majority of people with asthma, the condition can be effectively controlled with appropriate use of preventive and relief medication, as well as avoiding or controlling trigger factors. However, for some people, asthma can place considerable restrictions on their physical, social and emotional lives and their families.

Although asthma was the leading cause of disease burden for children in Australia in 2003 (Begg et al. 2007), deaths from asthma among children are rare (less than five deaths of children were due to asthma in 2006).

Asthma prevalence

Key national indicator: Proportion of children aged 0–14 years with asthma as a long-term condition

According to the ABS 2004–05 National Health Survey:

- An estimated 12%, (around 451,500) of Australian children aged 0–14 years reported asthma as a long-term condition, similar to that in 2001 (13%, or 527,500 children).
- The prevalence of asthma among children was similar to the general population (10%); however, children represented around one-fifth of the two million Australians with asthma.
- Asthma prevalence was higher among boys (13%) than girls (10%); however, among 15–24 year olds this pattern is reversed, with the prevalence for girls higher than for boys (AIHW 2007c).
- Asthma prevalence among children peaked at 10–14 years (17%) for boys and at 5–9 years (12%) for girls.

It is difficult to accurately estimate the prevalence of asthma in the population due to differences in how asthma is measured, for example, by self-reported wheeze, diagnosis by a general practitioner based on symptoms, or a combination of symptoms and lung function tests (GINA 2005). Despite these difficulties, there is consistent evidence that asthma prevalence increased in the 1980s to early 1990s among children. In recent years, data from small-scale prevalence studies suggest that this trend has stabilised and may be declining (ACAM 2005, 2008).

Health service use for asthma

HOSPITALISATIONS

In 2006–07, there were around 21,000 hospital separations for asthma among children aged 0–14 years—a rate of 520 per 100,000 children (accounting for 4% of all child hospital separations).

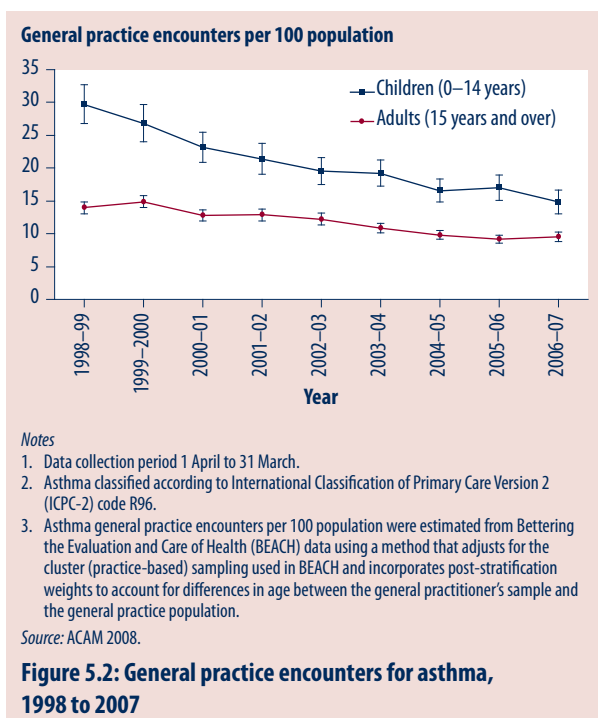
- The asthma hospital separation rate has declined significantly by one-third since 1996–97—from 796 per 100,000 children to 520. The largest reduction occurred among children aged 10–14 years (decline

of 55% for boys and 59% for girls). This decline may indicate improvements in asthma education, management and treatment in the community, particularly in managing severe exacerbations.

- Boys accounted for almost two-thirds of separations. The rates were of 637 per 100,000 and 397 for boys and girls, respectively.
- The highest rate for children was among those aged 0–4 years (1,000 per 100,000 children). The rate decreased with increasing age. However, due to difficulties in distinguishing asthma from other respiratory conditions such as viral respiratory illness, asthma hospital separations among children aged less than 5 years may be overestimated (GINA 2007).

GENERAL PRACTICE ENCOUNTERS

Asthma accounted for 4% of general practice encounters for children aged 0–14 years in 2006–07, according to the Bettering the Evaluation and Care of Health (BEACH) survey. The rate of general practice encounters for asthma among children halved between 1998–99 and 2006–07 (30 to 15 general practice encounters per 100 population, respectively). Despite this decline, the rate for children remained higher than for adults aged 15 years and over in 2006–07 (Figure 5.2).



Diabetes

Diabetes is a chronic condition in which the body cannot properly use its main energy source, the sugar glucose. This is due to a relative or absolute deficiency in insulin, a hormone produced by the pancreas. Insulin helps glucose enter the body's cells from the bloodstream and then to be used by them. Diabetes is marked by an abnormal build-up of glucose in the blood and can have serious short- and long-term effects, including diabetic coma, kidney failure, loss of eyesight and limbs, disability, and premature death. People with diabetes can control and reduce their risk of complications by ensuring that blood glucose levels remain within the normal range. This can be achieved through a combination of physical activity and dietary changes. Death due to diabetes is extremely rare among children aged 0–14 years—in 2006 there were less than five deaths from diabetes.

There are two main types of diabetes, Type 1 and Type 2. Type 1 diabetes (also called juvenile-onset or insulin-dependent diabetes) most often appears during childhood or adolescence and is marked by a complete lack of insulin, requiring insulin replacement for survival. Type 1 diabetes is believed to be caused by an autoimmune condition that destroys the pancreatic cells that produce insulin; however, the reasons for this remain unknown. Research has suggested that the increase in the incidence of Type 1 diabetes among children has been too rapid to be caused entirely by genetic factors and is more likely to be related to environmental factors causing changes in the immune system that ultimately trigger the disease (Chong et al. 2007; Furlanos et al. 2008).

Type 2 diabetes is the most common form of diabetes among the Australian adult population and is marked by reduced, or less effective, insulin (AIHW 2008b). Type 2 diabetes is often linked to lifestyle factors, such as obesity and physical inactivity, and occurs most often among people older than 40 years. Although there are no reliable national estimates on Type 2 diabetes among children, smaller studies among children and youth suggest that Type 2 diabetes has increased and is becoming a significant health problem (Craig et al. 2007; McMahon et al. 2004).

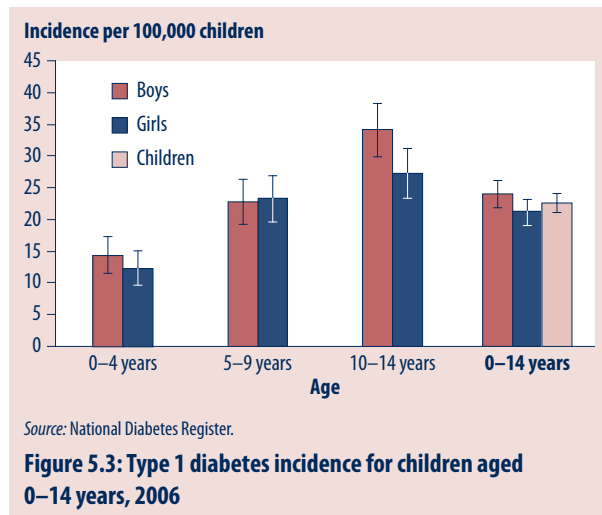
Diabetes incidence

Key national indicator: New cases of insulin-dependent diabetes per 100,000 children aged 0–14 years

According to the National Diabetes Register in 2006, among children aged 0–14 years with insulin-dependent Type 1 diabetes:

- There were 916 new cases—a rate of 23 per 100,000 children, a significant increase from 2000 (19 per 100,000). This represents 155 new cases in 2006 compared with 2000.
- Incidence rates were similar for boys and girls (24 and 21 cases per 100,000, respectively).
- The incidence rate increased with age, with rates over twice as high among 10–14 year olds as 0–4 year olds (31 per 100,000 children compared with 13) (Figure 5.3).

The National Diabetes Register recorded 150 new cases of insulin-dependent Type 2 diabetes among children aged 0–14 years between 1999 and 2005 (AIHW: Catanzariti et al. 2007). This is an underestimate of all new cases of Type 2 diabetes among children as the register records only insulin-dependent diabetes, and the majority of Type 2 diabetes cases do not require insulin.

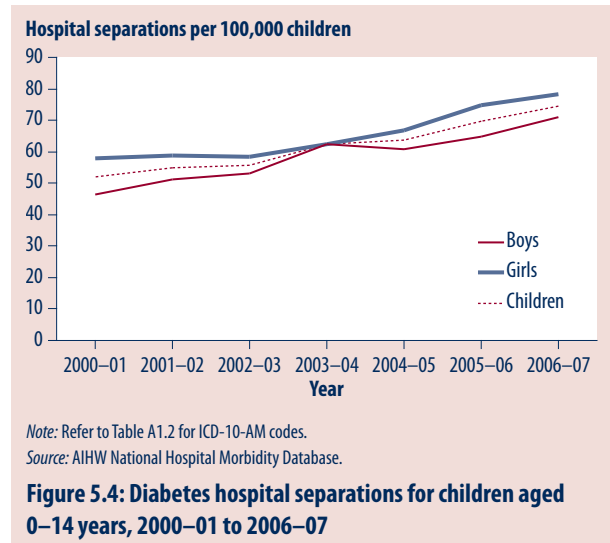


Health service use for diabetes

HOSPITALISATIONS

In 2006–07, there were around 3,000 hospital separations for diabetes among children aged 0–14 years—a rate of 75 per 100,000 children.

- The rate increased for children by almost 43% since 2000–01. The increase was 53% for boys (46 to 71 per 100,000 boys) and 35% for girls (58 to 78 per 100,000 girls) (Figure 5.4).
- The rate for girls was 10% higher than for boys in 2006–07.
- The rate increased rapidly with age, from 3 per 100,000 for 0–4 year olds to 20 and 43 for 5–9 and 10–14 year olds, respectively.



Cancer

Cancer is a common term used to describe a range of diseases in which cells become abnormal, grow in an uncontrolled way and form a mass called a neoplasm or tumour. Tumours can be benign (not cancerous) or malignant (cancerous). Benign tumours do not spread to other parts of the body, although they may interfere with other areas of the body as they expand. A malignant tumour is characterised by its ability to spread to other parts of the body through a process known as metastasis. Cancers can develop from most cell types in the body and are usually classified according to their organ or tissue of origin and histological features.

The risk of most cancers increases with age and most types of cancers are uncommon in children. Cancers in children tend to differ from those observed in adults in appearance, site of origin and response to treatment.

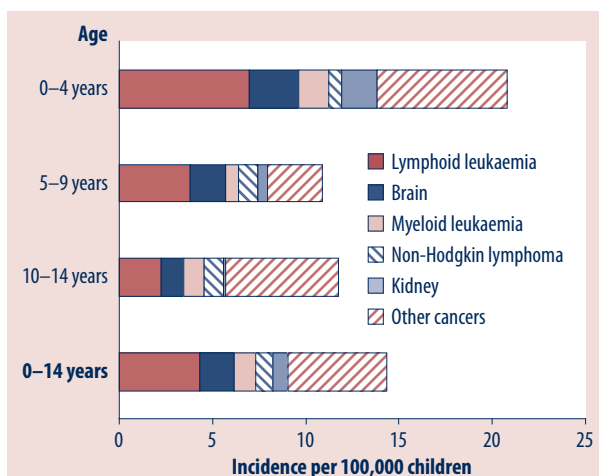
Cancer causes significant morbidity and mortality for children, and was a leading cause of death for 1–14 year olds in 2006 (see *Chapter 4*). However, over the last decade, medical advances and technological improvements in cancer diagnosis and treatment have resulted in improved survival and a clear decline in mortality among children, despite the cancer incidence rate remaining unchanged.

Cancer incidence

Key national indicator: New cases of cancer per 100,000 children aged 0–14 years

Over the period 2001–2005, among children aged 0–14 years:

- An average of 575 new cases of cancer were diagnosed annually—a rate of 14 per 100,000 children (15 and 13 per 100,000 boys and girls, respectively).
- Over half of all new cancers (55%) were diagnosed among boys.
- The cancer incidence rate for those aged 0–4 years (21 per 100,000 children) was almost twice those of children aged 5–9 years and 10–14 years (11 and 12 per 100,000, respectively) (Figure 5.5).



Note: Refer to Table A1.2 for ICD-10-AM codes.

Source: AIHW National Cancer Statistics Clearing House.

Figure 5.5: Most common types of new cancers among children aged 0–14 years, 2001–2005

- The most common types of new cancer diagnosed were lymphoid leukaemia, cancer of the brain and myeloid leukaemia (4.3, 1.9 and 1.1 per 100,000 children, respectively) (Figure 5.5), similar to the previous 5-year period (1996–2000). In 2005, these cancers accounted for half of all cancers diagnosed among children.

Health service use for cancer

HOSPITALISATIONS

There were around 6,500 hospital separations for cancer among children aged 0–14 years in 2006–07—a rate of 162 per 100,000 children.

- The majority of these separations were for boys (55%), a pattern consistent with previous years (1996–97 to 2006–07).
- Children aged 0–4 years had a separation rate nearly twice that of 10–14 year olds (227 compared with 118 per 100,000 children, respectively). This pattern is consistent with rates of cancer incidence among these age groups.
- There has been little change in the cancer hospital separation rate since 1997–98.

Cancer deaths

In 2006, there were 90 cancer deaths among children aged 0–14 years—a rate of 2.2 per 100,000 children (Table 5.1).

- This accounted for around 5% of all child deaths. Cancer was the second leading cause of death for children aged 1–14 years (see *Chapter 4 Mortality*).
- Death rates from cancer have declined by 38% since 1997—from 3.6 per 100,000 children to 2.2 between 1997 and 2006 (Table 5.1).
- The most common cancers causing death among children in 2006 were malignant neoplasm of the brain (33%), lymphoid leukaemia (17%), malignant neoplasm of the adrenal gland (10%) and myeloid leukaemia (9%).

Table 5.1: Cancer deaths among children aged 0–14 years, 1997–2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number	140	154	122	106	118	124	102	114	96	90
Deaths per 100,000 children	3.6	3.9	3.1	2.7	3.0	3.1	2.5	2.8	2.4	2.2

Note: Refer to Table A1.2 for ICD-9 and ICD-10 codes.

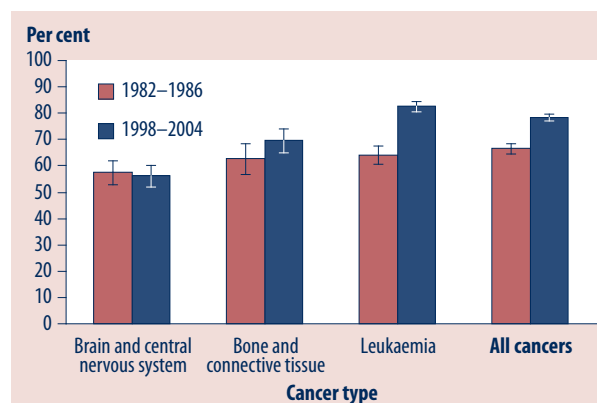
Source: AIHW National Mortality Database.

Cancer survival

Survival after a diagnosis of cancer can be used to assess the effectiveness of early cancer detection, access to appropriate treatment services, collaboration between health care professionals, and ongoing medical research and clinical trials. Relative survival is the ratio between the observed survival among a group of people with cancer and the expected survival among the same group in the general population. For example, a relative survival of 100% indicates that the disease has made no difference to survival of the group over a given period. A relative survival of less than 100% indicates that cancer did reduce survival compared with the general population.

The 5-year relative survival among children aged 0–14 years diagnosed with cancer in 1998–2004 was:

- 79% for all cancers, an increase from 67% for those diagnosed in 1982–1986. The gains in survival have not been consistent across all cancers—leukaemia survival increased by 19 percentage points since 1982–1986 (from 64% to 83%) (see also *Chapter 40*), while there was no statistically significant change in survival for cancer of the brain and central nervous system, and bone and connective tissue (Figure 5.6)
- similar for boys and girls for all cancers
- higher for leukaemia (83%) than for cancer of the bone and connective tissue (70%), and brain and central nervous system (56%) (Figure 5.6).



Note: Refer to Table A1.2 for ICD-9 and ICD-10 codes.

Source: AIHW National Cancer Statistics Clearing House.

Figure 5.6: Five-year relative survival for cancer among children aged 0–14 years, 1982–1986 to 1998–2004

How do chronic conditions vary across population groups?

Aboriginal and Torres Strait Islander children

- Asthma prevalence for Indigenous children was estimated to be 14% in 2004–05—3 percentage points higher than for non-Indigenous children (11%) (ABS & AIHW 2008). There are no reliable national estimates of diabetes or cancer incidence for Indigenous children aged 0–14 years.
- In 2006–07, hospital separation rates for asthma were similar among Indigenous and non-Indigenous children. However, diabetes and cancer hospital separation rates were 4 and 2 times as high as for non-Indigenous children, respectively (excludes data from Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory) (Table 5.2).

Remoteness

- Asthma prevalence for children aged 0–14 years was lowest in *Outer regional and Remote and very remote* areas (10% combined) compared with *Major cities* (11%) and *Inner regional* areas (14%), according to the ABS 2004–05 National Health Survey.
- The rate of new cases of insulin-dependent Type 1 diabetes was twice as high in *Major cities* compared with *Remote and very remote* areas (22 compared with 11 per 100,000 children) during 1999 to 2005 (National Diabetes Register, unpublished data).
- 5-year relative survival for cancer among children aged 0–14 years was significantly higher in *Major cities* (81%) and *Inner regional* areas (80%) than in *Remote and very remote* areas (64%).
- Hospital separation rates for asthma and cancer were 70% and 80% higher in *Major cities* compared with *Remote and very remote* areas, respectively; however, there was little difference in the diabetes hospital separation rate (Table 5.2).

Socioeconomic status

- Asthma prevalence was similar among children living in areas of lowest socioeconomic status (SES) and areas of highest SES (9% and 10%, respectively) according to the ABS 2004–05 National Health Survey.
- There was little difference in 5-year relative survival for cancer between children in the lowest SES areas compared with the highest SES areas (79% and 81%, respectively).
- Hospital separation rates for asthma and diabetes were higher for children living in the lowest SES areas compared with the highest SES areas (20% and 40% higher, respectively); however, for cancer, hospital separation rates were 20% lower among children living in the lowest SES areas compared with the highest SES areas.

How does Australia perform internationally on chronic disease indicators?

Asthma

Australia's prevalence of childhood asthma compares unfavourably with other countries. According to phase III of the International Study of Asthma and Allergies in Childhood, out of 37 countries, the proportion of children aged 6–7 years with current wheeze was highest in Costa Rica (35%) and Australia (24%) and lowest in Indonesia (3.5%) (Pearce et al. 2007). Other countries such as New Zealand (23%), United Kingdom (20%) and Canada (16%) all ranked lower than Australia. The prevalence of current wheeze among Australian children aged 6–7 years decreased by 0.8% between phase I (conducted in 1993) and phase III (2002).

Diabetes

The incidence of Type I diabetes among Australian children aged 0–14 years is high compared with other OECD countries. In 2003, Australia ranked 7th worst out of the 30 OECD countries (IDF 2008). Finland had the highest incidence of Type 1 diabetes (37 per 100,000 children), while Australia had a similar incidence to the United Kingdom (19 and 18, respectively). Korea had the lowest incidence of Type I diabetes (0.7).

Table 5.2 Hospital separations for children aged 0–14 years, 2006–07 (per 100,000)

Population group	Asthma		Diabetes		Cancer	
	Rate	Ratio	Rate	Ratio	Rate	Ratio
Indigenous status						
Indigenous	559	1.0	273	4.0	361	2.2
Non-Indigenous	526		69		166	
Remoteness						
Major cities	569	1.7	70	1.0	168	1.8
Remote and very remote	336		67		94	
Socioeconomic status ^(a)						
Lowest SES areas	557	1.2	83	1.4	149	0.8
Highest SES areas	480		59		181	
All children	520		75		162	

(a) See Appendix 1 Methods for explanation of socioeconomic status (SES).

Note: The ratio for hospital separation rates is calculated as Indigenous divided by non-Indigenous, Major cities divided by Remote and very remote and lowest SES areas divided by highest SES areas.

Source: AIHW National Hospital Morbidity Database.

6 Disability

Children with disability can have diverse physical, sensory, intellectual and psychiatric impairments, resulting in activity and participation limitations that restrict their full involvement in society.

An estimated 8% of Australian children had a disability in 2003 and, of these, half had profound or severe core activity limitations (4%).

Disability is a characteristic that goes beyond the presence or absence of particular health conditions; it relates to the way in which an individual functions in society and is strongly influenced by environmental factors (AIHW 2007a). As a child grows and develops, new challenges come with each new learning and social environment they encounter. For a child with disability, this often means changes in the lived experience of disability throughout childhood. The United Nations Convention on the Rights of Persons with Disabilities recognises disability as an evolving concept: 'disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others' (UN 2006).

Typically, the disability spectrum is measured in terms of the level of difficulty (also expressed as need for assistance) that a person has in performing the core activities of daily living: self-care, mobility and communication, as well as difficulty in other activities. Schooling is a vital aspect of life for most children and a child's disability might be described in terms of both core activity limitation and 'schooling restriction'. Schooling restriction is often associated with a need for special assistance and/or equipment to participate in a mainstream class, or attendance at special classes or a special school (AIHW 2008e). At the severe end of the disability spectrum, there can be a need for lifelong support through specialist services and informal or formal care.

Children with disability can have diverse physical, sensory and/or intellectual impairments, some of which may result in activity and participation restrictions that restrict their full involvement in society, and that of their carers. Disability, particularly disabilities with physical characteristics such as birth defects

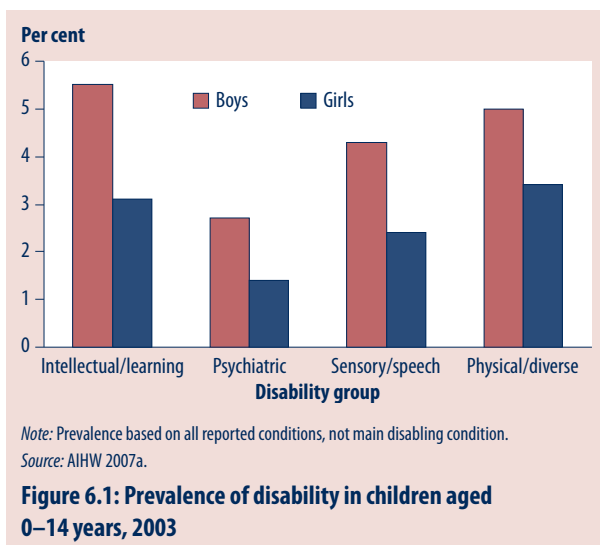
(see *Chapter 7 Congenital anomalies*), may be evident early in life, while others may occur as the result of an accident, or emerge during development in childhood. Individual variation in learning and development can complicate the identification of disability, yet early detection, along with intervention, has the potential to significantly reduce disability and its impact on the person's participation in all aspects of life over the life span (Kornhaber et al. 2007).

In addition to difficulties for the child, childhood disability has a significant impact on the family. Caring for a child with disability can place substantial strain on family relationships and is strongly associated with social and financial disadvantage. Parental employment may be difficult if a child requires intensive support, and financial stress from loss of income may be compounded by costs associated with managing disability and associated health conditions. There may be a significant impact for siblings if support and attention to their needs is diverted by the caregiving commitments of their parents (AIHW 2004). Disruption to family life may also occur due to the need to move house due to the child's disability or health condition—in 2003, one in eight families with a child with disability reported having to do so. Studies have also found children with disability to be more vulnerable to intra- and extra-familial abuse and neglect (Crosse et al. 1993; Sullivan & Knutson 2000), although Australian research in this area is limited (Chenoweth 2002).

HOW MANY AUSTRALIAN CHILDREN HAVE A DISABILITY?

The ABS 2003 Survey of Disability, Ageing and Carers found that around 8%, or 317,900, children aged 0–14 years had disability (ABS 2004a):

- The prevalence of disability increased from 5.3% in 1981 to 8.3% in 2003 (AIHW 2008f).
- Boys were more likely than girls to report disability (10% and 7%, respectively).
- The most prevalent disabilities among children were intellectual/learning, reported for an estimated 166,700 children (4.3%), and physical/diverse (162,800 children or 4.2%).
- Intellectual/learning disability was the most prevalent disability among boys (5.5%), while physical/diverse disability was the most prevalent among girls (3.4%) (Figure 6.1).



Children with severe disability

A person with a very high level of disability will usually need assistance (either sometimes or always) with self-care, mobility and/or communication. The ABS Survey of Disability, Ageing and Carers defines this level of disability as ‘severe or profound core activity limitation’, hereafter shortened to ‘severe disability’. Compared with other children, children with severe disability rely more heavily on parents, other family members and teachers for assistance, and many require formal intervention, including specialist health and disability services.

Key national indicator: Proportion of children aged 0–14 years with severe or profound core activity limitation

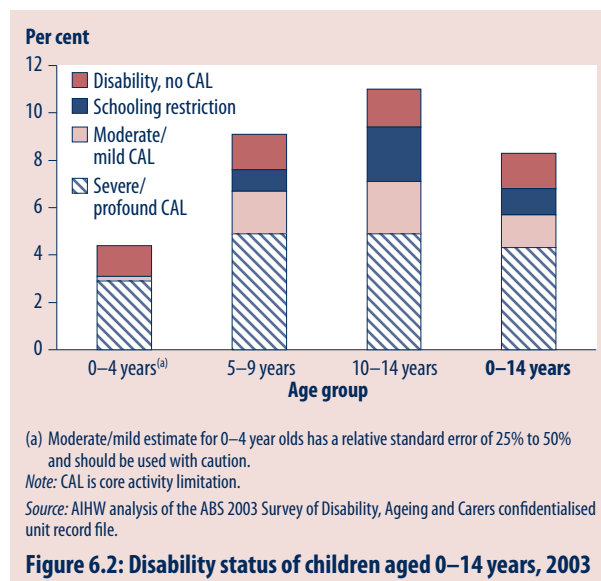
- In 2003, an estimated 4.3%, or 165,300, children aged 0–14 years had severe disability (Figure 6.2). Based on

2003 prevalence rates, in 2009 an estimated 168,500 children have severe disability (AIHW 2007b).

- The prevalence of severe disability in 2003 was higher than in 1981 (age-standardised rates of 4.3% and 1.6%, respectively). This is partially attributable to increased reporting of long-term health conditions in childhood, especially attention deficit hyperactivity disorder (ADHD) and autism-related disorders (AIHW 2008f).
- While the prevalence of disability generally increases with age, severe disability is more common among children aged 5–14 years than among 15–24 year olds (4.9% and 2.2%, respectively; ABS 2004a). Only for ages 55 and older does the prevalence of severe disability exceed that of the school-age years. Communication limitation may be particularly influential on childhood rates of severe disability (AIHW 2005a).

Different health conditions are associated with varying likelihood of severe disability in childhood. In 2003:

- Autism and intellectual impairment were strongly associated with severe disability—an estimated 87% and 75% of children with these conditions experienced severe disability, respectively.
- Epilepsy, speech difficulties, chromosomal abnormalities (for example, Down syndrome), hearing or middle ear disorders, and other mental and behavioural disorders were associated with between 50% and 75% likelihood of severe disability.
- Only 11% of children with asthma, the most commonly reported childhood health condition, had severe disability (AIHW 2006c).



Disability and schooling

Almost all children aged 5–14 years with disability attend school (97%), either a mainstream (89%) or special school (9%). Around one-third of school students with severe disability (that is, students who always need help with self-care, mobility or communication) attend a special school.

Disability impacts variously on a child's school life, depending on a range of factors such as the nature of the disability, school physical and social environments, and access to support and assistance. Around 63% of school-aged children with disability experienced difficulty at school. Learning difficulties, difficulty fitting in socially and communicating with others are the most commonly reported difficulties for students with a main disability of intellectual/learning, sensory/speech or psychiatric. For students with physical/diverse disability, participating in sports is the most common difficulty, followed by learning difficulties and fitting in socially. Overall, 43% of school-age children with disability experience learning difficulties and 30% have difficulty fitting in socially (AIHW 2006c). The level of schooling restriction is associated with the type of health condition that a child with disability may have. For example, all children aged 5–12 years with autism had schooling restrictions, while 93% of children with ADHD, 91% with intellectual disability and 69% with asthma experienced schooling restrictions (AIHW 2008l).

How do rates of disability vary across population groups?

Aboriginal and Torres Strait Islander children

Information about the prevalence and type of disability among Indigenous children nationally is limited. The ABS 2006 Census of Population and Housing asked questions about the need for assistance with the core activities of self-care, mobility and communication. Indigenous children aged 0–14 years were 30% more likely than non-Indigenous children to require assistance with a core activity (ABS & AIHW 2008).

The 2000–2002 Western Australian Aboriginal Child Health Survey found that between 1.2% and 2.2% of children aged 4 to 17 years required assistance with self-care and more than one in four (between 25% and 29%) were limited in one or more sensory functions (hearing, vision or speech), or experienced pain (Zubrick et al. 2004). The high rate of communication limitation suggests that the rate of severe disability would be much higher than the estimate based on self-care limitation alone.

See *Part IX* for more information on disability among Indigenous children.

Remoteness

The geographical distribution of children with severe disability generally reflects that of all Australian children: 64% in *Major cities*; 23% in *Inner regional* areas and 12% in *Outer regional, remote and very remote* areas combined, according to the ABS 2003 Survey of Disability, Ageing and Carers. This highlights the need for access to services for families living inside and outside large population centres.

Socioeconomic status

Disability is strongly associated with socioeconomic status, although the direction of this relationship is unknown. It may be that poverty contributes to the occurrence of a child's disability, due to increased exposure to environmental risks, lower rates of accessing health care or maternal risk factors associated with disability (for example, smoking or alcohol use during pregnancy). Alternatively, it may be that the associated costs of a child with disability, such as special aids, health service costs, modifications to the house, and reduced family income due to caring responsibilities, may lead to socioeconomic disadvantage and poverty (AIHW 2004).

Based on equivalised household income quintiles, the proportion of children with severe disability was highest among low-income households (29%) and lowest among high-income households (7%) in 2003 (AIHW 2005b).

7 Congenital anomalies

Congenital anomalies are a major cause of hospitalisation in infancy and childhood and a leading cause of infant mortality in Australia.

Indigenous infants and infants from remote areas are more likely to be born with selected congenital anomalies, particularly neural tube defects—a largely preventable condition.

A congenital anomaly, also known as a birth defect, is either a structural, functional, chromosomal or metabolic abnormality that is present at birth, even if not diagnosed until months or years later (Abeywardana et al. 2007).

In Australia and internationally, congenital anomalies are a significant health concern, usually requiring intensive health care management, and often resulting in disability and, in some cases, death. Congenital anomalies were the second leading cause of infant death in Australia in 2006 (22% of deaths) (see Chapter 4 Mortality), and accounted for 12% of the disease burden for Australian children aged 0–14 years in 2003 (Begg et al. 2007).

The causes of congenital anomalies are diverse, and include genetic disorders (single gene defects and chromosomal abnormalities) and partly genetic disorders (multifactorial congenital malformations); environmental factors, including agents that disturb normal growth and development of the embryo or fetus (such as maternal factors and prenatal behaviour); mechanical forces that deform the fetus; vascular accidents that disrupt the normal growth of organs and limbs; and other, as yet unknown, causes (Christianson et al. 2006). Czeizel (2005) estimates that around 25% of congenital anomalies are due to genetic disorders, around 15% are due to environmental factors, and around 60% are complex and multifactorial in origin.

Programs aimed at reducing the prevalence or impact of congenital anomalies include improved preconception knowledge and behaviour; high-quality maternal health care, including the management of labour; and health care for infants and children with acute and chronic disorders. Research into congenital anomalies has identified specific risk factors for some conditions, which has enabled public health interventions to be put in place to address these factors where appropriate. Interventions that have proved effective in addressing some of the risk factors for adverse birth outcomes include folic acid supplementation; the appropriate management of hyperglycaemia; vaccinations for rubella, influenza and hepatitis; antiretroviral medications to reduce the risk of HIV transmission from mother to child; and cessation of smoking and drinking alcohol.

This chapter looks at four congenital anomalies that are evident at birth, and for which reliable prevalence data are available: neural tube defects, Down syndrome, abdominal wall defects and orofacial clefts (see Box 7.1). These conditions contribute significantly to morbidity, are a major cause of short- and long-term disability, and have life-long implications for health and development.

Box 7.1: Overview of selected congenital anomalies

Neural tube defects

Neural tube defects include anencephaly, spina bifida and encephalocele. They result from incomplete closure of the neural tube early in pregnancy and lead to damage of the brain or spinal cord. Research has proven that ingestion of folate protects against the development of neural tube defects—the National Health and Medical Research Council recommends 0.5mg of folic acid supplements for women at low risk and 5mg for women at high risk in the month preceding conception and in the first trimester (NHMRC 2005).

Down syndrome

Down syndrome is a genetic disorder caused by the presence of all, or part of, an extra chromosome 21. Down syndrome is associated with impairment of cognitive ability and physical growth as well as a characteristic facial appearance. Children with Down syndrome often require lifelong care and assistance with daily activities, and comorbid conditions are common.

Abdominal wall defects

Abdominal wall defects (includes exomphalos and gastroschisis) are a significant cause of infant morbidity and occur when the abdominal contents form outside of the body. Babies with abdominal wall defects require immediate surgery and may require long-term care depending on their response to treatment and the presence of other anomalies. The prevalence of abdominal wall defects has increased in a number of countries at a rate that implies environmental or maternal factors may be associated with the development of this condition (Feldkamp et al. 2008).

Orofacial clefts

Orofacial clefts are caused by abnormal facial development and include cleft lip and/or cleft palate. Although able to be corrected with surgery, babies with orofacial clefts have difficulty feeding, particularly with breastfeeding.

CONGENITAL ANOMALIES IN AUSTRALIA

Data on congenital anomalies detected at birth (live births, still births, and terminations of pregnancy at or after 20 weeks gestation but not before 20 weeks gestation) are collected by all jurisdictions except the Northern Territory and are compiled into the Australian Congenital Anomalies Monitoring System.

Key national indicator: Rate of selected congenital anomalies among infants at birth (neural tube defects, Down syndrome, abdominal wall defects, orofacial clefts)

Over the 6-year period 1998–2003, the birth rates of selected congenital anomalies were:

- 5 per 10,000 infants for neural tube defects, or 688 births (Table 7.1). Of these infants, just over half (55%) were live births, reflecting the high rate of still births for neural tube defects. The prevalence of neural tube defects in Australia is similar to or slightly higher than other developed countries (Abeywardana & Sullivan 2008b)
- 11 per 10,000 infants for Down syndrome, or 1,725 births. Almost 90% of infants born with Down syndrome were live births
- 4 per 10,000 infants for abdominal wall defects, or 661 births. Around 83% of infants born with abdominal wall defects were live births. Between 1998–2000 and 2001–2003, there was a statistically significant increase of 20% in the birth rate for abdominal wall defects
- 17 per 10,000 infants for orofacial clefts, or 2,601 births. The majority of infants born with orofacial clefts were live births (94%).

Due to medical advances in prenatal diagnosis techniques, such as ultrasound and amniocentesis, congenital anomalies are being diagnosed earlier in pregnancy. The total prevalence for a congenital anomaly includes terminations before 20 weeks gestational age and estimates the prevalence of the condition inclusive of cases terminated in early pregnancy. However, these prevalence estimates are likely to be an underestimate because the number of spontaneous abortions due to congenital anomalies is unknown.

Table 7.1: Selected congenital anomalies among infants at birth, 1998–2003

	Neural tube defects		Down syndrome		Abdominal wall defects		Orofacial clefts		Total births
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	
Indigenous status									
Indigenous	48	10.9	50	11.9 *	29	6.6 *	111	25.3	43,947
Non-Indigenous	604	4.3	1,542	10.9 *	608	4.3 *	2,414	17.1	1,410,720
Remoteness ^(a)									
Major cities	433	4.5	1,091	11.5	382	4.0	1,668	17.5	952,480
Inner and outer regional	198	4.9 **	544	13.4	235	5.8	791	19.5	405,456
Remote and very remote	30	8.5	46	13.0 **	21	5.9 **	72	20.3 **	35,435
Live births	382	2.5	1,517	10.1	547	3.6	2,451	16.3	1,503,824
All births^(b)	688	4.5	1,725	11.4	661	4.4	2,601	17.2	1,514,259

* The difference between Indigenous and non-Indigenous infants was not significant at the 5% level of significance.

** The difference between the remoteness area indicated and *Major cities* was not significant at the 5% level of significance.

(a) Based on mother's usual place of residence.

(b) Includes live births and fetal deaths.

Notes

1. Rate is number per 10,000 births.

2. Data exclude the Northern Territory.

3. Neural tube defects include anencephaly, spina bifida and encephalocele; abdominal wall defects include gastroschisis and exomphalos; orofacial clefts include cleft palate without cleft lip and cleft lip with or without cleft palate.

Source: Australian Congenital Anomalies Monitoring System, unpublished data.

In 1998–2003, based on data from Victoria, South Australia and Western Australia (includes terminations due to congenital anomalies at less than 20 weeks gestational age), the total prevalence of:

- neural tube defects was almost 3 times the birth rate (13 and 5 per 10,000, respectively)
- Down syndrome was more than twice the birth rate (25 and 11 per 10,000, respectively).

Does the rate of congenital anomalies vary across population groups?

Some groups of the population, such as Indigenous Australians and those living in remote areas of Australia, are disadvantaged in terms of access to quality maternal health care services, and may not have access to the information they require about prenatal health behaviours to reduce adverse pregnancy outcomes. These are important factors in the development of some congenital anomalies and may, in part, account for the higher rate of congenital anomalies observed among these populations.

During 1998–2003:

- Indigenous infants were more than twice as likely as non-Indigenous infants to be born with neural tube defects—a congenital anomaly that is largely preventable (see Box 7.1). Birth rates were also 50% higher among Indigenous infants for orofacial clefts and abdominal wall defects, although the latter was not statistically significant. Down syndrome rates were similar for Indigenous and non-Indigenous infants (Table 7.1).
- Compared with *Major cities*, the birth rate for neural tube defects was twice as high among infants from *Remote and very remote* areas. Birth rates for Down syndrome, abdominal wall defects and orofacial clefts were statistically significantly higher in *Inner and outer regional* areas than in *Major cities* (Table 7.1).

8 Mental health

Children with mental health problems experience suffering, functional impairment, exposure to stigma and discrimination, and increased risk of premature death.

There is a lack of recent national data on the mental health and wellbeing of children in Australia, making it difficult to ascertain the extent to which mental health problems affect children.

Mental health is a state of wellbeing in which individuals can realise their abilities, can cope with the normal stresses of life, can work productively and fruitfully, and are able to make a contribution to their community (WHO 2001). Conversely, mental health problems can affect perceptions, emotions, behaviour and social wellbeing. Mental disorders, as distinct from mental health problems, are characterised by a clinically recognisable set of symptoms or behaviours that interfere substantially with social, academic or occupational functioning (APA 1994; Sawyer et al. 2000). Different types of mental disorders consist of a different combination of symptoms that may differ in severity.

It is estimated that as many as 20% of children in modern societies are affected by mental health problems and, in Australia, mental health problems and disorders as a broad cause group accounted for the highest burden of disease among children in 2003 (Bayer et al. 2007; Begg et al. 2007). Children with mental health problems experience a number of adverse outcomes, including general suffering, functional impairment, exposure to stigma and discrimination, and increased risk of premature death (Patel et al. 2007).

There are a number of developmental factors that contribute to the onset of mental illness in children, including prenatal brain damage, genetic factors, low intelligence, difficult temperament, poor social skills and low self-esteem. Other contributing factors include those within the school context, such as bullying and failure to achieve academically; physical or psychological trauma, such as sustaining injuries, experiencing abuse or neglect, or loss of family; as well as community and cultural factors such as low socioeconomic status or discrimination (DHAC 2000).

Parenting and family factors are also important determinants of children's mental health. Those identified as increasing the risk of mental health problems in children include the lack of a warm, positive relationship with parents; insecure attachment between carers and infants; harsh, inflexible or inconsistent discipline; inadequate supervision of, and involvement with, children; marital conflict and breakdown; and parental psychopathology (particularly maternal depression and high levels of parenting stress) (Sanders 2002). These factors increase the risk of children developing major behavioural and emotional problems, including conduct problems, substance misuse, antisocial behaviour and participation in delinquent activities (Sanders 2002).

A number of mental disorders first manifest in childhood and adolescence, and many disorders that are diagnosed in adulthood have their origins in childhood. Disorders known as 'impulse-control' disorders have the earliest typical age of onset—7–9 years for ADHD, 9–14 years for conduct disorder and 7–14 years for some anxiety disorders (phobias and separation anxiety disorder) (Kessler et al. 2007).

HOW MANY AUSTRALIAN CHILDREN HAVE MENTAL HEALTH CONDITIONS?

The most recent, comprehensive national information on the mental health and wellbeing of children comes from the 1998 Child and Adolescent component of the National Survey of Mental Health and Wellbeing (Sawyer et al. 2000). This survey estimated that as many as 14% (or around one in seven) children aged 4–14 years in Australia had mental health problems in 1998:

15% of boys and 14% of girls (AIHW analysis of 1998 Child and Adolescent component of National Survey of Mental Health and Wellbeing unit record file). Detailed information from this survey has been published in the previous edition of *A picture of Australia's children* and elsewhere (AIHW 2005b; Sawyer et al. 2000). This chapter, therefore, presents information from the ABS 2004–05 National Health Survey, and from states which have used the Strengths and Difficulties Questionnaire.

Key national indicator: Proportion of children aged 4–14 years with mental health problems

The ABS National Health Survey collects limited information on mental and behavioural problems as parent-reported long-term conditions among children. These conditions may not have been medically diagnosed.

According to the ABS 2004–05 National Health Survey, among children aged 4–14 years:

- An estimated 253,600 or 9% had a mental or behavioural problem as a long-term condition.
- The most commonly reported problems were
 - behavioural and emotional problems with usual onset in childhood or adolescence (3%)
 - problems of psychological development (3%)
 - anxiety-related problems (2%).

The Strengths and Difficulties Questionnaire collects information about children's mental health and behaviour (Goodman 2001). This questionnaire has been widely used within Australia and has good reliability and validity. Children are scored on each of five domains (emotional symptoms, conduct problems, hyperactive behaviour, peer relationships and prosocial behaviour) as 'normal', 'borderline' or 'of concern'. Children scoring 'of concern' are at substantial risk of developing a clinically significant behavioural problem. The questionnaire has been used on a representative sample of children in New South Wales and Victoria, and has been used in Western Australia for Indigenous and non-Indigenous children (see *Part IX*).

Results from the Strengths and Difficulties Questionnaire indicate that among children aged 4–12 years:

- In New South Wales, 7% of children had behaviour problems that were rated 'of concern' in 2005–06 (Table 8.1). Around 11% of children scored 'of concern' on both the emotional symptoms and hyperactivity scales, and 9% on the conduct disorders scale.

- In Victoria, 6% of children had behaviour problems that were rated 'of concern' in 2006. Around 11% of children scored 'of concern' on the hyperactivity scale, 9% on the conduct disorder scale and 8% on the peer problems scale.

Table 8.1: Children scoring 'of concern' on the Strengths and Difficulties Questionnaire, New South Wales and Victoria, 4–12 years (per cent and 95% confidence intervals)

	NSW (2005–06)		Vic (2006)	
	Per cent	95% CI	Per cent	95% CI
Emotional symptoms	10.6	9.1–12.0	7.8	6.7–8.9
Conduct problems	9.0	7.6–10.4	8.6	7.5–9.7
Hyperactivity	11.4	9.9–13.0	11.1	9.8–12.3
Peer problems	7.5	6.3–8.6	8.4	7.3–9.4
Prosocial behaviour	1.2	0.8–1.7	1.8	1.3–2.3
Total	6.6	5.4–7.7	5.6	4.7–6.5

Note: Children with missing data have been excluded from these results.
Sources: NSW Department of Health 2006, unpublished data; Victorian Child Health and Wellbeing Survey 2006, unpublished data.

Specific mental health conditions

ADHD, depressive disorder and conduct disorder have great significance for child and adolescent health in Australia (Sawyer et al. 2000), with ADHD and anxiety and depression among the leading specific causes of the disease burden among children in 2003 (Begg et al. 2007). These conditions have implications for a child's psychosocial growth and development, health-care requirements, educational and occupational attainment and their involvement with the justice system (Bhatia & Bhatia 2007; Eme 2007; Laurel & Wolraich 2007).

Key national indicator: Proportion of children aged 6–14 years with mental health disorders (attention deficit hyperactivity disorder [ADHD], depressive disorder, conduct disorder)

As with information on the mental health and wellbeing of children generally, there is a lack of recent national data on the prevalence of these specific conditions among Australian children.

Results from the 1998 Child and Adolescent component of the National Survey of Mental Health and Wellbeing estimated that 13% of children aged 6–14 years had ADHD and the prevalence of conduct disorder and depressive disorder was 3% each. The prevalence of each of these conditions was higher among boys compared with girls,

particularly for ADHD (18% of boys and 8% of girls) (AIHW analysis of 1998 Child and Adolescent component of National Survey of Mental Health and Wellbeing unit record file). Sawyer et al. (2000) suggest that the prevalence of ADHD could have been overestimated in this survey, as some children reported to have ADHD 'may have been more appropriately diagnosed with another disorder not included in the survey'.

How does child mental health vary across population groups?

Access to primary health care services plays an important role in the prevention, identification and treatment of children experiencing mental health problems. These services may not be equally accessible to Indigenous children, and children in remote and socioeconomically disadvantaged areas, due to reasons such as physical access to services, cultural barriers and affordability.

Aboriginal and Torres Strait Islander children aged 4–14 years were statistically significantly more likely to have a mental or behavioural problem as a long-term condition, compared with non-Indigenous children (13% compared with 8%), according to the ABS 2004–05 National Aboriginal and Torres Strait Islander Health Survey. See *Part IX* for more information on mental health among Indigenous children.

HOW OFTEN DO CHILDREN ACCESS HEALTH SERVICES FOR MENTAL HEALTH CONDITIONS?

General practice encounters

According to the 2007–08 Bettering the Evaluation and Care of Health (BEACH) survey of general practice activity in Australia, there were an estimated 340,300 general practice encounters with children aged 0–14 years where a mental health problem was managed. Mental health-related encounters comprised 2.2% of all general practice encounters for children, compared with 12% for those aged 15 years and over. The most common mental health problems managed for children were behaviour symptom/complaint (27%), ADHD (18%), sleep disturbance (14%) and depression/anxiety disorder (13%) (Table 8.2).

Table 8.2: Mental health problems managed for children aged 0–14 years, 2007–08^(a)

Mental health problem managed ^(b)	National estimate of number of encounters ^(c)	Per cent
Behaviour symptom/complaint	93,000	27.3
ADHD	61,500	18.1
Sleep disturbance	48,000	14.1
Depression/anxiety	43,700	12.9
Other	94,100	27.6
Total	340,300	100.0

(a) Data collection period 1 April 2007 to 31 March 2008.

(b) Based on first recorded mental health problem managed per encounter. Mental health problems classified according to ICD-10 codes: behaviour symptom/complaint (P22–P23), ADHD (P81), sleep disturbance (P06), and depression/anxiety (P01, P03, P74, P76). Other mental health problems include all remaining P codes.

(c) The estimated number of encounters is based on the proportion of encounters in the BEACH survey of general practice activity that are mental health-related, multiplied by the total number of Medicare services for Non-Referred (GP) Attendances (excluding Practice Nurse Items) for children aged 0–14 years as reported by Medicare Australia (Medicare Australia 2009b).

Source: BEACH survey of general practice activity. Refer to *Appendix 2* for further information.

Hospitalisations

In 2006–07, there were 6,600 hospital separations for mental and behavioural disorders among children aged 4–14 years—a rate of 221 per 100,000 children. This represents 2.5% of all hospital separations for this age group and 2.2% of all separations for mental and behavioural disorders. Around three-quarters of the mental and behavioural disorder separations among 4–14 year olds were same-day (that is, the patient was admitted and discharged on the same day), compared with just over half (55%) for all ages. The hospital separation rate for mental and behavioural disorders has declined from 247 per 100,000 children in 1998–99 to 221 in 2006–07—a statistically significant decrease of 11%.

The leading causes of hospital separation for mental and behavioural disorders among children aged 4–14 years in 2006–07 were:

- behavioural and emotional disorders with usual onset in childhood and adolescence (44%), such as conduct disorder and ADHD
- neurotic, stress-related and somatoform disorders (22%), such as anxiety disorders and adjustment disorders
- mood disorders (9%), such as depressive disorders.