



Injury among young Australians

Highlights

Injury has a major, but largely preventable, impact on the health of young Australians. It is the leading cause of death among young people aged 12–24 years—accounting for more deaths than all other causes of death combined—and can leave many with serious disability or long-term conditions. This is the first Australian Institute of Health and Welfare (AIHW) report to focus on injury specifically among young Australians, and draws together data on deaths, hospitalisations and incidence.

Among young Australians:

- injury was responsible for two-thirds of deaths in 2005, despite the injury death rate more than halving between 1986 and 2005 (52% decline)
- injury was the third leading cause of hospitalisation—accounting for 1 in 6 hospitalisations in 2005–06
- transport accidents were the most common cause of injury—accounting for one in five injury hospitalisations in 2005–06 and 44% of injury deaths in 2005. Motor vehicle traffic accidents were responsible for the vast majority of these deaths

(highlights continued overleaf)

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- suicide was the second leading cause of injury death—accounting for one-fifth of all their deaths in 2005
- young males accounted for around three-quarters of injury deaths and hospitalisations
- Aboriginal and Torres Strait Islander young people had considerably higher rates of death and hospitalisation due to injury than other young Australians. In particular, the assault hospitalisation rate was 6 times as high
- injury death and hospitalisation rates increase substantially with remoteness and socioeconomic disadvantage:
 - the injury death rate in Very Remote areas was almost 5 times those in Major Cities, and the hospitalisation rate was 3 times as high
 - those in the most socioeconomically disadvantaged fifth of the population had an injury death rate almost twice as high as those from the least socioeconomically disadvantaged fifth, and were almost 30% more likely to be hospitalised for injury.

Introduction

Injury, including poisoning, is a leading cause of death and hospitalisation among young Australians and can result in ongoing disability and long-term conditions. The largely preventable nature of injury, combined with its major impact on the health of Australians, led to the identification of injury prevention and control as a National Health Priority Area in 1986, and the development of national injury prevention plans (NPHP 2004).

Patterns of injury in young people are different to those seen for other age groups, showing the strong influence that stage of life has on susceptibility to certain types of injury. Injury patterns change during adolescence and early adulthood as young people assume more independent roles. Greater responsibility for decision making creates more opportunity for young people to engage in risky behaviours (NPHP 2004). For young people, particularly those aged 15–17 years, this independence occurs simultaneously with exposure to alcohol and other drugs, and the development of new skills, such as driving and job skills, at a time when peer acceptance is important. Young people are more likely to experiment with using illicit substances and alcohol, which can make them more prone to certain types of injuries, such as falls, transport accidents, accidental poisoning and assault, while they are under the influence of these substances.

Of particular concern is the over-representation of young adults, particularly young males, in road traffic accidents that have been linked to risky driving behaviours such as speeding, driving when fatigued and driving under the influence of alcohol or other drugs (Smart et al. 2005). Intentional injuries, such as self-harm or suicide and assault, are also important causes of hospitalisation and death among young people.

Injury can affect a person's employment, educational and recreational opportunities, and can lead to permanent disability and disfigurement, such as acquired brain injury or spinal cord injury. This can have long-term effects on future health and wellbeing (NPHP 2004).

This bulletin presents the latest available information on injury incidence, hospitalisations and deaths among young Australians aged 12–24 years. A particular focus of the bulletin is to explore injury by different age groups—12–14 years, 15–17 years and 18–24 years—as age is an important factor in the types of injuries sustained by young people. Four types of injury will be explored in detail: transport accidents, intentional self-harm and suicide, accidental poisoning and assault. When combined, these four types of injury account for the vast majority of injury deaths among young people (84%) and also contribute substantially to injury hospitalisations (40%). As some population groups are at greater risk of injury than others, this bulletin also examines injury among young Aboriginal and Torres Islander people, young people in remote areas and those who are at a socioeconomic disadvantage.

The main data sources used in this bulletin are the AIHW National Hospital Morbidity Database, the AIHW National Mortality Database and the ABS 2004–05 National Health Survey (NHS) and National Aboriginal and Torres Strait Islander Health Survey (NATSIHS). See the *Technical notes* for more information on the analysis and limitations of injury-related data from these sources, particularly for Aboriginal and Torres Strait Islander Australians.

Incidence

Incidence data are useful in providing information on the rate at which people in the community sustain injuries. Incidence data provide a more complete picture of injury occurrence than hospitalisation or death records, as incidence captures the less severe injuries that do not require hospitalisation or result in death.

The ABS 2004–05 NHS collected information about the most recent injury that was sustained by young people in the 4 weeks preceding the survey for which an action was taken (for example, receiving medical treatment or reducing usual activities). An estimated 793,400 young people (23%) sustained one or more injuries during this period—accounting for around one-fifth of injuries for all ages (Table 1). After children, young people have the highest incidence rate of injury. Proportions for young males and females were similar (24% and 22%, respectively). An estimated 6% of 18–24 year olds sustained their most recent injury while under the influence of alcohol or other substances, compared with 2% of the population aged 25 years and over.

The leading causes of the most recent injury for both males and females were being cut with a knife, tool or other implement (29%), followed by a low fall of one metre or less (19%) and hitting, or being hit by, something (17%). The most common injuries sustained were open wounds (43%), bruising (23%), and dislocations, sprains, strains or torn muscles/ligaments (15%).

It is difficult to determine the severity of the injuries being reported from the information collected in the NHS; however, the actions taken for the injury may be used as an indicator of severity. More than one action may be reported for an injury. Of those young

people who reported an injury, an estimated 6% attended hospital (including admitted hospital stays, visits to casualty/emergency and visits to outpatient clinics), 19% consulted a doctor and/or other health professional, 10% had days off work or study and almost one-quarter cut down on their usual activities due to their most recent injury.

Table 1: Injury incidence for young people aged 12–24 years by population characteristics, 2004–05

Population group	Males		Females		Persons	
	Number	Per cent ^(a)	Number	Per cent ^(a)	Number	Per cent ^(a)
Age group						
12–17 years	155,400	19.8	161,100	21.1	316,600	20.4
18–24 years	257,500	26.9	219,300	23.4	476,800	25.2
Indigenous status^(b)						
Indigenous	11,900	18.8	9,500	15.5	21,300	17.2
Non-Indigenous	405,400	23.7	370,500	22.3	775,900	23.0
Remoteness						
Major Cities	302,800	25.1	265,200	22.8	567,900	23.9
Inner Regional	53,100	15.5	83,300	23.7	136,300	19.8
Other areas ^(c)	57,100	26.7	32,000	17.7	89,200	22.6
Socioeconomic status (Index of Relative Disadvantage)						
Quintile 1 (most disadvantaged)	58,200	19.3	75,100	21.6	133,200	20.5
Quintile 5 (least disadvantaged)	79,800	21.8	83,900	25.3	163,700	23.5
Young people (12–24 years)	413,000	23.7	380,400	22.4	793,400	23.0

(a) Age-standardised to the Australian population as at 30 June 2001, with the exception of rates by 'Age group', which are age-specific.

(b) Data for 'Indigenous status' (Indigenous and non-Indigenous) are from the ABS 2004–05 NATSIHS (which includes non-Indigenous respondents from the 2004–05 NHS for comparisons), while other data in the table is derived from the ABS 2004–05 NHS. Weighted data derived from the NATSIHS will not equate to NHS estimates, as there is no distinction made on the basis of Indigenous status in the NHS (see ABS 2006b:16 for further information).

(c) Includes Outer Regional, Remote, and Very Remote Australia.

Source: AIHW analysis of ABS 2004–05 NHS and ABS 2004–05 NATSIHS confidentialised unit record files.

- The incidence of injury was lower among Aboriginal and Torres Strait Islander young people (17%) than among non-Indigenous young people (23%), after adjusting for differences in age structure (Table 1). The most frequent causes of injury for Indigenous young people were low falls (one metre or less) (23%), hitting, or being hit by, something (21%) and being cut with a knife, tool or other implement (20%). The most common injuries sustained by Indigenous young people were open wounds (36%), bruising (27%), and dislocations, sprains, strains or torn muscles/ligaments (18%).
- Inner Regional areas had the lowest overall incidence of injury (20%); the incidence of injury in Outer Regional, Remote and Very Remote areas combined was similar to Major Cities (23–24%) (Table 1). This pattern varied by sex—for young males, the highest incidence (27%) was recorded outside Major Cities and Inner Regional areas, while for young females, areas outside Major Cities and Inner Regional areas recorded the lowest incidence (18%).
- The incidence of injury was higher among young people from the least disadvantaged areas (24%) compared with those from the most disadvantaged areas (21%) (Table 1).

Hospitalisations

A hospitalisation (also known as a separation), as defined in this bulletin, is an episode of care for an admitted patient, which can be a total hospital stay, or a portion of a hospital stay beginning or ending in a change of care type (for example, from acute to rehabilitation).

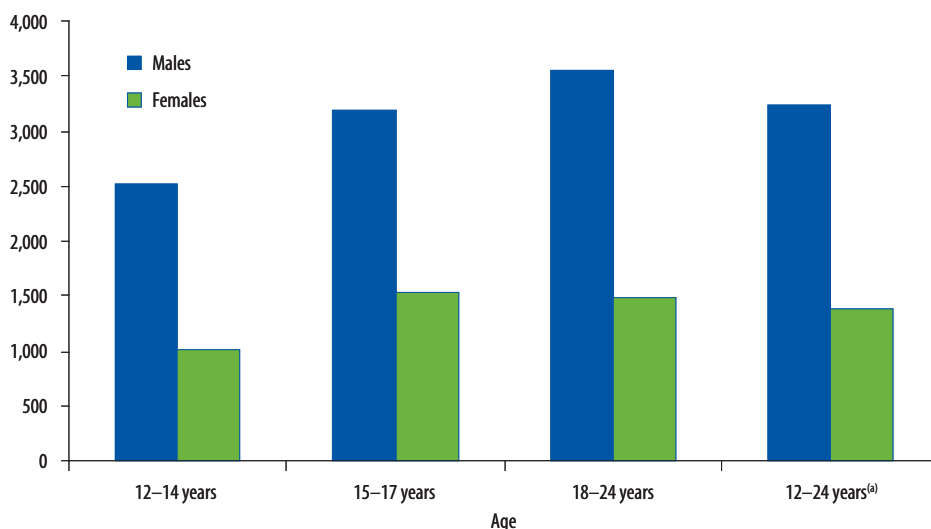
In 2005–06, injury, including poisoning, was the third leading cause of hospitalisation for young people, representing 16% of all hospitalisations. Conditions related to pregnancy, childbirth and puerperium, and diseases of the digestive system were the leading causes of hospitalisation. However, this pattern differed by age and sex. Injury was the leading cause of hospitalisation for young males aged 12–14 years, 15–17 years and 18–24 years—accounting for around 30% of all hospitalisations in each age group. For females, injury was the second leading cause of hospitalisation among 12–14 year olds, following diseases of the digestive system. However, among females aged 15–17 and 18–24 years, injury was the fourth and sixth leading cause of hospitalisation, respectively, with other causes, such as conditions related to pregnancy, childbirth and the puerperium and mental and behavioural disorders accounting for a higher number of hospitalisations.

Almost one in five injury hospitalisations in 2005–06 were for 12–24 year olds—males and females of this age accounted for 24% and 13% of all male and female hospitalisations for injury, respectively.

The criteria used to define injury hospitalisations can be found in *Technical notes* and for information on the National Hospital Morbidity Database see *Appendix 2: Data sources*. Further information on young people hospitalised for injuries can be found in Berry & Harrison (2007).

- In 2005–06, there were 86,032 hospitalisations due to injury among young people—a rate of 2,326 per 100,000. Almost three-quarters of these hospitalisations were for young males (61,072 hospitalisations).
- The injury hospitalisation rate has increased by 7% since 1996–97, with the male rate consistently more than twice the female rate over this period (3,171 compared with 1,391 per 100,000 young people in 2005–06).
- The hospitalisation rate among young males increased steadily with age (Figure 1). Males aged 18–24 years were hospitalised at 1.4 times the rate of males aged 12–14 years. The hospitalisation rate among young females was highest for those aged 15–17 years in 2005–06 (1,531 per 100,000 young people) (Table A1.1).
- Injury hospitalisation rates varied between states and territories in 2005–06, with the highest rate among young people in the Northern Territory (3,515 per 100,000 young people or 1.5 times the national rate) and the lowest in the Australian Capital Territory and Western Australia (2,033 and 2,058 per 100,000 young people, respectively) (Table A1.2).

Hospitalisations per 100,000 young people



(a) Age-standardised to the Australian population as at 30 June 2001.

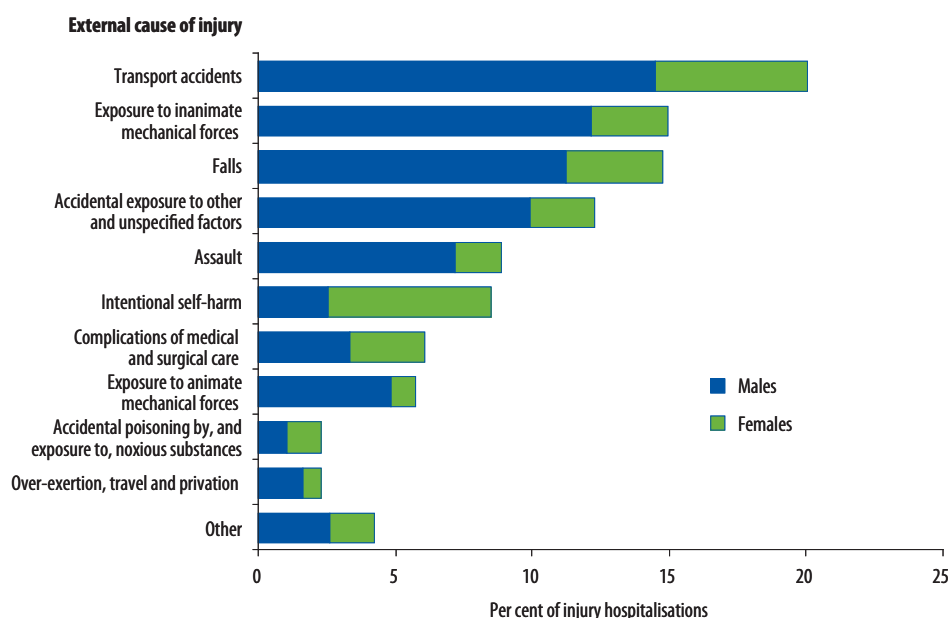
Note: ICD-10-AM codes S00–T98.

Source: AIHW National Hospital Morbidity Database.

Figure 1: Injury hospitalisation rate for young people aged 12–24 years, 2005–06

The event or circumstance that led to an injury is known as the external cause. Almost all injury hospitalisations among young people (99.9% or 85,957 hospitalisations) have at least one external cause code recorded (see *Technical notes* for further information).

- In 2005–06, the most common external cause of injury leading to hospitalisation among young people was transport accidents—accounting for 20% of injury hospitalisations (17,228 hospitalisations or a rate of 466 per 100,000 young people) (Figure 2). See *Transport accidents* for more detail on this external cause of injury.
- Exposure to inanimate mechanical forces (for example, being struck by a thrown or falling rock) and falls were the second and third highest external causes of injury, respectively—each accounting for approximately 15% of injury hospitalisations among young people.
- Assault and intentional self-harm were also important external causes of hospitalisation—accounting for 9% and 8% of external cause hospitalisations, respectively. See *Assault and Intentional self-harm and suicide* for more detail on these external causes of injury.
- Young males made up a higher proportion of hospitalisations for external causes of injury overall (71% of all external cause hospitalisations in 2005–06), although females made up the majority of hospitalisations for intentional self-harm and accidental poisoning by, and exposure to, noxious substances (70% and 55%, respectively).



Notes

1. ICD-10-AM codes S00–T98 and V01–Y98. See Table 7 in *Technical notes* for specific external cause codes.
2. Includes the first reported external cause per injury hospitalisation only.
3. The denominator is all injury hospitalisations among young people aged 12–24 years with an external cause recorded.

Source: AIHW National Hospital Morbidity Database.

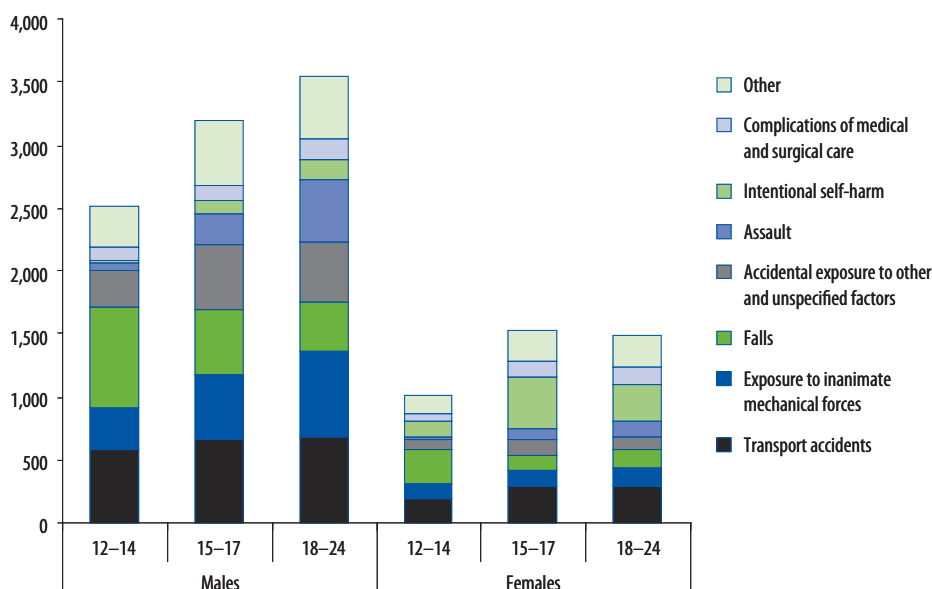
Figure 2: Injury hospitalisations for young people aged 12–24 years, by external cause of injury 2005–06

Age and sex

The profile of external causes of injury hospitalisation differed by age and sex (Figure 3).

- Transport accidents accounted for a similar proportion (approximately 20%) of injury hospitalisations for young males and females across all three age groups in 2005–06, although the rate for females was lower than for males.
- Falls accounted for the highest injury hospitalisation rate among 12–14 year olds for both males and females (803 and 249 per 100,000 young people, respectively), and then decreased with increasing age (rates among 12–14 year olds were around twice those for 18–24 year olds).
- The hospitalisation rate for assault increased with age. For males aged 18–24 years, the rate was 9 times that of 12–14 year olds, while for females it was 5 times. Female rates remained much lower than for males for each age group. See *Assault* for further information.
- The intentional self-harm hospitalisation rate was highest for females aged 15–17 years (426 per 100,000 young females) and was almost 4 times as high as for 12–14 year olds and 1.5 times as high for 18–24 year olds. For males, the intentional self-harm hospitalisation rate increased with age, although remained much lower than for females. See *Intentional self-harm and suicide* for further information.

Hospitalisations per 100,000 young people



Notes

1. ICD-10-AM codes S00–T98 and V01–Y98. See Table 7 in *Technical notes* for specific external cause codes.
2. Includes the first reported external cause per injury hospitalisation only.

Source: AIHW National Hospital Morbidity Database.

Figure 3: Injury hospitalisations for young people, by age, sex and external cause of injury 2005–06

Population groups

Injury hospitalisation rates and the leading external causes of injury hospitalisation varied among young people from different population groups in 2005–06.

In 2005–06, the age-standardised injury hospitalisation rate among young Aboriginal and Torres Strait Islander people aged 12–24 years was 1.6 times that of other young Australians (3,559 per 100,000 compared with 2,255 per 100,000 young people) (Table A1.1) (data do not include Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory, see *Technical notes*). The difference in injury hospitalisation rates between Indigenous and other Australians was greater for females than for males (twice as high for females and 1.4 times as high for males). The most common causes of injury hospitalisation among Indigenous young people were assault (28%), exposure to inanimate mechanical forces (15%) and transport accidents (13%). Further information on injury hospitalisations among Indigenous Australians can be found in Helps & Harrison (2006).

Injury hospitalisation rates among young people aged 15–24 years increase substantially with remoteness, with the age-standardised rate for Very Remote areas almost 3 times as high as in Major Cities in 2005–06 (5,908 per 100,000 compared with 2,154 per 100,000 young people, respectively) (Table A1.1).

The age-standardised injury hospitalisation rate among young people aged 15–24 years in the most socioeconomically disadvantaged areas was almost 30% higher than among young people in the least socioeconomically disadvantaged areas (2,605 per 100,000 compared with 2,038 per 100,000 young people, respectively) (Table A1.1).

For remoteness and socioeconomic status, the only significant difference in hospitalisation rates among 12–24 year olds was for transport accidents, which accounted for a greater proportion of injury hospitalisations in Remote and Very Remote areas (both 24%) than in Major Cities (18%), and those in the most disadvantaged areas (22%) areas compared with those in the least disadvantaged areas (16%).

Circumstances of injury

The activity engaged in at the time of injury, and the place where an injury occurs, can provide important information for developing preventive strategies to reduce the number of young people at risk of serious injury.

Information about what people were doing at the time of injury (activity while injured), and the location where injuries were received, is not always specified or collected in hospital records. In 2005–06, an activity while injured was specified for 39,520 or 46% of injury hospitalisations, and place of occurrence was specified for 46,906 hospitalisations (55%). All proportions in this section are based on those injury hospitalisations with an activity or place recorded, rather than all injury hospitalisations. The data presented here therefore may not be representative of all injury hospitalisations.

Activity while injured

Almost half of hospitalised injuries for young people (49% or 19,171 hospitalisations), for which an activity was recorded, occurred while engaged in sporting and leisure activities (55% for young males and 31% for females). The remainder of hospitalised injuries occurred while working for an income (12%), while resting, sleeping, eating or engaging in other vital activities (3%), while engaged in work not for income (3%) and other specified activities (33%).

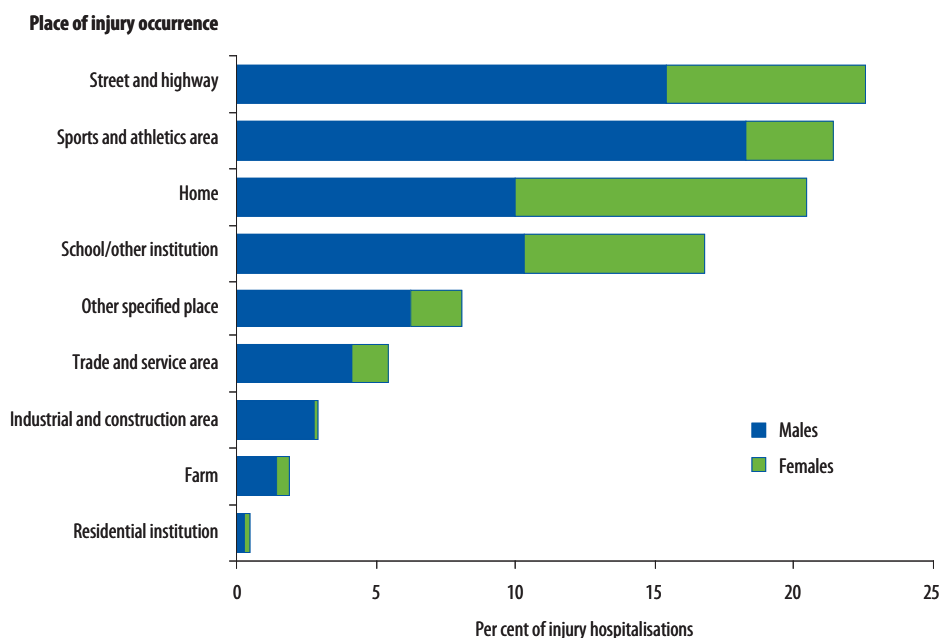
Around half of the injury hospitalisations that occurred during sporting and leisure activities occurred while playing team ball sports (9,820 hospitalisations). The proportion was much higher among young males compared with young females (54% and 36%, respectively), and was highest among males aged 12–14 years (37%) and 15–17 years (38%). The most common team ball sports leading to injury hospitalisations for 12–24 year olds were Australian Rules football, soccer and unspecified football (25%, 18% and 17%, respectively). For further information on hospitalised sports-related injury, see Flood & Harrison (2006).

Patterns of activity while injured vary by age group. For 12–14 year olds, wheeled non-motor sports (includes cycling and non-motored scooters) accounted for a substantial proportion of injury hospitalisations—15% and 6% of hospitalised injuries for males and females, respectively. For females in this age group, equestrian activities were responsible for approximately 8% of hospitalised injuries. Among young people aged 15–24 years,

work-related injuries become an increasingly important issue. This may be due to the types of jobs young people are employed in, inexperience with the tasks required, or risk-taking (AIHW: Moller 1995). For young people aged 15–17 years, 7% of hospitalised injuries occurred while working for an income—this increased to 19% among 18–24 year olds, with the proportion among males (23%) being much higher than for females (9%). For further information on hospitalised work-related injuries see Flood et al. (2007).

Place of injury occurrence

Streets and highways were the most common place for injuries resulting in hospitalisation to occur for young Australians in 2005–06, consistent with transport accidents being the leading cause of injury hospitalisation among young people (Figure 4).



Notes

1. ICD-10-AM codes S00–T98 and V01–Y98.
2. Percentages were calculated based upon those records for which a specific place of occurrence of injury was recorded.
3. 'Residential institution' includes places such as prisons, juvenile detention centres, military camps, orphanages and aged care facilities.
4. 'Other specified place of occurrence' includes areas such as beach, lake, parking place, railway line and sea.

Source: AIHW National Hospital Morbidity Database.

Figure 4: Place of injury occurrence for young people aged 12–24 years, 2005–06

- In 2005–06, almost one-quarter of injury hospitalisations for young people with place of occurrence reported occurred on streets and highways (10,593 hospitalisations), with two-thirds of these being for young males. Injuries occurring on streets and highways increased with age for both young males and females, from 12% of injury hospitalisations with place of occurrence recorded among 12–14 year olds to 27% among 18–24 year olds.

- Injuries occurring in sports and athletics areas accounted for 10,022 hospitalisations or 21% of hospitalisations with a place of occurrence recorded. This is consistent with the large number of hospitalised injuries that occurred while engaged in sporting and leisure activities (see *Activity while injured*). Sports and athletics areas were the most common place of injury occurrence for young males (18% of those with place of occurrence recorded or 8,584 hospitalisations), compared with 3% for young females.
- Injuries sustained in the home accounted for the third highest proportion of hospitalised injuries (20% of those recorded or 9,551 hospitalisations). The home was the most common place of injury occurrence for young females (10% of those with place of occurrence recorded or 4,904 hospitalisations), although proportions were similar for males and females.
- Injuries occurring at schools or other institutions (including health services and public areas) accounted for 17% of hospitalisations among young people with a place of occurrence recorded, but were most common for 12–14 year olds (28%).
- Injuries occurring in trade and service areas, and industrial and construction areas, were responsible for a greater proportion of injury hospitalisations among young males compared with young females (7% and 1% for males and females, respectively), and increased with age—accounting for 15% of injury hospitalisations among males aged 18–24 years. These injuries are likely to be work-related, and the trend is consistent with that seen for injuries occurring while working for an income (see *Activity while injured*).

Population groups

There were no statistically significant differences in hospitalisation rates by activity while injured by Indigenous status, remoteness or socioeconomic status, however there were differences by place of occurrence by Indigenous status and remoteness.

Injuries among Aboriginal and Torres Strait Islander young people aged 12–24 years were most likely to occur at home (31% of injury hospitalisations with place recorded), followed by streets and highways (23%) and sports and athletics areas (15%) (data do not include Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory, see *Technical notes*).

The proportion of hospitalised injuries occurring on farms increased with increasing remoteness—accounting for 6% and 13% of hospitalised injuries in Remote and Very Remote areas, respectively, compared with less than 1% in Major Cities.

Length of stay

Length of stay in hospital can be used as an indicator of injury severity, as severe injuries are likely to result in a longer hospitalisation compared with minor injuries. Length of stay is not a perfect measure of severity, as other factors can influence the length of a hospitalisation (such as socioeconomic factors, hospital policy, other health conditions, death in hospital and transfer to another hospital). Length of stay can also be an indication of the burden of an external cause or health condition on the hospital system.

Length of stay is calculated as the total number of days admitted to hospital (bed days), excluding days where the patient was on leave. Patients admitted and discharged on the same day (same-day separation) are allocated a length of stay of one day. The average length of stay is calculated as the length of stay divided by the total number of hospitalisations. Excluding same-day separations provides information on the average length of stay for injury cases requiring more than one day in hospital: that is, it excludes less severe cases and patients who died or were transferred on the same day. However, to look at the burden of an external cause on the hospital system, it is appropriate to include same-day separations.

Unlike previous hospitalisation data presented in this bulletin, length of stay is calculated including cases transferred from another hospital (see *Technical notes*), and therefore the number of hospitalisations presented in this section will be higher than in previous sections.

Excluding same-day separations, the longest average length of stay in hospital among young people was for injuries received from exposure to electric current, radiation and extreme ambient air temperature and pressure (10.2 days). This was followed by other accidental threats to breathing (which includes accidental hanging and strangulation) (8.3 days), exposure to smoke, fire and flames (8.2 days) and transport accidents (7.3 days).

Although the average length of stay for injury hospitalisations among young people was longest for exposure to electric current, radiation and extreme ambient air temperature and pressure, and other accidental threats to breathing, these external causes of injury account for only a very small number of hospitalisations (0.3% and 0.1% of external cause hospitalisations, respectively). The burden on the hospital system is therefore higher for other external causes of injury that have a greater number of hospitalisations, such as transport accidents, complications of medical and surgical care, falls and intentional self-harm. The average lengths of stay for these leading external causes of injury are presented in Table 2.

- In 2005–06, there were 197,865 bed days for hospitalisations with a principal diagnosis of injury and almost three-quarters of these were same-day separations.
- The average length of stay for injuries with an external cause was 2.2 days including same-day separations and 5.4 days excluding same-day separations.
- Including same-day separations, complications of medical and surgical care had the longest average length of stay of the leading external causes of injury (3.5 days), followed by transport accidents (3.3 days) and intentional self-harm (2.3 days).
- Excluding same-day separations, transport accidents had the longest average length of stay of the leading external causes of injury (7.3 days), followed by complications of medical and surgical care (6.4 days), intentional self-harm (5.8 days) and falls (4.3 days). Assault and accidental poisoning by, and exposure to, noxious substances also had high average lengths of stay (4.1 days each).

Table 2: Average length of stay of young people aged 12–24 years for leading external causes of injury, 2005–06

External cause	Including same-day separations			Excluding same-day separations		
	Hospitalisations	Bed days	Average length of stay (days)	Hospitalisations	Bed days	Average length of stay (days)
Transport accidents	18,874	63,199	3.3	7,032	51,357	7.3
Exposure to inanimate mechanical forces	13,813	21,466	1.6	2,787	10,440	3.7
Falls	13,513	25,106	1.9	3,556	15,149	4.3
Accidental exposure to other and unspecified factors	10,735	13,485	1.3	1,349	4,099	3.0
Assault	8,095	13,746	1.7	1,809	7,460	4.1
Intentional self-harm	7,609	17,630	2.3	2,100	12,121	5.8
Complications of medical and surgical care	5,501	19,242	3.5	2,552	16,293	6.4
Exposure to animate mechanical forces	5,190	8,680	1.7	1,279	4,769	3.7
Accidental poisoning by, and exposure to, noxious substances	2,033	2,790	1.4	245	1,002	4.1
Over-exertion, travel and privation	2,020	3,210	1.6	521	1,711	3.3
<i>All external causes</i>	<i>91,265</i>	<i>197,694</i>	<i>2.2</i>	<i>24,103</i>	<i>130,532</i>	<i>5.4</i>
All injuries	91,342	197,865	2.2	24,116	130,639	5.4

Notes

1. ICD-10-AM codes S00–T98 and V01–Y98. ‘All injuries’ includes hospitalisations in the ICD-10-AM range S00–T98 with no external cause code recorded. See Table 7 in *Technical notes* for specific external cause codes.
2. Table includes cases transferred from other hospitals (see *Technical notes*).
3. Table is ordered by hospitalisations (including same-day separations).

Source: AIHW National Hospital Morbidity Database.

Deaths

This section examines deaths among young people where the underlying cause of death is an external cause, according to the tenth revision of the International Classification of Diseases and Related Health Problems (ICD-10) *Chapter XX: External causes of morbidity and mortality* (WHO 2004). Deaths with an external cause as the underlying cause of death are referred to as injury deaths in this section. See *Technical notes* for information relating to the quality of data for injury deaths.

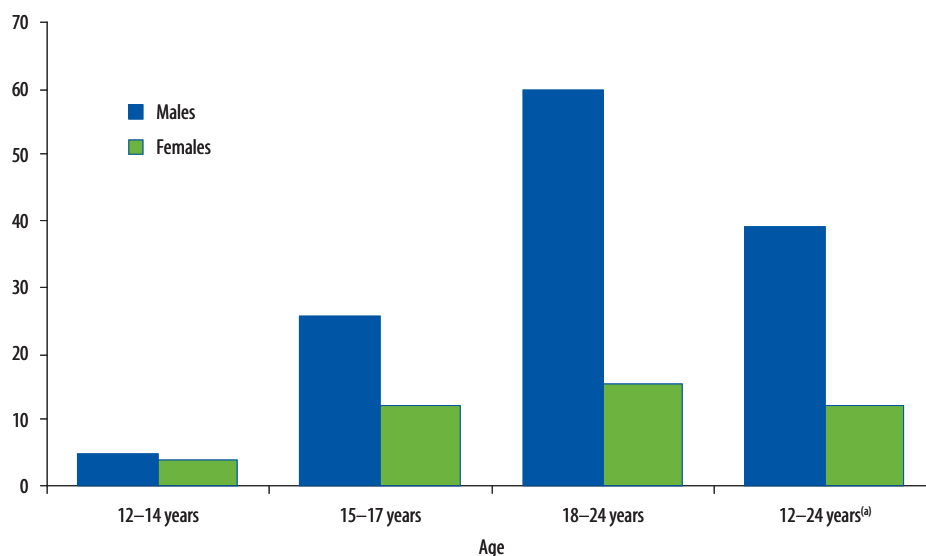
In 2005, there were 1,401 deaths of young people. Injury was the underlying cause of two-thirds, or 954, of these deaths, making it the leading cause of death for this age group, followed by neoplasms and diseases of the nervous system. The overall death rate for young people has almost halved since 1986, although the proportion of deaths due to injuries has remained similar during this time.

The proportion of all deaths due to injury differed by age—accounting for 71% of all deaths among those aged 18–24 years, 66% of all deaths for 15–17 year olds and 38% of all deaths among 12–14 year olds in 2005.

Young people comprised 12% of all injury deaths in 2005—14% among males and 8% among females.

- In 2005, there were 954 deaths of young people due to injury—a rate of 26 deaths per 100,000 young people. The majority of these deaths occurred among those aged 18–24 years (80%), followed by those aged 15–17 years (17%) and 12–14 years (4%) (Table A1.3).
- More than three-quarters of injury deaths among young people were for males in 2005. The injury death rate for young males overall was 3 times the rate for young females, with this gap increasing with age, from 1.3 times among 12–14 year olds, to 2.2 times among 15–17 year olds and to 3.8 times among 18–24 year olds (Figure 5).
- The injury death rate varied between states and territories, with rates highest in the Northern Territory, at 3 times the national rate (79 per 100,000 young people compared with 26), followed by South Australia (39 per 100,000 young people). The rate in New South Wales was significantly lower than the national rate (20 per 100,000 young people), while rates for other states and territories did not differ significantly from the national rate (Table A1.4).
- Between 1986 and 2005, the injury death rate for young people more than halved—the rate decreased from 54 per 100,000 young people to 26 (52% decline). This rate of decline was the same for young males (from 81 per 100,000 young males to 39) and young females (from 25 per 100,000 young females to 11) (Figure 6).

Deaths per 100,000 young people



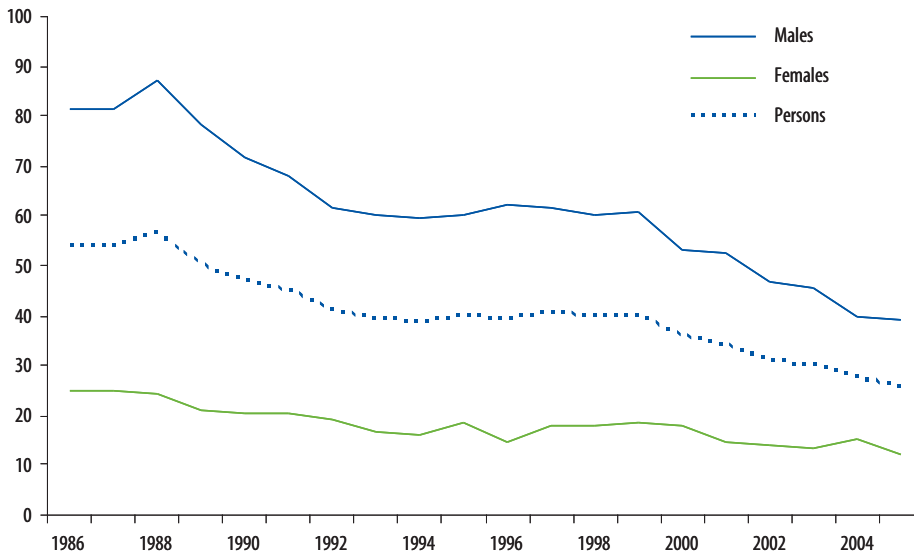
(a) Age-standardised to the Australian population as at 30 June 2001.

Note: Includes deaths registered during 2005 for which an 'external cause' was coded as the underlying cause of death: ICD-10 codes V01–Y98.

Source: AIHW National Mortality Database.

Figure 5: Injury death rates for young people aged 12–24 years, 2005

Deaths per 100,000 young people



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
 2. Includes deaths for which an 'external cause' was coded as the underlying cause of death: ICD-9 codes E800–E999 (1986 to 1996) and ICD-10 codes V01–Y98 (1997 to 2005).
 3. Deaths due to external causes are likely to have been under-enumerated from 2003 onwards. See *Technical notes* for further information.
- Source: AIHW National Mortality Database.

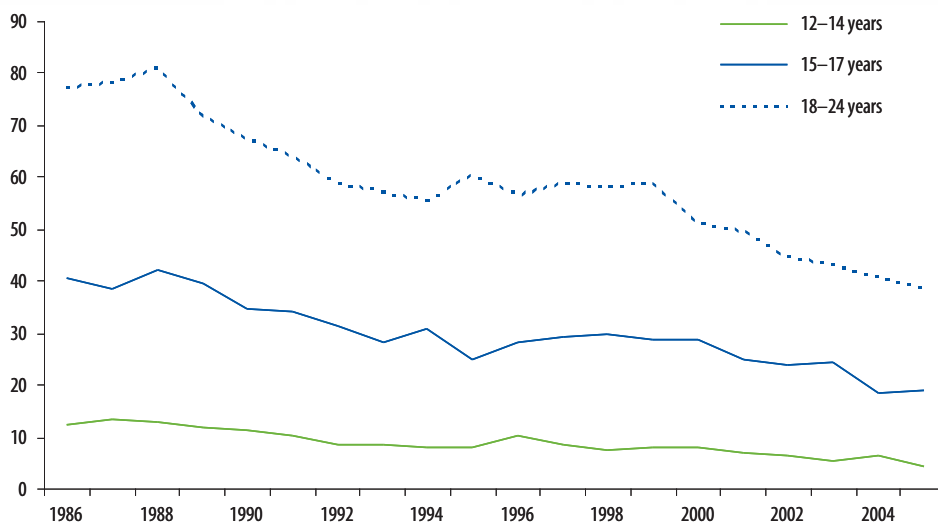
Figure 6: Trends in injury deaths for young people aged 12–24 years, 1986 to 2005

- The injury death rates have been consistently higher for young males than for young females between 1986 and 2005, with the male rate consistently between 3 and 4 times the female rate over this period.
- Between 1986 and 2005, the injury death rate for young people aged 12–14 years has had the largest percentage decline (67% decrease), with large declines also evident for young people aged 15–17 years and 18–24 years (decreases of 53% and 50%, respectively) (Figure 7).

The most common external causes of death are similar to those seen for hospitalisations. In 2005, the most common external causes of injury leading to death among young people were transport accidents and intentional self-harm (Figure 8). These causes combined accounted for three-quarters of all injury deaths among young people.

- Transport accidents were responsible for 419 deaths, or 44% of injury deaths, among young people in 2005, and this pattern was consistent across all three age groups (12–14 years, 15–17 years and 18–24 years). Males accounted for 78% of transport accident deaths. Car drivers injured in a traffic collision with a fixed or stationary object (97 deaths) and car passengers injured in a traffic collision with a fixed or stationary object (44 deaths) were the most common specific causes of transport accident deaths. See *Transport accidents* for further detail.

Deaths per 100,000 young people

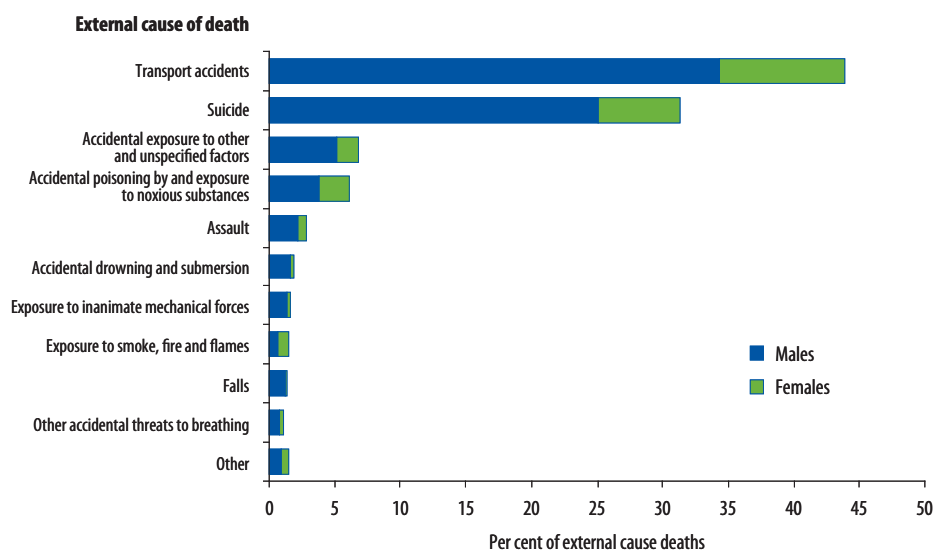


Notes

- Includes deaths for which an 'external cause' was coded as the underlying cause of death: ICD-9 codes E800–E999 (1986 to 1996) and ICD-10 codes V01–Y98 (1997 to 2005).
- Deaths due to external causes are likely to have been under-enumerated from 2003 onwards. See *Technical notes* for further information.

Source: AIHW National Mortality Database.

Figure 7: Trends in injury deaths for young people aged 12–24 years by age, 1986 to 2005



Note: ICD-10 codes V01–Y98. See Table 7 in *Technical notes* for specific external cause codes.

Source: AIHW National Mortality Database.

Figure 8: Deaths among young people aged 12–24 years, by external cause, 2005 (per cent)

- Suicide was responsible for 299 deaths or almost one-third of injury deaths among young people. Young males again accounted for the majority of these deaths (80% or 239 deaths). Suicide by hanging, strangulation and suffocation was the specific cause accounting for the most suicide deaths of young people in 2005 (67% or 199 deaths). See *Intentional self-harm and suicide* for further detail.
- Accidental poisoning by, and exposure to noxious substances, and assault comprised 6% and 3% of all injury deaths among young people, respectively. See *Accidental poisoning* and *Assault* for further detail.
- Males made up a higher proportion of deaths for each external cause among young people in 2005 (between 63% and 89%), except for exposure to smoke, fire and flames, where the number of deaths was the same for males and females.

Population groups

Injury death rates and the leading causes of injury death varied among young people from different population groups in 2003–2005.

There were 197 deaths of young Aboriginal and Torres Strait Islander people aged 12–24 years due to external causes of injury between 2003 and 2005—an age-standardised rate of 89 per 100,000 young people (Table A1.3) (data includes Queensland, Western Australia, South Australia and the Northern Territory only, see *Technical notes*). The Indigenous death rate was 3 times as high as that for non-Indigenous Australians, for both young males and females. The high injury death rate in the Northern Territory compared with the national rate (3 times as high) may be partially explained by the large proportion of Indigenous young people in this area (an estimated 40% of young people in the Northern Territory were Indigenous in 2003–2005).

As was the case for all young Australians, the injury death rate among Indigenous young people increased with age, and the rate for young Indigenous males was higher than for females (Table A1.3). The most common causes of injury death among young Indigenous people in 2003–2005 were suicide (41%), transport accidents (36%) and assault (6%).

Injury death rates among young people aged 15–24 years were higher with increasing remoteness (Table A1.3). In 2003–05, the age-standardised rate in Very Remote areas was more than 5 times that in Major Cities—141 per 100,000 young people compared with 27. Transport accidents accounted for a greater proportion of injury deaths outside of Major Cities for young people aged 15–24 years in 2003–2005. Transport accidents were responsible for 40% of deaths due to external causes in Major Cities, whereas in regional and remote areas the proportion was between 45% and 53%.

The age-standardised injury death rate among 15–24 year-olds in the most socioeconomically disadvantaged areas was almost twice that of young people in the least socioeconomically disadvantaged areas in 2003–2005 (42 per 100,000 young people compared with 24) (Table A1.3). Transport accidents accounted for a greater proportion of injury deaths among 15–24 year olds in the most socioeconomically disadvantaged areas (42%) areas than in the least socioeconomically disadvantaged areas (31%) in 2003–05.

Burden of injury

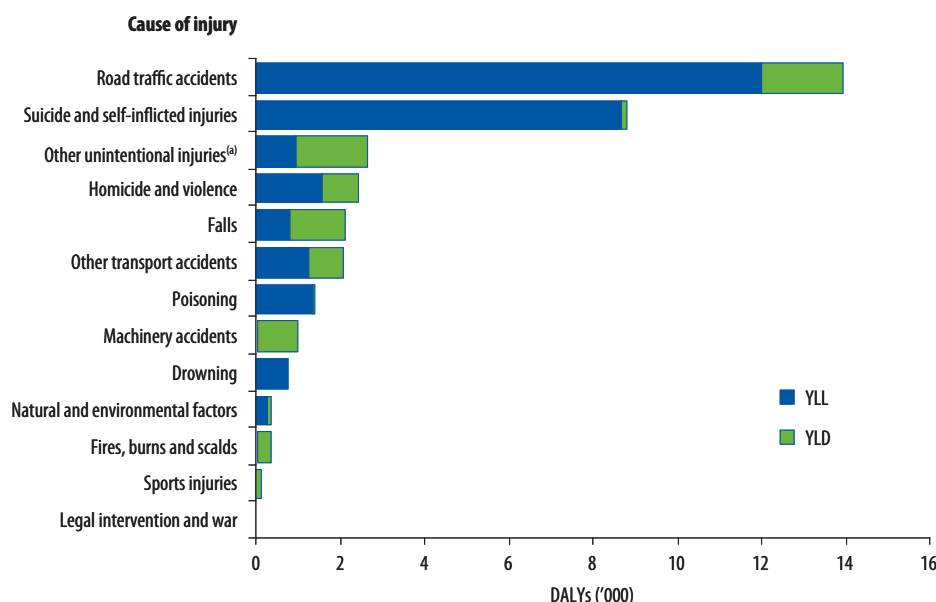
A set of measures, called disability-adjusted life years (DALYs), has been developed to summarise the burden of disease and injury at a population level. DALYs combine information on the impact of premature death with non-fatal health outcomes. Premature death is measured by the years of life lost (YLL) due to disease or injury and non-fatal health outcomes are measured by years of 'healthy' life lost (YLD) due to disease, disability or injury. To combine these two health measures into a summary health measure, the DALY uses time as a common 'currency'. It is a measure of the years of healthy life lost due to illness or injury—one DALY is one lost year of 'healthy' life. Detailed information on burden of disease and injury methodology and results is available in Begg et al. (2007). This section provides information on the burden of injury in Australia for 15–24 year olds in 2003.

Injuries were the second highest contributor to the burden of disease and injury among young Australians aged 15–24 years—accounting for 36,052 DALYs, or 18% of their total burden, after mental disorders, which accounted for 49%. The burden of injury among young Australians was higher than for all ages, at a rate of 13 DALYs per 1,000 population compared with 9 DALYs per 1,000 population for all ages. Young males had the highest rate of injury burden of all age groups, with a rate of 20 DALYs per 1,000 population, while the rate for young females (6 DALYs per 1,000 population) was the third highest due to the impact of falls among older women (65 years and over age group).

Among young people, injuries were the leading cause of premature mortality—accounting for 27,683 YLL or two-thirds of the total years of life lost due to disease or injury. In terms of healthy years of life lost (YLD), injuries ranked fourth highest after mental disorders, neurological and sense disorders and genitourinary diseases, with 8,369 YLD or 5.4% of all YLD.

The leading specific causes of injury burden were road traffic accidents and suicide and self-inflicted injuries (Figure 9).

- Road traffic accidents were responsible for 13,952 DALYs, or 39% of the injury burden, among 15–24 year olds, followed by suicide and self-inflicted injuries, which accounted for 8,798 DALYs or 24%. The burden from both road traffic accidents and suicide and self-inflicted injuries was predominantly due to premature mortality (YLL) (86% and 98%, respectively).
- Other unintentional injuries, homicide and violence, falls, and other transport accidents each accounted for between 6% and 7% of the injury burden in 2003. For other unintentional injuries and falls, this burden was largely due to healthy years of life lost (YLD) (64% and 61%, respectively), while for homicide and violence and other transport accidents, premature mortality (YLL) accounted for the majority of the burden (64% and 60%, respectively).
- Fires, burns and scalds, sports injuries, and legal intervention and war each accounted for less than 1% of all DALYs due to injury.



(a) Includes suffocation and foreign bodies, adverse effects of medical treatment, other mechanical force injuries and other unintentional injuries.

Figure 9: Leading causes of injury burden (YLL, YLD and DALYs) for 15–24 year olds, 2003

Road transport accidents and suicide and self-inflicted injuries were the two leading causes of injury burden for both males and females, however other leading causes differed by sex (Table 3).

- Road traffic accidents and suicide and self-inflicted injuries were the leading causes of injury burden for both males and females aged 15–24 years—accounting for almost two-thirds of the total injury burden for young people. Homicide and violence also ranked highly for both males and females (5th and 3rd highest, respectively)—accounting for 6% of the male burden and 9% of the female injury burden.
- Poisoning was the 5th highest cause of injury burden for young females, and 8th highest for males—accounting for 6% and 3% of the injury burden, respectively.
- Falls were also an important cause of injury burden—ranking 6th for both males and females and representing 5% and 6% of the injury burden, respectively.
- Machinery accidents were the 7th highest cause of injury burden for young males—accounting for 3%. This is mainly due to greater occupational exposure to machinery among males.
- The total injury burden for young males was more than 3 times that for young females in 2003 (28,191 compared with 7,861 DALYs).

Table 3: Leading causes of injury burden (DALYs) for 15–24 year olds, by sex, 2003

Rank	Males	DALYs ('000)	Per cent of injury DALYs	Females	DALYs ('000)	Per cent of injury DALYs
1	Road traffic accidents	10,380	36.8	Road traffic accidents	3,572	45.4
2	Suicide and self-inflicted injuries	7,320	26.0	Suicide and self-inflicted injuries	1,479	18.8
3	Other unintentional injuries(a)	2,070	7.3	Homicide and violence	721	9.2
4	Other transport accidents	1,756	6.2	Other unintentional injuries(a)	586	7.5
5	Homicide and violence	1,722	6.1	Poisoning	463	5.9
6	Falls	1,717	6.1	Falls	379	4.8
7	Machinery accidents	957	3.4	Other transport accidents	316	4.0
8	Poisoning	927	3.3	Natural and environmental factors	98	1.2
9	Drowning	672	2.4	Drowning	94	1.2
10	Fires, burns and scalds	279	1.0	Fires, burns and scalds	63	0.8
	All injuries	28,191	100.0	All injuries	7,861	100.0

(a) Includes suffocation and foreign bodies, adverse effects of medical treatment, other mechanical force injuries and other unintentional injuries.

Transport accidents

The significant over-representation of young drivers in transport accidents is found both in Australia and internationally (Smart et al. 2005). The disproportionate involvement of young drivers in crashes is in absolute terms, or relative to their proportion of the population, licences held, or distance driven (NRMA Motoring and Services 2005). Factors contributing to this over-representation include inexperience, combined with engaging in risky driving behaviours (such as speeding, driving when fatigued, driving under the influence of alcohol or other drugs and carrying passengers) and/or driving in situations that place them at greater risk (for example, driving at night or on weekends and driving older vehicles) (Australian Transport Council 2006; Smart et al. 2005).

The AIHW National Injury Surveillance Unit (NISU) has produced a number of comprehensive reports on transport accidents, which include information on young people (AIHW: Berry et al. 2007; AIHW: Flood et al. 2007; AIHW: Harrison & Berry 2007).

Hospitalisations

In 2005–06, there were 17,228 hospitalisations of young people due to transport accidents—a rate of 466 per 100,000 young people aged 12–24 years. Most (98%) of these hospitalisations were due to land transport accidents (see Box 1), which resulted in 16,860 hospitalisations—a rate of 456 per 100,000 young people. Land transport accidents will therefore be the focus of this section on hospitalisations.

The hospitalisation rate for land transport accidents increased slightly (5%) between 1996–97 and 2005–06 and, during this period, the rate increased with age and was consistently higher for young males than for young females (2.5 times in 2005–06).

Box 1: Definition of transport accidents

*Transport accidents include any accident involving a device designed primarily for, or primarily being used at the time for, conveying persons or goods from one place to another. **Motor vehicle accidents** are a subset of this category. Other groups under the transport accident category include accidents involving pedestrians and pedal cyclists, and railway and water transport. Transport accidents are further classified into traffic accidents, non-traffic accidents, persons injured while boarding or alighting and not specified. Traffic accidents are those that occur on public highways and streets, while non-traffic accidents are those that occur entirely in a place other than on public highways or streets.*

***Land transport accidents** are a subset of transport accidents and are those occurring on land, excluding those involving aircraft, spacecraft or watercraft, or other specified and unspecified vehicles. Land transport accidents can be classified as traffic, non-traffic, persons injured while boarding or alighting and not specified (see Transport accidents).*

***Motor vehicle accidents** are transport accidents involving a motor vehicle. The injured person may, or may not, have been an occupant in the vehicle for it to be considered a motor vehicle accident. For example, for a pedestrian injured in a collision with a motor vehicle, the mode of transport is 'pedestrian', while the type of accident is 'motor vehicle accident'. Motor vehicle accidents can be traffic or non-traffic (see Transport accidents). Where it is unspecified as to whether a motor vehicle accident is traffic or non-traffic, or where a person is injured while boarding or alighting, it is assumed to be a traffic accident unless the vehicle involved is designed primarily for off-road use.*

Mode of transport

The mode of transport of young people hospitalised for land transport accidents differed by age and sex (Table 4). Pedal cyclists were most likely to be hospitalised among young people aged 12–17 years, while motor vehicle occupants were most likely to be hospitalised among 18–24 year olds. Young males were more likely than young females to be hospitalised for each mode of transport.

- In 2005–06, occupants of motor vehicles (excluding motorcycles) had the most hospitalisations of young people out of all land transport accidents (6,355 hospitalisations or 171 per 100,000 young people). The hospitalisation rate among those aged 18–24 years was more than twice that of 12–17 year olds (235 per 100,000 young people compared with 98).
- Motorcyclists (including passengers) had the second highest rate of hospitalisation for injury from land transport accidents—a rate of 130 per 100,000 young people.
- Rates for all modes of transport were higher for young males than for young females, although this was most pronounced for motorcyclists and pedal cyclists, for which the male hospitalisation rates were 12 times and 8 times the female rates, respectively.
- Pedal cyclists aged 12–17 years were hospitalised at more than 3 times the rate of those aged 18–24 years (141 compared with 40 per 100,000 young people) and motor vehicle occupants aged 18–24 years were hospitalised at more than twice the rate of 12–17 year olds (235 compared with 98 per 100,000 young people). For motorcyclists and pedestrians, the difference in hospitalisation rates between 12–17 and 18–24 year olds was less prominent, although rates were higher among 18–24 year olds, which was mainly due to higher rates among males rather than females in this age group.

Table 4: Mode of transport for young people aged 12–24 years hospitalised for land transport accidents, 2005–06^(a)

Mode of transport	Age (years)	Number			Rate per 100,000 young people		
		Males	Females	Persons	Males	Females	Persons
Motor vehicle ^(b)	12–17	850	797	1,647	98.1	97.1	97.6
	18–24	2,816	1,892	4,708	275.3	192.5	234.7
	12–24	3,666	2,689	6,355	192.5	147.9	170.7
Motorcycle	12–17	1,818	166	1,984	209.7	20.2	117.6
	18–24	2,644	190	2,835	258.5	19.3	141.3
	12–24	4,462	356	4,819	235.7	19.7	130.2
Pedal cycle	12–17	2,142	237	2,379	247.1	28.9	141.0
	18–24	692	109	801	67.7	11.1	39.9
	12–24	2,834	346	3,180	151.5	19.4	87.1
Pedestrian	12–17	212	144	356	24.5	17.5	21.1
	18–24	354	186	540	34.6	18.9	26.9
	12–24	566	330	896	29.9	18.3	24.2
All land transport	12–17	5,303	1,891	7,194	611.7	230.4	426.3
	18–24	6,888	2,777	9,666	673.5	282.5	481.9
	12–24	12,191	4,668	16,860	644.6	258.2	455.9
All transport	12–24	12,472	4,755	17,228	659.6	263.1	466.0

(a) Includes traffic accidents, non-traffic accidents, persons injured while boarding or alighting, and not specified.

(b) Includes car, three-wheeled motor vehicle, pick-up truck or van, heavy transport vehicle and bus. Excludes motorcycle.

Notes

1. ICD-10-AM codes S00–T98 and V01–V89.

2. Age-standardised to the Australian population as at 30 June 2001.

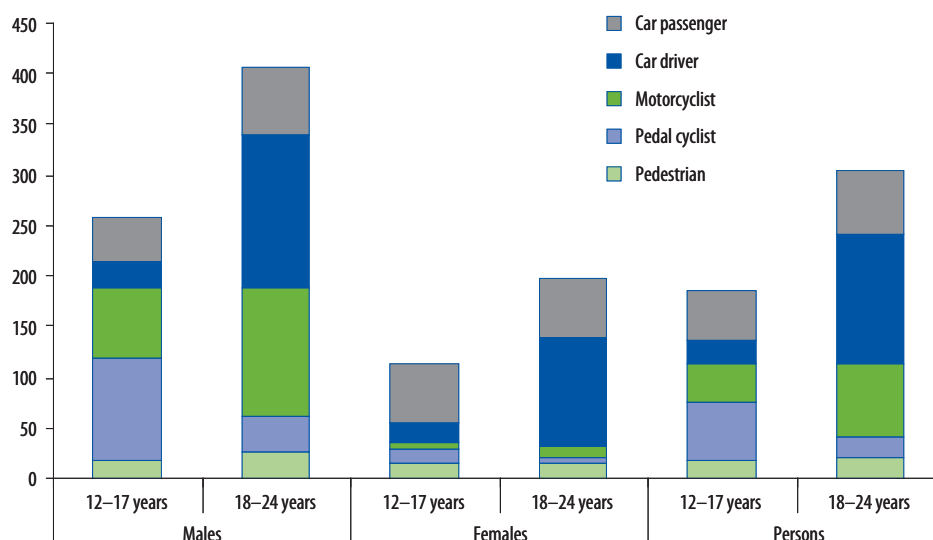
Source: AIHW National Hospital Morbidity Database.

Traffic accidents

Traffic accidents are a subset of land transport accidents, and are those that occur on public highways and streets. In 2005–06, there were 9,589 hospitalisations of young people for traffic accidents (258 per 100,000 young people). Traffic accident hospitalisations by selected mode of transport—car passenger, car driver, motorcyclist, pedal cyclist and pedestrian—are presented in Figure 10. These modes of transport accounted for 97% of all traffic accident hospitalisations in 2005–06.

- The hospitalisation rate for traffic accidents increased with age, but was much lower for females than for males for both 12–17 year-olds (112 compared with 258 per 100,000 young people) and 18–24 year-olds (198 compared with 407 per 100,000 young people).
- The most common mode of transport for traffic accident hospitalisations varied by both age and sex. For males aged 12–17 years, pedal cyclists, followed by motorcyclists had the highest hospitalisation rates (101 and 62 per 100,000 males, respectively), whereas for females, rates were highest for car passengers, followed by car drivers (58 and 20 per 100,000 females, respectively).

Hospitalisations per 100,000 young people



Note: ICD-10-AM codes S00–T98 and pedestrian V01–V08 (.1), V09 (.2,.3), pedal cyclist V10–V18 (.4–.9), V19 (.4–.6,.9), motorcyclist V20–V28 (.4–.9), V29 (.4–.6,.9), car driver V40–V48 (.5), V49.4, car passenger V40–V48 (.6), V49.5.

Source: AIHW National Hospital Morbidity Database.

Figure 10: Traffic accident hospitalisations by selected mode of transport, 2005–06

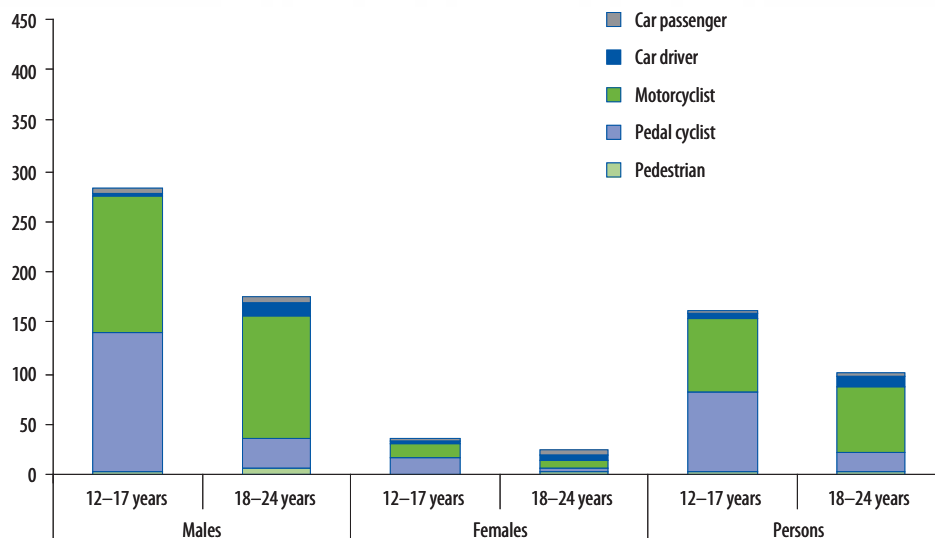
- Among 18–24 year olds, car drivers had the highest hospitalisation rate for both males and females (151 and 106 per 100,000 young people, respectively). For males, the second highest hospitalisation rate was for motorcyclists, followed by car passengers (127 and 66 per 100,000 males, respectively). For females, the second most frequently hospitalised group were car passengers (58 per 100,000 females).

Non-traffic accidents

Non-traffic accidents are a subset of land transport accidents, and are those that do not occur on public highways or streets. In 2005–06, there were 5,111 hospitalisations of young people for non-traffic accidents (129 per 100,000 young people). Non-traffic accidents by selected mode of transport—car passenger, car driver, motorcyclist, pedal cyclist and pedestrian—are presented in Figure 11. These modes of transport accounted for 93% of all non-traffic accidents in 2005–06.

- Unlike the pattern observed for traffic accidents, the hospitalisation rate for non-traffic accidents decreased with age, although the rate remained substantially lower for females than for males, for both 12–17 year olds (36 and 282 per 100,000 young people) and 18–24 year olds (23 and 176 per 100,000 young people).
- Among 12–17 year old males, pedal cyclists were the group most frequently hospitalised in non-traffic accidents, followed by motorcyclists (138 and 133 per 100,000 young males, respectively). For 18–24 year old males, motorcyclists had the highest hospitalisation rate, followed by pedal cyclists (122 and 29 per 100,000 young males, respectively).

Hospitalisations per 100,000 young people



Note: ICD-10-AM codes S00–T98 and pedestrian V01–V09 (.0), V09.1, pedal cyclist V10–V18 (.0–.2), V19 (.0–.3), motorcyclist V20–V28 (.0–.2), V29 (.0–.3), car driver V40–V49 (.0), car passenger V40–V49 (.1).

Source: AIHW National Hospital Morbidity Database.

Figure 11: Non-traffic accident hospitalisations by selected mode of transport, 2005–06

- Similar to males, pedal cyclists and motor cyclists were the groups most frequently hospitalised in non-traffic accidents among 12–17 year old females, although the rates were much lower (14 and 13 per 100,000 young females, respectively). Among 18–24 year old females, motorcyclists and car drivers were the groups most commonly hospitalised (7 and 6 per 100,000 young females, respectively).

Motor vehicle accidents

More than half (54%) of land transport accident hospitalisations were due to traffic accidents involving a motor vehicle (9,237 hospitalisations or 249 per 100,000 young people) and almost one-quarter were due to non-traffic accidents involving a motor vehicle (3,749 hospitalisations or 102 per 100,000 young people) (see Box 1). The remaining 23% of land transport accident hospitalisations did not involve a motor vehicle (3,874 hospitalisations or 106 per 100,000 young people), and of these, pedal cyclists were the most commonly injured (68%).

There has been an 8% decline in the hospitalisation rate for motor vehicle traffic accidents among young people (from 269 to 248 per 100,000 young people) between 1996–97 and 2005–06. During this time, the rate for young males was consistently higher than for young females (almost twice as high in 2005–06).

In motor vehicle traffic accident hospitalisations in 2005–06, motor vehicles occupants were the most commonly injured (62%), followed by motorcyclists (24%). Of the motor vehicle occupants, 53% were the drivers of the motor vehicle, 37% were passengers and the

remaining 10% were either on the outside of the vehicle, were injured while boarding or alighting or mode of transport was unspecified.

In 2005–06, the hospitalisation rate for motor vehicle traffic accidents increased with age—the rate among 18–24 year-olds was 1.6 times that of 15–17 year-olds and 3.3 times that of 12–14 year-olds.

For motor vehicle non-traffic accident hospitalisations, the person most commonly injured was a motorcyclist, followed by a motor vehicle occupant (63% and 24% of the 3,749 motor vehicle non-traffic accidents, respectively).

Population groups

The age-standardised hospitalisation rate for land transport accidents among Aboriginal and Torres Strait Islander young people aged 12–24 years was not statistically significantly different from other young Australians in 2005–06 (454 compared with 450 per 100,000 young people, respectively) (data do not include Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory, see *Technical notes*). Similarly, there were no statistically significant differences between the rates of motor vehicle traffic accident and motor vehicle non-traffic accident hospitalisation for young Indigenous Australians compared with other young Australians.

In Very Remote areas, the age-standardised land transport accident hospitalisation rate for 15–24 year-olds was almost 3 times as high as that in Major Cities in 2005–06 (1,017 compared with 371 per 100,000 young people). The age-standardised rate for motor vehicle traffic accidents was twice as high in Very Remote areas as in Major Cities (542 per 100,000 young people compared with 250), and for motor vehicle non-traffic accidents this increased to almost 5 times as high (289 per 100,000 young people in Very Remote areas compared with 61 in Major Cities).

Young people living in the most socioeconomically disadvantaged areas had a higher land transport accident hospitalisation rate than those in the least socioeconomically disadvantaged areas (age-standardised rates of 515 and 307 per 100,000 young people, respectively). Rates were 60% higher for motor vehicle traffic accidents for young people in the most socioeconomically disadvantaged areas compared with those in the least socioeconomically disadvantaged areas (327 per 100,000 young people and 207, respectively), and were almost 3 times as high for motor vehicle non-traffic accidents (114 and 43 per 100,000 young people).

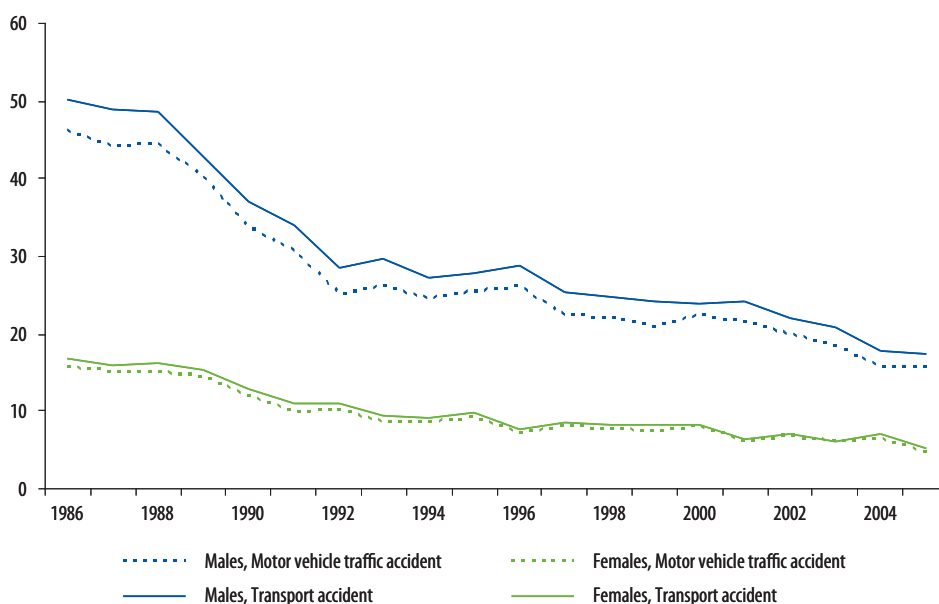
Deaths

In 2005, one-quarter of all transport accident deaths were of young people, and transport accidents accounted for 30% of all deaths of young people.

The number of deaths due to transport accidents, particularly motor vehicle traffic accidents, from 2003 onwards is likely to be significantly underestimated for young people. These data should therefore be interpreted with caution. See Henley et al. (2007:19) for further information.

- In 2005, there were 419 deaths of young people due to transport accidents—a rate of 10 deaths per 100,000 young people (15 per 100,000 young males and 9 per 100,000 young females). This is a decrease of almost 70% since 1986, when the rate was 31 deaths per 100,000 young people. This decline has almost entirely been due to the decrease in the motor vehicle traffic accident death rate over this period (Figure 12).
- The transport accident death rate for young males has been consistently around 3 times as high as for young females since 1986.
- The majority (90%) of transport accident deaths are due to traffic accidents involving a motor vehicle. These accounted for 376 deaths of young people—a rate of 8 per 100,000 young people. There were 24 deaths of young people due to motor vehicle non-traffic accidents—accounting for 6% of transport accident deaths. The remainder of transport accidents did not involve a motor vehicle.
- Of the 419 deaths of young people due to transport accidents, the most common mode of transport was a motor vehicle (67%), followed by a motor cycle (16%) and pedestrian (10%).

Deaths per 100,000 young people



Notes

1. Age-standardised to the Australian population as at 30 June 2001.
2. Transport accidents ICD-9 codes E800–E848 (1986 to 1996) and ICD-10 codes V01–V99 (1997 to 2005). Motor vehicle traffic accidents ICD-9 codes E810–E819 and ICD-10 codes V02–V04 (.1–.9), V09.2, V12–V14 (.3–.9), V19 (.4–.6), V20–V28 (.3–.9), V29 (.4–.9), V30–V39 (.4–.9), V40–V49 (.4–.9), V50–V59 (.4–.9), V60–V69 (.4–.9), V70–V79 (.4–.9), V80 (.3–.5), V81.1, V82.1, V83–V86 (.0–.3), V87 (.0–.8), V89.2.
3. Deaths due to external causes are likely to have been under-enumerated from 2003 onwards. See *Technical notes* for further information.

Source: AIHW National Mortality Database.

Figure 12: Transport accident and motor vehicle traffic accident death rates for young people aged 12–24 years, 1986 to 2005

Population groups

The age-standardised death rate from transport accidents among Aboriginal and Torres Strait Islander young people aged 12–24 years was twice as high as for non-Indigenous young people in 2003–2005 (31 per 100,000 young people compared with 14) (data includes Queensland, Western Australia, South Australia and the Northern Territory only, see *Technical notes*). The vast majority of transport accidents among Indigenous young people were due to motor vehicle traffic accidents, for which the death rate was also twice the non-Indigenous rate (29 per 100,000 young people compared with 13).

Death rates for transport accidents and motor vehicle traffic accidents also varied by remoteness and socioeconomic status for 15–24 year olds in 2003–2005. Age-standardised death rates were more than 4 times as high in Remote/Very Remote areas compared with Major Cities for both transport accidents (46 and 11 per 100,000 young people, respectively) and motor vehicle traffic accidents (40 and 10 per 100,000 young people, respectively). For young people living in the most socioeconomically disadvantaged areas, age-standardised death rates for transport accidents and motor vehicle traffic accidents were more than twice as high as for those living in the least socioeconomically disadvantaged areas (8 and 18 per 100,000 young people, respectively, for transport accidents and 7 and 16 per 100,000 young people, respectively, for motor vehicle traffic accidents).

Intentional self-harm and suicide

The term ‘self-harm’ refers to a range of behaviours that range from mild to moderate self-injury as a response to emotional pain to more extreme behaviours such as attempted suicide (Skegg 2005). In many cases, self-harm is not intended to be fatal (Skegg 2005). Self-harm frequently involves cutting and poisoning (typically overdosing on medication), but may also involve behaviours such as self-battery or hanging (De Leo & Heller 2004; Skegg 2005).

The number of young people who commit suicide is relatively low compared with the number who commit self-harm. A range of interacting factors—related to individual, family and social circumstances—are associated with increased risk of suicide among young people. These include:

- mental illness combined with harmful drug use
- previous suicide attempts or intentional self-harm
- family history of suicide or suicidal behaviour
- socioeconomic disadvantage, including low educational achievement, unemployment, imprisonment
- experience of abuse in childhood
- easy access to firearms (Beautrais 2000; Goldney 1998).

There is a distinction to be made between intentional self-harm where the intent is to commit suicide, and where the intent is to only commit self-harm, but death results. In

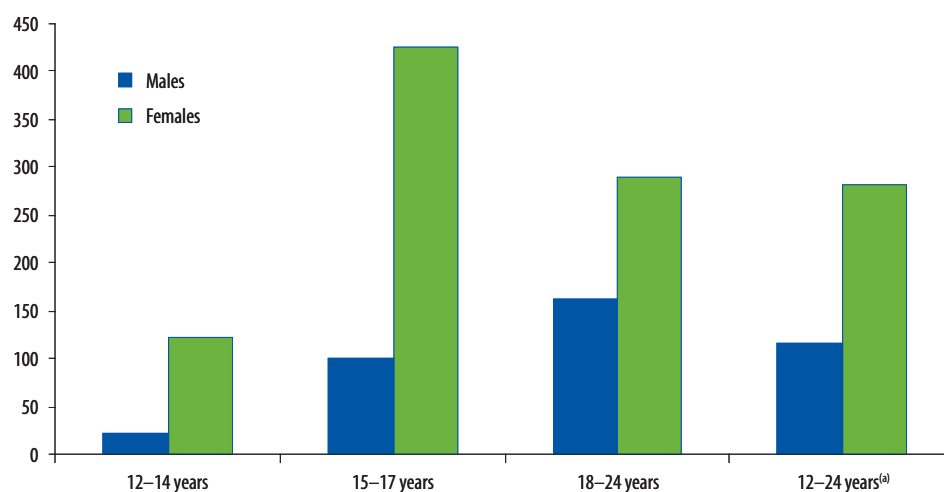
this section, hospitalisations for intentional self-harm will be referred to as such (this includes attempted suicide), while deaths due to intentional self-harm will be referred to as suicides, but it is acknowledged that not all of these deaths occurred with that intention.

Hospitalisations

Almost one-third of all intentional self-harm hospitalisations were for young people in 2005–06, although this represented only 2% of all hospitalisations of young people.

- In 2005–06, there were 7,299 hospitalisations of young people due to intentional self-harm—a rate of 197 per 100,000 young people.
- Between 1996–97 and 2005–06, the hospitalisation rate for intentional self-harm among young people increased by 43%, from 138 per 100,000 young people to 197. The percentage increase was greater among females than males (51% compared with 27%), and the female rate was consistently at least twice as high as for males over this period (2.5 times in 2005–06) (Table 5).
- In 2005–06, the hospitalisation rate for young females was highest among those aged 15–17 years (426 per 100,000 young females, which was 3.5 and 1.5 times that for 12–14 year old and 18–24 year old females, respectively) (Figure 13). Among young males, the rate increased with age (from 21 to 163 per 100,000 12–14 year old and 18–24 year old males, respectively).
- The majority (79%) of intentional self-harm hospitalisations among young people were due to intentional self-poisoning (5,769 hospitalisations), followed by intentional self-harm by sharp object (15% or 1,122 hospitalisations).

Hospitalisations per 100,000 young people



(a) Age-standardised to the Australian population as at 30 June 2001.

Note: ICD-10-AM codes S00–T98 and X60–X84.

Source: AIHW National Hospital Morbidity Database.

Figure 13: Intentional self-harm hospitalisation rates for young people aged 12–24 years, 2005–06

Table 5: Intentional self-harm hospitalisation rates for young people aged 12–24 years, 1996–97 to 2005–06 (rate per 100,000 young people)

Sex	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Males	90.9	107.1	116.9	114.3	122.6	111.3	110.0	114.1	117.0	115.4
Females	187.5	208.1	221.4	224.0	244.8	241.8	253.9	279.0	303.5	283.2
Persons	138.2	156.6	168.0	168.1	182.5	175.3	180.5	194.7	208.1	197.2

Notes

1. ICD-9-CM codes 800–999 and E950–E959 (1996–97 to 1997–98) and ICD-10-AM codes S00–T98 and X60–X84 (1998–99 to 2005–06).

2. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

Population groups

The intentional self-harm hospitalisation rate was almost twice as high among Aboriginal and Torres Strait Islander young people compared with other young Australians in 2005–06 (332 hospitalisations per 100,000 young people aged 12–24 years compared with 188), after adjusting for differences in age structure (data do not include Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory, see *Technical notes*).

Young people aged 15–24 years living in Very Remote areas were hospitalised for intentional self-harm at twice the rate of young people living in Major Cities in 2005–06 (age-standardised rates of 438 compared with 222 per 100,000 young people). Similarly, the age-standardised hospitalisation rate was higher for those young people living in the most socioeconomically disadvantaged areas than those living in the least socioeconomically disadvantaged areas (260 compared with 203 per 100,000 young people).

Deaths

In 2005, 14% of all suicide deaths were of young people, and suicide accounted for one-fifth of all deaths of young people.

The number of deaths due to suicide from 2003 onwards is likely to be significantly underestimated for young people (see *Technical notes* and Henley et al. 2007:19) for further information). There are also specific issues related to the classification of suicide among children (12–14 years), related to the ability of children to form intent. As such, some jurisdictions do not classify suicide among children. These data should therefore be interpreted with caution.

- In 2005, suicide accounted for 299 deaths of young people—a rate of 8 per 100,000 young people.
- While young females are more likely to be hospitalised for intentional self-harm than young males (2.5 times in 2005–06), young males have a much higher suicide rate. In 2005, the suicide rate for young males was almost 4 times that of young females (13 compared with 3 deaths per 100,000 young people).

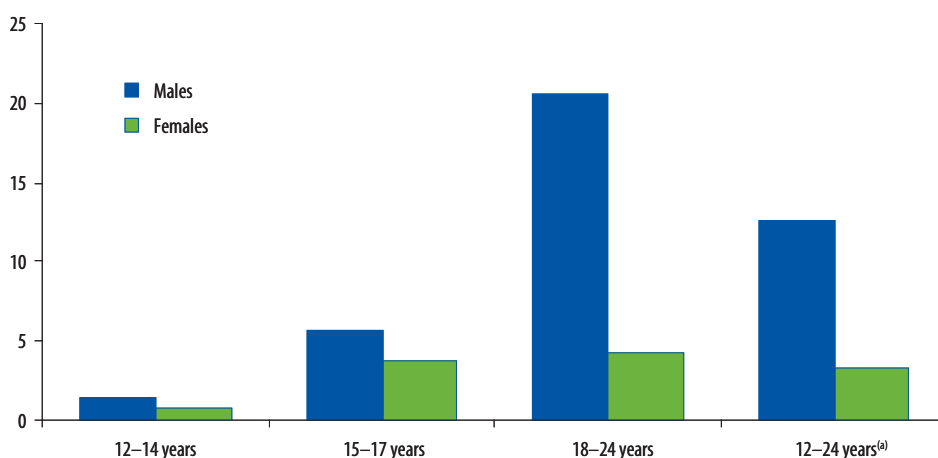
- Suicide rates increased with age for both males and females—from 1 death per 100,000 young people aged 12–14 years to 5 per 100,000 15–17 year olds and 13 per 100,000 18–24 year olds. The rate of increase was greater for males than females—for young males the rate increased from 1 per 100,000 males aged 12–14 years to 21 per 100,000 males aged 18–24 years, while for females the corresponding rates were 1 and 4 (Figure 14).
- In 2005, hanging, strangulation and suffocation were the major methods of suicide among young people—accounting for two-thirds of suicide deaths (199 deaths). Self-poisoning accounted for 12% of suicide deaths.

The suicide death rate fluctuated between 1986 and 2005; however, overall there has been a 25% decline, from 11 deaths per 100,000 young people to 8. The percentage decrease was similar for both males and females over this period. These data should be interpreted with caution, as there are issues related to the quality of suicide data (see *Technical notes*), which have resulted in an under-count of the number of deaths due to suicide from 2003 onwards. As a result, it is not known to what extent the decline observed between 2003 and 2005 is a true decline, as opposed to a data artefact. Between 1986 and 2002, the suicide rate decreased by 14%, to 9 per 100,000 young people.

Population groups

The age-standardised suicide rate for 12–24 year olds was more than 4 times as high among Aboriginal and Torres Strait Islander young people compared with non-Indigenous young people—37 compared with 8 deaths per 100,000 young people in 2003–05 (data includes Queensland, Western Australia, South Australia and the Northern Territory only, see *Technical notes*).

Deaths per 100,000 young people



(a) Age-standardised to the Australian population as at 30 June 2001.

Note: ICD-10 codes X60–X84.

Source: AIHW National Mortality Database.

Figure 14: Suicide rates for young people aged 12–24 years, 2005

The suicide rate for young people aged 15–24 years increased with remoteness, with the age-standardised rate in Remote/Very Remote areas being more than 3 times that for Major Cities in 2003–2005 (31 compared with 9 per 100,000 young people).

The age-standardised suicide rate was also higher among young people aged 15–24 years in the most socioeconomically disadvantaged areas of Australia, compared with the least socioeconomically disadvantaged areas (13 per 100,000 young people compared with 9 in 2003–2005).

Accidental poisoning

Accidental poisoning includes poisoning by drugs, as well as poisoning by other substances, such as gases and vapours, pesticides, corrosive and caustic agents, glues and adhesives, paints, dyes, soaps and detergents, poisonous foodstuffs and poisonous plants.

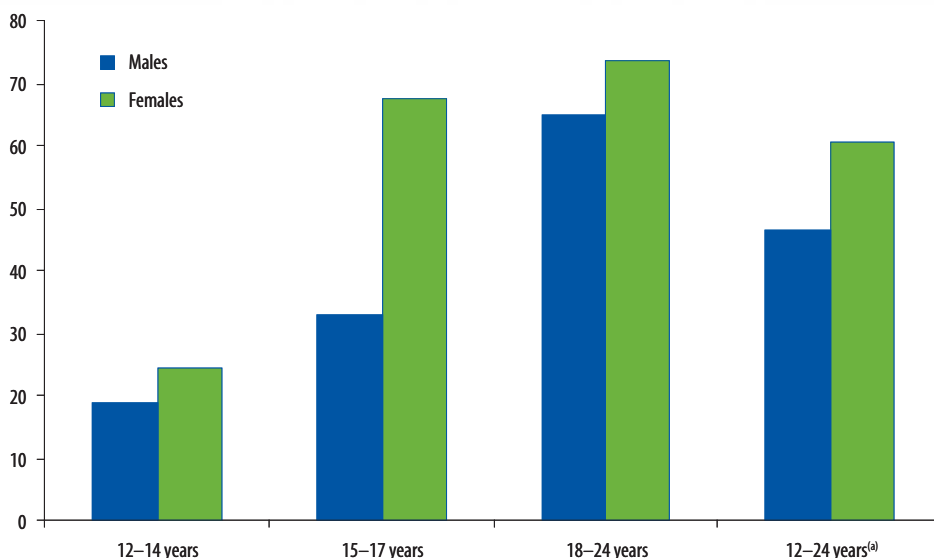
The most likely cause of accidental poisoning among young people is drugs. This includes accidental overdose, accidents in the use of drugs, medicaments and biological substances in medical and surgical procedures, and cases where the wrong drug is given, taken in error or taken inadvertently. Accidental poisoning does not include cases where there is drug dependence, administration with suicidal or homicidal intent, or where the correct drug is properly administered in therapeutic or prophylactic dosage as the cause of any adverse effect. As a result, the numbers reported in this section will underestimate the number of hospitalisations and deaths due to poisoning, because the focus is accidental poisoning only. Intentional self-poisoning accounted for the majority of hospitalisations due to intentional self-harm among young people in 2005–06 and was the second leading cause of suicide deaths in 2005 (see *Intentional self-harm and suicide*).

Hospitalisations

Almost one-fifth of all accidental poisoning hospitalisations were for young people in 2005–06, although hospitalisations for accidental poisoning represented only 1% of all hospitalisations of young people.

- In 2005–06, there were 1,987 hospitalisations of young people due to accidental poisoning—a rate of 53 per 100,000 young people.
- The accidental poisoning hospitalisation rate decreased by 41% for young people between 1998–99 and 2005–06 (from 91 per 100,000 to 53 per 100,000 young people).
- Hospitalisation rates for young females were higher than for young males—61 and 47 per 100,000 young males and females, respectively. The difference in rates was particularly high among 15–17 year olds, where the rate for females was twice that for males.
- Accidental poisoning hospitalisation rates increased with age for males and females. The hospitalisation rate among 18–24 year olds was around 1.5 times that for 15–17 year olds, and more than 3 times that for 12–14 year olds (69, 50 and 22 per 100,000 young people, respectively). The female hospitalisation rate increased rapidly between 12–14 years and 15–17 years (almost 3 times), and then only slightly between 15–17 years and 18–24 years (1.1 times) (Figure 15).

Hospitalisations per 100,000 young people



(a) Age-standardised to the Australian population as at 30 June 2001.

Note: ICD-10-AM codes S00–T98 and X40–X49.

Source: AIHW National Hospital Morbidity Database.

Figure 15: Accidental poisoning hospitalisation rates for young people aged 12–24 years, 2005–06

- ✦ Almost one-third of accidental poisoning hospitalisations among young people in 2005–06 were due to other and unspecified drugs, medicaments and biological substances (599 hospitalisations), and a further one-quarter were due to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs (521 hospitalisations). Accidental poisoning by non-opioid analgesics, antipyretics and antirheumatics accounted for 16%, or 319, hospitalisations.

Population groups

Hospitalisation rates for accidental poisoning were not statistically significantly different by Indigenous or remoteness. However, there were significant differences by socioeconomic status, with the age-standardised accidental poisoning hospitalisation rate higher among young people aged 15–24 years living in the most disadvantaged areas compared with those living in the least disadvantaged areas in 2005–06 (69 per 100,000 young people compared with 54).

Deaths

Previous work by the AIHW National Injury Surveillance Unit (NISU) has shown that there is no clear demarcation between the coding of accidental poisoning deaths to an external cause (ICD-10 codes X40–X44) or to a mental and behavioural disorder (ICD-10 codes F11–F16, F19) (Kreisfeld & Harrison 2005). Between 1997 and 2005, there has

been an increase in the proportion of accidental poisoning deaths among young people coded to an external cause, and a corresponding decrease in those coded to a mental and behavioural disorder. This should be kept in mind when interpreting the trend data presented in Figure 16. The World Health Organization has recommended that, from January 2006, deaths due to poisoning should no longer be assigned underlying cause of death codes from *Chapter V: Mental and behavioural disorders* of the International Classification of Diseases and Related Health Problems.

- In 2005, accidental poisoning accounted for 59 deaths of young people—a rate of 1.6 per 100,000 young people. Young people accounted for 8% of all deaths from accidental poisoning in 2005.
- The death rate for accidental poisoning among young people in 1997 and 2005 was not significantly different (Figure 16). However, the rate peaked in 1999, at 6 deaths per 100,000 young people, which coincided with an epidemic of drug poisoning by opiate narcotics (mainly heroin) (Henley et al. 2007).
- Between 1997 and 2004, the accidental poisoning death rate for young males was between 2 and 3 times the rate for young females. In 2005, the gap has narrowed and the male rate was 1.5 times the female rate (1.9 per 100,000 compared with 1.2 per 100,000 young people).
- Of the 59 deaths from accidental poisoning in 2005, the majority (44 deaths or 66%) were due to other and unspecified drugs, medicaments and biological substances. A further 14 deaths (24%) were due to narcotics and psychodysleptics (hallucinogens).

Deaths per 100,000 young people



Notes

1. ICD-10 codes X40–X49.

2. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Mortality Database.

Figure 16: Accidental poisoning death rates for young people aged 12–24 years, 1997 to 2005

Assault

Both fatal and non-fatal assaults involving young people contribute greatly to the global burden of premature death, injury and disability. Violence among young people harms not only its victims, but also their families, friends and communities and adds greatly to the costs of health and welfare services, reduces productivity, decreases the value of property and disrupts a range of essential services (Krug et al. 2002). Harmful and hazardous alcohol use are risk factors both for being victimised and perpetrating youth violence, and is therefore a priority area for intervention (WHO 2006).

Effective interventions identified to reduce violence among young people include life skills training programs; preschool enrichment to strengthen bonds to school, raise achievement and improve self-esteem; family therapy for children and adolescents at high risk; and educational incentives for at-risk high school students (WHO 2007).

Hospitalisations

- In 2005–06, there were 7,652 hospitalisations of young people due to assault—a rate of 205 per 100,000 young people, which is just over 1% of all hospitalisations for young people. More than one-third of all assault hospitalisations were for young people in 2005–06.
- The assault hospitalisation rate has increased overall for young people—27% increase between 1996–97 and 2005–06 (a 29% increase for males and a 19% increase for females) (Table 6). There was an exception to this trend in 2002–03 and 2003–04, when the rate declined; however, an upward trend has been observed in recent years, with the rate peaking in 2005–06.

Table 6: Assault hospitalisation rates for young people aged 12–24 years, 1996–97 to 2005–06 (rate per 100,000 young people)

Sex	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Males	252.5	275.0	282.6	300.3	325.8	319.9	298.7	277.8	299.5	325.4
Females	67.3	73.5	73.7	75.7	79.3	82.7	78.6	76.2	75.9	80.0
Persons	161.6	176.1	180.0	190.0	204.7	203.4	190.7	179.0	190.1	205.3

Notes

1. ICD-9-CM codes 800–999 and E960–E969 (1996–97 to 1997–98) and ICD-10-AM codes S00–T98 and X85–Y09 (1998–99 to 2005–06).

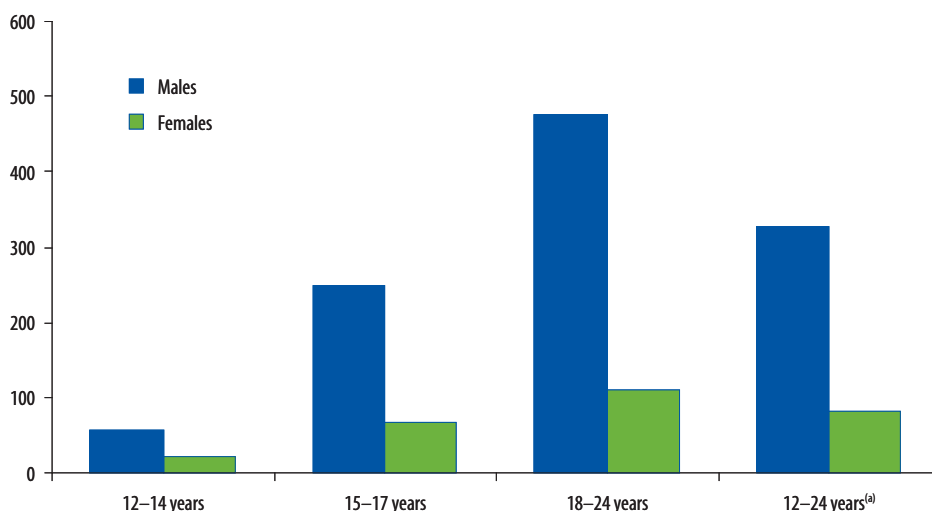
2. Age-standardised to the Australian population as at 30 June 2001.

Source: AIHW National Hospital Morbidity Database.

- Since 1996–97, the assault hospitalisation rate for young males has been consistently around 4 times that for young females (325 compared with 80 per 100,000 young males and females, respectively, in 2005–06). The disparity in rates between males and females increased with age, from 3 times among 12–14 year olds to around 4 times for 15–17 and 18–24 year olds.
- Assault hospitalisation rates increased with age for both males and females. For young males, the rate increased rapidly, from 56 per 100,000 among 12–14 year olds, to 247

among 15–17 year olds and 477 among 18–24 year olds. Rates also increased with age for females, but remained much lower than for males at each age, with corresponding rates of 21, 67 and 111, respectively (Figure 17).

Hospitalisations per 100,000 young people



(a) Age-standardised to the Australian population as at 30 June 2001.

Note: ICD-10-AM codes S00–T98 and X85–Y09.

Source: AIHW National Hospital Morbidity Database.

Figure 17: Assault hospitalisation rates for young people aged 12–24 years, 2005–06

- Assault by bodily force (that is, an unarmed brawl or fight) accounted for almost two-thirds of assault hospitalisations among young people (4,858 hospitalisations) in 2005–06. This was followed by assault by a sharp object, such as a knife, and assault by a blunt object—accounting for 12% and 11% of assault hospitalisations, respectively.
- A stranger or multiple strangers were the perpetrators in 15% of assault hospitalisations among young people, and a spouse or domestic partner were responsible for a further 7%. The perpetrator of the majority of assault hospitalisations among young people was an ‘other specified or unspecified person’ (68%).

Population groups

Hospitalisation rates for assault are much higher among Aboriginal and Torres Strait Islander young people compared with other young Australians—6 times as high in 2005–06 after adjusting for differences in age structure (1,039 per 100,000 young people compared with 173) (data do not include Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory, see *Technical notes*). The assault hospitalisation rate for young Indigenous females was 24 times that of other young females (1,078 per 100,000 young people compared with 46), reflecting the small number of hospitalisations

for assault among other young females. The rate for young Indigenous males was more than 3 times that of other young males (1,000 per 100,000 young people compared with 295). The assault hospitalisation rate is higher for young Indigenous females than for young Indigenous males, which is a different pattern to that observed for other young Australians.

The age-standardised assault hospitalisation rate for young people aged 15–24 years in Very Remote areas was 9 times that for young people in Major Cities in 2005–06 (1,820 per 100,000 young people compared with 213), reflecting the high hospitalisation rate for assault among Indigenous young people and the high proportion of Indigenous young people living in Very Remote areas (18% in 2001).

Hospitalisation rates were also higher among those young people aged 15–24 years living in the most socioeconomically disadvantaged areas compared with the least socioeconomically disadvantaged areas (twice as high in 2005–06)—with an age-standardised rate of 333 per 100,000 young people compared with 164.

Deaths

There are issues related to the quality of assault data, and the number of assault deaths from 2003 onwards are likely to be a significant underestimate of the true number of deaths (see *Technical notes* and Henley et al. 2007:80). Data from 2003 onwards should therefore be interpreted with caution.

In 2005, there were 27 deaths of young people aged 12–24 years due to assault—a rate of 0.7 deaths per 100,000 young people. This represents 14% of all deaths due to assault and 2% of all deaths among young people in this year. Rates were higher among young males than young females (more than 3 times as high in 2005), and were highest among 18–24 year olds.

The assault death rate decreased between 1986 and 2002—from 1.9 deaths per 100,000 young people to 1.5. Further decreases occurred between 2002 and 2005, however; due to the under-count of assault deaths, it is not known whether this is a true decline or a data artefact.

Population groups

The assault death rate among Aboriginal and Torres Strait Islander young people aged 12–24 years was much higher than for young non-Indigenous Australians in 2003–2005 after adjusting for differences in age structure—5.1 per 100,000 young people compared with 0.9 (data includes Queensland, Western Australia, South Australia and the Northern Territory only, see *Technical notes*).

Assault death rates (age-standardised) increased with remoteness for 15–24 year olds—from 1.2 per 100,000 young people in Major Cities to 5.1 in Remote/Very Remote areas in 2003–2005, reflecting the high assault death rates among Indigenous young people and the high proportion of Indigenous young people in Remote/Very Remote areas.

Young people aged 15–24 years living in the most socioeconomically disadvantaged areas were almost 3 times as likely to die from assault as those living in the least socioeconomically disadvantaged areas in 2003–2005 (age-standardised rates of 2.2 per 100,000 young people compared with 0.8).

Technical notes

Statistical methods

Age-specific rates

An age-specific rate is defined as the number of events for a specified age group over a specified period (for example, a year) divided by the total population at risk of the event in that age group. Age-specific rates in this bulletin were calculated by dividing, for example, the number of hospitalisations or deaths in each specified age group by the corresponding population in the same age group in a specified period.

Age-standardised rates

Age-standardised rates enable comparisons to be made between populations that have different age structures. This publication uses direct standardisation, in which the age-specific rates are multiplied by a constant population. This effectively removes the influence of the age structure on the summary rate.

All age-standardised rates in this report have used the June 2001 Australian estimated resident population as the standard population.

The method used for the calculation of age-standardised rates consists of three steps:

- Step 1: Calculate the age-specific rate for each age group.
- Step 2: Calculate the expected number of cases in each age group by multiplying the age-specific rates by the corresponding standard population to get the expected number of cases.
- Step 3: Sum the expected number of cases in each age group, divide by the total of the standard population and multiply by 100,000. This gives the age-standardised rate.

Significance testing

The observed value of a rate may vary due to chance even where there is no variation in the underlying value of the rate. Therefore, where comparisons have been made between time periods, sex, geographical locations, socioeconomic groups or Indigenous and non-Indigenous status, a 95% confidence interval has been calculated for administrative data (AIHW National Hospital Morbidity Database and the AIHW National Mortality Database). These confidence intervals are available on request.

The 95% confidence intervals for this bulletin were calculated using a method for obtaining approximate confidence intervals for a weighted sum of Poisson parameters developed by Dobson et al. (1991).

As with all statistical comparisons, care should be exercised in interpreting the results of the comparison. If two rates are statistically significantly different, this means that the

difference is unlikely to have arisen by chance. Judgment should, however, be exercised in deciding whether or not the difference is of any practical significance.

For data from the ABS 2004–05 NHS and ABS 2004–05 NATSIHS, standard errors were calculated for all estimates, using information about sampling variability (see Chapter 7 ABS 2006c, 2006d).

Cause of death and hospital diagnosis classification

Australia uses the International Statistical Classification of Diseases and Related Health Problems for coding causes of death. The ninth revision (ICD-9) is available for the years 1979–1998 and the tenth revision from 1999 onwards. The ABS back-coded the 1997 and 1998 cause of death data in ICD-10 and consequently dual coding in ICD-9 and ICD-10 is available for use for these years. In this report, trend data for mortality used ICD-10 from 1997 onwards (WHO 2004).

This international classification has been modified for morbidity coding in health services in Australia. ICD-9-CM is a clinical modification of ICD-9, and has been used in the AIHW National Hospital Morbidity Database (NHMD) from 1993–94 to 1997–98. ICD-10-AM is an Australian modification of ICD-10, and has been used in the AIHW NHMD from 1998–99 onwards (NCCH 2006).

Table 7 lists the ICD-10 and ICD-10-AM external cause codes (*Chapter XX: External causes of morbidity and mortality*) used in this bulletin.

Table 7: External cause codes used in this bulletin for deaths and hospitals data

External cause	ICD-10 and ICD-10-AM codes
Transport accidents	V01–V99
Falls	W00–W19
Exposure to inanimate mechanical forces	W20–W49
Exposure to animate mechanical forces	W50–W64
Accidental drowning and submersion	W65–W74
Other accidental threats to breathing	W75–W84
Exposure to smoke, fire and flames	X00–X09
Accidental poisoning by and exposure to noxious substances	X40–X49
Over-exertion, travel and privation	X50–X57
Accidental exposure to other and unspecified factors	X58–X59
Intentional self-harm (suicide)	X60–X84
Assault	X85–Y09
Complications of medical and surgical care	Y40–Y84

Hospitalisations data

The methods used to undertake analysis on hospitalisations for injury and for external causes, including the criteria used to select cases, are described here.

In this bulletin, an approximate method has been used to reduce over-counting of injury cases, by omitting records in which the mode of admission is recorded as being a transfer from another acute-care hospital. These records have been excluded, as they are likely to result in multiple counting of the one injury case. This is consistent with other AIHW reports on injury (see, for example, Berry & Harrison 2007). In 2005–06, if transfers are included, the number of injury hospitalisations for young people aged 12–24 years is 91,341, whereas if they are excluded, the count is 86,032. Cases transferred from another hospital are included in estimates of patient days only.

The criterion used to select injury hospitalisations was a principal diagnosis in the ICD-10-AM range S00–T98 (ICD-10-AM *Chapter XIX: Injury and poisoning and certain other consequences of external causes*).

All records in the AIHW NHMD that have a principal diagnosis of injury should include one or more ICD-10-AM external cause codes. In 2005–06, of all injury hospitalisations for 12–24 year olds, only 0.09% had no external cause code. Injury hospitalisations without an external cause code are included in the total number of injury hospitalisations, but are not included in external cause hospitalisations as the aim of this analysis is to describe injury hospitalisations in terms of the external cause.

The criteria used to select hospitalisations for external causes was a principal diagnosis in the ICD-10-AM range S00–T98 (ICD-10-AM *Chapter XIX: Injury and poisoning and certain other consequences of external causes*) and an external cause code in the ICD-10-AM range V01–Y98 (ICD-10-AM *Chapter XX: External causes of morbidity and mortality*). As multiple external causes can be recorded, only the first reported external cause per hospitalisation was selected (that is, one external cause per injury hospitalisation).

This method differs from that used in reports produced by the AIHW National Injury Surveillance Unit, where codes in the range of S00–T75, T79 are reported separately from complications of medical and surgical care (T80–T88) and residual groups (T78, T89 and T90–T98) (see Berry & Harrison 2007 for further information).

Approximately 1% of cases with a principal diagnosis of complications of medical and surgical care (T80–T88) did not have a first reported external cause code of complications of medical and surgical care (Y40–Y84) in 2005–06.

Deaths data

The purpose of this bulletin was to examine deaths among young people where the underlying cause of death was an injury. Where the death is due to an injury (ICD-10 *Chapter XIX: Injury and poisoning and certain other consequences of external causes*), the underlying cause of death is coded as the external cause of this injury (ICD-10 *Chapter XX: External causes of morbidity and mortality*).

The Australian Bureau of Statistics (ABS), who compile the deaths data received from the Registrars of Births, Deaths and Marriages, advises that care should be taken in interpreting injury deaths data from 2004 onwards (although this issue may also apply for

recent years before 2004), particularly for the following areas within ICD-10 Chapter XX: *External causes of morbidity and mortality*:

- ♦ Falls—administrative changes have resulted in an increased number of deaths being assigned underlying cause codes in this range.
- ♦ Intentional self-harm (suicide) and assault (homicide)—an increase is stated to have occurred in the number of coroner cases where final information, following coronial enquiry, was not available to the ABS in time for inclusion in the causes of death publication. This may partly explain the apparent recent downward trends in deaths due to intentional self-harm (suicide) and assault (homicide). For assault (homicide) in particular, the number of deaths is likely to be a significant underestimate. The Australian Institute of Criminology estimated the number of homicides in Australia in 2003–04 to be 41% higher than that reported by the ABS (Henley 2007:80).

The extent to which these issues affect those aged 12–24 years is not yet known.

For further information, see ABS (2006a) and Henley et al. (2007).

Population groups

Aboriginal and Torres Strait Islander people

At present, there is considerable variation across the states and territories in the completeness of mortality and hospital data for Aboriginal and Torres Strait Islander people. Problems associated with identification result in an underestimation of deaths and hospitalisations for Indigenous people.

This bulletin includes hospitalisation and mortality data on Indigenous Australians for jurisdictions that are considered to have sufficient level of coverage to produce reliable statistics on Indigenous Australians. Data for non-Indigenous Australians used for comparison with Indigenous Australians are from the same jurisdictions. For hospitalisation data, New South Wales, Victoria, Queensland, Western Australia, South Australia and public hospitals in the Northern Territory are included in analysis (that is, Tasmania, the Australian Capital Territory and private hospitals in the Northern Territory are excluded). For mortality data, only Queensland, Western Australia, South Australia and the Northern Territory are included in analysis. Due to the small numbers of deaths among young Indigenous people aged 12–24 years, three years of mortality data have been combined for analysis in this bulletin (2003–2005).

Interpretation of results should take into account the relative quality of the data from these jurisdictions and that data from these jurisdictions are not necessarily representative of the excluded jurisdictions. See AIHW & ABS (2006) for further information.

For hospitalisation data, where Indigenous status is 'not stated/inadequately described', these hospitalisations have been amalgamated with the hospitalisations for non-Indigenous people. As such, the categories used for presentation of hospitalisation statistics are 'Indigenous Australians' and 'other Australians'.

For mortality data, where Indigenous status is 'not stated/inadequately described', these deaths have been excluded from the analysis. As such, the categories used for presentation of mortality statistics are 'Indigenous Australians' and 'non-Indigenous Australians'.

Remoteness

This bulletin uses the Australian Standard Geographical Classification (ASGC), which groups geographic areas into five classes based on Census Collection Districts (CDs) and defines CDs using the Accessibility/Remoteness Index for Australia (ARIA). ARIA is a measure of the remoteness of a location from the services provided by large towns or cities—a higher ARIA score denotes a more remote location. The five classes of the ASGC Remoteness classification, along with a sixth 'Migratory' class, are listed in Table 8.

Table 8: Remoteness classification

Classes	Collection districts (CDs) within class
Major Cities of Australia	CDs with an average ARIA index value of 0 to 0.2
Inner Regional Australia	CDs with an average ARIA index value greater than 0.2 and less than or equal to 2.4
Outer Regional Australia	CDs with an average ARIA index value greater than 2.4 and less than or equal to 5.92
Remote Australia	CDs with an average ARIA index value greater than 5.92 and less than or equal to 10.53
Very Remote Australia	CDs with an average ARIA index value greater than 10.53
Migratory	Areas composed of off-shore, shipping and migratory CDs

Source: ABS 2001.

All information in this bulletin presented by remoteness is for 15–24 year olds and is based on place of usual residence. Due to the small number of deaths occurring among young people, three years of mortality data have been combined for analysis in this bulletin (2003–2005), and where numbers are particularly small in Remote and Very Remote areas, these categories have been combined as Remote/Very Remote, in order to obtain reliable disaggregations by remoteness.

Of young people aged 15–24 years, remoteness could not be assigned for 1.6% of hospital records with a principal diagnosis of injury in 2005–06, or for 2.3% of deaths with injury as the underlying cause in 2003–2005. The reasons for this include incomplete or invalid Statistical Local Area (SLA) information, and records where the death or hospitalisation was for a non-resident of Australia.

Socioeconomic status

There is no reliable information on death certificates or hospital records in Australia on socioeconomic status. Instead, Socio-Economic Indexes for Areas (SEIFA), developed by the Australian Bureau of Statistics, are used in this bulletin. SEIFA are compiled at the Census Collection District (CD) level, and summarise a range of socioeconomic variables associated with disadvantage. The index used in this bulletin is the Index of Relative Socioeconomic Disadvantage (IRSD), aggregated to the SLA level.

The IRSD summarises variables that indicate disadvantage only. Those areas with high index scores may be considered less disadvantaged relative to areas with lower index scores—that is, a high score reflects a relative lack of disadvantage rather than advantage. It is important to note that the IRSD is an area-level index, and relates to the average disadvantage of all people living in a geographic area. Therefore, it should not be presumed to apply to all individuals living within the area. For further information, see Adhikari (2006).

In this report, SEIFA quintiles were used, with quintile 1 representing the most relatively disadvantaged area and quintile 5 representing the least relatively disadvantaged area.

All information in this bulletin presented by socioeconomic status is for 15–24 year olds and is based on place of usual residence. Additionally, due to the small number of deaths occurring among young people, three years of mortality data have been combined for analysis in this bulletin (2003–2005), in order to obtain reliable disaggregations by socioeconomic status.

Of young people aged 15–24 years, socioeconomic status could not be assigned for 7.5% of hospital records with a principal diagnosis of injury in 2005–06, or for 3.4% of deaths with injury as the underlying cause in 2003–2005. The reasons for this include incomplete or invalid SLA information, and records where the death or hospitalisation was for a non-resident of Australia.

Appendix 1: Statistical tables

Table A1.1: Injury hospitalisations for young people by population characteristics, 2005–06

Population group	Males		Females		Persons	
	Number	Rate ^(a)	Number	Rate ^(a)	Number	Rate ^(a)
Age group						
12–14 years	10,973	2,529	4,184	1,018	15,157	1,793.8
15–17 years	13,818	3,192	6,270	1,531	20,088	2,384.2
18–24 years	36,281	3,547	14,505	1,476	50,787	2,532.0
Indigenous status,^(b) 12–24 years						
Indigenous	2,760	4,327	1,667	2,758	4,427	3,559
Other Australians	55,229	3,157	21,859	1,311	77,089	2,255
Remoteness, 15–24 years						
Major Cities	29,045	2,954	12,450	1,323	41,495	2,154
Inner Regional	11,456	4,034	4,347	1,617	15,803	2,865
Outer Regional	6,701	4,968	2,432	2,005	9,133	3,572
Remote	1,244	5,925	558	3,117	1,803	4,636
Very Remote	932	6,700	608	5,000	1,540	5,908
Socioeconomic status (Index of Relative Disadvantage), 15–24 years						
Quintile 1 (most disadvantaged)	9,699	3,549	4,133	1,603	13,833	2,605
Quintile 2	10,764	4,100	4,068	1,652	14,832	2,916
Quintile 3	9,978	3,687	4,032	1,598	14,010	2,678
Quintile 4	8,208	3,034	3,325	1,288	11,533	2,180
Quintile 5 (least disadvantaged)	7,858	2,772	3,517	1,280	11,375	2,038
Young people (12–24 years)	61,072	3,227	24,959	1,382	86,032	2,326

(a) Age-standardised to the Australian population as at 30 June 2001, with the exception of rates by 'age group', which are age-specific rates. Rates are per 100,000 young people.

(b) For data quality reasons, data are for New South Wales, Victoria, Queensland, Western Australia, South Australia and public hospitals in the Northern Territory only. The data presented here are not necessarily representative of the excluded jurisdictions.

Notes

1. ICD-10-AM codes S00–T98.

2. Persons for whom remoteness or socioeconomic status is unknown have been excluded. See *Technical notes*.

3. Reference categories for statistical significance are non-Indigenous, Major Cities and Quintile 5 (least disadvantaged).

Source: AIHW National Hospital Morbidity Database.

Table A1.2: Injury hospitalisation rates for young people aged 12–24 years, by state and territory^(a), 2005–06 (rate per 100,000)

Age (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
12–14	1,836	1,617	2,136	1,481	1,695	1,529	1,547	1,983	1,794
15–17	2,382	2,253	2,650	2,012	2,404	2,338	2,257	3,035	2,384
18–24	2,412	2,400	2,661	2,330	2,523	2,769	2,146	4,395	2,532
12–24^(b)	2,271	2,184	2,536	2,058	2,303	2,379	2,033	3,515	2,326

(a) State or territory of usual residence.

(b) Age-standardised to the Australian population as at 30 June 2001.

Note: ICD-10-AM codes S00–T98. See *Technical notes: Hospitalisations data* for further information.

Source: AIHW National Hospital Morbidity Database.

Table A1.3: Injury deaths for young people by population characteristics, 2005

Population group	Males		Females		Persons	
	Number	Rate ^(a)	Number	Rate ^(a)	Number	Rate ^(a)
Age group						
12–14 years	20	4.6	15	3.7	35	4.1
15–17 years	110	25.7	48	11.8	158	18.9
18–24 years	609	60.0	152	15.6	761	38.3
Indigenous status,^(b) 12–24 years, 2003–2005						
Indigenous	149	133.0	48	43.7	197	88.6
Non-Indigenous	892	43.8	284	14.7	1,176	29.6
Remoteness, 15–24 years, 2003–2005						
Major Cities	1,197	40.4	390	13.8	1,587	27.3
Inner Regional	495	60.6	142	17.8	637	39.9
Outer Regional	325	83.3	88	24.7	413	55.7
Remote	59	93.5	20	35.7	78	67.2
Very Remote	98	236.1	12	33.2	110	141.0
Socioeconomic status (Index of Relative Disadvantage), 15–24 years, 2003–2005						
Quintile 1 (most disadvantaged)	511	61.2	169	21.4	680	41.9
Quintile 2	474	60.5	132	17.9	606	39.9
Quintile 3	455	55.9	135	17.8	590	37.5
Quintile 4	395	46.4	112	13.8	507	30.4
Quintile 5 (least disadvantaged)	312	36.3	98	11.7	410	24.2
Young people (12–24 years)	739	39.1	215	11.9	954	25.8

(a) Age-standardised to the Australian population as at 30 June 2001, with the exception of rates by 'Age group', which are age-specific rates. Rates are per 100,000 young people.

(b) For data quality reasons, data are for Queensland, Western Australia, South Australia and the Northern Territory only. The data presented here are not necessarily representative of the excluded jurisdictions.

Notes

1. Includes deaths registered during 2005, or 2003–2005 where specified, for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).
2. Persons for whom remoteness or socioeconomic status is unknown have been excluded. See *Technical notes*.
3. Reference categories for statistical significance are non-Indigenous, Major Cities and Quintile 5 (least disadvantaged).

Source: AIHW National Mortality Database.

Table A1.4: Injury deaths for young people aged 12–24 years, by state and territory^(a), 2005

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Number	241	222	200	107	106	28	17	33	954
Rate per 100,000 ^(b)	20.1	24.3	27.1	28.4	38.6	33.9	24.1	78.8	25.8
95% confidence interval	17.7–22.8	21.3–27.6	23.6–31.0	23.3–34.3	31.8–46.6	22.7–48.8	14.9–37.3	54.9–109.7	24.2–27.5

(a) State or territory of registration.

(b) Age-standardised to the Australian population as at 30 June 2001.

Note: Includes deaths registered during 2005 for which an 'external cause' was coded as the underlying cause of death (ICD-10 V01–Y98).

Source: AIHW National Mortality Database.

Appendix 2: Data sources

AIHW National Hospital Morbidity Database (NHMD)

The NHMD is a collection of electronic confidentialised summary records for separations (that is, episodes of care) in public and private hospitals in Australia.

Hospital records are for 'separations' and not individuals, and as there can be multiple admissions for the same individuals within a financial year, hospitalisation rates do not usually reflect the incidence or prevalence of the disease or condition in question.

The collection contains establishment data (information about the hospital), demographic data of the patient, administrative data, length of stay data and, clinical and related data.

AIHW National Mortality Database

The AIHW National Mortality Database is held at the AIHW for the analysis of mortality statistics. The database includes information on the factors that caused death (usually referred to as the cause of death). The collection also contains information about the deceased person such as their age at death, the place of death, their country of birth, and where applicable the circumstances of their death. These data are collected in Australia by the Registrars of Births, Deaths and Marriages in each state and territory. The data are then compiled nationally by the ABS, which codes the data according to the International Classification of Diseases (ICD). The tenth revision (ICD-10) is available for use from 1997.

ABS National Health Survey (NHS)

The most recent NHS was conducted between August 2004 and June 2005 by the ABS. The survey collected information from 19,501 Australians of all ages and from all states and territories and from urban and remote areas. Very remote areas were excluded.

The aims of the survey are to obtain national benchmark information on a range of health issues and to enable trends in health to be monitored over time. Information was collected about the health status of the Australian population, health-related aspects of lifestyle and other health risk factors and use of health services. Information is reported by a parent/guardian for young people under the age of 15 years, a combination of self- and parent-report for ages 15–17 years and self-report only for those aged 18 years and over.

ABS National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)

The ABS 2004–05 NATSIHS provides information about the health circumstances of Indigenous Australians. The sample size was 10,439 persons (or about one in 45 of the total Indigenous population)—considerably larger than the supplementary Indigenous samples in the 1995 and 2001 NHS. This survey, which was conducted in remote and non-remote areas throughout Australia, collected information from Indigenous

Australians about health-related issues, including health status, risk factors and actions, and socioeconomic circumstances. The survey can provide comparisons with results for the non-Indigenous population from the 2001 and 2004–05 NHS.

Acknowledgments

This bulletin was written by Deanna Eldridge of the Australian Institute of Health and Welfare, with valuable input provided by Sushma Mathur.

The AIHW would like to acknowledge the valuable contribution of James Harrison, of the National Injury Surveillance Unit, as well as funding provided by the Australian Government Department of Health and Ageing for this project.

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This publication is part of the Australian Institute of Health and Welfare's bulletin series. A complete list of the Institute's publications is available from the Institute's website <www.aihw.gov.au>.

Cat.no. AUS 102

ISSN 1446-9820

ISBN 978 1 74024 779 5

Suggested citation

AIHW: Eldridge D 2008. Injury among young Australians. AIHW bulletin series no. 60. Cat. no. AUS 102. Canberra: AIHW.

Australian Institute of Health and Welfare

Board Chair	Director
Hon. Peter Collins, AM, QC	Penny Allbon

Any enquiries about or comments on this publication should be directed to:

Deanna Eldridge
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601
Phone: (02) 6244 1011
Email: deanna.eldridge@aihw.gov.au

Printed by Elect Printing