

# **Part VII: Injury**

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## **Chapter 18: External causes of injury**



## Chapter 18: External causes of injury

Injury is the leading cause of child death and one of the main causes of ill-health in Australia.<sup>1</sup> For every child who dies from injury, many more are admitted to hospital for treatment, and others are treated in emergency departments. Injuries can have lasting effects, such as disability or disfigurement, that can impair a child's development and future wellbeing. In addition, disability or death from injury significantly impacts on a child's family.

The risk of injury and types of injury suffered are strongly associated with sex and age of the child, the area of residence, and the socioeconomic status of the family. For most types of childhood injury, and for every age after infancy, boys are at higher risk of injury than girls. This difference between boys and girls may be related to differences in behaviour or differences in exposure related to traditional male and female roles.

Differences in socialisation, operating even at an early age, may also result in differences in risk-taking behaviours between boys and girls (Wilson et al. 1991). The injury pattern is also strongly associated with age (AIHW NISU: Moller & Kreisfeld 1997). For example, the risk of hospitalisation for falls increases with age, but for other conditions, such as poisoning, younger children (<5 years) are more at risk than those aged 5 years or more (AIHW NISU: Steenkamp & Cripps 2001).

The area of a child's residence is also an important factor. Children living on farms are more likely to suffer different types of injury, and those living in remote areas are more likely to have higher rates of injury than those in metropolitan areas.

The rate and severity of injury are also related to the socioeconomic status of the family. Poor children are more likely to be injured and more likely to die from their injuries than children from better-off families. In a recent international report on childhood injury, it was suggested that the risk of child deaths from injury appears to rise steeply with poverty (UNICEF 2001). The likelihood of a child being injured or killed was associated with single parenthood, low maternal education, young maternal age at birth, poor housing, large family size, and parental drug or alcohol abuse. Children from low socioeconomic status groups are more likely to suffer injury from certain causes, such as house fire or assault, which are more often fatal than other causes of injury.

Injuries also vary by intent. Some intentionally inflicted injuries may be labelled as 'accidents'. While it can be difficult to distinguish between unintentional (accidental) injury and injury due to neglect and intentional injury, strategies that focus on the prevention of unintentional injury in at-risk families may also reduce intentional injury and therefore indirectly reduce the risks of child abuse and neglect (Wilson et al. 1991).

Preventing injury in childhood must use a full range of approaches such as education, environmental modification, maintaining national design standards as well as improving regulations and legislation (National Center for Injury Prevention and Control 1999). Environmental modification includes initiatives such as the use of safe furniture, installing smoke alarms in homes and safe keeping of drugs and poisons. Programs that focus on educational and public awareness, as well as on families at risk, can be used to highlight certain injury prevention strategies in the home. Legislation requiring the use of safety equipment, such as seat belts, car safety seats, bike helmets, and the fencing of swimming pools, has reduced much of the injury that was once thought difficult to prevent.

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1. 'Injury' as defined here includes poisoning.

This chapter examines the more serious spectrum of childhood injury, including that which requires hospitalisation or results in death. The focus is on external causes, rather than the nature of the injuries themselves, since the circumstances of injury are most relevant to injury prevention.

## Hospitalisations for all injuries

The indicator for hospitalisation for all injuries is the number of hospitalisations for injuries in children aged 0–14 years in a given year as a rate per 100,000 children. The rates of hospitalisation for injuries for children aged 0–14 years between 1993–94 and 1999–00 are shown in Table 18.1.

**Table 18.1: Hospitalisation rates for children aged 0–14 years for injuries as a result of external causes,<sup>(a)</sup> 1993–94 to 1999–00 (per 100,000 children)**

	Age (years)	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–00
Males	<1	1,260.9	1,253.7	1,125.3	1,238.9	1,328.0	1,322.3	1,250.5
	1–4	2,122.8	2,086.5	2,167.8	2,375.0	2,324.7	2,274.7	2,293.9
	5–9	1,771.5	1,784.8	1,795.5	1,845.4	1,902.7	1,858.6	1,907.1
	10–14	2,235.5	2,244.2	2,312.3	2,383.8	2,347.8	2,302.8	2,361.8
	0–14	1,982.7	1,979.8	2,018.7	2,122.1	2,122.2	2,078.9	2,114.8
Females	<1	991.7	985.5	927.1	979.1	1,048.2	1,062.8	1,040.5
	1–4	1,595.9	1,564.7	1,634.1	1,676.2	1,700.7	1,788.0	1,745.4
	5–9	1,223.2	1,199.5	1,253.2	1,370.7	1,310.9	1,343.2	1,332.4
	10–14	1,167.0	1,149.6	1,168.1	1,148.2	1,134.0	1,112.2	1,076.3
	0–14	1,288.6	1,266.1	1,304.9	1,352.6	1,339.2	1,367.2	1,338.9
<b>Persons</b>	<b>0–14</b>	<b>1,644.7</b>	<b>1,632.1</b>	<b>1,670.8</b>	<b>1,747.0</b>	<b>1,740.5</b>	<b>1,731.9</b>	<b>1,736.6</b>

(a) Includes all hospitalisations where injury or poisoning was recorded as the principal diagnosis for which an external cause was documented. This is the case for all hospital data in this chapter.

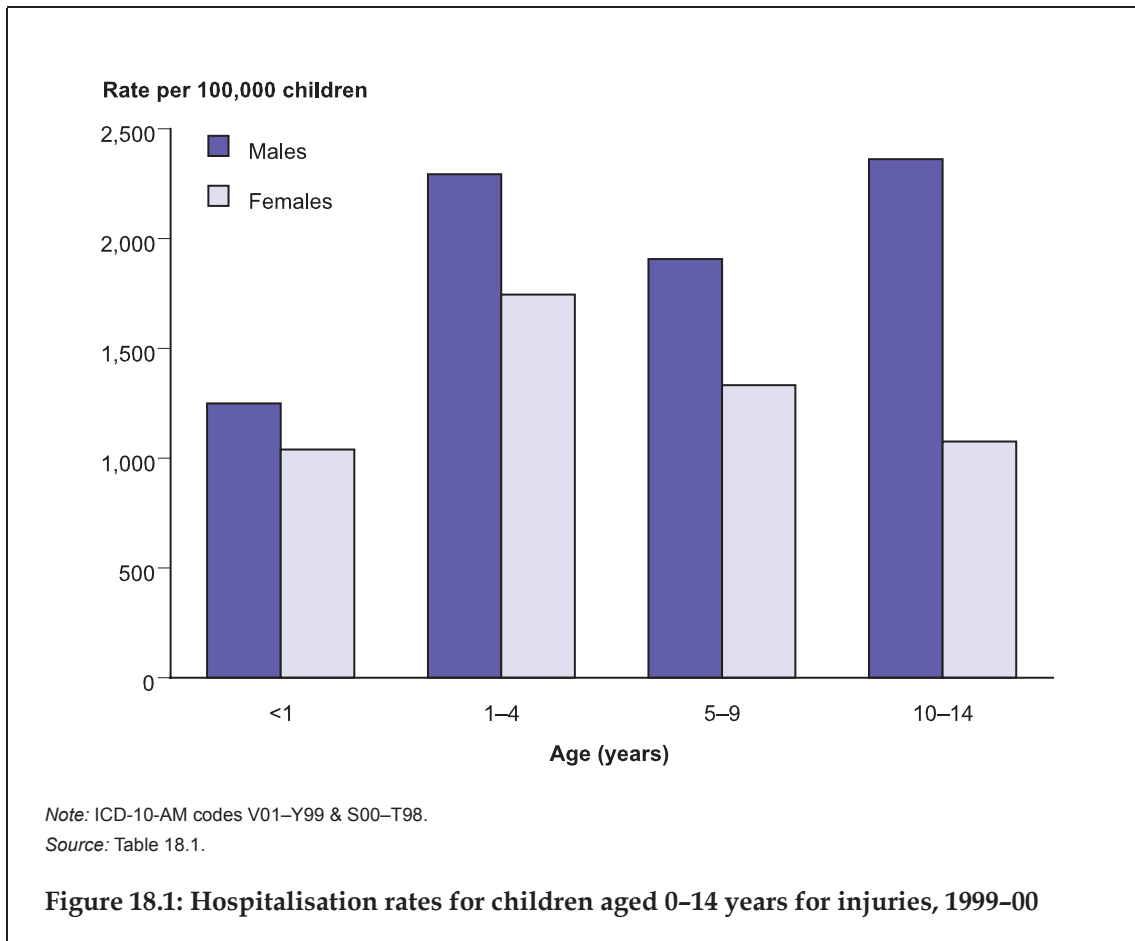
### Notes

- ICD-9-CM codes E800–E999 & 800–999 (1993–94 to 1997–98) and ICD-10-AM codes V01–Y99 & S00–T98 (1998–99 to 1999–00). ICD-10-AM codes for falls (W00–W19) are not equivalent to ICD-9-CM codes for falls (E880–E888) because there is no equivalent to ICD-9-CM code E887 (Fracture, cause unspecified) in ICD-10-AM.
- These data include codes for complications of medical and surgical care. In 1999–00, these codes (Y40–Y84) accounted for approximately 6% of hospitalisations for injury.

Source: AIHW National Hospital Morbidity Database.

- The rates of hospitalisation for all injuries for children aged 0–14 years appear to have remained fairly constant over the period 1993–94 to 1999–00. However, the changeover to ICD-10-AM in 1998–99 means that the time series should be interpreted with caution because of variations in injury coding.
- Boys had higher rates than girls. This sex difference was constant for all age groups.
- Among boys, those aged 10–14 years had the highest rate of hospitalisation for injury over the period, while among girls, those aged 1–4 years had the highest rate.

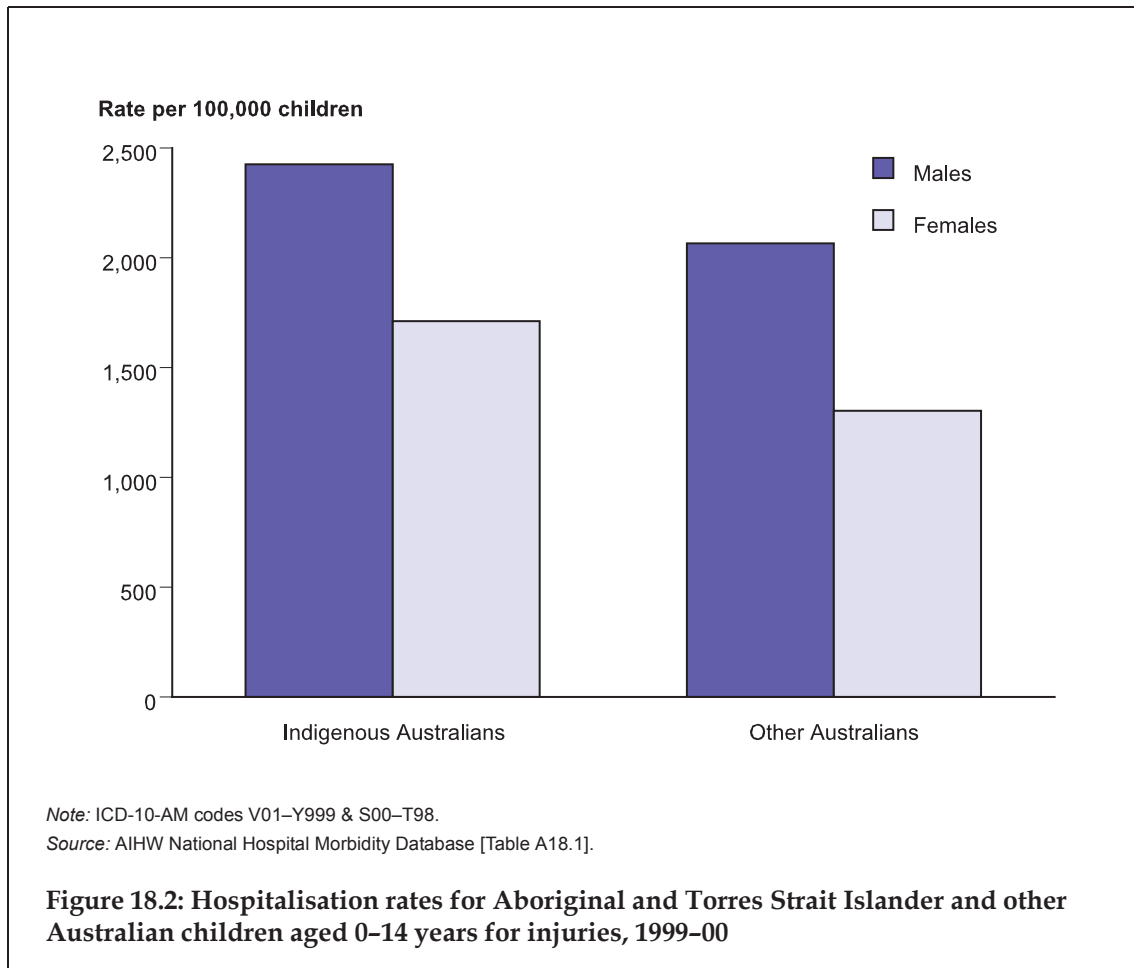
The hospitalisation rates for injuries for children aged 0–14 years in 1999–00 are shown in Figure 18.1.



- In 1999–00, there were 68,150 hospitalisations for injury in children. Rates ranged from 2,361.8 per 100,000 boys aged 10–14 years to 1,040.5 per 100,000 infant girls.
- In all age groups, the hospitalisation rate for injury or poisoning was consistently higher for boys than for girls.
- Among boys, those aged 10–14 years and 1–4 years had the highest rates of hospitalisation for treatment of an injury, while among girls, those aged 1–4 years had the highest rates.

### Aboriginal and Torres Strait Islander children

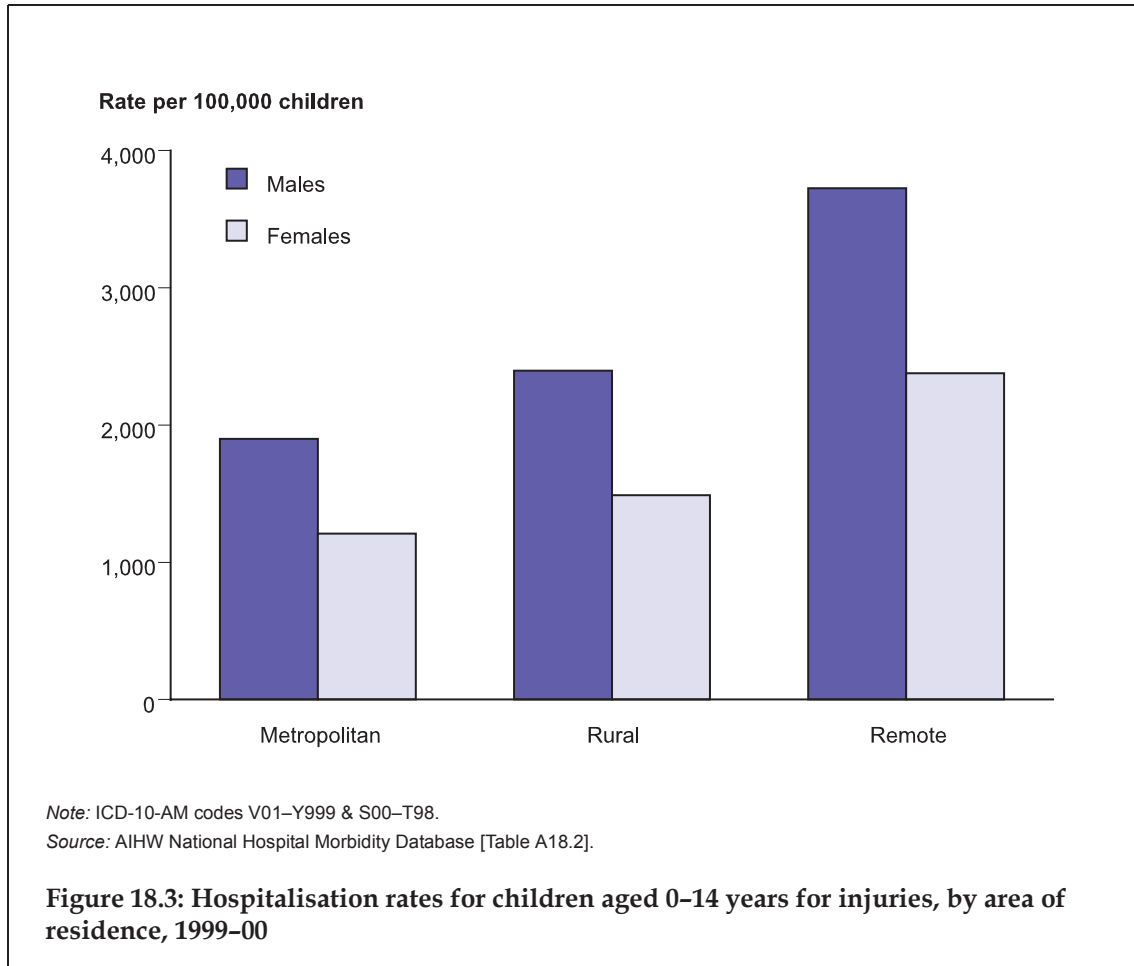
The rates of hospitalisation for all injuries for Aboriginal and Torres Strait Islander children are presented in Figure 18.2.



- In 1999–00, there were 3,357 hospitalisations of Aboriginal and Torres Strait Islander children aged 0–14 for injuries. The rate for all injuries was greater for Indigenous children than for other Australian children across all age groups (2,075.5 compared with 1,693.8 per 100,000 children).
- Consistent with findings for all Australian children, Indigenous children in the 1–4 years age group had a higher rate than children of other ages.

### Children in metropolitan, rural and remote areas

The distribution of hospitalisation rates for injuries in 1999–00 by area of residence is presented in Figure 18.3.



- In 1999, 41,987 children in metropolitan areas, 21,310 in rural areas and 4,494 in remote areas were hospitalised for injuries.
- The rates of hospitalisation in 1999–00 for injury in rural and remote areas were higher than in metropolitan areas.
- Boys in all areas had higher rates than girls.
- Among boys in metropolitan areas, those aged 1–4 years had the highest rates, while in rural and remote areas, those aged 10–14 years had the highest rates. Irrespective of area of residence, girls aged 1–4 years had the highest rates.

## Hospitalisation for specific external causes of injury

To form a comprehensive picture of childhood injury in Australia, it is necessary to identify the causes of injury suffered by children.

Six of the most common groups of external causes of injury recorded in children aged 0–14 years are shown in Table 18.2.

**Table 18.2: Hospitalisation rates for children aged 0–14 years for specific external causes of injuries, 1999–00 (per 100,000 children)**

	Age (years)	Falls	Pedal cyclist injured in transport accident	Accidental poisoning	Burns and scalds	Pedestrian injured in transport accident	Assault	Other causes
Males	<1	340.1	0.8	112.1	145.5	3.1	87.2	561.8
	1–4	719.6	46.2	307.0	155.4	43.1	20.2	1,002.3
	5–9	862.7	151.4	23.6	33.1	40.1	10.0	786.3
	10–14	871.4	286.2	19.5	39.2	33.1	41.4	1,071.0
	0–14	791.5	157.2	104.1	75.5	36.1	28.3	922.1
Females	<1	350.1	0.8	103.3	100.0	4.9	60.7	420.6
	1–4	585.1	22.9	263.3	108.7	28.8	17.5	719.1
	5–9	696.8	75.3	15.7	19.0	19.6	5.7	500.3
	10–14	365.1	72.3	20.2	13.0	21.7	12.6	571.4
	0–14	534.4	55.2	89.4	46.6	21.7	14.9	576.7
<b>Persons</b>	<b>0–14</b>	<b>666.2</b>	<b>107.5</b>	<b>96.9</b>	<b>61.4</b>	<b>29.1</b>	<b>21.8</b>	<b>753.8</b>

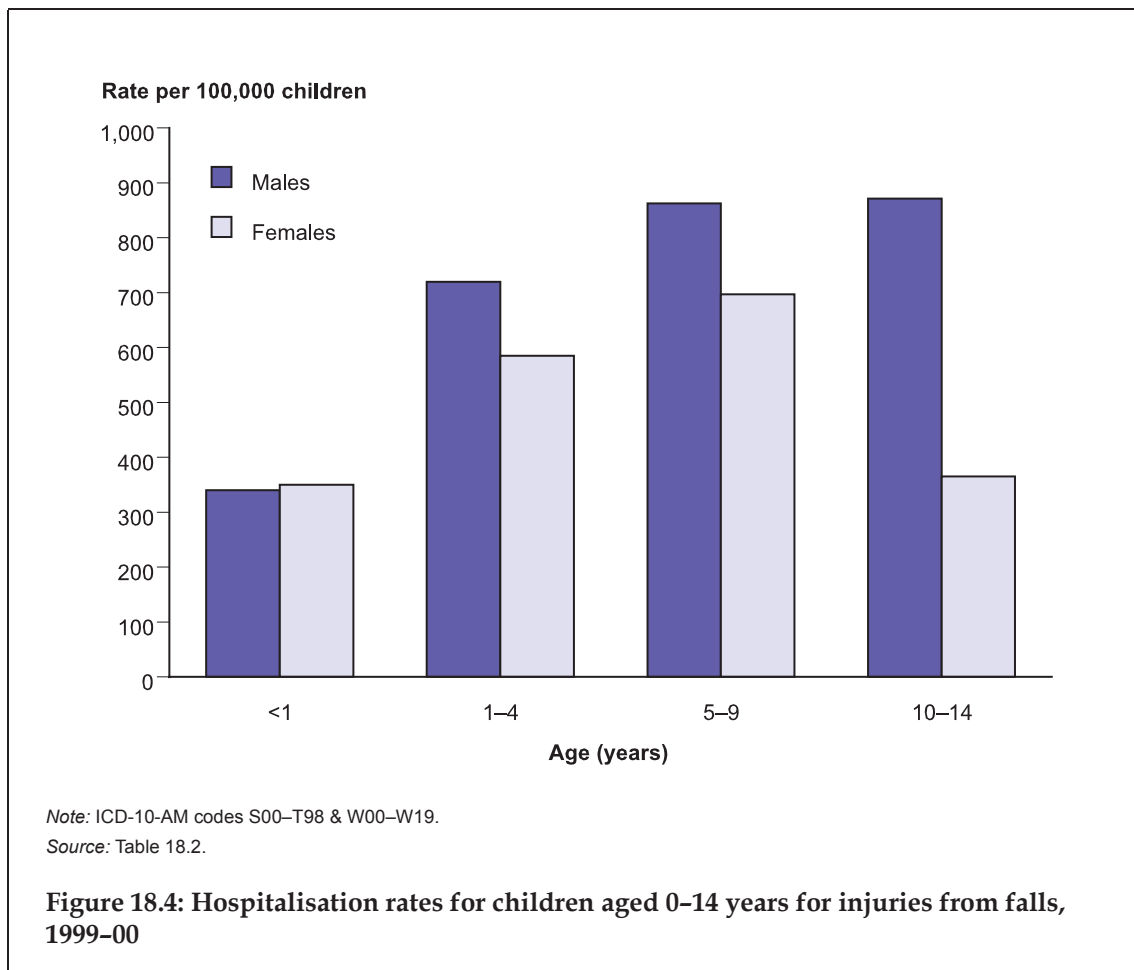
*Note:* Categories: Falls ICD-10-AM codes S00–T98 & W00–W19; Pedal cyclist injured in transport accident ICD-10-AM codes S00–T98 & V10–V19; Accidental poisoning ICD-10-AM codes S00–T98 & X40–X49; Burns and scalds ICD-10-AM codes S00–T98 & X10–X19 & X00–X09; Pedestrian injured in transport accident ICD-10-AM codes S00–T98 & V01–V09; Assault ICD-10-AM codes S00–T98 & X85–Y09.

*Source:* AIHW National Hospital Morbidity Database.

- In 1999–00 for all age groups, falls were by far the most common external cause of hospitalisation for injury among children.
- Pedal cycle injuries were the second most common cause among children. Rates were highest among those aged 5–14 years.
- For both boys and girls, accidental poisoning was the third most common cause. Burns and scalds were the fourth most common cause. Rates for both accidental poisoning and burns and scalds were highest among children aged less than 5 years.
- Hospitalisation rates for pedestrians injured in a transport accident were distributed evenly across age groups but were more common for boys than for girls.
- The 'other' category accounted for the remainder of external causes, which amounted to 43% of hospitalisations for injuries. The group which accounted for the greatest proportion of hospitalisations among these was exposure to inanimate mechanical forces, which includes injuries such as being hit by an object or cut by a sharp object. This group accounted for 17% of all injury hospitalisations. Other types of external causes in the 'other' category included exposure to unspecified factors, exposure to animate mechanical forces (e.g. injuries by another person or an animal), medical complications, and motorcycle accidents.

## Falls

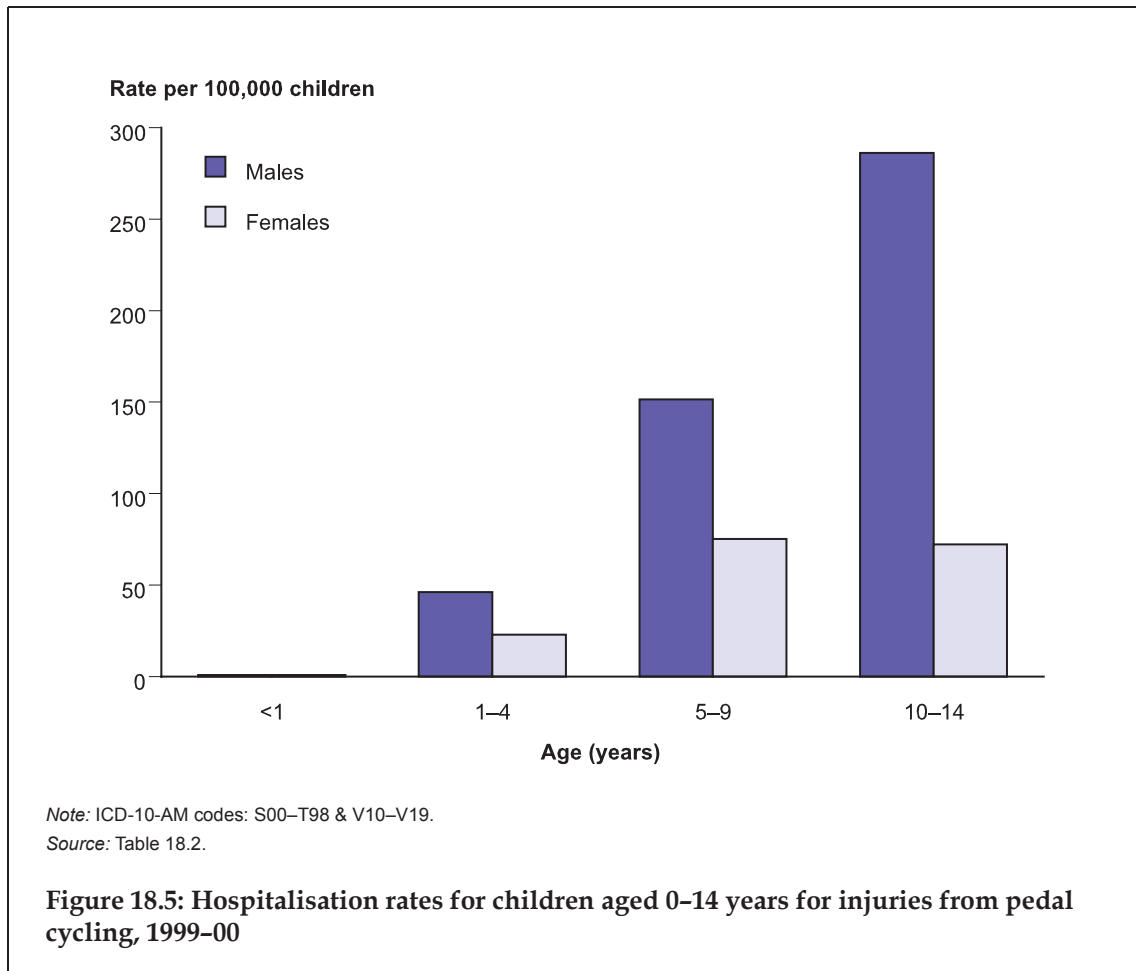
Falls are the most common cause of injury hospitalisation for Australian children (AIHW NISU: Steenkamp & Cripps 2001). They are important to examine given the varying degrees of severity this type of injury causes, and the association between falls and the physical design of a child's environment. The indicator for hospitalisations for falls is the number of hospitalisations of children aged 0–14 years for falls in a given year as a rate per 100,000 children.



- In 1999–00, there were 26,202 hospitalisations of children aged 0–14 years for injuries from falls, with a hospitalisation rate of 666.2 per 100,000 children.
- Hospitalisation rates were higher for boys than for girls (791.5 compared with 534.4).
- The age group with the highest rate for falls in both sexes was children aged 5–9 years (781.9).
- Boys aged 10–14 years were hospitalised at a rate 2.4 times higher than girls in the same age group.

### Pedal cycling injuries

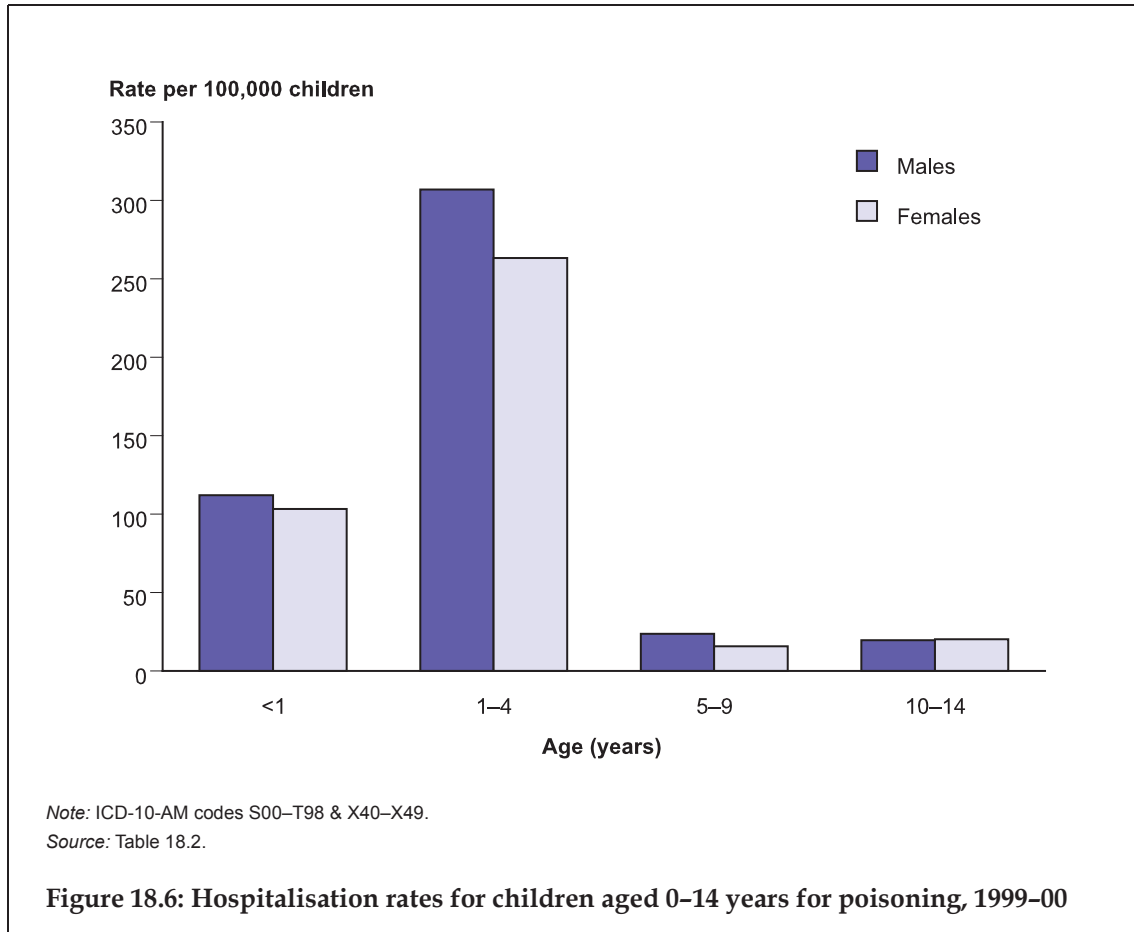
Injuries caused as a result of pedal cycling are a common reason for hospitalisations of children. The indicator for hospitalisations for pedal cycling injuries is the number of hospitalisations of children aged 0–14 years for pedal cycling injuries in a given year as a rate per 100,000 children.



- In 1999–00, there were 4,283 hospitalisations of children aged 0–14 years for injuries from pedal cycling, with a hospitalisation rate of 107.5 per 100,000 children.
- Hospitalisation rates increased markedly with age for both boys and girls. However, boys aged 10–14 years were hospitalised at a rate 1.9 times the rate for boys aged 5–9 years, whereas the rates for girls aged 5–9 years and 10–14 years were almost the same.
- Male cyclists were hospitalised at a much higher rate than girls. In 1999–00, boys aged 10–14 years were hospitalised at a rate 4 times that for girls in the same age group.

## Accidental poisoning

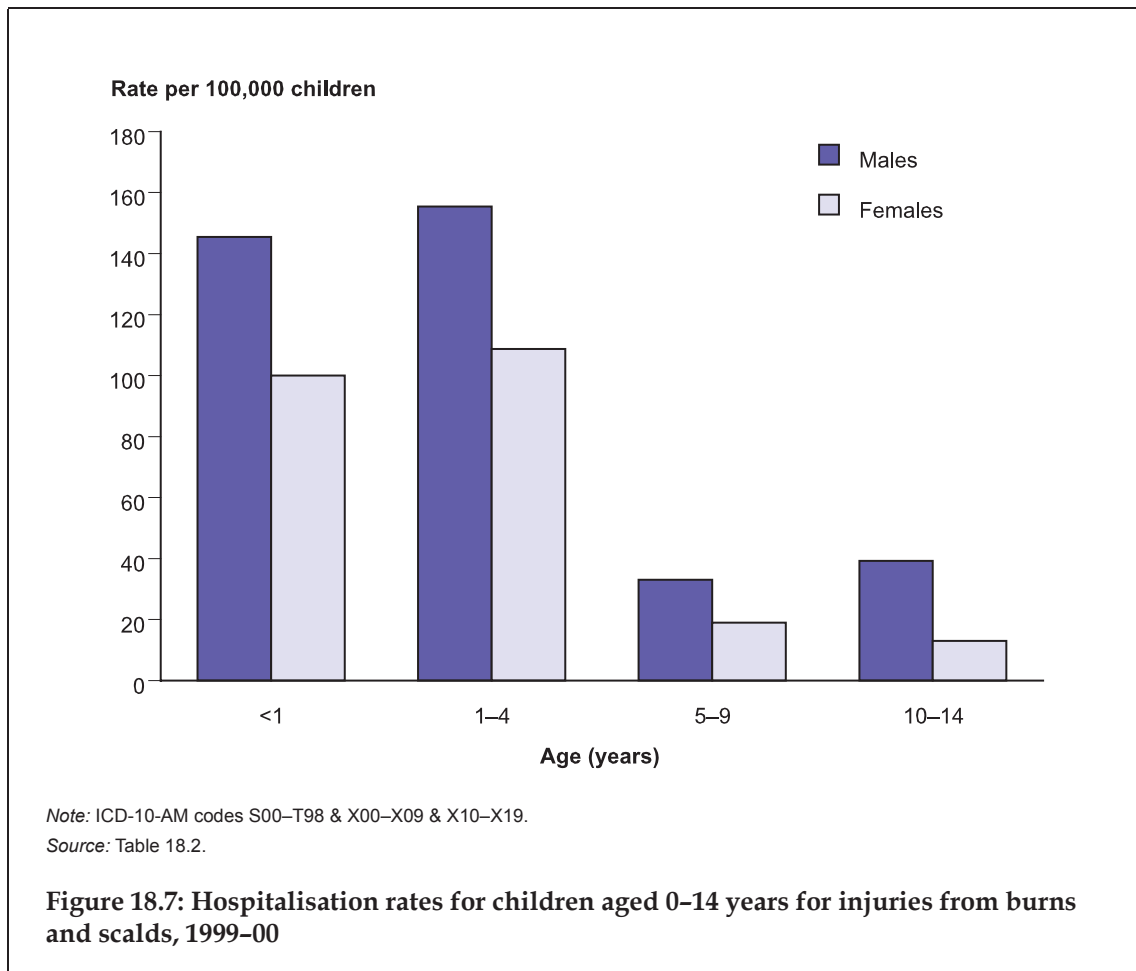
The indicator for hospitalisations for poisoning is the number of hospitalisations of children aged 0–14 years for poisoning in a given year as a rate per 100,000 children.



- In 1999–00, there were 3,711 hospitalisations of children aged 0–14 years for accidental poisoning, with a hospitalisation rate of 96.9 per 100,000 children.
- Children aged 1–4 years, followed by infants, had higher rates than other children, with rates dropping sharply for older children. For example, children aged 1–4 years had rates more than 14 times those for children aged 5–9 or 10–14 years (285.7 compared with 19.8 per 100,000 children aged 5–9 and 10–14 years).
- Among children aged less than 10 years, hospitalisation rates for boys were slightly higher than for girls, but this difference disappeared for children aged 10 years and over.

### Burns and scalds

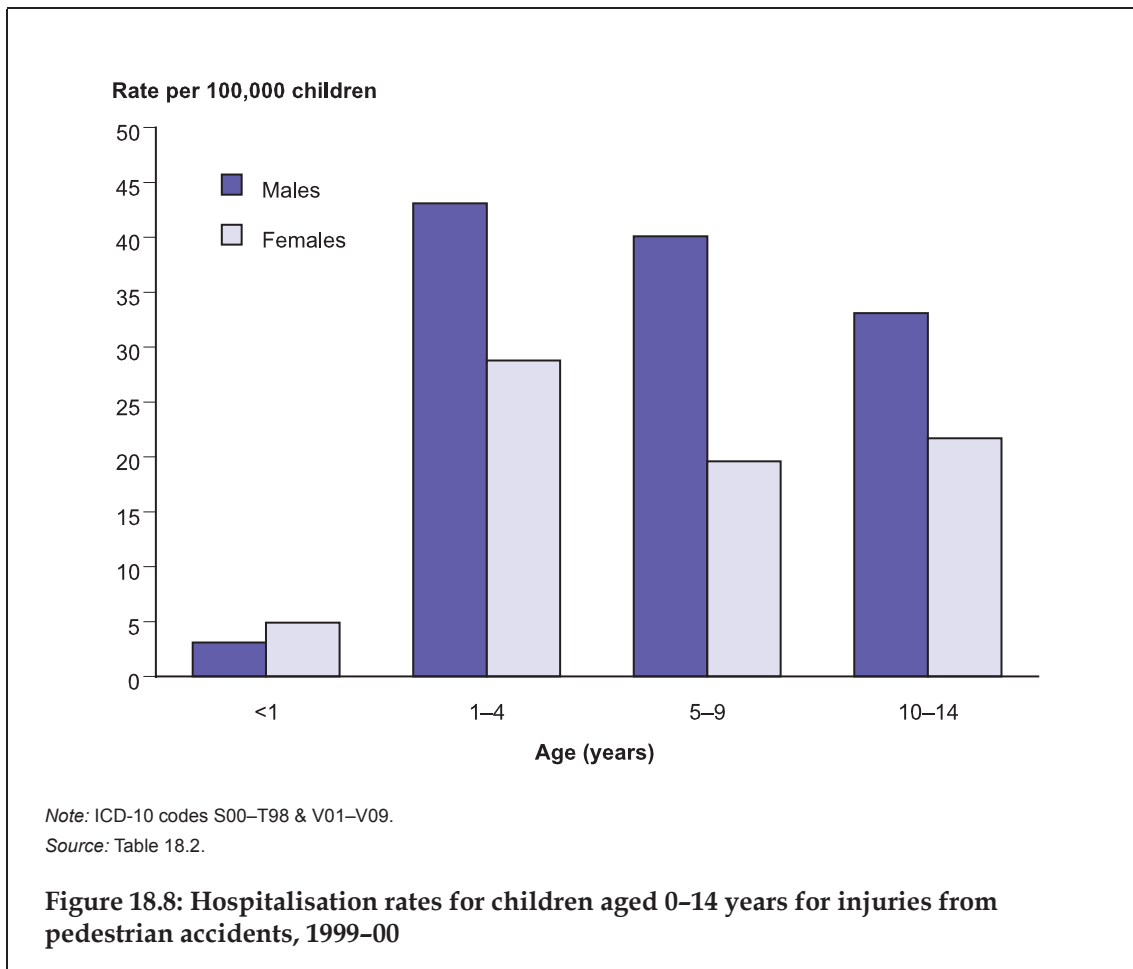
The indicator for hospitalisations for burns and scalds is the number of hospitalisations of children aged 0–14 years for burns and scalds in a given year as a rate per 100,000 children.



- In 1999–00, there were 2,361 hospitalisations of children aged 0–14 years for injuries from burns and scalds, with a hospitalisation rate of 61.4 per 100,000 children.
- Boys were hospitalised at a rate 1.6 times that for girls (75.5 compared with 46.6).
- Rates were highest for children aged less than 5 years (132.7 for children aged 1–4 years and 123.4 for infants).

## Pedestrian injuries

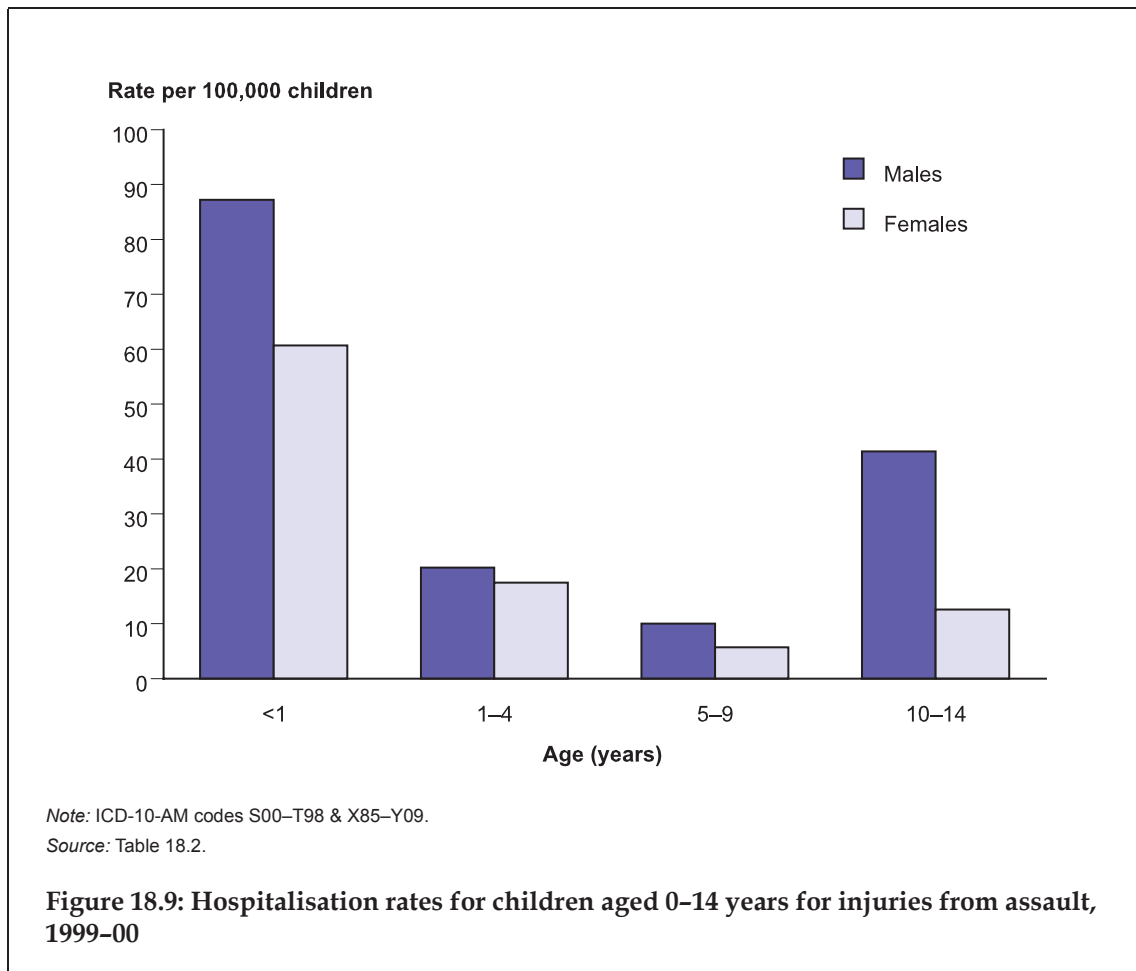
The indicator for hospitalisations for pedestrian injuries is the number of hospitalisations of children aged 0–14 years who were injured as pedestrians in a given year as a rate per 100,000 children.



- In 1999–00, there were 1,144 hospitalisations of children aged 0–14 years for injuries from pedestrian accidents, with a hospitalisation rate of 29.1 per 100,000 children.
- In all age groups except infants, boys had higher hospitalisation rates than girls. The rate for boys aged 0–14 years was 36.1, compared with 21.7 for girls.
- Among children aged 1–14 years, hospitalisation rates decreased with age and were lowest for those aged 10–14 years.

### Assault

The indicator for hospitalisations for assault is the number of hospitalisations of children aged 0–14 years who were injured for assault in a given year as a rate per 100,000 children.



- In 1999–00, there were 845 hospitalisations of children aged 0–14 years for injuries from assault, with a hospitalisation rate of 21.8 per 100,000 children.
- In all age groups, the rate was higher for boys than for girls.
- The highest rates were for infants.
- The next highest rate for was for boys aged 10–14 years, where the rate was approximately 3 times that for girls in the same age group.

## Aboriginal and Torres Strait Islander children

The rates of hospitalisations for injuries from external causes for Aboriginal and Torres Strait Islander and other Australian children are presented in Table 18.3.

**Table 18.3: Hospitalisation rates for Aboriginal and Torres Strait Islander and other Australian children aged 0–14 years for injuries, 1999–00 (per 100,000 children)**

	Age (years)	Falls	Burns and scalds	Assault	Accidental poisoning	Pedal cyclist injured in transport accident	Pedestrian injured in transport accident	Other causes
<b>Indigenous Australians</b>								
Males	<1	389.7	305.0	559.1	84.7	16.9 <sup>(a)</sup>	16.9 <sup>(a)</sup>	847.2
	1–4	713.5	350.3	103.8	320.0	56.2	64.9	1,063.7
	5–9	883.3	114.0	42.7	46.3	156.7	78.4	1,100.6
	10–14	768.4	52.0	128.1	48.0	192.1	48.0	1,032.5
	0–14	766.4	169.9	122.4	122.7	131.9	60.6	1,051.1
Females	<1	374.4	142.6	285.3	89.1	—	—	784.5
	1–4	581.3	202.8	112.7	301.9	36.1	103.6	941.8
	5–9	782.6	52.2	48.4	29.8	96.9	48.4	622.3
	10–14	348.5	20.7	136.9	37.3	83.0	16.6	643.2
	0–14	558.4	88.34	110.9	109.1	69.4	49.4	725.7
<b>All children</b>		<b>664.4</b>	<b>130.0</b>	<b>116.8</b>	<b>116.1</b>	<b>108.1</b>	<b>55.1</b>	<b>891.8</b>
<b>Other Australians</b>								
Males	<1	333.6	132.9	62.8	111.7	—	2.4 <sup>(a)</sup>	540.8
	1–4	709.9	143.0	15.8	302.4	45.5	41.7	983.7
	5–9	847.8	29.3	8.4	22.3	148.9	38.2	759.9
	10–14	859.3	37.0	37.6	18.3	284.4	32.1	1,053.3
	0–14	779.5	69.33	23.7	102.0	155.5	34.7	901.0
Females	<1	342.9	94.5	45.5	100.6	0.9 <sup>(a)</sup>	5.2	394.5
	1–4	578.3	101.8	12.9	258.7	22.3	24.9	699.9
	5–9	681.7	17.4	3.9	14.8	72.9	18.3	488.0
	10–14	360.1	12.7	7.7	19.3	70.9	21.6	558.7
	0–14	525.4	43.71	10.4	87.4	53.8	20.3	561.5
<b>All children</b>		<b>655.6</b>	<b>56.9</b>	<b>17.2</b>	<b>94.9</b>	<b>113.7</b>	<b>27.7</b>	<b>735.6</b>

(a) Figure denotes that the rate is based on a number less than 5.

Note.: Categories: Falls ICD-10-AM codes S00–T98 & W00–W19; Pedal cyclist injured in transport accident ICD-10-AM codes S00–T98 & V10–V19; Accidental poisoning ICD-10-AM codes S00–T98 & X40–X49; Burns and scalds ICD-10-AM codes S00–T98 & X10–X19 & X00–X09; Pedestrian injured in transport accident ICD-10-AM codes S00–T98 & V01–V09; Assault ICD-10-AM codes S00–T98 & X85–Y09.

Source: AIHW National Hospital Morbidity Database.

- In 1999–00, there were 1,072 hospitalisations of Aboriginal and Torres Strait Islander children for accidental falls. Indigenous children had higher hospitalisation rates for falls than other Australian children (664.4 compared with 655.6 per 100,000 children). Indigenous boys had higher rates than Indigenous girls (766.4 compared with 558.4).