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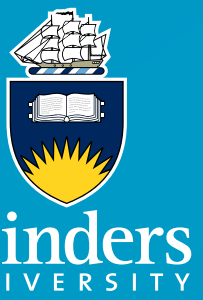
Serious injury due to land transport accidents, Australia 2008–09



INJURY RESEARCH AND STATISTICS SERIES NUMBER 67

Australian Government
Australian Institute of Health and Welfare

Authoritative information and statistics to promote better health and wellbeing

INJURY RESEARCH AND STATISTICS SERIES
Number 67

Serious injury due to land transport accidents, Australia

2008–09

Australian Institute of Health and Welfare
Canberra
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Contents

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Abbreviations

4WD	Four-wheel drive
ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographic Classification
CI	Confidence interval
DIT	Department of Infrastructure and Transport
ICD	International Classification of Diseases
ICD-10-AM	International statistical classification of diseases and related health problems, 10th revision, Australian modification
ICISS	ICD-based Injury Severity Score
NHMD	National Hospital Morbidity Database
SLA	Statistical Local Area
SRR	Survival Risk Ratio

Symbols

n	number
n.p.	not publishable because of small numbers, confidentiality or other concerns about the quality of the data

Summary

This report presents information on serious injury, that is, injury resulting in hospitalisation but not in-hospital death, due to land transport accidents in 2008–09. There is a focus on road vehicle traffic crashes which accounted for nearly two-thirds of all serious injury. This is a companion report to the report on serious injury due to land transport accidents in Australia for the 2007–08 financial year and the report on trends in serious injury due to land transport accidents in Australia 2000–01 to 2008–09.

Land transport accidents

Land transport accidents accounted for 0.7% of all hospitalisations and 9.8% of all hospitalisations due to injury in Australia during 2008–09. There were 53,406 persons seriously injured due to land transport injury with a mean length of stay in hospital of 4.4 days.

Of those seriously injured, 63.9% (n = 34,116) were injured in traffic (on-road) accidents, while 25.9% (n = 13,855) were injured in non-traffic (off-road) accidents. For 10.2% (n = 5,435) of serious injury cases, the location was not specified.

Males were 2.3 times more likely than females to be seriously injured as a result of a land transport accident, while just less than 50% of those seriously injured were aged less than 30 years.

Nationally, and in each jurisdiction, the age-specific rates of serious injury due to land transport accidents were highest at ages 15–24 years.

Car occupants accounted for 33.6% (n = 17,937) of all serious injury cases, followed by motorcyclists (27.1%, n = 14,493) and pedal cyclists (17.9%, n = 9,572).

Road vehicle traffic crashes

For traffic (on-road) accidents, 47.1% of those seriously injured were car occupants, 24.0% were motorcyclists and 15.4% were pedal cyclists.

For those seriously injured due to traffic (on-road) accidents, 25.8% were judged to be suffering from injuries which were considered to be high threat to life.

Motorcyclists had by far the highest rate of 1,346 serious injury cases per 100,000 registered vehicles. This was ten times the corresponding rate for car occupants (134 per 100,000).

Age-standardised rates of serious injury increased according to remoteness of the person's usual residence from an urban centre.

The Northern Territory had by far the highest rates of serious injury per 100,000 vehicles for cars, motorcycles and pick-up trucks or vans. Conversely, the Northern Territory had by far the lowest rate of serious injury for buses. The Northern Territory also had easily the highest age-standardised rates of serious injury and serious injury with high threat to life for road vehicle traffic accidents.

For persons with serious injuries that posed a high threat to life, the mean length of stay in hospital (11.8 days) was almost 2.5 times that of all seriously injured persons and was greater for all age groups.

1 Introduction

The primary purpose of this publication is to present estimates of the number of persons seriously injured in Australia due to transport accidents that occurred on land in the one-year period 2008–09, the latest year for which data were available at the time this report was prepared. Cases were defined as being due to land transport accidents if the first reported International statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM) external cause code in their hospital records was in the range V00-V89.

The main focus of this report is on persons seriously injured as a result of road vehicle traffic crashes. These are defined as land transport accidents coded as having occurred in traffic conditions (i.e. on a public road). This is the subject of Chapter 3. Road vehicles include motor vehicles, pedal cycles and other road vehicles such as trams, animals and animal-drawn vehicles (when they travel on the road). Injured pedestrians were also included. Those seriously injured as a result of an accident involving a train were also included if the accident occurred in a traffic setting such as at a railway level crossing.

Serious injury is defined for this report as an injury which results in the person being admitted to hospital, and subsequently discharged alive either on the same day or after one or more night's stay in a hospital bed (i.e. deaths in hospital are excluded).

The definition of transport injury used in this report includes only unintentional injuries. Hence, cases reported as being due to intentional self-harm, assault or undetermined intent are excluded. Readers should consult the appendix for notes on the methodology employed and for the meaning of technical terms used in this report such as 'separations'.

This report also provides analysis on cases of serious injury resulting from road traffic crashes which are defined as being high threat to life. These cases are selected on the basis of having an ICD-based Injury Severity Score (ICISS) of less than 0.941. ICISS is a measure of injury severity based upon a patient's injury diagnoses. The ICISS measure for this report is based upon ICD-10-AM coding and was derived using Australian hospital separations data (Stephenson et al. 2004). More detail on the ICISS method is provided in the appendix of this report.

Confidence intervals are provided in some tables to show non-sampling variation, which is largest where case counts are small. Further information is provided in the Data issues section.

Overview of all serious injury due to transport

The main topic of this report is serious injury due to land transport accidents. Table 4.1 puts this topic into the context of serious injury due to all forms of transport accidents. During 2008–09 there were an estimated 55,141 serious injury cases due to some form of transport accident. Most (97%; n = 53,406) are known to have involved land transport.

2 Serious injury due to land transport accidents in 2008–09

This section examines non-fatal injury due to road and rail transport. Road and rail transport includes traffic (occurring on a public road), non-traffic and unspecified as to whether traffic or non-traffic.

The number of persons seriously injured during 2008–09 was 53,406 (Table 4.2.2). The mean length of stay in hospital for these persons was 4.4 days. For road traffic crashes, twice as many males as females were seriously injured while for non-traffic (off-road) crashes, more than five times as many males as females were seriously injured. The age-standardised rate for males of 340.8 serious injuries per 100,000 population was almost 2.3 times that of the female rate (150.6 per 100,000 population).

Land transport accidents accounted for 0.7% of all hospital separations and 10% of all injury-related hospital separations (Table 4.2.2). These accidents also accounted for 0.9% of all hospital patient days and 11% of all injury-related hospital patient days.

Of those seriously injured in land transport accidents, almost two-thirds (64%) were injured in traffic conditions (i.e. on public roads) and one-quarter (26%) injured in non-traffic conditions (i.e. off-road) (Table 4.2.1).

State and territory of usual residence

Nationally, and in each jurisdiction, the rates of serious injury due to land transport accidents were highest at ages 15–24 years (Table 4.2.3).

The Northern Territory had the highest age-standardised rate of serious injury due to land transport accidents (344 per 100,000 population) and Western Australia had the lowest rate (220 per 100,000 population). Of the 807 persons seriously injured in the Northern Territory, 247 (30.6%) were Aboriginal and Torres Strait Islanders. Transport injury among Aboriginal and Torres Strait Islander peoples during 2007–08 has been the subject of a previous report in this series (Henley & Harrison 2010).

Age and sex distribution

Just less than half (49%; *n* = 26,162) of the persons seriously injured in land transport accidents were less than 30 years of age. Young people aged 15–24 years represented over one-quarter (26%) of all land transport-related serious injury cases (Table 4.2.4).

Circumstances of injury

Just over one-third (34%, *n* = 272) of children aged 0–4 years seriously injured due to land transport accidents were riding a pedal cycle at the time they sustained their injuries (Table 4.2.5). A smaller proportion (26%) of children aged 0–4 years sustained injuries while occupants of a car, while a further 22% were seriously injured as pedestrians. A relatively high proportion (48%) of land transport accidents involving children aged 0–4 years were specified as having occurred in a non-traffic (i.e. off-road) setting.

Children aged 5–17 years seriously injured due to land transport accidents were most likely to be riding a pedal cycle (36%) or a motorcycle (27%) at the time they sustained their injuries (Table 4.2.6). Just 17% were injured while as an occupant in a car. Similar to children aged

0–4 years , a relatively high proportion (44%) of land transport accidents involving children in this age group were specified as having occurred in a non-traffic (i.e. off-road) setting.

Almost 38% of adults aged 18 years and over seriously injured due to land transport accidents were occupants of a car (Table 4.2.7). Adults were also commonly injured while riding a motorcycle (27%), while a further 13% were injured while riding a pedal cycle. In contrast to those aged 17 years and under, adults were much more likely to be injured in a traffic (i.e. on-road) setting (69%).

Road user group

Overall, the three most common road user groups involved in serious injury were car occupants (33.6% of cases), motorcyclists (27.1%) and pedal cyclists (17.9%) (Table 4.2.8).

Just over three-quarters (75.2%) of the persons seriously injured resided in the three most populous jurisdictions: New South Wales, Victoria and Queensland. These three jurisdictions include 77.5% of the population of Australia.

Mechanism of injury

Many injuries result from a collision between a person's mode of transport and another vehicle, or collision with some other object. In this report, the other vehicle or object is called the counterpart. The counterpart in land transport crashes that resulted in the serious injury of Australians is presented in Tables 4.2.9 (for events recorded as occurring in traffic), 4.2.10 (for events recorded as occurring in non-traffic, codes provided in the ICD-10-AM for injuries to animal riders and occupants of animal-drawn vehicles do not allow traffic/non-traffic to be recorded, all cases of these types are included in Table 4.2.10.) and 4.2.11 (for instances where it is unspecified as to whether it is traffic or non-traffic).

Some of the notable differences between traffic accidents and non-traffic accidents include:

- Almost half (47%) of those injured in traffic accidents were occupants of a car compared to 9% of those injured in non-traffic accidents.
- Cases involving motorcyclists and pedal cyclists collectively made up 72% of all those seriously injured in non-traffic accidents compared to the equivalent total of 40% of those injured in traffic accidents.
- Almost 46% of the car occupants injured in traffic accidents were involved in a collision with another motor vehicle, and a further 26% were involved in a collision with fixed or stationary objects. In contrast, 18% of car occupants injured in non-traffic accidents were involved in a collision with another motor vehicle, while just over 44% were involved in non-collision accidents.
- Around 40% of motorcyclists and pedal cyclists injured in traffic accidents were involved in non-collision accidents and almost one-quarter were injured in a collision with another motor vehicle. In contrast, over 73% of motorcyclists and 77% of pedal cyclists injured in non-traffic accident were involved in non-collision accidents.
- Almost 59% of cases which were unspecified as to whether they occurred in traffic or non-traffic conditions involved an animal rider or occupant of an animal-drawn vehicle, with almost 93% of these cases involving non-collision accidents.

3 Serious injury due to road vehicle traffic crashes, Australia, 2008–09

This section of the report is restricted to road vehicle traffic crashes only, i.e. crashes involving a motor vehicle, pedal cycle or other road vehicle such as an animal, animal-drawn vehicle or tram on a public road. These are crashes that road safety authorities focus on in their development of safety programmes. This section excludes cases unspecified as to whether they occurred in traffic or non-traffic, some of which will have occurred in traffic.

The number of persons seriously injured in road vehicle traffic crashes during 2008–09 was 34,116 (Table 4.3.1). The age-standardised rate for males of 210.9 serious injuries per 100,000 population was almost 2.1 times that of the female rate (101.8 per 100,000 population).

Road vehicle traffic accidents accounted for 0.4% of all hospital separations and 6.3% of all injury-related hospital separations. These accidents also accounted for 0.6% of all hospital patient days and 7.6% of all injury-related hospital patient days.

Age and sex distribution

The burden of injury due to road vehicle traffic crashes was mainly among those of 'working age'; 82% of persons seriously injured were aged 15–64 years (Table 4.3.2). Males accounted for just over two-thirds (67%) of serious injury cases due to road vehicle traffic crashes in 2008–09.

Age-specific serious injury male rates for car drivers and motorcyclists peaked in the 20–24 year age group (Figure 4.3.1). Male rates for car passengers peaked in those aged 15–19 years, while rates for pedal cyclists peaked at 10–14 years of age. Rates for pedestrians were slightly elevated from 15–19 years of age through to 25–29 years of age and in those aged 65 years and over.

Similar patterns were observed for females, although peaks were generally less pronounced. However, in contrast to males, there was no distinct peak in age-specific rates for female motorcyclists.

Age-specific male rates for motorcyclists and pedal cyclists were much higher than female rates across nearly all age groups. Rates for male car drivers were moderately higher than female rates across nearly all age groups. Rates for male car passengers were similar to rates for females from ages 0–4 years through to ages 35–39 years. At older age groups, female rates were higher than male rates, especially in the oldest age group. Rates for male pedestrians were moderately higher than rates for females across most age groups.

Mechanism of injury

In 2008–09, nine circumstances accounted for about 80% of all persons seriously injured in road vehicle traffic crashes (Table 4.3.3). Collisions of a car with a car, pick-up truck or van accounted for almost 22% (n = 7,365).

Road user group

Almost half (47%) of the persons seriously injured in road vehicle traffic crashes were car occupants (Table 4.3.4). There was a large discrepancy between sexes with 36% of seriously injured males being car occupants, compared with 69% of females. Large discrepancies were also observed for motorcyclists (32% of seriously injured males compared to 7% of females) and pedal cyclists (18% of seriously injured males compared to 9% of females). Similar patterns were observed for high threat to life cases.

Twenty-six per cent of serious injury cases due to road vehicle traffic crashes presented a high threat to life (Table 3.4). Males (27%) were slightly more likely to sustain a high threat to life injury than females (24%). Pedestrians (35%) were more likely to sustain a high threat to life injury than any other road user group, while pedal cyclists (17%) were least likely to sustain a high threat to life injury.

Vehicle type by number of registered vehicles

This section shows injury rates for the different types of vehicles registered in Australia. Registered vehicles are motor vehicles authorised to travel on public roads. Hence, serious injury rates for off-road vehicles, pedal cycles, pedestrians, animal riders or occupants of animal-drawn vehicles, occupants of special agricultural, industrial or construction vehicles and trams or trains are not presented.

Motorcyclists had by far the highest serious injury rate recording 1,346 injuries per 100,000 registered motorcycles (Table 4.3.5). This was ten times the corresponding rate for cars (134 per 100,000 registered cars). Overall, the Northern Territory had by far the highest rate of the number of serious injury cases per 100,000 registered vehicles. This was more than 80% higher than the next highest rate of 166 persons recorded by Queensland.

Road user group by state and territory of residence

Most persons who were seriously injured were hospitalised in the same state in which they resided, but about 32% of persons hospitalised in the Australian Capital Territory were residents of New South Wales (Table 4.3.6). For patients hospitalised in a state other than their state of residence, it is unknown whether the location of the crash was interstate or the crash occurred in the same state that the patient resided in but they were transferred to an interstate hospital.

Just over 29% of the cases of persons seriously injured resided in New South Wales, over a quarter resided in Victoria (22%) and 21% resided in Queensland (Table 4.3.7). Notably, the number of car drivers seriously injured was roughly double that for car passengers in all jurisdictions except for the Northern Territory, where the numbers were similar.

High threat to life injury by road user group by state and territory of residence

Differences in rates between jurisdictions can reflect differences in transport-related injury, but they can also reflect differences in practice concerning hospital admission. Cases with highly life-threatening injuries are normally admitted to hospital unless they die too soon for that to happen. However, most injuries present quite low threat to life and can often be treated without being admitted to hospital. Various factors can influence whether injury cases with low threat to life are admitted, including emergency department practices and hospital admission procedures. Analysis of high threat to life injury presents similar data to analysis of serious injury, but is restricted to more severe cases, which are likely to be less subject to data variation due to such factors than are data on all admissions.

On a population basis, age-standardised rates for serious injury with a high threat to life were less likely to vary significantly from the national rate when compared to the rates for serious injury only (Table 4.3.9 and Figures 4.3.5 to 4.3.7). For the Northern Territory, rates for all road user groups except pedal cyclists, were significantly higher than the national average. For Victoria and South Australia, population-based rates for car drivers were significantly higher than the national rate with South Australia also recording a rate for all road traffic crashes significantly higher than the national rate. In Queensland, the rate for motorcyclists was significantly above the national rate.

Remoteness area of residence

The majority (82%) of persons seriously injured in road vehicle traffic crashes resided in Major cities or Inner regional areas (Table 4.3.10). A further 4% of serious injury cases were residents of Remote or Very remote areas. Male rates of serious injury were about 2 to 2.6 times the rate observed for females in each remoteness area. Age-standardised rates of injury increased according to remoteness of the person's usual residence from an urban centre (Table 4.3.11 and Figure 4.3.8).

Length of stay in hospital

Length of stay provides an approximate indication of case severity, as people who are severely injured are more likely to experience longer episodes of care than those with more minor injuries. The mean length of stay in hospital for persons seriously injured in road vehicle traffic crashes was 4.9 days. Persons in older age groups were more likely to have longer lengths of stay in hospital than those in younger age groups (Figure 4.3.9). For the 8,798 persons with serious injuries that posed a high threat to life, the mean length of stay in hospital (11.8 days) was almost 2.5 times that of seriously injured persons and was greater across all age groups (Figure 4.3.10). Refer to the Data issues section of the report for details on how mean length of stay is calculated.

Length of stay in hospital by road user group

Among persons seriously injured due to road vehicle traffic crashes, pedestrians had the longest episodes of care, with a mean length of stay of 7.6 days in hospital. The mean length of stay in hospital was 5.4 days, 5.1 days, 4.8 days and 2.9 days for motorcyclists, car passengers, car drivers and pedal cyclists respectively. Mean length of stay generally increased with age in most age groups (Figure 4.3.11).

Body region injured

The body region injured in road vehicle traffic crashes differed according to road user group (Table 4.3.12). The head was the most commonly injured body region among car occupants and pedestrians while injuries to the shoulder and upper limb were most commonly observed among motorcyclists and pedal cyclists. Injuries to the thorax were also prominent among car occupants while injuries to the lower limbs were also prominent among pedestrians and motorcyclists. The head was the second most commonly injured body region among pedal cyclists.

Length of stay in hospital by body region injured

Persons with hip and thigh injuries had the longest episodes of care, with a mean length of stay in hospital of 8.4 days (Figure 4.3.12). Regardless of the body part injured, persons in older age groups were more likely to have longer lengths of stay in hospital than those in younger age groups.

Patient days in hospital

Injuries to the head accounted for just over one-quarter (26%) of all patient days for car occupants and over 31% of all patient days for pedestrians (Table 4.3.13). For motorcyclists, injuries to the lower limbs accounted for almost one-third (32%) of all patient days, while for pedal cyclists, injuries to the shoulder and upper limbs accounted for over one-quarter (26%) of all patient days. In terms of patient days, head injuries were also prominent among pedal cyclists, while injuries in the abdominal region were prominent among car occupants and injuries to the shoulder and upper limbs were prominent among motorcyclists.

Almost 70% of patient days in hospital were due to six types of road vehicle traffic crashes (Table 4.3.14). Three of these five types of crashes involved car occupants injured in collisions with: 1) a car, pick-up truck or van, 2) a fixed of stationary object or 3) a non-collision transport accident. The remaining three types of crashes involved motorcyclists injured in a collision with a car, pick-up truck or van or a non-collision transport accident or a pedal cyclist injured in a collision with a car, pick-up truck or van.

4 Tables and charts

4.1 Overview of all serious injury due to transport

Table 4.1: Mode of transport for serious injury, Australia 2008–09

Seriously injured person	Count[(a)]	Per cent	Rate[(b)]
Car occupant	*17,937*	*32.5*	*81.5*
traffic	16,079	29.2	73.2
non-traffic	1,259	2.3	5.7
Motorcyclist	*14,493*	*26.3*	*67.4*
traffic	8,197	14.9	37.9
non-traffic	5,939	10.8	27.8
Pedal cyclist	*9,577*	*17.4*	*45.3*
traffic	5,264	9.5	24.7
non-traffic	4,068	7.4	19.4
Pedestrian	*3,686*	*6.7*	*16.8*
traffic	2,690	4.9	12.3
non-traffic	692	1.3	3.2
Occupant of pick-up truck or van	*425*	*0.8*	*1.9*
traffic	321	0.6	1.5
non-traffic	74	0.1	0.3
Occupant of heavy transport vehicle	*790*	*1.4*	*3.6*
traffic	517	0.9	2.4
non-traffic	171	0.3	0.8
Bus occupant	*508*	*0.9*	*2.2*
traffic	171	0.3	0.8
non-traffic	58	0.1	0.3
Animal rider or occupant of animal-drawn vehicle	3,189	5.8	14.9
Occupant of special all-terrain or off-road vehicle	1,095	2.0	5.1
Occupant of three-wheeled motor vehicle	41	0.1	0.2
Occupant of a tram	105	0.2	0.5
Occupant of a train	116	0.2	0.5
Occupant of special industrial vehicle	156	0.3	0.7
Occupant of special agricultural vehicle	227	0.4	1.0
Occupant of special construction vehicle	79	0.1	0.4
Other and unspecified land transport (V87–V89)	982	1.8	4.5
Total (Land transport)	**53,406**	**96.9**	**246.5**
Occupant of watercraft	1,131	2.1	5.2
Occupant of aircraft	163	0.3	0.7
Other and unspecified transport (V98)	441	0.8	2.0
Total (All transport)	**55,141**	**100.0**	**254.5**

(a) Totals for road user groups stratified by traffic and non-traffic include cases that are unspecified as to whether traffic or non-traffic.

(b) Per 100,000 population, adjusted by direct standardisation to the Australian population in June 2001.

Notes

1. Shading denotes the 3 highest figures for a column.
2. 'Mode of transport' here means the vehicle the person was travelling in at the time of being injured in a transport accident. A 'special all-terrain or off-road motor vehicle' refers only to such vehicles that are not registrable for on-road use and does not include registrable 4WD vehicles which are included under 'car occupants'.
3. A traffic accident is any vehicle accident occurring on a public road (i.e. originating on, terminating on, or involving a vehicle partially on the road). A non-traffic accident is any accident that occurs entirely at any place other than a public road.

4.2 Serious injury due to land transport accidents in 2008–09

Table 4.2.1: Land transport injury, Australia 2008–09

Seriously injured[a]	Males	Females	Persons
Road traffic crashes	22,897	11,219	34,116
Non-traffic crashes	11,575	2,280	13,855
Unspecified as to whether traffic or non-traffic	2,443	2,991	5,435
Total	**36,915**	**16,490**	**53,406[b]**

(a) In this report, 'seriously injured' means admitted to hospital due to injury, excluding those who died while in hospital (see the Data issues section under 'Serious injury').

(b) Includes one case where sex is undetermined.

Table 4.2.2: Key indicators for serious land transport injury, Australia 2008–09

			Persons		
Indicator	**Males**	**Females**	**Traffic**	**Non-traffic**	**Total**
Seriously injured[a]					
Person admitted to hospital[b]	36,915	16,490	34,116	13,855	53,406[c]
Percentage of all hospital separations	1.0	0.4	0.4	0.2	0.7
Percentage of all hospital separations due to injury	12.0	7.0	6.3	2.6	9.8
Same day hospitalisations	11,791	5,553	11,094	4,503	17,345
Mean length stay in hospital (days) [d]	4.4	4.4	4.8	3.5	4.4
Total patient days (including same day)	162,120	71,761	164,572	48,220	233,882
Crude rate/100,000 population[e]	341.4	151.1	157.0	63.8	245.8
Age-standardised rate/100,000 population[f]	340.8	150.6	156.7	64.9	246.5

(a) In this report 'seriously injured' means admitted to hospital due to injury (see the Data issues section under 'Serious injury').

(b) In total there were 59,020 admissions to hospital for land transport injury for an estimated 53,782 persons, of whom 376 (0.7%) died in hospital. These deaths are included in estimates of fatal transport injury provided elsewhere by organisations such as the DIT and are omitted from the seriously injured counts in Table 4.2.2 and throughout this report in order to avoid double-counting. The estimate of total patient days excludes separations in which the person died in hospital.

(c) This includes 5,435 hospital cases (including 1,748 same day hospitalisations) and 21,090 total patient days where it is unspecified as to whether the crash occurred in traffic or non-traffic conditions.

(d) This is the average number of days a person is stayed in hospital when seriously injured. Refer to the Data Issues section of this report for details on how mean length of stay is calculated.

(e) Using population denominators in December 2008.

(f) Adjusted by direct standardisation to the Australian population in June 2001.

State and territory of usual residence

Table 4.2.3: Land transport—age-specific rates of serious injury per 100,000 population by state/territory of residence, Australia 2008–09

State and Territory	Age group (years)																		Age Std[a]	Total case numbers
	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+		
NSW	56.1	138.9	276.2	428.6	350.6	278.6	235.1	250.6	226.8	205.8	182.4	176.4	149.3	135.0	162.8	186.0	227.0	223.4	224.6	15,837
Vic	40.6	115.2	289.9	451.8	427.1	313.2	284.7	275.2	252.9	226.7	214.5	167.7	162.4	148.7	164.0	185.7	207.0	234.8	243.8	13,171
Qld	85.3	175.8	417.5	588.7	452.9	353.0	284.1	293.1	246.6	254.1	217.2	187.0	164.5	120.2	159.2	181.1	180.2	183.3	275.6	12,012
WA	52.7	129.2	255.3	480.8	413.7	313.8	261.9	233.9	223.6	177.7	136.8	131.8	112.1	108.0	99.7	187.2	211.6	140.5	219.9	4,874
SA	46.3	127.1	296.5	528.3	386.3	278.3	281.4	267.0	221.2	221.8	197.2	141.7	162.1	125.3	148.7	151.2	190.5	161.1	235.8	3,745
Tas	30.6	99.7	359.4	609.3	508.7	376.4	305.6	303.3	249.8	189.2	177.1	154.5	133.8	130.7	128.2	123.7	155.0	160.4	259.1	1,242
ACT	26.4	121.4	277.5	546.1	452.5	309.9	282.5	319.6	255.1	379.0	288.3	168.5	268.9	88.4	168.1	158.4	242.0	169.6	271.0	976
NT	153.4	255.2	458.6	742.6	586.8	421.4	376.9	382.3	389.1	335.8	218.8	191.6	165.4	95.7	n.p.	n.p.	n.p.	n.p.	343.6	807
Total[b]	**57.8**	**140.7**	**313.8**	**494.0**	**422.3**	**319.3**	**271.7**	**270.4**	**241.5**	**224.7**	**197.8**	**169.9**	**156.8**	**133.5**	**155.6**	**181.9**	**207.8**	**203.8**	**246.5**	
Total case numbers	**808**	**1,894**	**4,396**	**7,302**	**6,471**	**4,867**	**3,995**	**4,331**	**3,651**	**3,485**	**2,790**	**2,186**	**1,778**	**1,119**	**1,042**	**994**	**887**	**751**		

(a) Adjusted by direct standardisation to the Australian population in June 2001.

(b) Includes cases where state/territory of residence is not specified.

Age and sex distribution

Table 4.2.4: Serious injury due to land transport accidents by age group, Australia 2008–09

	Males		Females		Persons	
Age group	**Count**	**Per cent**	**Count**	**Per cent**	**Count**	**Per cent**
0–4 years	510	1.4	300	1.8	810	1.5
5–14 years	4,518	12.2	1,792	10.9	6,310	11.8
15–24 years	10,209	27.7	3,836	23.3	14,045	26.3
25–44 years	12,429	33.7	4,652	28.2	17,081	32.0
45–64 years	6,867	18.6	3,464	21.0	10,332	19.3
65+ years	2,382	6.5	2,446	14.8	4,828	9.0
Total	**36,915**	**100.0**	**16,490**	**100.0**	**53,406**[(a)]	**100.0**

(a) Include one case where sex is undetermined

Circumstances of serious injury in young children aged 0–4 years

Table 4.2.5: Place of occurrence and road user group for young children aged 0–4 years seriously injured due to land transport accidents, Australia 2008–09

			Road user group			
Place	**Count**	**Per cent**	**Pedestrian**	**Pedal cycle**	**Car**	**Other**
Driveway to home	62	7.7	42	8	6	6
Other and unspecified place in home	53	6.5	n.p	41	n.p.	7
Street and highway	*307*	*37.9*	*77*	*37*	*172*	*21*
Roadway	273	33.7	70	24	161	18
Footpath next to road	11	1.4	n.p.	6	n.p.	n.p.
Other and unspecified street and highway	23	2.8	n.p.	7	n.p.	n.p.
Farm	15	1.9	n.p.	0	n.p.	12
School	6	0.7	n.p.	5	n.p.	n.p.
Other specified place of occurrence	46	5.7	14	16	n.p.	n.p.
Unspecified place of occurrence	321	39.6	42	165	22	92
Total	**810**	**100.0**	**178**	**272**	**209**	**151**

.

Circumstances of serious injury for children aged 5–17 years

Table 4.2.6: Place of occurrence and road user group for young children aged 5–17 years seriously injured due to land transport accidents, Australia 2008–09

			Road user group						
Place	**Count**	**Per cent**	**Pedestrian**	**Pedal cycle**	**Car**	**Motorcycle**	**Animal or animal-drawn vehicle**	**Bus**	**Other**
Driveway to home	54	0.5	16	27	5	n.p.	0	0	n.p.
Other and unspecified place in home	143	1.4	7	59	n.p.	37	27	n.p.	10
Street and highway	*3,627*	*34.9*	*436*	*962*	*1,594*	*501*	*0*	*16*	*100*
Roadway	3,201	30.8	406	768	1,485	432	n.p.	16	n.p.
Footpath next to road	131	1.3	15	88	11	15	n.p.	n.p.	0
Cycleway	23	0.2	n.p.	19	n.p.	n.p.	0	0	0
Other specified public highway, street or road	91	0.9	n.p.	17	40	22	n.p.	n.p.	6
Unspecified public highway, street or road	181	1.7	15	70	n.p.	n.p.	n.p.	n.p.	5
Parking place	21	0.2	9	8	n.p.	n.p.	0	0	0
Farm	416	4.0	n.p.	9	24	235	90	n.p.	55
School	41	0.4	n.p.	32	n.p.	0	n.p.	n.p.	0
Sports and athletics area	982	9.4	12	383	6	428	112	0	41
Forest, beach, area of water and other specified countryside	288	2.8	n.p.	79	9	149	29	n.p.	21
Other specified place of occurrence	333	3.2	19	151	9	94	33	n.p.	n.p.
Unspecified place of occurrence	4,496	43.2	79	2,057	102	1,390	593	n.p.	n.p.
Total	**10,401**	**100.0**	**589**	**3,767**	**1,757**	**2,842**	**897**	**23**	**526**

Circumstances of serious injury for adults aged 18 years and older

Table 4.2.7: Place of occurrence and road user group for adults aged 18 years and older seriously injured due to land transport accidents, Australia 2008–09

			Road user group						
Place	**Count**	**Per cent**	**Pedestrian**	**Pedal cycle**	**Car**	**Motorcycle**	**Animal or animal-drawn vehicle**	**Heavy trans-port vehicle**	**Other**
Driveway to home	309	0.7	110	26	93	59	n.p.	n.p.	17
Other and unspecified place in home	196	0.5	14	19	30	72	36	0	25
Street and highway	*27,634*	*65.5*	*2,141*	*2,943*	*14,687*	*6,072*	*28*	*491*	*1,268*
Roadway	25,301	60.0	1,874	2,446	13,727	5,639	23	473	1,119
Footpath next to road	484	1.1	128	150	106	41	0	0	59
Cycleway	133	0.3	n.p.	119	8	n.p.	n.p	n.p.	0
Other specified public highway, street or road	630	1.5	34	62	304	173	5	9	43
Unspecified public highway, street or road	1,086	2.6	n.p.	166	542	n.p.	n.p.	n.p.	47
Parking place	190	0.5	83	9	73	16	n.p.	n.p.	7
Farm	1,282	3.0	18	n.p.	67	585	307	13	n.p.
School	8	0.0	n.p.	n.p.	0	n.p.	8	0	n.p.
Sports and athletics area	1,481	3.5	n.p.	230	80	681	366	n.p.	103
Forest, beach, area of water and other specified countryside	1,196	2.8	n.p.	232	55	695	74	n.p.	127
Other specified place of occurrence	1,074	2.5	135	195	115	246	47	58	278
Unspecified place of occurrence	8,825	20.9	386	1,881	771	3,169	1,398	204	1,016
Total	**42,195**	**100.0**	**2,919**	**5,538**	**15,971**	**11,600**	**2,260**	**775**	**3,132**

Road user group by state and territory of residence

Table 4.2.8: Land transport—serious injury cases by road user group and state/territory of usual residence, Australia 2008–09

	Serious injury case counts														
Road user group	**Car**	**Motor-cycle**	**Pedal cycle**	**Pedestrian**	**Animal or animal-drawn vehicle**	**Heavy transport vehicle**	**Pick-up truck or van**	**Special all-terrain or off-road vehicle[(a)]**	**Bus**	**Special industrial, agricultural or construction vehicle**	**Train**	**Three-wheeled motor vehicle**	**Tram**	**Unknown**	**Total**
State and territory															
NSW	5,249	4,348	2,701	1,250	972	240	100	281	181	116	44	15	14	326	15,837
Vic	4,796	3,183	2,580	977	693	167	125	147	103	90	39	12	67	192	13,171
Qld	3,451	3,759	2,083	622	1,011	223	73	254	93	148	16	8	11	260	12,012
WA	1,641	1,388	813	329	162	81	50	215	59	34	6	n.p.	n.p.	91	4,874
SA	1,439	965	604	247	177	50	33	85	45	36	8	n.p.	n.p.	49	3,745
Tas	441	337	205	69	65	11	8	57	8	18	0	n.p.	n.p.	21	1,242
ACT	278	226	352	46	33	n.p.	5	6	n.p.	n.p.	n.p.	8	n.p.	13	976
NT	285	197	139	59	47	n.p.	17	36	n.p.	n.p.	n.p.	0	0	10	807
Total[(b)]	**17,937**	**14,493**	**9,577**	**3,686**	**3,189**	**790**	**425**	**1,095**	**508**	**462**	**116**	**41**	**105**	**982**	**53,406**

(a) A ‘special all-terrain or off-road motor vehicle’ refers only to such vehicles that are not registrable for on-road use and does not include registrable 4WD passenger vehicles, which are included under ‘Car’.

(b) Total includes other territories such as Cocos (Keeling) Islands, Christmas Island and Jervis Bay (n<5) as well as cases where state/territory of residence is not specified.

Mechanism of injury

Table 4.2.9: Traffic serious injury—mechanism of serious injury in land transport accidents, Australia 2008–09

	Counterpart in collision										
Injured person	**Car, pick-up truck or van**	**2- or 3-wheeled motor vehicle**	**Pedal cycle**	**Pedestrian or animal**	**Heavy transport vehicle or bus**	**Train**	**Other non-motor vehicle**	**Fixed or stationary object**	**Non-collision transport accident[(b)]**	**Other and unspecified transport accidents**	**Total**
Car occupant	7,365	30	11	123	541	20	34	4,191	2,831	933	16,079
Motorcyclist	1,868	173	5	149	85	n.p.	n.p.	712	3,162	2,037	8,197
Pedal cyclist	1,090	14	198	33	71	n.p.	n.p.	253	2,152	1,445	5,264
Pedestrian	2,359	51	40	8	131	17	8	0	0	76	2,690
Occupant of pick-up truck or van	75	n.p.	0	10	20	n.p.	0	69	124	21	321
Occupant of heavy transport vehicle	60	0	0	6	86	n.p.	n.p.	40	250	72	517
Bus occupant	29	0	0	n.p.	15	0	0	n.p.	102	18	171
Animal rider or occupant of animal-drawn vehicle	n.p.	0	0	0	0	0	0	0	0	0	n.p.
Occupant of special all-terrain or off-road vehicle[(a)]	0	0	0	0	0	0	0	0	0	70	70
Occupant of three-wheeled motor vehicle	n.p.	n.p.	0	n.p.	0	0	0	n.p.	6	n.p.	14
Occupant of a tram	0	0	0	0	0	0	0	0	0	11	11
Occupant of a train	0	0	0	0	0	0	0	0	0	7	7
Occupant of special agricultural or industrial or construction vehicle	0	0	0	0	0	0	0	0	0	n.p.	n.p.
Unknown	0	0	0	0	0	0	0	0	98	670	768
Total	**12,848**	**271**	**254**	**331**	**949**	**43**	**53**	**5,271**	**8,725**	**5,371**	**34,116**

(a) A 'special all-terrain or off-road vehicle' refers only to such vehicles that are no longer registrable for on-road use and does not include registrable 4WD passenger vehicles, which are included under 'car occupants'.

(b) Includes non-collision accidents such as overturning, falling or being thrown from a vehicle.

Note: Shading denotes categories included in the seven most common types of land transport accidents resulting in serious injury as listed in the 'mechanism of injury' section.

Table 4.2.10: Non-traffic serious injury—mechanism of serious injury in land transport accidents, Australia 2008–09

	Counterpart in collision										
Injured person	**Car, pick-up truck or van**	**2- or 3-wheeled motor vehicle**	**Pedal cycle**	**Pedestrian or animal**	**Heavy transport vehicle or bus**	**Train**	**Other non-motor vehicle**	**Fixed or stationary object**	**Non-collision transport accident[(b)]**	**Other and unspecified transport accidents**	**Total**
Car occupant	222	n.p.	0	16	n.p.	0	n.p.	404	558	51	1,259
Motorcyclist	58	264	8	74	6	n.p.	n.p.	858	4,314	346	5,939
Pedal cyclist	36	6	307	32	n.p.	0	n.p.	284	3,126	269	4,068
Pedestrian	405	23	51	45	22	9	25	0	0	112	692
Occupant of pick-up truck or van	7	0	0	n.p.	n.p.	0	0	11	43	9	74
Occupant of heavy transport vehicle	n.p.	0	0	n.p.	18	0	n.p.	10	133	n.p.	171
Bus occupant	n.p.	0	0	n.p.	n.p.	n.p.	0	n.p.	41	11	58
Animal rider or occupant of animal-drawn vehicle	0	0	0	0	0	0	0	0	0	0	0
Occupant of special all-terrain or off-road vehicle[(a)]	0	0	0	0	0	0	0	0	0	1,014	1,014
Occupant of three-wheeled motor vehicle	n.p.	n.p.	0	0	0	0	n.p.	n.p.	16	n.p.	25
Occupant of a tram	0	0	0	0	0	0	0	0	0	0	0
Occupant of a train	0	0	0	0	0	0	0	0	0	0	0
Occupant of special agricultural or industrial or construction vehicle	0	0	0	0	0	0	0	0	0	424	424
Unknown	0	0	0	0	0	0	0	0	30	101	131
Total	**731**	**294**	**366**	**170**	**56**	**10**	**48**	**1,575**	**8,261**	**2,344**	**13,855**

(a) A 'special all-terrain or off-road vehicle' refers only to such vehicles that are no longer registrable for on-road use and does not include registrable 4WD passenger vehicles, which are included under 'car occupants'.

(b) Includes non-collision accidents such as overturning, falling or being thrown from a vehicle.

Note: Shading denotes categories included in the two most common types of land transport accidents resulting in serious injury as listed in the 'mechanism of injury' section.

Table 4.2.11: Unspecified as to whether traffic or non-traffic serious injury—mechanism of serious injury in land transport accidents, Australia, 2008–09

	Counterpart in collision										
Injured person	**Car, pick-up truck or van**	**2- or 3-wheeled motor vehicle**	**Pedal cycle**	**Pedestrian or animal**	**Heavy transport vehicle or bus**	**Train**	**Other non-motor vehicle**	**Fixed or stationary object**	**Non-collision transport accident[(b)]**	**Other and unspecified transport accidents**	**Total**
Car occupant	49	0	0	n.p.	n.p.	n.p.	0	6	395	147	599
Motorcyclist	n.p.	n.p.	0	0	0	0	0	n.p.	25	323	357
Pedal cyclist	n.p.	0	n.p.	0	0	0	0	n.p.	17	221	245
Pedestrian	201	11	24	n.p.	9	n.p.	n.p.	0	0	52	304
Occupant of pick-up truck or van	0	0	0	0	0	0	n.p.	n.p.	19	10	30
Occupant of heavy transport vehicle	0	0	0	0	10	0	n.p.	n.p.	75	16	102
Bus occupant	0	n.p.	0	5	11	0	n.p.	4	192	65	279
Animal rider or occupant of animal-drawn vehicle[(a)]	0	0	0	5	0	0	9	14	2,963	198	3,189
Occupant of special all-terrain or off-road vehicle	0	0	0	0	0	0	0	0	0	n.p.	n.p.
Occupant of three-wheeled motor vehicle	0	0	0	0	0	0	0	0	n.p.	n.p.	n.p.
Occupant of a tram	0	0	n.p.	0	n.p.	0	n.p.	0	0	93	94
Occupant of a train	0	0	0	0	n.p.	0	0	0	n.p.	107	109
Occupant of special agricultural or industrial or construction vehicle	0	0	0	0	0	0	0	0	0	31	31
Unknown	0	0	0	0	0	0	0	0	0	83	83
Total	**253**	**16**	**28**	**15**	**31**	**n.p.**	**n.p.**	**32**	**3,689**	**1,358**	**5,435**

(a) A 'special all-terrain or off-road vehicle' refers only to such vehicles that are no longer registrable for on-road use and does not include registrable 4WD passenger vehicles, which are included under 'car occupants'.

(b) Includes non-collision accidents such as overturning, falling or being thrown from a vehicle.

4.3 Serious injury due to road vehicle traffic crashes, Australia, 2008–09

Table 4.3.1: Key indicators for serious injury due to road vehicle traffic crashes, Australia 2008–09

Indicator	Males	Females	Persons
Seriously injured[(a)]			
Persons admitted to hospital[(b)]	22,897	11,219	34,116
Percentage of all hospital separations	0.6	0.3	0.4
Percentage of all hospital separations due to injury	7.4	4.8	6.3
Same day hospitalisations	7,294	3,800	11,094
Mean length of stay in hospital (days)[(c)]	4.9	4.6	4.8
Total patient days (including same day)	112,624	51,948	164,572
Crude rate/100,000 population[(d)]	211.7	102.8	157.0
Age-standardised rate/100,000 population[(e)]	210.9	101.8	156.7

(a) In this report 'seriously injured' means admitted to hospital due to injury (see the Data issues section under 'Serious injury').

(b) In total there were 37,515 admissions to hospital for land transport injury for an estimated 34,447 persons, of whom 331 (1.0%) died in hospital. These deaths are included in estimates of fatal transport injury provided elsewhere by organisations such as the DIT and are omitted from the seriously injured counts in Table 4.3.1 and throughout this report in order to avoid double-counting. The estimate of total patient days excludes separations in which the person died in hospital.

(c) This is the average number of days a person stayed in hospital when seriously injured. Refer to the Data issues section of this report for details on how mean length of stay is calculated.

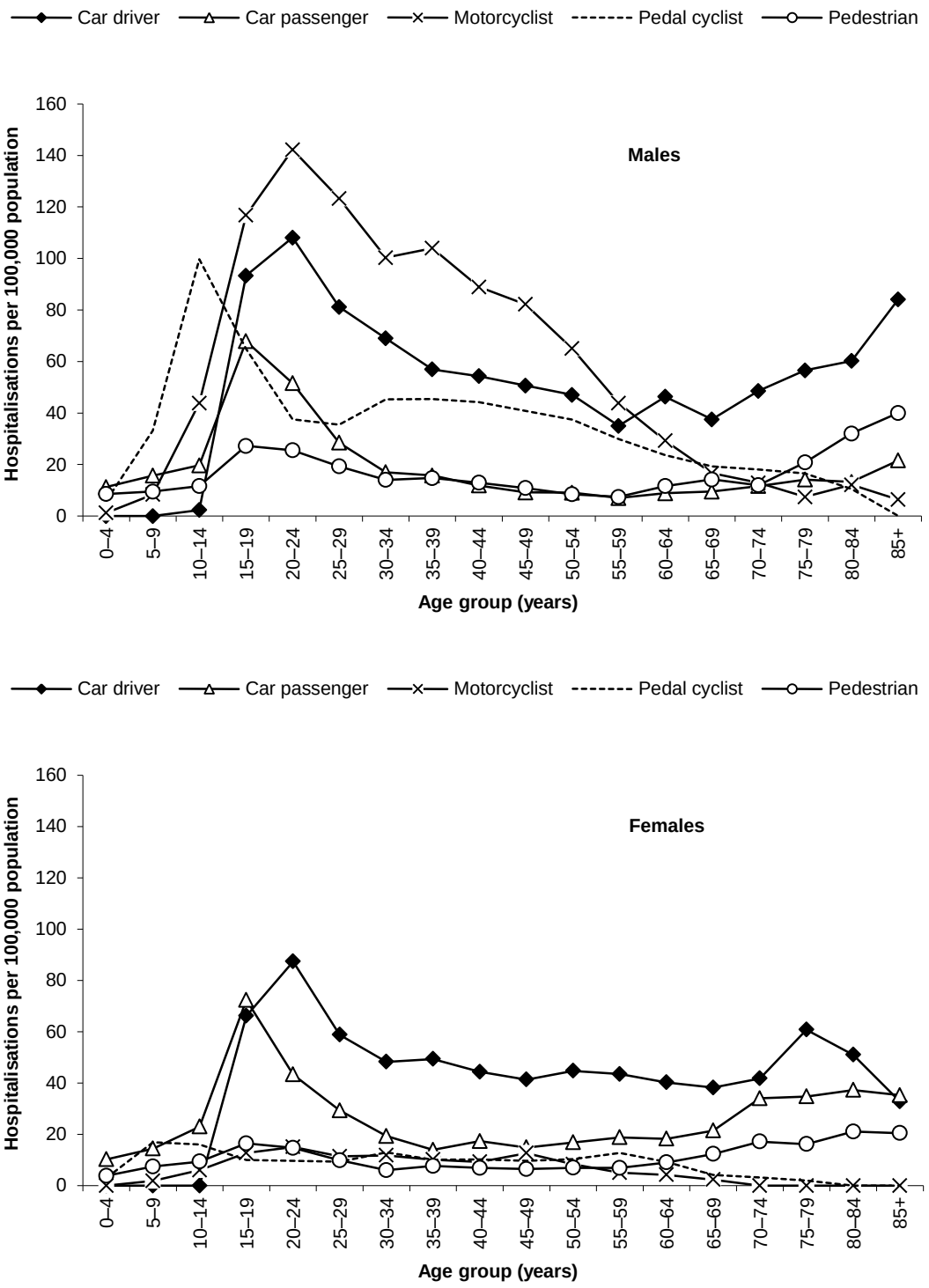
(d) Using population denominators in December 2008.

(e) Adjusted by direct standardisation to the Australian population in June 2001.

Age and sex distribution

Table 4.3.2: Serious injury due to road vehicle traffic crashes by age group, Australia 2008–09

	Males		Females		Persons	
Age group	Count	Per cent	Count	Per cent	Count	Per cent
0–4 years	214	0.9	133	1.2	347	1.0
5–14 years	1,808	7.9	679	6.1	2,487	7.3
15–24 years	6,258	27.3	2,817	25.1	9,075	26.6
25–44 years	8,297	36.2	3,328	29.7	11,625	34.1
45–64 years	4,684	20.5	2,565	22.9	7,249	21.2
65+ years	1,636	7.1	1,697	15.1	3,333	9.8
Total	**22,897**	**100.0**	**11,219**	**100.0**	**34,116**	**100.0**



Note: Rates based on small cell counts have been set to zero.

Figure 4.3.1: Road vehicle traffic crashes—age-specific serious injury rates by sex, Australia 2008–09

Mechanism of injury

Table 4.3.3: Nine most common mechanisms of serious injury for road vehicle traffic crashes, Australia 2008-09

		Seriously injured	
Road user type of injured person	**Type of collision**	**Count**	**Per cent of road vehicle traffic serious injury cases (*n* = *34*,116)**
Car occupant	Car in collision with car, pick-up truck or van	7,365	21.6
	Car in collision with fixed or stationary object	4,191	12.3
	Car in non-collision transport accident	2,831	8.3
Pedestrian	Pedestrian in collision with a car, pick-up truck or van	2,359	6.9
Motorcyclist	Motorcycle in non-collision transport accident	3,162	9.3
	Motorcycle in other and unspecified transport accident	2,037	6.0
	Motorcycle in collision with car, pick-up truck or van	1,868	5.5
Pedal Cyclist	Pedal cycle in non-collision transport accident	2,152	6.3
	Pedal cycle in other and unspecified transport accident	1,445	4.2
	Total of most common mechanisms	**27,410**	**80.3**

Road user group

Table 4.3.4: Serious injury due to road vehicle traffic crashes by road user group, Australia 2008–09

	Seriously injured						
	All cases			High threat-to-life cases[a]			Per cent high threat-to-life
Road user group	Count	Per cent	Rate[b]	Count	Per cent	Rate[b]	
Males							
Car occupant[c]	*8,310*	*36.3*	*76.1*	*2,634*	*42.8*	*24.0*	*31.7*
Car driver	5,530	24.2	50.6	1,738	28.2	15.9	31.4
Car passenger	2,238	9.8	20.5	776	12.6	7.0	34.7
Motorcyclist	7,373	32.2	67.8	1,799	29.2	16.5	24.4
Pedal cyclist	4,224	18.4	39.4	783	12.7	7.2	18.5
Pedestrian	1,622	7.1	15.0	581	9.4	5.4	35.8
Heavy transport vehicle occupant	492	2.1	4.5	160	2.6	1.5	32.5
Pick-up truck or van occupant	243	1.1	2.2	83	1.3	0.8	34.2
Bus occupant	68	0.3	0.6	15	0.2	0.1	22.1
Other or unknown	565	2.5	5.2	102	1.7	1.0	18.1
Total	**22,897**	**100.0**	**210.9**	**6,157**	**100.0**	**56.4**	**26.9**
Females							
Car occupant[c]	*7,769*	*69.2*	*70.2*	*1,885*	*71.4*	*16.9*	*24.3*
Car driver	4,566	40.7	41.1	1,063	40.2	9.5	23.3
Car passenger	2,752	24.5	25.0	762	28.9	6.9	27.7
Motorcyclist	824	7.3	7.7	160	6.1	1.5	19.4
Pedal cyclist	1,040	9.3	9.8	134	5.1	1.2	12.9
Pedestrian	1,068	9.5	9.6	358	13.6	3.2	33.5
Heavy transport vehicle occupant	25	0.2	0.2	5	0.2	0.0	20.0
Pick-up truck or van occupant	78	0.7	0.7	26	1.0	0.2	33.3
Bus occupant	103	0.9	0.9	21	0.8	0.2	20.4
Other or unknown	312	2.8	2.8	52	2.0	0.5	16.7
Total	**11,219**	**100.0**	**101.8**	**2,641**	**100.0**	**23.7**	**23.5**
Persons							
Car occupant[c]	*16,079*	*47.1*	*73.2*	*4,519*	*51.4*	*20.5*	*28.1*
Car driver	10,096	29.6	45.8	2,801	31.8	12.6	27.7
Car passenger	4,990	14.6	22.9	1,538	17.5	7.0	30.8
Motorcyclist	8,197	24.0	37.9	1,959	22.3	9.0	23.9
Pedal cyclist	5,264	15.4	24.7	917	10.4	4.2	17.4
Pedestrian	2,690	7.9	12.3	939	10.7	4.3	34.9
Heavy transport vehicle occupant	517	1.5	2.4	165	1.9	0.8	31.9
Pick-up truck or van occupant	321	0.9	1.5	109	1.2	0.5	34.0
Bus occupant	171	0.5	0.8	36	0.4	0.2	21.1
Other or unknown	877	2.6	4.0	154	1.8	0.7	17.6
Total	**34,116**	**100.0**	**156.7**	**8,798**	**100.0**	**40.1**	**25.8**

(a) Cases for which the ICISS <0.941. Refer to the Data issues section for definition of ICISS.

(b) Per 100,000 population, adjusted by direct standardisation to the Australian population in June 2001.

(c) 'Car occupants' includes cases for which the position of the injured person within the car is unspecified.

Vehicle type by number of registered vehicles

Table 4.3.5: Road vehicle traffic crashes—serious injury rate per 100,000 registered vehicles by vehicle type and state/territory, Australia 2008–09

	Crude injury rate per 100,000 vehicles (95% CI[a])						
State and territory	**Cars‡**	**Motorcycles***	**Pick-up trucks or vans****	**Heavy transport vehicles† [b]**	**Buses**	**Total[c]**	**Total case numbers**
NSW	130 (126–133)	1,536 (1,476–1,598)	11.1 (8.81–14.1)	103 (87.6–122)	248 (190–322)	162 (158–166)	**7,372**
Vic	139 (135–144)	1,239 (1,183–1,298)	19.5 (16.1–23.7)	86.6 (71.6–105)	229 (169–311)	162 (158–166)	**6,454**
Qld	129 (125–134)	1,437 (1,378–1,500)	7.5 (5.65–10.1)	133 (113–155)	148 (102–215)	166 (162–171)	**5,414**
WA	109 (103–115)	943 (879–1,011)	13.5 (9.93–18.4)	96.7 (76.3–123)	133 (82.7–214)	131 (126–137)	**2,375**
SA	136 (129–144)	1,207 (1,108–1,315)	17.1 (11.7–24.9)	96.6 (69.0–135)	267 (155–461)	158 (151–165)	**1,896**
Tas	136 (123–151)	1,400 (1,212–1,618)	7.42 (3.34–16.5)	56.7 (27.0–119)	248 (111–552)	148 (137–161)	**591**
ACT	119 (105–135)	1,326 (1,128–1,559)	n.p.	n.p.	n.p.	163 (148–180)	**401**
NT	322 (284–364)	2,185 (1,823–2,619)	42.4 (25.1–71.7)	n.p.	0 (0–0)	306 (277–338)	**390**
Total	**134 (132–136)**	**1,346 (1,317–1,376)**	**13.7 (12.2–15.2)**	**103 (94.9–113)**	**205 (176–238)**	**162 (160–164)**	
Total case numbers	**16,079**	**8,211**	**321**	**517**	**171**		**25,299**

(a) Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

(b) For trucks, data are presented for state and territory of operation rather than state/territory of registration.

(c) Includes in the denominator the ABS Motor Vehicle Census data for campervans and non-freight carrying trucks as these would be coded using ICD-10-AM variously as cars, trucks, pick-up trucks or vans and hence included in the numerator.

Notes

1. Case numbers are grouped by state and territory of usual residence and vehicle denominators are grouped by state/territory of registration of vehicle.
2. The vehicle types in this table are defined according to ICD-10-AM, which are very close to the definitions used by the ABS from which the denominators are derived.
3. Defined in the ABS Motor Vehicle Census as ‡ Passenger vehicles, ** Light commercial vehicle and † Rigid truck and articulated truck.
4. *Motorcycles as defined in the ABS Motor Vehicle Census include two or three-wheeled motor vehicles, so three-wheeled motor vehicles are also included in the numerator for this table.

Road user group by state and territory of residence

Table 4.3.6: Serious injury due to road vehicle traffic crashes—state and territory of hospitalisation and state/territory of usual residence, Australia 2008–09

State or territory of residence	State or territory of hospitalisation								
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	National
NSW	9,415	107	170	13	46	15	279	5	10,050
Vic	153	8,472	46	16	69	24	18	20	8,818
Qld	176	23	6,914	20	12	n.p.	n.p.	17	7,170
WA	5	12	15	3,090	13	n.p.	n.p.	10	3,152
SA	20	26	17	n.p.	2,361	n.p.	n.p.	18	2,445
Tas	n.p.	n.p.	n.p.	n.p.	n.p.	755	n.p.	n.p.	775
ACT	40	9	n.p.	0	n.p.	0	556	n.p.	613
NT	n.p.	n.p.	10	11	16	0	n.p.	468	513
Not reported	123	79	165	81	23	n.p.	n.p.	34	523
National[(a)]	**9,983**	**8,743**	**7,347**	**3,233**	**2,544**	**817**	**867**	**582**	**34,116**

(a) Includes other territories such as Cocos (Keeling) Islands, Christmas Island and Jervis Bay (*n* = 57).

Table 4.3.7: Serious injury due to road vehicle traffic crashes by sex and state/territory of residence, Australia 2008–09

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	National
Males									
Car occupant	*2,377*	*2,223*	*1,614*	*781*	*660*	*210*	*119*	*155*	*8,310*
Car driver	1,642	1,590	1,015	463	450	137	84	72	5,530
Car passenger	587	541	443	252	183	54	30	70	2,238
Motorcyclist	2,222	1,604	1,894	728	472	177	123	97	7,373
Pedal cyclist	1,206	1,176	887	354	274	97	131	55	4,224
Pedestrian	558	408	268	161	115	28	16	27	1,622
Heavy transport vehicle occupant	131	102	146	67	32	7	n.p.	n.p.	492
Pick-up truck or van occupant	57	78	36	32	21	n.p.	n.p.	9	243
Bus occupant	19	18	13	n.p.	6	n.p.	n.p.	n.p.	68
Other or unknown	196	89	170	n.p.	31	n.p.	n.p.	n.p.	565
Total	**6,766**	**5,698**	**5,028**	**2,170**	**1,611**	**540**	**403**	**350**	**22,897**[(a)]
Females									
Car occupant	*2,285*	*2,189*	*1,435*	*672*	*639*	*178*	*128*	*102*	*7,769*
Car driver	1,348	1,368	825	365	385	109	83	42	4,566
Car passenger	805	727	488	258	230	60	38	57	2,752
Motorcyclist	219	184	240	69	49	7	24	20	824
Pedal cyclist	244	310	206	111	62	13	44	21	1,040
Pedestrian	390	314	154	78	57	19	9	8	1,068
Heavy transport vehicle occupant	9	n.p.	8	n.p.	n.p.	0	n.p.	n.p.	25
Pick-up truck or van occupant	13	24	10	8	6	n.p.	n.p.	n.p.	78
Bus occupant	36	23	15	13	7	n.p.	n.p.	n.p.	103
Other or unknown	88	n.p.	74	n.p.	n.p.	n.p.	n.p.	6	312
Total	**3,284**	**3,120**	**2,142**	**982**	**834**	**235**	**210**	**163**	**11,219**[(a)]
Persons									
Car occupant	*4,662*	*4,412*	*3,049*	*1,453*	*1,299*	*388*	*247*	*257*	*16,079*
Car driver	2,990	2,958	1,840	828	835	246	167	114	10,096
Car passenger	1,392	1,268	931	510	413	114	68	127	4,990
Motorcyclist	2,441	1,788	2,134	797	521	184	147	117	8,197
Pedal cyclist	1,450	1,486	1,093	465	336	110	175	76	5,264
Pedestrian	948	722	422	239	172	47	25	35	2,690
Heavy transport vehicle occupant	140	n.p.	154	n.p.	n.p.	7	n.p.	n.p.	517
Pick-up truck or van occupant	70	102	46	40	27	6	n.p.	n.p.	321
Bus occupant	55	41	28	n.p.	13	6	n.p.	0	171
Other or unknown	284	n.p.	244	73	n.p.	27	12	12	877
Total	**10,050**	**8,818**	**7,170**	**3,152**	**2,445**	**775**	**613**	**513**	**34,116**[(a)]

(a) There were 523 (male=293, female=230) cases missing data on state/territory of usual residence and 57 cases (male=38, female=19) that were 'other territories'. 'Other territories' include Cocos (Keeling) Islands, Christmas Island and Jervis Bay.

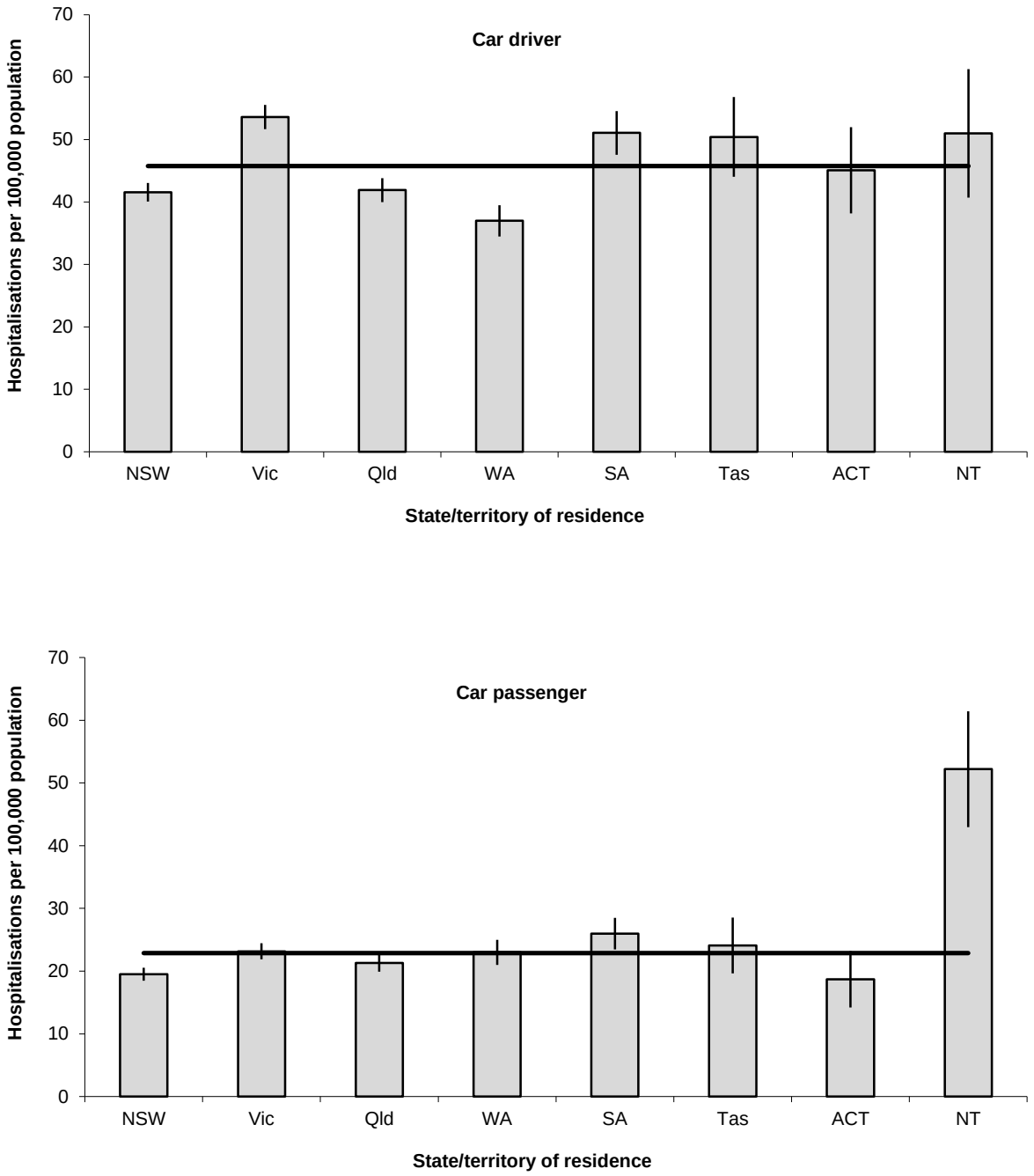
Table 4.3.8: Road vehicle traffic crashes—age-standardised rates of serious injury by road user group and state and territory of residence, Australia, 2008–09

Seriously injured person	Age-standardised rate per 100,000 population (95% CI[(a)])								
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	National[(b)]
Car occupant	65 (63–67)	80 (78–83)	70 (67–72)	65 (62–68)	80 (76–85)	80 (72–88)	67 (59–76)	111 (97–126)	73 (72–74)
Car driver	42 (40–43)	54 (52–56)	42 (40–44)	37 (34–40)	51 (48–55)	50 (44–57)	45 (38–52)	51 (41–61)	46 (45–47)
Car passenger	20 (18–21)	23 (22–24)	21 (20–23)	23 (21–25)	26 (23–29)	24 (20–29)	19 (14–23)	52 (43–61)	23 (22–23)
Motorcyclist	35 (33–36)	33 (32–35)	49 (47–51)	36 (33–38)	34 (31–37)	39 (34–45)	39 (33–46)	48 (39–57)	38 (37–39)
Pedal cyclist	21 (20–22)	28 (27–30)	25 (24–27)	21 (19–23)	22 (19–24)	23 (19–27)	49 (42–57)	32 (25–39)	25 (24–25)
Pedestrian	13 (12–14)	13 (12–14)	10 (9–11)	11 (9–12)	11 (9–12)	9 (6–12)	7 (4–9)	15 (10–19)	12 (12–13)
Total for road traffic crashes	**142 (139–144)**	**162 (159–166)**	**164 (160–168)**	**142 (137–147)**	**153 (147–159)**	**161 (149–172)**	**168 (155–182)**	**217 (198–237)**	**157 (155–158)**
Total case numbers	**10,050**	**8,818**	**7,170**	**3,152**	**2,445**	**775**	**613**	**513**	**34,116**

(a) Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

(b) There were 523 (male=293, female=230) cases missing data on state/territory of usual residence and 57 (male=39, female=19) cases that were 'other territories'. 'Other territories' include Cocos (Keeling) Islands, Christmas Island and Jervis Bay.

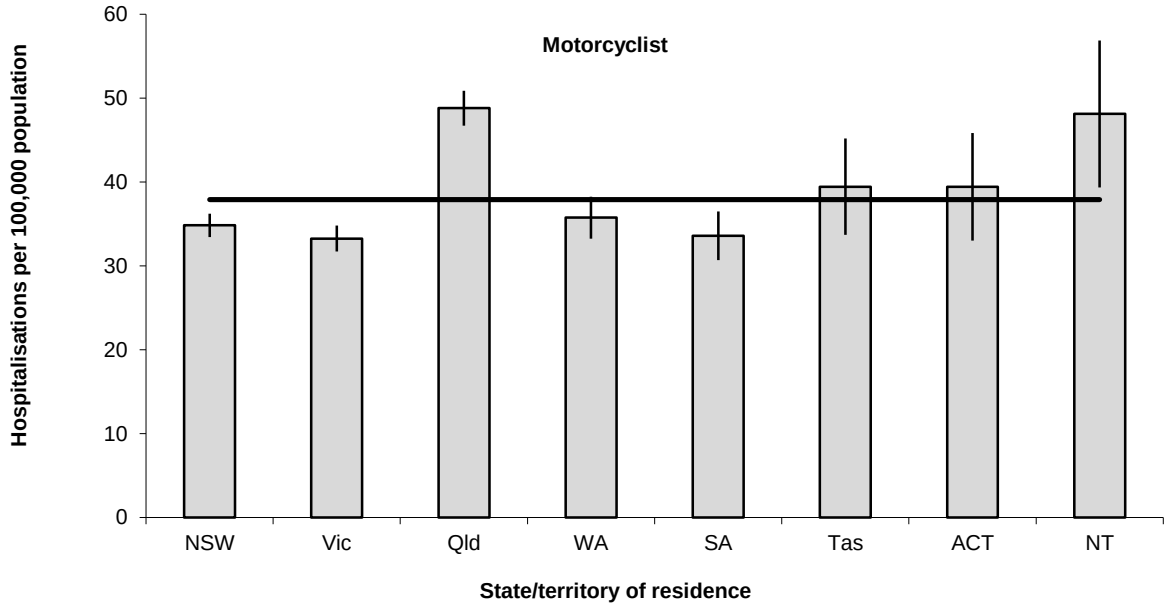
Note: Shaded areas indicate jurisdictions with rates markedly above the national rate.

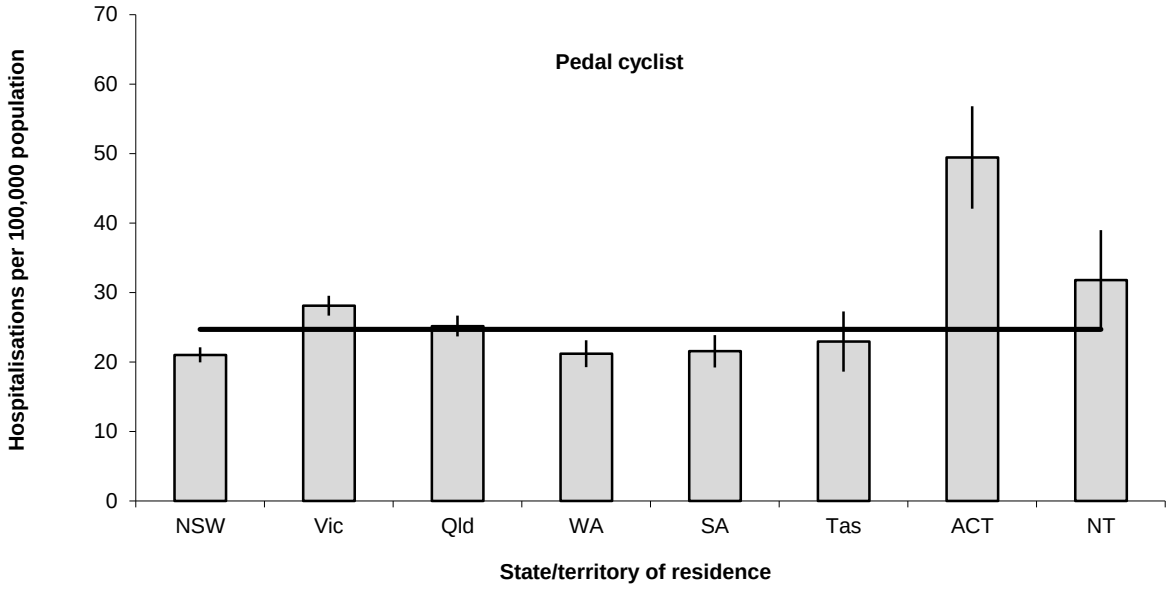


Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.2: Road vehicle traffic crashes—age-standardised rates of serious injury for car drivers and car passengers by state/territory of residence, Australia 2008–09

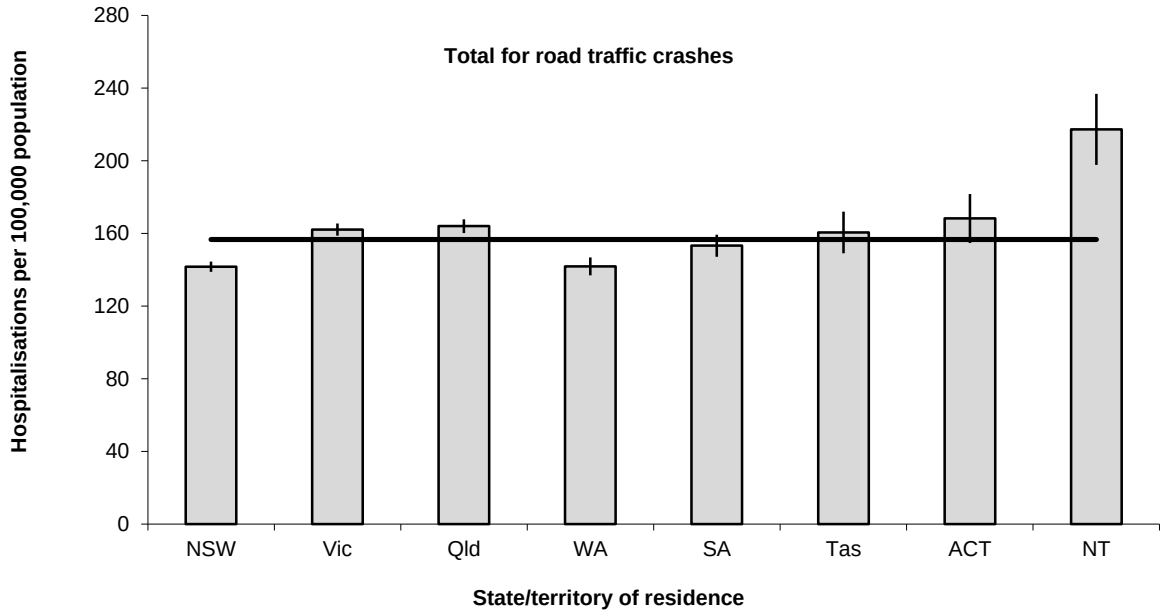




Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.3: Road vehicle traffic crashes—age-standardised rates of serious injury for motorcyclists and pedal cyclists by state/territory of residence, Australia 2008–09



Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.4: Road vehicle traffic crashes—age-standardised rates of serious injury for pedestrians and all road traffic crashes by state/territory of residence, Australia 2008–09

High threat to life by road user group by state and territory of residence

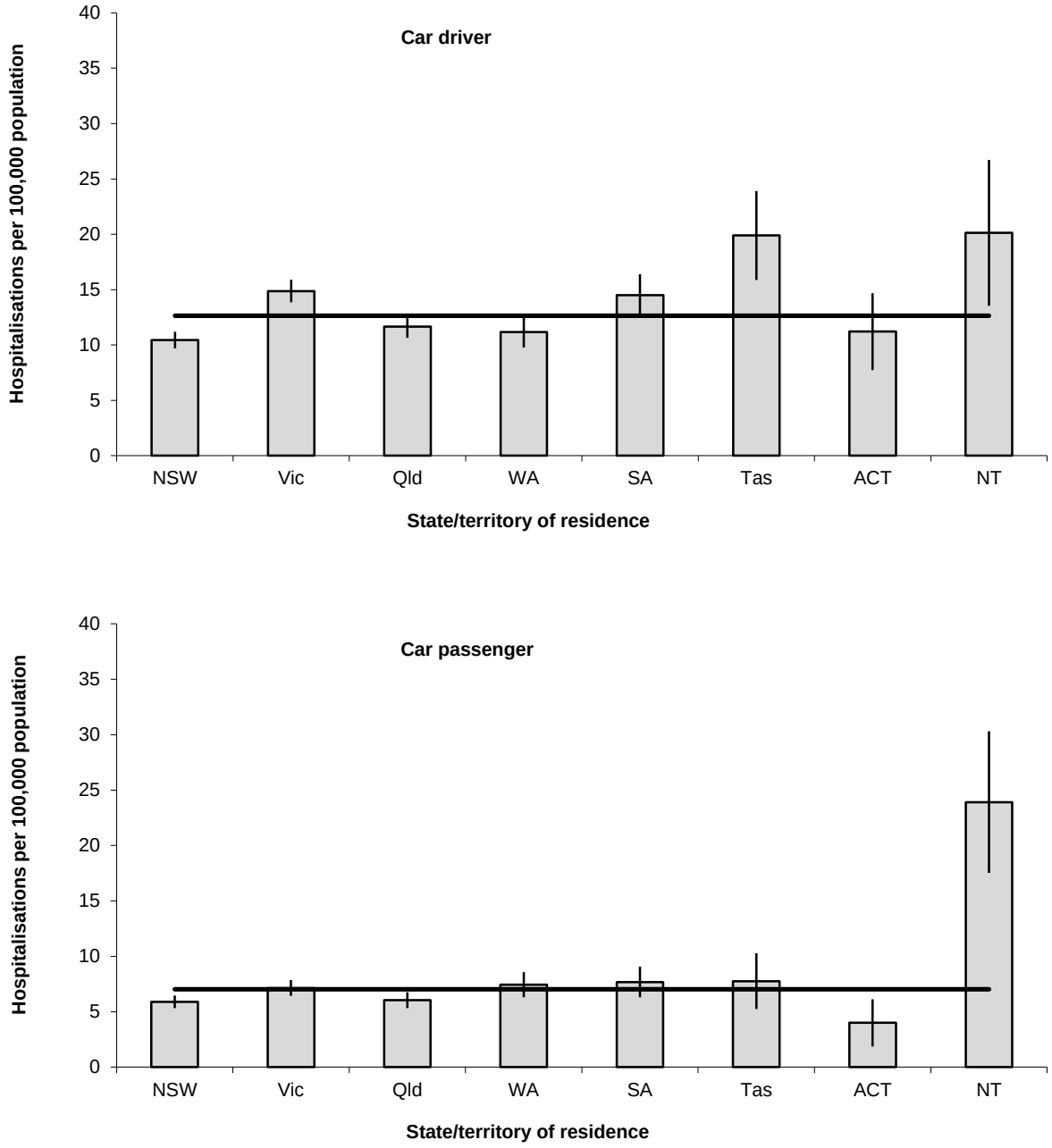
Table 4.3.9: Serious injury with a high threat to life – age-standardised rates for road vehicle traffic crashes by road user group and state/territory of residence, Australia, 2008–09

Seriously injured person	Age-standardised rate per 100,000 population (95% CI[(a)])								
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	National[(b)]
Car occupant	*17 (16–18)*	*22 (21–24)*	*19 (17–20)*	*20 (18–22)*	*23 (21–25)*	*28 (24–33)*	*16 (12–20)*	*48 (38–58)*	*20 (20–21)*
Car driver	10 (10–11)	15 (14–16)	12 (11–13)	11 (10–13)	15 (13–16)	20 (16–24)	11 (8–15)	20 (14–27)	13 (12–13)
Car passenger	6 (5–6)	7 (6–8)	6 (5–7)	7 (6–9)	8 (6–9)	8 (5–10)	4 (2–6)	24 (18–30)	7 (7–7)
Motorcyclist	8 (7–8)	8 (7–9)	11 (10–12)	8 (7–9)	9 (8–11)	10 (7–13)	9 (6–12)	16 (11–21)	9 (9–9)
Pedal cyclist	3 (3–4)	5 (4–5)	5 (4–5)	4 (3–4)	4 (3–6)	3 (2–5)	8 (5–11)	3 (1–6)	4 (4–5)
Pedestrian	4 (4–5)	5 (4–6)	3 (3–4)	4 (3–4)	4 (3–5)	4 (2–6)	4 (2–6)	5 (2–8)	4 (4–5)
Total for road traffic crashes	34 (33–36)	42 (40–44)	41 (39–43)	37 (34–39)	43 (39–46)	49 (42–55)	38 (31–44)	78 (66–90)	40 (39–41)
Total case numbers	**2,463**	**2,310**	**1,790**	**824**	**687**	**237**	**136**	**180**	**8,798**

(a) Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

(b) There were 153 cases missing data on state and territory of usual residence and 18 cases that were 'other territories'. 'Other territories' include Cocos (Keeling) Islands, Christmas Island and Jervis Bay.

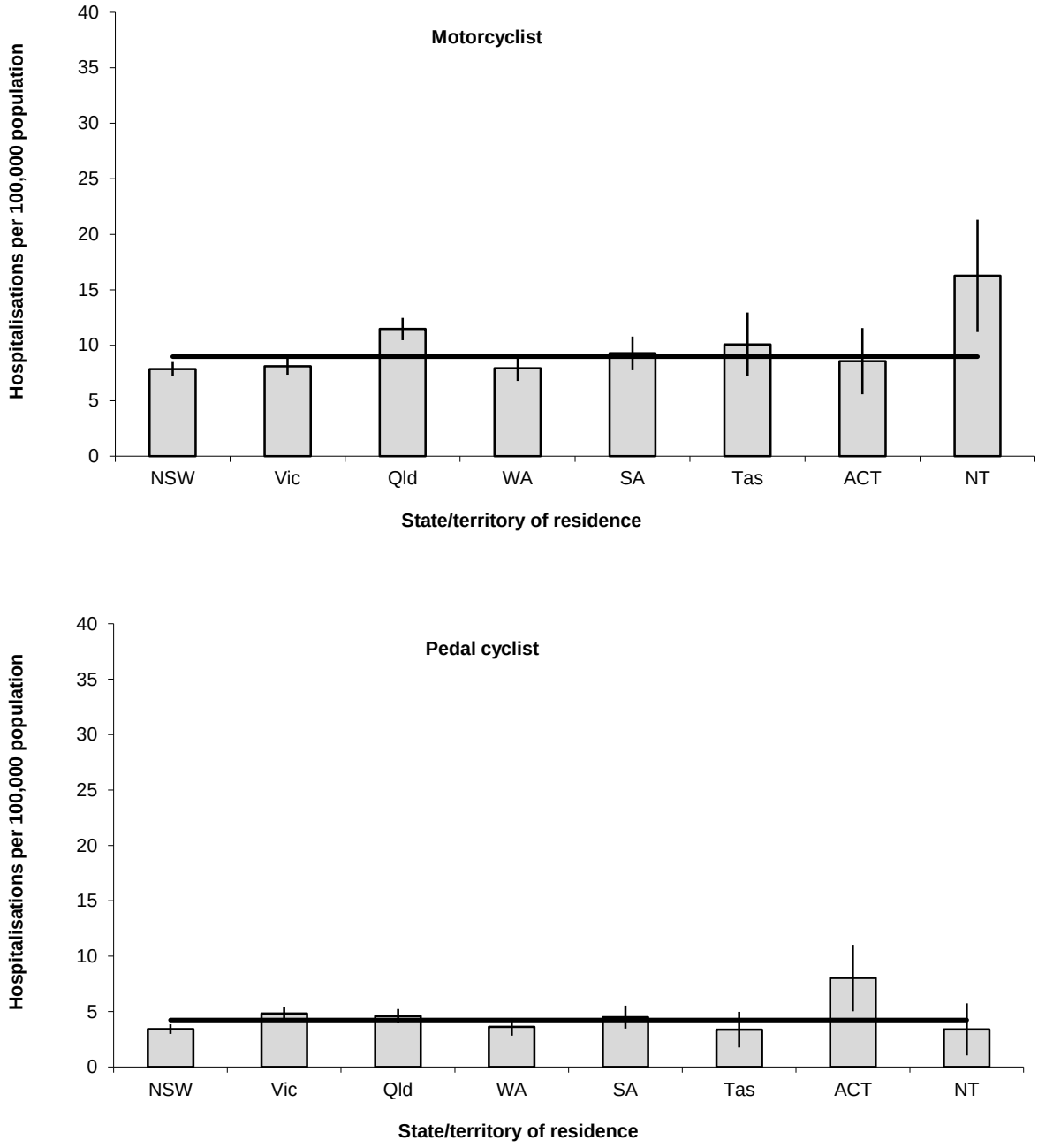
Note: Shaded areas indicate jurisdictions with rates markedly above the national rate.



Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

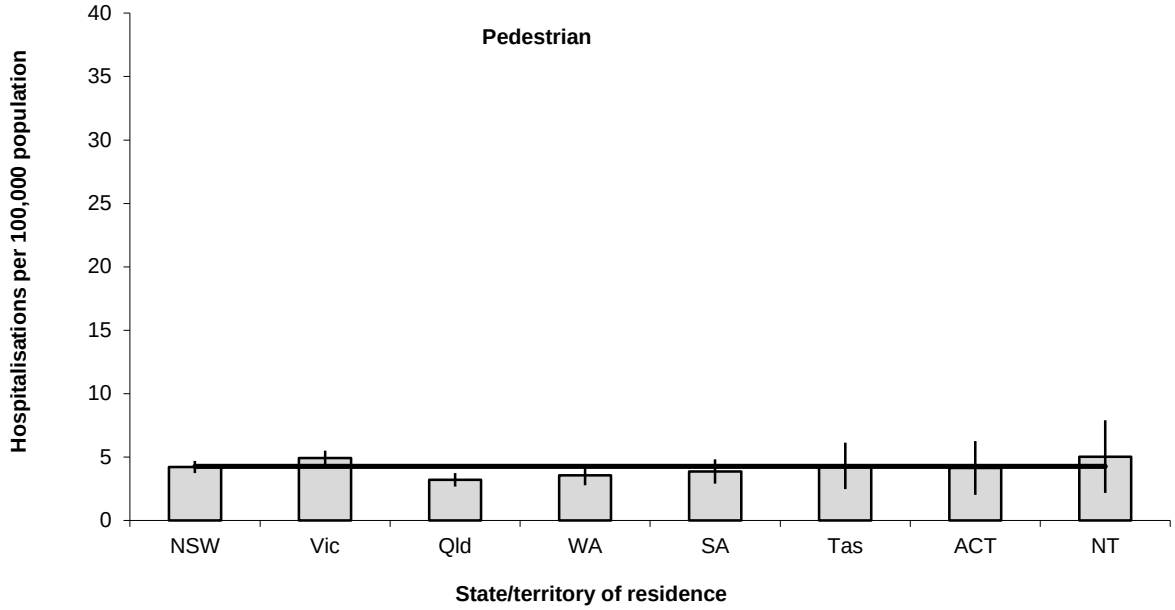
Figure 4.3.5: Serious injury with high threat to life—age-standardised rates of road vehicle traffic crashes for car drivers and car passengers by state/territory of residence, Australia 2008–09

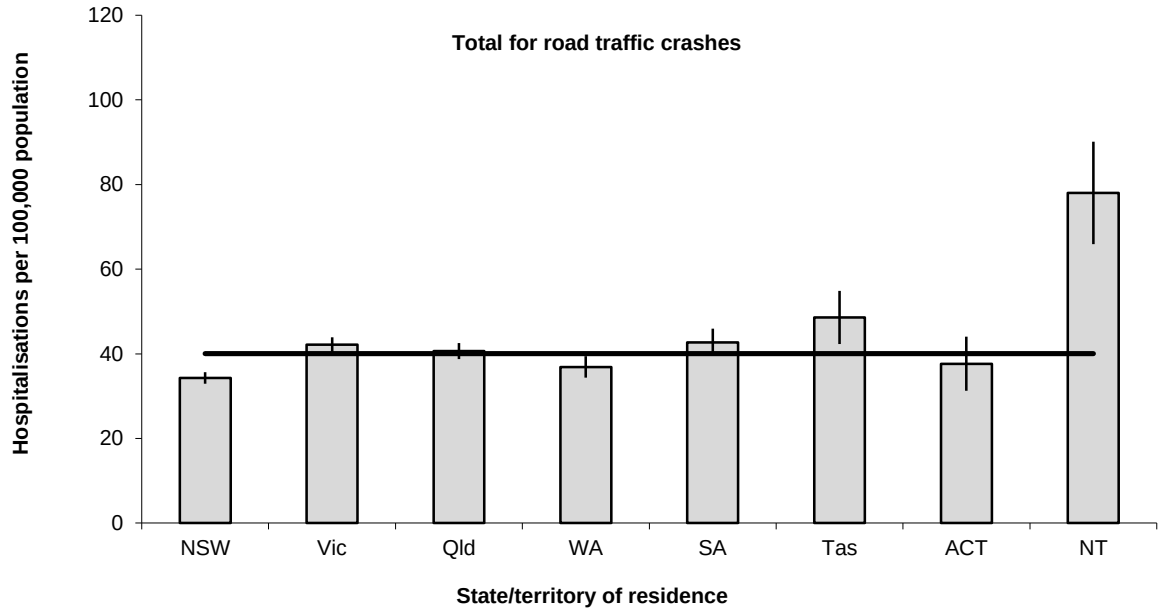


Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.6: Serious injury with high threat to life—age-standardised rates of road vehicle traffic crashes for motorcyclists and pedal cyclists by state/territory of residence, Australia 2008–09





Notes

1. The thick horizontal line shows the rate for all people in Australia.
2. Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.7: Serious injury with high threat to life—age-standardised rates of road vehicle traffic crashes for pedestrians and all road traffic crashes by state/territory of residence, Australia 2008–09

Remoteness area of residence

Table 4.3.10: Serious injury cases by remoteness area of residence for road vehicle traffic crashes, Australia 2008–09

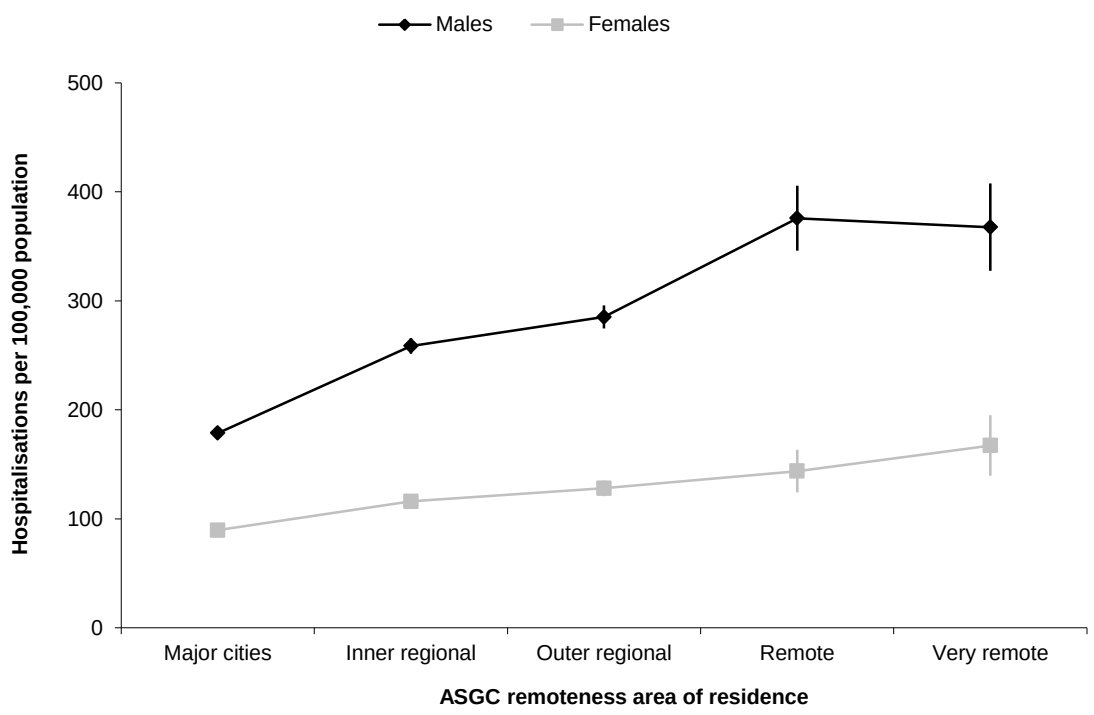
ASGC remoteness area of residence	Males	Females	Persons		
	Count	Count	Count	Per cent	Per cent male cases
Major cities	13,446	6,902	20,348	59.6	66.1
Inner regional	5,285	2,458	7,743	22.7	68.3
Outer regional	2,852	1,246	4,098	12.0	69.6
Remote	618	210	828	2.4	74.6
Very remote	342	143	485	1.4	70.5
Total[(a)]	**22,897**	**11,219**	**34,116**		**67.1**

(a) Total includes cases for which ASGC remoteness area of residence not reported (males = 354, females = 260).

Table 4.3.11: Age-standardised serious injury rates by remoteness area of residence for road vehicle traffic crashes, Australia, 2008–09

ASGC remoteness area of residence	Age-standardised rate per 100,000 population (95% CI)		
	Males	Females	Persons
Major cities	179 (176–182)	90 (88–92)	134 (132–136)
Inner regional	259 (252–266)	116 (111–121)	188 (183–192)
Outer regional	285 (275–296)	128 (121–135)	209 (203–216)
Remote	376 (346–406)	144 (124–163)	266 (247–284)
Very remote	368 (328–408)	167 (140–195)	273 (248–297)

(a) Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.



Note: Confidence intervals are provided to show by about how much rates might be expected to vary (between years, for example) in view of the number of cases. See the Data issues section for further information.

Figure 4.3.8: Road vehicle traffic crashes—age-standardised rates of serious injury by remoteness of residence, Australia 2008–09

Length of stay in hospital

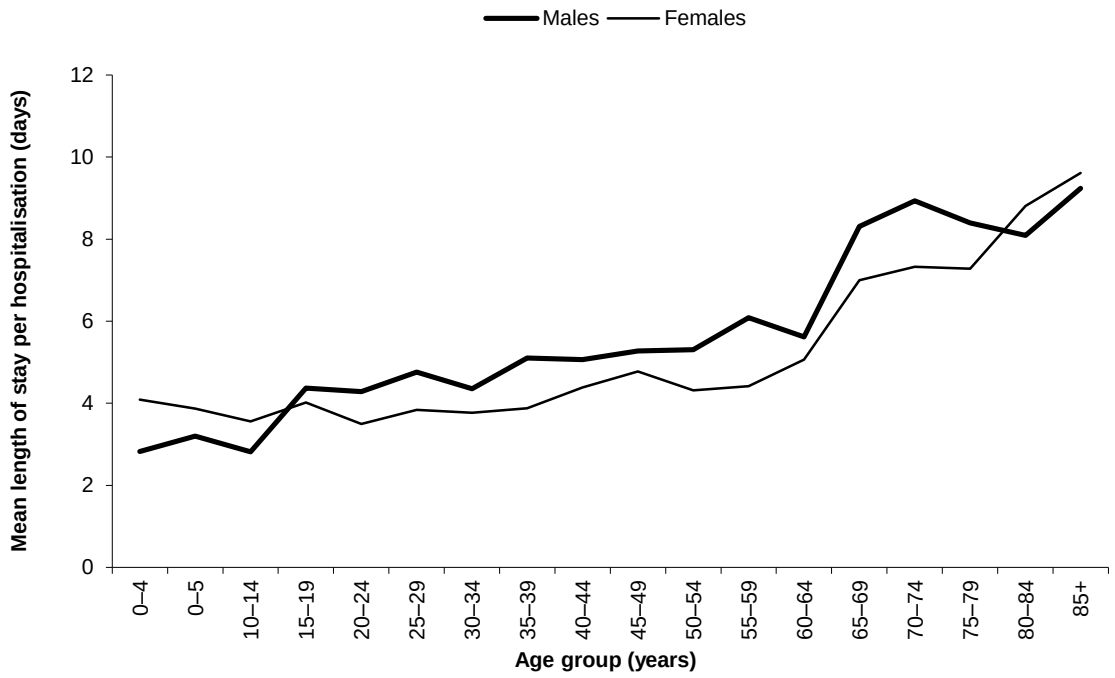


Figure 4.3.9: Road vehicle traffic crashes—mean length of stay in hospital for serious injury by age and sex, Australia 2007–08

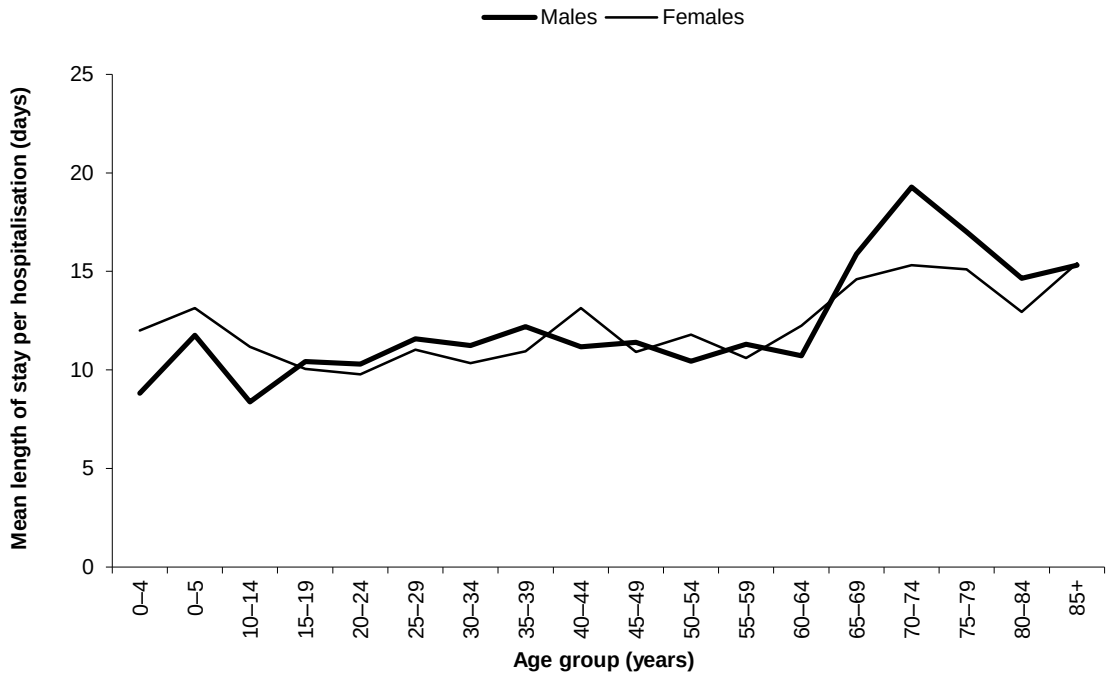


Figure 4.3.10: Serious injury with a high threat to life—mean length of stay in hospital for road vehicle traffic crashes by age and sex, Australia 2008–09

Length of stay in hospital by road user group

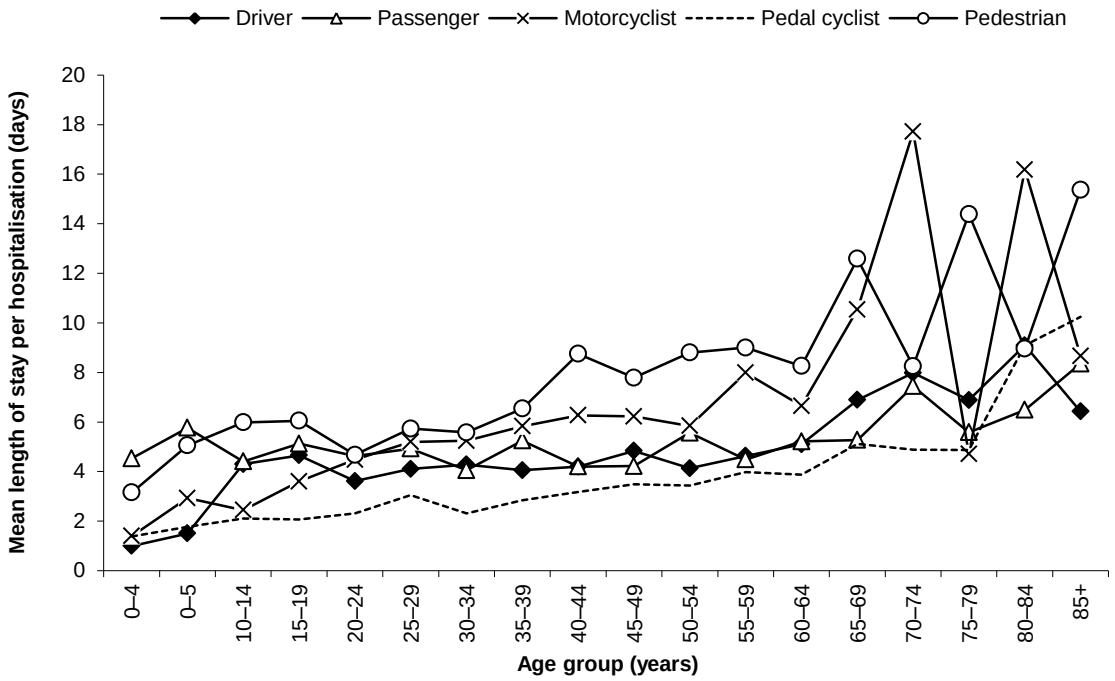


Figure 4.3.11: Road vehicle traffic crashes—mean length of stay in hospital for serious injury by road user group, Australia 2008–09

Body region injured

Table 4.3.12: Case counts and proportions by body region for serious injury due to road vehicle traffic crashes, Australia 2008–09

	Pedestrian		Car occupant[(a)]		Car driver		Car passenger		Motorcyclist		Pedal cyclist	
Body region injured	**Count**	**Per cent**	**Count**	**Per cent**	**Count**	**Per cent**	**Count**	**Per cent**	**Count**	**Per cent**	**Count**	**Per cent**
Head	825	30.7	3,810	23.7	2,402	23.8	1,181	23.7	884	10.8	1,226	23.3
Neck	76	2.8	2,762	17.2	1,833	18.2	800	16.0	210	2.6	130	2.5
Thorax	117	4.3	3,097	19.3	2,028	20.1	933	18.7	621	7.6	246	4.7
Abdomen, lower back, lumbar spine and pelvis	238	8.8	2,200	13.7	1,232	12.2	859	17.2	610	7.4	363	6.9
Shoulder and upper limb	409	15.2	2,163	13.5	1,282	12.7	644	12.9	2,870	35.0	2,342	44.5
Hip and thigh	186	6.9	466	2.9	266	2.6	179	3.6	442	5.4	236	4.5
Lower limb	789	29.3	1,363	8.5	933	9.2	326	6.5	2,369	28.9	670	12.7
Other injuries not specified by body region	50	1.9	218	1.4	120	1.2	68	1.4	191	2.3	51	1.0
Total	**2,690**	**100.0**	**16,079**	**100.0**	**10,096**	**100.0**	**4,990**	**100.0**	**8,197**	**100.0**	**5,264**	**100.0**

(a) Includes 993 cases where the position of the person in the car is unspecified.

Notes

1. Shading denotes the 2 highest figures for each column.
2. The 'body region injured' is the principal diagnosis recorded by the hospital as chiefly responsible for occasioning an episode of admitted patient care, i.e. a person might have suffered other injuries as well. Information on precisely how injuries were sustained, e.g. the role of vehicle features, is not available from the data sources used for this report.

Length of stay in hospital by body region injured

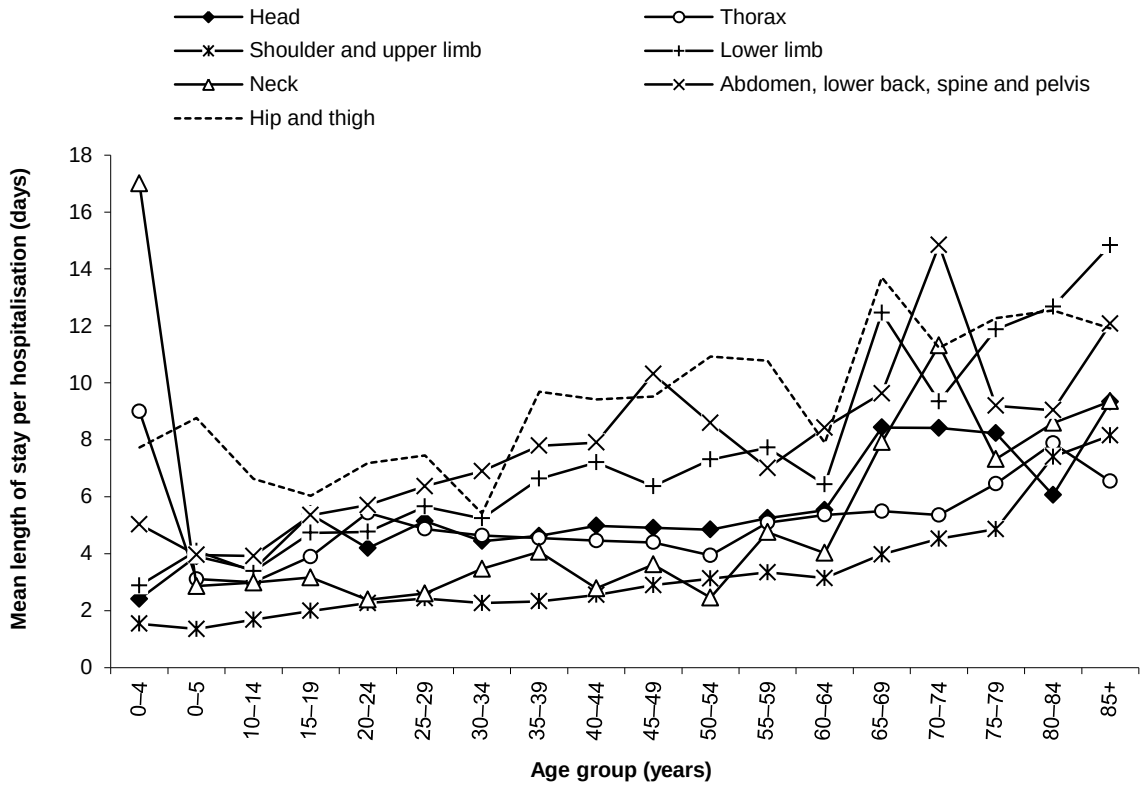


Figure 4.3.12: Mean length of stay in hospital for serious injury by body region injured, Australia 2008–09

Patient days

Table 4.3.13: Road vehicle traffic crashes—patient days in hospital for serious injury by body region, Australia 2008–09

	Pedestrian		Car occupant[(a)]		Car driver		Car passenger		Motor cyclist		Pedal cyclist	
Body region injured	**Patient days**	**Per cent**	**Patient days**	**Per cent**	**Patient days**	**Per cent**	**Patient days**	**Per cent**	**Patient days**	**Per cent**	**Patient days**	**Per cent**
Head	6,116	30.7	19,129	24.8	11,177	23.6	6,486	25.7	5,454	12.4	3,423	23.1
Neck	561	2.8	8,933	11.6	5,194	11.0	3,318	13.1	1,433	3.3	711	4.8
Thorax	1,179	5.9	13,813	17.9	9,089	19.2	3,903	15.4	4,041	9.2	1,265	8.5
Abdomen, lower back, lumbar spine and pelvis	2,445	12.3	13,359	17.3	8,027	16.9	4,727	18.7	6,601	15.1	1,763	11.9
Shoulder and upper limb	1,707	8.6	7,000	9.1	4,142	8.7	2,277	9.0	7,402	16.9	3,938	26.6
Hip and thigh	1,774	8.9	4,285	5.5	2,610	5.5	1,559	6.2	3,675	8.4	1,177	7.9
Lower limb	5,921	29.7	9,691	12.5	6,592	13.9	2,583	10.2	14,188	32.4	2,421	16.3
Other injuries not specified by body region	230	1.2	1,071	1.4	563	1.2	411	1.6	1,050	2.4	118	0.8
Total	**19,933**	**100.0**	**77,281**	**100.0**	**47,394**	**100.0**	**25,264**	**100.0**	**43,844**	**100.0**	**14,816**	**100.0**

(a) Includes 4,623 patient days for which the position of the person in the car is unspecified, in addition to cases specified as car driver or car passenger.

Notes

1. Shading denotes the 2 highest figures for a road user group.
2. The 'body region injured' is the principal diagnosis recorded by the hospital as chiefly responsible for occasioning an episode of admitted patient care, i.e. a person might have suffered other injuries as well. Information on precisely how injuries were sustained, e.g. the role of vehicle features, is not available from the data sources used for this report.

Table 4.3.14: Road vehicle traffic crashes—patient days in hospital by seriously injured person's role and the counterpart in the collision, Australia 2008–09

	Counterpart in collision										
Seriously injured person	**Car, pick-up truck or van**	**2- or 3-wheeled motor vehicle**	**Pedal cycle**	**Pedestrian or animal**	**Heavy transport vehicle or bus**	**Train**	**Other non-motor vehicle**	**Fixed or stationary object**	**Non-collision transport accident[(a)]**	**Other and unspecified transport accidents**	**Total**
Car occupant	29,735	82	16	462	3,205	87	87	24,450	14,750	4,407	77,281
Motorcyclist	15,287	1,059	14	753	1,245	n.p.	n.p.	5,421	12,909	7,138	43,844
Pedal cyclist	4,096	27	621	112	693	n.p.	n.p.	689	5,655	2,910	14,816
Pedestrian	17,072	309	112	50	1,635	249	53	0	0	453	19,933
Occupant of pick-up truck or van	242	n.p.	0	39	102	0	n.p.	485	654	68	1,592
Occupant of heavy transport vehicle	330	0	0	10	773	34	0	324	854	138	2,463
Bus occupant	92	0	0	6	148	0	0	28	819	103	1,196
Occupant of special all-terrain or off-road vehicle	0	0	0	0	0	0	0	0	0	224	224
Occupant of three-wheeled motor vehicle	8	n.p.	0	0	0	n.p.	0	78	9	8	108
Occupant of a tram	0	0	0	0	0	0	0	0	0	38	38
Occupant of a train	0	0	0	0	0	0	0	0	0	9	9
Occupant of special agricultural or industrial or construction vehicle	0	0	0	0	0	0	0	0	0	141	141
Unknown	0	0	0	0	0	0	0	0	465	2,462	2,927
Total	**66,862**	**1,484**	**763**	**1,432**	**7,801**	**375**	**166**	**31,475**	**36,115**	**18,099**	**164,572**

(a) Includes non-collision accidents such as overturning, falling or being thrown from a vehicle.

Notes

1. Shading denotes the 6 highest figures in the table.
2. A 'special all-terrain or off-road motor vehicle' refers only to such vehicles that are not registrable for on-road use and does not include registrable 4WD passenger vehicles, which are included under 'car occupants'.

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Appendix 1: Data issues

Source of case data

National hospital separations data were sourced from the Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database (NHMD), coded according to the sixth edition of ICD-10-AM (NCCH 2008). A 'separation' is a term used in Australian hospitals to refer to a formal, or statistical process, by which an episode of care for an admitted patient ceases (AIHW 2010). An 'episode of care' is a period of health care characterised by only one care type. For the lay person, this is perhaps best understood as a stay in a particular ward in a hospital. For example, a person who is in an acute care ward and is then transferred to a rehabilitation ward will have undergone two episodes of care and hence two separations within the hospital.

Land transport accidents

Hospital cases were defined as being due to land transport accidents if they contained a first reported ICD-10-AM external cause code in the range V00–V89. Cases with a Principal diagnosis other than injury and cases in which land transportation only appears as an additional external cause code were excluded on the grounds that injury due to a land transport accident was not recorded as being the main reason for admission to hospital (Table A1), resulting in a starting file of 59,020 records.

Table A1: Selection criteria for hospital records of land transport injury

Record occurring from 1 July 2008 to 30 June 2009	Persons
Records with an ICD-10-AM 'Land Transport Accident' code (V00–V89) as external cause anywhere in the record[(a)]	69,205
Records with a 'Land Transport Accident' as first reported external cause[(b)]	68,680
Injury as a Principal Diagnosis (S00–T98)	59,020

(a) There were 525 records with a first reported external cause code of another type of injury (e.g. complications of surgical and medical care, other unintentional injuries, falls, intentional self-harm etc.) but a 2nd or subsequent external cause code indicating a land transport accident.

(b) There were 9,660 cases with a first reported external cause code indicating a land transport accident but a Principal diagnosis outside of the injury range (S00–T98). The most common Principal diagnoses were care involving use of rehabilitation procedure, unspecified (Z50.9, *n* = 5,146), examination and observation following transport accident (Z04.1, *n* = 1,012), care involving use of other rehabilitation procedures (Z50.8, *n* = 193), other specified surgical follow-up care (Z48.8, *n* = 191), other specified orthopaedic follow-up care (Z47.8, *n* = 161), and cellulitis of lower limb (L03.11, *n* = 152).

Road Vehicle Traffic Crashes

Hospital cases were defined as being due to road vehicle traffic crashes if they contained a Principal diagnosis in the range S00–T98 and a first reported external cause code of: V00–V06.[1], V09.2, V09.3, V10–V18.[4,5,9], V19.[4,5,6,9], V20–V28.[4,5,9], V29.[4,5,6,9], V30–V38.[5,6,7,9], V39.[4,5,6,9], V40–V48.[5,6,7,9], V49.[4,5,6,9], V50–V58.[5,6,7,9], V59.[4,5,6,9], V60–V68.[5,6,7,9], V69.[4,5,6,9], V70–V78.[5,6,7,9], V79.[4,5,6,9], V81.1, V82.1, V82.9, V83–V86.[0,1,2,3], V87, V89.2, V89.3.

Key: In the list shown above, V00–V06.[1] includes all cases where the first reported external cause code is in the range V00 to V06 and having a fourth character of 1.

Serious injury

'Seriously injured' is defined for this report as an injury which results in the person being admitted to hospital, and subsequently discharged alive either on the same day or after staying for one or more nights in a hospital bed (i.e. deaths are excluded). As discharge from hospital can include transfer to home, to another acute care hospital and to another form of care (e.g. rehabilitation), a method has been used in this report to reduce over-counting of injury cases by omitting separations in which the mode of admission is recorded as being by transfer from another acute-care hospital, on the grounds that such cases are likely to result in two or more separation records for the same injury.

Records that met the following criteria are included in this report:

- Australian hospital separations occurring 1 July 2008 to 30 June 2009.
- Principal diagnosis in the ICD-10-AM range S00–T98 using Chapter 19 Injury, poisoning and certain other consequences of external causes codes.
- First (left-most) external cause of injury or poisoning in ICD-10-AM range V00–V89 (i.e. the 'Land transport accidents' section of Chapter 20 External causes of morbidity and mortality).
- Mode of admission with any value except the one indicating that transfer from another acute-care hospital has occurred.
- Mode of separation with any value except the one indicating that the person died while in hospital.

The calculation of land transport accidents as a percentage of all hospital separations (including same day, which are assigned a stay of one day) included all separations (i.e. not omitting separations in which the mode of admission is recorded as being by transfer from another acute-care hospital or separations in which the person died in hospital). The calculation of total patient days included all separations except for those where the person died in hospital.

Serious injury with a high threat to life

'High threat to life' serious injury cases are selected on the basis of having an ICISS of less than 0.941. ICISS is a measure of injury severity based upon a patient's injury diagnoses. The ICISS measure for this report is based upon ICD-10-AM coding and was derived using Australian hospital separations data (Stephenson et al. 2004). ICISS involves calculating a Survival Risk Ratio (SRR), i.e. the probability of survival, for each individual injury diagnosis code as the ratio of the number of patients with that injury code who have not died to the total number of patients diagnosed with that code. Thus, a given SRR approximates the likelihood that a patient will survive a particular injury. Each patient's ICISS score (survival probability) is then the product of the probabilities of surviving each of their injuries individually. This may be a single SRR, as in the case of a patient with a single injury, or it may be multiple SRRs, as in the case of a patient with multiple injuries. Hence a patient's ICISS score can vary from 0 (most severe) to 1 (least severe).

Location of crash

The hospital data set used for this report does not contain specific information on the crash location. There are two options for presenting the hospital data on location—by state and territory of hospitalisation or by state and territory of residence. Presenting serious injury cases by the state and territory of the hospital where the person was treated may give a better indication of place of occurrence. This would be the case if a person was treated in a hospital close to the crash site. However, the practice of airlifting (or driving) seriously injured patients to major metropolitan hospitals, sometimes across borders, complicates such analyses.

Population and other denominators

With the exception of Table 4.3.5, all rates in this report were calculated using, as the denominator, the final estimate of the estimated resident population as at 31 December in the relevant year (e.g. 31 December 2008 for 2008–09 data). The rates in Table 4.3.5 were calculated using, as the denominator, the estimated number of each vehicle type registered by state and territory as at 31 December 2008, sourced from the ABS Motor Vehicle Census (ABS 2009a, 2009b). Direct standardisation was used to age-standardise rates, using the Australian population in 2001 as the standard (ABS 2003). Note that it is a convention of the ABS and AIHW to change the standard reference population only once a decade.

Age-standardised rates and 95% confidence intervals were calculated in Stata version 12.0 statistical software (StataCorp 2011) using the -dstdize- command. Further information regarding the reasons to use state of residence can be found on page 27 of a previous land transport report (Henley & Harrison 2009)

Quantifying variability in the counts presented in this report

The data presented in this report are subject to two types of statistical error, non-random and random. (A third type of statistical error, sampling error, does not apply here because none of the data sources used involved probability sampling.)

Non-random error: Some amount of non-random error is to be expected in administrative data collections such as the hospital inpatient data on which this report relies. For example, non-random error could occur if the approach to assigning cause codes to cases were to differ systematically between jurisdictions or over time. Systems are in place to encourage uniform data collection and coding and scrutiny of data during analysis includes checking for patterns that might reflect non-random error. Nevertheless, some non-random error is likely to remain. Identified or suspected non-random errors large enough to materially affect findings are mentioned in reports.

Random error: The values presented in the report are subject to random error, or variation. Variation is relatively large when the case count is small (especially if less than about 10) and small enough to be unimportant in most circumstances when the case count is larger (i.e. more than a few tens of cases).

Some of the topics for which results are reported compare groups that vary widely in case count, largely due to differences in population size (e.g. the population of NSW is more than 30 times as large as the NT population and the *Major cities* zone population is nearly 90 times as large as that of the *Very remote* zone). In this situation, year-to-year changes in counts or

rates for the smaller-population groups may be subject to large random variation. There is potential to misinterpret such fluctuations as meaningful rises or falls in occurrence.

In this situation, and similar ones, guidance is provided to readers concerning how much variation of values can be expected due to random variation of small counts. Confidence intervals (CIs) are calculated for this purpose. In this report CIs were calculated using the Stata –dstdize- command (CIs around single estimates) (StataCorp 2011).

Confidence intervals

The AIHW is currently undertaking a review to assess the provision of confidence intervals and statistical tests when data arise from sources that provide information on all subjects, rather than from a sample survey. This review will include analysis of the methods used to calculate confidence intervals, as well as the appropriateness of reporting confidence intervals and undertaking statistical testing for such data. This review aims to ensure that statistical methods used in the AIHW reports remain robust and appropriately inform understanding and decision making. As a consequence, the type of information reported in future editions of this publication may change.

Calculation of mean length of stay in hospital

Mean length of stay in hospital was calculated by dividing the total number of patient days for all hospital separations in 2008–09 where admission was as a result of a land transport accident by the estimated number of serious injury cases resulting from a land transport accident. The estimated number of serious injury cases is calculated by excluding cases transferred from another acute hospital and cases where death occurred in hospital. These exclusions are done in order to prevent double counting of cases (i.e. where a patient may have two or more hospital separations relating to the same injury).

Classification of remoteness area

Remoteness area in this report refers to the place of usual residence of the person who was admitted to hospital. The remoteness areas were specified according to the ABS Australian Standard Geographical Classification (ASGC) (ABS 2010). According to this classification, remoteness is an index applicable to any point in Australia, based on road distance from urban centres of five sizes. The ABS has provided tables that specify the proportion of the population of each Statistical Local Area (SLA) in Australia whose place of residence is in each of five segments of the remoteness index. These segments are:

- *Major cities*, with an Accessibility/Remoteness Index of Australia (ARIA) value of 0 to 0.2
- *Inner regional*, with ARIA index value of >0.2 and ≤2.4
- *Outer regional*, with ARIA index value of >2.4 and ≤5.92
- *Remote*, with ARIA index value of >5.92 and ≤10.53
- *Very remote*, with average ARIA index value of >10.53.

These tables were used to assign records to the five areas, on the basis of the SLA of usual residence of the person.

Most SLAs lie entirely within one of the five areas. If this was so for all SLAs, then each record could simply be assigned to the area in which its SLA lies. However, some SLAs

overlap two or more of the areas. Records with these SLAs were assigned to remoteness areas in proportion to the area-specific distribution of the resident population of the SLA according to the 2001 census. For hospitalisations, each record in the set having a particular SLA code was assigned to one or other of the areas probabilistically, in proportion to the resident population of that SLA. The resulting values are integers.

The hospital data sets used for this report do not contain information on the crash location and it is therefore not possible to determine with certainty if the crash occurred in the remoteness area of residence of the person injured. Remoteness area of residence is nonetheless a useful classification in itself and an indicator of crash location if it can be assumed that most crashes in which people are seriously injured occur in the vicinity of where they live. The DIT estimates, based on 2000 to 2003 data, that around 30% of operators (drivers, motorcyclists and cyclists) or persons killed in fatal road crashes are involved in crashes within their postcode of residence and a further 50% or more are involved in a fatal road crash within 100 kilometres of the centroid of their postcode of residence (but not within their postcode of residence). It is likely that non-fatal crashes in which people are seriously injured follow a similar pattern.

Suppression of small cell counts in tables

Cell counts in tables that are four cases or fewer have been suppressed as have rates derived from them, to protect confidentiality and because values based on very small numbers are sometimes difficult to interpret. In the instances where only one cell in a row or column has a count of four or less, counts of one or more other cells in the same row or column have generally also been suppressed. The abbreviation 'n.p.' has been used in these tables to denote suppressions. For these tables, the totals include the suppressed information.

Comparability with other reports

Australian hospitals use an Australian clinical modification of the international standard classification called the International Statistical Classification of Diseases (ICD) when reporting data on persons injured and subsequently admitted to hospital (morbidity data). ICD provides a nationally consistent basis for looking at morbidity due to transport accidents of all kinds (road, rail, water and air). However, it is not necessarily consistent with the approach taken by the DIT or others in looking at safety in each transport mode individually. For example, road safety statistics compiled by the DIT are focused on crashes on public roads, whereas ICD covers road crashes both on and off public roads.

Serious injury data series published previously by the DIT for the period 1999–00 to 2002–03 excluded same-day separations from the definition of serious injury. The previously published reports for the periods 2003–04 (Berry & Harrison 2007) , 2005–06 (Berry & Harrison 2008), 2006–07 (Henley & Harrison 2009) and 2007–08 (yet to be published) and the current report include same-day separations in the figures. This effectively means the threshold for serious injury is now 'admitted to hospital', regardless of the length of stay. In 2008–09, same-day separations accounted for almost one-third of non-fatal transport injury. It has been found that persons with injuries that pose a high threat to life can still be admitted to and discharged from hospital to a place of usual residence on the same day. In 2008–09, for example, there were over 690 such transport injury cases.

The 1999–00 to 2002–03 data series also focused only on serious injury in traffic or accidents on public roads whereas the reports for the periods 2003–04 (Berry & Harrison 2007),

2005–06 (Berry & Harrison 2008), 2006–07 (Henley & Harrison 2009) and 2007–08 (yet to be published) and the current report have broadened the scope to include non-traffic or off-road accidents in part of the report, further increasing the overall figures above those previously reported.

For national road deaths, readers should refer to the 'road statistics' part of the Bureau of Infrastructure and Regional Economics website at <www.bitre.gov.au>, where road death statistics are published on a monthly basis. For details on marine, rail and air safety, the Australian Transport Safety Bureau website should be consulted at <www.atsb.gov.au>.

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