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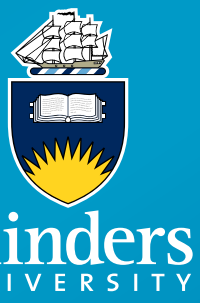
Australian sports injury hospitalisations 2011–12



INJURY RESEARCH AND STATISTICS SERIES NO. 92

Australian Government
Australian Institute of Health and Welfare

Authoritative information and statistics to promote better health and wellbeing

INJURY RESEARCH AND STATISTICS SERIES
Number 92

Australian sports injury hospitalisations

2011–12

Australian Institute of Health and Welfare
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Contents

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Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
CURF	confidentialised unit record file
HTTL	high threat to life
ICD-10-AM	International Classification of Diseases, 10th revision, Australian modification
LFS	labour force survey
MLOS	mean length of stay
MPHS	Multipurpose Household Survey
NHMD	National Hospital Morbidity Database
PSPRA	Participation in Sport and Physical Recreation, Australia
RADL	Remote Access Data Laboratory
RSE	relative standard error
SE	standard error

Symbols

*	Denominator has an RSE > 25 and ≤ 50
n.a.	not available
n.p.	not publishable because of small numbers, confidentiality or other concerns about the quality of the data

Summary

During 2011–12, an estimated 36,000 people aged 15 and over were hospitalised as the result of an injury sustained while playing sport, and spent a total of 79,000 days in hospital, though these numbers are likely to represent a significant underestimate of sporting injuries.

This report includes 2 types of measures of sport related injury: one based on rates of injury within the total population and the other on rates of injury within the population that reported participation in sports activities. Population-based rates enable comparisons between parts of the Australian population that differ in size, such as age groups by sex. However, since most people in the population do not participate in each, or any, type of sport, population-based injury rates do not provide a good indication of the risk of hospitalisation for participants in a sport, unlike rates based on numbers of participants.

Which sports were involved?

Around one-third of all sports injury hospitalisations were associated with playing various codes of football. A large number of hospitalisations were also associated with motor sports and water sports. Motor sports, water sports and football together accounted for nearly half (47%) of all sports injury hospitalisations.

Australian Rules football and soccer had the highest population-based age-standardised rates of injury hospitalisation (18 and 17 cases per 100,000 population, respectively). The highest rate of hospitalisation based on the number of participants was for wheeled motor sports (3,574 per 100,000 participants). Other sports with high participation-based rates were roller sports, Australian Rules football and Rugby (2,305, 1,319 and 1,292 per 100,000 participants, respectively).

Injury while cycling was also common (8% of cases), although cycling as a sport is not well distinguished from cycling for other reasons in the hospitalisations data used for this report.

For 3 sports in particular—cycling, motor sports and equestrian activities—the injuries sustained were considered life-threatening in around one-quarter of cases.

Wheeled motor sports contributed the highest number of days spent by patients in hospital to the total burden of hospitalised sports injury (over 9,500 days).

Who was injured and what injuries occurred?

Around two-thirds of those admitted to hospital were aged under 35 and over three-quarters were men. People aged 65 and over represented 5% of all sports injury hospitalisations. People in this age group had a comparatively higher population-based age-standardised rate of injury (52 cases per 100,000). People aged 65 and over also had a higher mean length of stay in hospitals (4.5 days compared with 2.1 for sports injury as a whole) and, in a relatively high proportion of cases (28%), the injuries they sustained were life-threatening.

In all but 2 sports (netball and fishing), the most frequent principal diagnosis was a fracture. The most commonly affected body region was the knee and lower leg. Although the mechanism of injury varied from sport to sport, falls were the most common type.

1 Introduction

Participation in regular physical activity is important for good health. It is estimated that physical inactivity contributes to 13,500 deaths each year in this country and accounts for around 7% of the total burden of disease and injury (PHAA 2014). However, the potential for injury to those participating in sports and other forms of physical recreation is also cause for concern (Stevenson et al. 2000, Mummery et al. 2002, Finch & Cassell 2006, Cassell et al. 2012). Such injuries may also sometimes be severe (Gabbe et al. 2005). As well as its impact on individuals, sports injury places a heavy cost burden on the community. In 2004, one study estimated this cost to be $1.8 billion each year (Medibank Private 2004).

The kind of information that can support the development of sports injury prevention policy is in short supply. This includes information about the size of the problem and the health burden that it imposes, as well as information about the groups in society that are most at risk of sustaining injury (Finch 2012).

This report includes 2 types of measures of sport related injury: one based on rates of injury within the total population and the other on rates of injury within the population that reported participation in sports activities. Population-based rates enable comparisons between parts of the Australian population that differ in size, such as age groups by sex. However, since most people in the population do not participate in each, or any, type of sport, population-based injury rates do not provide a good indication of the risk of hospitalisation for participants in a sport, unlike rates based on numbers of participants.

Data on the sport or other activity that patients were participating in when injured is not collected on all occasions, so the numbers of hospitalisations reported here as being due to sports injuries are likely to be underestimates. Injuries treated in emergency departments and other health care settings that do not result in hospitalisation are also not included. For more information, see 'activity codes' in Section 1.1 Methods and data sources.

1.1 Methods and data sources

This report used the most recently available data from the National Hospital Morbidity Database (NHMD). Diagnoses and information on the external causes of injuries for the hospital separations reported here were coded according to the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification* (ICD-10-AM) (NCCH 2010). The report also uses data from the ABS Survey on Participation in Sport and Physical Recreation (PSPRA), Australia, 2011–12 (ABS 2013). Access to the survey in Confidentialised Unit Record Form (CURF) was via the ABS Remote Access Data Laboratory (RADL).

Selection criteria

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

- hospital separations occurring in Australia between 1 July 2011 and 30 June 2012
- records including a sports activity code in the range ICD-10-CM U50–U71
- an age of 15 years or over for those hospitalised. Age categories were chosen to achieve consistency with the PSPRA (ABS 2013) for the purpose of calculating participation-based injury rates.

- a mode of admission that was not a transfer from another acute hospital. (The exclusion of those separations where mode of admission was a transfer from another acute hospital is used for injury case estimation [see Appendix A]. Other than in indicated sections, this report is focussed on estimated cases of sports injury hospitalisation.)

All chapters on specific sports have used this methodology supplemented by selection criteria based on the relevant activity code for the sport.

Other information on methods is included in Appendix A. Important terms regarding the data used in this report are summarised in Box 1.1.

Box 1.1: Summary of terms relating to hospitalised injury

Statistics on admitted patients are compiled when an **admitted patient** (a patient who undergoes a hospital's formal admission process) completes an episode of admitted patient care and 'separates' from the hospital. This is because most of the data on the use of hospitals by admitted patients are based on information provided at the end of a patient's episodes of care, rather than at the beginning. The length of stay and the procedures carried out are then known and the diagnostic information is more accurate.

'Separation' is the term used to refer to the episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute care to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.

The **principal diagnosis** is the diagnosis established, after study, to be chiefly responsible for occasioning the patient's episode of admitted patient care.

An '**external cause'** is defined as the environmental event, circumstance or condition that was the cause of injury or poisoning. Whenever a patient has a principal or additional diagnosis of an injury or poisoning, an 'external cause code' should be recorded.

The injury separation records included in this report are those that have a principal diagnosis code in the ICD-10-AM range S00–T75 or T79, and an external cause code in the ICD-10-AM range V00 to Y36. This includes records where the main reason for the episode in hospital was a recent injury, such as a fracture, laceration or burn to any part of the body, or poisoning. Records are included whether the injury was caused unintentionally ('accidents') or intentionally (intentional self-harm or assault). Records where intent was not determined are also included.

Injury cases are estimated as the number of injury separations, less those records where the mode of admission was 'inward transfer'. (Inward transfers are omitted to reduce over-counting.)

The **mean length of stay** is the average number of days each patient stayed in hospital. This is calculated by dividing the total number of patient days for **injury separations** by the number of **injury cases,** estimated as above. Patients who were admitted and discharged from hospital on the same day are counted as staying for 1 day.

Hospital separations data provide several indicators of the **severity of injury**: the length of stay in hospital, the level of threat to life posed by the injury, and whether the person sustained injuries to multiple regions of the body.

(continued)

Box 1.1 (continued): Summary of terms relating to hospitalised injury

Injuries can be classified according to the likelihood that a patient with that injury will die in hospital. The method used refers to cases with a predicted mortality risk of about 6% or higher as having a **high threat to life** (HTTL) (Stephenson et al. 2003). Injuries of this severity are likely to have a large impact on the patient, often with persisting problems and an ongoing need for health care services. This report contains information on the proportion of cases of hospitalised injury that were classified as 'high threat to life', as well as information on length of stay and on multiple injuries.

Activity codes

ICD-10-AM includes a range of codes to indicate the type of activity being engaged in at the time of injury (U50–U73). The block of activity codes U50–U71 encompasses sports. U72 is used to identify *Leisure activity, not elsewhere classified* and U73 is used to identify other types of activities including working for income in various industries and unpaid work.

The availability of activity codes has been fundamental to carrying out this project as they enabled us to select those cases of hospitalised injury that were attributed to a variety of sports.

Although the available activity codes are reasonably comprehensive, they do not distinguish between professional sports and community-based sports. They also don't differentiate, for example, between playing amateur team cricket and backyard cricket during the course of a social event such as a barbecue.

While the introduction of activity codes was a major step forward for reporting on sports-related injury, their utility is hampered by the fact that, in a substantial proportion of sports injury cases, hospitalisation records have been found to have either a missing or 'unspecified activity' code (Langley et al. 2007, Finch & Boufous 2008, Soo et al. 2009).

Overall, in the National Hospital Morbidity Database for 2011–12, 61% of estimated injury cases for which an activity code should have been reported did not have the type of activity reported, or had reported the activity as 'unspecified'. Information is also sometimes reported with relatively non-specific information. An example from this report was that 2,688 cases were assigned the code 'U50.09 Football, unspecified', almost as many as were assigned codes for 'Australian Rules football' or 'soccer'.

An examination by Finch and Boufous (2008) of New South Wales hospital separations data for the period 2003–04 led them to conclude that the use of activity codes to identify sports and leisure-related injury results in a significant underestimation of the number of cases involved. They found that, in over 30% of cases, an activity code was either missing or unspecified. Their analyses, based on cases with a valid activity code, showed that 13.9% of all sports injury hospitalisations during the period were related to sports or leisure. After adjustment for the underreporting associated with 'unspecified' or missing activity codes, this proportion rose to 20% of all sports injury hospitalisations (Finch & Boufous 2008).

Soo et al. (2009) suggest that the large number of sports injury cases with missing or 'unspecified' activity codes may, in part, be due to some hospitals and clinicians not giving sufficient priority to recording the information necessary for the assignment of these codes. McKenzie et al.(2009) also point to the absence Australian coding standards to guide clinical coders in assigning activity codes (McKenzie et al. 2009). As with other information on the

causes and circumstances of injury, there will be varying disclosure of detail by patients and carers to hospital staff.

Recommendations made by Soo et al. (2009) for improving the quality of activity coding include:

- the validation, by external coders, of medical records and admissions data in order to ascertain whether there is a need for the inclusion of better or additional codes in ICD-10-AM
- the need for additional research and education directed at state-specific activity coding practices, to identify the reasons for the overuse of non-specific codes and to identify measures to improve the current situation.

Based on the findings described above, the results reported here are likely to be an underestimate of the true extent of hospitalised sports injury in Australia. It is also possible that the quality of activity-code data varies from sport to sport. For this reason, comparisons between different sports need to be interpreted with caution.

The groups of ICD-10-AM activity codes included in this report are shown in Table A1.1 (Appendix A). Table A1.1 also includes the groups of sports reported for the PSPRA. The correspondence between the ICD groups and the survey groups, as detailed in the table, is not exact, and this should be borne in mind when interpreting participation-based rates given in this report.

Calculation of rates

Two types of sports injury hospitalisation rates were calculated using 2 different denominators:

- population-based sports injury hospitalisation rates where the denominator is the estimated resident population data for Australia as at December 2011.
- participation-based sports injury hospitalisation rates which use, as the denominator, estimates for the number of participants in Australia who engage in a range of sports and activities reported in the PSPRA.

ABS Survey on Participation in Sport and Physical Recreation (PSPRA), Australia, 2011–12

In each financial year the ABS conducts a Multipurpose Household Survey (MPHS) throughout Australia. The survey is designed to provide annual statistics for a number of small, self-contained topics, and in 2011–12, one of those topics was participation in sport and physical recreation. Respondents to the survey were asked for details about sport or physical recreational activity that they had participated in at least once during the 12 months prior to interview. For the survey, ABS defines the term 'participant' as a player, competitor or person who takes part in some other physically active role. Participation in the PSPRA is restricted to people aged 15 years and over. More details about the use of the PSPRA in this report can be found in Appendix A.

Box 1.2: Relative standard error

Where estimates based on data from the PSPRA were presented in the report they are accompanied by a relative standard error (RSE) measure.

Sampling error is the difference between the published estimates, derived from a sample of persons, and the value that would have been produced if the total population (as defined for the scope of the survey) had been included in the survey.

One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might have varied by chance because only a sample of persons was included. There are about 2 chances in 3 (67%) that a sample estimate will differ by less than 1 SE from the number that would have been obtained if all persons had been surveyed, and about 19 chances in 20 (95%) that the difference will be less than 2 SEs.

Another measure of the likely difference is the RSE, which is obtained by expressing the SE as a percentage of the estimate. Estimates were not reported in relevant tables if RSE was greater than 50 (indicated by n.p.).

1.2 Structure of this report

Chapter 1 of the report contains an introduction to the topic of sports injury and describes the methods used to analyse the data that underlie the following chapters.

Chapter 2 provides an overview of all hospitalisations due to sport-related injury. As well as describing analyses in relation to number of cases, this chapter also looks at the total number of days spent by sports injury patients in hospital by including care types such as rehabilitation after sports injury.

Chapters 3 to 10 focus on the injury profile of cases in relation to specific types of sport, such as football or combative sports. Chapter 11 contains briefer injury profiles of a range of other sports not included in the previous chapters.

'Appendix A: Data issues' provides further information on the NHMD, notes on the presentation of data, the population estimates used to calculate population rates and analysis methods.

'Appendix B: Additional tables' consists of tables of the data underpinning results presented in the chapters.

2 Hospitalised sports injury overview

During the 1-year period 2011–12, there were 36,237 cases of hospitalised sports injury. This represents 8% of all cases of sports injury hospitalisation during that period.

2.1 Age and sex

Sports injury hospitalisations were most common among younger people. Around two-thirds (65%) were aged under 35 (Table 2.1). Over three-quarters were men, with an age-standardised rate of 335 per 100,000 population (Table 2.2).

Participation-based rates could not be calculated for sports injury as a whole because the necessary data were not available.

Table 2.1: Summary measures for sports injury hospitalisations, by age group, Australia, 2011–12

	Age group							
	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Cases	5,770	9,147	8,565	5,810	3,443	1,849	1,653	36,237
Proportion of all cases	15.9	25.2	23.6	16.0	9.5	5.1	4.6	100
Age-standardised rate per 100,000 population	692.6	430.9	278.6	194.0	125.8	84.5	71.3	220.2

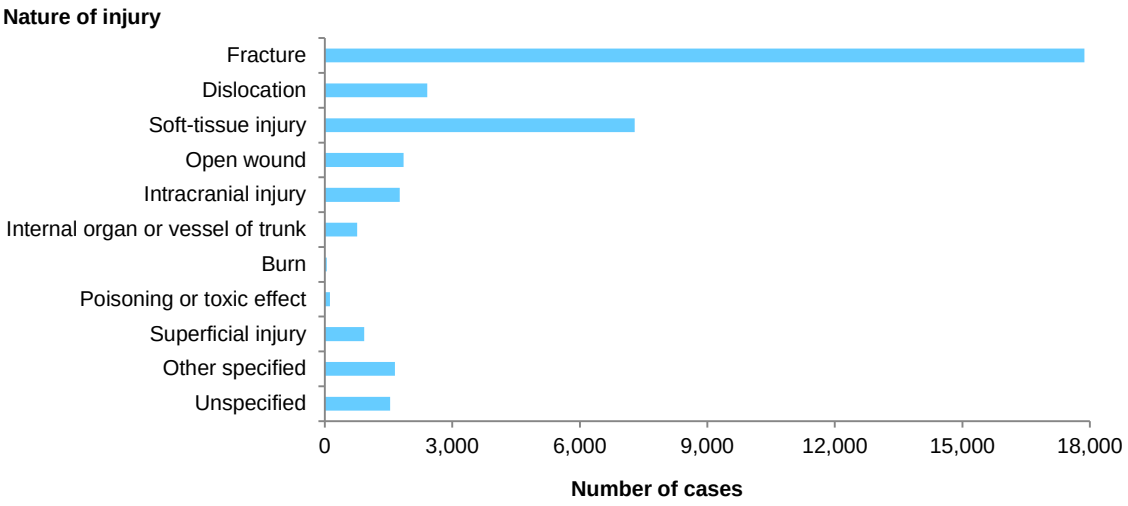
Table 2.2: Summary measures for sports injury hospitalisations, by sex, Australia, 2011–12

	Males	Females	Persons
Cases	27,935	8,302	36,237
Proportion of all cases	77.1	22.9	100
Age-standardised rate per 100,000 population	335.8	101.8	220.2

2.2 Nature and location of injury

Nature of injury

By far the most common type of injury sustained was a fracture, accounting for around half of all cases (49%), followed by soft tissue injury (10%) (Figure 2.1). Fractures most commonly involved the knee and lower leg (23%), the elbow and forearm (20%) and the wrist and hand (20%). A notable proportion of fractures also involved the head (11%) (Table 2.3).



Note: Data underpinning this figure are available in Table B1.5 in Appendix B.

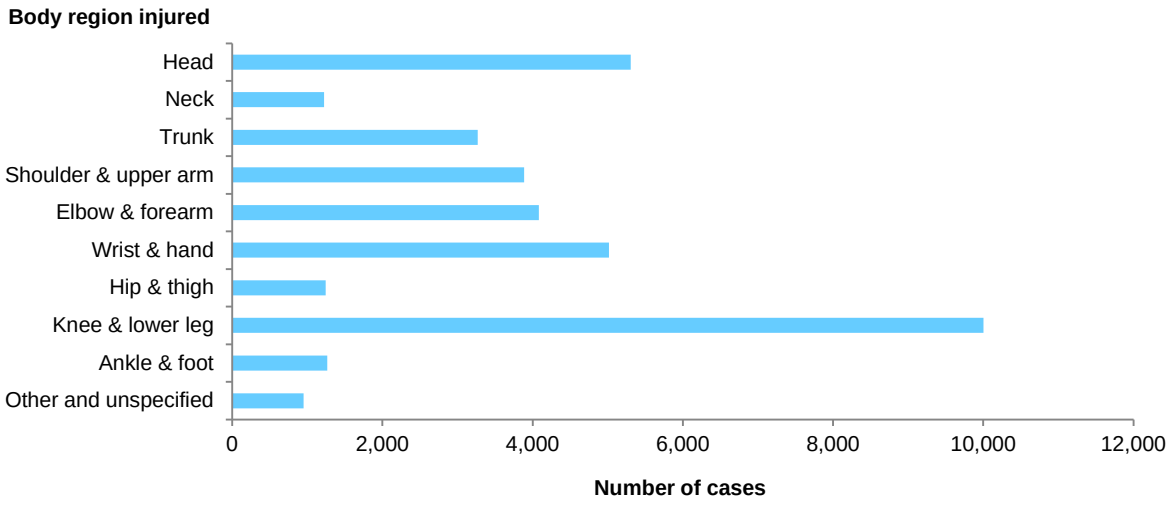
Figure 2.1: Cases of sports injury hospitalisation by nature of the injury, Australia, 2011–12

Table 2.3: Fractures by body region for sports injury hospitalisation, Australia, 2011–12

Body region	Frequency	%
Knee and lower leg	4,152	23
Elbow and forearm	3,588	20
Wrist and hand	3,544	20
Head	2,017	11
Shoulder & upper arm	1,883	11
Trunk	1,258	7
Hip and thigh	597	3
Ankle and foot	486	3
Neck	345	2
Other and unspecified	1	0
Total	**17,871**	**100**

Body region injured

The most frequently injured part of the body (28%) was the knee and lower leg. The next most common body region injured was the head (15%). In 4 in 10 cases (42%), the injury to the knee and lower leg was a fracture. The most common types of injury to the head were fractures (38%), followed by intracranial injuries (33%) (Figure 2.2).

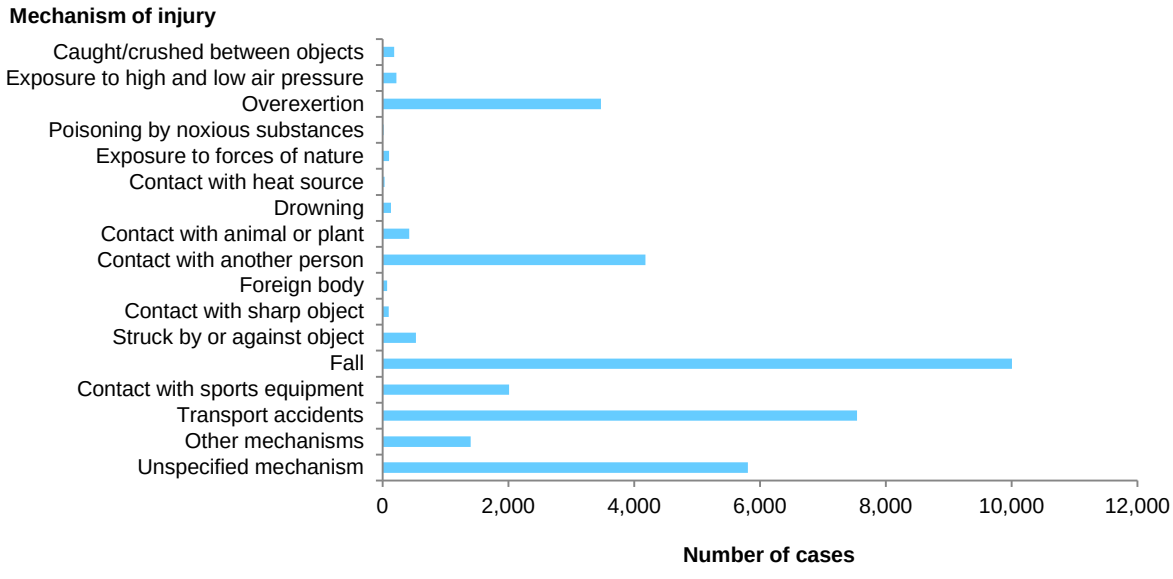


Note: Data underpinning this figure are available in Table B1.5 in Appendix B.

Figure 2.2: Cases of sports injury hospitalisation by body region injured, Australia 2011–12

2.3 Mechanism of injury

The mechanism of injury was not specified in 16% of cases. For those cases where it was specified, a fall was the most common mechanism of injury (28%) (Figure 2.3). Transport accidents (21%), contact with another person (12%) and overexertion (10%) were also frequent mechanisms of injury. To improve readability, in figures and tables, cases of injury due to overexertion and strenuous or repetitive movements are referred to as injury due to 'overexertion'.



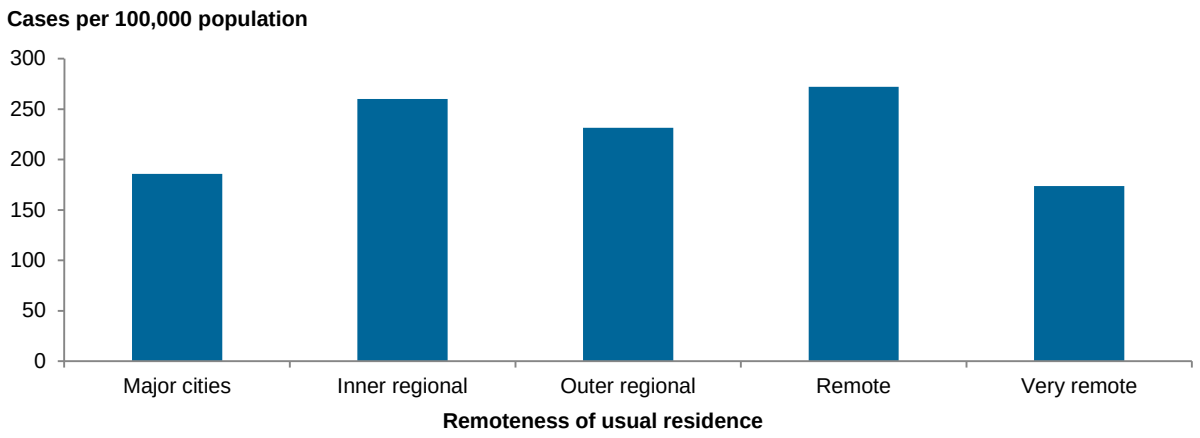
Notes

1. Data underpinning this figure are available in Table B1.5 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 2.3: Cases of sports injury hospitalisation by mechanism of injury, Australia 2011–12

2.4 Remoteness of usual residence

Population-based rates were distributed fairly evenly across all remoteness areas. *Inner regional* and *Outer regional* areas, and *Remote* areas had rates that were higher than those of Major cities (Figure 2.4).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 2.4: Age-standardised rates for cases of sports injury hospitalisation, by remoteness of usual residence, Australia 2011–12

2.5 Severity of injury

High threat to life

For 1 in 10 cases of sports injury admitted to a hospital, the injuries sustained presented a high threat to life (HTTL). In more than half (55%) of HTTL cases, the principal diagnosis was a fracture. Other common forms of injury were intracranial injury (16%), injury to an internal organ (7%), and a traumatic haemo- or pneumothorax (7%). In those cases where the injury was a fracture, it most commonly involved the trunk (36%), the hip and thigh (22%), the neck (15%), or the head (14%).

A total of 31 people (0.1%) died in hospital in 2011–12 after sustaining a sports-related injury.

Overall, the proportions of hospitalised sports injury that were considered to be life-threatening were fairly similar for men and women. There were a few exceptions to this pattern, such as ice and snow sports; roller sports; and cycling, where notably higher proportions of the male cases had HTTL injuries.

Overall, the proportion of HTTL cases increased with age (Figure 2.5).This was the pattern for several types of sport, including equestrian activities; ice and snow sports; and cycling. An example of this is cycling, where the proportion of HTTL cases was particularly high in the 2 oldest age groups (Figure 2.6). However, for some sports, such as Rugby, the proportion of HTTL cases was low or non-existent in the older age groups.

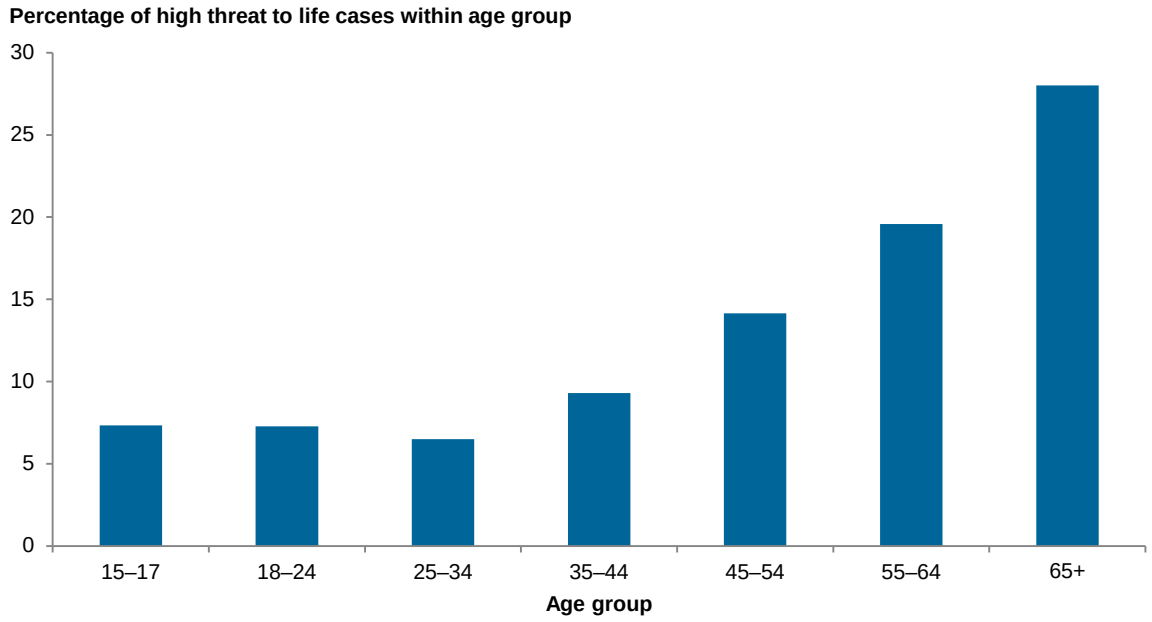


Figure 2.5: Percentage of HTTL cases for sports, by age, Australia, 2011–12

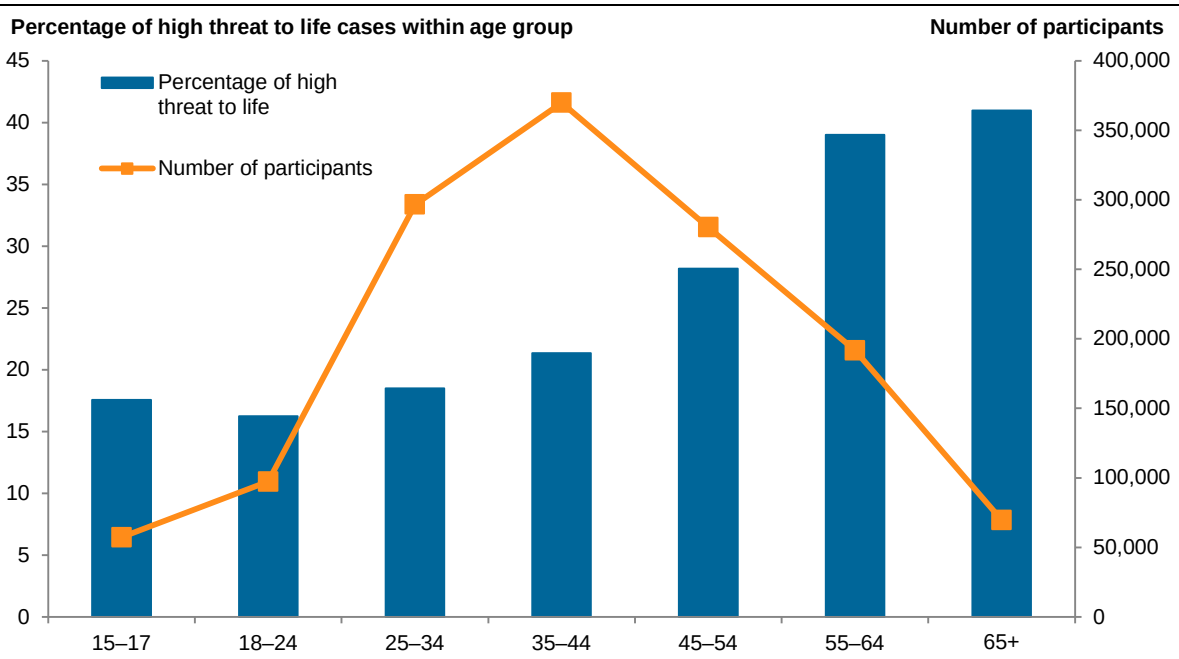


Figure 2.6: Percentage of high threat to life cases within each age group for cycling and the estimated number of participants, by age, Australia, 2011–12

Multiple body regions

Having injuries to multiple body regions increases the chance that a person's overall medical condition will present a high threat to life. Around 10% of people (3,580) sustained injuries to 2 or more body regions.

Length of stay

The mean length of stay (MLOS) in hospital for sports-related injury was 2.2 days. In 17% of cases, the length of stay was 3 days or more. Length of stay tended to rise with age, with the oldest age group having a MLOS of 5 days (Table 2.4). Over one-third (36%) of people were discharged on the same day as they were admitted. Cases of sports injury were responsible for a total of 79,489 days spent in hospital in 2011–12.

Table 2.4: Mean length of stay in hospital for sports injury, by age, Australia, 2011–12

	Age group							
Mean length of stay in hospital (days)	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	1.7	1.9	1.9	2.2	2.7	3.1	5.1	2.1
Females	1.8	1.9	1.9	2.2	2.6	3.1	4.7	2.4
Persons	1.7	1.9	1.9	2.2	2.7	3.1	4.9	2.2

2.6 Where the injury occurred

The most common location in which sports injuries occurred were outdoor sports areas (28%). The place of occurrence was not specified in 30% of cases (Figure 2.7).

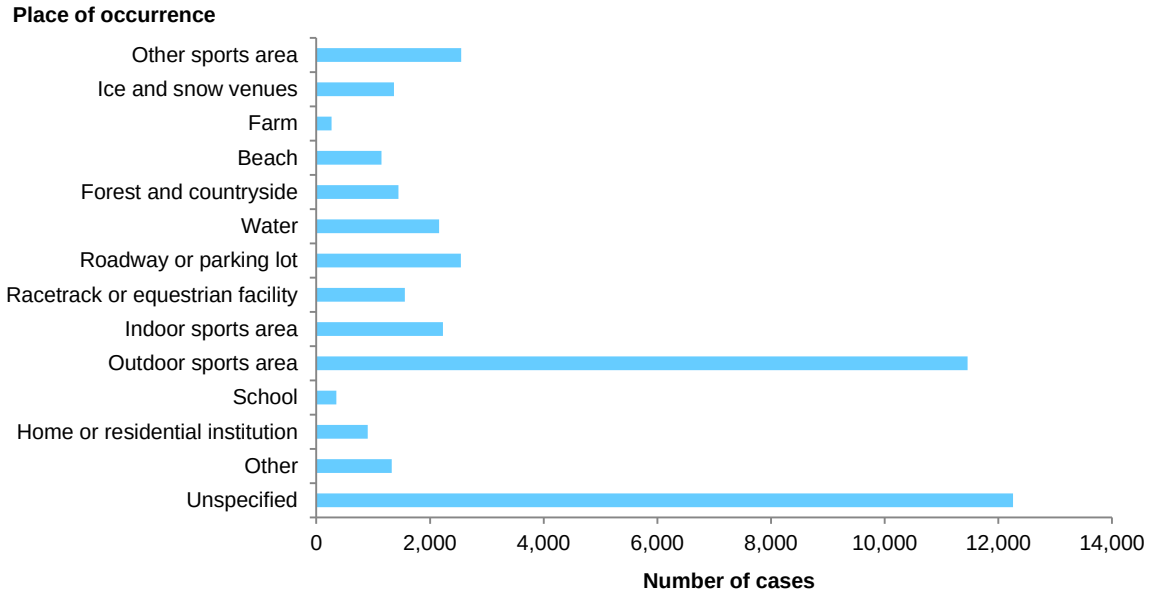


Figure 2.7: Cases of sports injury hospitalisation by the place at which the injury occurred, Australia, 2011–12

2.7 Types of sport

Table 2.5 shows the number of sports injury hospitalisation in relation to the types of sport. All codes of football, combined, accounted for around one-third of all hospitalisations (34%).

Table 2.5: Cases of sports injury hospitalisation, by type of sport, Australia, 2011–12

Type of sport	Number of cases	%
Australian rules football	3,186	8.8
Soccer	2,962	8.2
Cycling	2,917	8.0
Football, other and unspecified	2,821	7.8
Wheeled motor sports	2,737	7.6
Water sports	2,502	6.9
Rugby, unspecified	1,650	4.6
Roller sports	1,632	4.5
Equestrian activities	1,568	4.3
Basketball	1,322	3.6
Netball	1,262	3.5
Ice and snow sports	1,114	3.1
Cricket	913	2.5
Walking and running	878	2.4
Rugby league	709	2.0
Racquet sports	687	1.9
Touch football	644	1.8
Combative sports	602	1.7
Fishing	525	1.4
Dancing	517	1.4
Hockey	442	1.2
Adventure and extreme sports	335	0.9
Rugby union	262	0.7
Golf	251	0.7
Gymnastics and trampolining	121	0.3
Other and unspecified sports	3,678	10.1
Total	**36,237**	**100.0**

Summary

The differences and similarities in the profiles of all of the sports included in the report are summarised in Table 2.6. By far the most common type of injury sustained among all sports was a fracture. In just over half of all sports included in the report the most common body region injured was the knee and lower leg. Three sports with the highest proportion of HTTL cases were cycling (25%), wheeled motor sports (24%) and equestrian activities (23%).

Table 2.6: Key indicators for sports injury hospitalisations included in the report

Sport	Number of cases	Population-based rate (per 100,000 persons)[(a)]	Participation-based rate (per 100,000 persons)	Most common nature of injury	Most common body region injured	Most common mechanism of injury	% that were HTTL cases	MLOS (days)	Total bed days
All Rugby	2,621	15	1,292	Fracture	Knee and lower leg	Fall	5	1.7	4,522
Australian Rules football	3,186	18	1,319	Fracture	Head	Contact with another person	5	1.6	5,099
Soccer	2,962	17	433	Fracture	Knee and lower leg	Fall	3	1.8	5,282
Touch football	644	4	n.a.	Fracture	Knee and lower leg	Fall	1	1.5	958
Combative sports	602	4	168	Fracture	Wrist and hand	Contact with another person	3	1.5	928
Netball	1,262	7	282	Soft tissue	Knee and lower leg	Overexertion[(c)]	0	1.4	1,740
Basketball	1,322	8	373	Fracture	Knee and lower leg	Fall	2	1.5	1,987
Wheeled motor sports	2,737	16	3,574	Fracture	Trunk	Transport accidents	24	3.5	9,637
Ice and snow sports	1,114	6	803	Fracture	Knee and lower leg	Fall	9	2.2	2,404
Water sports	2,502	14	99[(b)]	Fracture	Knee and lower leg	Fall	17	2.6	6,571
Roller sports	1,632	9	2,312	Fracture	Elbow and forearm	Fall	10	2.3	3,803
Equestrian activities	1,568	9	902[(b)]	Fracture	Trunk	Transport accidents	23	3.1	4,888
Fishing	525	3	212	Open wound	Wrist and hand	Fall	11	3.1	1,620
Dancing	517	3	199	Fracture	Knee and lower leg	Fall	8	2.9	1,517
Walking and running	878	5	16	Fracture	Knee and lower leg	Fall	13	2.9	2,519
Cycling	2,917	16	214	Fracture	Head	Transport accidents	25	2.6	7,645

(continued)

Table 2.6 (continued): Key indicators for sports injury hospitalisations included in the report

Sport	Number of cases	Population-based rate (per 100,000 persons)[(a)]	Participation-based rate (per 100,000 persons)	Most common nature of injury	Most common body region injured	Most common mechanism of injury	% that were HTTL cases	MLOS (days)	Total bed days
Adventure and extreme sports	335	2	n.a.	Fracture	Knee and lower leg	Fall	13	3.6	1,213
Gymnastics and trampolining	121	1	242	Fracture	Knee and lower leg	Fall	4	2.4	291
Hockey	442	3	393	Fracture	Wrist and hand	Contact with sports equipment	1	1.3	593
Cricket	913	5	254	Fracture	Wrist and hand	Contact with sports equipment	3	1.4	1,263
Racquet sports	687	4	64	Fracture	Knee and lower leg	Fall	4	1.9	1,307
Golf	251	1	29	Fracture	Knee and lower leg	Fall	10	3.9	991

(a) Age-standardised rate.

(b) The participation-based rates for water sports and equestrian activities represent an underestimate because they were calculated using a restricted subset of cases. (See sections 8.1 and 10.1 for details.)

(c) 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

2.8 Total days spent by patients due to sports injury

While this report focuses on reporting cases of sports injury, the burden of associated hospitalisation can be represented by the total number of days spent by patients in hospital for their injury.

The 36,237 cases reported on earlier in this chapter were associated with a total of 78,489 days of in-hospital acute care (not including care provided in any episode prior to an inwards transfer). In addition, the following categories of hospital separation were associated with injury.

Follow-up care separations

Many sports injury cases require rehabilitation and related care after an acute episode. This aspect of hospital care is typically recorded in a different separation record to the acute care phase.

1,523 sports-related follow-up care separations were identified for people aged 15 and older in 2011–12. Over half involved men (905, or 59%).

Most sports-related follow-up care separations (1,421, or 93%) had a principal diagnosis of Z50 *Care involving use of rehabilitation procedures*.

'Non-injury' sports separations

Despite having a sports activity code in the record, an additional 1,514 hospital separations involving people aged 15 and older had neither an injury principal diagnosis from ICD-10-AM Chapter 19, nor a principal diagnosis indicating that they were for follow-up care. Around three-quarters of these separations involved men (76%, 1,144).

For one-third of these separations (33%), the principal diagnosis fell in the range M00–M99 *Diseases of the musculoskeletal system and connective tissue*. A further 16% had, as their principal diagnosis, L03 *Cellulitis* (a bacterial infection of the skin and the tissues below it, often occurring subsequent to a wound). For the remaining separations, the principal diagnoses were widely distributed across the non-injury ICD-10-AM codes.

Length of stay

There was a total of 107,425 patient days for hospital care attributable to sports injury (that is, the initial acute care hospitalisation for the sports injury, follow-up care separations and 'non-injury' sports separations) for people aged 15 and over in 2011–12 (Table 2.7).

Table 2.7: Total patient days for sports injury related hospitalisation, Australia, 2011–12

Separation type	Males	Females	Persons
Sports injury initial acute care	59,558	19,931	79,489
Sports-related follow-up care separations	14,554	5,964	20,518
'Non-injury' sports-related separations	5,456	1,962	7,418
Total	**79,568**	**27,857**	**107,425**

3 Football

This chapter includes the following codes of football:

- Rugby Union (U50.01)
- Rugby League (U50.02)
- Rugby, unspecified (U50.03)
- Australian Rules football (U50.00)
- Soccer (U50.04)
- Touch football (U50.05)
- Football, other and unspecified (U50.08 and U50.09)

In 2011–12, 12,234 people (32% of all cases of sports injury) were admitted to hospital as the result of an injury sustained while playing football of some kind. This is the largest proportion of cases of sports injury. Table 3.1 shows the distribution of cases for each of the sports covered in this chapter.

Table 3.1: Overview of all cases of football-related sports injury hospitalisation, Australia, 2011–12

Football code	Number of cases	%
Rugby Union	262	2.1
Rugby League	709	5.8
Rugby, unspecified	1,650	13.5
Australian Rules football	3,186	26.0
Football, other and unspecified	2,821	23.1
Soccer	2,962	24.2
Touch football	644	5.3
Total	**12,234**	**100**

3.1 Rugby

In this section, the categories of 'Rugby Union, unspecified, 'Rugby League, unspecified' and 'Rugby, unspecifie have been combined. This was done because, for a large number of the cases, only 'Rugby, unspecified' was reported.

Playing Rugby resulted in 2,621 cases of sports injury hospitalisation in 2011–12. These cases accounted for 7% of all cases of hospitalised sports injuries.

Age and sex

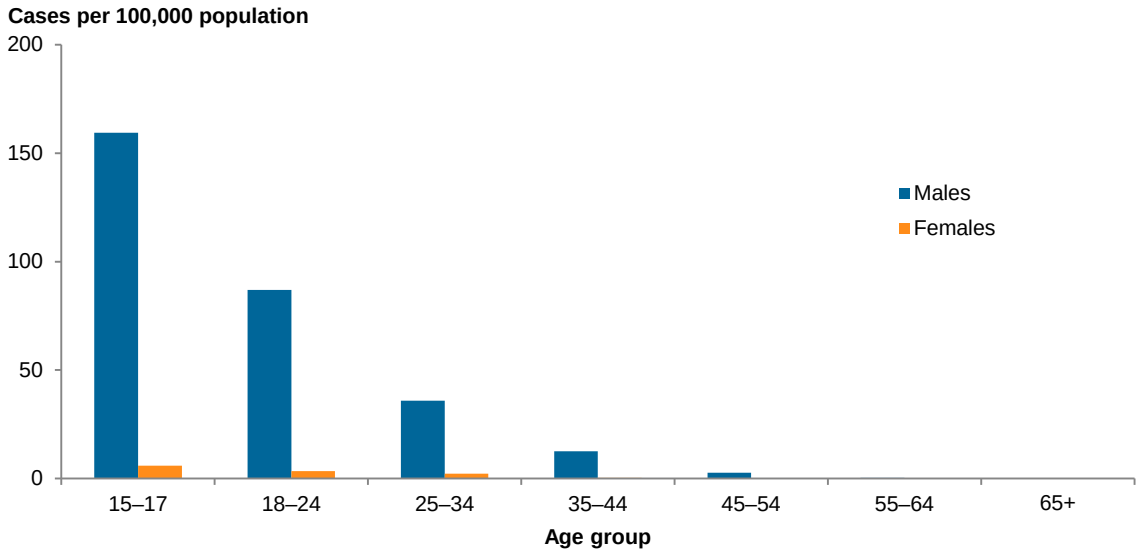
Rugby is principally played by young men. This is reflected in the age and sex profile of the sports injury hospitalisations, where 96% of cases involved males and, in 90% of all cases, the injured person was aged under 35 (Table 3.2).

Table 3.2: Cases of Rugby-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	707	981	584	198	41	3	1	2,515
Females	25	37	36	5	2	0	1	106
Persons	732	1,018	620	203	43	3	2	2,621

Population-based rates of sports injury

There were 20 cases per 100,000 population for males and 1.2 per 100,000 for females across all ages. However, age-specific rates are much higher for younger men. The highest population-based age-specific rate was for men aged 15–17 (159.4 cases per 100,000 population), followed by a rate of 87 for men aged 18–24. Caution should be exercised in interpreting these results due to small case numbers in older age groups (Figure 3.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 3.1: Age-specific rates of Rugby-related sports injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 202,902 (RSE 11.5%) people reported playing Rugby at least once in the 12 months prior to survey. More males than females reported playing Rugby in this period—188,676 men (RSE 13.1%) compared with 14,226 women (RSE 45.2%).

For men, there were 1,333 sports injury hospitalisations per 100,000 participants (see Table 3.3), while the equivalent rate for all persons was 1,292. Women had a participation-based sports injury rate of 745, but caution should be used with respect to this rate because the relative standard error (RSE) for the denominator was > 25 and ≤ 50. Participation-based age-specific rates for women are not included in Table 3.3 because the RSE exceeded 50. The highest sports injury hospitalisation rate by participation for men was in the 18–24 age group.

Table 3.3: Participation-based sports injury hospitalisation rates[(a)] for males for Rugby-related injury, by age, Australia, 2011–12

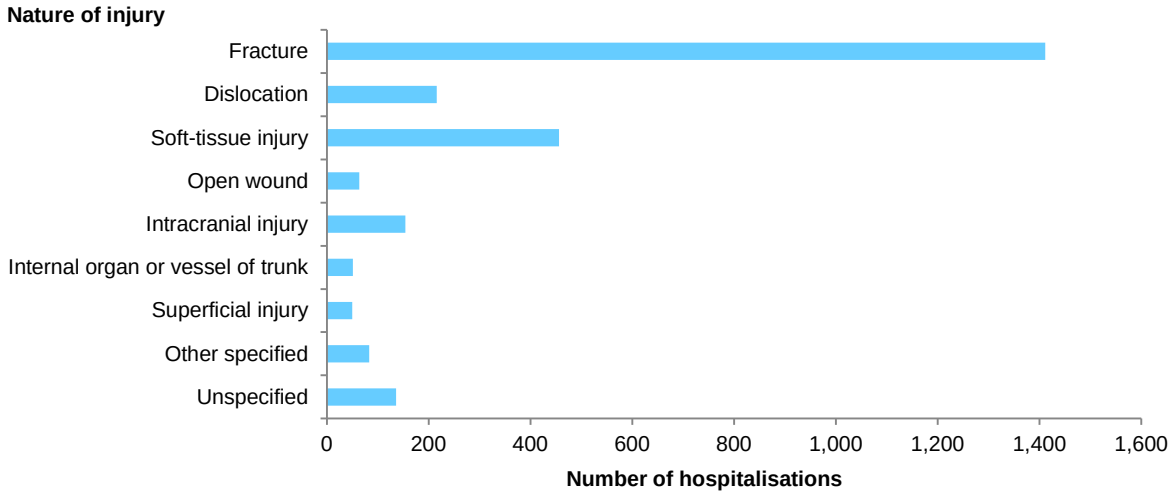
	Age group				
Sex	**15–17**	**18–24**	**25–34**	**35+**	**All ages**
Males	938	2,246*	1,170*	1,230*	1,333

(a) Per 100,000 participants.

* Caution should be exercised because the dominator has an RSE > 25 and ≤ 50.

Nature and bodily location of injury

Fractures were the most common type of injury sustained in playing Rugby (54%). The serious outcome of intracranial injury accounted for 6% of cases (Figure 3.2). Fractures most frequently affected the knee and lower leg (26%), the head (25%), and the wrist and hand (23%) (Table 3.4).



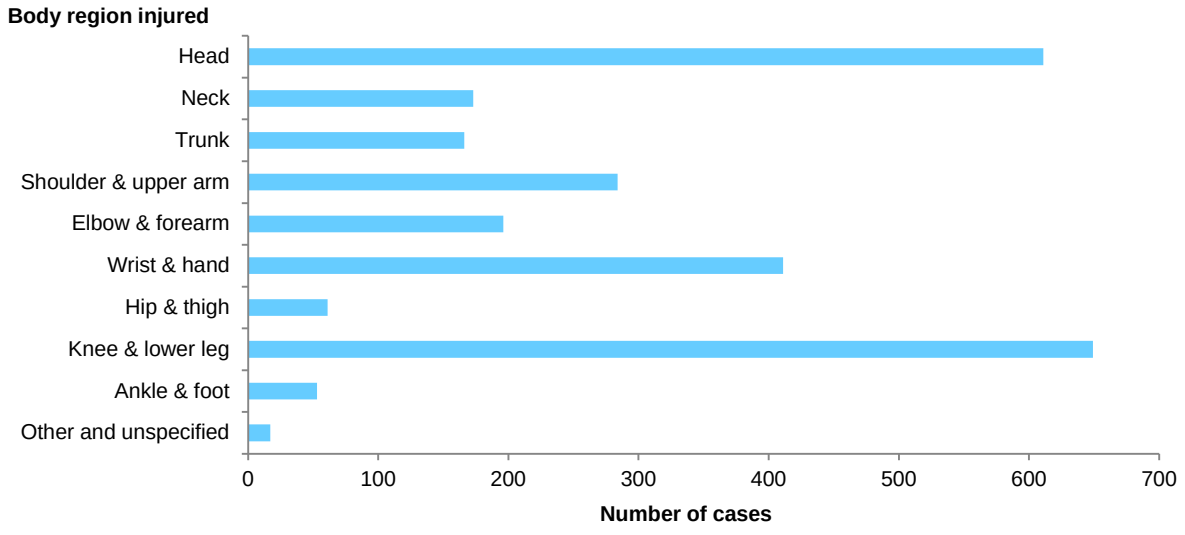
Notes: Data underpinning this figure are available in Table B1.6 in Appendix B.

Figure 3.2: Cases of Rugby-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 3.4: Fractures by body region for Rugby-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Knee & lower leg	361	26
Head	348	25
Wrist & hand	321	23
Elbow & forearm	171	12
Shoulder & upper arm	102	7
Trunk	42	3
Neck	35	3
Hip & thigh	17	1
Ankle & foot	14	1
Total	**1,411**	**100**

The knee and lower leg, and the head, were the most frequently injured areas of the body (25% and 23% of cases, respectively). The wrist and hand, and the shoulder and upper arm, were also common sites of injury (16% and 11% of cases, respectively) (Figure 3.3). The largest proportion of injuries to the knee and lower leg were fractures (56%). A fracture was sustained in over half (57%) of the cases of injury to the head, and in a further 25% of cases, the injury was intracranial in nature.

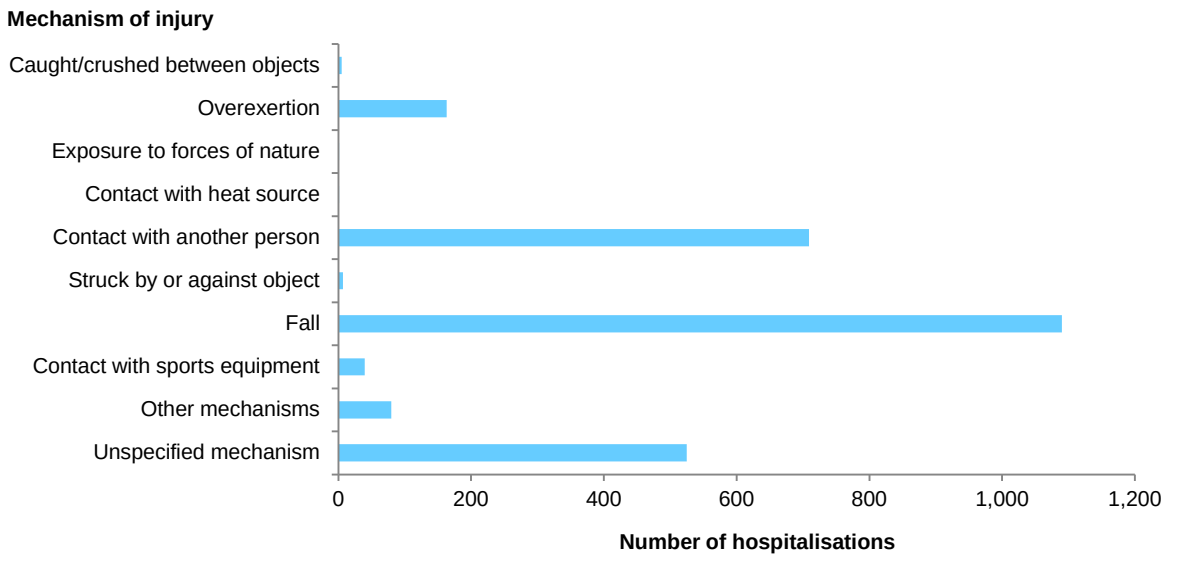


Note: Data underpinning this figure are available in Table B1.6 in Appendix B.

Figure 3.3: Cases of Rugby-related sports injury hospitalisation, by body region injured, Australia, 2011–12

Mechanism of injury

The most frequent mechanism of injury was a fall (42%), followed by a collision with another person (27%) (Figure 3.4).

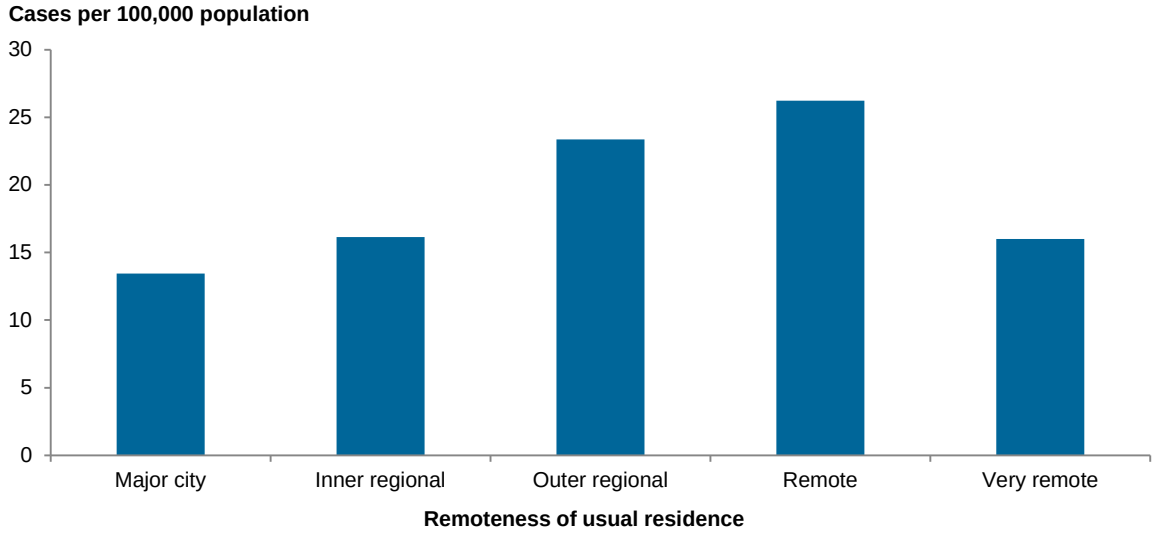


Note: Data underpinning this figure are available in Table B1.6 in Appendix B.

Figure 3.4: Cases of Rugby-related sports injury hospitalisation, by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

Population-based age-standardised rates of Rugby-related sports injury hospitalisation were higher in all regional and remote areas than in major cities. The rates for regional and remote areas ranged from 16.0–26.2 per 100,000 population compared with a rate of 13.4 for *Major cities* (Figure 3.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 3.5: Age-standardised rates of Rugby-related sports injury hospitalisation, by remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

There were 135 (5%) of cases of hospitalisation due to Rugby-related injury where the injuries presented a high threat to life. In the largest proportion of these cases, the person had sustained a fracture (69, or 51%). In 15% of HTTL cases the person had sustained an intracranial injury. Of the 69 fractures, the most commonly involved body regions were the neck (41%), the head (28%) and the trunk (23%). One person died while in hospital.

Length of stay

The MLOS in hospital after a Rugby-related injury was 1.7 days. A little over one-third of people (37%) were discharged on the same day as they were admitted, but for 13% the hospital stay was 3 days or more. The total number of hospital days spent by patients attributable to Rugby was 4,522.

3.2 Australian Rules football

Playing this sport resulted in 3,186 cases of sports injury hospitalisation in 2011–12. These cases accounted for 9% of all cases of hospitalised sports injuries.

Age and sex

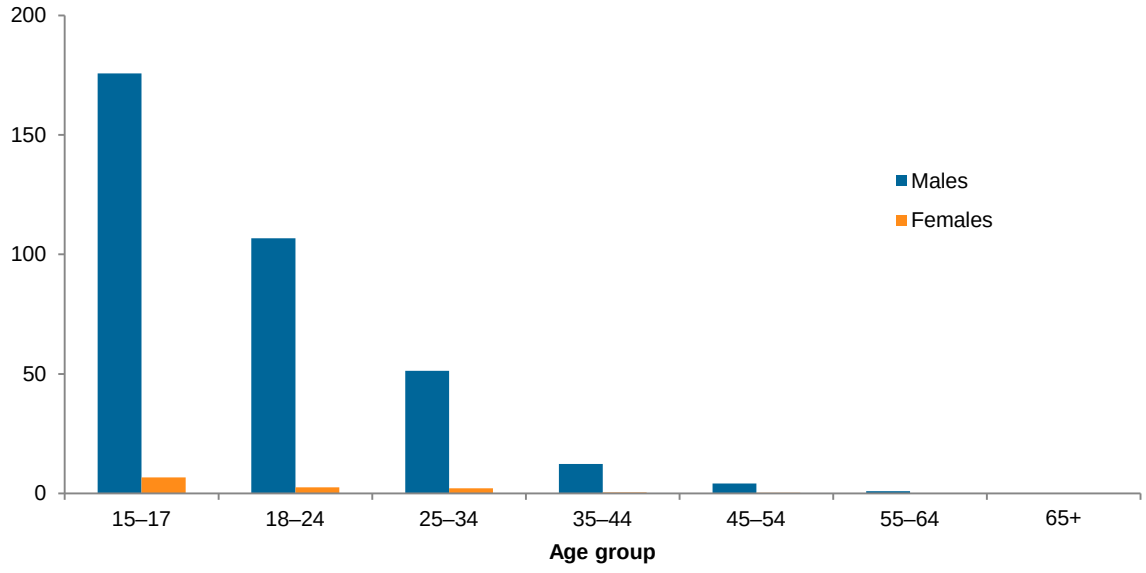
As is the case for Rugby, Australian Rules is mainly played by young men. In 2011–12, 97% of cases involved males and, in 91% of all cases, the injured person was aged under 35 (Table 3.5).

Table 3.5: Cases of Australian Rules football-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	779	1,204	836	194	62	12	2	3,089
Females	28	27	34	5	3	0	0	97
Persons	807	1,231	870	199	65	12	2	3,186

Population-based rates of sports injury

There were 26 cases per 100,000 population for males and 1 per 100,000 for females. Age-specific rates for young men are much higher than this. For example, men aged 15–17 had an age-specific rate of 176. The small number of cases for women players makes the interpretation of rates problematic (Figure 3.6).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 3.6: Age-specific rates of sports injury hospitalisation related to Australian Rules football, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 241,531 people (RSE 9.2%) reported playing Australian Rules football at least once in the 12 months prior to survey. More males (222,641, RSE 9.6%) than females (18,890, RSE 25.9%) reported playing Australian Rules football in this period.

The participation-based sports injury hospitalisation rate for men was 1,387 per 100,000 participants (see Table 3.6), and the equivalent rate for all persons was 1,319. Women had a sports injury hospitalisation participation-based rate of 514, but caution should be used with respect to this rate because the RSE for the denominator was > 25 and ≤ 50. As for Rugby, the highest rate for men was for those aged 18–24.

Table 3.6: Participation-based[(a)] Australian Rules football-related injury hospitalisation rates, by sex, Australia, 2011–12

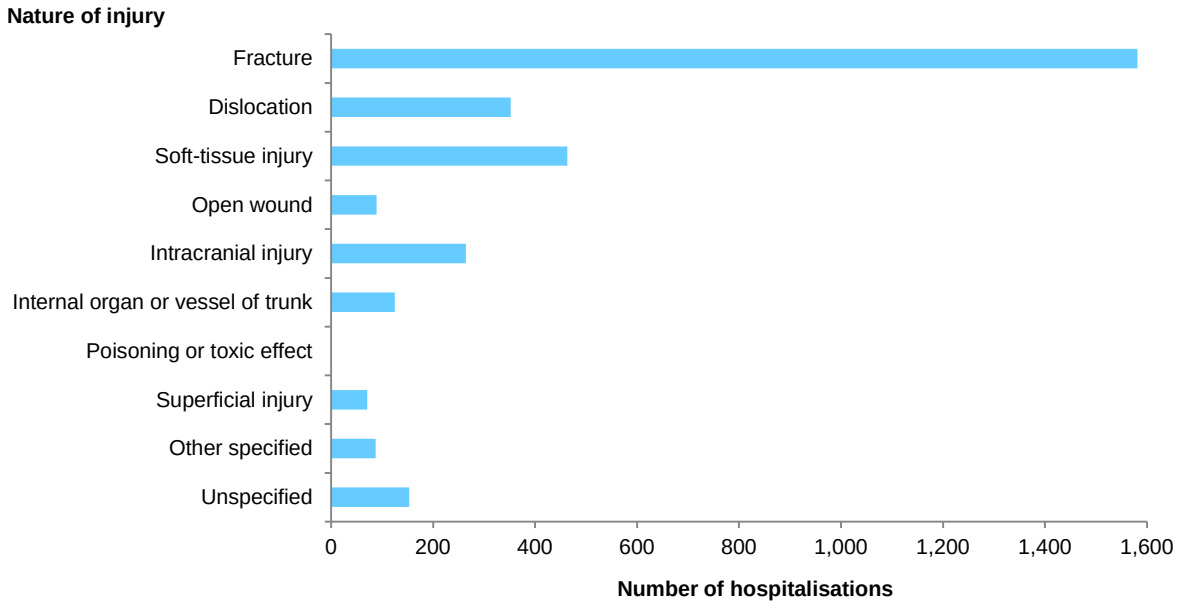
	Age group					
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45+**	**All ages**
Males	1,424*	2,036	1,371	480	1,029*	1,387
Persons	1,318*	1,806	1,326	490	1,227*	1,319

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

Nature and bodily location of injury

Fractures accounted for half (50%) of the hospitalised injuries due to Australian Rules football (Figure 3.7). Fractures most frequently involved the wrist and hand (30%), the knee and lower leg (21%), and the head (21%) (Table 3.7). Soft-tissue injuries were the next most common injury outcome (15%).



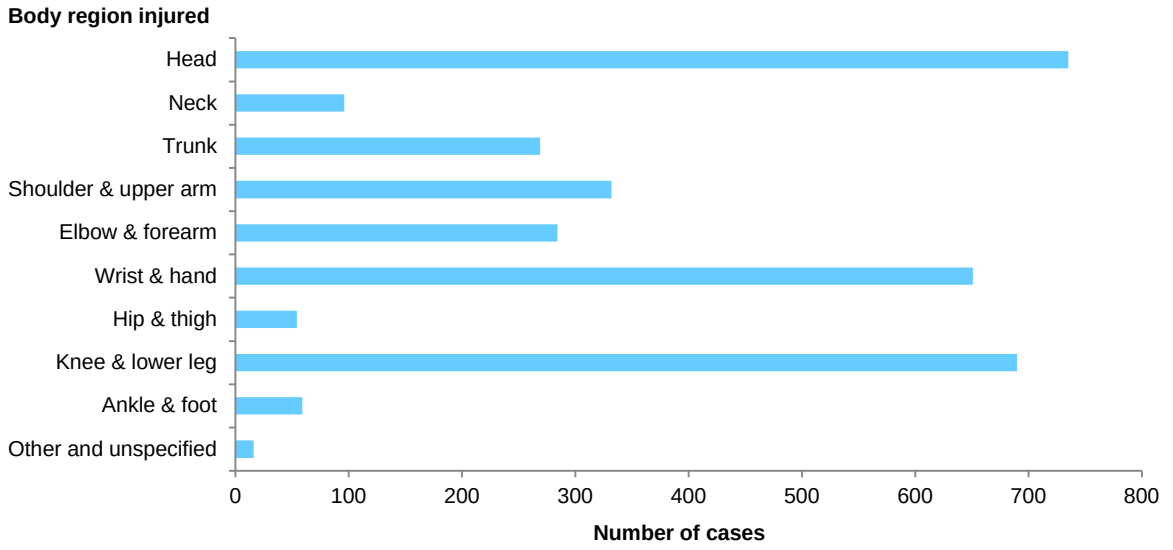
Note: Data underpinning this figure are available in Table B1.7 in Appendix B.

Figure 3.7: Cases of Australian Rules football-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 3.7: Fractures by body region for Australian Rules football-related sports injury hospitalisation, Australia, 2011–12

Body region	Number of cases	%
Wrist & hand	468	30
Knee & lower leg	334	21
Head	326	21
Elbow & forearm	251	16
Shoulder & upper arm	124	8
Trunk	41	3
Neck	14	1
Ankle & foot	12	1
Hip & thigh	11	1
Total	**1,581**	**100**

The head, the knee and lower leg, and the wrist and hand were the most commonly injured areas of the body (23%, 22% and 20% of cases, respectively) (Figure 3.8). The most frequently sustained injury to the head was a fracture (44% of head injuries), followed by intracranial injury (36%). For the knee and lower leg, the most common injuries were fractures (48%). Around three-quarters (72%) of injuries to the wrist and hand were fractures, and a further 20% were dislocations.

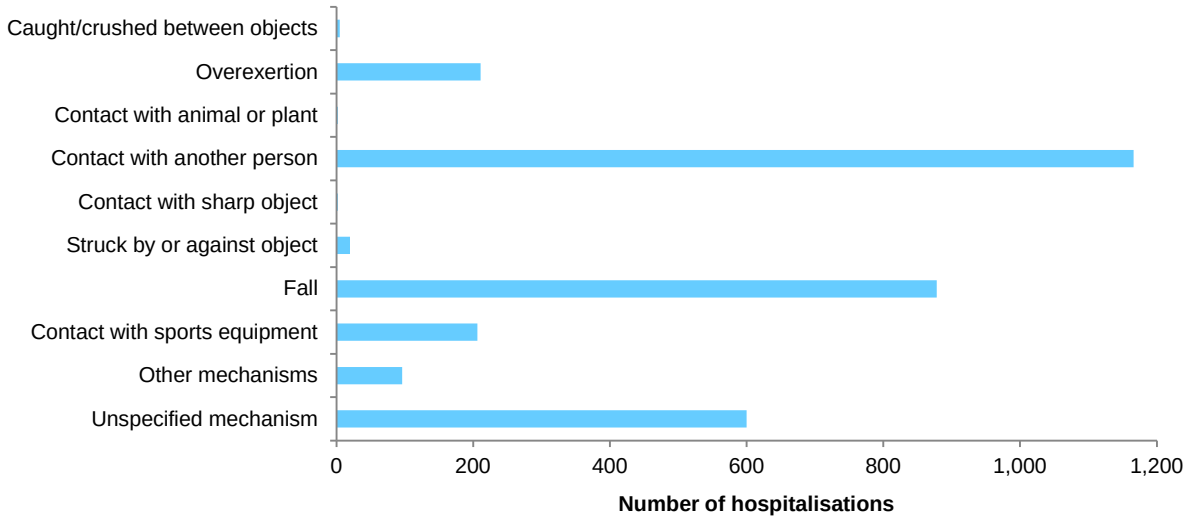


Note: Data underpinning this figure are available in Table B1.7 in Appendix B.

Figure 3.8: Cases of Australian Rules football-related sports injury hospitalisation, by body region injured, Australia, 2011–12

Mechanism of injury

Contact with another person was the most common mechanism of injury (37%), followed by a fall (28%). The mechanism of injury was not specified in 19% of cases (Figure 3.9).

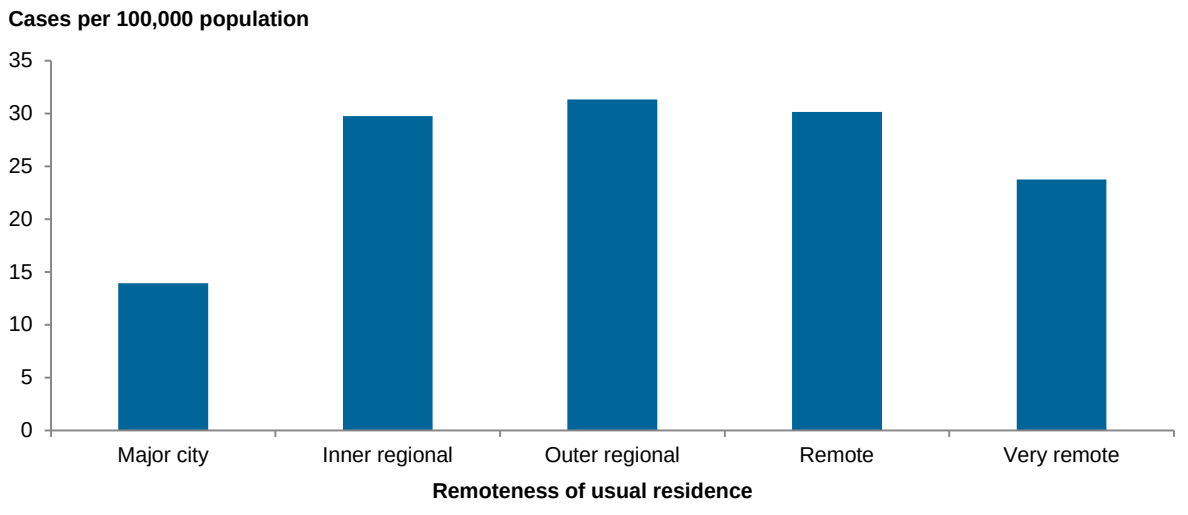


Note: Data underpinning this figure are available in Table B1.7 in Appendix B.

Figure 3.9: Cases of Australian Rules football-related sports injury hospitalisation by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

Population-based age-standardised rates were much higher in regional and remote areas than in *Major cities*. Rates in regional and remote areas ranged from 23.8 to 31.3 per 100,000 population compared with a rate of 13.9 for *Major cities* (Figure 3.10).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 3.10: Age-standardised rates of Australian Rules football-related sports injury hospitalisation, by remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

In 165 (5%) of cases, the injuries sustained while playing Australian Rules football presented a high threat to life. In 57 (35%) of these cases, the injury was a fracture to the head, neck or trunk. In 36 (22%) of cases, there was injury to an internal organ. Intracranial injury accounted for 16% of cases and a traumatic haemo- or pneumothorax had occurred in 13% of cases. Two people died in hospital after being injured while playing Australian Rules football.

Length of stay

The MLOS in hospital after a Australian Rules-related injury was 1.6 days. Over 4 in 10 (43%) of people were discharged on the same day as they were admitted. Ten per cent of those admitted spent 3 or more days in hospital. The MLOS tended to increase with age (Table 3.8). Injury related to playing Australian Rules football resulted in a total of 5,099 days spent in hospital.

Table 3.8: Mean length of stay in hospital for Australian Rules football-related injury, by age, Australia, 2011–12

	Age group							
	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Persons	1.4	1.5	1.7	1.8	2.8	2.9	1.5	1.6

3.3 Soccer

Playing soccer resulted in 2,962 cases of sports injury hospitalisation in 2011–12. These cases accounted for 8% of all cases of hospitalised sports injury.

Age and sex

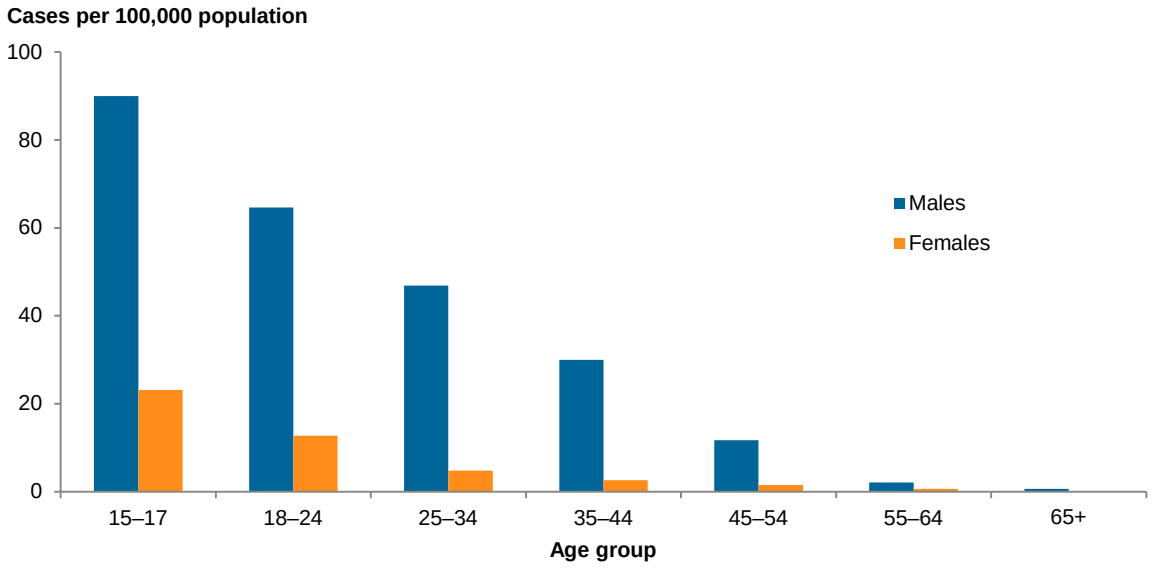
In 2011–12, 87% of cases involved men. The highest number of cases for men was in the 25–34 age group (Table 3.9).

Table 3.9: Cases of soccer-related sports injury hospitalisation Australia, 2011–12

	Age group							
Sex	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Males	399	729	764	472	176	27	9	2,576
Females	97	137	77	42	23	8	2	386
Persons	496	866	841	514	199	35	11	2,962

Population-based rates of sports injury

There were 25 cases per 100,000 population for males and 5 for females. The highest age-specific rates for both men and women were found in the 15–17 year age group (90 and 23 cases, respectively). Caution should be exercised in interpreting these results due to small case numbers in older age groups (Figure 3.11).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 3.11: Age-specific rates of soccer-related sports injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 683,292 (RSE 5.4%) people reported playing soccer at least once in the 12 months prior to survey. More males (535,278, RSE 5.8%) than females (148,014, RSE 15.0%) reported playing soccer in this period.

The participation-based sports injury hospitalisation rate was 433 per 100,000 participants. Men had a higher participation rate (481 per 100,000 participants) than did women (261) (Table 3.10). For men, and for all persons, the participation-based rate was highest for those aged 55–64, although caution should be exercised with respect to these. For women, for those age groups where a rate could be published, rates were similar across age groups.

Table 3.10: Participation-based[(a)] soccer-related sports injury hospitalisation rates, Australia, 2011–12

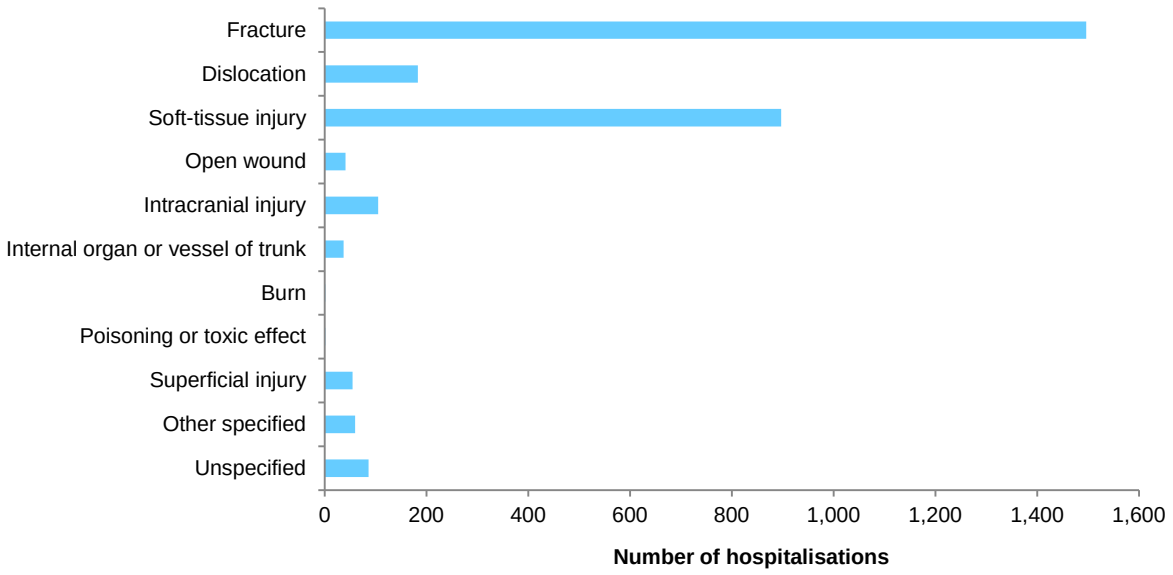
Sex	15–17	18–24	25–34	35–44	45–54	55–64	65+	All ages
Males	388	525	511	440	510*	1,167*	n.p.	481
Females	188	295	301	294*	228*	n.p.	n.p.	261
Persons	321	467	481	423	446	1,513*	n.p.	433

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

Nature and bodily location of injury

Fractures accounted for half (51%) of the hospitalised injuries due to soccer. The 3 most frequently fractured body regions were the knee and lower leg (40%), the elbow and forearm (20%), and the wrist and hand (15%). Soft tissue injuries were the next most common type of injury (30%) (Figure 3.12 and Table 3.11).



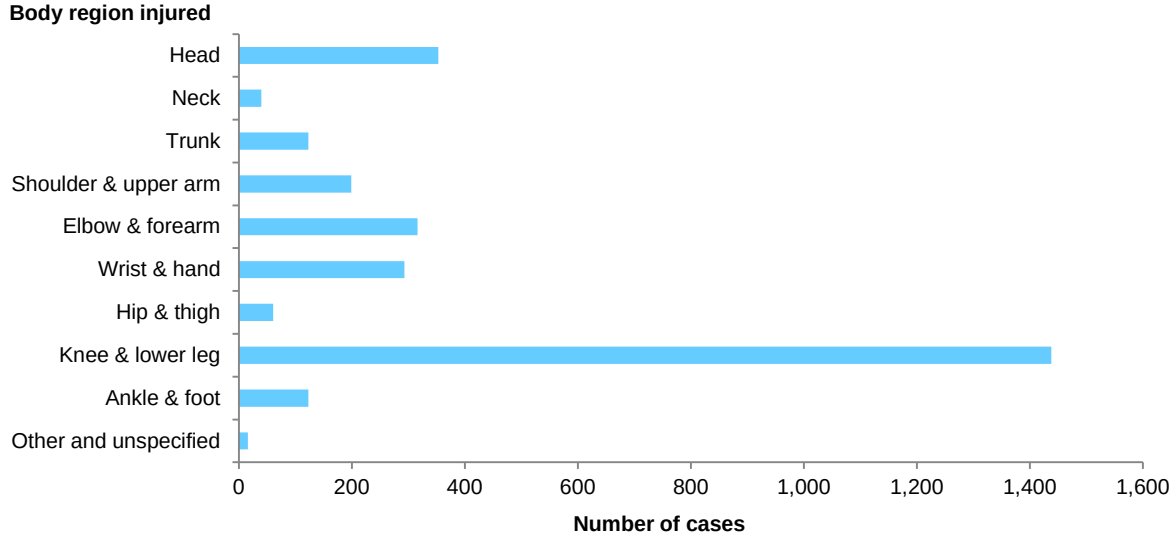
Note: Data underpinning this figure are available in Table B1.8 in Appendix B.

Figure 3.12: Cases of soccer-related sports injury hospitalisation by nature of injury, Australia, 2011–12

Table 3.11: Fractures by body region for soccer-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Knee & lower leg	594	40
Elbow & forearm	298	20
Wrist & hand	230	15
Head	168	11
Shoulder & upper arm	105	7
Ankle & foot	46	3
Trunk	30	2
Hip & thigh	20	1
Neck	5	0
Total	**1,496**	**100**

The 3 most commonly injured regions of the body were the knee and lower leg (49%), the head (12%) and the elbow and forearm (11%). Most injuries to the knee and lower leg were fractures (41%). Head injuries mostly comprised fractures (48%) and intracranial injuries (30%). Nearly all injuries to the elbow and forearm were fractures (94%) (Figure 3.13).

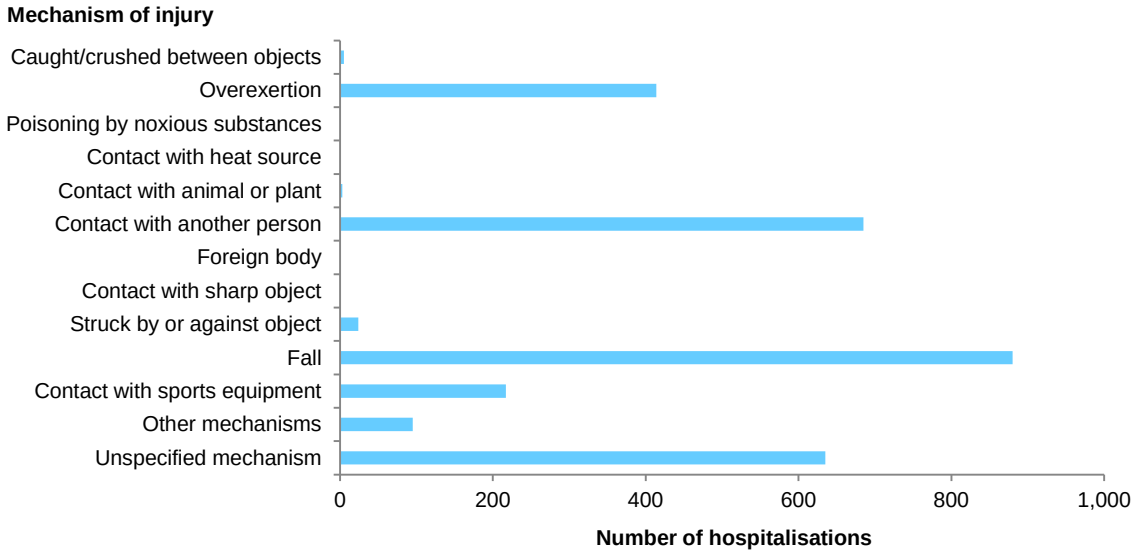


Note: Data underpinning this figure are available in Table B1.8 in Appendix B.

Figure 3.13: Cases of soccer-related sports injury hospitalisation by body region injured, Australia, 2011–12

Mechanism of injury

Falls were the most common mechanism of injury in soccer (30%), followed by contact with another person (23%). Overexertion and strenuous or repetitive movements was also a frequently coded mechanism (14%). A mechanism of injury was not specified in 21% of cases (Figure 3.14).



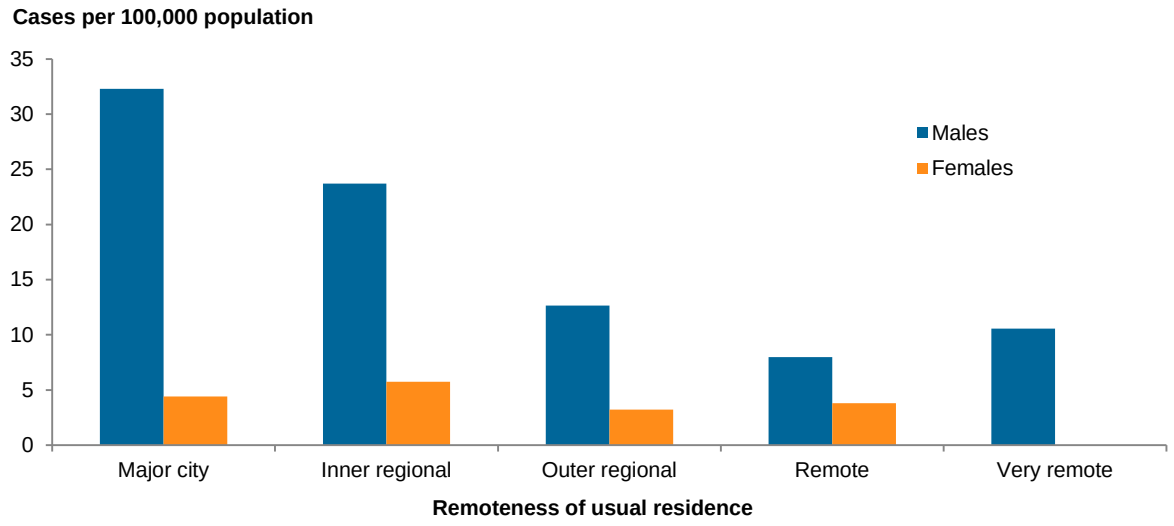
Notes

1. Data underpinning this figure are available in Table B1.8 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 3.14: Cases of soccer-related sports injury hospitalisation by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

Population-based age-standardised rates for men were highest in *Major cities* and *Inner regional* areas (32 and 24 cases per 100,000 population, respectively) (Figure 3.15). There were relatively few cases involving women, so the population-based rates for women should be interpreted with caution.



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 3.15: Age-standardised rates of soccer-related sports injury hospitalisation, by sex and remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

In 83 (3%) of cases, the injuries sustained while playing soccer were assessed as posing a high threat to life. Around half of these cases (49%) involved a fracture. Intracranial injury accounted for 19% and a traumatic haemo- or pneumothorax for 13%. Two people died while in hospital.

Length of stay

The MLOS in hospital after a soccer-related injury was 1.8 days. One-third of people were discharged on the same day as they were admitted. Fifteen per cent of those admitted spent 3 or more days in hospital. MLOS was consistent across age groups with the exception of those aged 65 and over, for whom the MLOS was 6 days (Table 3.12). The total days spent in hospital by patients for soccer-related injury was 5,282.

Table 3.12: Mean length of stay in hospital for soccer-related injury, by age, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	1.7	1.8	1.7	1.9	1.9	2.0	6.7	1.8
Females	1.5	1.5	1.8	2.1	2.0	2.4	3.5	1.7
Persons	1.7	1.7	1.7	1.9	1.9	2.1	6.1	1.8

3.4 Touch football

Playing touch football resulted in 644 cases of sports injury hospitalisation in 2011–12. These cases accounted for 2% of all cases of hospitalised sports injuries.

Age and sex

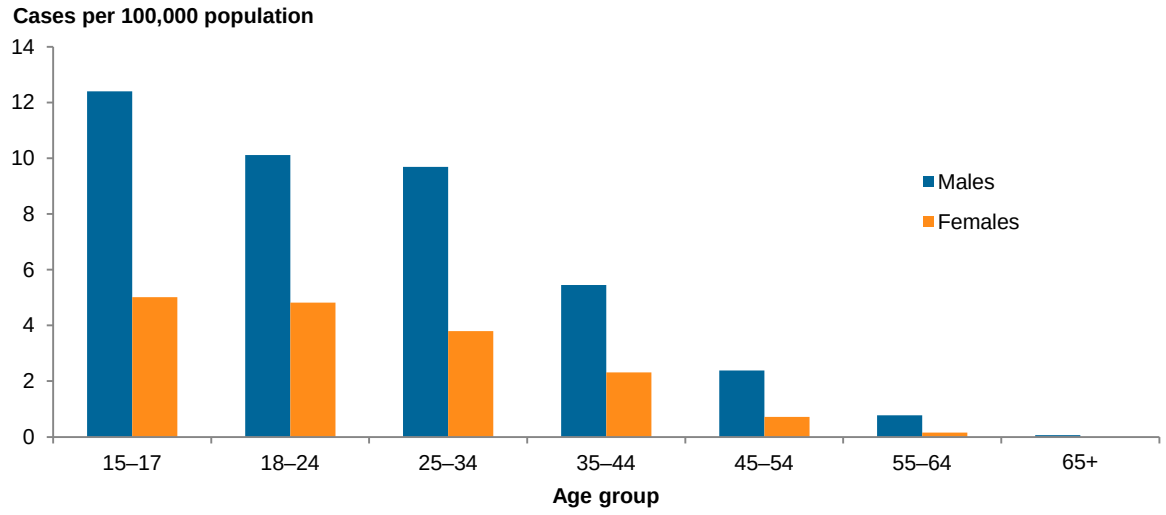
In 2011–12, around 7 in 10 cases (72%) involved men. The highest number of cases for men were in the 25–34 age group (Table 3.13).

Table 3.13: Cases of touch football-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	55	114	158	86	36	10	1	460
Females	21	52	61	37	11	2	0	184
Persons	76	166	219	123	47	12	1	644

Population-based rates of sports injury

Population-based age-standardised rates for men and women were 5 and 2 cases per 100,000 population, respectively. Age-specific rates were highest for both men and women in the in the 15–17 age group (12 and 5 cases, respectively). Caution should be exercised in interpreting these results, due to small case numbers in older age groups (Figure 3.16).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

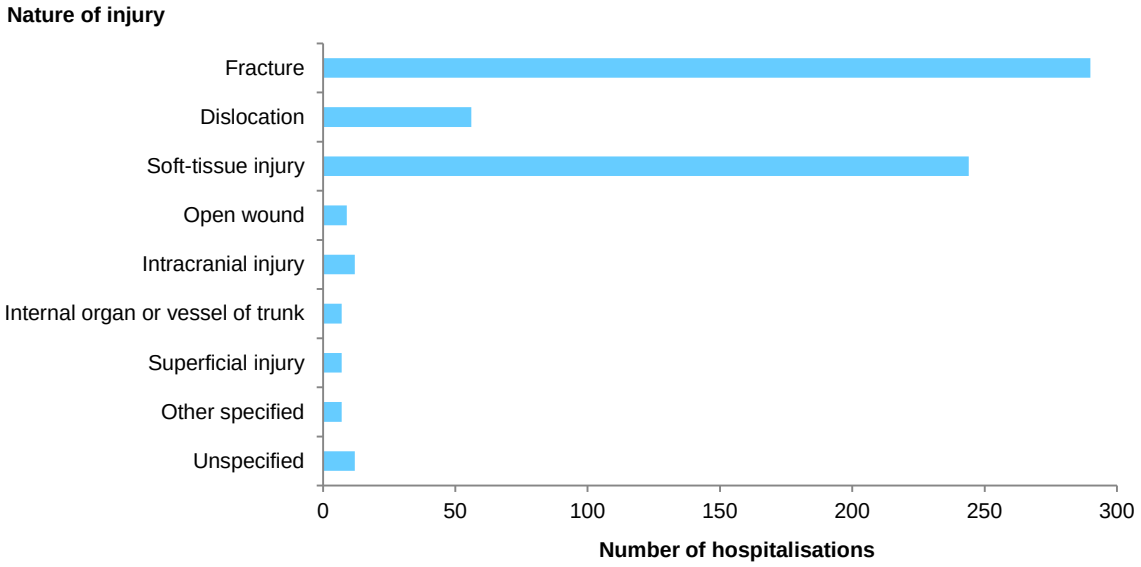
Figure 3.16: Age-specific rates of touch football-related sports injury hospitalisation , by sex, Australia, 2011–12

Participation-based rates of sports injury

Participation-based rates could not be calculated for touch football due to lack of data in the PSPRA.

Nature and bodily location of injury

The 2 most common types of injury associated with touch football were fractures (45%) and soft-tissue injury (38%) (Figure 3.17). The 3 most common sites of fracture were the wrist and hand (38%), knee and lower leg (26%) and elbow and forearm (20%) (Table 3.14).



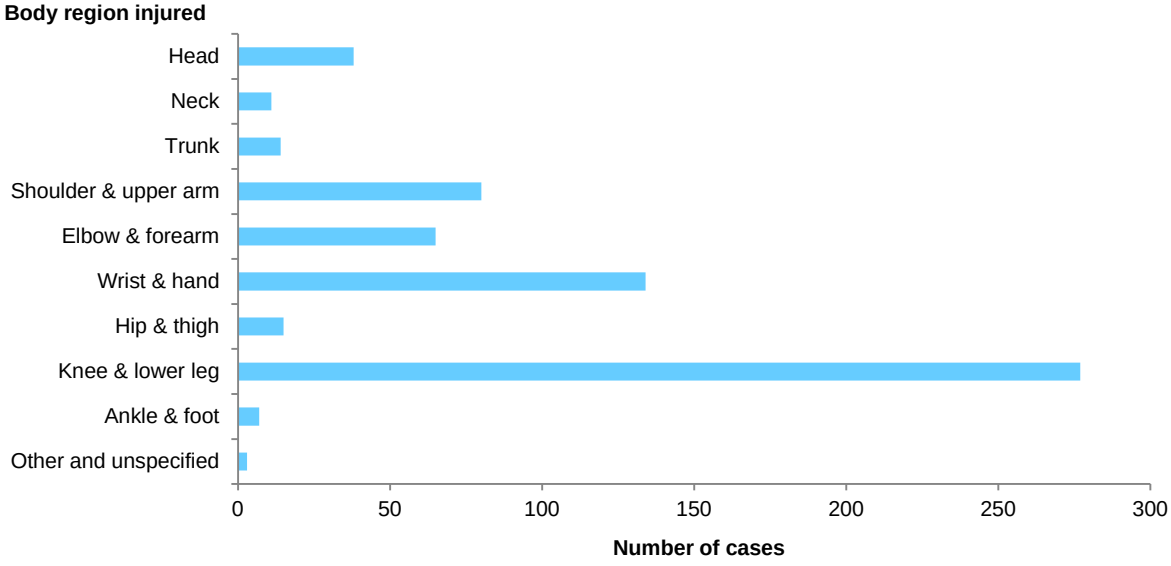
Note: Data underpinning this figure are available in Table B1.9 in Appendix B.

Figure 3.17: Cases of touch football-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 3.14: Fractures by body region for touch football-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Wrist & hand	109	38
Knee & lower leg	76	26
Elbow & forearm	57	20
Shoulder & upper arm	23	8
Head	17	6
Hip & thigh	4	1
Ankle & foot	3	1
Trunk	1	0
Total	**290**	**100**

The most commonly injured body regions were the knee and lower leg (43%) and the wrist and hand (21%) (Figure 3.18). Knee and lower leg injuries comprised both soft tissue and fracture injuries (27%). Around 8 in 10 (81%) of the injuries to the wrist and hand were fractures.

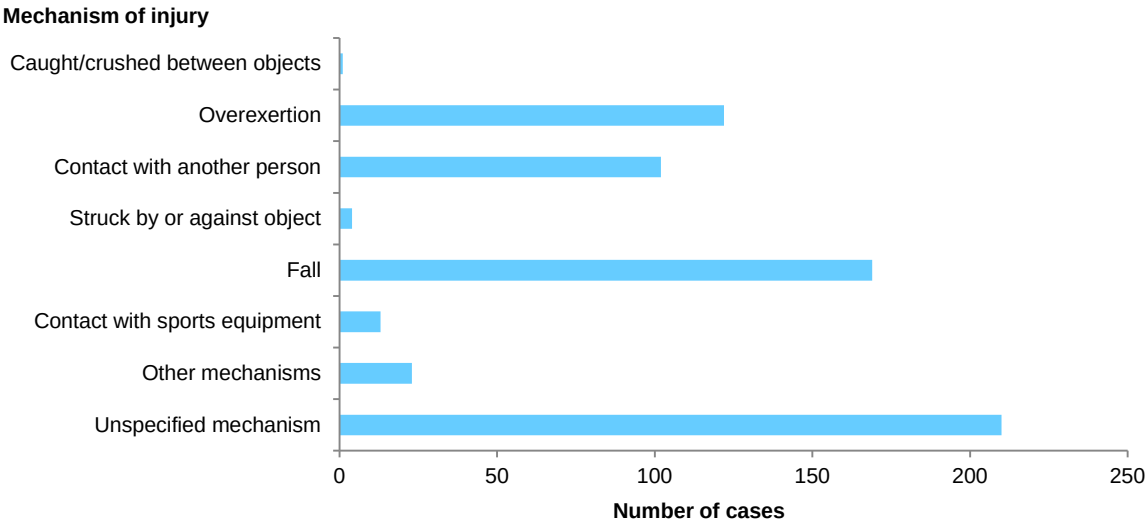


Note: Data underpinning this figure are available in Table B1.9 in Appendix B.

Figure 3.18: Cases of touch football-related sports injury hospitalisation, by body region injured, Australia, 2011–12

Mechanism of injury

The most common mechanism of injury in touch football was a fall (26%). Overexertion and strenuous or repetitive movements, and contact with another person were also common mechanisms (19% and 16% respectively). A mechanism of injury was not specified in over one-third (33%) of cases (Figure 3.19).



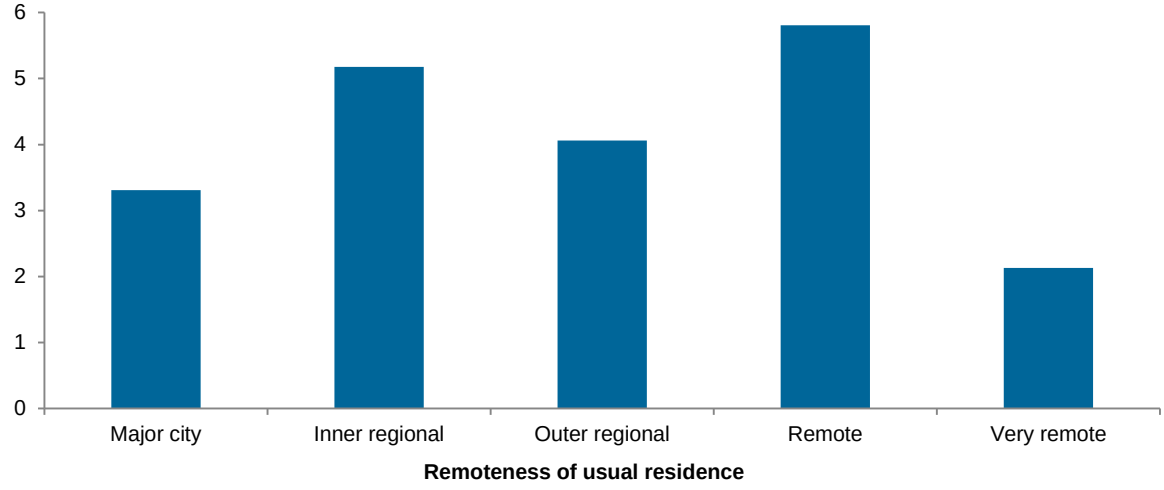
Notes

1. Data underpinning this figure are available in Table B1.9 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 3.19: Cases of touch football-related sports injury hospitalisation, by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

Population-based age-standardised rates for touch-football related hospitalisations followed no particular pattern as to their geographic location. Caution should be exercised in interpreting these rates because of small case numbers, particularly for *Remote* areas (Figure 3.20).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 3.20: Age-standardised rates of touch football-related sports injury hospitalisation, by remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

The injuries sustained in 9 cases (1%) were considered to be life-threatening. None of those injured died while in hospital.

Length of stay

The MLOS in hospital after a touch football-related injury was 1.5 days. Over one-third (38%) of people were discharged on the same day as they were admitted. The total number of days spent in hospital by patients attributed to touch football was 958.

3.5 Other and unspecified football

Other and unspecified football accounted for 2,821 cases. Of these, 133 (5%) were coded to U50.08 *Other specified football* which includes the football codes *American tackle, Gaelic football* and *Gridiron*. For the remaining 2,688 cases (95%), the type of football was not specified.

3.6 Football code comparison

Age and sex

Those injured while playing Rugby and Australian Rules were primarily aged under 35 years. There was a wider distribution of age groups for touch football and, to a lesser extent, for soccer (Figure 3.21).

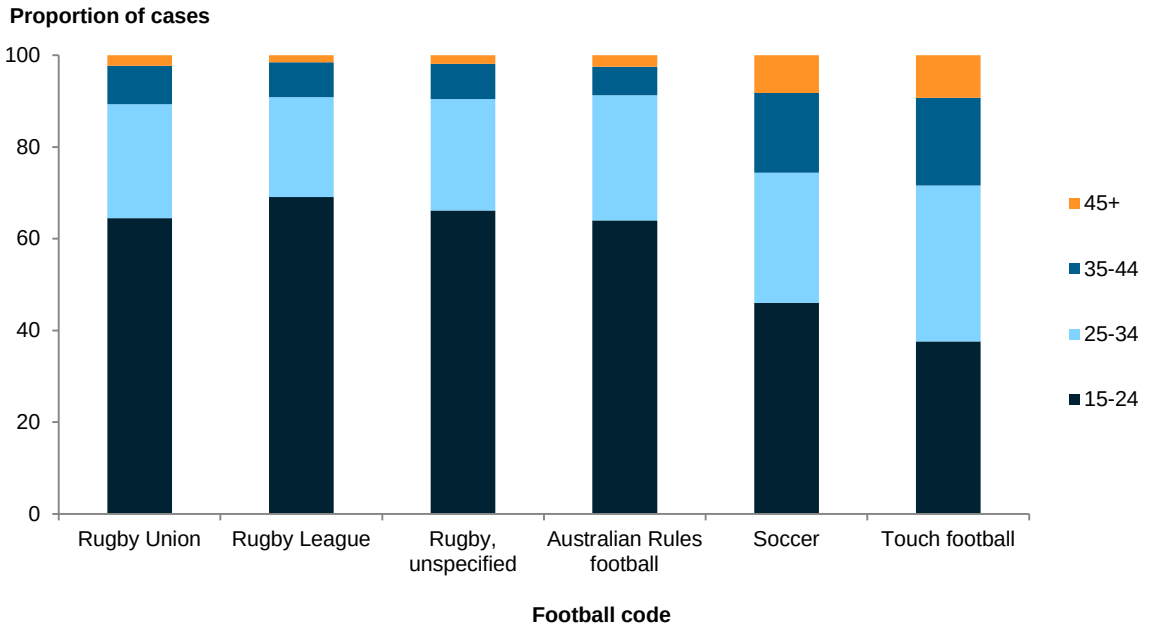


Figure 3.21: Comparison between football codes, by age, Australia, 2011–12

Men predominated among those injured in all codes of football. However, there were higher proportions of women injured while playing touch football and soccer (Figure 3.22).

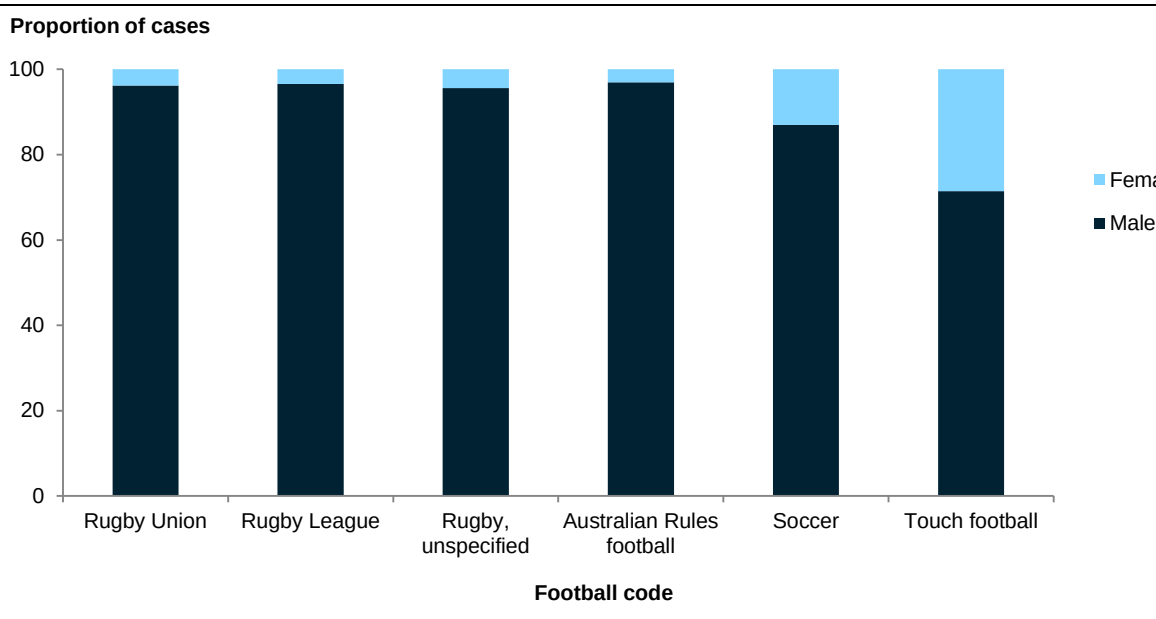


Figure 3.22: Comparison between football codes, by sex, Australia, 2011–12

Nature and bodily location of injury

The most common type of injury sustained while playing any code of football was a fracture. Soft-tissue injury was also comparatively common across all codes, but particularly in touch football (38%) and soccer (30%). Intracranial injuries were most frequently sustained in the course of playing Australian Rules football and Rugby (Figure 3.23).

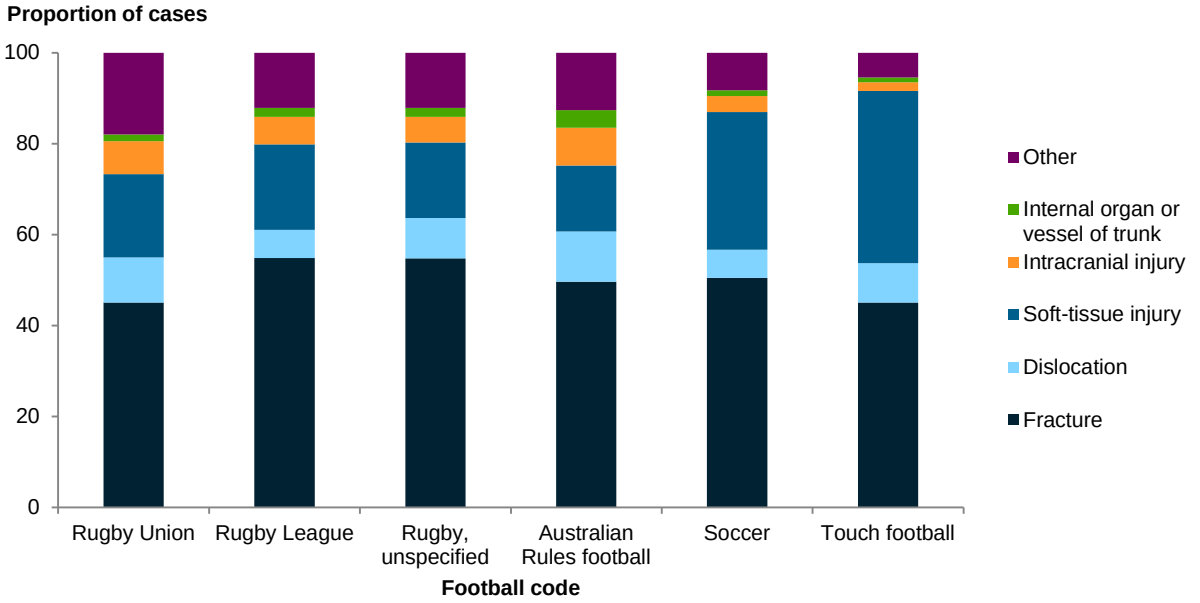


Figure 3.23: Comparison between football codes, by nature of injury, Australia, 2011–12

Across all codes, the hip and lower limb and the shoulder and upper limb were the most common sites of injury. Injuries to the head and trunk were comparatively more common among those injured while playing Rugby and Australian Rules football (Figure 3.24).

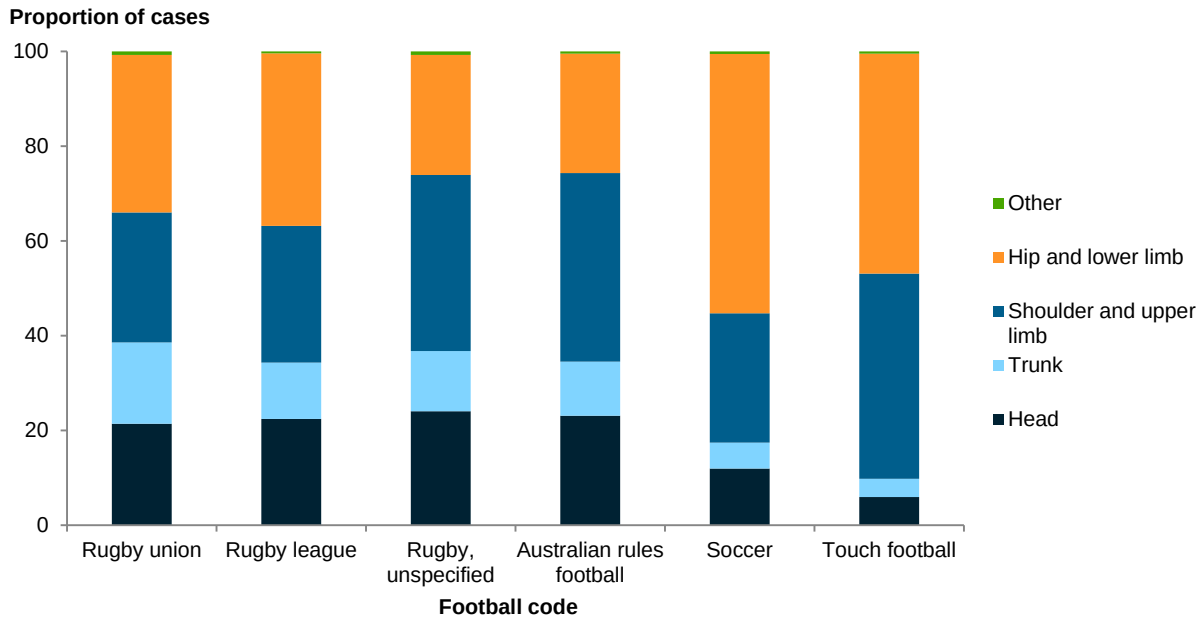
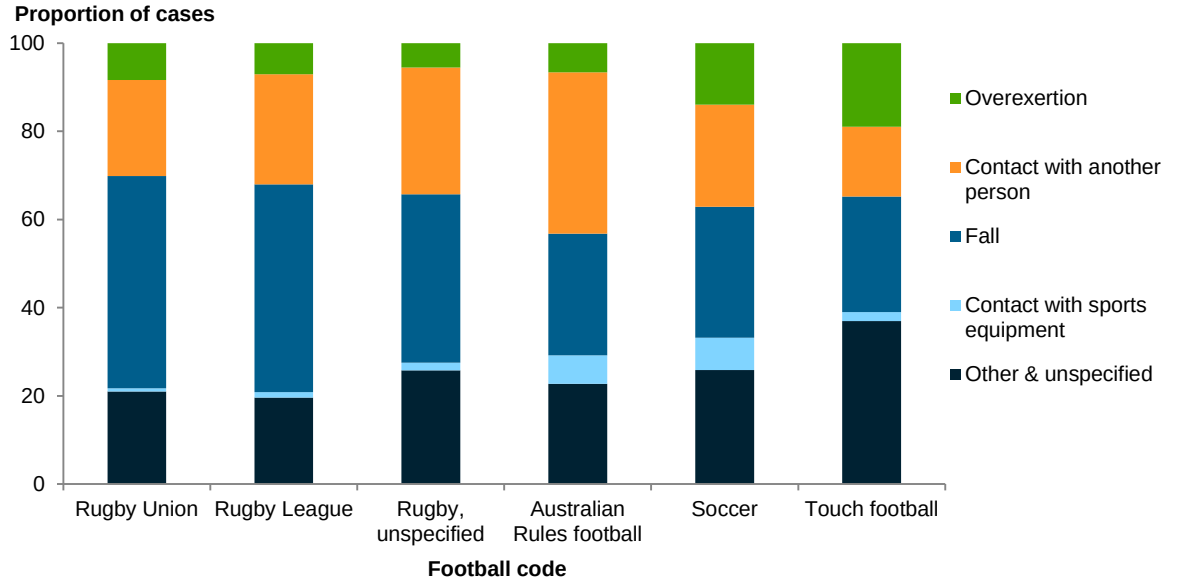


Figure 3.24: Comparison between football codes, by body region injured, Australia, 2011–12

Mechanism of injury

The mechanism of injury varied across football codes. Falls were the most common mechanism for all codes with the exception of Australian Rules football, for which contact with another person was the most common mechanism. There was a comparatively higher proportion of cases of injury due to contact with sports equipment for soccer (7%) and Australian Rules football (6%). The proportion of cases with overexertion and strenuous or repetitive movements as the cause of injury was relatively high for touch football (19%) and for soccer (14%) (Figure 3.25).



Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 3.25: Comparison between football codes, by mechanism of injury, Australia, 2011–12

Summary

The differences and similarities in the profiles of the football codes included in this chapter are summarised in Table 3.15. The most common type of injury sustained among the football codes was a fracture. The body region injured varied according to type of football code, although 3 out of 4 injuries were cause by falls.

Table 3.15: Overview of key indicators by football code-related sports injury hospitalisations, Australia, 2011–12

Football code	Population-based rate (per 100,000 population)[(a)]	Participation-based rate (per 100,000 participants)	Most common nature of injury	Most common body region injured	Most common mechanism of injury	% that were HTTL cases	MLOS in days	Total bed days
Australian Rules	19.2	1,319	Fracture	Shoulder & upper limb	Contact with another person	6%	1.6	5,099
Rugby	15.0	1,292	Fracture	Knee & lower leg	Fall	5%	1.7	4,522
Soccer	17.7	433	Fracture	Hip & lower limb	Fall	3%	1.8	5,282
Touch football[(b)]	3.8	n.a.	Fracture	Hip & lower limb	Fall	< 2%	1.5	958

(a) Age-standardised rate.

(b) A participation-based rate could not be calculated for Touch football because the data required for the denominator were not available.

4 Combative sports

This chapter includes the following combative sports:

- Martial arts (U61.3)
  - Judo (U61.30)
  - Jujitsu (U61.31)
  - Karate (U61.32)
  - Kendo (U61.33)
  - Kick-boxing (U61.34)
  - Kung fu (U61.35)
  - Tae kwon do (U61.36)
  - Other specified martial arts (U61.38)
  - Martial arts, unspecified (U61.39)
- Aikido (U61.0)
- Boxing (U61.1).

In this chapter, Aikido (U61.0), a Japanese martial art, has been grouped with the other martial arts (U61.3) included in ICD-10-AM. Some of the martial arts listed here, such as aikido, kung fu and kendo, sometimes use weapons.

The sports included in this chapter resulted in 602 cases of sports injury hospitalisations in 2011–12. These cases accounted for 2% of all cases of hospitalised sports injuries.

Of the 602 cases of sports injury hospitalisation, 401 resulted from martial arts and 201 from boxing. A comparison between injuries sustained during participation in boxing and martial arts is provided at the end of this chapter.

4.1 Age and sex

Nearly 9 in 10 (86%) cases involved men. The highest number of cases for men was in the 25–34 age group (Table 4.1).

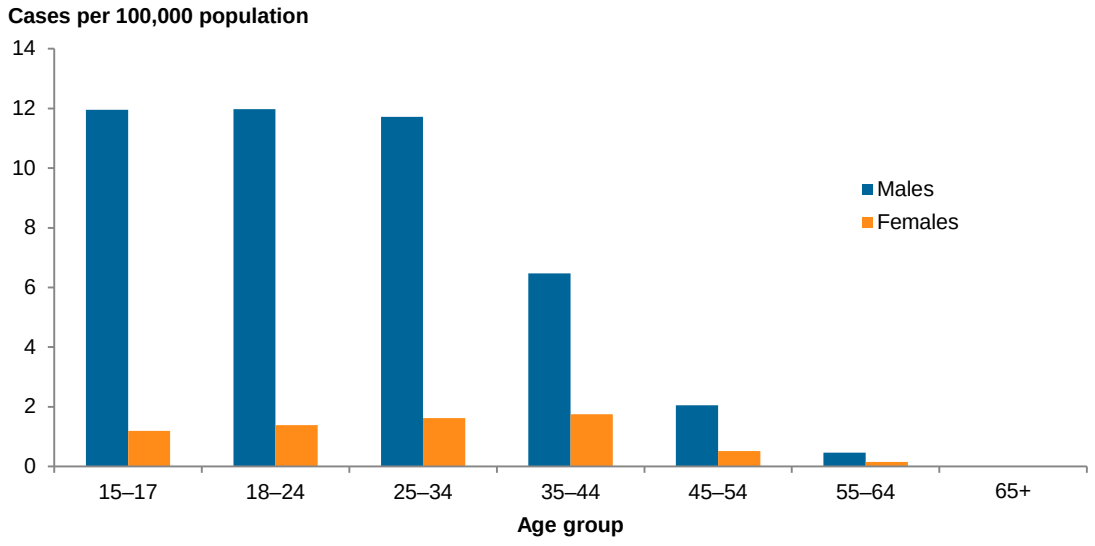
Table 4.1: Cases of combative sport-related injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	53	135	191	102	31	6	0	518
Females	5	15	26	28	8	2	0	84
Persons	58	150	217	130	39	8	0	602

Population-based rates of sports injury

Men had higher age-standardised rates of hospitalisation, as the result of injury sustained while engaging in combative sports, than did women (population-based age-standardised rates of 5 and 1 per 100,000 population, respectively) (Figure 4.1).

Among men, population-based age-specific rates of combative sports injury were highest in the youngest 3 age groups (12 cases per 100,000 population). Age-specific rates for women should be viewed cautiously due to small numbers. Caution should also be exercised in interpreting results for older age groups for both sexes due to small case numbers (Figure 4.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 4.1: Age-specific rates of combative sport-related injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 358,259 (RSE 9.3%) people reported engaging in combative sports at least once in the 12 months prior to survey. More males (205,141, RSE 14.4%) than females (153,118, RSE 11.7%) reported engaging in combative sports in this period.

Men had higher participation-based sports injury hospitalisation rate (253 per 100,000 participants) than women (56) (Table 4.2). The participation-based rate for all persons was 168 per 100,000. All participation-based rates were comparatively lower for those aged 45 and over.

The participation-based rates for all persons for boxing and martial arts were 183 and 161, respectively. Participation estimates for boxing and martial arts were 109,617 (RSE 14.5%) and 248,643 (RSE 10.1%) for all persons, respectively.

Table 4.2: Participation-based[(a)] combative sport-related injury hospitalisation rates, by sex, Australia, 2011–12

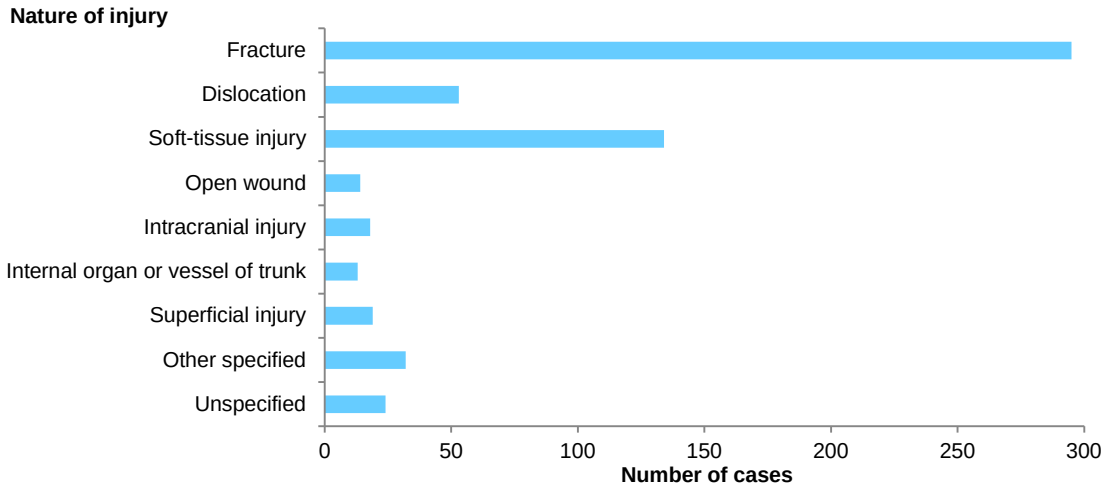
	Age group					
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45+**	**All ages**
Males	200*	256*	362	215	144*	253
Females	n.p.	93*	63	108	15	56
Persons	183*	196*	203	139	40	168

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

4.2 Nature and bodily location of injury

The most common type of injury sustained while engaging in combative sports was a fracture, accounting for half (49%) of all cases (Figure 4.2). Fractures most commonly affected the wrist and hand (38%) and the head (26%) (Table 4.3).



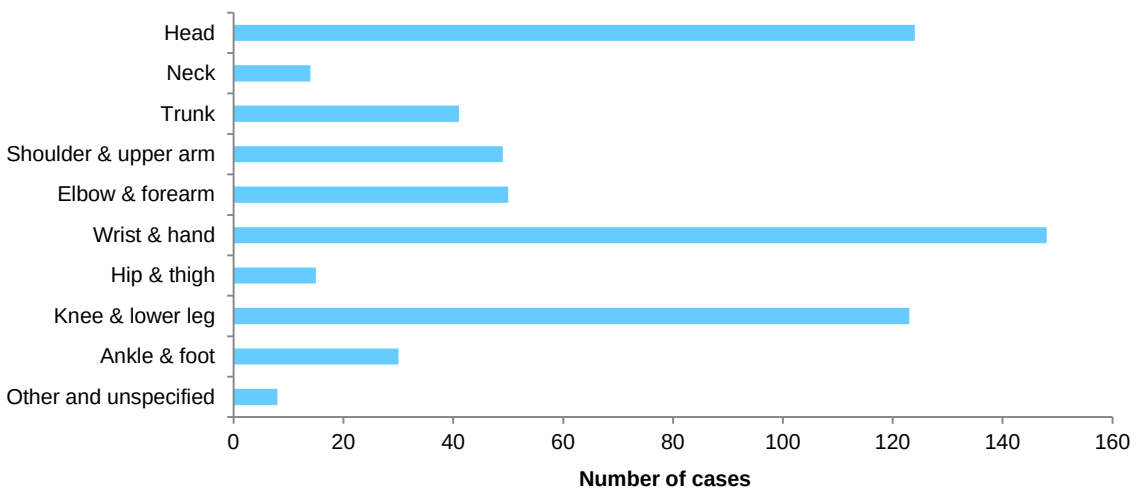
Note: Data underpinning this figure are available in Table B1.10 in Appendix B.

Figure 4.2: Cases of combative sport-related injury hospitalisation, by nature of injury, Australia, 2011–12

Table 4.3: Fractures by body region for combative sport-related injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Wrist & hand	113	38
Head	76	26
Elbow & forearm	37	13
Knee & lower leg	35	12
Ankle & foot	18	6
Hip & thigh	6	2
Shoulder & upper arm	6	2
Trunk	4	1
Total	**295**	**100**

The 3 most commonly injured regions of the body were the wrist and hand (25%), the head (21%) and the knee and lower leg (20%) (Figure 4.3). Fractures (29%) were a common injury to the knee and lower leg. Injuries to the head and to the wrist and hand most commonly took the form of fractures (61% and 76%, respectively). Intracranial injury was also fairly common (15% of head injuries).

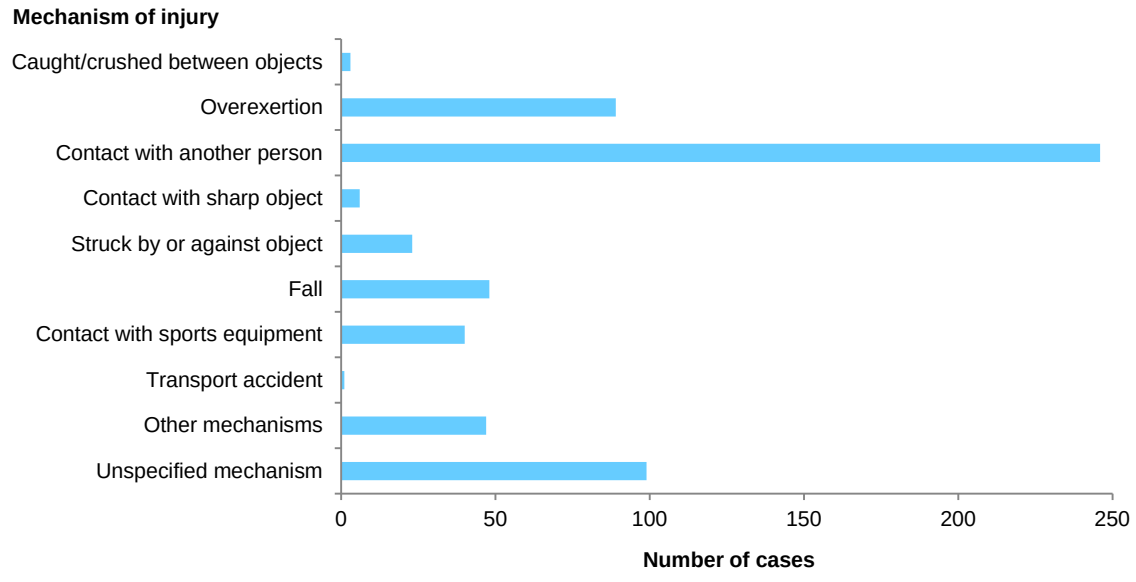


Note: Data underpinning this figure are available in Table B1.10 in Appendix B.

Figure 4.3: Cases of combative sport-related injury hospitalisation, by body region injured, Australia, 2011–12

4.3 Mechanism of injury

By far the most common mechanism of injury was contact with another person (41%). A mechanism of injury was not specified in 16% of cases (Figure 4.4).

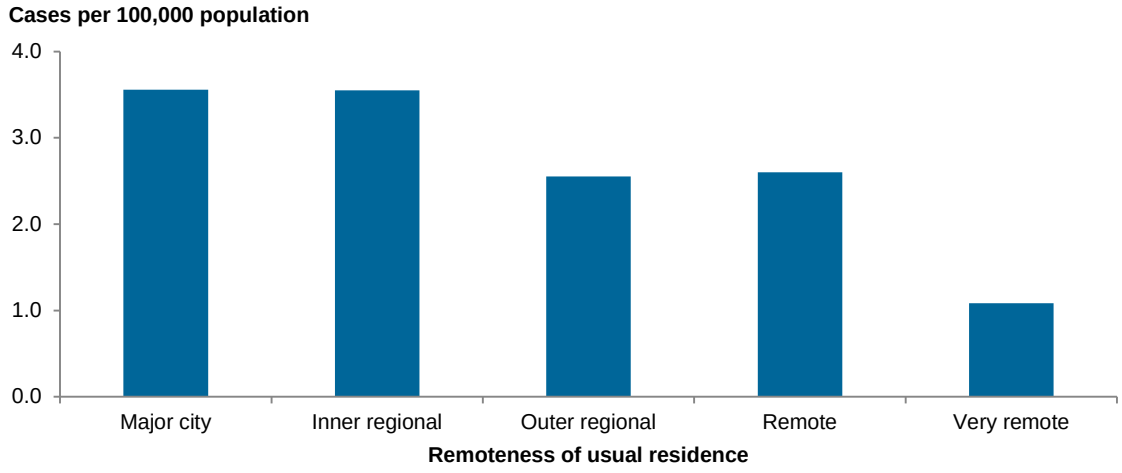


Note: Data underpinning this figure are available in Table B1.10 in Appendix B.

Figure 4.4: Cases of combative sport-related injury hospitalisation, by mechanism of injury, Australia, 2011–12

4.4 Remoteness of usual residence

Population-based age-standardised rates of combative sports injury were highest for residents of *Major cities* and *Inner regional* areas (4 cases per 100,000 population), although rates for residents of *Outer regional* and *Remote* areas were not much lower (3 cases per 100,000). Caution should be exercised when interpreting rates for combative injury due to small numbers of cases (Figure 4.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 4.5: Age-standardised rates of combative sport-related injury hospitalisation, by remoteness of usual residence, Australia, 2011–12

4.5 Severity of injury

High threat to life

The injuries were considered to be HTTL for 16 cases (3%). One person died while in hospital, having been admitted after sustaining an injury while participating in martial arts.

Length of stay

The MLOS in hospital, after a combative sports injury, was 1.5 days. Nearly half (45%) of those admitted were discharged on the same day. In 10% of cases, the stay in hospital had a duration of 3 days or more. There was only minor variation in the MLOS across age groups. A total of 928 hospital days spent by patients for sports injury were attributable to combative sports injury.

4.6 Comparison between martial arts and boxing

This section compares the injury profiles of the 2 types of sport that are included in the category of combative sports: martial arts and boxing.

People hospitalised for boxing-related injury were younger, overall, than those hospitalised after sustaining an injury while participating in martial arts. A higher proportion (82%) of people hospitalised for boxing-related injury were younger (aged

under 35) compared with those hospitalised after being injured while participating in martial arts (65%) (Figure 4.6).

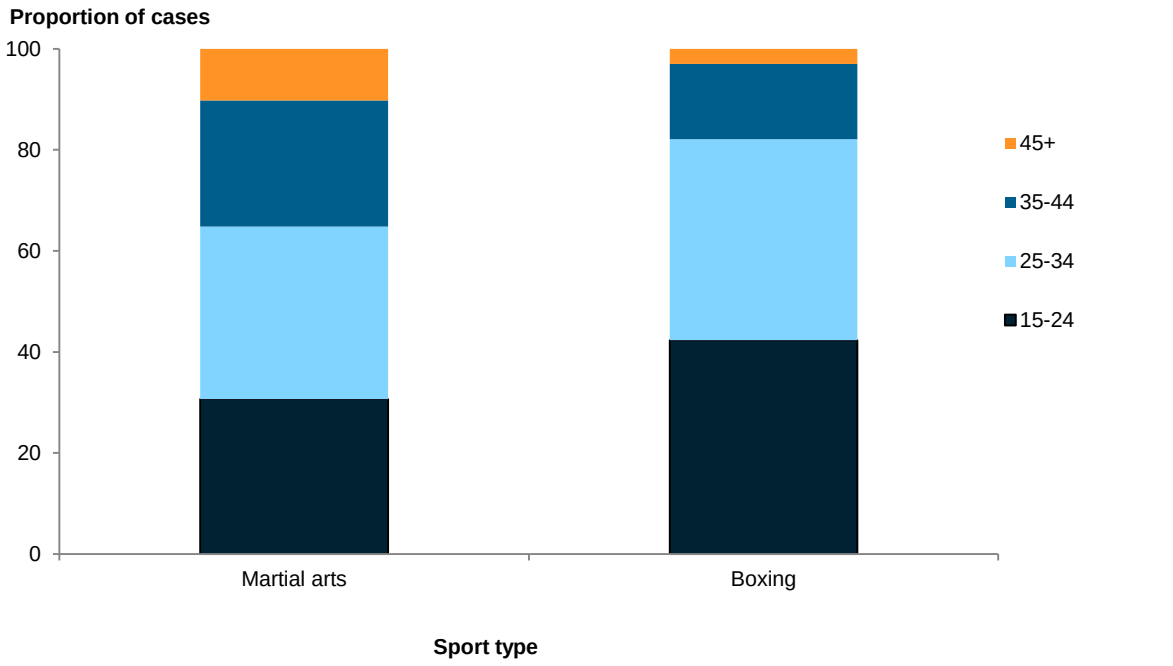


Figure 4.6: Comparison between martial arts and boxing cases, by age, Australia, 2011–12

Higher proportions of potentially more serious injuries, such as fractures and intracranial injury, were seen for boxing than for martial arts (Figure 4.7).

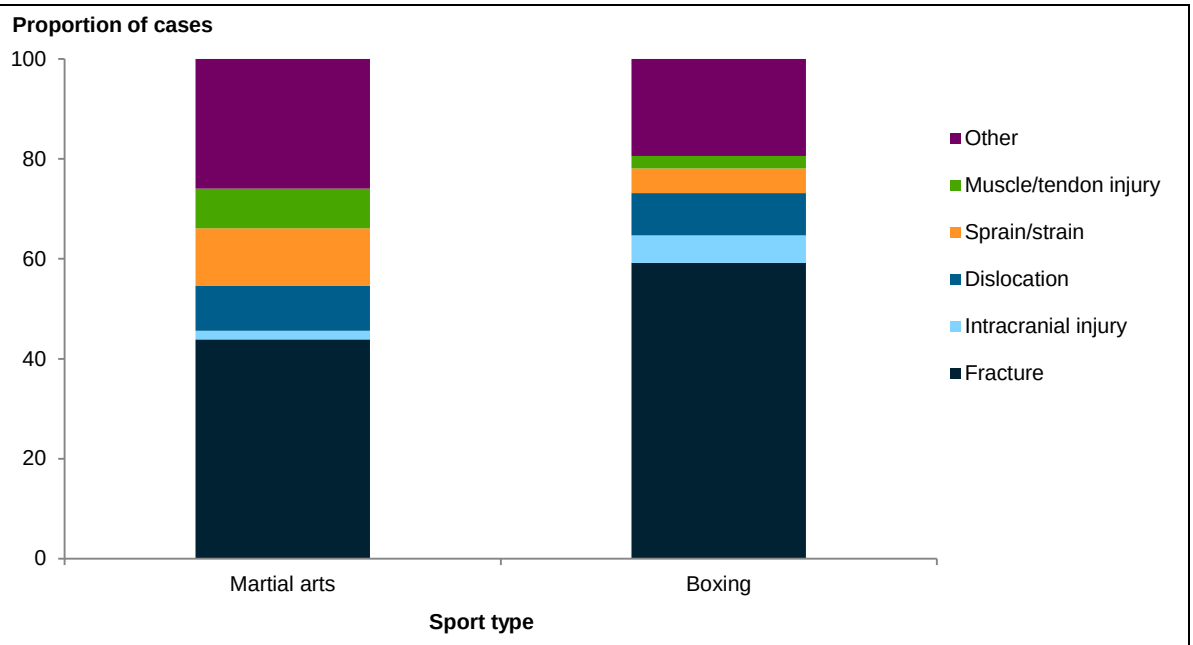


Figure 4.7: Comparison between martial arts and boxing, by nature of injury, Australia, 2011–12

Injuries to the shoulder and upper limb and to the head predominated in boxing-related hospitalisations (66% and 26% of boxing cases). In comparison, martial arts-related hospitalisations featured injuries to a broader range of body regions. Injuries to the head are often serious or present a high threat to life. The higher proportion of boxing-related head injuries is therefore noteworthy (26% compared with 18% for martial arts cases) (Figure 4.8).

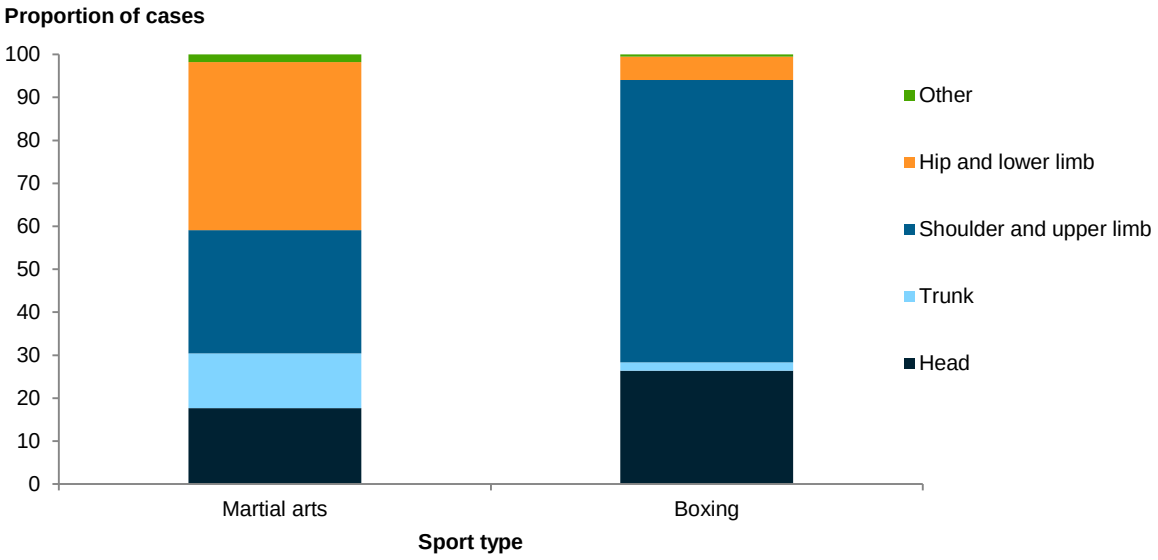


Figure 4.8: Comparison between martial arts and boxing, by major body region injured, Australia, 2011–12

5 Netball and basketball

This chapter includes the following sports:

- Netball (U50.3)
  - Indoor (U50.30)
  - Netball, other and unspecified (U50.39)
- Basketball (U50.1).

In 2011–12 there was a total of 2,584 cases of injury resulting from the playing of either netball or basketball.

5.1 Netball

In the year 2011–12, 1,262 people were admitted to hospital as the result of injuries sustained while playing netball. These cases represented 4% of all cases of sports injury.

Age and sex

There were 1,262 cases of netball-related sports injury hospitalisation in 2011–12. The majority of these (88%) were women. The highest number of cases for women was in the 25–34 age group (Table 5.1).

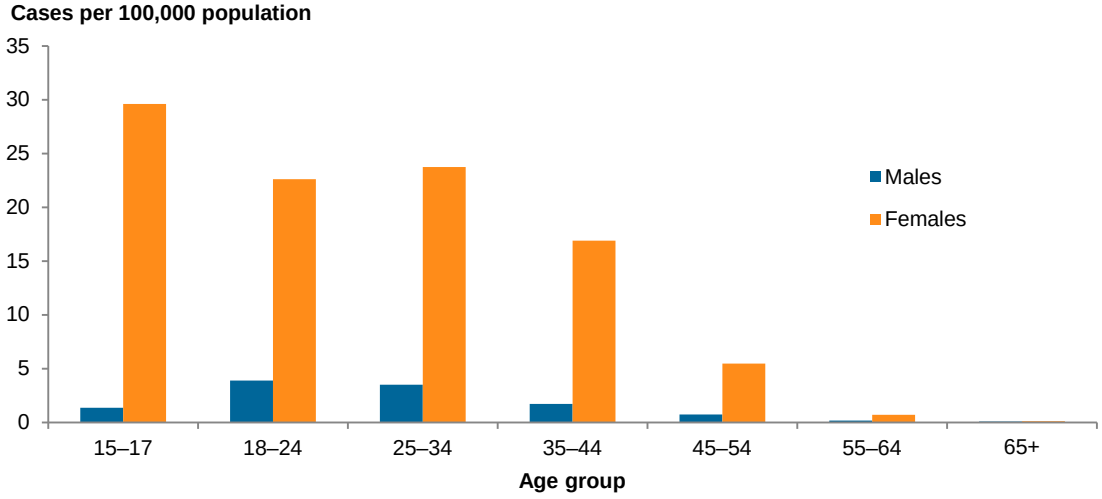
Table 5.1: Cases of netball-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	6	44	57	27	11	2	1	148
Females	124	244	381	270	84	9	2	1,114
Persons	130	288	438	297	95	11	3	1,262

Population-based rates of sports injury

Women had a much higher rate of hospitalised injury than men as the result of playing netball (age-standardised population-based rates of 13 and 2 per 100,000 population, respectively). Close to 9 in 10 (88%) of cases involved women.

Among women, population-based age-specific rates of netball-related injury were highest in the youngest age group (30 cases per 100,000 population), and remained comparatively high up to the age of 44. For men, the highest age-specific population-based rates were in the 18–24 and 25–34 year age groups (4 per 100,000). Caution should be exercised in interpreting these results due to small case numbers in older age groups (Figure 5.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 5.1: Age-specific rates of netball-related sports injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 448,048 (RSE 6.0%) people reported playing netball at least once in the 12 months prior to survey. More females (406,493, RSE 5.4%) than females (41,555, RSE 27.8%) reported playing netball in this period.

Men had a higher participation-based sports injury hospitalisation rate for netball (356 cases per 100,000 participants) than did women (274) (Table 5.2). However, caution should be used with respect to the male rate, which was calculated using a denominator with an RSE > 25 and ≤ 50. The participation-based injury rate for all persons was 282. Participation-based injury rates were comparatively higher for women in the 2 oldest age groups. For all persons, the highest rate was for those aged 45 and over.

Table 5.2: Participation-based[(a)] netball-related sports injury hospitalisation rates, Australia, 2011–12

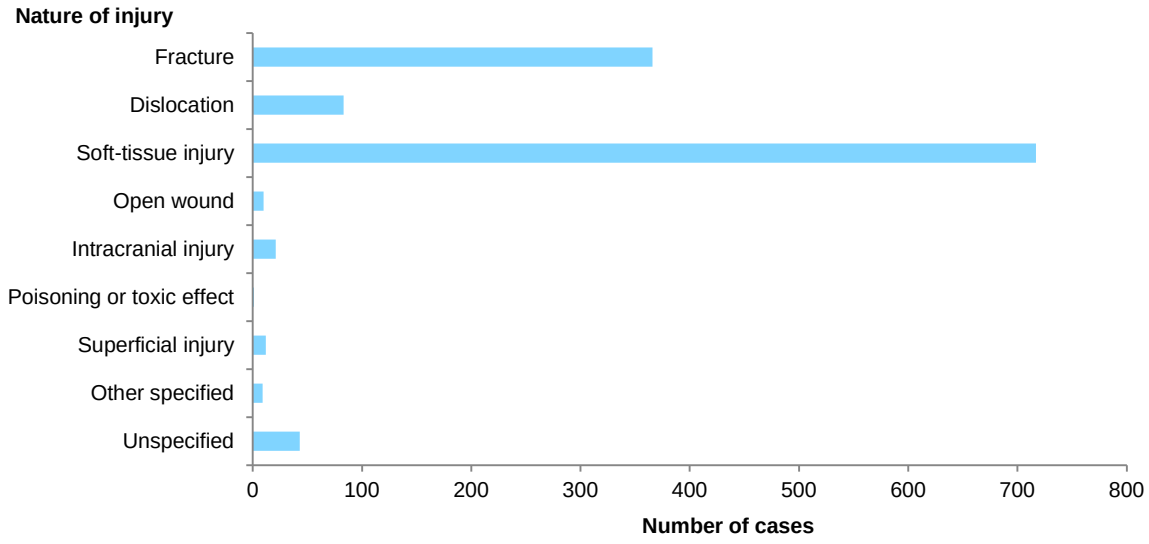
	Age group				
Sex	**15–24**	**25–34**	**35–44**	**45+**	**All ages**
Females	189	282	508	408*	274
Persons	207	271	61	393*	282

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

Nature and bodily location of injury

Soft-tissue injury and fractures were the most common reasons for admission to hospital (57% and 29% of cases, respectively) (Figure 5.2). Fractures most commonly involved the wrist and hand (36%) and the elbow and forearm (30%) (Table 5.3). Over 9 in 10 (93%) of cases of soft-tissue injury affected the knee and lower leg.



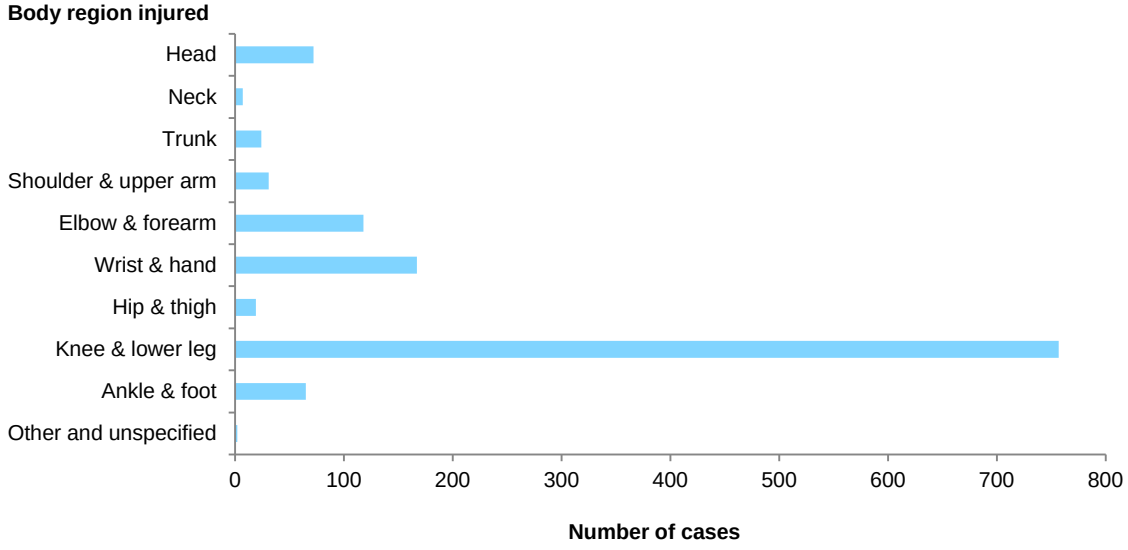
Note: Data underpinning this figure are available in Table B1.11 in Appendix B.

Figure 5.2: Cases of netball-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 5.3: Fractures by body region for netball-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Wrist & hand	131	36
Elbow & forearm	109	30
Knee & lower leg	67	18
Ankle & foot	25	7
Head	23	6
Shoulder & upper arm	6	2
Hip & thigh	3	1
Trunk	2	1
Total	**366**	**100**

By far the most frequently injured body region was the knee and lower leg (60%) (Figure 5.3), and in over three-quarters of those cases, a soft tissue injury was sustained.

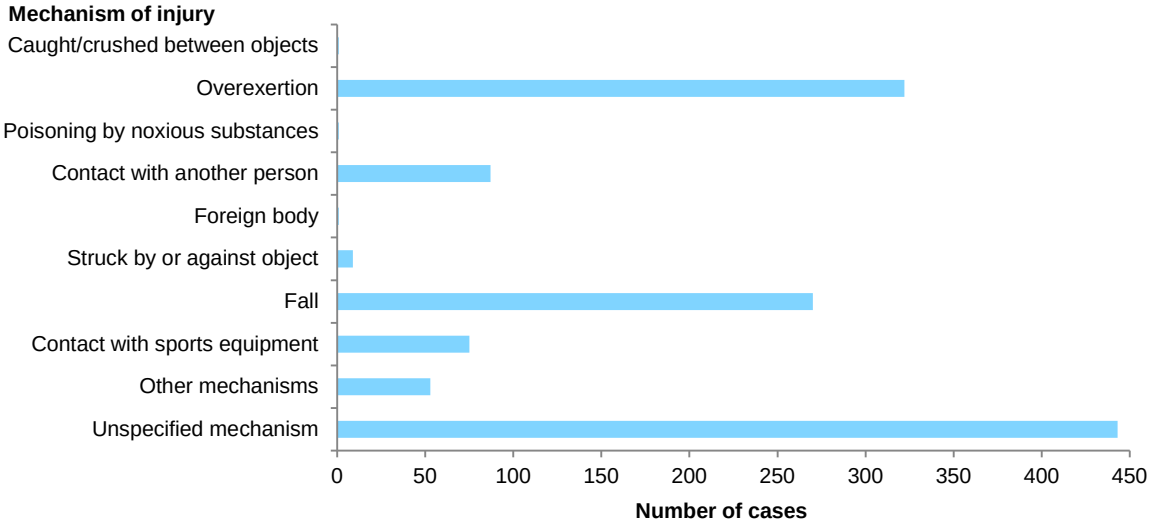


Note: Data underpinning this figure are available in Table B1.11 in Appendix B.

Figure 5.3: Cases of netball-related sports injury hospitalisation, by body region injured, Australia, 2011–12

Mechanism of injury

The 2 most common mechanisms of injury were coded to the categories X50 *Overexertion and strenuous or repetitive movements* (26%) and W00–W19 *Falls* (21%). A mechanism of injury was not specified in 35% of cases (Figure 5.4).



Notes

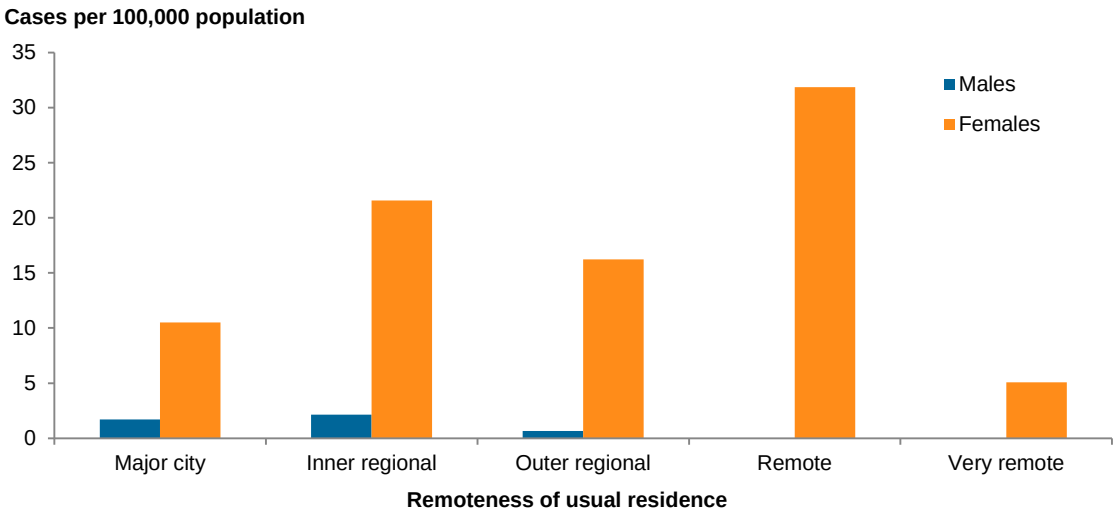
1. Data underpinning this figure are available in Table B1.11 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 5.4: Cases of netball-related sports injury hospitalisation, by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

For women, population-based age-standardised rates of netball injury were highest for residents of *Remote* areas (32 cases per 100,000 population). Higher age-standardised

population-based rates were also found for female residents of *Inner regional* and *Outer regional* areas (22 and 16, respectively). Rates for men were difficult to interpret because of the small numbers of cases involved for some of the more remote areas (Figure 5.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 5.5: Age-standardised rates of netball-related sports injury hospitalisation, by sex and remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

For 4 cases (0.3%), the injuries were assessed as being life-threatening. None of those injured died while in hospital.

Length of stay

The MLOS in hospital, after a netball-related injury, was 1.4 days. Around one-third (34%) of those hospitalised were discharged on the same day as being admitted. There was little variation in MLOS with respect to age (Table 5.4). The total number of days spent in hospital by patients for netball-related injury was 1,740.

Table 5.4: Mean length of stay in hospital for netball-related injury, by age, Australia, 2011–12

	Age group							
	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Persons	1.3	1.2	1.4	1.4	1.7	1.2	1.3	1.4

5.2 Basketball

There were 1,322 cases of hospitalised injury related to playing basketball. These cases accounted for 4% of all cases of hospitalised sports injuries.

Age and sex

Around 8 in 10 (79%) of cases of basketball-related injury involved men. The highest number of cases for men were in the 25–34 age group (Table 5.5).

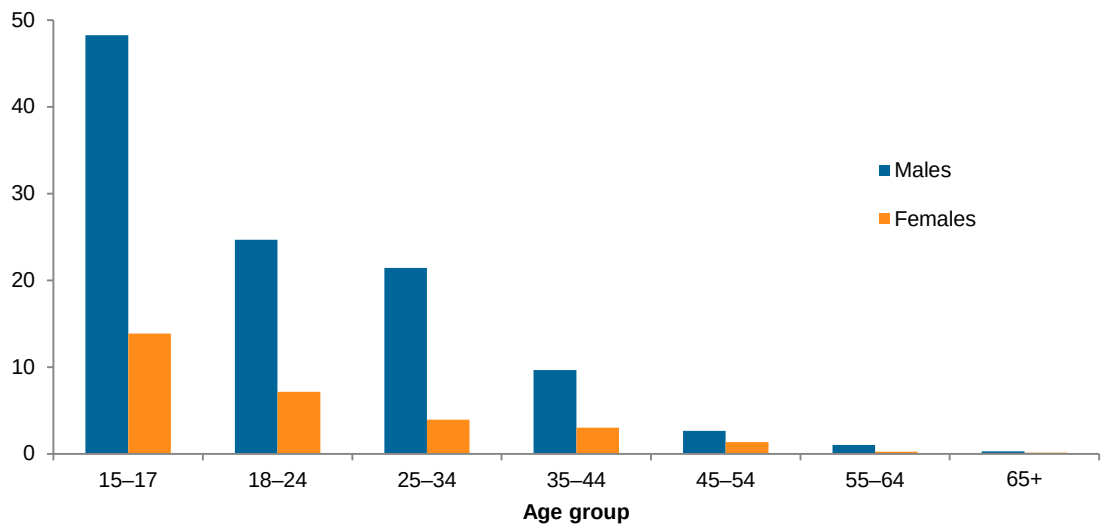
Table 5.5: Cases of basketball-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	214	278	349	152	40	13	4	1,050
Females	58	77	63	48	21	3	2	272
Persons	272	355	412	200	61	16	6	1,322

Population-based rates of sports injury

Men had 3 times the rate of hospitalised injury of women as the result of playing basketball (age-standardised population-based rates of 9 and 3 per 100,000 population, respectively). Around 8 in 10 (79%) of cases involved men.

For both men and women, population-based age-specific rates of basketball-related injury were much the highest in the youngest age group (48 and 14 cases per 100,000, respectively). Caution should be exercised in interpreting the rates for basketball due to small case numbers in older age groups (Figure 5.6).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 5.6: Age-specific rates of basketball-related sports injury hospitalisation, by sex, Australia 2011–12

Participation-based rates of sports injury

According to the ABS participation survey, an estimated 354,829 (RSE 9.1%) people reported engaging in basketball at least once in the 12 months prior to survey. More males (245,579, RSE 11.0%) than females (109,250, RSE 11.7%) reported engaging in playing basketball in this period.

The participation-based rate of hospitalised sports injury for men (428 cases per 100,000 participants) was higher than for women (249) (Table 5.6). The participation-based rate for all persons was 373. The highest rate for men was for those aged 15–17. For women, the highest rate was for the 35–44 age group.

Table 5.6: Participation-based[(a)] basketball related sports injury hospitalisation rates, by sex, Australia, 2011–12

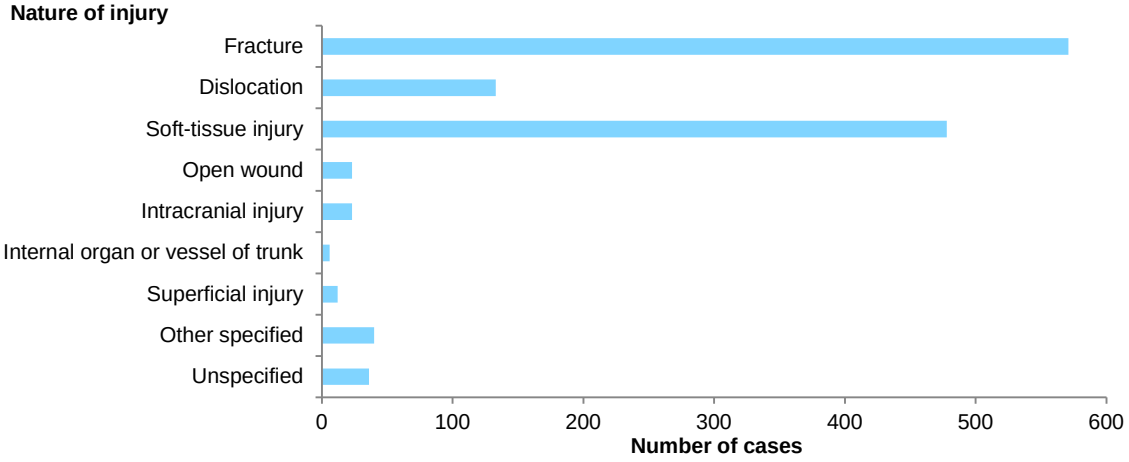
	Age group					
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45+**	**All ages**
Males	566	347	442	455	374*	428
Females	120	440*	234	549*	337*	249
Persons	316	364	389	474	362*	373

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

Nature and bodily location of injury

Fractures were the most common injury sustained in basketball (43%). Soft-tissue injury and dislocations were also comparatively common (36% and 10%, respectively) (Figure 5.7). The 2 most common body regions affected by fractures were the wrist and hand (36%) and the elbow and forearm (24%) (Table 5.7).



Note: Data underpinning this figure are available in Table B1.12 in Appendix B.

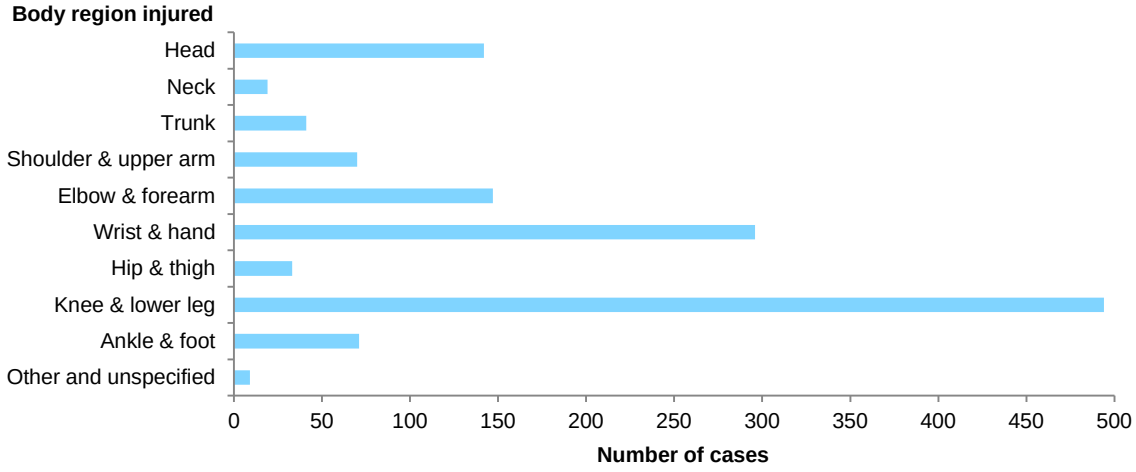
Figure 5.7: Cases of basketball-related sports injury hospitalisation, by nature of injury, Australia 2011–12

Table 5.7: Fractures by body region for basketball-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Wrist & hand	207	36
Elbow & forearm	134	24
Knee & lower leg	99	17
Head	78	14
Ankle & foot	26	5
Shoulder & upper arm	15	3
Hip & thigh	6	1
Trunk	5	1
Neck	1	0
Total	**571**	**100**

The most frequently injured body region was the knee and lower leg, accounting for over one-third of cases (37%). In nearly one-quarter of those cases (22%), the body region injured was the wrist and hand. The head was the site of injury in 11% of cases (Figure 5.8).

Injuries to the knee and lower leg comprised soft tissue injuries, muscle and tendon injury and fractures. Over two-thirds (70%) of the injuries to the wrist and hand were fractures, with an additional 19% being dislocations. The highest proportion of injuries to the head were fractures (55%).

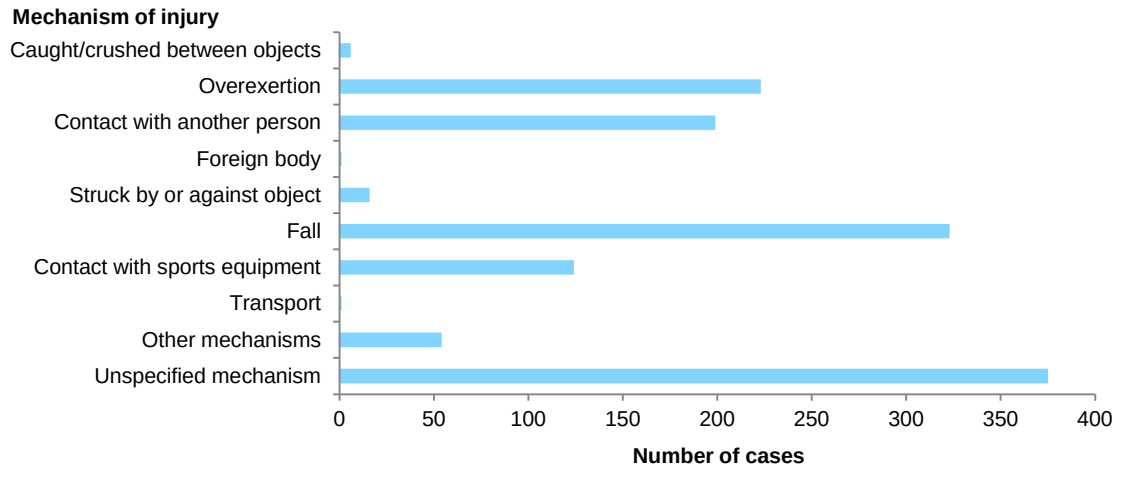


Note: Data underpinning this figure are available in Table B1.12 in Appendix B.

Figure 5.8: Cases of basketball-related sports injury hospitalisation, by body region injured, Australia, 2011–12

Mechanism of injury

The most common mechanism of injury was a fall (24%). Also common were overexertion and strenuous or repetitive movements (17%) and contact with another person (15%). A mechanism of injury was not specified in 28% of cases (Figure 5.9).



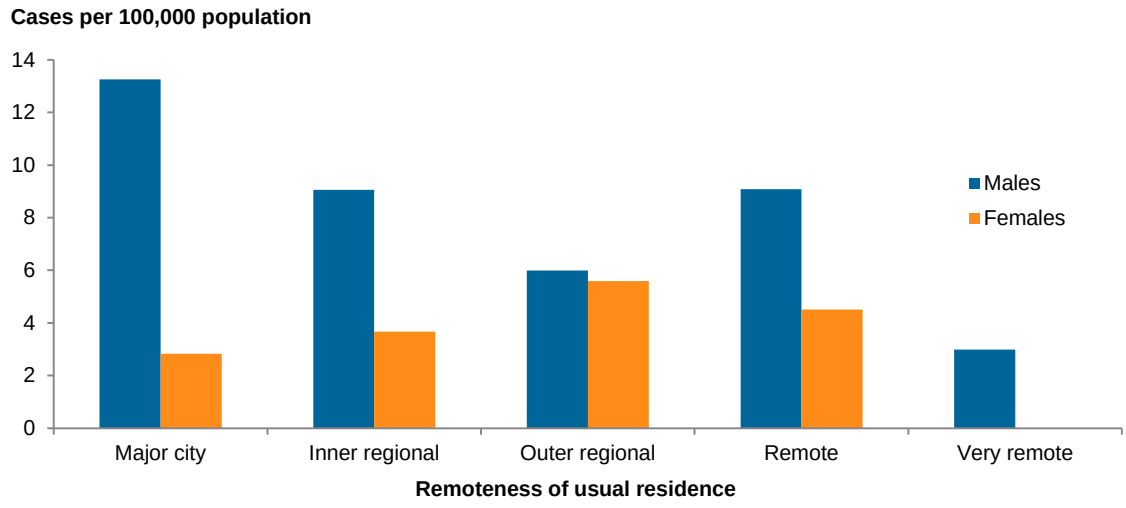
Notes

1. Data underpinning this figure are available in Table B1.12 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 5.9: Cases of basketball-related sports injury hospitalisation, by mechanism of injury, Australia, 2011–12

Remoteness of usual residence

Population-based age-standardised rates of basketball injury were slightly higher for residents of *Major cities* than for other areas (Figure 5.10). Some caution should be exercised in interpreting rates for *Remote* and *Very remote* areas because of small numbers.



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 5.10: Age-standardised rates of basketball-related sports injury hospitalisation, by sex and remoteness of usual residence, Australia, 2011–12

Severity of injury

High threat to life

In a small proportion of cases (2%), the injuries sustained were assessed as posing a high threat to life. Fractures and intracranial injuries were the most common type of HTTL cases (46% and 36% of cases, respectively). None of those injured died while in hospital.

Length of stay

The MLOS in hospital, after a basketball-related injury, was 1.5 days. Around 4 in 10 people (41%) were discharged on the same day as they were admitted. Those in the oldest age group had a longer MLOS in hospital (Table 5.8). A total of 1,987 days spent in hospital were attributed to basketball-related injury.

Table 5.8: Mean length of stay in hospital for basketball-related injury, by age, Australia 2011–12

	Age group							
	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Persons	1.6	1.3	1.5	1.5	1.9	1.8	5.3	1.5

5.3 Comparison between netball and basketball

Age and sex

Nearly half (47%) of the cases of basketball-related sports injury hospitalisation were aged 15–24 compared with around one-third (33%) of netball-related cases (Figure 5.11).

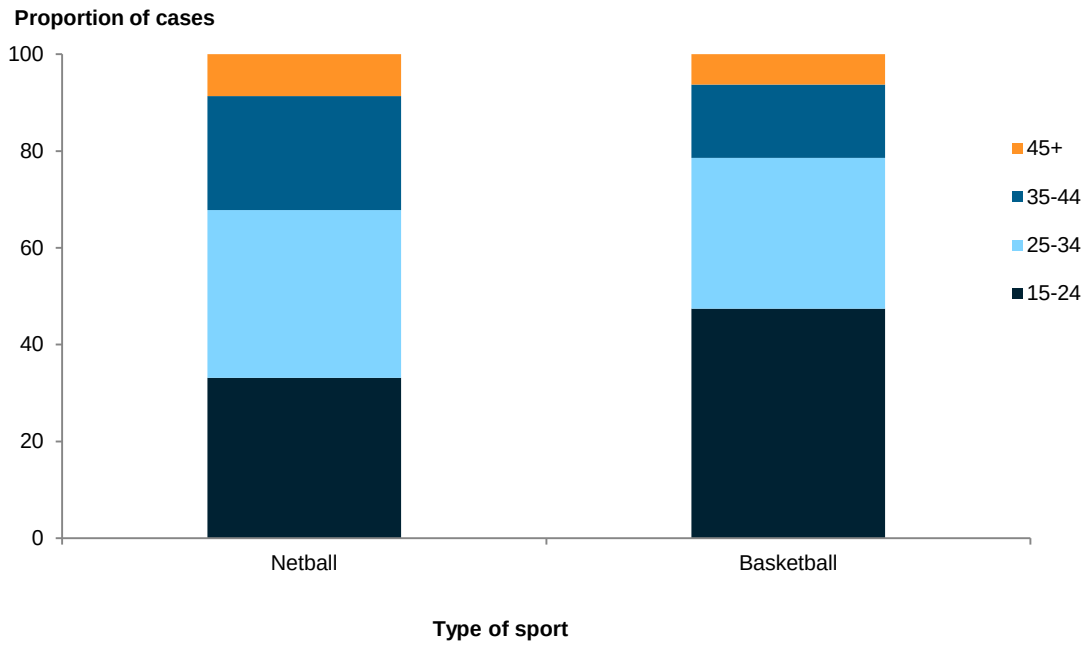


Figure 5.11: Comparison between netball and basketball, by age, Australia, 2011–12

A large majority of those hospitalised as a result of playing netball were women (88%). The reverse was true of basketball, where 79% of those hospitalised were men.

Nature and bodily location of injury

There was a higher proportion of fractures for basketball hospitalisation (43%) than for netball (29%), and a higher proportion of soft-tissue injury for netball than for basketball (57% vs. 36%, respectively) (Figure 5.12).

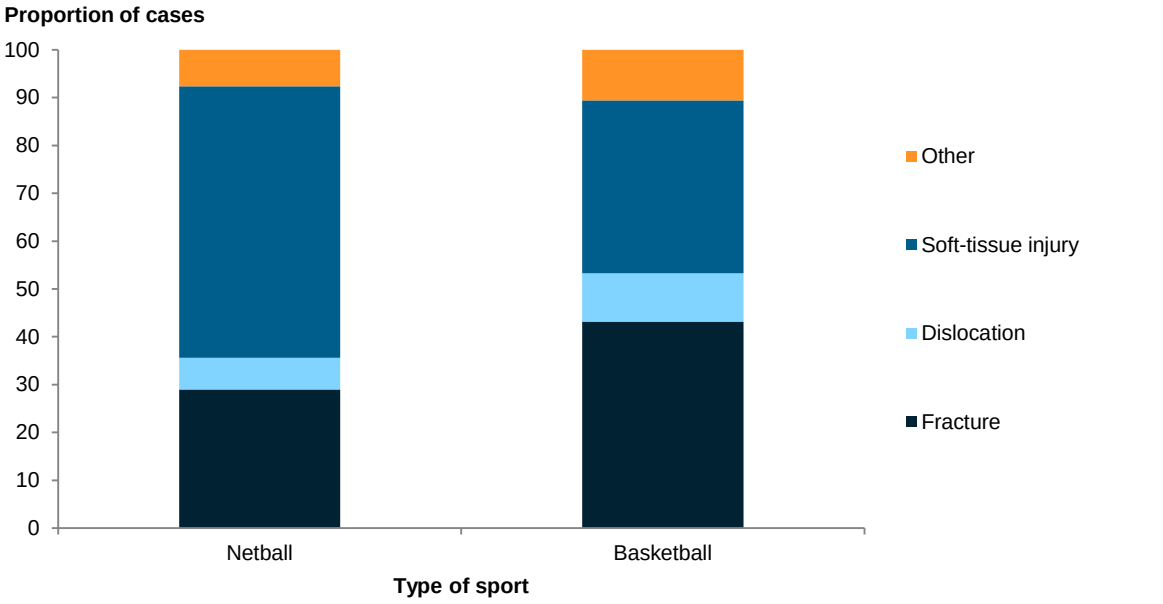


Figure 5.12: Comparison between netball and basketball, by nature of injury, Australia, 2011–12

Netball hospitalisations included a higher proportion of hip and lower limb injuries (67%) than did basketball hospitalisations (45%). Basketball had higher proportions than netball of shoulder and upper limb injuries (39% vs. 25%) and head injuries (11% vs. 6%) (Figure 5.13).

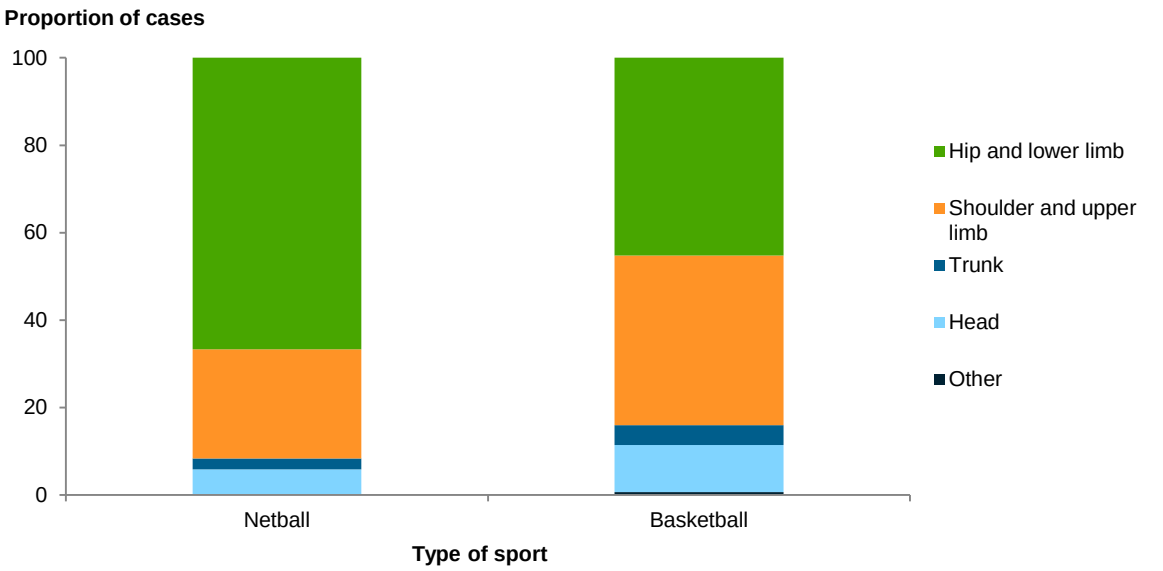
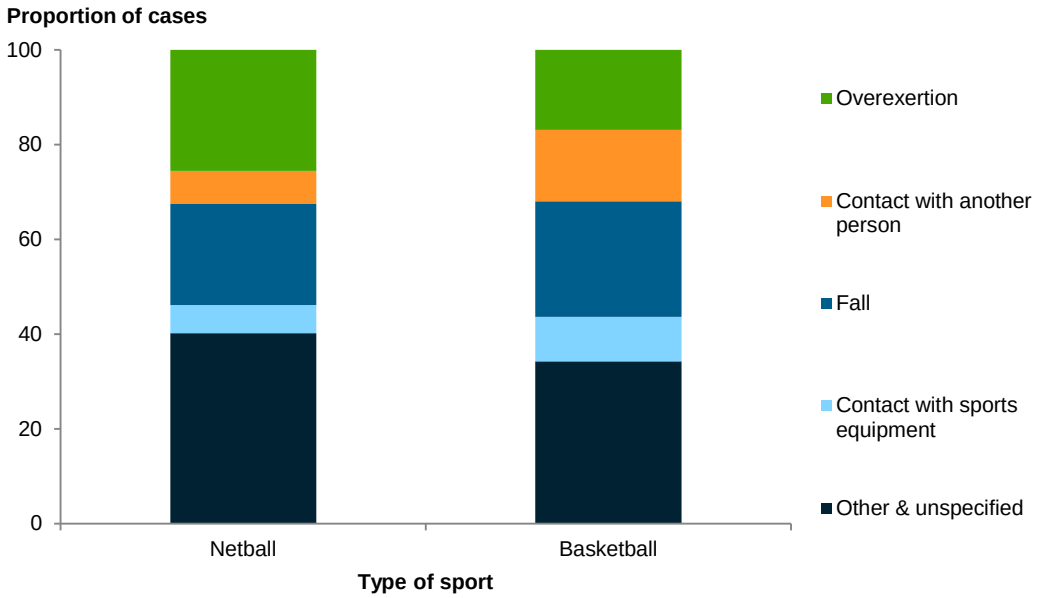


Figure 5.13: Comparison between netball and basketball, by body region injured, Australia, 2011–12

Mechanism of injury

The most common mechanism of injury in netball (other than 'other and unspecified', was 'overexertion and strenuous or repetitive movements' (26%) and, for basketball, a fall (24%). Hospitalisations due to contact with another person were twice as common in basketball (15%) as in netball (7%) (Figure 5.14).



Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 5.14: Comparison between netball and basketball, by mechanism of injury, Australia, 2011–12

6 Wheeled motor sports

This chapter includes the following:

- Wheeled motor sports (U65)
  - Riding an all-terrain vehicle (ATV) (U65.0)
  - Motorcycling (U65.1)
  - Motor car racing (U65.2)
  - Go-carting (U65.3)
  - Other specified motor sport (U65.8)
  - Unspecified motor sport (U65.9)

In 2011–12, 2,737 people were admitted to hospital as the result of injuries sustained while participating in wheeled motor sports. These cases accounted for 8% of all cases of hospitalised sports injuries.

6.1 Age and sex

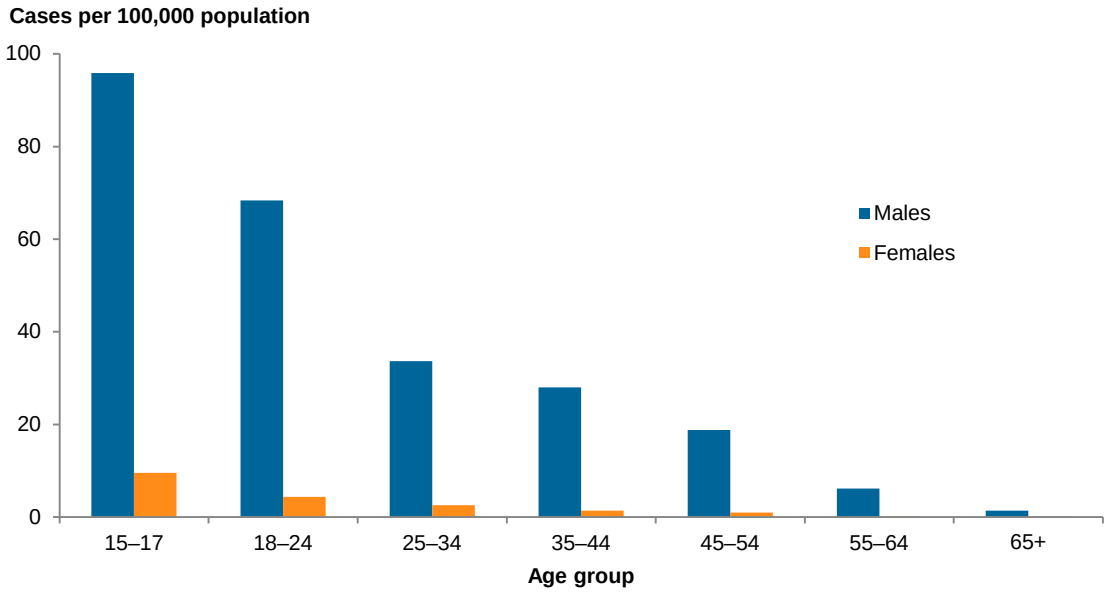
Wheeled motor sports are predominantly engaged in by men (94% of participants were male). For males, the highest number of cases was in the 18–24 age group (Table 6.1).

Table 6.1: Cases of wheeled motor sports-related injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	425	771	549	441	284	79	20	2,569
Females	40	47	41	22	15	2	1	168
Persons	465	818	590	463	299	81	21	2,737

Population-based rates of sports injury

Men aged 15–24 had the highest population-based age-specific rate of wheeled motor sports related injury (96 cases per 100,000 population for 15–17 year olds and 68 for those aged 18–24). Population-based age-standardised rates for men and women were 24 and 2, respectively (Figure 6.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 6.1: Age-specific rates of wheeled motor sports-related injury hospitalisation, by sex, Australia, 2011–12

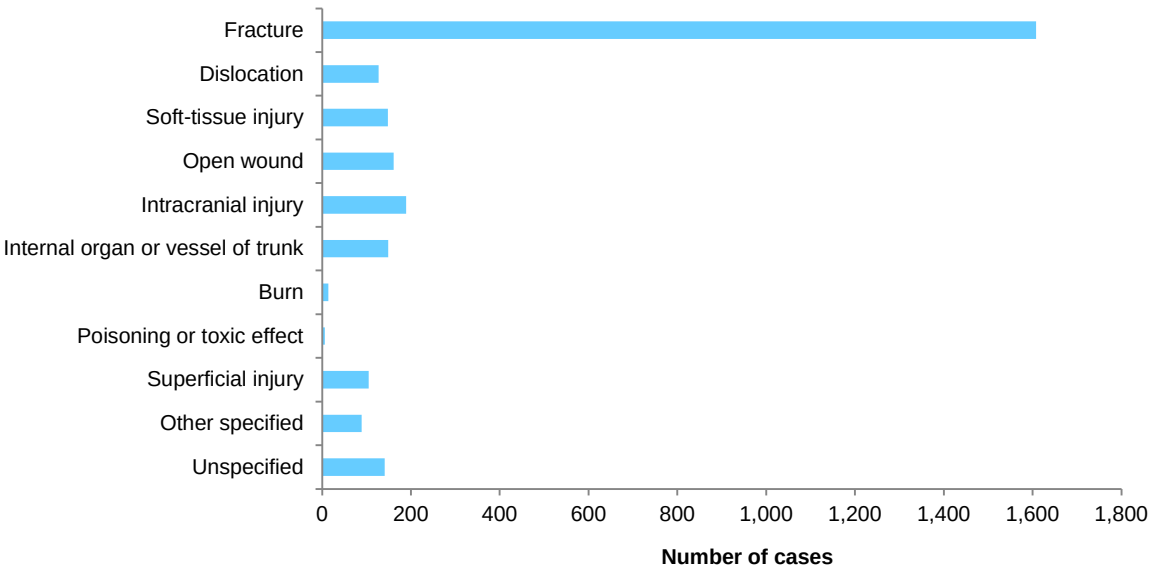
Participation-based rates of sports injury

According to the PSPRA survey, an estimated 76,585 (RSE 18.0%) people reported engaging in wheeled motor sports at least once in the 12 months prior to survey. The majority were male (72,847, RSE 18.8%).

The participation-based sports injury hospitalisation rate for men for motor sports was high compared to that for other sports (3,527 per 100,000 participants). The rate for all persons was 3,574. Participation-based rates for women, and by age group, could not be reported because the RSE for the denominator exceeded 50.

6.2 Nature and bodily location of injury

By far the most common type of injury sustained in wheeled motor sports was a fracture (59%) (Figure 6.2). Fractures were distributed across a wide range of body regions, but the most common were the knee and lower leg (24%), the elbow and forearm (19%), the shoulder and upper arm (18%) and the trunk (14%) (Table 6.2).



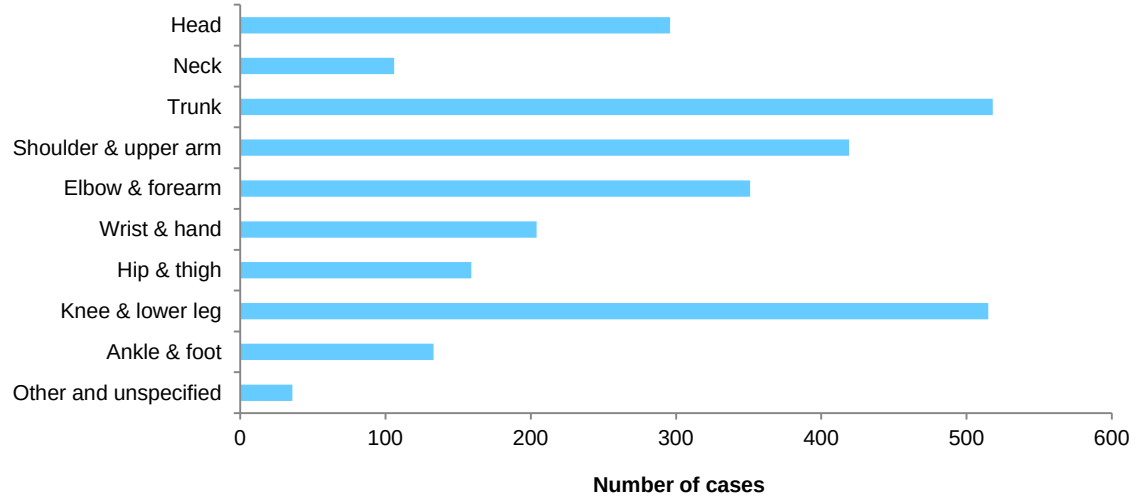
Note: Data underpinning this figure are available in Table B1.13 in Appendix B.

Figure 6.2: Cases of wheeled motor sports-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 6.2: Fractures by body region for wheeled motor sports-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Knee & lower leg	379	24
Elbow & forearm	302	19
Shoulder & upper arm	294	18
Trunk	229	14
Wrist & hand	143	9
Ankle & foot	99	6
Hip & thigh	94	6
Neck	38	2
Head	30	2
Total	**1,608**	**100**

The most commonly injured body regions were the trunk (19%) and the knee and lower leg (19%) (Figure 6.3). Potentially serious head injuries were also fairly common (11%). The most frequent types of injury to the trunk and knee and to the lower leg were fractures (74% and 44%, respectively). The most frequent type of injury to the head was intracranial injury (64% of head injuries).



Note: Data underpinning this figure are available in Table B1.13 in Appendix B.

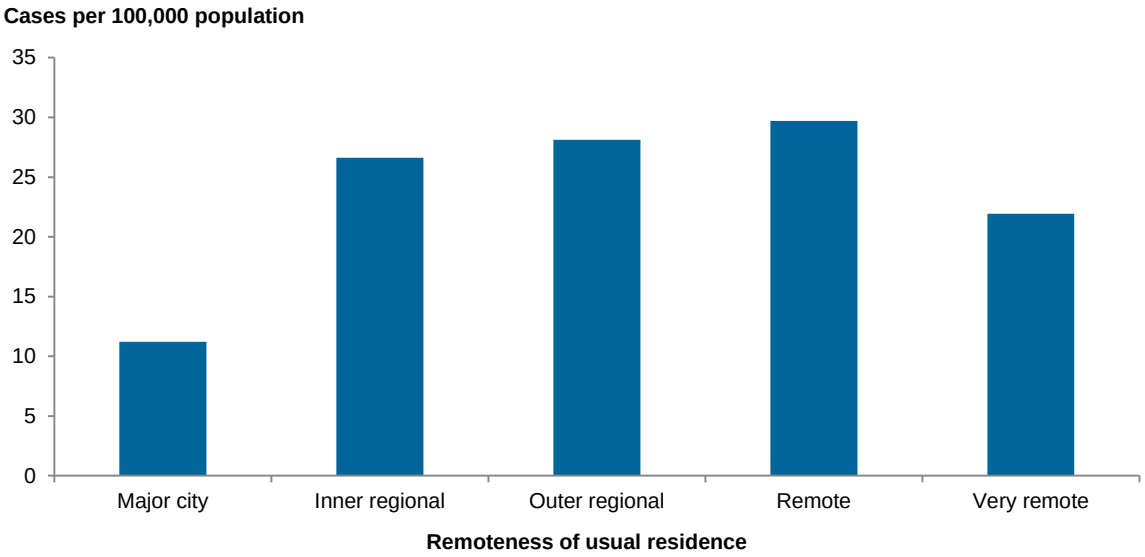
Figure 6.3: Cases of wheeled motor sports-related sports injury hospitalisation, by body region injured, Australia, 2011–12

6.3 Mechanism of injury

In 96% of cases of injury due to wheeled motor sports, the coded mechanism was 'transport accident'. Over 9 in 10 (92%) of these cases involved motorcycles. The vast majority (82%) of wheeled motor sports cases did not occur in traffic.

6.4 Remoteness of usual residence

Population-based age-standardised rates for all regional and remote areas exceeded those for major cities. Age-standardised rates for regional and remote areas ranged from 22 to 30 cases per 100,000 population compared to 11 for major cities (Figure 6.4).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 6.4: Age-standardised rates of wheeled motor sports-related sports injury hospitalisation, by remoteness of usual residence, Australia 2011–12

6.5 Severity of injury

High threat to life

In around one-quarter of cases (24%), the person's injuries were assessed as presenting a high threat to life. For these HTTL cases, over half involved a fracture (54%). These fractures most commonly involved the trunk (41%), the hip and thigh (16%) and the neck (11%). Other frequent injuries included intracranial injury (13%), injury to an internal organ (10%) and a traumatic haemo- or pneumothorax (10%). One person died while in hospital.

Length of stay

The MLOS in hospital, after a wheeled motor sports injury, was 3.5 days. While 27% of people were discharged on the day of admission, around 1 in 5 (21%) spent 4 or more days there. Mean length of stay tended to increase with age, ranging from 3 days for ages 15–17, to 6 days for people aged 65 and over (Table 6.3).

Table 6.3: Mean length of stay in hospital for wheeled motor sports, by age, Australia, 2011–12

	Age group							
	15–17	18–24	25–34	35–44	45–54	55–64	65+	Total
Persons	2.7	3.4	3.3	3.7	4.7	5.1	6.0	3.5

The total number of hospital days spent by patients attributable to wheeled motor sports injury was 9,637. This was the highest number of days spent by patients associated with any of the sports covered in this report.

6.6 Where the injury occurred

In over one-third of cases (38%), the injury occurred at a designated sports and athletics area. 213 (8%) of cases occurred on a street or highway, and 92 (3%) on a farm. Place of occurrence was not specified in 29% of cases (Table 6.4).

Table 6.4: Wheeled motor sports-related sports injury hospitalisations, by place of occurrence, Australia, 2011–12

Place of occurrence	Number of cases	%
Sports and athletics area	1,042	38.1
Street and highway	213	7.8
Farm	92	3.4
Other specified place of occurrence	584	21.3
Unspecified place of occurrence	806	29.4
Total	**2,737**	**100**

7 Ice and snow sports

This chapter includes the following sports:

- Ice and snow sports (U55)
  - Bobsledding (U55.0)
  - Ice skating and ice dancing (U55.1)
  - Speed skating (U55.5)
  - Skiing (U55.2)
  - Alpine and downhill (U55.20)
  - Nordic and cross country (U55.21)
  - Freestyle (U55.22)
  - Snow ski jumping (U55.23)
  - Other specified skiing (U55.28)
  - Skiing, unspecified (U55.29)
  - Snowmobiling (U55.3)
  - Snow boarding (U55.4)
  - Speed skating (U55.5)
  - Tobogganing (U55.6)
  - Curling (U55.7)
  - Other specified ice or snow sport (U55.8)
  - Unspecified ice or snow sport (U55.9)
- Ice hockey (U51.20)

In the year 2011–12, there were 1,114 cases of hospitalised injury as the result of ice and snow sports. These cases accounted for 3% of all cases of hospitalised sports injuries.

7.1 Age and sex

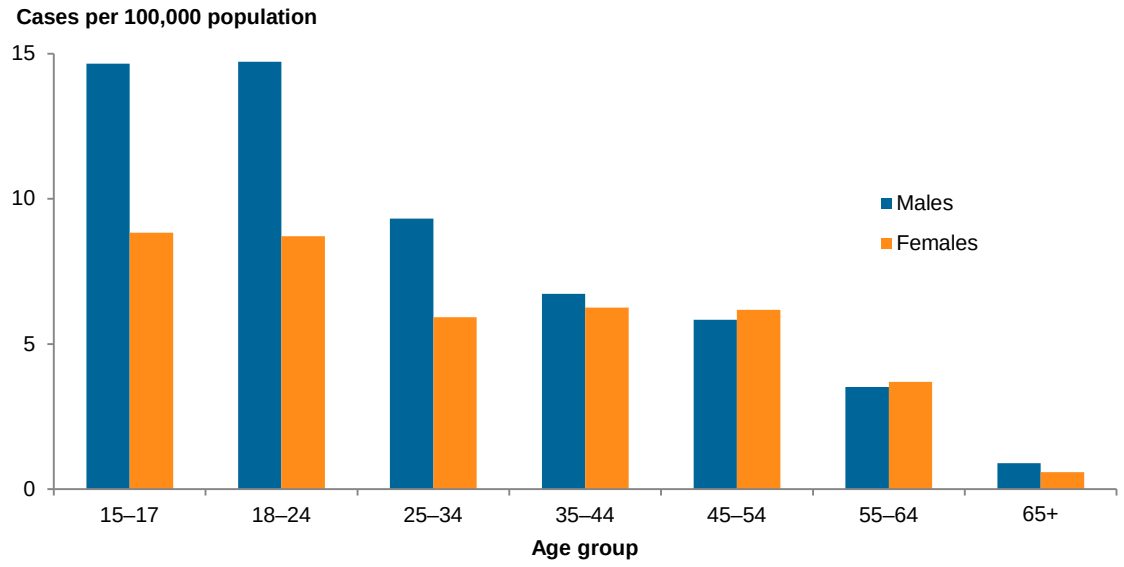
Of those who were admitted to hospital as a result of an ice and snow sports-related **injury**, a slightly higher proportion were men than women (57% and 43%, respectively. For men, the highest number of cases was in the 18–24 age group and, for women, in the 35–44 age group (Table 7.1).

Table 7.1: Cases of ice and snow sports-related injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	65	166	152	106	88	45	13	635
Females	37	94	95	100	95	48	10	479
Persons	102	260	247	206	183	93	23	1,114

Population-based rates of sports injury

The population-based age-standardised rates of ice and snow sports related sports injury hospitalisation for men and women were, 7 and 5 cases per 100,000 population, respectively. Population-based age-specific rates were highest for both men and women between the ages of 15 and 24 (15 and 9, respectively) (Figure 7.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 7.1: Age-specific rates of ice and snow sports-related injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

According to the PSPRA survey, an estimated 138,653 (RSE 17.6%) people reported engaging in ice and snow sports at least once in the 12 months prior to survey. More males (90,491, RSE 19.3%) than females (48,162, RSE 24.4%) reported engaging in ice and snow sports in this period.

Women had a higher participation-based sports injury hospitalisation rate (995 cases per 100,000 participants) for ice and snow-related injury than did men (702). The rate for all persons was 803 (Table 7.2). Rates were highest for those aged 15–24 and 35–44.

Table 7.2: Participation-based[(a)] ice and snow sports-related injury hospitalisation rates, Australia, 2011–12

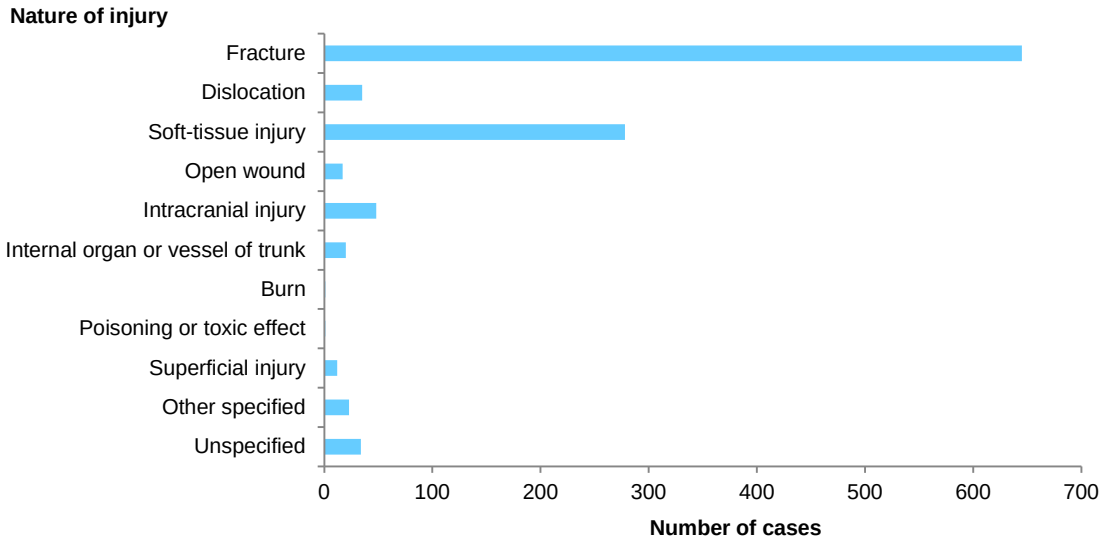
	Age group				
Sex	**15–24**	**25–34**	**35–44**	**45+**	**All ages**
Persons	1,249*	623*	1,017*	601	803

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

7.2 Nature and bodily location of injury

As for many other sports, fractures were the most common type of injury (58%) (Figure 7.2. The next most frequent injury type was soft-tissue injury (25%). The fractures most often involved the elbow and forearm (32%), the knee and lower leg (26%) and the shoulder and upper arm (16%) (Table 7.3).



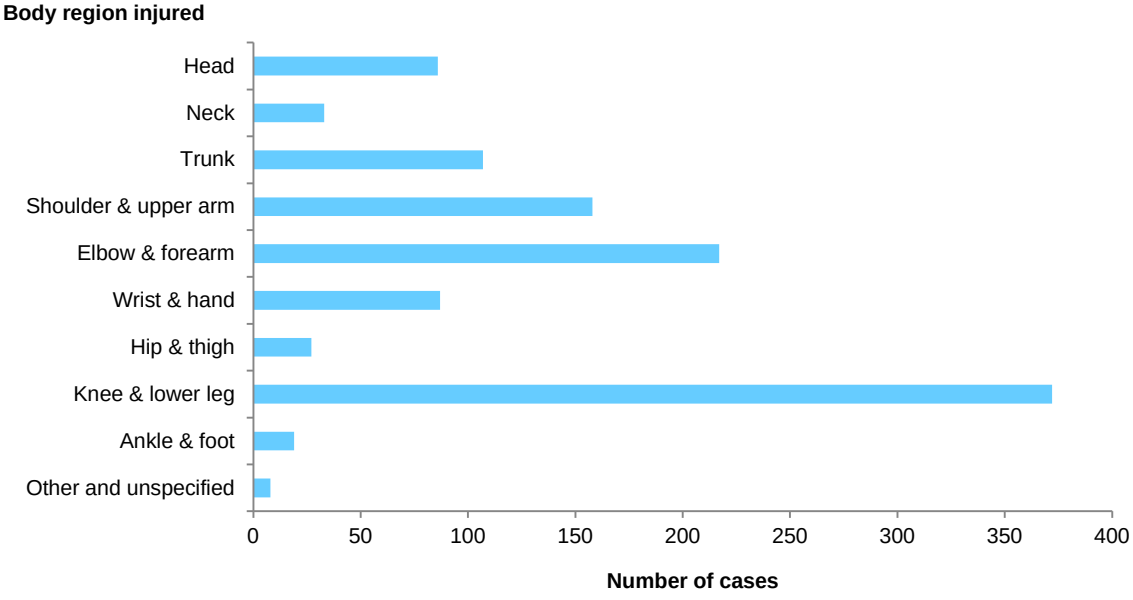
Note: Data underpinning this figure are available in Table B1.14 in Appendix B.

Figure 7.2: Cases of ice and snow sports-related injury hospitalisation, by nature of injury, Australia, 2011–12

Table 7.3: Fractures by body region for ice and snow sports-related injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Elbow & forearm	207	32
Knee & lower leg	167	26
Shoulder & upper arm	102	16
Trunk	60	9
Wrist & hand	55	9
Hip & thigh	18	3
Head	18	3
Neck	11	2
Ankle & foot	7	1
Total	**645**	**100**

The most commonly injured body regions were the knee and lower leg (33%) and the elbow and forearm (20%) (Figure 7.3). Head injuries were the body region affected in 8% of cases. Among the head injuries, 21% were fractures and nearly 6 in 10 (56%) were intracranial injuries. Around 4 in 10 (45%) of the knee and lower leg injuries were fractures. Injuries to the elbow and forearm were overwhelmingly fractures (95%).

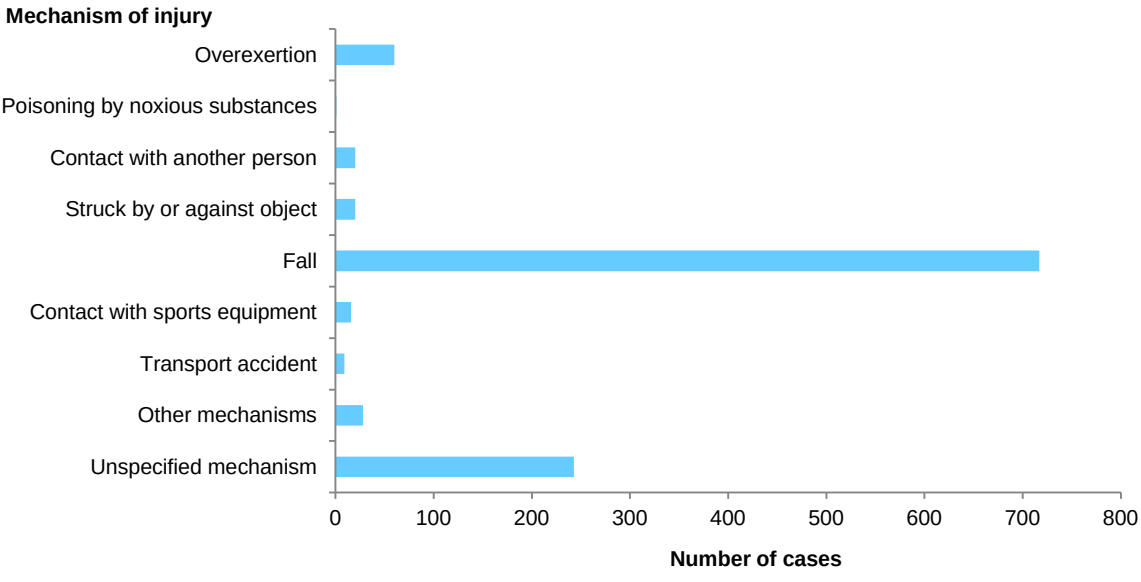


Note: Data underpinning this figure are available in Table B1.14 in Appendix B.

Figure 7.3: Cases of ice and snow sports-related injury hospitalisation, by body region injured, Australia, 2011–12

7.3 Mechanism of injury

By far the most common mechanism of injury was a fall (64%). A mechanism was not specified in 22% of cases (Figure 7.4).

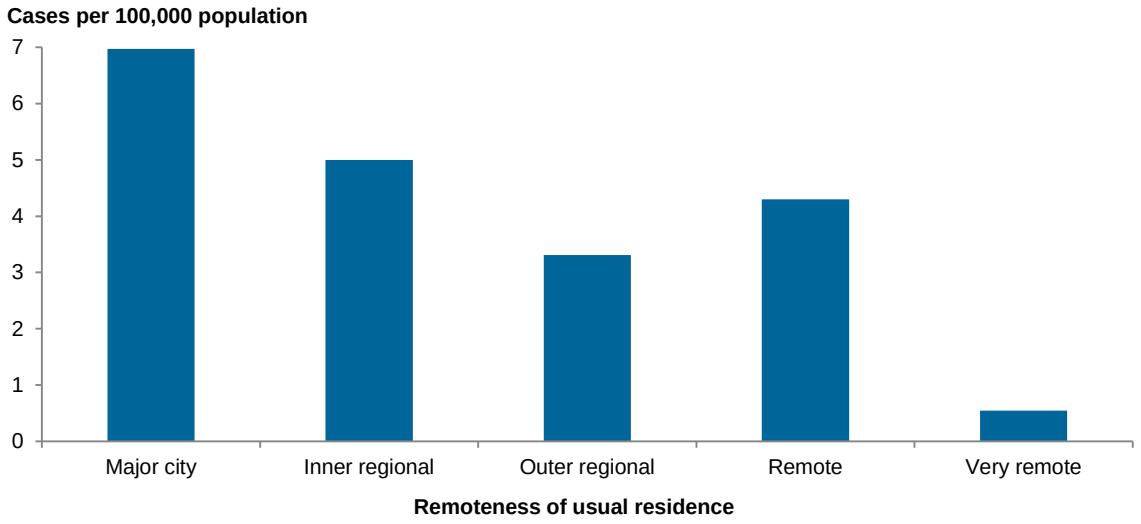


Note: Data underpinning this figure are available in Table B1.14 in Appendix B.

Figure 7.4: Cases of ice and snow sports-related injury hospitalisation, by mechanism of injury, Australia, 2011–12

7.4 Remoteness of usual residence

Population-based rates of ice and snow sports-related injury were highest in *Major cities* (7 cases per 100,000 population) and lowest in *Very remote* areas (0.5) (Figure 7.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 7.5: Age-standardised rates of ice and snow sports-related injury hospitalisation, by remoteness of usual residence, Australia 2011–12

7.5 Severity of injury

High threat to life

In 9% of cases, the person's injuries were considered to pose a high threat to life. For these HTTL cases, around 6 in 10 involved a fracture (64%) and 17% involved an intracranial injury. The fractures mainly affected the trunk (55%), the neck (18%) and the hip and thigh (18%). One person died while in hospital.

Length of stay

The MLOS in hospital, after an ice and snow sports-related injury, was 2.2 days. Around one-quarter (24%) of people were discharged on the same day as they were admitted to hospital. One in 5 spent 3 or more days there. MLOS tended to increase with age, reaching a level of 6.9 for those aged 65 and over (Table 7.4). Ice and snow sports-related injuries were associated with a total of 2,404 hospital days spent by patients.

Table 7.4: Mean length of stay in hospital for ice and snow sports-related injury, by age, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	2.0	1.8	2.0	2.2	2.3	3.0	9.6	2.2
Females	2.2	1.9	2.3	1.8	1.8	2.5	3.4	2.0
Persons	2.1	1.9	2.1	2.0	2.0	2.8	6.9	2.2

8 Water sports

This chapter covers a variety of water sports, including the following:

- Team water sports (U52)
  - Synchronised swimming (U52.0)
  - Water polo (U52.1)
  - Other specified team water sport (U52.8)
  - Unspecified team water sport (U52.9)
- Boating sports (U53)
  - Canoeing (U53.0)
  - Jet skiing (U53.1)
  - Kayaking (U53.2)
  - Power boat racing (U53.3)
  - Rowing and sculling (U53.4)
  - Surf boating (U53.5)
  - Yachting and sailing (U53.6)
  - Surf skiing (U53.7)
  - Other specified boating sport (U53.8)
  - Unspecified boating sport (U53.9)
- Individual water sports (U54)
  - Diving (U54.0)
  - Fishing (U54.1)
  - Scuba diving (U54.2)
  - Snorkelling (U54.3)
  - Surfing and boogie boarding (U54.4)
  - Swimming (U54.5)
  - Water skiing (U54.6)
  - Wind surfing (U54.7)
  - Other specified individual water sport (U54.8)
  - Unspecified individual water sport (U54.9).

In the year 2011–12, there were 2,502 cases of hospitalised injury associated with participation in water sports. These cases accounted for 7% of all cases of hospitalised sports injuries.

8.1 Age and sex

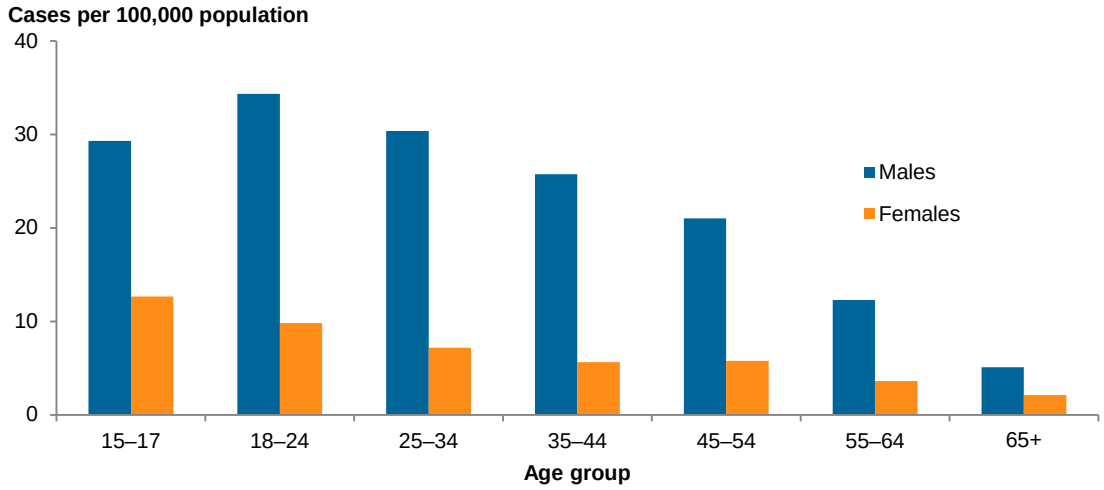
Over three-quarters of the water sports-related injury hospitalisations (79%) involved men. The highest number of cases for men was in the 25–34 age group (Table 8.1).

Table 8.1: Cases of water sports-related injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	130	387	495	406	317	157	74	1,966
Females	53	106	115	90	89	47	36	536
Persons	183	493	610	496	406	204	110	2,502

Population-based rates of sports injury

The population-based age-standardised rates of water sports-related injury hospitalisations for men and women were 22 and 6 cases per 100,000 population, respectively. Population-based age-specific rates were higher for younger men aged under 35. Female age-specific rates were also comparatively higher in that age range (Figure 8.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 8.1: Age-specific rates of water sports-related injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

The data collected in relation to all of the water sports categories in the PSPRA survey were not available for analysis. This section presents an analysis of injury hospitalisations for those water wports for which data were available. The subset includes the following:

- U53.0 Canoeing
- U53.2 Kayaking
- U53.6 Yachting and sailing
- U54.2 Scuba diving
- U54.3 Snorkelling
- U54.4 Surfing and boogie boarding
- U54.5 Swimming
- U54.6 Water-skiing.

According to the PSPRA survey, an estimated 1,981,939 (RSE 4.1%) people reported engaging in the specified water sports at least once in the 12 months prior to survey. More males (1,140,625, RSE 5.3%) than females (841,314, RSE 5.0%) reported engaging in water sports in this period.

Using hospitalisations from the subset of hospitalisations as the numerator, men had a higher participation-based sports injury hospitalisation rate (137 per 100,000 participants) than did women (49) (Table 8.2). The participation-based rate for all persons was 99. Rates for men, women and persons were highest for those aged 18–24, and lower in older age groups.

Table 8.2: Participation-based[(a)] water sports-related injury hospitalisation rates, by sex, Australia, 2011–12

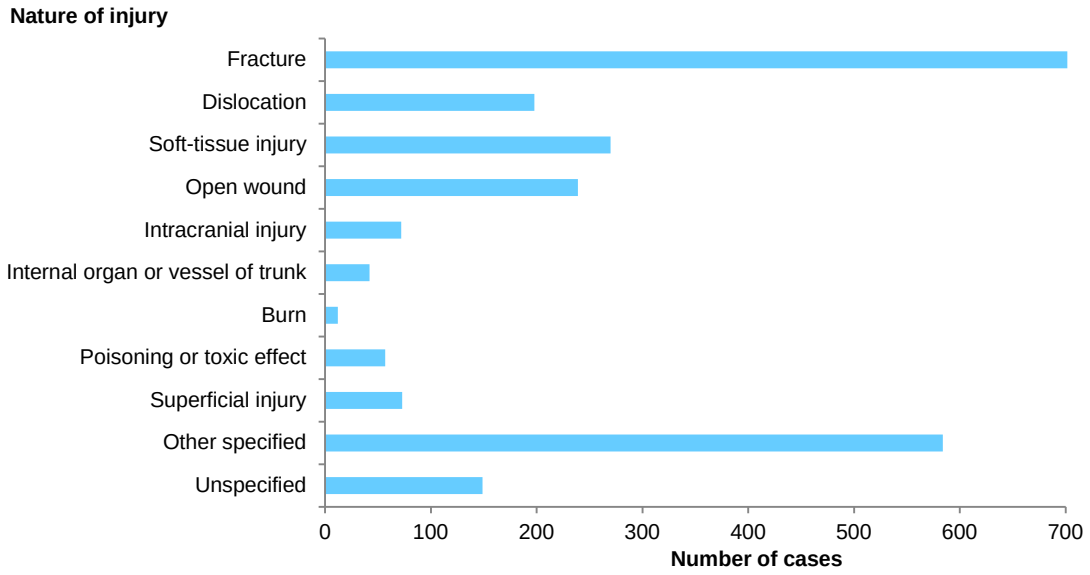
	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**All ages**
Males	148	220	198	119	119	73	74	137
Females	117*	122	48	33	50	27	36	49
Persons	139	190	124	82	92	53	55	99

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

8.2 Nature and bodily location of injury

Fractures were the most common type of injury (32%), followed by soft-tissue injury (11%) and open wounds (10%) (Figure 8.2). The fractures most frequently involved the knee and lower leg (29%) (Table 8.3).



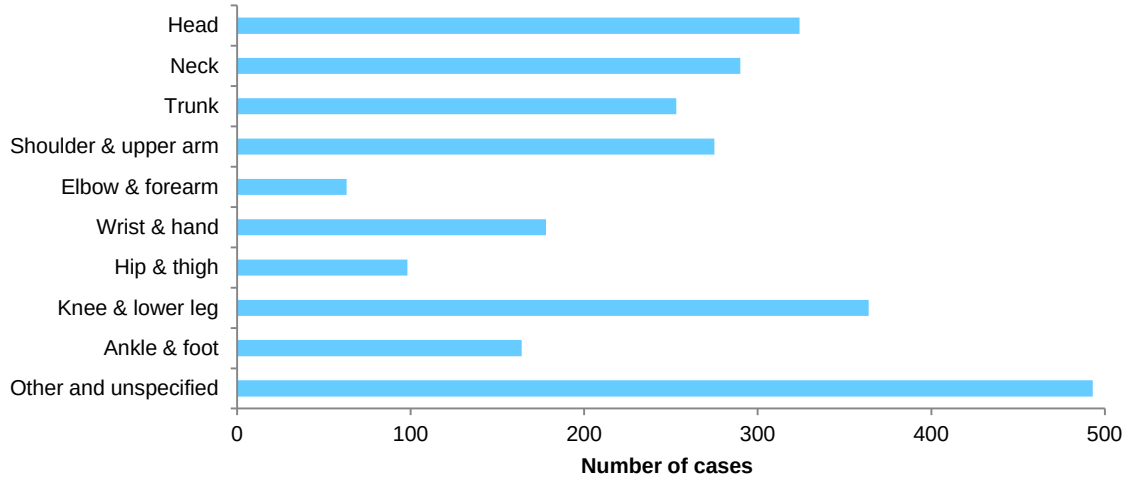
Note: Data underpinning this figure are available in Table B1.15 in Appendix B.

Figure 8.2: Cases of water sports-related injury hospitalisation, by nature of injury, Australia, 2011–12

Table 8.3: Fractures by body region for water sports-related injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Knee & lower leg	230	29
Neck	108	13
Trunk	100	12
Wrist & hand	98	12
Head	92	11
Shoulder & upper arm	68	8
Ankle & foot	42	5
Elbow & forearm	34	4
Hip & thigh	33	4
Other and unspecified	1	0
Total	**806**	**100**

The 3 most commonly injured body regions were the knee and lower leg (15%), the head (13%) and the neck (12%) (Figure 8.3). Most of the injuries to the knee and lower leg were fractures (63%). The most common injuries to the head were fractures (28%), open wounds (25%) and intracranial injury (22%). Among neck injuries, fractures were most common (37%) followed by injury to the nerves and spinal cord (16%).

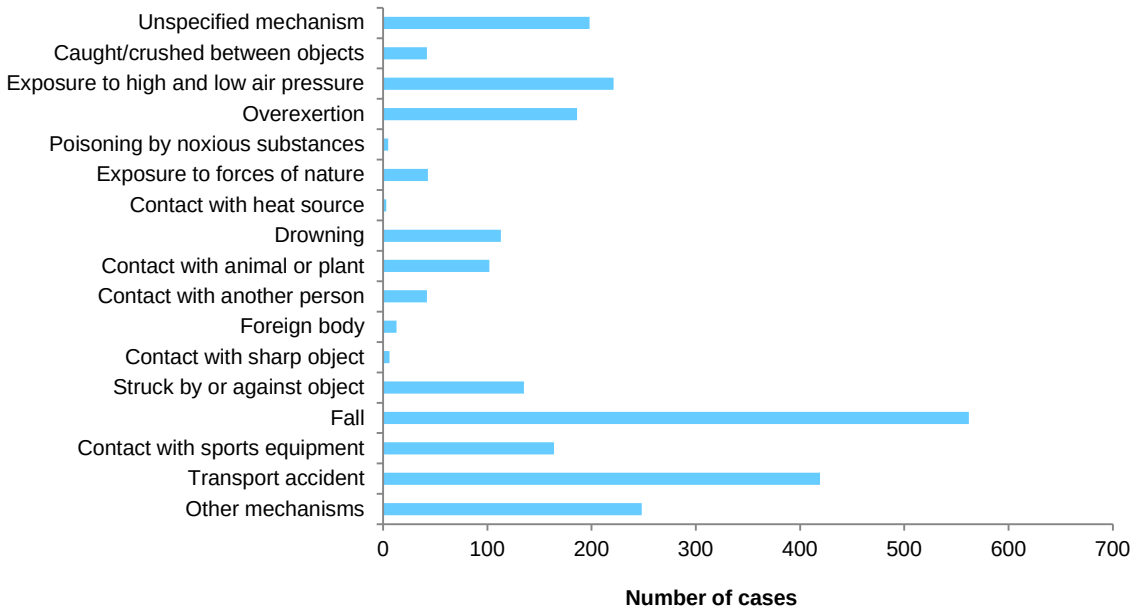


Note: Data underpinning this figure are available in Table B1.15 in Appendix B.

Figure 8.3: Cases of water sports-related injury hospitalisation, by body region injured, Australia, 2011–12

8.3 Mechanism of injury

The most common mechanisms of injury were falls (23%), transport accidents (17%), exposure to high and low air pressure (9%), overexertion and strenuous or repetitive movements (7%) and contact with sports equipment (7%). Exposure to high and low air pressure is normally associated with diving (Figure 8.4).



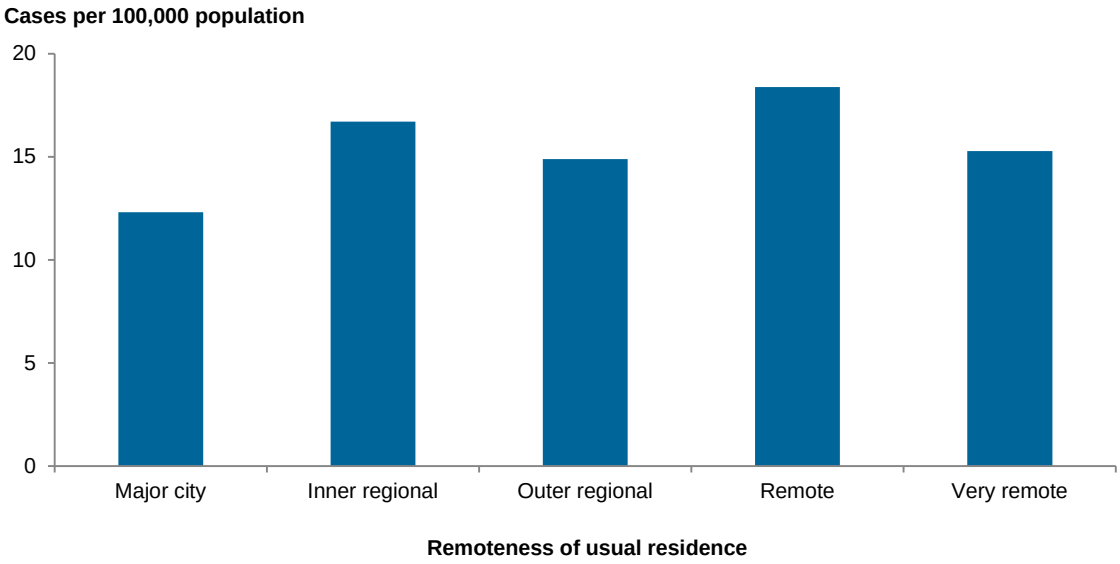
Notes

1. Data underpinning this figure are available in Table B1.15 in Appendix B.
2. 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Figure 8.4: Cases of water sports-related injury hospitalisation, by mechanism of injury, Australia, 2011–12

8.4 Remoteness of usual residence

Population-based age-standardised rates were fairly evenly distributed across all areas. *Major cities* had the lowest rate of 12 cases per 100,000 population (Figure 8.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 8.5: Age-standardised rates of water sports-related injury hospitalisation, by remoteness of usual residence, Australia 2011–12

8.5 Severity of injury

High threat to life

In 415 (17%) of cases, the person's injuries were considered to pose a high threat to life. The injuries sustained in 4 in 10 (43%) of these HTTL cases were fractures and around one-quarter (24%) involved immersion or near drowning. The fractures in these life-threatening cases most commonly affected the neck (45%), trunk (24%) and head (16%). Seven people died while in hospital.

Length of stay

The MLOS in hospital, after a water sports injury, was 2.6 days. Four in 10 people were discharged on the same day as they were admitted to hospital. One in 5 spent 3 or more days in hospital.

MLOS was highest for those aged 65 and over (6 days) (Table 8.4). Water sports-related injury resulted in a total of 6,571 hospital days spent in hospital, the third-highest number of days spent by patients for the sports covered in this report.

Table 8.4: Mean length of stay in hospital for water sports-related injury, by age, Australia 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	1.9	2.1	2.3	2.3	3.3	2.8	5.7	2.6
Females	2.8	2.5	1.6	2.9	3.4	3.3	5.5	2.9
Persons	2.2	2.2	2.2	2.4	3.3	2.9	5.6	2.6

9 Roller sports

This chapter includes the following sports:

- In-line skating and rollerblading (U66.1)
- Roller skating (U66.2)
- Skateboarding (U66.3)
- Scooter riding (U66.4).

In the year 2011–12, there were 1,632 cases of hospitalised injury as the result of participation in roller sports. These cases accounted for 5% of all hospitalised sports injuries.

9.1 Age and sex

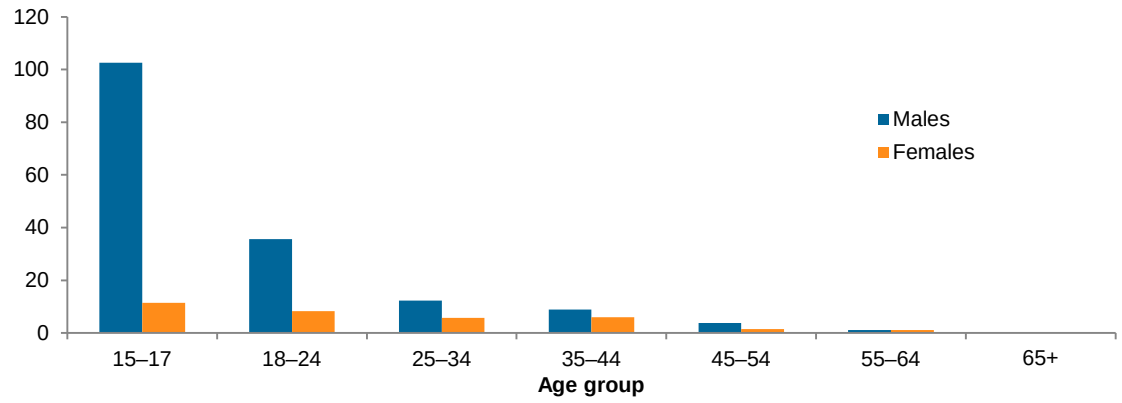
Over three-quarters of the roller sports-related injury hospitalisations (78%) involved men. For men, the highest number of cases was in the youngest age group (Table 9.1).

Table 9.1: Cases of roller sports-related injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	454	401	200	140	57	12	3	1,267
Females	48	89	91	96	23	14	4	365
Persons	502	490	291	236	80	26	7	1,632

Population-based rates of sports injury

The population-based age-standardised rates of roller sports-related injury hospitalisation for men and women were, in turn, 14 and 4 cases per 100,000 population. Young men aged 15–17 had the highest population-based age-specific rate of 102. Caution should be exercised in interpreting these results due to small case numbers in older age groups (Figure 9.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 9.1: Age-specific rates of roller sports-related injury hospitalisation, by sex, Australia, 2011–12

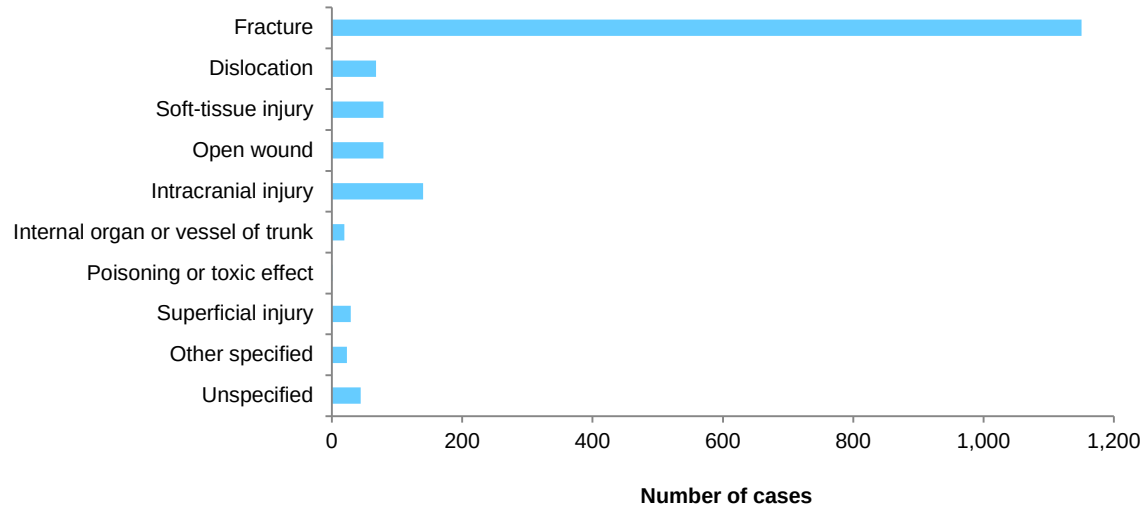
Participation-based rates of roller sports injury

According to the PSPRA survey, an estimated 70,810 (RSE 17.9%) people reported engaging in roller sports at least once in the 12 months prior to survey. More males (49,672, RSE 22.9%) than females (21,138, RSE 28.7%) reported engaging in roller sports in this period.

The participation-based sports injury hospitalisation rate for roller sports was higher for men (2,559 per 100,000 participants) than for women (1,731). Caution should be used with respect to the female rate which was calculated using a denominator with an RSE > 25 and ≤ 50. The participation-based rate for all persons was 2,312. Age-specific participation-based rates could not be reported because the denominators had an RSE that exceeded 50.

9.2 Nature and bodily location of injury

Fractures were the most common type of injury (70%) (Figure 9.2). These fractures most frequently involved the elbow and forearm (43%) and the knee and lower leg (30%) (Table 9.2).



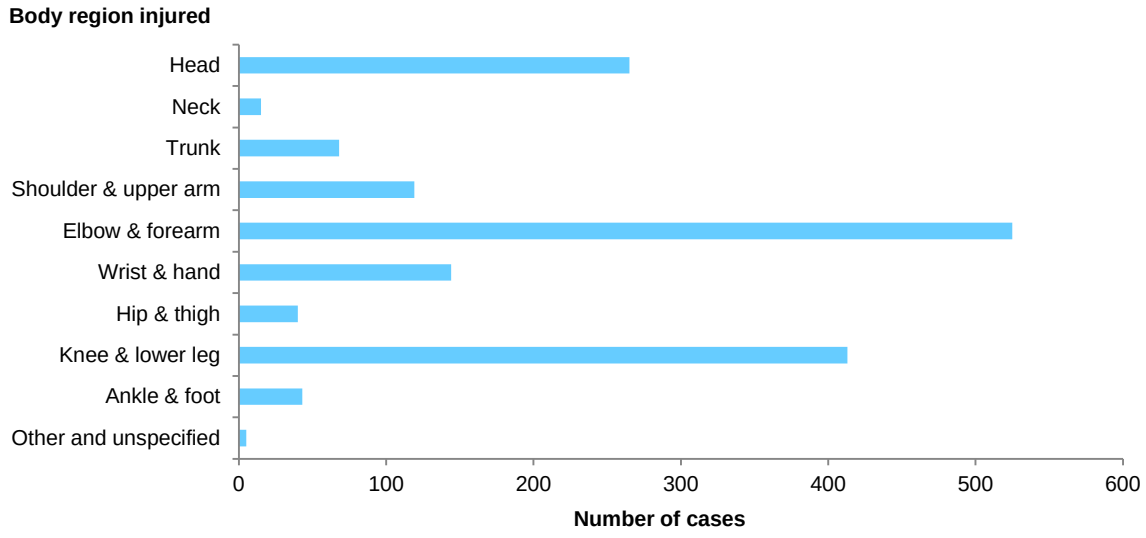
Note: Data underpinning this figure are available in Table B1.16 in Appendix B.

Figure 9.2: Cases of roller sports-related injury hospitalisation, by nature of injury, Australia, 2011–12

Table 9.2: Fractures by body region for roller sports-related injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Elbow & forearm	492	43
Knee & lower leg	341	30
Wrist & hand	107	9
Shoulder & upper arm	78	7
Head	55	5
Trunk	27	2
Ankle & foot	24	2
Hip & thigh	24	2
Neck	5	0
Total	**1,153**	**100**

The 3 most commonly injured body regions were the elbow and forearm (32%), knee and lower leg (25%) and the head (16%) (Figure 9.3). Most of the injuries to the elbow and forearm and the knee and lower leg were fractures (94% and 83%, respectively). Over half (53%) of the injuries to the head took the form of intracranial injury. A further 21% of head injuries were fractures.

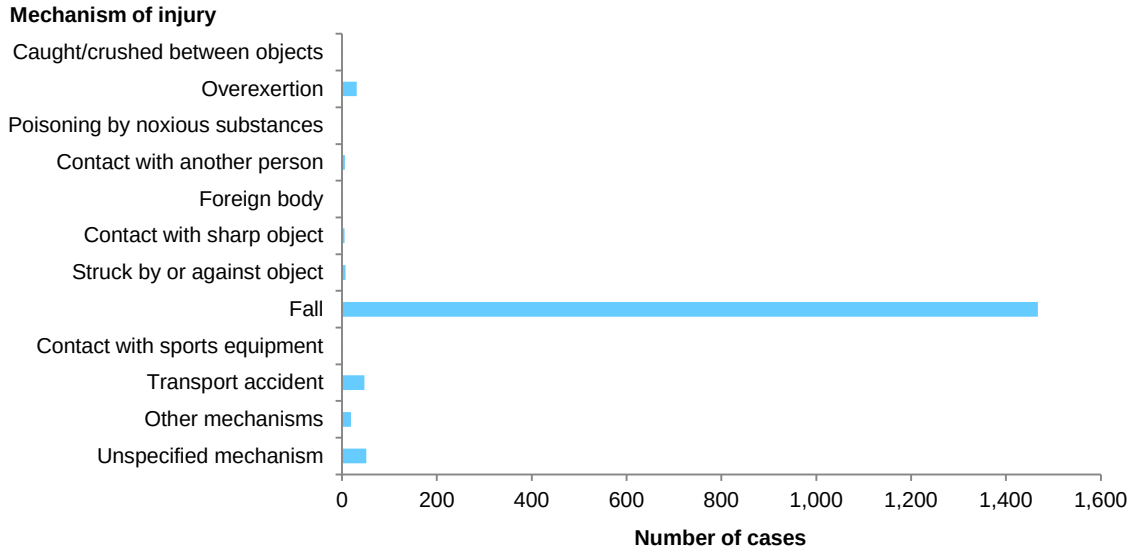


Note: Data underpinning this figure are available in Table B1.16 in Appendix B.

Figure 9.3: Cases of roller sports-related injury hospitalisation, by body region injured, Australia, 2011–12

9.3 Mechanism of injury

A fall was the mechanism of injury in 9 out of 10 cases (Figure 9.4). Nearly three-quarters of cases (74%) involved a fall from a skateboard. In 1 in 10 cases, the person fell while roller skating.

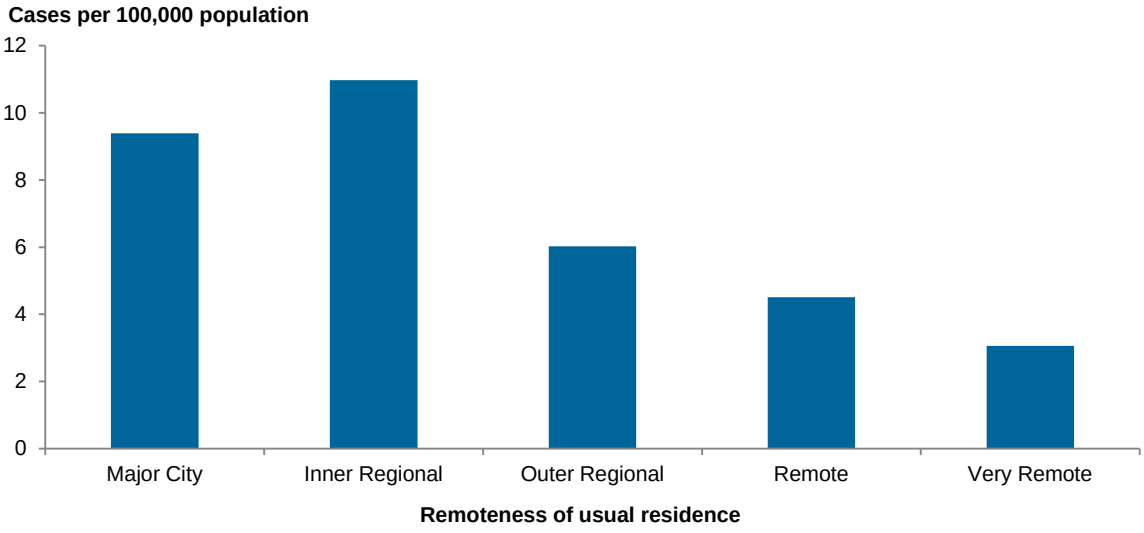


Note: Data underpinning this figure are available in Table B1.16 in Appendix B.

Figure 9.4: Cases of roller sports-related injury hospitalisation, by mechanism of injury, Australia, 2011–12

9.4 Remoteness of usual residence

Population-based age-standardised rates were highest in *Major cities* and *Inner regional* areas (9 and 11 cases per 100,000 population, respectively) (Figure 9.5).



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 9.5: Age-standardised rates of roller sports-related injury hospitalisation, by remoteness of usual residence, Australia 2011–12

9.5 Severity of injury

High threat to life

In 167 (10%) of cases, the person's injuries were considered to pose a high threat to life. The injuries sustained in these HTTL cases were primarily intracranial injury (46%) and fractures (44%). Over 4 in 10 of the fractures involved the head. One person died while in hospital.

Length of stay

The MLOS in hospital, after a roller sports-related injury, was 2.3 days. Nearly one-third (30%) of people were discharged on the same day as they were admitted. Around 1 in 5 (21%) spent 3 or more days in hospital care. People aged 65 and over had the longest MLOS in hospital (5 days) (Table 9.3). Roller sports-related injury resulted in a total of 3,816 hospital days spent by patients.

Table 9.3: Mean length of stay in hospital for roller sports-related injury, by age, Australia 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	2.1	2.4	2.4	2.1	3.1	1.9	1.0	2.3
Females	2.6	2.2	2.1	2.8	2.2	2.4	9.3	2.5
Persons	2.2	2.3	2.3	2.4	2.8	2.2	5.7	2.3

10 Equestrian activities

This chapter includes the following equestrian activities:

- Equestrian events (U63.0)
  - Dressage (U63.01)
  - Show jumping (U63.02)
  - Steeplechase and cross country eventing (U63.03)
  - Other specified equestrian event (U63.08)
  - Equestrian event, unspecified (U63.09)
- Endurance riding (U63.1)
- Polo and polocrosse (U63.2)
- Horse racing events (U63.3)
  - Horse racing (U63.31)
  - Hurdle racing (U63.32)
- Rodeo (U63.4)
- Trail or general horseback riding (U63.5)
- Trotting and harness (U63.6)
- Other specified equestrian activity (U63.8)
- Unspecified equestrian activity (U63.9).

In the year 2011–12, there were 1,568 cases of hospitalised injury resulting from equestrian activities. These cases accounted for 4% of all cases of hospitalised sports injuries.

10.1 Age and sex

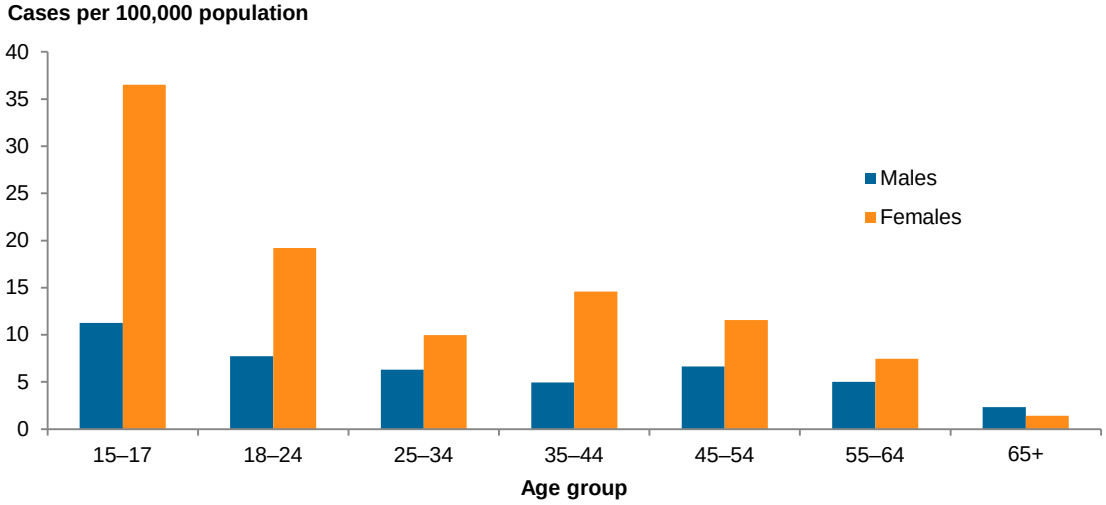
Women comprised two-thirds of cases of equestrian-related sports injury hospitalisation. For women, the highest number of cases was in the 35–44 year age group (Table 10.1).

Table 10.1: Cases of equestrian-related sports injury hospitalisation, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	50	87	103	78	100	64	34	516
Females	153	207	160	233	178	97	24	1,052
Persons	203	294	263	311	278	161	58	1,568

Population-based rates of sports injury

Two-thirds (67%) of hospitalisation related to equestrian activities involved women. The population-based age-standardised rates of hospitalisation for women and men were, in turn, 12 and 6 cases per 100,000 population. Population-based age-specific rates were highest for women aged 15–17 (37 per 100,000) (Figure 10.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 10.1: Age-specific rates of equestrian activity-related sports injury hospitalisation, by sex, Australia, 2011–12

Participation-based rates of sports injury

The category for equestrian activities in the 2011–12 PSPRA survey specifically excluded horse racing and rodeo events. In the interests of optimising comparability between the survey category and the ICD-10-AM codes included in selecting cases of sports injury hospitalisation, cases with an activity code 'U63.3 Horse racing events' or 'U63.4 Rodeo' were excluded from the subset of hospitalisations used as the numerator in calculating participation-based rates. This should be noted with respect to the rates reported in this section.

According to the PSPRA survey, an estimated 148,797 (RSE 15.3%) people reported engaging in equestrian activities at least once in the 12 months prior to survey. More females (105,698, RSE 17.0%) than males (43,099, RSE 26.8%) reported engaging in equestrian activities in this period.

The participation-based sports injury hospitalisation rate for all persons injured while engaging in the restricted set of equestrian activities was 902 per 100,000 participants. Women had higher participation-based rates than did men (957 and 766, respectively). It should be noted that the male rate was calculated using a denominator where the RSE was > 25 and ≤ 50, so caution should be exercised. Age-specific participation-based rates could not be reported for men because the denominators had an RSE exceeding 50 (Table 10.2). Rates for women were highest in the youngest and oldest age groups. For all persons, the rate was highest for those aged 45 and over.

Table 10.2: Participation-based[(a)] equestrian activity related sports injury hospitalisation rates, by sex, Australia, 2011–12

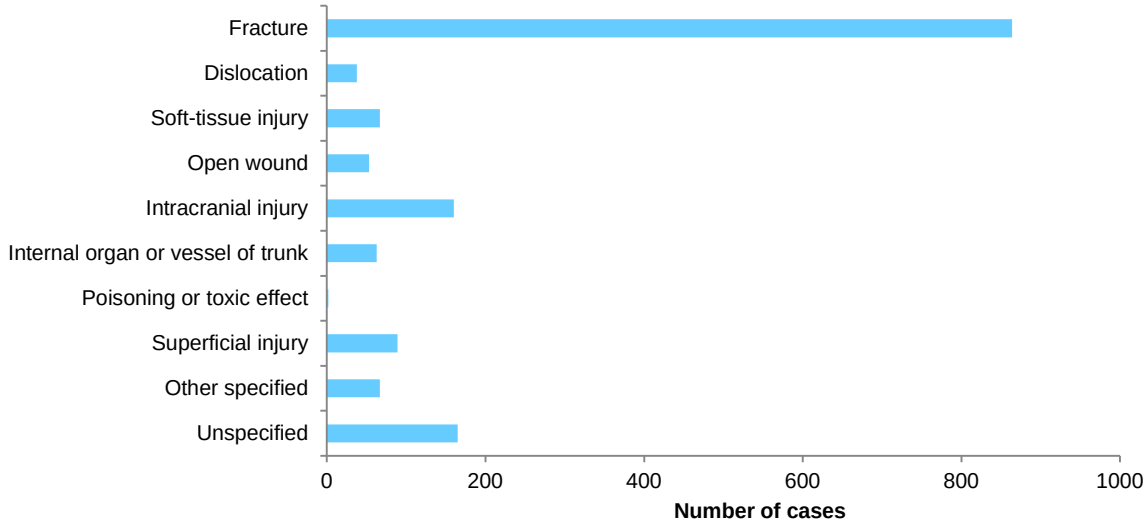
	Age group				
Sex	**15–24**	**25–34**	**35–44**	**45+**	**All ages**
Females	1,022*	705*	926*	1,117	957
Persons	846*	800*	780*	1,148	902

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

10.2 Nature and bodily location of injury

Fractures were the type of injury most commonly sustained (55%) (Figure 10.2). They most frequently involved the trunk (30%), the knee and lower leg (21%), and the elbow and forearm (17%) (Table 10.3). An intracranial injury was sustained by 10% of people.



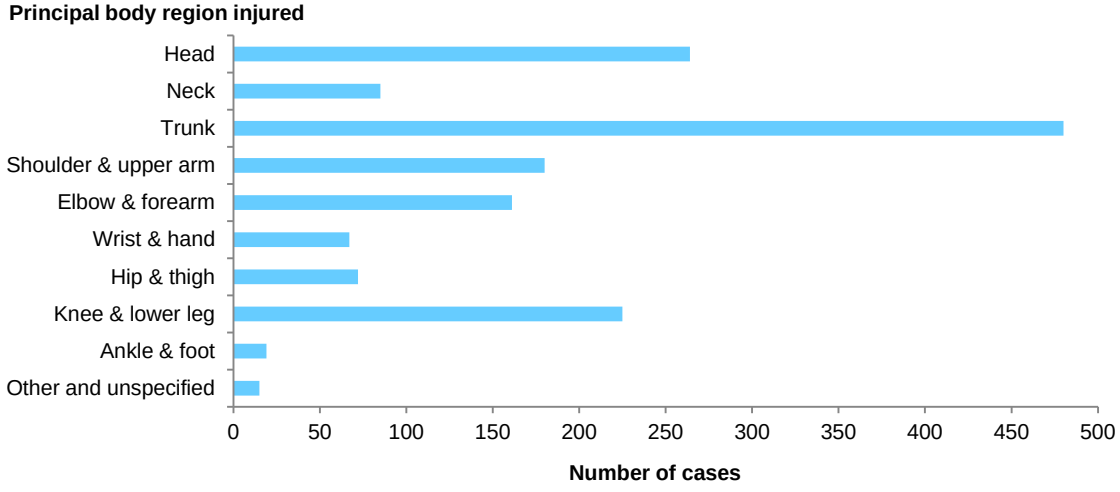
Note: Data underpinning this figure are available in Table B1.17 in Appendix B.

Figure 10.2: Cases of equestrian-related sports injury hospitalisation, by nature of injury, Australia, 2011–12

Table 10.3: Fractures by body region for equestrian-related sports injury hospitalisations, Australia, 2011–12

Body region	Number of cases	%
Trunk	259	30
Knee & lower leg	178	21
Elbow & forearm	145	17
Shoulder & upper arm	136	16
Wrist & hand	52	6
Head	32	4
Hip & thigh	25	3
Neck	25	3
Ankle & foot	12	1
Total	**864**	**100**

The 3 most commonly injured body regions were the trunk (31%), head (17%) and the knee and lower leg (14%) (Figure 10.3). Injuries to the trunk were primarily fractures (54%). Head injuries mainly comprised intracranial injury (61% of head injuries). Fractures accounted for over three-quarters (79%) of injuries to the knee and lower leg.



Note: Data underpinning this figure are available in Table B1.17 in Appendix B.

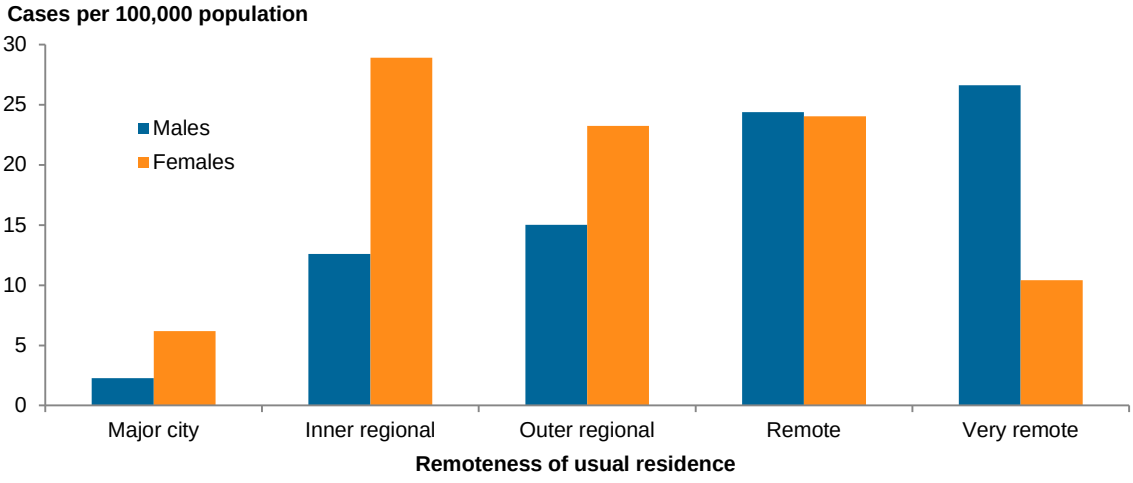
Figure 10.3: Cases of equestrian-related sports injury hospitalisation, by body region injured, Australia 2011–12

10.3 Mechanism of injury

The mechanism of injury in the majority of cases of equestrian-related sports injury hospitalisation was coded as 'transport accident'. In 6% of cases the mechanism was a fall. Mechanism of injury was unspecified in 1% of cases.

10.4 Remoteness of usual residence

For both men and women, population-based age-standardised rates were higher for all regional and remote areas than for *Major cities* (Figure 10.4). Male rates were comparatively high in *Remote* and *Very remote* areas (24 and 27 per 100,000 population, respectively). Rates for women were highest in *Inner regional* areas (29 per 100,000). Female rates substantially exceeded those for men in *Major cities* and regional areas.



Note: Data underpinning this figure are available in Table B1.4 in Appendix B.

Figure 10.4: Age-standardised rates of equestrian-related sports injury hospitalisation, by sex and remoteness of usual residence, Australia 2011–12

10.5 Severity of injury

High threat to life

The injuries in a relatively high proportion of equestrian-related hospitalisations (23%) were considered to pose a high threat to life. The injuries sustained in these HTTL cases were primarily fractures (60%) and intracranial injury (16%). Around two-thirds (67%) of the fractures involved the trunk. Fractures involving the neck (9%), hip and thigh (7%) and head (6%) were also present. Two people died while in hospital.

Length of stay

The MLOS in hospital, after an equestrian-related injury, was 3.1 days. Around one-quarter (28%) of people were discharged on same day that they were admitted. Nearly one-third (29%) spent 3 or more days in hospital care. The MLOS increased with age. People aged 65 and over had the longest MLOS (6 days) (Table 10.4). Equestrian-related injury resulted in a total of 4,888 hospital days spent by patients.

Table 10.4: Mean length of stay in hospital for equestrian-related injury, by age, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**Total**
Males	2.9	2.9	2.4	2.9	2.8	5.1	6.1	3.3
Females	2.0	2.5	3.0	2.9	3.8	4.4	4.7	3.0
Persons	2.2	2.6	2.8	2.9	3.4	4.7	5.5	3.1

10.6 Where the injury occurred

Where reported, equestrian-related injuries most frequently occurred in a designated sports and athletics area (22%). Other locations were the home (4%), a farm (7%) and a street or highway (1%). Place of occurrence was not specified for a large proportion of cases (59%) (Table 10.5).

Table 10.5: Cases of equestrian-related sports injury hospitalisation, by place of occurrence, Australia, 2011–12

Place of occurrence	Number of cases	%
Home	63	4.0
Sports and athletics area	340	21.7
Street and highway	17	1.1
Farm	105	6.7
Other specified place of occurrence	113	7.2
Unspecified place of occurrence	930	59.3
Total	**1,568**	**100**

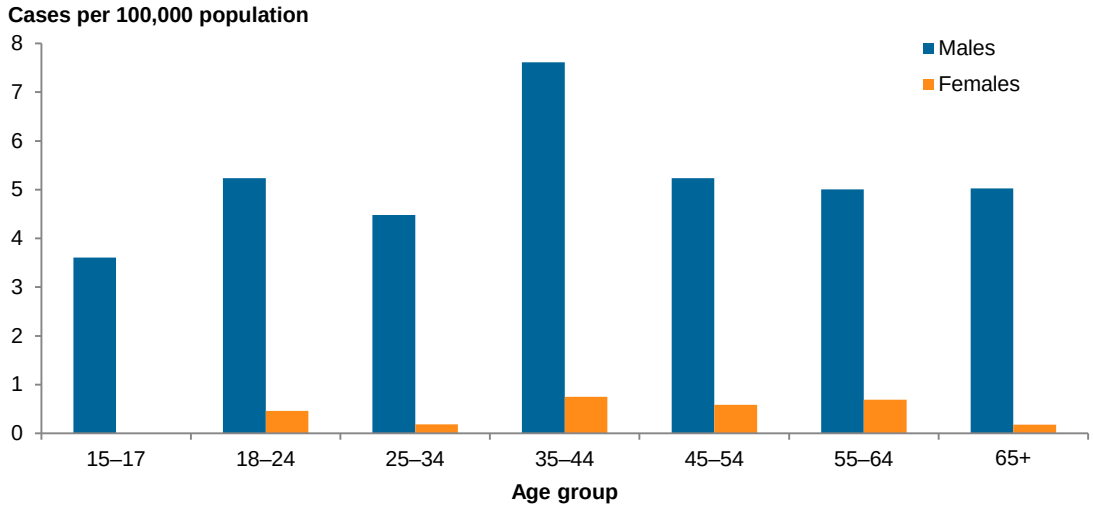
11 Other sports

The following sections provide information on a number of other sporting activities. Sports were included in this section due to either small numbers of hospitalisations (usually less than 1,000 cases) or where there was some uncertainty surrounding whether the activity was undertaken for sports or another reason (for example, walking-related injury hospitalisations may include cases which occurred in the course of normal daily activities). Where feasible, participation injury rates have been provided. The sports included in this chapter are fishing; dancing; walking and running; cycling; adventure and extreme sports; gymnastics and trampolining; hockey; cricket; racquet sports; and golf.

11.1 Fishing

This section includes cases related to Fishing (U54.1).

In 2011–12, 525 people were hospitalised for an injury sustained while fishing. Over 9 in 10 (92%) of these were men. The highest population-based age-specific rate for men was in the 35–44 year age group. Age-specific rates for women were below 1 per 100,000 population at all ages (Figure 11.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.1: Age-specific rates of fishing-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 247,163 (RSE 9.2%) people reported engaging in fishing at least once in the 12 months prior to survey. More males (213,064, RSE 9.5%) than females (34,099, RSE 25.6%) reported engaging in fishing in this period.

Participation-based rates for men and women for fishing-related hospitalisation were 227 and 120 per 100,000 participants, respectively. The rate for all persons was 212. The female rate should be regarded with caution because the denominator used for its calculation had an RSE > 25 and ≤ 50.

An open wound was the injury in over one-third of cases (36%). Fractures were also common (23%), as were muscle and tendon injuries (11%). The highest proportion of injuries sustained affected the wrist and hand (34%).

A variety of mechanisms were coded as having caused an injury. The most common of these were falls (27%), contact with an animal or plant (15%), contact with a sharp object (11%) and transport accidents (11%).

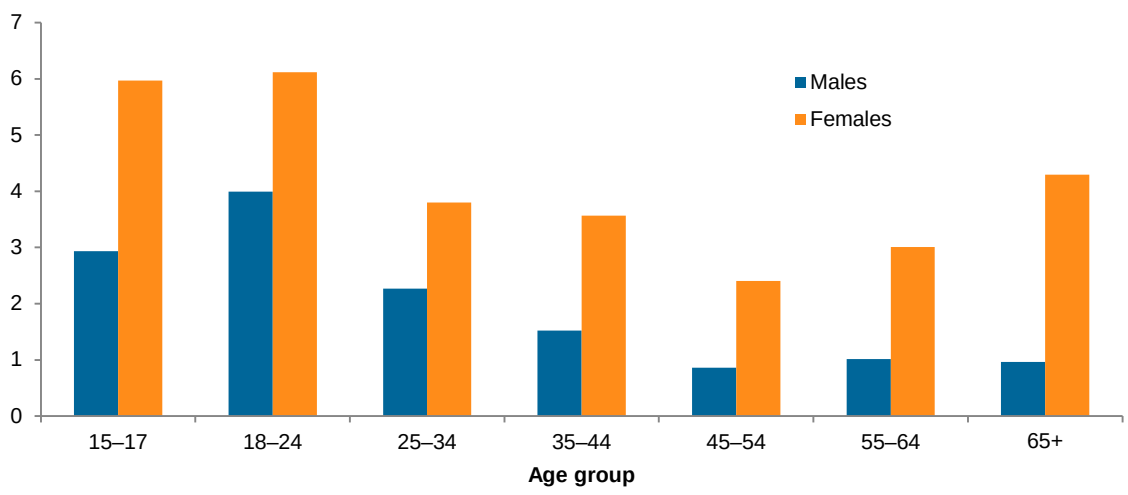
The MLOS in hospital for fishing-related injuries was 3.1 days. Fishing injuries resulted in a total of 1,620 days spent by patients in hospital. In 11% of cases the injuries sustained were life-threatening.

11.2 Dancing

This section includes cases related to Dancing (U58.0).

Of the 517 cases where participation in dancing resulted in admission to hospital, over two-thirds (69%) involved women.

Population-based age-specific rates were highest for both men and women in the 2 youngest age groups (women: 6 in both cases; men: 3 and 4, respectively) (Figure 11.2).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.2: Age-specific rates of dancing-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 259,185 (RSE 9.4%) people reported engaging in dancing activities at least once in the 12 months prior to survey. More females (229,058, RSE 10.2%) than males (30,127, RSE 22.1%) reported engaging in dancing activities in this period.

Participation-based rates for men and women for dancing-related hospitalisation were 528 and 156 per 100,000 participants, respectively. The rate for all persons was 199.

As for many sports, fractures were very common (62%). Two body regions were most commonly affected: the knee and lower leg (38%) and the elbow and forearm (25%). By far the most frequent mechanism of injury was a fall (63%). Overexertion and strenuous or repetitive movements was also commonly reported as having caused the injury (22%).

The MLOS in hospital for a dancing-related injury was 2.9 days. A total of 1,517 days spent in hospital by patients were attributed to participation in this activity.

In 8% of cases, the injuries sustained were assessed as presenting a high threat to life.

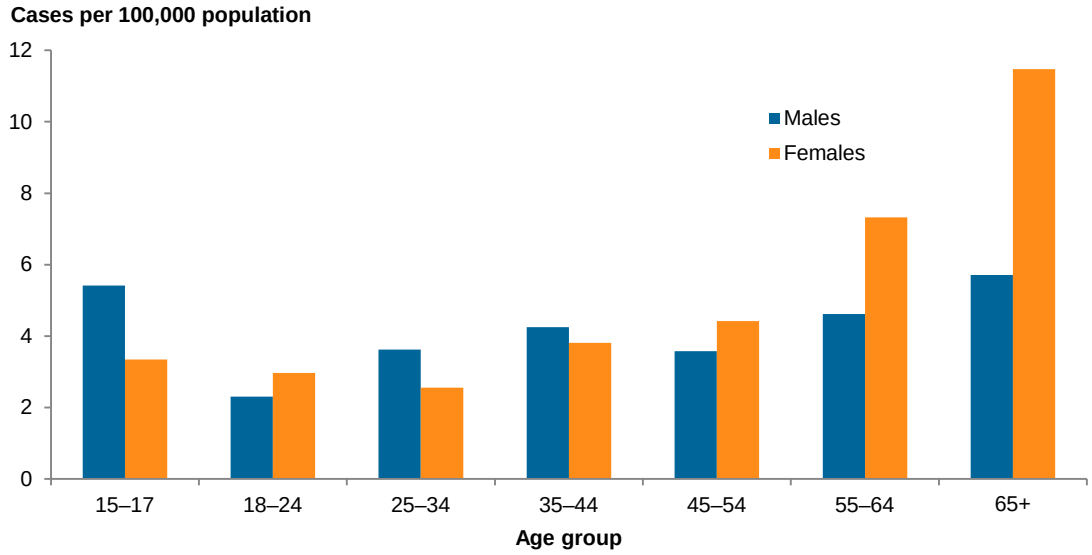
11.3 Walking and running

This section includes the following sports:

- Jogging and running (U56.1)
- Walking (U56.2).

There were 878 cases of walking or running-related sports injury hospitalisation in 2011–12. These cases involved more women than men (58% and 42%, respectively).

The highest population-based age-specific rates for women were in the 2 oldest age groups (7 and 12 cases per 100,000 population, respectively) (Figure 11.3).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.3: Age-specific rates of walking and running-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 5,591,883 (RSE 1.7%) people reported engaging in walking and running at least once in the 12 months prior to survey. More females (3,352,563, RSE 1.9%) than males (2,239,320, RSE 3.0%) reported engaging in walking and running in this period.

Male and female participation-based rates for walking and running-related hospitalisation were 17 and 15 per 100,000 participants, respectively. The rate for all persons was 16.

A fracture was sustained in nearly half of the cases (48%). Open wounds and muscle and tendon injuries were also fairly common (13% and 9%, respectively). In around one-third of cases, the body region injured was the knee and lower leg. Potentially serious head injuries were present in 13% of cases.

In 6 in 10 cases, the mechanism of injury was a fall. Overexertion and strenuous or repetitive movements was also a frequently reported mechanism (14%).

People with walking and running-related hospitalisations had a MLOS of 2.9 days. A total of 2,519 days spent by patients were attributable to this cause. Two people died while in hospital after being injured while walking or running.

The injuries in 13% of cases were considered to be life-threatening.

11.4 Cycling

This section includes the following sports:

- Cycling (U66.0)
  - BMX (U66.00)
  - Mountain (U66.01)
  - Road (U66.02)
  - Track and velodrome (U66.03)
  - Other specified cycling (U66.08)
  - Cycling, unspecified (U66.09).

Box 11.1: Cycling injury

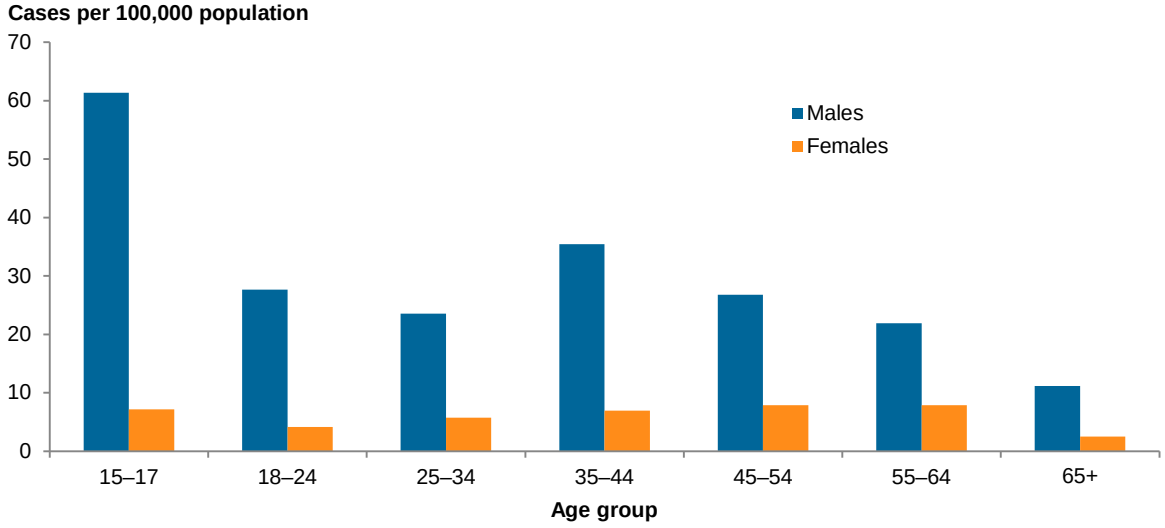
Pedal cycling is both a means of transport and a sporting or recreational pursuit. For several reasons, the available data on hospitalised injury for pedal cyclists don't provide a good guide as to which cases should be regarded as resulting from sports and recreation and which resulted from transport accidents. The cases of injured cyclists reported in the hospital data generally have some information on the circumstances of occurrence (for example, whether the accident occurred in traffic), but mostly do not have information on the specific purpose of the cyclist at the time of injury. This report includes all cases reported with an activity of 'sports-cycling' only, and does not include other cases reported as associated with cycling.

Reports on serious injury suggest that rates of hospitalised injury have increased substantially for pedal cyclists. The rise in rates is particularly marked for males aged 45–64 (Henley & Harrison 2012).

There were 2,917 people admitted to hospital after a cycling injury in 2011–12. As for many other sports, men were more prominent in this group (81%).

The highest population-based age-specific rate was for young men aged from 15–17 (61 cases per 100,000 population) (Figure 11.4).

The highest participation-based rates were for men in the two youngest age groups (550 and 562 per 100,000, respectively) (Table 11.1).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.4: Age-specific rates of cycling-related sports injury hospitalisation, by sex, Australia, 2011–12

Table 11.1: Participation-based[(a)] rates for cycling-related hospitalisation, by sex, Australia, 2011–12

	Age group							
Sex	**15–17**	**18–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65+**	**All ages**
Males	550*	562	225	237	227	221	294	272
Females	n.p.	108*	73	83	119	157	296*	111
Persons	528	367	161	181	187	199	295	214

(a) Per 100,000 participants.

* Caution should be exercised because the denominator has an RSE > 25 and ≤ 50.

Fractures were the most common type of injury, accounting for over half (55%) of cases. The next most common injury types were open wounds (12%) and intracranial injury (9%). The head was the most frequently affected body region (20%). Injuries to the shoulder and upper arm were also common (19%). As would be expected, in most cases the mechanism of injury was coded as 'transport accident'.

People hospitalised for cycling injury had a MLOS of 2.6 days. Cycling-related hospitalisation lead to a total of 7,645 days spent by patients in hospital.

Compared with other sports, there was a relatively high proportion of cases where the injuries were assessed as presenting a high threat to life (25%). Of these HTTL cases, 53% occurred on roads, in traffic and 44% occurred off-road (for example, on a bicycle path or in a park). Five people died in hospital after being admitted for a cycling-related injury.

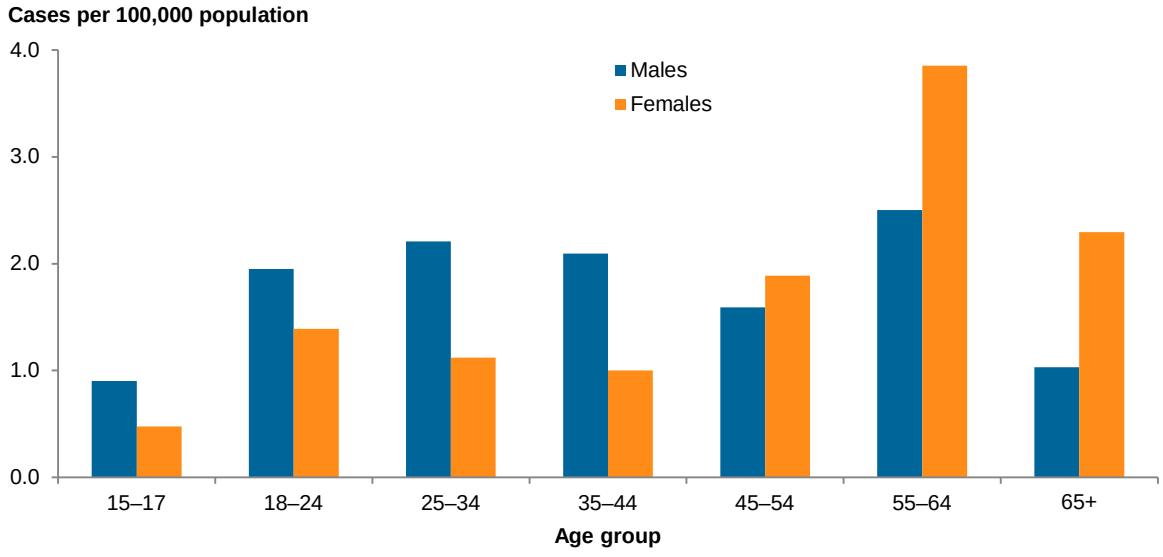
11.5 Adventure and extreme sports

This section includes the following sports:

- Adventure sports (U64)
  - Abseiling and rappelling (U64.0)
  - Hiking (U64.1)
  - Mountaineering (U64.2)
  - Orienteering and rogaining (U64.3)
  - River rafting (U64.4)
  - White-water rafting (U64.5)
  - Rock climbing (U64.6)
  - Bungy jumping (U64.7)
  - Other specified adventure sport (U64.8)
  - Unspecified adventure sport (U64.9).

There were a comparatively small number of cases of sports injury hospitalisation due to adventure and extreme sports (335). These cases were evenly divided between men and women.

Population-based age-specific rates were comparatively low for all age groups. Rates were lowest for the youngest age group and highest from 55–64 years (3 per 100,000 population for men and 4 for women). Caution should be exercised in interpreting these results due to small case numbers particularly in younger age groups (Figure 11.5).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.5: Age-specific rates of adventure and extreme sports-related sports injury hospitalisation, by sex, Australia, 2011–12

Because of poor correspondence between the selected ICD-10-AM codes and the sporting activities reported in the PSPRA survey, valid participation-based rates could not be calculated for these types of sports.

A fracture was the most common type of injury sustained, accounting for two-thirds of all cases. The most commonly affected body region was the knee and lower leg (43%). Over two-thirds of injuries (69%) resulted from a fall.

The MLOS of 3.6 days was slightly higher than that for other sports in this chapter. Adventure and extreme sports resulted in a total of 1,213 days spent by patients.

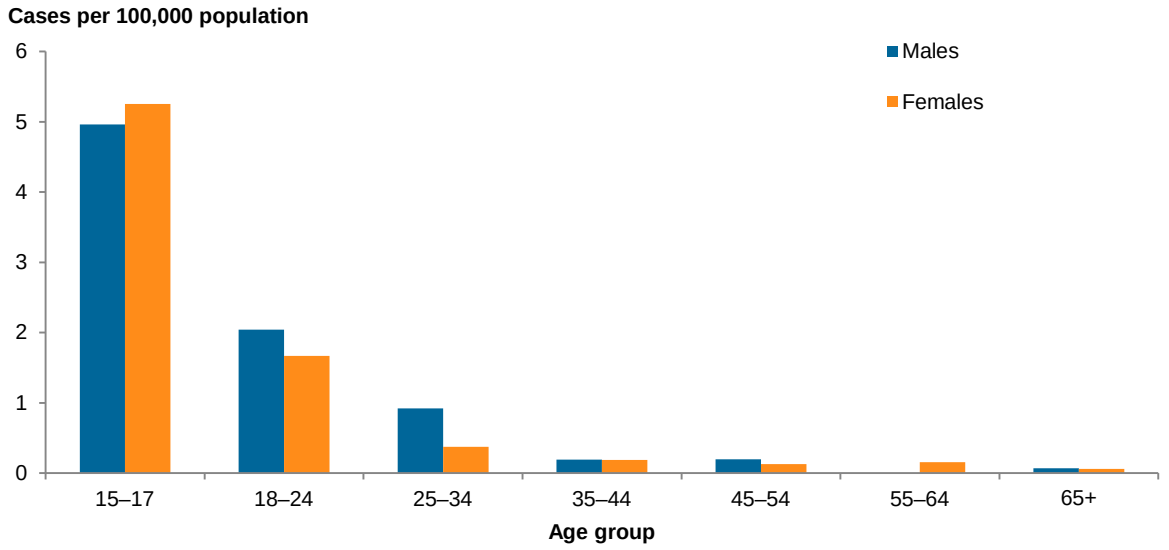
In 13% of cases, the injuries sustained in this type of activity presented a high threat to life. None of those injured died while in hospital.

11.6 Gymnastics and trampolining

This section includes the following sports:

- Gymnastics (U57.0)
  - Balance beam (U57.00)
  - Floor (U57.01)
  - High bar (U57.02)
  - Parallel bars (U57.03)
  - Rings (U57.04)
  - Side horse and pommel horse (U57.05)
  - Trampoline and mini-trampoline (U57.06)
  - Vault (U57.07)
  - Other specified gymnastics (U57.08)
  - Gymnastics, unspecified (U57.09)
  - Other specified acrobatic sport (U57.8)
  - Unspecified acrobatic sport (U57.9).

There was a comparatively small number of hospitalisations resulting from this activity (121). Men were slightly more commonly injured than women (55% versus 45%). The age-specific rates were highest for the 15–17 year group and declined sharply with age. Caution should be exercised in interpreting these results due to small case numbers particularly in older age groups (Figure 11.6).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.6: Age-specific rates of gymnastics and trampolining-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 359,705 (RSE 11.0%) people reported participating in gymnastics or trampolining at least once in the 12 months prior to survey. More males (339,421, RSE 11.1%) than females (20,284, RSE 33.9%) reported participating in gymnastics or trampolining in this period.

The participation-based rate for all persons hospitalised as the result of gymnastics and trampolining-related injury was 242 per 100,000 participants. It should be noted, however, that this rate should be regarded with caution because the denominator used in its calculation had an RSE > 25 and ≤ 50.

The participation-based rate for all persons was calculated using a population estimate of 49,914 (RSE 26.9%) as the denominator.

Almost half (49%) of the injuries sustained were fractures and the body region most commonly affected by injury was the knee and lower leg (32%). A fall was the most frequent mechanism of injury (47%), but overexertion and strenuous or repetitive movements was also common (26%).

In a small proportion (4%) of cases the injuries were judged to present a high threat to life. There were no deaths in hospital after admission for a gymnastics or trampolining-related injury.

The MLOS in hospital was 2.4 days. Gymnastics and trampolining-related injury resulted in a total of 291 days spent by patients in hospital.

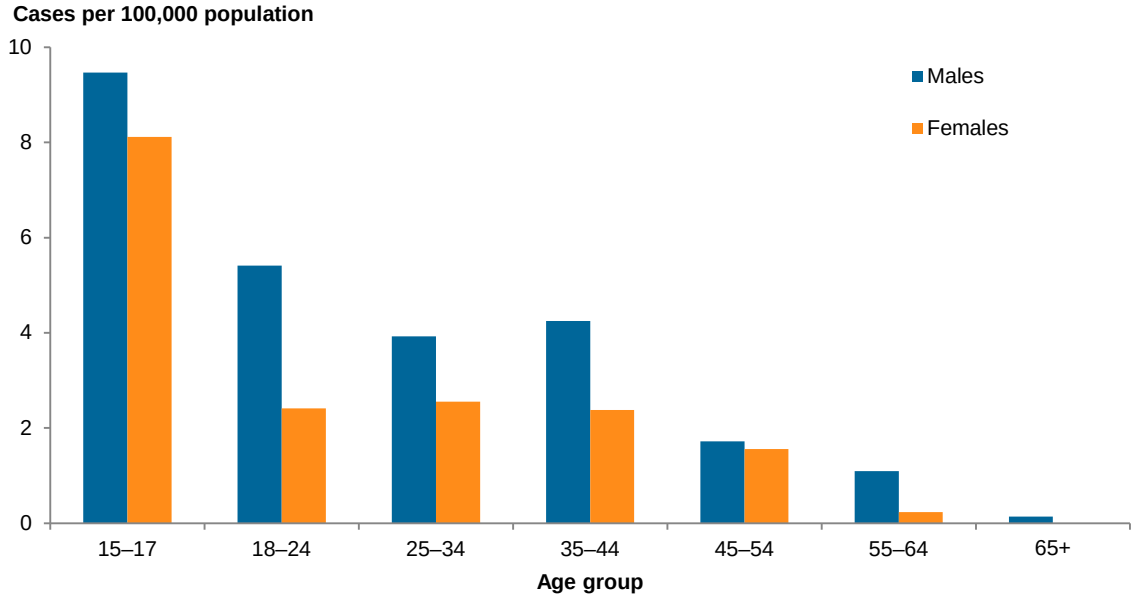
11.7 Hockey

This section includes the following sports:

- Field hockey (U51.22)
- Floor hockey (U51.23)
- Other specified hockey (U51.28)
- Hockey, unspecified (U51.29).

There were 442 hospitalisations resulting from hockey in 2011–12. More males (62%) than females (38%) were injured through engaging in this sport.

Population-based age-specific rates were highest for both men and women in the youngest age group (10 and 8 cases per 100,000 population, respectively). Caution should be exercised in interpreting these results due to small case numbers particularly in older age groups (Figure 11.7).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.7: Age-specific rates of hockey-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 576,873 (RSE 6.0%) people reported playing hockey at least once in the 12 months prior to survey. More males (315,352, RSE 8.3%) than females (261,520, RSE 8.2%) reported playing hockey in this period.

Male and female participation-based rates for hockey-related hospitalisation were 719 and 224 per 100,000 participants, respectively. Caution should be exercised with respect to the rate for men because the denominator used in its calculation had an RSE > 25 and ≤ 50. The rate for all persons was 393.

Participation rates were calculated using the following population estimates as the denominator: all persons: 112,573, RSE 17.0%; males: 38,374, RSE 27.0%; females: 74,199, RSE 18.9%.

Fractures were the most common type of injury sustained in hockey (55%). Three body regions were commonly affected by injury: the wrist and hand (31%), the head (26%) and

the knee and lower leg (23%). The most frequent mechanism by far was contact with sports equipment (50%), which is unusual when compared with other sports described in this report.

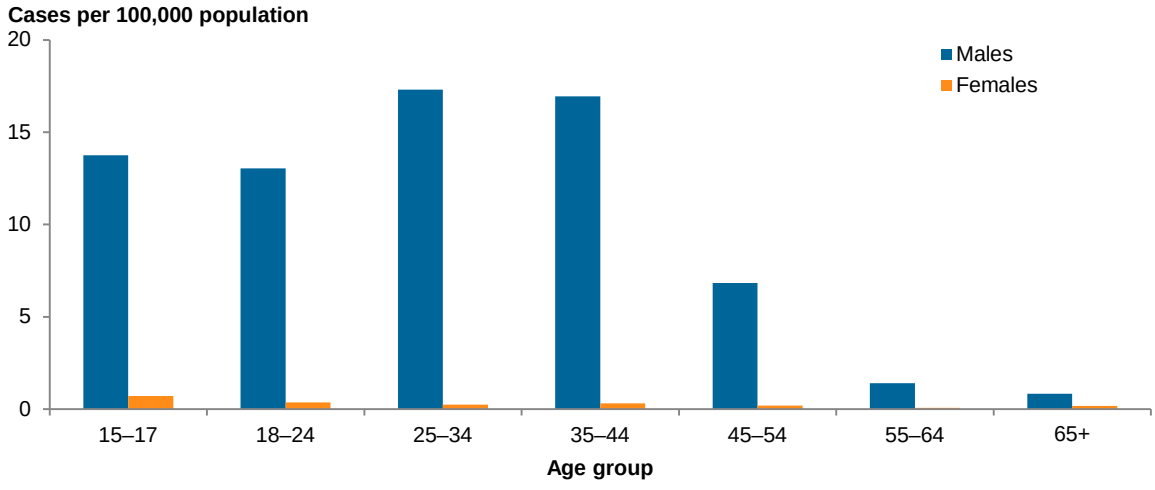
The MLOS for hockey related hospitalisations was 1.3 days. The injuries sustained were considered to be life-threatening in 1% of cases. One person died while in hospital after having a hockey-related injury.

11.8 Cricket

This section includes cases related to cricket (U51.1).

Almost all of the 913 people hospitalised for cricket related injury were men (98%).

Population-based age-specific rates were highest for men aged 25–34 and 35–44 (17 cases per 100,000 population). Age-specific rates for men fell from 45 onwards. Caution should be exercised in interpreting these results due to small case numbers, particularly in older age groups (Figure 11.8).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.8: Age-specific rates of field cricket-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 359,705 (RSE 11.0%) people reported playing cricket at least once in the 12 months prior to survey. More males (339,421, RSE 11.1%) than females (20,284, RSE 33.9%) reported playing cricket in this period.

Participation-based rates for men and women for cricket-related hospitalisation were 262 and 113 per 100,000 participants, respectively. The female rate should be regarded with caution because the denominator used in its calculation had an RSE > 25 and ≤ 50. The participation-based rate for all persons was 254.

Participation rates were calculated using the following population estimates as the denominator: all persons: 359,705, RSE 11.0%; males: 339,421, RSE 11.1%; females: 20,284, RSE 33.9%.

In over half of cases, the injury was a fracture (53%). Muscle and tendon injuries and dislocations were also common (10%). The 3 most frequently injured body regions were

the wrist and hand (38%), the knee and lower leg (22%) and the head (18%). In almost half of the cases (47%), contact with sports equipment was the mechanism of injury.

The MLOS in hospital for cricket-related injury was 1.4 days, which is slightly less than for most other sports. A total of 1,263 days spent by patients were attributed to this type of sporting injury. In 3% of cases the injuries were considered to be life-threatening. None of those admitted died while in hospital.

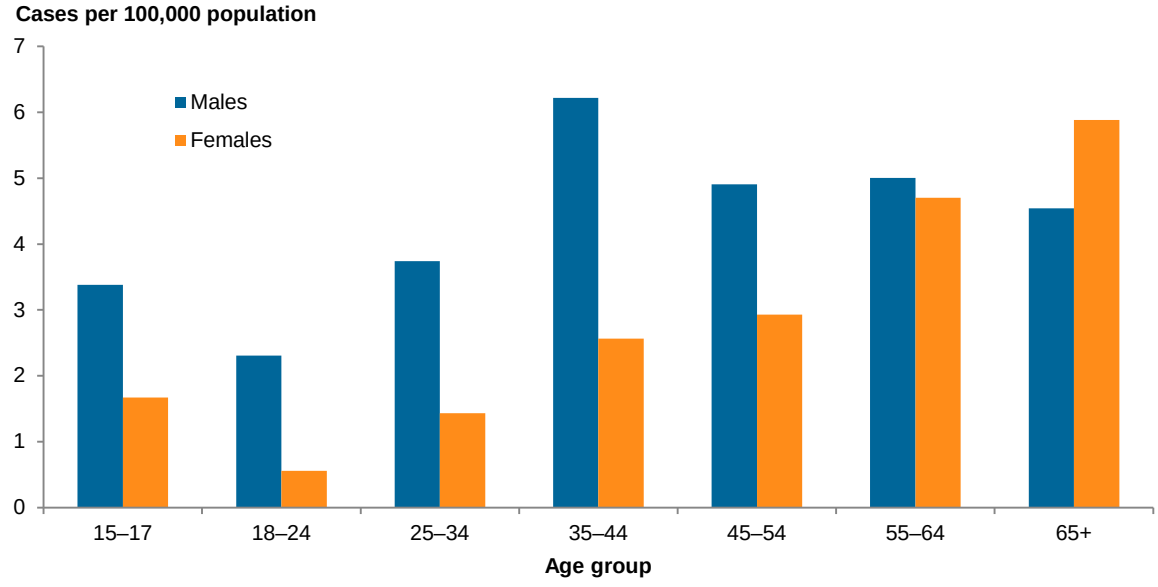
11.9 Racquet sports

This section includes the following sports:

- Badminton (U59.0)
- Racquetball (U59.1)
- Squash (U59.2)
- Table tennis and ping-pong (U59.3)
- Tennis (U59.4)
- Other specified racquet sport (U59.8)
- Unspecified racquet sport (U59.9).

There were 687 hospitalisations in 2011–12 as the result of injuries sustained during the playing of racquet sports. Around 6 in 10 of these involved men (59%).

Population-based age-specific rates for men were highest in the 35–44 age group (6 per 100,000 population) and for women, in the 65+ group (6 per 100,000). Overall, rates tended to be higher for those of middle age and older (Figure 11.9).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.9: Age-specific rates of racquet sports-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 1,073,709 (RSE 5.4%) people reported playing racquet sports at least once in the 12 months prior to survey. More males (654,865, RSE 6.9%) than females (418,844, RSE 7.0%) reported playing racquet sports in this period.

Male and female participation-based rates for racquet sports-related hospitalisation were 62 and 68 per 100,000 participants, respectively. The rate for all persons was 64.

Participation rates were calculated using the following population estimates as the denominator: all persons: 1,073,709, RSE 5.4%; males: 654,865, RSE 6.9%; females: 418,844, RSE 7.0%.

Fractures were the most common type of injury sustained (39%), followed closely by muscle and tendon injuries (31%). The most frequently injured body parts were the knee and lower leg (45%) and the elbow and forearm (23%). Falls and overexertion and strenuous or repetitive movements were the most common mechanisms of injury in racquet sports (41% and 26%, respectively).

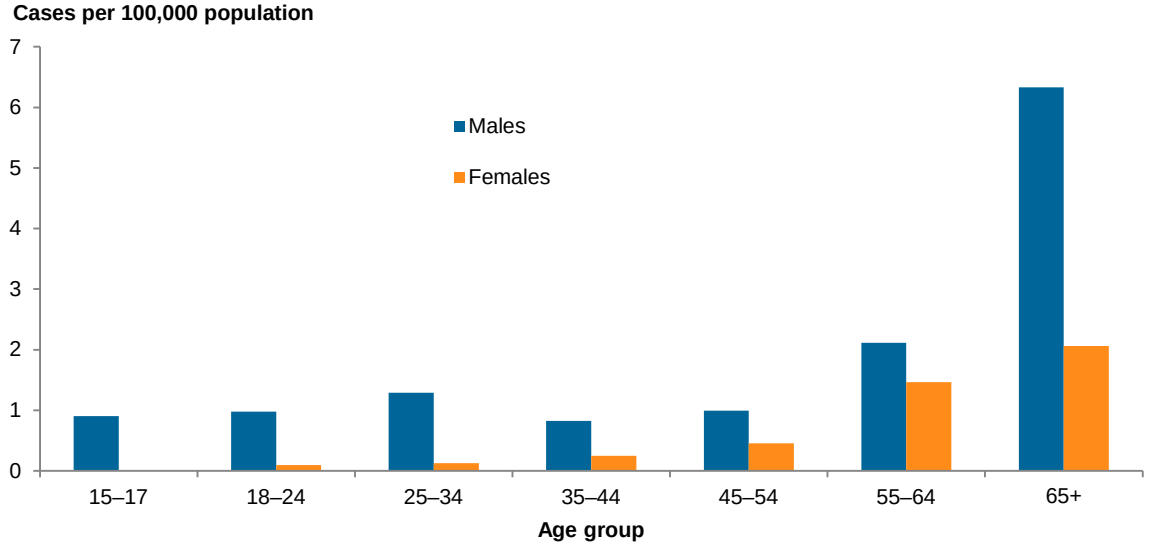
The MLOS for those injured while playing racquet sports was 1.9 days. This sport resulted in a total of 1,307 days spent by patients in hospital. In a small proportion of cases (4%) the injuries were severe enough to present a high threat to life. There were no deaths in hospital after admission for injury sustained in playing racquet sports.

11.10 Golf

This section includes the following sports:

- Golf (U60.5).

There were 251 cases of sports injury hospitalisation associated with playing golf. Nearly three-quarters (73%) of these were men. Population-based age-specific rates tended to be fairly low. The highest rate was for men aged 65 and over (6 cases per 100,000 population). Caution should be exercised in interpreting these results due to small case numbers, particularly in younger age groups (Figure 11.10).



Note: Data underpinning this figure are available in Tables B1.2 and B1.3 in Appendix B.

Figure 11.10: Age-specific rates of golf-related sports injury hospitalisation, by sex, Australia, 2011–12

According to the PSPRA survey, an estimated 1,073,709 (RSE 5.4%) people reported playing golf at least once in the 12 months prior to survey. More males (654,865, RSE 6.9%) than females (418,844, RSE 7.0%) reported playing golf in this period.

The participation-based rates for men and women for golf-related hospitalisation were 25 and 53 per 100,000 participants, respectively. The rate for all persons was 29.

In half of cases, a fracture was the injury sustained. The next most common injury was an open wound (14%). The most commonly affected region of the body was the knee and lower leg (33%), followed by the head (21%). A fall was the most frequently coded mechanism of injury (41%). The next most common mechanisms were contact with sports equipment (17%) and transport accidents (13%). (Note that 'transport accidents' may refer to golf buggies).

The MLOS of 3.9 days is higher than the MLOS for many other types of sport. Golfing injury resulted in 991 days spent by patients in hospital. In 1 in 10 cases, the injuries sustained were considered to be life-threatening. None of those admitted for golfing-related injury died while in hospital.

Appendix A: Data issues

Data sources

The data on hospital separations in this report are from the Australian Institute of Health and Welfare's (AIHW) National Hospital Morbidity Database (NHMD). Comprehensive information on the quality of the data for 2011–12 is available in *Australian hospital statistics 2011–12* (AIHW 2013) and the data quality statement below. Essentially all injury cases admitted to hospitals in Australia are included in the NHMD.

In 2011–12, diagnoses and external cause injury and poisoning were recorded using the seventh edition of the *International statistical classification of diseases and related health problems, 10th revision, Australia modification* (ICD-10-AM) (NCCH 2010).

The data used to calculate participation-based rates are from the confidentialised unit record file for the 2011–12 Participation in sport and physical recreation survey which forms part of the ABS 2011–12 Multipurpose Household Survey. The data were supplied by the ABS.

Definitions

The 'principal diagnosis' is the diagnosis established, after study, to be chiefly responsible for occasioning the patient's episode of admitted patient care (AIHW 2014).

An 'external cause' is defined as the environmental event, circumstance or condition that was the cause of injury or poisoning. Whenever a patient has a principal or additional diagnosis of an injury or poisoning, an external cause code should be recorded.

Place of occurrence codes appear in ICD-10-AM to identify the place(s) where an injury occurred. ICD-10-AM includes a range of codes to indicate the type of activity being engaged in at the time of injury (U50–U73). The block of activity codes U50–U71 encompasses sports. U72 is used to identify *Leisure activity, not elsewhere classified* and U73 is used to identify other types of activities, including working for income in various industries, and unpaid work.

Selecting sports cases

Case data for this report are a subset of records from the National Hospital Morbidity Database (NHMD) compiled by the AIHW. All records in the NHMD that refer to episodes of care, provided by acute care hospitals in Australia, that concluded during the year ending 30 June 2012 and contain an ICD-10-AM 'Activity at the time of injury' code in the range U50–U71 (sport and leisure) anywhere in the record (41,549 cases) were included. 38,326 of these hospital separations were for acute treatment of a sports injury. The balance relate to follow-up care or 'non-injury' separations as explained in Chapter 2 of the report.

Grouped ICD-10-AM sports activity codes used in this report are listed in Table A1.1. The table provides detail on the correspondence between the PSPRA survey and ICD groups analysed in this report. The correspondence between the ICD groups and the survey groups is imperfect. The limited documentation available for both sources, in particular the stated inclusions and exclusions, were used in order to align the types of sport in each category.

Table A1.1: ICD-10-AM codes used to select cases for inclusion in sports chapters

	ICD-10-AM		ABS Survey on participation in sport and physical recreation, 2011–12	
Chapter	**ICD-10-AM codes**	**Comments**	**Survey sports categories**	**Comments**
Hospitalised sports injury overview	Range U50–U71			
Football				
Rugby	U50.01 Rugby Union, U50.02 Rugby League, U50.03 Rugby, unspecified.		Rugby League Rugby Union	
Australian Rules	U50.00 Australian Rules football		Australian Rules football	
Soccer	U50.04 Soccer		Soccer (outdoor) Soccer (indoor)	
Touch football	U50.05 Touch football			No discrete category for touch football in the CURF. Participation-based rates could not be calculated.
Combative sports	U61.0 Aikido U61.3 Martial arts U61.1 Boxing		Martial arts Boxing	Includes aikido, chi kung, judo, jujitsu, karate, kendo, kick-boxing, ninjitsu, taekwondo, tai chi, and martial arts (other).
Netball and basketball				
Netball	U50.3 Netball		Netball (indoor and outdoor)	
Basketball	U50.1 Basketball		Basketball (indoor and outdoor)	
Wheeled motor sports	U65 Wheeled motor sports		Motor sports	Includes car racing, motorbike racing, speedway, drag racing, go-karting and motor sports (other).

(continued)

Table A1.1 (continued): ICD-10-AM codes used to select cases for inclusion in sports chapters

	ICD-10-AM		ABS Survey on participation in sport and physical recreation, 2011–12	
Chapter	**ICD-10-AM codes**	**Comments**	**Survey sports categories**	**Comments**
Ice and snow sports	U55 Ice and snow sports U51.20 Ice hockey	U55 includes skiing, snow mobiling, ice skating, snowboarding, tobogganing, curling , ice hockey, Other specified ice or snow sport and unspecified ice or snow sport.	Ice/snow sports	Includes bobsledding, broomball, ice hockey, ice-skating, snowboarding, skeleton, snow skiing and ice sport (other).
Water sports	U52 Team water sports U53 Boating sports U54.0 Diving U54.2 Scuba diving U54.3 Snorkelling U54.4 Surfing and boogie boarding U54.5 Non-team swimming U54.6 Water skiing U54.7 Wind surfing U54.8 Other specified individual water sport U54.9 Unspecified individual water sport	U54.1 Fishing is not included in this category.	Canoeing/kayaking Sailing Scuba diving/snorkelling Surf sports Swimming/diving Waterskiing/powerboating	Additional types of water sport were reported in the survey but the data for them were not provided in the CURF (ABS 2013). These categories were rowing, surf lifesaving, water polo, water volleyball/canoe polo/rafting/other water sports and wind surfing.
Roller sports	U66.1 In-line skating and rollerblading U66.2 Roller skating U66.3 Skate boarding U66.4 Scooter riding U66.8 Other specified wheeled non-motored sport U66.9 Unspecified wheeled nonmotored sport		Skateboarding/inline hockey/roller sports	Includes inline hockey, rollerblading, rollerskating, skateboarding and roller sport (other).

(continued)

Table A1.1 (continued): ICD-10-AM codes used to select cases for inclusion in sports chapters

	ICD-10-AM		ABS Survey on participation in sport and physical recreation, 2011–12	
Chapter	**ICD-10-AM codes**	**Comments**	**Survey sports categories**	**Comments**
Equestrian activities	U63 Equestrian activities.	Includes dressage; show jumping; steeplechase and cross-country eventing; endurance riding; polo and polocrosse; horse racing; hurdle racing; rodeo; trail or general horseback riding; trotting and harness. 'Equestrian activities' also includes a range of other less-common activities such as buggy racing and tent pegging.	Horse riding/equestrian activities/polo.	Includes dressage, polo cross and show jumping. Excludes rodeo and horseracing.
Other sports				
Fishing	U54.1 Fishing	Includes rock fishing; other specified fishing such as ice fishing and spear fishing; and unspecified fishing.	Fishing	Includes angling.
Dancing	U58.0 Dancing		Dancing/ballet	Includes ballroom dancing, belly dancing, boot scooting, calisthenics, sport, folk dancing, Latin dancing, line dancing, salsa, swing dancing and dancing (other).
Walking and running	U56.1 Jogging and running U56.2 Walking	Excludes walking and running activities as part of 'U56.3 Track and field'.	Jogging/running Walking for exercise	Includes running (for exercise). Excludes bush walking.
Cycling	U66.0 Cycling	Includes BMX; mountain; road; track and velodrome; other specified cycling; and cycling, unspecified.	Cycling/BMXing	Includes bike riding and mountain bike riding. Excludes exercise bike cycling and spin cycling. Survey data and documentation do not state if track and velodrome are included.
Adventure and extreme sports	U64 Adventure sports	Includes abseiling and rappelling; hiking (bush walking, tramping); mountaineering; orienteering and rogaining; river rafting; white-water rafting; rock climbing; bungy jumping; other specified adventure sport; and unspecified adventure sport.	Bush walking Cross country running Orienteering and rogaining Rock climbing/abseiling/caving	Orienteering and rogaining not included in the CURF.

(continued)

Table A1.1 (continued): ICD-10-AM codes used to select cases for inclusion in sports chapters

	ICD-10-AM		ABS Survey on participation in sport and physical recreation, 2011–12	
Chapter	**ICD-10-AM codes**	**Comments**	**Survey sports categories**	**Comments**
Gymnastics and trampolining	U57 Gymnastics	Includes balance beam; floor gymnastics; high bar; parallel bars; rings; side horse and pommel horse; trampoline and mini-trampoline; vault; other specified gymnastics; gymnastics, unspecified; other specified acrobatic sport; and unspecified acrobatic sport.	Gymnastics	Includes acrobatics, trampolining and cheerleading.
Hockey	U51.22 Field hockey U51.23 Floor hockey U51.28 Other specified hockey U51.29 Hockey, unspecified	'U51.20 Ice hockey' and 'U51.21 Street and ball hockey' (outdoor hockey played on inline or roller skates) are not included.	Hockey (indoor and outdoor)	Excludes inline hockey.
Cricket	U51.1 Cricket		Cricket (indoor) Cricket (outdoor)	
Racquet sports	U59 Racquet sports	Includes badminton; racquetball; squash; table tennis and ping pong; tennis; other specified racquet sport; and unspecified racquet sport.	Badminton Table tennis Tennis (indoor and outdoor) Squash/racquetball	
Golf	U60.5 Golf		Golf	Excludes mini-golf.

Estimating cases

Each record in the NHMD refers to a single episode of care in a hospital. Some injuries result in more than 1 episode in hospital and, hence, more than 1 NHMD record. This can occur in 2 main ways:

- a person is admitted to one hospital, then transferred to another or has a change in care type (for example, acute to rehabilitation) within the same hospital
- a person has an episode of care in hospital, is discharged home (or to another place of residence) and is then admitted for further treatment for the same injury, to the same hospital or another one.

The NHMD does not include information designed to enable the set of records belonging to an injury case to be recognised as such. Hence, there is potential for some injury cases to be counted more than once, when a single injury case results in 2 or more NHMD records being generated, all of which satisfy the selection criteria being used.

Information in the NHMD enables this problem to be reduced, though not eliminated. The approach used for this report makes use of the 'mode of admission' variable, which indicates whether the current episode began with inward transfer from another acute care hospital. Episodes of this type (inward transfers) are likely to have been preceded by another episode that also met the case selection criteria for injury cases, so are omitted from our estimated case counts.

This procedure should largely correct for over-estimation of cases due to transfers, but will not correct for over-estimation due to readmissions.

Length of stay

'Mean length of stay' is calculated by dividing the total number of patient days for injury separations by the estimated number of injury cases.

Note that length of stay as presented in this report does not include some patient days potentially attributable to injury. In particular, it does not include days for most aspects of injury rehabilitation, which were difficult to assign correctly without information enabling the identification of all admitted episodes associated with an injury case.

Rates

All age-specific population-based rates in this report were calculated using, as the denominator, the final estimate of the estimated resident population (ERP) as at 31 December 2011.

Age-standardisation

Direct standardisation was used to age-standardise rates using the Australian population in 2001 as the standard (ABS 2003).

ABS Participation in Sport and Physical Recreation survey

Participation-based rates were calculated using denominator data derived from the PSPRA (ABS 2013). Data from the survey were analysed using the ABS Remote Data Analysis Laboratory (RADL).

Data for the PSPRA 2011–12 were collected as part of the Australian Bureau of Statistics' 2011–12 Multipurpose Household Survey (MPHS). The MPHS is run each financial year from July to June throughout Australia as a supplement to the ABS monthly Labour Force Survey (LFS). For the 2011–12 PSPRA, 1 person was randomly selected in 17,036 private dwellings. Of these, 80% fully responded to the questions on participation in sport and physical recreation. Data were collected using computer-assisted telephone interviewing (CATI).

Subjects of the PSPRA included persons 15 years and over, hence, all the rates of hospitalisation per 100,000 participants shown in the graphs and tables are for persons 15 years and over.

A data quality declaration can be found under 'Explanatory notes' at the ABS website: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4177.0>.

Confidentiality and reliability of data

The AIHW operates under a strict privacy regime which has its basis in Section 29 of the *Australian Institute of Health and Welfare Act 1987* (AIHW Act) and the *Privacy Act 1988* (Privacy Act).

Section 29 of the AIHW Act requires that confidentiality of data relating to persons (living and deceased) and of organisations be maintained. The Privacy Act governs confidentiality of information about living individuals.

As well as the protection offered by AIHW Act and the Privacy Act, personal information held by the AIHW is covered by a range of other Commonwealth, state and territory legislation.

The AIHW is committed to reporting that maximises the value of information released for users, while being statistically reliable and meeting legislative requirements described above. To ensure the confidentiality of its data, the AIHW has a range of policies, protocols and processes in place—the AIHW policy on reporting to manage confidentiality and reliability (AIHW Confidentiality Policy) is one important example, as it deals with how data should be reported to ensure confidentiality.

AIHW Confidentiality Policy: a summary

The AIHW Confidentiality Policy contains 7 guidelines to assist those working with data to apply it to their outputs.

Guideline 1

It is AIHW policy that if the data being considered have already been released publicly at the granularity AIHW intends to release, further confidentialisation is not required.

Guideline 2

Cells in tables where the value of the cell is the same as a row/column/wafer total (that is, all other cells in the row, column or wafer are zero) generally lead to disclosure of an additional attribute. It is AIHW policy that these cells need to be confidentialised unless the attribute that would be disclosed is deemed to be non-sensitive in the context of the data being published.

Guideline 3

It is AIHW policy that data on organisations must be confidentialised if 1 organisation contributes more than 85% of the total, or 2 organisations more than 90%, unless the attribute that would be disclosed is deemed to be non-sensitive in the context of the data being published or the organisation(s) have given consent to release.

Guideline 4

It is AIHW policy that guidelines 2 and 3 need to be applied so as to ensure that attribute confidentiality is maintained within tables and across tables within the same release. That is, when assessing whether a cell needs to be confidentialised, consideration needs to be given to whether there are other cells in that table, or other tables in the release, which may require consequential confidentialisation.

Guideline 5

Rates, averages and other statistics based on denominators of less than 100 are usually not reliable and it is AIHW policy that they should generally not be reported.

Guideline 6

It is AIHW policy that if data suppliers or clients require additional suppression rules be applied to an AIHW release in order to manage confidentiality or reliability, then these should be applied. Where such additional rules are applied they should be described in the release, and it should be noted that this approach is required by the data supplier.

Guideline 7

It is AIHW policy that, if a client wishes to be provided with data output (for example, tables) at a more detailed level than any of the above guidelines would allow, then they may apply to be provided output against which some or all of the above guidelines are not applied. Provision of this more detailed output would be subject to the client signing a confidentiality undertaking and agreeing that any publication of information (including in online data cubes) based on output released to them will comply with this policy.

Errors, inconsistencies and uncertainties

Due to rounding, the sum of the percentages in tables may not equal 100 per cent.

NHMD data are generally abstracted from records, entered and coded in hospitals, passed to state and territory health departments, then to the AIHW before being provided to the National Injury Surveillance Unit. Processing occurs at each of these steps. Errors and inconsistencies can arise due to the large number of people and processes involved in providing the data. Some variations occur in reporting and coding although coding standards, national minimum data sets and other mechanisms have reduced this.

Data Quality Statement: National Hospital Morbidity Database

This section provides a summary of key issues relevant to interpretation of the National Hospital Morbidity Database (NHMD) for 2011–12. The full AIHW Data Quality Statement for the NHMD is accessible at: <http://meteor.aihw.gov.au/content/index.phtml/itemId/529483>.

Summary of key issues

- The NHMD is a comprehensive dataset that has records for all separations of admitted patients from essentially all public and private hospitals in Australia.
- A record is included for each separation, not for each patient, so patients who separated more than once in the year have more than 1 record in the NHMD.
- For 2011–12, almost all public hospitals provided data for the NHMD. (The exception was a mothercraft hospital in the ACT.) The great majority of private hospitals also provided data, the exceptions being the private day hospital facilities in the ACT and the single private free-standing day hospital facility in the NT.
- There is apparent variation between states and territories in the use of statistical discharges and associated assignment of care types. For example, for public hospitals, the proportion of separations ending with a statistical discharge varied from 0.9% to 3.9% across states and territories.
- Variations in admission practices and policies lead to variation among providers in the number of admissions for some conditions.
- Caution should be used in comparing diagnosis, procedure and external-cause data over time, as the classifications and coding standards for those data can change over time.

Appendix B: Additional tables

Table B1.1: Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, persons, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total[(a)]	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
All sports injury[(a)]	5,770	669.2	9,147	414.6	8,565	264.8	5,810	183.0	3,443	113.1	1,849	71.8	1,653	52.4	36,237	205.6
Football																
Rugby (all codes)	732	84.9	1,018	46.1	620	19.2	203	6.4	43	1.4	3	0.0	2	0.0	2,621	15.0
Australian Rules	807	93.6	1,231	55.8	870	26.9	199	6.3	65	2.1	12	0.5	2	0.0	3,186	18.2
Soccer	496	57.5	866	39.3	841	26.0	514	16.2	199	6.5	35	1.4	11	0.3	2,962	17.0
Touch football	76	8.8	166	7.5	219	6.8	123	3.9	47	1.5	12	0.5	1	0.0	644	3.7
Combative sports	58	6.7	150	6.8	217	6.7	130	4.1	39	1.3	8	0.3	0	0	602	3.5
Netball	130	15.1	288	13.1	438	13.5	297	9.4	95	3.1	11	0.4	3	0.1	1,262	7.3
Basketball	272	31.5	355	16.1	412	12.7	200	6.3	61	2.0	16	0.6	6	0.2	1,322	7.6
Wheeled motor sports	465	53.9	818	37.1	590	18.2	463	14.6	299	9.8	81	3.1	21	0.7	2,737	15.6
Ice and snow sports	102	11.8	260	11.8	247	7.6	206	6.5	183	6.0	93	3.6	23	0.7	1,114	6.3
Water sports	183	21.2	493	22.3	610	18.9	496	15.6	406	13.3	204	7.9	110	3.5	2,502	14.1
Roller sports	502	58.2	490	22.2	291	9.0	236	7.4	80	2.6	26	1.0	7	0.2	1,632	9.4
Equestrian activities	203	23.5	294	13.3	263	8.1	311	9.8	278	9.1	161	6.2	58	1.8	1,568	8.8
Walking and running	38	4.4	58	2.6	100	3.1	128	4.0	122	4.0	154	6.0	278	8.8	878	4.7
Cycling	302	35.0	357	16.2	476	14.7	670	21.1	525	17.2	382	14.8	205	6.5	2,917	16.3
Fishing	16	1.9	64	2.9	76	2.3	132	4.2	88	2.9	73	2.8	76	2.4	525	2.9
Adventure and extreme sports	6	0.7	37	1.7	54	1.7	49	1.5	53	1.7	82	3.2	54	1.7	335	1.8
Dancing	38	4.4	111	5.0	98	3.0	81	2.6	50	1.6	52	2.0	87	2.8	517	2.8

(continued)

Table B1.1 (continued): Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, persons, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total*	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Hockey	76	8.8	87	3.9	105	3.2	105	3.3	50	1.6	17	0.7	2	0.1	442	2.5
Gymnastics and trampolining	44	5.1	41	1.9	21	0.6	6	0.2	5	0.1	2	0.1	2	0.1	121	0.7
Golf	4	0.5	12	0.5	23	0.7	17	0.5	22	0.7	46	1.8	127	4.0	251	1.3
Cricket	64	7.4	151	6.8	286	8.8	272	8.6	106	3.5	19	0.7	15	0.5	913	5.3
Racquet sports	22	2.6	32	1.5	84	2.6	139	4.4	119	3.9	125	4.9	166	5.3	687	3.7

(a) 'All sports injury' includes sports other than those that are listed in Table B1.1.

Table B1.2: Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, males, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total[(a)]	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
All sports injury	4,803	1,083.1	7,612	675.1	6,860	420.9	4,306	273.2	2,386	158.2	1,140	89.2	828	57.0	27,935	258.6
Football																
Rugby (all codes)	707	159.4	981	87.0	584	35.8	198	12.6	41	2.7	3	0.2	1	0.1	2,515	20.0
Australian Rules	779	175.7	1,204	106.8	836	51.3	194	12.3	62	4.1	12	0.9	2	0.1	3,089	25.5
Soccer	399	90.0	729	64.7	764	46.9	472	29.9	176	11.7	27	2.1	9	0.6	2,576	24.6
Touch football	55	12.4	114	10.1	158	9.7	86	5.5	36	2.4	10	0.8	1	0.1	460	4.6
Combative sports	53	12.0	135	12.0	191	11.7	102	6.5	31	2.1	6	0.5	0	0	518	5.3
Netball	6	1.4	44	3.9	57	3.5	27	1.7	11	0.7	2	0.2	2	0.1	148	1.6
Basketball	214	48.3	278	24.7	349	21.4	152	9.6	40	2.7	13	1.0	4	0.3	1,050	9.4
Wheeled motor sports	425	95.8	771	68.4	549	33.7	441	28.0	284	18.8	79	6.2	20	1.4	2,569	24.0
Ice and snow sports	65	14.7	166	14.7	152	9.3	106	6.7	88	5.8	45	3.5	13	0.9	635	7.1
Water sports	130	29.3	387	34.3	495	30.4	406	25.8	317	21.0	157	12.3	74	5.1	1,966	22.1
Roller sports	454	102.4	401	35.6	200	12.3	140	8.9	57	3.8	12	0.9	3	0.2	1,267	14.4
Equestrian activities	50	11.3	87	7.7	103	6.3	78	4.9	100	6.6	64	5.0	34	2.3	516	5.8
Walking and running	24	5.4	26	2.3	59	3.6	67	4.3	54	3.6	59	4.6	83	5.7	372	4.1
Cycling	272	61.3	312	27.7	384	23.6	559	35.5	404	26.8	280	21.9	162	11.1	2,373	26.7
Fishing	16	3.6	59	5.2	73	4.5	120	7.6	79	5.2	64	5.0	73	5.0	484	5.4
Adventure and extreme sports	4	0.9	22	2.0	36	2.2	33	2.1	24	1.6	32	2.5	15	1.0	166	1.8
Dancing	13	2.9	45	4.0	37	2.3	24	1.5	13	0.9	13	1.0	14	1.0	159	1.8
Hockey	42	9.5	61	5.4	64	3.9	67	4.3	26	1.7	14	1.1	2	0.1	276	3.1

(continued)

Table B1.2 (continued): Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, males, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total*	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Gymnastics and trampolining	22	5.0	23	2.0	15	0.9	3	0.2	3	0.2	0	0	1	0.1	67	0.8
Golf	4	0.9	11	1.0	21	1.3	13	0.8	15	1.0	27	2.1	92	6.3	183	2.0
Cricket	61	13.8	147	13.0	282	17.3	267	16.9	103	6.8	18	1.4	12	0.8	890	10.2
Racquet sports	15	3.4	26	2.3	61	3.7	98	6.2	74	4.9	64	5.0	66	4.5	404	4.5

(a) Age-standardised rate.

Table B1.3: Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, females, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total[(a)]	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
All sports injury	967	230.9	1,535	142.3	1,705	106.2	1,504	94.1	1,057	68.8	709	54.6	825	48.5	8,302	93.1
Football																
Rugby (all codes)	25	6.0	37	3.4	36	2.2	5	0.3	2	0.1	0	0	1	0.1	106	1.2
Australian Rules	28	6.7	27	2.5	34	2.1	5	0.3	3	0.2	0	0	0	0	97	1.1
Soccer	97	23.2	137	12.7	77	4.8	42	2.6	23	1.5	8	0.6	2	0.1	386	4.5
Touch football	21	5.0	52	4.8	61	3.8	37	2.3	11	0.7	2	0.2	0	0	184	2.1
Combative sports	5	1.2	15	1.4	26	1.6	28	1.8	8	0.5	2	0.2	0	0	84	1.0
Netball	124	29.6	244	22.6	381	23.7	270	16.9	84	5.5	9	0.7	2	0.1	1,114	13.0
Basketball	58	13.8	77	7.1	63	3.9	48	3.0	21	1.4	3	0.2	2	0.1	272	3.2
Wheeled motor sports	40	9.6	47	4.4	41	2.6	22	1.4	15	1.0	2	0.2	1	0.1	168	2.0
Ice and snow sports	37	8.8	94	8.7	95	5.9	100	6.3	95	6.2	48	3.7	10	0.6	479	5.4
Water sports	53	12.7	106	9.8	115	7.2	90	5.6	89	5.8	47	3.6	36	2.1	536	6.0
Roller sports	48	11.5	89	8.3	91	5.7	96	6.0	23	1.5	14	1.1	4	0.2	365	4.2
Equestrian activities	153	36.5	207	19.2	160	10.0	233	14.6	178	11.6	97	7.5	24	1.4	1,052	12.0
Walking and running	14	3.3	32	3.0	41	2.6	61	3.8	68	4.4	95	7.3	195	11.5	506	5.2
Cycling	30	7.2	45	4.2	92	5.7	111	6.9	121	7.9	102	7.9	43	2.5	544	6.0
Fishing	0	0	5	0.5	3	0.2	12	0.8	9	0.6	9	0.7	3	0.2	41	0.4
Adventure and extreme sports	2	0.5	15	1.4	18	1.1	16	1.0	29	1.9	50	3.9	39	2.3	169	1.7
Dancing	25	6.0	66	6.1	61	3.8	57	3.6	37	2.4	39	3.0	73	4.3	358	3.9
Hockey	34	8.1	26	2.4	41	2.6	38	2.4	24	1.6	3	0.2	0	0	166	1.9

(continued)

Table B1.3 (continued): Case numbers and age-specific rates for sports injury hospitalisation, by sporting group, females, Australia, 2011–12

	15–17		18–24		25–34		35–44		45–54		55–64		65+		Total*	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Gymnastics and trampolining	22	5.3	18	1.7	6	0.4	3	0.2	2	0.1	2	0.2	1	0.1	54	0.6
Golf	0	0	1	0.1	2	0.1	4	0.3	7	0.5	19	1.5	35	2.1	68	0.7
Cricket	3	0.7	4	0.4	4	0.2	5	0.3	3	0.2	1	0.1	3	0.2	23	0.3
Racquet sports	7	1.7	6	0.6	23	1.4	41	2.6	45	2.9	61	4.7	100	5.9	283	2.9

(a) Age-standardised rate.

Table B1.4: Age-standardised rates of sports injury hospitalisation for remoteness of usual residence, by type of sport, Australia, 2011–12

	Age-standardised rates				
Sport	**Major cities**	**Inner regional**	**Outer regional**	**Remote**	**Very remote**
All sports injury	185.6	260.1	231.5	272.1	173.6
Rugby	13.4	16.1	23.4	26.2	16.0
Australian Rules	13.9	29.7	31.3	30.1	23.8
Soccer	18.4	14.8	8.0	6.0	5.9
Touch football	3.3	5.2	4.1	5.8	2.1
Combative sports	3.6	3.6	2.6	2.6	1.1
Netball	6.1	11.8	8.3	15.0	2.2
Basketball	8.1	6.4	5.8	7.0	1.6
Wheeled motor sports	11.2	26.6	28.1	29.7	21.9
Ice and snow sports	7.0	5.0	3.3	4.3	0.5
Water sports	12.3	16.7	14.9	18.4	15.3
Roller sports	9.4	11.0	5.9	4.5	3.1
Equestrian activities	4.2	20.7	19.0	24.2	19.3

Table B1.5: Five most common injuries, affected body regions and mechanisms of injury for all sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	17,871	49
Soft-tissue injury	7,288	20
Dislocation	2,414	7
Open wound	1,856	5
Intracranial injury	1,761	5
Other	5,047	14
Total	**36,237**	**100**
Body region		
Knee & lower leg	10,001	28
Head	5,307	15
Wrist & hand	5,015	14
Elbow & forearm	4,082	11
Shoulder & upper arm	3,887	11
Other and unspecified	7,945	22
Total	**36,237**	**100**
Mechanism of injury		
Fall	10,007	28
Transport accidents	7,541	21
Contact with another person	4,180	12
Overexertion	3,472	10
Contact with sports equipment	2,011	6
Other and unspecified	9,026	25
Total	**36,237**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.6: Five most common injuries, affected body regions and mechanisms of injury for Rugby, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	1,411	54
Soft-tissue injury	456	17
Dislocation	216	8
Intracranial injury	154	6
Open wound	64	2
Other	320	12
Total	**2,621**	**100**
Body region		
Knee & lower leg	649	25
Head	611	23
Wrist & hand	411	16
Shoulder & upper arm	284	11
Elbow & forearm	196	8
Other and unspecified	470	18
Total	**2,621**	**100**
Mechanism of injury		
Fall	1,090	42
Contact with another person	709	27
Overexertion	163	6
Contact with sports equipment	40	2
Struck by or against object	7	0
Other and unspecified	612	23
Total	**2,621**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.7: Five most common injuries, affected body regions and mechanisms of injury for Australian Rules football, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	1,581	50
Soft-tissue injury	463	15
Dislocation	352	11
Intracranial injury	264	8
Internal organ or vessel of trunk	125	4
Other	401	13
Total	**3,186**	**100**
Body region		
Head	735	23
Knee & lower leg	690	22
Wrist & hand	651	20
Shoulder & upper arm	332	10
Elbow & forearm	284	9
Other and unspecified	494	16
Total	**3,186**	**100**
Mechanism of injury		
Contact with another person	1,166	37
Fall	878	28
Overexertion	211	7
Contact with sports equipment	206	7
Struck by or against object	20	1
Other and unspecified	705	22
Total	**3,186**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.8: Five most common injuries, affected body regions and mechanisms of injury for soccer, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	1,496	51
Soft-tissue injury	897	30
Dislocation	183	6
Intracranial injury	105	4
Superficial injury	55	2
Other	226	8
Total	**2,962**	**100**
Body region		
Knee & lower leg	1438	49
Head	353	12
Elbow & forearm	316	11
Wrist & hand	293	10
Shoulder & upper arm	199	7
Other and unspecified	363	12
Total	**2,962**	**100**
Mechanism of injury		
Fall	880	30
Contact with another person	685	23
Overexertion	414	14
Contact with sports equipment	217	7
Struck by or against object	24	1
Other and unspecified	742	25
Total	**2,962**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.9: Five most common injuries, affected body regions and mechanisms of injury for Touch football, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	290	45
Soft-tissue injury	244	38
Dislocation	56	9
Intracranial injury	12	2
Open wound	9	1
Other	33	5
Total	**644**	**100**
Body region		
Knee & lower leg	277	43
Wrist & hand	134	21
Shoulder & upper arm	80	12
Elbow & forearm	65	10
Head	38	6
Other and unspecified	50	8
Total	**644**	**100**
Mechanism of injury		
Fall	169	26
Overexertion	122	19
Contact with another person	102	16
Contact with sports equipment	13	2
Struck by or against object	4	1
Other and unspecified	234	36
Total	**644**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.10: Five most common injuries, affected body regions and mechanisms of injury for Combative sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	295	49
Soft-tissue injury	134	22
Dislocation	53	9
Superficial injury	19	3
Intracranial injury	18	3
Other	83	14
Total	**602**	**100**
Body region		
Wrist & hand	148	25
Head	124	21
Knee & lower leg	123	20
Elbow & forearm	50	8
Shoulder & upper arm	49	8
Other and unspecified	108	18
Total	**602**	**100**
Mechanism of injury		
Contact with another person	246	41
Overexertion	89	15
Fall	48	8
Contact with sports equipment	40	7
Struck by or against object	23	4
Other and unspecified	156	26
Total	**602**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.11: Five most common injuries, affected body regions and mechanisms of injury for netball, Australia, 2011–12

	Number of cases	%
Nature of injury		
Soft-tissue injury	717	57
Fracture	366	29
Dislocation	83	7
Intracranial injury	21	2
Superficial injury	12	1
Other	63	5
Total	**1,262**	**100**
Body region		
Knee & lower leg	757	60
Wrist & hand	167	13
Elbow & forearm	118	9
Head	72	6
Ankle & foot	65	5
Other and unspecified	83	7
Total	**1,262**	**100**
Mechanism of injury		
Overexertion	322	26
Fall	270	21
Contact with another person	87	7
Contact with sports equipment	75	6
Struck by or against object	9	1
Other and unspecified	499	40
Total	**1,262**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.12: Five most common injuries, affected body regions and mechanisms of injury for basketball, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	571	43
Soft-tissue injury	478	36
Dislocation	133	10
Open wound	23	2
Intracranial injury	23	2
Other	94	7
Total	**1,322**	**100**
Body region		
Knee & lower leg	494	37
Wrist & hand	296	22
Elbow & forearm	147	11
Head	142	11
Ankle & foot	71	5
Other and unspecified	172	13
Total	**1,322**	**100**
Mechanism of injury		
Fall	323	24
Overexertion	223	17
Contact with another person	199	15
Contact with sports equipment	124	9
Struck by or against object	16	1
Other and unspecified	437	33
Total	**1,322**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.13: Five most common injuries, affected body regions and mechanisms of injury for wheeled motor sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	1,608	59
Intracranial injury	189	7
Open wound	161	6
Internal organ or vessel of trunk	149	5
Soft-tissue injury	148	5
Other	482	18
Total	**2,737**	**100**
Body region		
Trunk	518	19
Knee & lower leg	515	19
Shoulder & upper arm	419	15
Elbow & forearm	351	13
Head	296	11
Other and unspecified	638	23
Total	**2,737**	**100**
Mechanism of injury		
Transport accidents	2,613	96
Fall	21	1
Struck by or against object	20	1
Overexertion	12	0
Caught/crushed between objects	9	0
Other and unspecified	62	2
Total	**2,737**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.14: Five most common injuries, affected body regions and mechanisms of injury for ice and snow sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	645	58
Soft-tissue injury	278	25
Intracranial injury	48	4
Dislocation	35	3
Internal organ or vessel of trunk	20	2
Other	88	8
Total	**1,114**	**100**
Body region		
Knee & lower leg	372	33
Elbow & forearm	217	20
Shoulder & upper arm	158	14
Trunk	107	10
Wrist & hand	87	8
Other and unspecified	173	16
Total	**1,114**	**100**
Mechanism of injury		
Fall	717	64
Overexertion	60	5
Other mechanisms	28	3
Struck by or against object	20	2
Contact with another person	20	2
Other and unspecified	269	24
Total	**1,114**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.15: Five most common injuries, affected body regions and mechanisms of injury for water sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	806	32
Soft-tissue injury	270	11
Open wound	239	10
Dislocation	198	8
Superficial injury	73	3
Other	916	37
Total	**2,502**	**100**
Body region		
Knee & lower leg	364	15
Head	324	13
Neck	290	12
Shoulder & upper arm	275	11
Trunk	253	10
Other and unspecified	996	40
Total	**2,502**	**100**
Mechanism of injury		
Fall	562	23
Transport accidents	419	17
Exposure to high and low air pressure	221	9
Overexertion	186	7
Contact with sports equipment	164	7
Other and unspecified	950	38
Total	**2,502**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Table B1.16: Five most common injuries, affected body regions and mechanisms of injury for roller sports, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	1,150	71
Intracranial injury	140	9
Soft-tissue injury	79	5
Open wound	79	5
Dislocation	68	4
Other	116	7
Total	**1,632**	**100**
Body region		
Elbow & forearm	525	32
Knee & lower leg	412	25
Head	265	16
Wrist & hand	143	9
Shoulder & upper arm	117	7
Other and unspecified	170	10
Total	**1,632**	**100**
Mechanism of injury		
Transport accidents	43	3
Contact with sports equipment	1	0
Fall	1,467	90
Struck by or against object	7	0
Contact with sharp object	5	0
Other and unspecified	109	7
Total	**1,632**	**100**

Table B1.17: Five most common injuries, affected body regions and mechanisms of injury for equestrian activities, Australia, 2011–12

	Number of cases	%
Nature of injury		
Fracture	864	55
Intracranial injury	160	10
Superficial injury	89	6
Soft-tissue injury	67	4
Internal organ or vessel of trunk	63	4
Other	325	21
Total	**1,568**	**100**
Body region		
Trunk	480	31
Head	264	17
Knee & lower leg	225	14
Shoulder & upper arm	180	12
Elbow & forearm	161	10
Other and unspecified	258	17
Total	**1,568**	**100**
Mechanism of injury		
Transport accidents	1,364	87
Contact with animal or plant	99	6
Caught/crushed between objects	19	1
Struck by or against object	17	1
Overexertion	12	1
Other and unspecified	57	4
Total	**1,568**	**100**

Note: 'Overexertion' refers to cases of injury due to overexertion and strenuous or repetitive movements.

Glossary

Definitions in the *Glossary* contain an identification number from the Metadata Online Registry (METeOR). METeOR is Australia's central repository for health, community services and housing assistance metadata, or 'data about data'. It provides definitions for data for health and community services-related topics and specifications for related national minimum data sets (NMDSs), such as the NMDSs that form the basis of this report. METeOR can be viewed on the AIHW website at <www.aihw.gov.au>. For further information on the terms used in this report, refer to the definitions in the *National health data dictionary,* version 16 (AIHW 2012c).

Activity when injured: The type of activity being undertaken by a person at the time of injury. METeOR identifier: 391320.

Acute: Having a short and relatively severe course.

Acute care: Acute care is care in which the clinical intent or treatment goal is to:

- cure illness or provide definitive treatment of injury
- perform surgery
- relieve symptoms of illness or injury (excluding palliative care)
- reduce severity of an illness or injury
- protect against exacerbation and/or complication of an illness and/or injury which could threaten life or normal function
- perform diagnostic or therapeutic procedures. See Care type. METeOR identifier: 270174.

Acute care hospital: Establishments which provide at least minimal medical, surgical or obstetric services for inpatient treatment and/or care, and which provide round-the-clock comprehensive qualified nursing service as well as other necessary professional services. They must be licensed by the state health department, or controlled by government departments. Most of the patients have acute conditions or temporary ailments and the average stay per admission is relatively short. See Establishment type. METeOR identifier: 269971.

Admitted patient: A patient who undergoes a hospital's admission process to receive treatment and/or care. This treatment and/or care is provided over a period of time and can occur in hospital and/or in the person's home (for hospital-in-the-home patients). METeOR identifier: 268957.

Age-standardisation: A set of techniques used to remove, as far as possible, the effects of differences in age when comparing two or more populations.

Episode of care: A period of health care with a defined start and end. METeOR identifier: 268978.

External cause: The environmental event, circumstance or condition as the cause of injury, poisoning and other adverse effect, as represented by a code. METeOR identifier: 391330.

Hospital: A health care facility established under Commonwealth, state or territory legislation as a hospital or a free-standing day procedure unit and authorised to provide treatment and/or care to patients. METeOR identifier: 268971.

International Classification of Diseases and Related Health Conditions (ICD): The World Health Organization's internationally accepted classification of diseases and related health conditions. The 10th revision, Australian modification (ICD-10-AM) is currently in use in Australian hospitals for admitted patients. METeOR identifier: 391301.

Length of stay: The length of stay of a patient, excluding leave days, measured in days. Formula: LOS = Separation date minus Admission date minus Total leave days. The calculation is inclusive of admission and separation dates. METeOR identifier: 269982.

Mode of admission: The mechanism by which a person begins an episode of care, as represented by a code. METeOR identifier: 269976.

Patient days: The total number of days for all patients who were admitted for an episode of care and who separated during a specified reference period. Patients admitted and separated on the same date (same-day patients) are given a count of one patient day. METeOR identifier: 270045.

Principal diagnosis: The diagnosis established after study to be chiefly responsible for occasioning an episode of admitted patient care, an episode of residential care or an attendance at the health care establishment, as represented by a code. METeOR identifier: 391326.

Private hospital: A privately owned and operated institution, catering for patients who are treated by a doctor of their own choice. Patients are charged fees for accommodation and other services provided by the hospital and relevant medical and paramedical practitioners. Acute care and psychiatric hospitals are included, as are private free-standing day hospital facilities.

Public hospital: A hospital controlled by a state or territory health authority. Public hospitals offer free diagnostic services, treatment, care and accommodation to all eligible patients.

Same-day patient: An admitted patient who is admitted and separated on the same date. METeOR identifier: 327270.

Separation: An episode of care for an admitted patient, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care.

Separations: The total number of separations occurring during the reference period. This includes both formal and statistical separations. METeOR identifier: 270407.

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During 2011-12, over 36,000 people aged 15 and over were hospitalised as the result of an injury sustained while playing sport. This represented 8% of all injury hospitalisations during that year. Around two thirds of those admitted to hospital were aged under 35 and over three quarters were men.