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# Trends in hospitalised injury due to falls in older people 2002–03 to 2014–15

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**Australian Government**

**Australian Institute of  
Health and Welfare**

Injury Research and Statistics Series

Number 111

# **Trends in hospitalised injury due to falls in older people**

**2002–03 to 2014–15**

Australian Institute of Health and Welfare  
Canberra

Cat. no. INJCAT 191

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# Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
APC NMDS	Admitted Patient Care National Minimum Data Set
ASGS	Australian Statistical Geography Standard
ARIA	Accessibility and Remoteness Index of Australia
ERP	estimated resident population
ICD-10-AM	International Statistical Classification of Diseases, 10th revision, Australia Modification
METeOR	Metadata Online Registry
MLOS	mean length of stay
NCCC	National Casemix and Classification Centre
NHMD	National Hospital Morbidity Database
NISU	National Injury Surveillance Unit
NMDS	National Minimum Data Set
NPHP	National Public Health Partnership
SLA	Statistical Local Area

# Symbols

n.e.c.	not elsewhere classified
CI	confidence interval

# Summary

This report focuses on trends in hospitalised (serious) fall injury for people aged 65 and over that occurred over the period 2002–03 to 2014–15. Information is also presented on the hospital care provided.

## Fall injury cases

An estimated 111,222 people aged 65 and over were hospitalised due to falls in 2014–15. Almost 3% of hospitalisations for people aged 65 and over were the result of a fall.

Women accounted for most of these fall injury cases, and rates of cases were higher for women than for men for all age groups aged 65 and over. Age-standardised rates of hospitalised fall injury cases increased over the period 2002–03 to 2014–15 for both men (rate of increase 3% per year) and women (2%).

Injuries to the *Hip and thigh* (24%) and *Head* (24%) were the most common types of injury resulting from a fall, for people aged 65 and over in 2014–15. Rates of head injury were particularly high in older Australians aged 85 and over. *Fractures of the neck of the femur* (also commonly called 'hip fractures') accounted for the majority of injuries to the *Hip and thigh* (73%). Rates of injury to the head more than doubled over the period 2002–03 to 2014–15 for both men and women. In 2002–03, the rates of *Head* injury among men and women were 319 and 336 cases per 100,000 population, respectively, compared with 706 and 731 cases per 100,000 in 2014–15.

The most common cause of fall injury cases for those aged 65 and over in 2014–15 was *Fall on the same level from slipping, tripping and stumbling* (34%). Falls from household objects (15% combined)—such as *Beds* (4,688 cases); *Chairs* (3,228 cases), *Stairs and steps* (7,042 cases); and *Ladders* (1,989 cases)—comprised the next largest proportion of cases.

Around 85% of fall injury cases in 2014–15 were recorded as having occurred in either the home or in residential aged care. The age-standardised rate of falls in the home for older people living in the community was 1,814 per 100,000 population, while the rate of falls for older people living in residential aged care was 10,090 per 100,000 population. These rates are likely to be underestimated because of missing information on the places in which falls occurred.

## Hospital care attributable to fall injury

In addition to the initial hospitalisations for these fall injury cases, there were more than 50,000 other fall-related hospital episodes (mainly for rehabilitation care) for people aged 65 and over in 2014–15. Taken together with the initial hospitalisation for a fall, there were 1.5 million days of patient care over the year, with the average total length of stay per fall injury case estimated to be 13 days. Overall, 1 in every 10 days spent in hospital by a person aged 65 and over in 2014–15 was attributable to an injurious fall. The days of patient care attributable to fall-related injury rose from 0.8 million patient days in 2002–03 to 1.4 million patient days in 2014–15.

# 1 Introduction

This report focuses on trends in hospitalised (serious) fall injury for people aged 65 and over that occurred over the period 2002–03 to 2014–15. The main topics addressed in this report are:

- an overview of hospitalised cases of injury due to falls by people aged 65 and over in 2014–15
- trends in hospitalised injury cases due to falls by people aged 65 and over, over the period 2002–03 to 2014–15.

## Structure of this report

**Chapter 2** presents an overview of fall injury cases by people aged 65 and over in Australia in 2014–15 and over the period 2002–03 to 2014–15. Information is also included on falls by Indigenous Australians aged 65 and over. **Chapters 3 to 5** present information on the types of injuries, external causes and places of occurrence of fall injuries. **Chapter 6** presents information of additional episodes of hospital care due to falls by older people, including hospital care following transfers after initial fall injury episodes and fall-related rehabilitation and related care separations. Other types of fall-related separations that were included in previous editions of this report are presented in ‘Appendix B: Falls as additional diagnoses’.

**Appendix A: Data issues** provides summary information on the hospital data sources and includes notes on the presentation of data, the population estimates used to calculate population rates and methods of analysis. Relevant terms for the data used in this report are summarised in Box 1.1.

**Appendix B: Falls as additional diagnoses** presents summary information regarding *Other fall-related* and *Tendency to fall* separations for both the single year 2014–15 and over the period 2002–03 to 2014–15.

## Methods

This report uses data from the National Hospital Morbidity Database (NHMD) covering the years 1 July 2002 to 30 June 2015 to provide information on fall-related injury in Australia. The report examines all NHMD records for people aged 65 and over that included both an ICD-10-AM injury diagnosis in the range S00–T75 or T79 and an external cause code signifying an unintentional fall (W00–W19). These codes could appear anywhere within the record (that is, analysis was not restricted to records that had a principal diagnosis indicating that the injury was the chief reason for the episode of hospital care). However, our definition of fall injury cases is restricted to records where the principal diagnosis is an injury. Hence, patients who fell while in hospital, and had an injury reported only as an additional diagnosis (rather than as the principal diagnosis), would not have been counted as cases.

Chapters 3 to 5 focus on cases of fall injury. Some injuries result in more than 1 episode in hospital and, accordingly, generate more than 1 NHMD record. As the NHMD does not include information that enables a set of records belonging to a particular injury case to be recognised as such, case numbers need to be estimated. In this report, eligible separations were excluded from case numbers if their *Mode of admission* was a transfer from another acute hospital. Inclusion of such separations would be likely to result in the multiple counting of some cases. While this approach corrects for overestimation of cases that is due to transfers, it cannot correct for overestimation that is due to re-admissions.

Rates are generally age-standardised because the risk of fall injury varies greatly with age and the age distribution of the Australian population aged 65 and over changed during the study period.

In tables and charts, unless stated otherwise:

- the patient's age is calculated at the date of admission
- in tables by age group and sex, separations for which age and sex were not reported were included in totals
- rates were age-standardised as detailed in 'Appendix A: Data issues'
- trends were analysed using the negative binomial distribution regression technique, as described in Berry and Harrison (2006). See also 'Appendix A: Data issues'.

Generally, summary tables and figures are placed immediately below the discussion in related text. Where appropriate, tables and figures within the chapter are accompanied by footnotes referring readers to additional statistical tables available for download from the AIHW website. Further information about the methods used in this report can be found in 'Appendix A: Data issues'.

#### **Box 1.1: Summary of terms and classifications 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 the patients' 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 admitted patient 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 **additional diagnosis** is a condition or complaint that either coexists with the principal diagnosis or arises during the episode of admitted patient care. Additional diagnoses are reported if the conditions affect patient management.

**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.

### **Box 1.2: National injury prevention plans**

Injury is the subject of 3 national prevention plans: the National Injury Prevention and Safety Promotion Plan: 2004–2014 (NPHP 2005c), the National Aboriginal and Torres Strait Islander Safety Promotion Strategy (NPHP 2005a) and—of particular relevance to this report—the National Falls Prevention for Older People Plan: 2004 Onwards (NPHP 2005b).

The aim of the National Falls Prevention Plan is to work strategically and collectively to reduce the burden and impact of falls and fall-related injury among older people in 3 key settings: residential aged care, acute care and the community.

The goals of the plan include:

- generating a low risk population and promoting independence
- improving outcomes through local partnerships
- creating safer environments and products
- enhancing the capacity of workers in the health and related sectors in the prevention of falls and fall-related injury in older people
- developing and managing knowledge through research, information dissemination and training.

The plan also advocates that prevention of fall-related injury should be a responsibility of all who promote products, services or information to older people.

### **Box 1.3: Indigenous status reporting for time-series analyses**

In this report, the terms *Indigenous* and *Other Australians* are used to refer to persons identified as such in Australian hospital separations data and population data collections. Separations for which Indigenous status was 'not stated' have been included in the category *Other Australians*. There were 1,571 hospitalised fall injury cases in 2014–15 with Indigenous status recorded as 'not stated'.

From 2010–11 onwards, Indigenous status information within hospital separations data from all jurisdictions were of sufficient quality for statistical reporting purposes (AIHW 2013). An AIHW study found that an estimated 88% of Indigenous patients were correctly identified in Australian public hospital admission records in 2011–12.

The report recommends that the data for all jurisdictions are used in analysis of Indigenous hospitalisation rates, for hospitalisations in total in national analyses of Indigenous admitted patient care for data from 2010–11 onwards.

Injury rates were age-standardised to 85+ by the direct method.

Further information is available in 'Appendix A: Data issues'.

**Box 1.4: Calculation of aged care place-specific rates**

About 6 in every 7 fall injury cases with a specified place of occurrence in 2014–15 were reported to have happened in either the home or an aged care facility. We have calculated the age-standardised rate of falls reported to have occurred in residential aged care and involving people aged 65 and over by using population estimates from AIHW report series, including *Residential aged care in Australia* (AIHW 2012), *Residential aged care and aged care packages in the community* (AIHW 2012) and *Residential aged care and aged care packages in the community* (AIHW 2014). In the most recent year, 2014–15 population estimates were obtained from the AIHW National Aged Care Data Clearinghouse.

We have similarly calculated the rate of falls reported to have occurred in the home for people aged 65 and over and resident in the community (that is, the population who were not residents of residential aged care in 2014–15). Of course, some of the 17% of fall injury cases that either had an unspecified place of occurrence code or no place code recorded may have occurred in either of these locations and, hence, were not included in this analysis.

## 2 Overview

This chapter presents an overview of fall injury cases for people aged 65 and over in Australia in 2014–15 and over the period 2002–03 to 2014–15. Information is also included on falls by Indigenous Australians aged 65 and over.

### Age and sex

There were an estimated 111,222 hospitalised fall injury cases for Australians aged 65 years or older in 2014–15 (Table 2.1). Almost 3% of all hospitalisations for people aged 65 are a result of a fall.

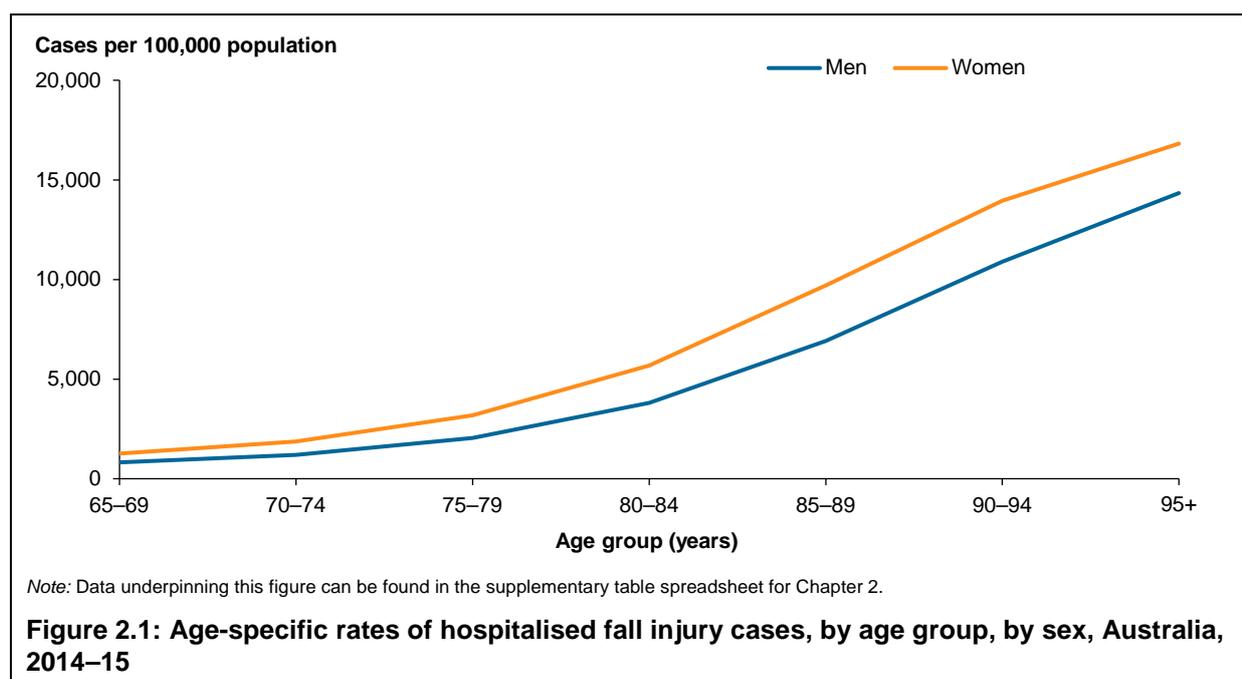
**Table 2.1: Key indicators for hospitalised fall injury, Australia, 2014–15**

Key indicators	Men	Women	People
All hospital separations 2014–15, people aged 65+ <sup>(a)</sup>	2,163,827	1,993,538	4,157,371
Estimated fall injury cases, people aged 65+	37,036	74,186	111,222
As percentage of all hospital separations, people aged 65+	1.7	3.7	2.7

(a) Data source: *Australian hospital statistics 2014–15* (AIHW 2016).

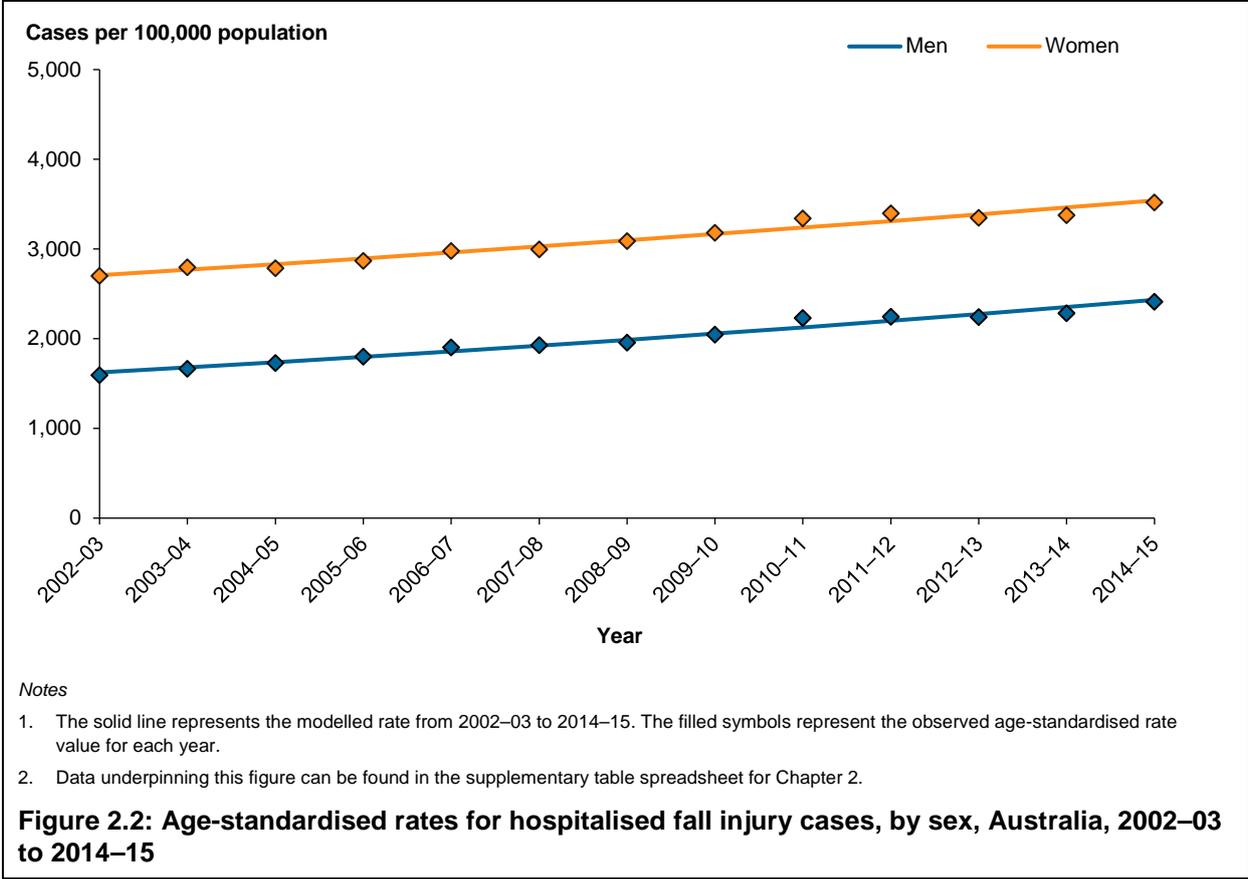
Unlike most other types of injury, women aged 65 and over sustained a greater number of hospitalised fall injuries than men, constituting 67% of the cases in 2014–15 (74,186). The age-standardised rate of hospitalised *Falls* for older women was 3,519 per 100,000 population. This compares with 2,412 per 100,000 population for fall cases involving men aged 65 and over.

Age-specific rates of fall injury cases increased markedly with age for both men and women (Figure 2.1). The rate of fall injury cases was higher for women than for men in all age groups. In 2014–15, the highest rate observed was for women aged 95 and over: 16,820 cases per 100,000 population.

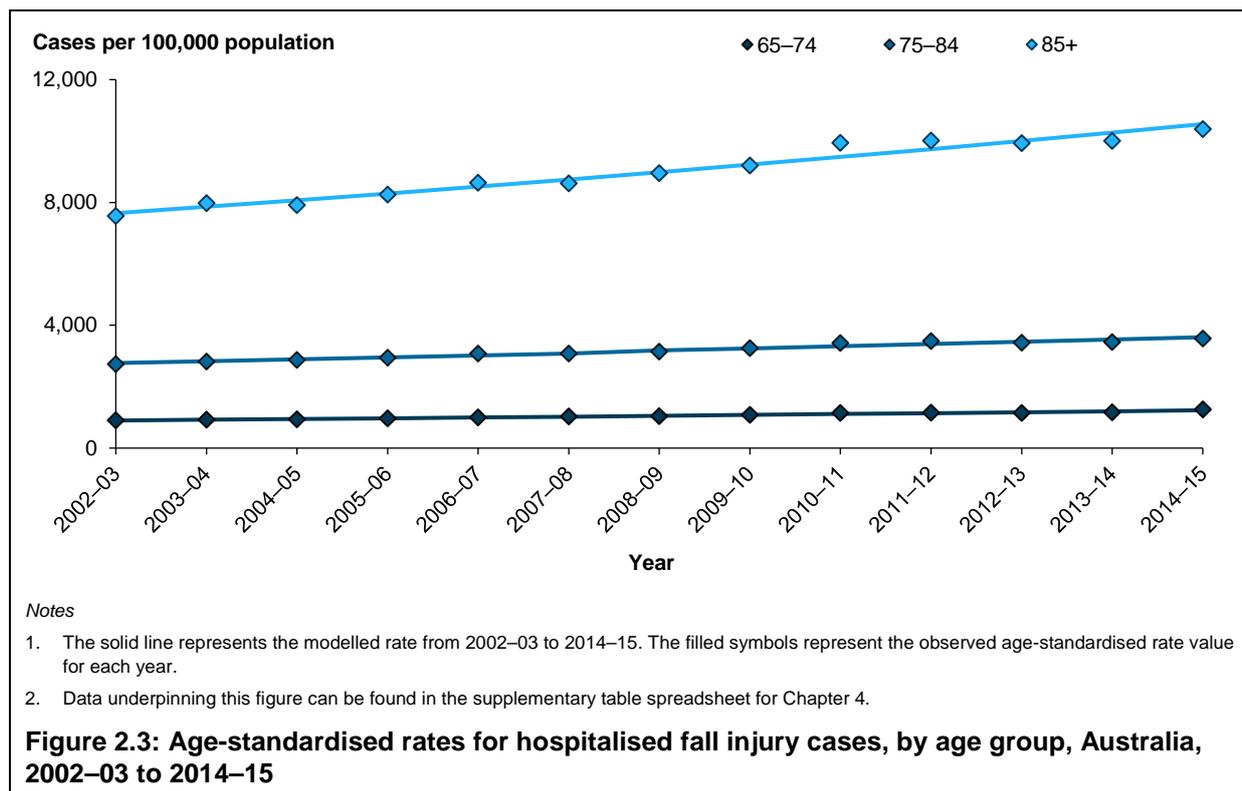


## How have fall injury cases changed over time?

The age-standardised rate of hospitalised fall injury cases for both men and women aged 65 and over increased over the period 2002–03 to 2014–15 (Figure 2.2). The rate of hospitalised *Falls* for men increased by a greater magnitude (3.4% per year, 95% CI: 3.1–3.7) than for women (2.3%, 95% CI: 2.0–2.5).



Increases in the rate of hospitalised *Falls* were not consistent across all age groups in the older population (Figure 2.3). For those aged 65–74 and 85 and over, the increase was 2.7% per year between 2002–03 and 2014–15 (95% CI: 2.5–2.9 and 2.4–3.0, respectively), compared with 2.1% per year for people aged 75–84 (95% CI: 1.9–2.4). These increases were statistically significant ( $p < 0.001$ ).



## Indigenous Australians

There were 705 hospitalised fall injury cases for Indigenous Australians aged 65 and over during 2014–15 (Table 2.2). For Indigenous Australians aged 65 and over, the age-standardised rate of hospitalised fall injury in 2014–15 was slightly higher than that for *Other Australians*. This was true for both male and female Indigenous Australians. For more information about Indigenous reporting, see Box 1.3.

**Table 2.2: Key indicators for cases hospitalised fall injury, by Indigenous status, by sex, Australia, 2014–15**

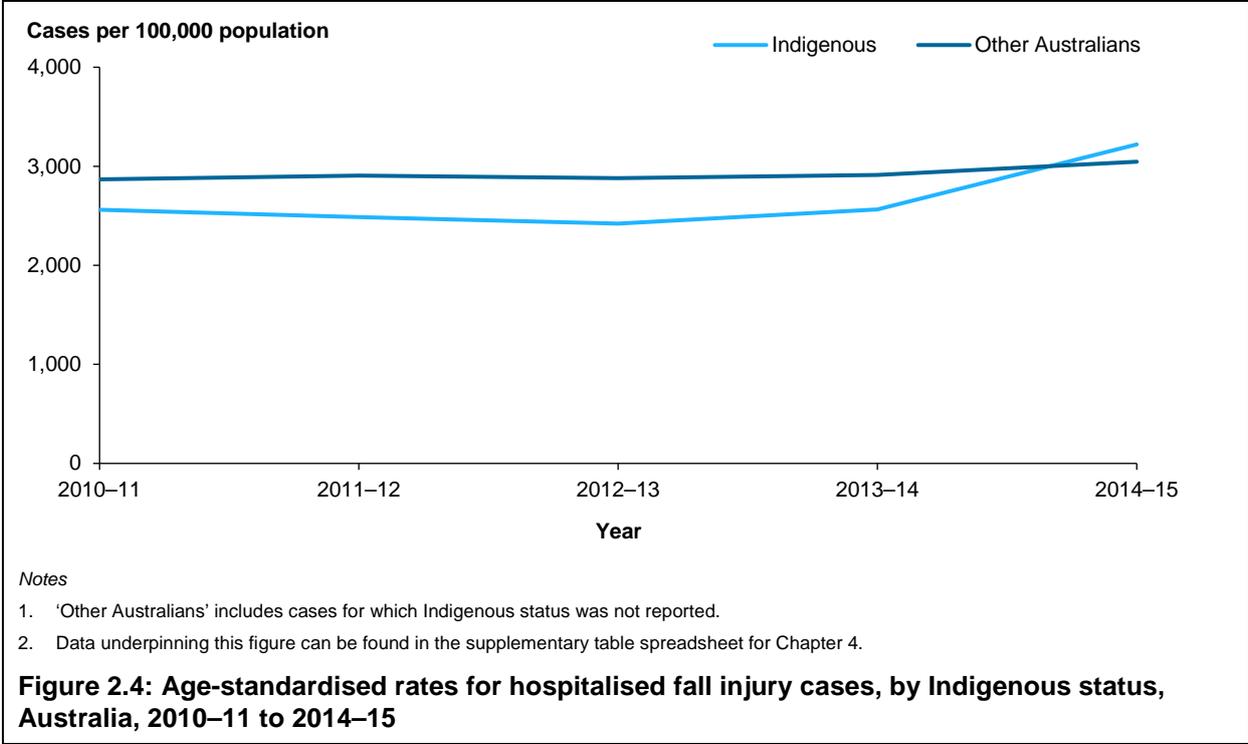
Indicator	Indigenous Australians			Other Australians		
	Men	Women	Persons	Men	Women	Persons
Estimated fall injury cases	244	461	705	36,792	73,725	110,517
Age-standardised rate/100,000 population	2,403	3,766	3,220	2,395	3,551	3,046

Note: The *Other Australians* category excludes cases for which Indigenous status was not reported.

## How have fall injuries for Indigenous Australians changed over time?

The following section presents data for all jurisdictions for the period 2010–11 to 2014–15 (see Box 1.3. for more information on time-series analysis of Indigenous data). Case numbers of fall-related hospitalisations for Indigenous Australians rose considerably, from 488 to 705 (125 cases), in the 5-year period from 2010–11. For those aged 86 and over, there was a 58% rise (79 cases) from 2010–11 to 2014–15. This reflects the increased size of the Indigenous population aged 65 and over, which grew even more rapidly than the population of *Other Australians* of the same age (ABS 2013a).

Figure 2.4 presents age-standardised rates of hospitalised fall injury from 2010–11 to 2014–15 for Indigenous people and *Other Australians* aged 65 and over. Up until the most recent year, the rate of fall-related injury among *Other Australians* has been higher than that of Indigenous people. In 2014–15, the rate of fall injury among Indigenous people was 3,220 cases per 100,000 population, compared with 3,046 for *Other Australians*.



The interpretation of the results in this section requires care. Uncertainty due to the relatively small annual numbers of cases for Indigenous Australians is exacerbated by the possibility that the completeness of Indigenous identification has changed over time.

The current results provide some evidence of rising rates of hospitalised fall injury for Indigenous Australians. However, increasing completeness of Indigenous identification could also produce, or steepen, these upward trends—so is important to be cautious in interpreting them. In particular, we do not consider that there is a sound basis to conclude that trends for Indigenous Australians differ from those for *Other Australians*.

### 3 Type of injury

This chapter presents information on the body region injured and type of injury sustained by people aged 65 and over in Australia as a result of a fall, both in 2014–15 and over the period 2002–03 to 2014–15.

#### Body region injured

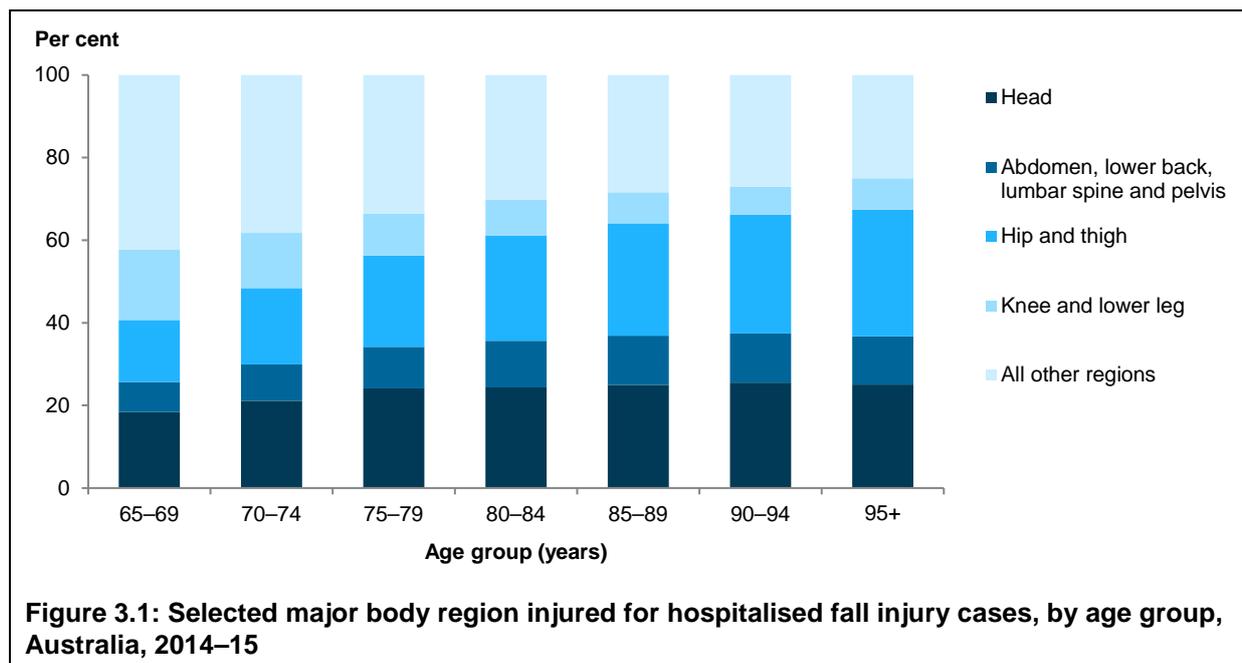
The largest proportions of body regions injured as a result of a fall for people aged 65 and over in 2014–15 were to the *Hip and thigh* and the *Head* (Table 3.1). *Fracture of the neck of the femur* cases (those with a principal diagnosis of S72.0–S72.2, also commonly called ‘hip fractures’) accounted for the majority of injuries to the *Hip and thigh* (73%). Injury to the *Hip and thigh*, and *Fracture of the neck of the femur*, were proportionately more common for women than for men.

Overall, injuries to the *Head* were just as common a principal diagnosis as injuries to the *Hip and thigh* for older people overall—constituting 24% of all fall cases. Among men, the proportion of injuries to the *Head* was 29%, compared with 21% among women.

**Table 3.1: Body region injured for hospitalised fall injury cases, by sex, Australia, 2014–15**

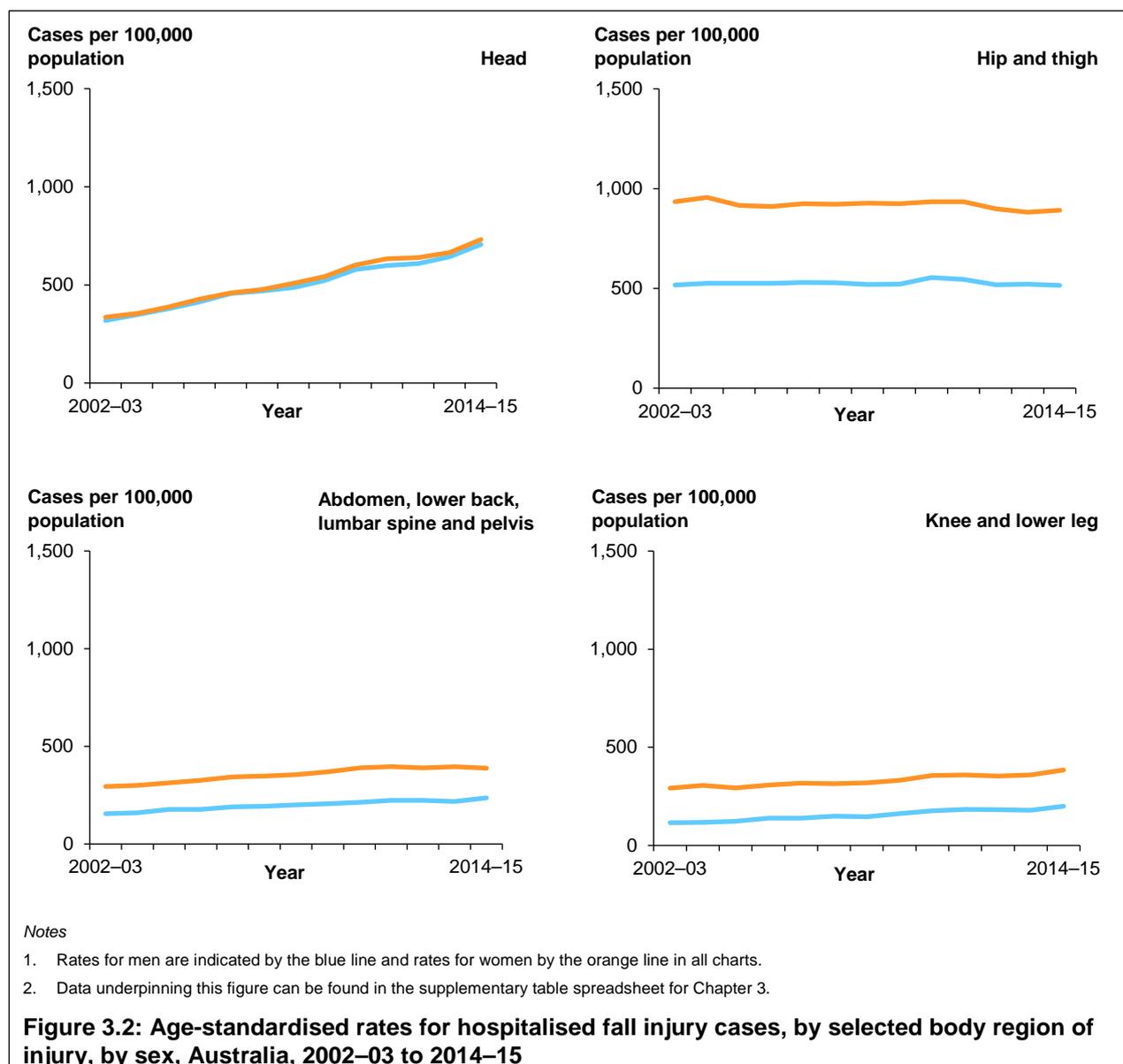
Body region injured by principal diagnosis	Men		Women		People	
	Count	%	Count	%	Count	%
Head	10,882	29.4	15,448	20.8	26,330	23.7
Neck	773	2.1	971	1.3	1,744	1.6
Thorax	3,535	9.5	4,413	5.9	7,948	7.1
Abdomen, lower back, lumbar spine and pelvis	3,640	9.8	8,218	11.1	11,858	10.7
Shoulder and upper arm	2,874	7.8	7,531	10.2	10,405	9.4
Elbow and forearm	2,302	6.2	7,771	10.5	10,073	9.1
Wrist and hand	999	2.7	1,364	1.8	2,363	2.1
Hip fractures	5,584	15.1	14,036	18.9	19,620	17.6
Other injuries to the hip and thigh	2,320	6.3	4,957	6.7	7,277	6.5
<i>Total Hip and thigh</i>	7,904	21.3	18,993	25.6	26,897	24.2
Knee and lower leg	3,159	8.5	7,647	10.3	10,806	9.7
Ankle and foot	469	1.3	1,078	1.5	1,547	1.4
Other, multiple and incompletely specified body regions	166	0.4	264	0.4	430	0.4
Injuries not described in terms of body region	333	0.9	488	0.7	821	0.7
<b>Total</b>	<b>37,036</b>	<b>100</b>	<b>74,186</b>	<b>100</b>	<b>111,222</b>	<b>100</b>

As a proportion of the most common body regions injured, *Hip and thigh* injuries were higher in successive age categories (Figure 3.1). Among those aged 95 and over, injuries to the *Hip and thigh* accounted for 31% of all fall-related hospitalisations. In contrast, *Knee and lower leg* injuries were proportionately more common among the younger age groups. For the 65–69 age group, *Knee and lower leg* injuries accounted for 42% of all fall-related hospitalisations.



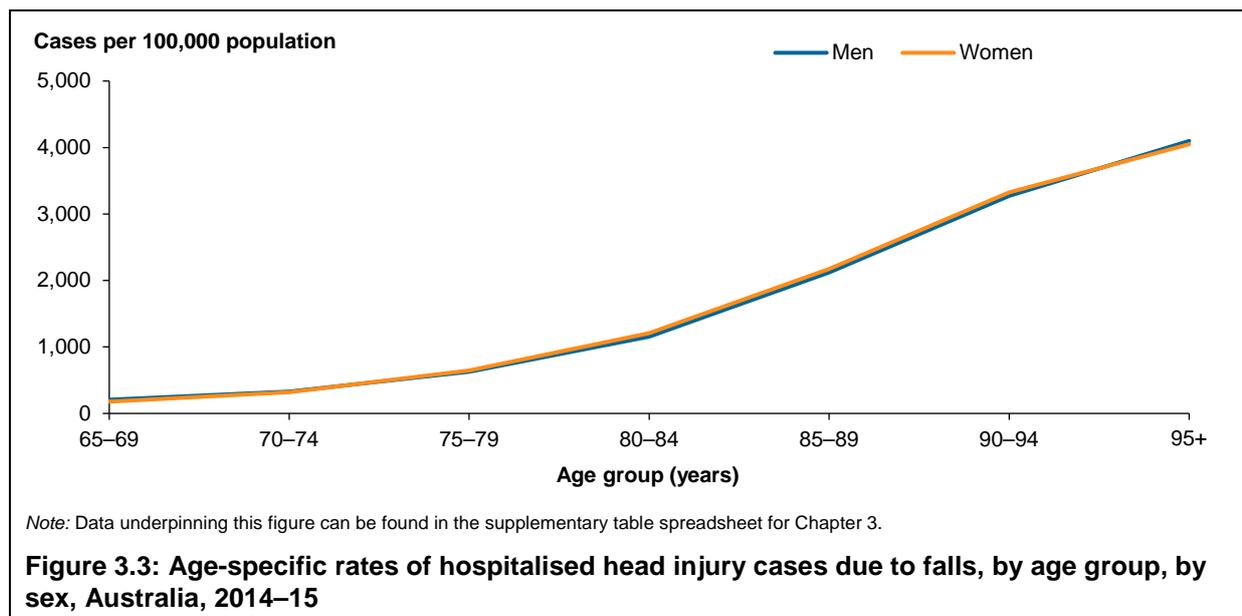
Analyses of fall injury cases, for the most common body regions injured over the 2002-03 to 2014-15 study period, are shown in Figure 3.2. Rates of injury to the *Head* more than doubled over the period for both men and women. In 2002-03, *Head* injury rates among men and women were 319 and 336 cases per 100,000 population, respectively, compared with 706 and 731 cases per 100,000 in 2014-15.

Smaller rises in the rates of *Abdomen, lower back, lumbar spine and pelvis* fall-related injuries, along with *Knee and lower leg* injuries, were seen for both men and women over the period. For men in particular, the rate of fall-related *Knee and lower leg* injuries increased, from 116 cases per 100,000 population in 2002-03 to 200 cases per 100,000 in 2014-15. By contrast, rates of fall-related injuries to the *Hip and thigh* remained steady between 2002-03 and 2014-15. Separate analyses of *Hip fracture* injuries are presented later in this chapter.

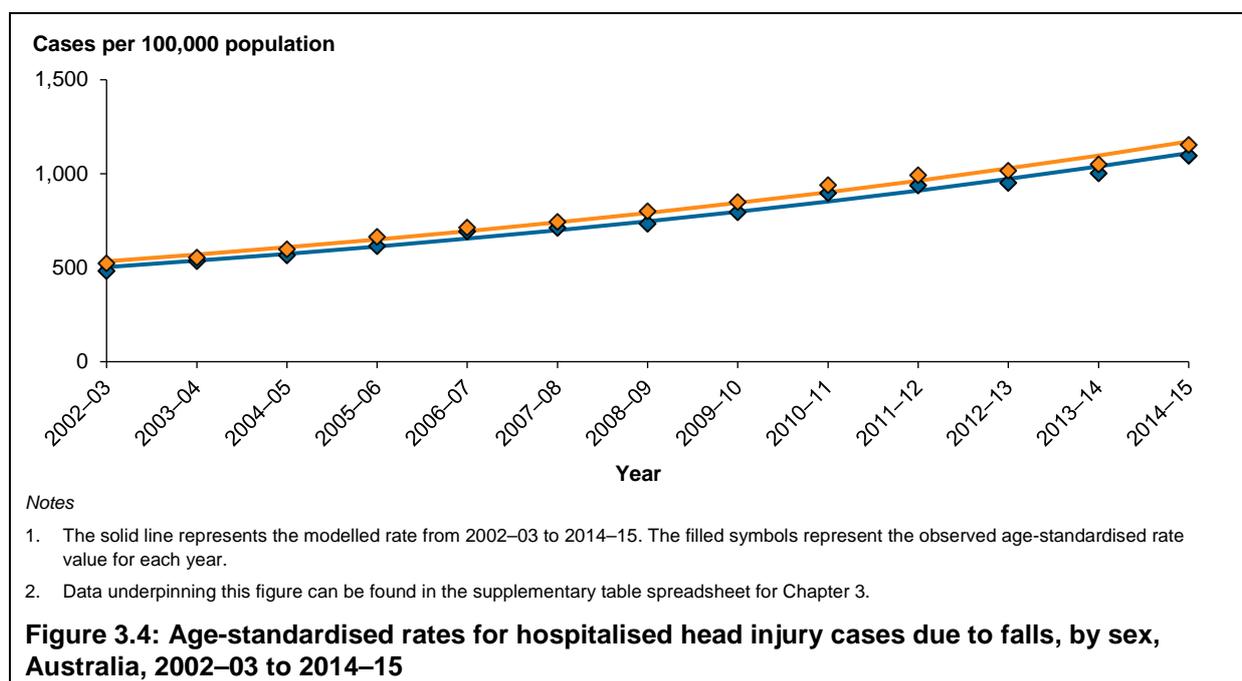


## Head injuries

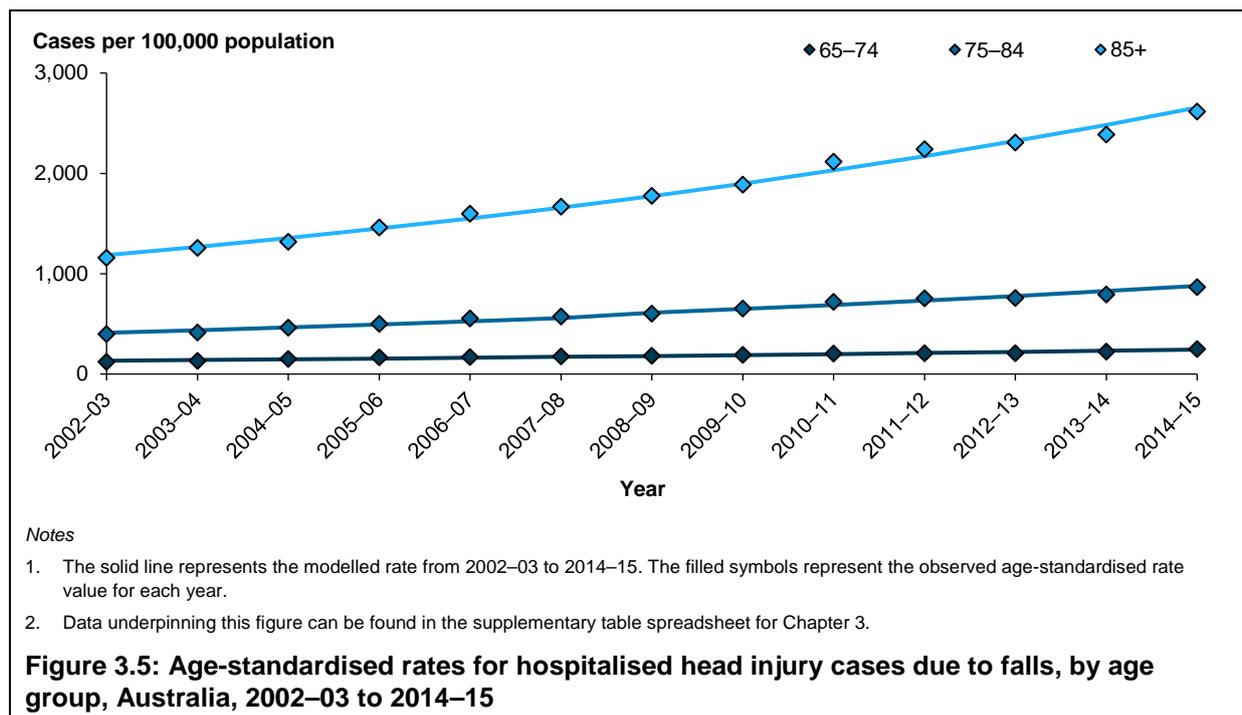
There was very little difference between men and women in the rate of fall-related *Head* injury, by age group, in 2014–15 (Figure 3.3). The rate of *Head* injury was much higher for those aged 85 and over and was at its highest level among the oldest patients. For those aged 95 and over, the rate of fall-related *Head* injury among men was 4,098 cases per 100,000 population and among women it was 4,050 cases per 100,000.



The rates of hospitalised *Head* injury cases due to falls in people aged 65 and over increased over the period 2002-03 to 2014-15 (Figure 3.4). The increase in the age-standardised rate of *Head* injury due to falls over the 13 years to June 2013 was estimated to be 6.8% per year (95% CI: 6.4 to 7.2,  $p < 0.001$ ) for women and the rate for men increased by 6.8% (95% CI: 6.4 to 7.3,  $p < 0.001$ ).



The magnitude of the rise in fall-related *Head* injuries over time was greater for those in older age groups (Figure 3.5). For those aged 85 and over, the increase in the rate of *Head* injury due to falls was estimated to be 7.0% per year (95% CI: 6.6-7.3,  $p < 0.001$ ), compared with increases of 6.3% per year for 75-84 year olds (95% CI: 6.6-7.3,  $p < 0.001$ ) and 5.2% per year for 65-74 year olds (95% CI: 4.5-5.9,  $p < 0.001$ ).



## Nature of injury

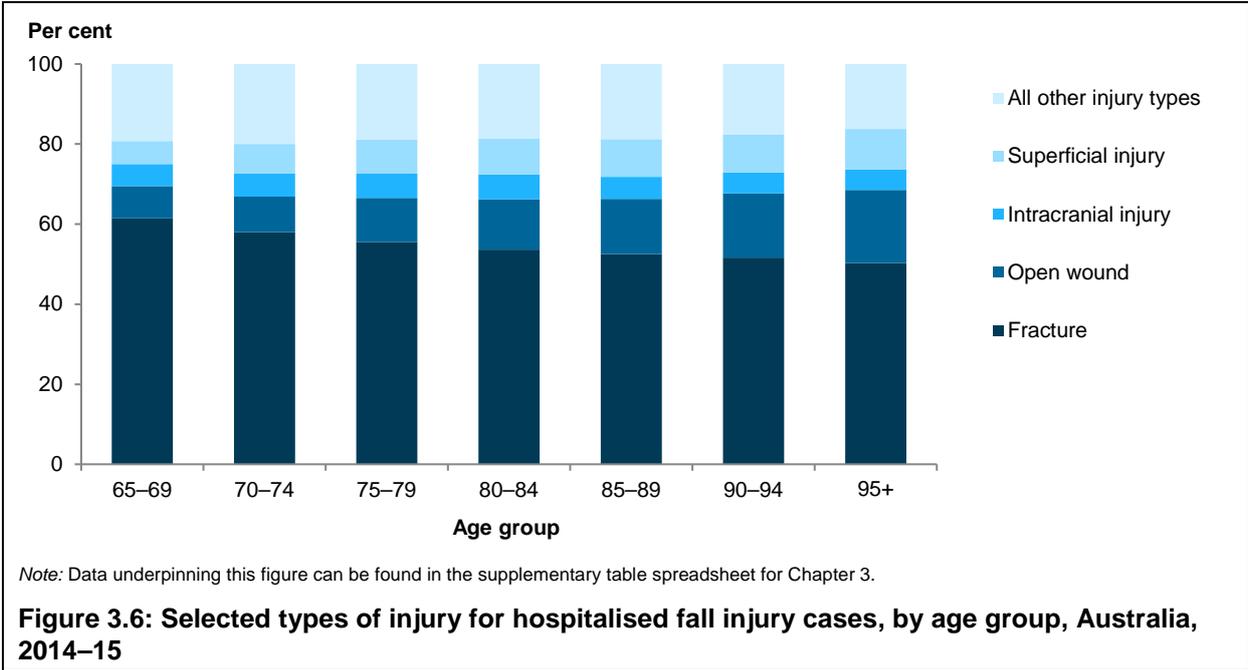
More than half of people aged 65 and over who were hospitalised due to an injurious fall in 2014–15 had a principal diagnosis of a *Fracture* (60,629 cases, or 55%). *Fractures* were a proportionately more common principal diagnoses for women than for men, whereas *Open wound* and *Soft-tissue injury* were more common for men (Table 3.2).

**Table 3.2: Type of injury for hospitalised fall cases, by sex, Australia, 2014–15**

Type of injury	Men		Women		People	
	Count	%	Count	%	Count	%
Fracture	16,550	44.7	44,079	59.4	60,629	54.5
Dislocation	615	1.7	1,111	1.5	1,726	1.6
Soft-tissue injury	1,584	4.3	2,121	2.9	3,705	3.3
Open wound	6,258	16.9	7,689	10.4	13,947	12.5
Intracranial injury	3,049	8.2	3,283	4.4	6,332	5.7
Internal organ or vessel of trunk	378	1	252	0.3	630	0.6
Burn	2	0	2	0	4	0
Superficial injury	3,244	8.8	6,339	8.5	9,583	8.6
Poisoning or toxic effect	0	0	1	0	1	0
Other specified nature of injury	1,170	3.2	1,860	2.5	3,030	2.7
Unspecified nature of injury	4,186	11.3	7,449	10	11,635	10.5
<b>Total</b>	<b>37,036</b>	<b>100</b>	<b>74,186</b>	<b>100</b>	<b>111,222</b>	<b>100</b>

*Fracture* principal diagnoses were less common for older people, reported for 61% of cases for people aged 65–69 and 50% of cases for people aged 95+. The proportion of cases with

principal diagnoses of an *Open wound* or *Superficial injury*, in particular, increased with age (Figure 3.6).



### Fractures

Over time, *Fracture* has been the most frequent nature of injury, followed by *Open wound* and *Superficial injury*. In 2014-15, fractures accounted for 6 in 10 (55%) of all fall-related injuries sustained by people aged 65 and over. The principal diagnosis in 13% of cases was an *Open wound* and in 9% of cases a *Superficial injury* was sustained. Together, these 3 types of injury accounted for over three-quarters of all injuries.

Nearly 3 in every 5 people aged 65 and over who were hospitalised due to an injurious fall in 2014-15 sustained at least 1 fracture (63,725 cases, or 57%). A higher proportion of women than men sustained fractures (59% and 45%, respectively).

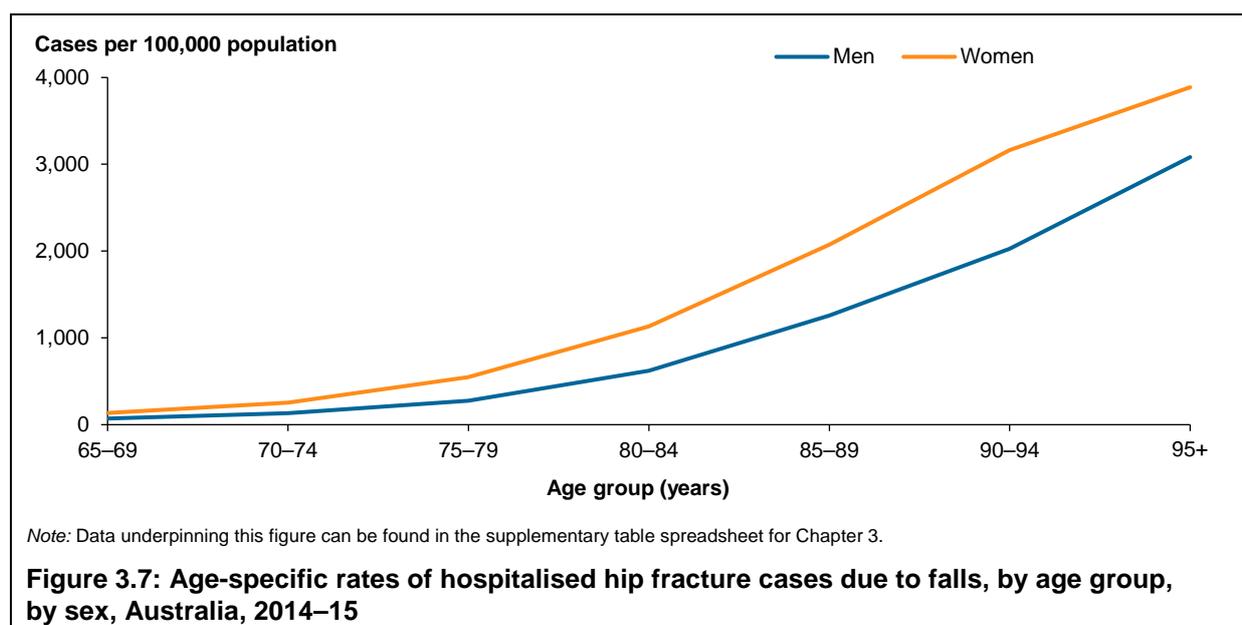
Table 3.3 describes the location of the fracture for fall injury cases with at least 1 fracture. Fractures to the *Hip and thigh* accounted for the greatest proportion of all fracture-related fall injury cases: about 1 in every 3 such injuries (31%). The vast majority of these *Hip and thigh* fracture cases had a principal diagnosis of *Fractured neck of femur* (90%).

**Table 3.3: Fracture location by body region for hospitalised fall injury cases involving a fracture, by sex, Australia, 2014–15**

Body region injured, by principal diagnosis	Men		Women		People	
	Count	%	Count	%	Count	%
Head	1,697	9.4	2,418	5.3	4,115	6.5
Neck	507	2.8	631	1.4	1,138	1.8
Thorax	2,647	14.7	3,275	7.2	5,922	9.3
Abdomen, lower back, lumbar spine and pelvis	2,273	12.7	6,018	13.2	8,291	13.0
Shoulder and upper arm	1,623	9.0	5,527	12.1	7,150	11.2
Elbow and forearm	1,086	6.0	6,637	14.5	7,723	12.1
Wrist and hand	360	2.0	710	1.6	1,070	1.7
Hip fractures	5,584	31.1	14,036	30.7	19,620	30.8
Other injuries to the hip and thigh	556	3.1	1,582	3.5	2,138	3.4
<i>Total Hip and thigh</i>	<i>6,140</i>	<i>34.2</i>	<i>15,618</i>	<i>34.1</i>	<i>21,758</i>	<i>34.1</i>
Knee and lower leg	1,363	7.6	4,324	9.4	5,687	8.9
Ankle and foot	246	1.4	572	1.2	818	1.3
Other, multiple and incompletely specified body regions	3	0	4	0	7	0
Injuries not described in terms of body region	17	0.1	29	0.1	46	0.1
<b>Total</b>	<b>17,962</b>	<b>100</b>	<b>45,763</b>	<b>100</b>	<b>63,725</b>	<b>100</b>

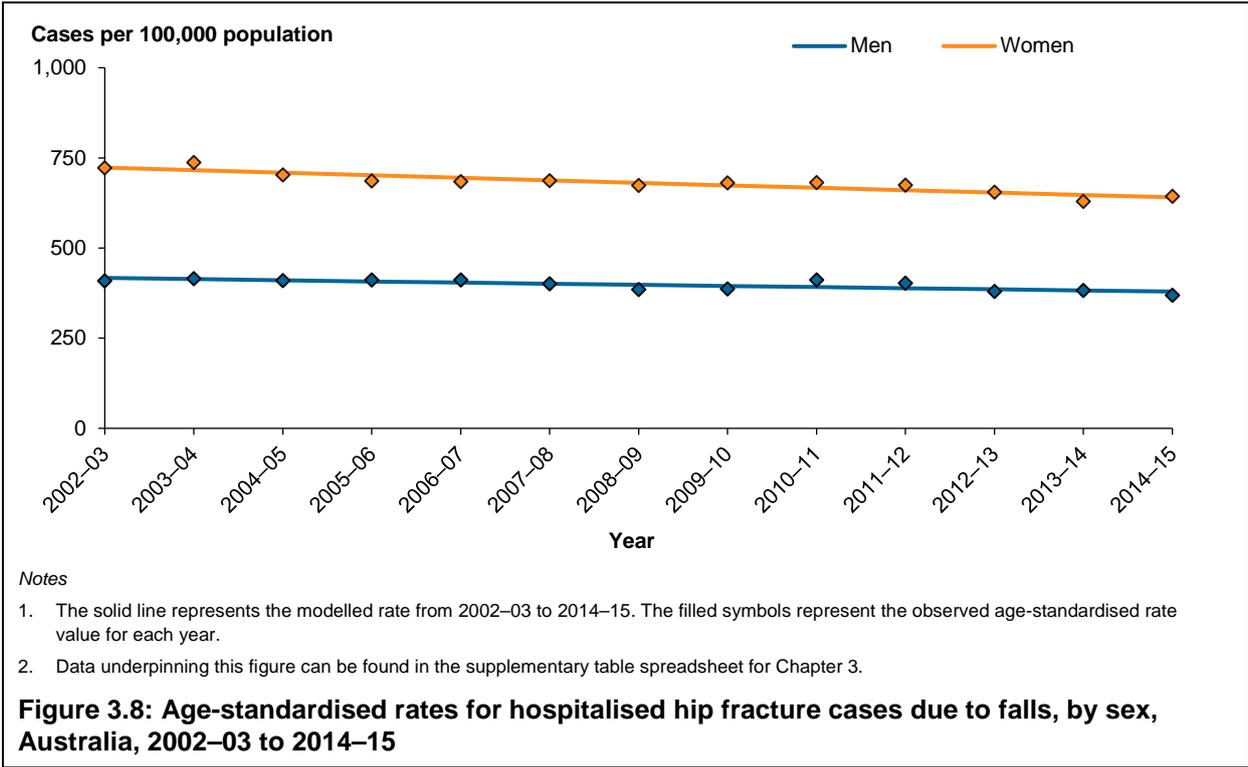
## Hip fractures

Fall injury cases that had a principal diagnosis of *Hip fracture (Fractured neck of femur)* occurred at an age-standardised rate of 526 per 100,000 population in 2014–15. Women aged 65 and over in 2014–15 had a higher rate of fall-related *Hip fracture* (643 cases per 100,000) than men (369 per 100,000). Age-specific rates of fall-related *Fractured neck of femur* injuries were highest for those aged 95 and over: 3,887 per 100,000 population for women and 3,083 per 100,000 for people aged 65–69 (Figure 3.7).

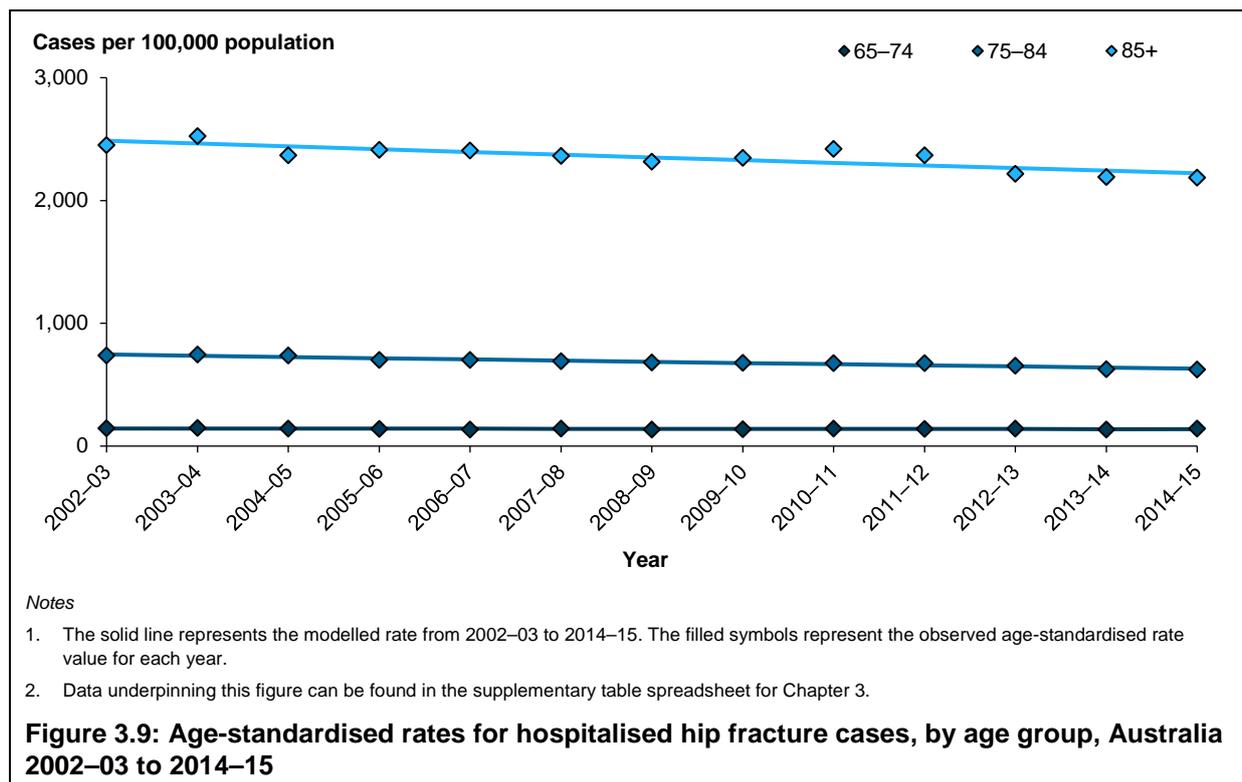


In contrast to fall injury cases generally, and head injuries specifically, the rates of hospitalised cases of *Hip fracture* (principal diagnoses S72.0–S72.2) due to falls in people aged 65 and over decreased over the period 2002–03 to 2014–15 (Figure 3.8). While changes in admission practices over time may affect the rate of all hospitalised fall injury cases, it is thought that *Hip fractures* are serious enough to be admitted to hospital in nearly every instance.

The decrease in the age-standardised rate of *Hip fracture* over the 13 years to June 2013 was estimated to be 1.0% per year (95% CI: –1.2 to –0.8,  $p < 0.001$ ) for women and the rate for men decreased by 0.8% (95% CI: –1.1 to –0.4,  $p < 0.001$ ).



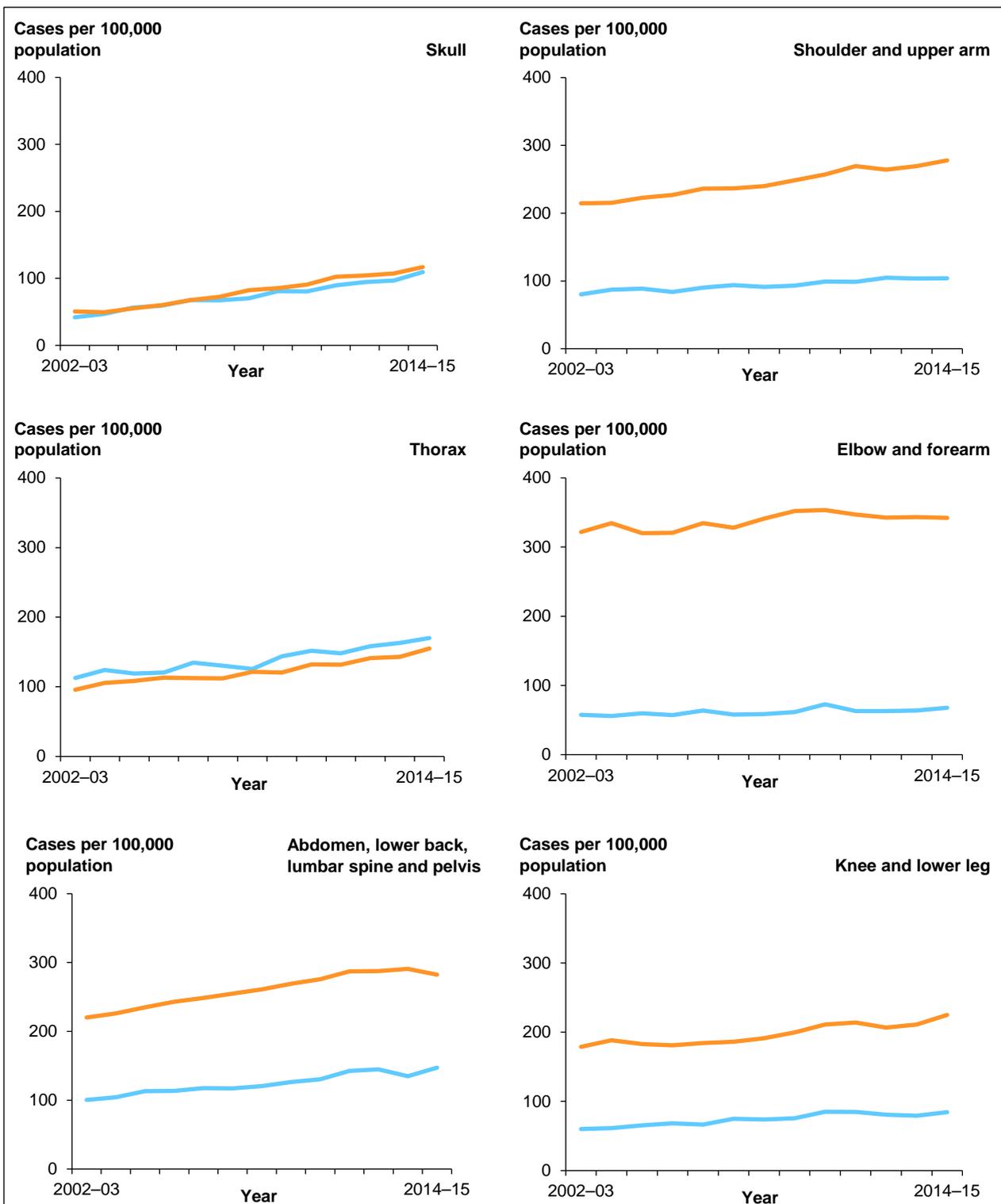
Decreases in the rate of *Hip fractures* were not consistent across all age groups in the older population (Figure 3.9). The decrease in the rate of hospitalised *Hip fracture* due to falls was significant in the 2 older groups; an estimated decrease of 1.4% per year for people in the 75–84 age group (95% CI: –1.6 to –1.2,  $p < 0.001$ ) and 0.9% per year for people aged 85 and over (95% CI: –1.3 to –0.6,  $p < 0.001$ ). There was no significant decrease in the youngest of the groups (0.3% per year) (95% CI: –0.6 to 0.1,  $p = 0.113$ ).



### Other types of fracture

Rates of many other types of fracture (that is, any other fractures other than *Hip fractures*) were estimated to have increased over the study period (Figure 3.10). Of the 6 types of fall-related fractures presented in Figure 3.10, only fractures to the *Elbow and forearm* remained steady over the period.

With respect to gender differences, women had higher rates of all types of fractures due to falls, other than *Skull and Thorax* fractures. The greatest difference occurred in *Elbow and forearm* fractures, where, for the entire period, rates of injury were 5 times higher among women, compared with men.



**Notes**

1. Rates for men are indicated by the blue line and rates for women by the orange line in all charts.
2. Data underpinning this figure can be found in the supplementary table spreadsheet for Chapter 3.

**Figure 3.10: Age-standardised rates for hospitalised fracture cases, by selected body region of injury, by sex, Australia, 2002-03 to 2014-15**

## 4 External causes

This chapter presents information on the causes of hospitalised injury in people aged 65 and over in Australia as a result of a fall in 2014–15 and over the period 2002–03 to 2014–15.

### Causes of hospitalised fall injury

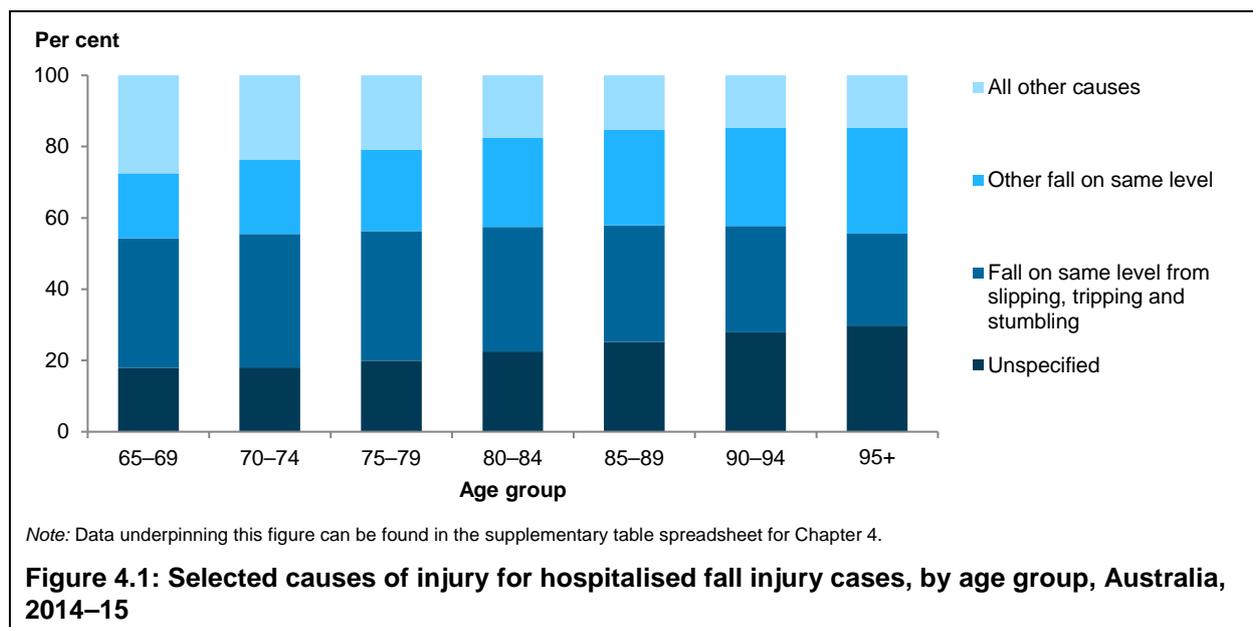
The most common cause of hospitalised fall injury for those aged 65 and over in 2014–15 was a *Fall on same level from slipping, tripping and stumbling* (34%) (Table 4.1). Slips, trips and stumbles were proportionately more common for women than for men and, for both sexes, most of these types of fall (62%) were attributed to *Tripping*.

**Table 4.1: Causes of hospitalised fall injury cases, by sex, Australia, 2014–15**

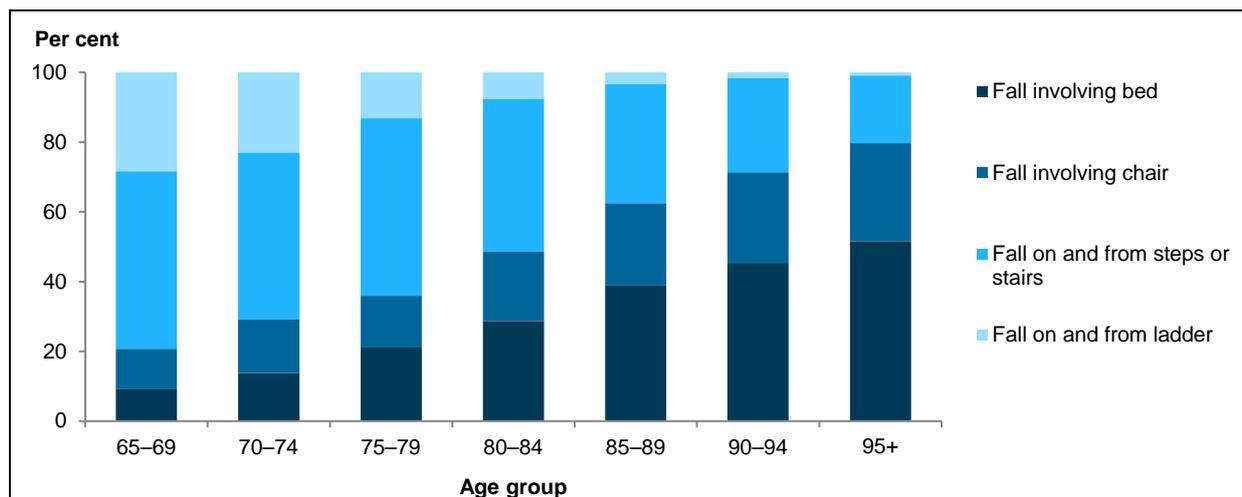
External cause	Men		Women		People	
	Count	%	Count	%	Count	%
Fall on same level involving ice and snow	7	0	13	0	20	0
Fall on same level from slipping	2,840	25.3	6852	26	9692	25.8
Fall on same level from tripping	6,736	59.9	16,433	62.3	23,169	61.6
Fall on same level from stumbling	1,661	14.8	3,094	11.7	4,755	12.6
<i>Total fall on same level from slipping, tripping and stumbling</i>	<i>11,237</i>	<i>30.3</i>	<i>26,379</i>	<i>35.6</i>	<i>37,616</i>	<i>33.8</i>
Fall involving ice-skates, skis, roller-skates or skateboards	259	0.7	221	0.3	480	0.4
Other fall on same level due to collision with, or pushing by, another person	70	0.2	178	0.2	248	0.2
Fall while being carried or supported by other persons	17	0	52	0.1	69	0.1
Fall involving wheelchair	290	0.8	428	0.6	718	0.6
Fall involving bed	1,637	4.4	3,051	4.1	4,688	4.2
Fall involving chair	1094	3	2,134	2.9	3,228	2.9
Fall involving other furniture	55	0.1	95	0.1	150	0.1
Fall involving playground equipment	3	0	11	0	14	0
Fall on and from stairs and steps	2,407	6.5	4,635	6.2	7,042	6.3
Fall on and from ladder	1,547	4.2	442	0.6	1,989	1.8
Fall on and from scaffolding	46	0.1	1	0	47	0
Fall from, out of or through building or structure	443	1.2	143	0.2	586	0.5
Fall from tree	41	0.1	5	0	46	0
Fall from cliff	47	0.1	24	0	71	0.1
Diving or jumping into water causing injury other than drowning or submersion	12	0	15	0	27	0
Other fall from one level to another	702	1.9	716	1	1,418	1.3
Other fall on same level	8,810	23.8	18,422	24.8	27,232	24.5
Unspecified fall	8,312	22.4	17,221	23.2	25,533	23.0
<b>Total</b>	<b>37,036</b>	<b>100</b>	<b>74,186</b>	<b>100</b>	<b>111,222</b>	<b>100</b>

*Unspecified fall* (accounting for 23% of cases) and *Other fall on same level* (25%) were the second- and third-most common types of external cause of hospitalised fall injury in 2014–15.

Three external causes of hospitalised fall injury accounted for 4 in 5 (81%) cases (*Fall on same level from slipping, tripping and stumbling*, 34%; *Other fall on same level*, 25%; and *Unspecified fall*, 23%). Examining these selected causes of fall-related injury by age reveals increasing proportions of *Other fall on same level* (Figure 4.1). For those in the 65–69 age group, *Other fall on same level* accounted for 18% of all fall-related injuries, compared with 30% among those aged 95 and over. Conversely, the proportion of injuries due to *Fall on same level from slipping, tripping and stumbling* decreased by age group, with the largest proportions occurring among the younger age groups.



While not as large in number, falls from household objects such as *Beds* (4,688 cases), *Chairs* (3,228 cases), *Stairs and steps* (7,042 cases), and *Ladders* (1,989 cases) are preventable and comprise the next largest proportion of combined cases (15%). Figure 4.2 shows the change in the proportion of fall-related injuries caused by these objects, by age. Declines in fall-related hospitalisations due to *Ladders* and *Stairs and steps*, as a proportion of these 4 causes, were analysed by age group. For the 65–69 age group, 51% of fall-related hospitalisations involved *Stairs and steps*, decreasing to just 19% among those aged 95 and over. For the 65–69 age group, the proportion of cases due to a *Fall on or from ladder* was 28%, compared with less than 1% among those aged 95 and above. In contrast, there were increases in the proportion of fall-related hospitalisations due to falls from beds and chairs by age group. Injurious falls from beds comprised just 9% of the 4 causes in the 65–69 age group, but about half (52%) in those aged 95 and over.

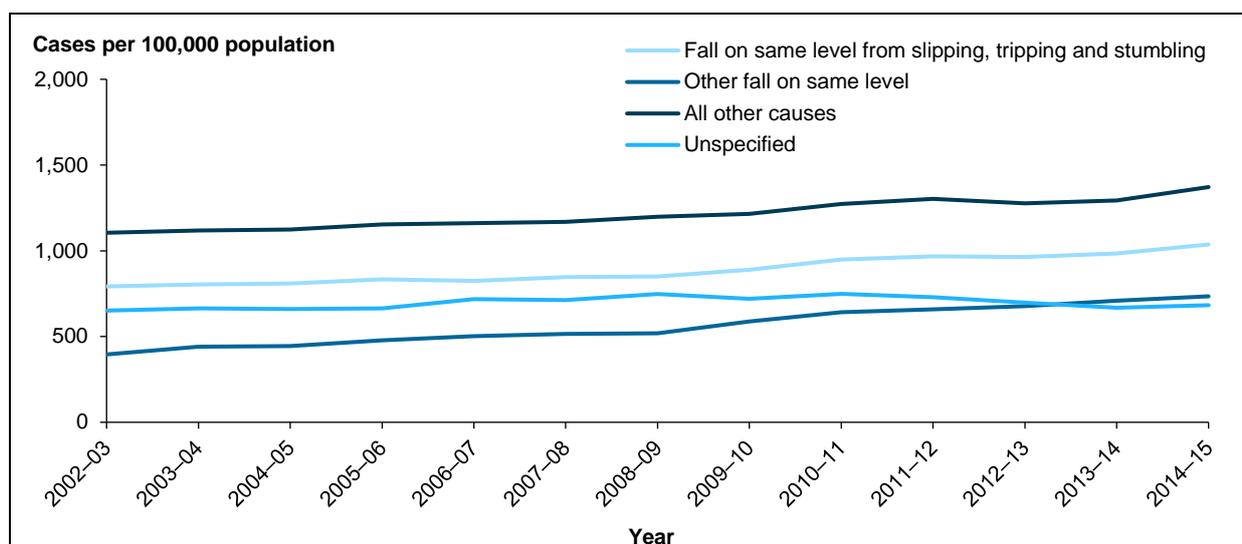


Note: Data underpinning this figure can be found in the supplementary table spreadsheet for Chapter 4.

**Figure 4.2: Additional selected causes of injury for hospitalised fall injury cases, by age group, Australia, 2014–15**

## How have the causes of fall injury cases changed over time?

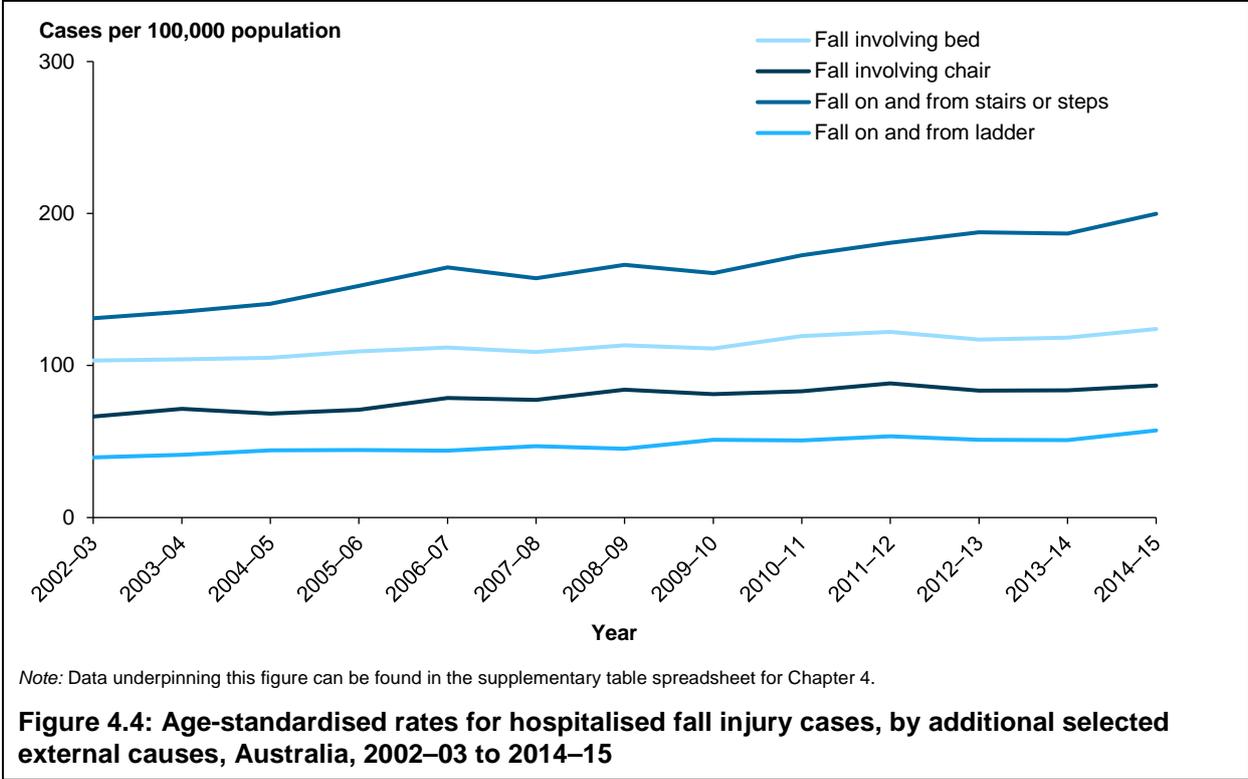
Trends in the rates for the 3 main external causes of fall injury (*Fall on same level from slipping, tripping and stumbling*; *Other fall on same level*; and *Unspecified fall*), and all other fall external causes combined, are shown in Figure 4.3. The age-standardised rate for 3 out of 4 categories of *Falls* increased over the period: the exception was cases where the external cause was *Unspecified*. The small decrease in the rate of *Unspecified* cases over recent years may account for some of the increase in more specific categories—however this was unlikely to be a major contributor.



Note: Data underpinning this figure can be found in the supplementary table spreadsheet for Chapter 4.

**Figure 4.3: Age-standardised rates for hospitalised fall injury cases, by selected external causes, Australia, 2002–03 to 2014–15**

The results of an analysis of hospitalised falls caused over time by *Beds; Chairs; Stairs and steps*; and *Ladders* can be seen in Figure 4.4. Small increases in age-standardised rates were seen for falls due to *Beds; Chairs*; and *Ladders* over the time period. Falls involving *Stairs and steps* showed the steepest increase year on year: in 2002–03, the rate of injury due to *Fall on and from stairs and steps* was 131 cases per 100,000 population, while in 2014–15 it was 200 cases per 100,000.



## 5 Place of occurrence

This chapter presents information on the place of occurrence of hospitalised falls injury in people aged 65 and over in Australia as a result of a fall in 2014–15 and over the period 2002–03 to 2014–15. Information is presented on falls that occurred in the home within the community and those that occurred in residential aged care.

A specific place of occurrence was not identified in 15% of records for fall injury cases in 2014–15 (Table 5.1). Half of all hospitalised fall injury cases involving people aged 65 and over in 2014–15 occurred in the home (57,778 cases, or 52%). The bulk of these cases were recorded as occurring in *Other and unspecified places in home* (22,935 cases, or 40%). A further 18% of falls in the home were recorded as occurring in *Outdoor areas* of the home (10,106 cases), with falls occurring in the *Bathroom* and *Bedroom* also relatively common (12% and 10% of falls in the home, respectively).

Residential aged care was the reported place of occurrence for a further 21% of hospitalised fall injury cases in 2014–15 (22,873 cases). In all, about 6 in every 7 fall injury cases with a *specified* place of occurrence were reported to have happened in either the home or an aged care facility (61% and 24% of specified places, respectively).

**Table 5.1: Place of occurrence for hospitalised fall injury cases, by sex, Australia, 2014–15**

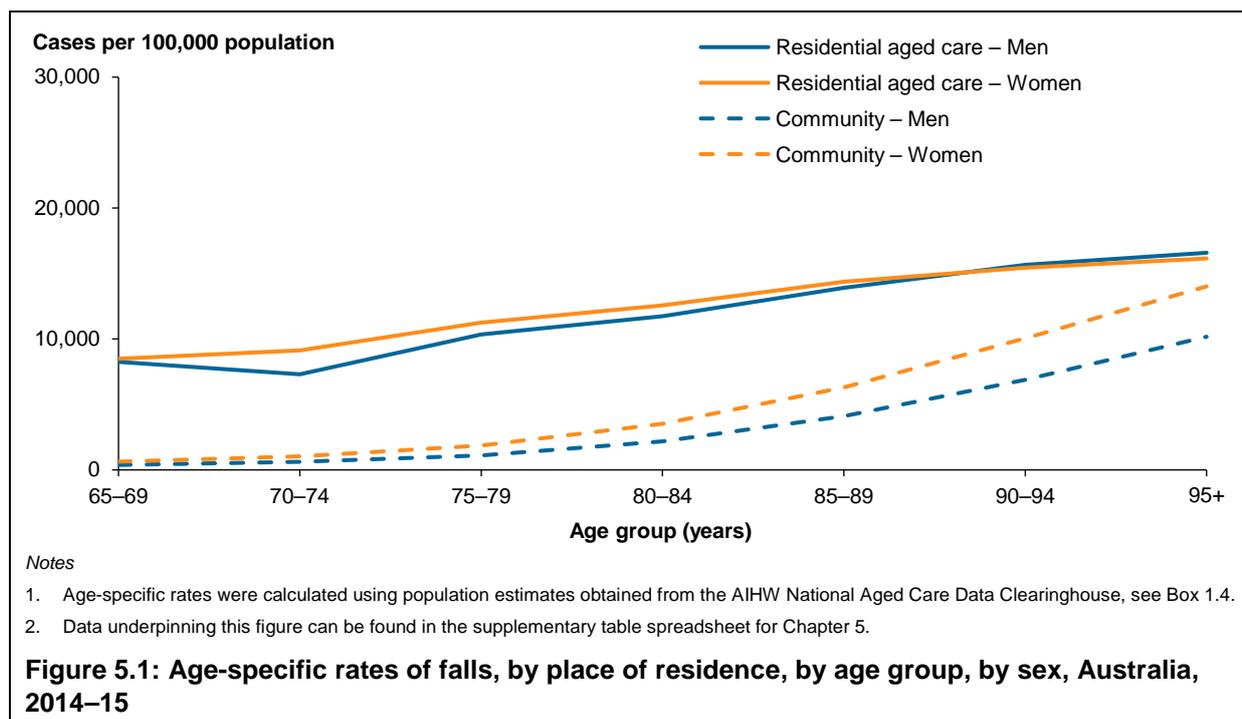
Place of occurrence	Men		Women		People	
	Count	%	Count	%	Count	%
Driveway to home	473	1.3	795	1.1	1,268	1.1
Outdoor areas	3,849	10.4	6,257	8.4	10,106	9.1
Garage	384	1.0	337	0.5	721	0.6
Bathroom	2,225	6.0	4,621	6.2	6,846	6.2
Kitchen	1,043	2.8	3,019	4.1	4,062	3.7
Bedroom	1,775	4.8	4,069	5.5	5,844	5.3
Laundry	70	0.2	293	0.4	363	0.3
Indoor living areas, n.e.c.	1,744	4.7	3,889	5.2	5,633	5.1
Other and unspecified place in home	7,442	20.1	15,493	20.9	22,935	20.6
<i>Total home</i>	<i>19,005</i>	<i>51.3</i>	<i>38,773</i>	<i>52.3</i>	<i>57,778</i>	<i>51.9</i>
Residential aged care	6,501	17.6	16,372	22.1	22,873	20.6
All other residential institution	117	0.3	215	0.3	332	0.3
<i>Total residential institution</i>	<i>6,618</i>	<i>17.9</i>	<i>16,587</i>	<i>22.4</i>	<i>23,205</i>	<i>20.9</i>
School, other institution and public administration area	752	2.0	1,403	1.9	2,155	1.9
Sports and athletics area	240	0.6	325	0.4	565	0.5
Street and highway	1,805	4.9	2,835	3.8	4,640	4.2
Trade and service area	1,396	3.8	2,670	3.6	4,066	3.7
Industrial and construction area	78	0.2	13	0.0	91	0.1
Other specified place of occurrence	929	2.6	1,436	1.9	2,365	2.1
Unspecified/not reported	6,213	16.8	10,144	13.7	16,357	14.7
<b>Total</b>	<b>37,036</b>	<b>100</b>	<b>74,186</b>	<b>100</b>	<b>111,222</b>	<b>100</b>

## Residential aged care

The estimated age-standardised rate of fall injury cases occurring in residential aged care for people aged 65 and older living in residential facilities in 2014–15 was 10,090 cases per 100,000 population, 5 times as high as the rate of falls in the home involving people aged 65 and over resident in the community (1,814 cases per 100,000 population). (Information about the calculation of rates of fall injury in residential aged care can be found in Box 1.4.)

The age-standardised rate of *Falls* by female residents of residential aged care (10,482 per 100,000 population) was somewhat higher than that for male residents (9,607 per 100,000), giving a male:female rate-ratio of 0.9. This compares to a rate of 2,170 per 100,000 for women and 1,367 per 100,000 for men resident in the community and falling at home (a male:female rate-ratio of 0.6).

The age-specific rates of fall injury cases that occurred in the home and in residential aged care in 2014–15 are presented in Figure 5.1. Unlike falls reported to have occurred in the home, the rate of hospitalised falls for the oldest men resident in residential aged care was very similar to the rate for the oldest women (16,150 per 100,000 population and 16,587 per 100,000 respectively). Rates of falls in the home by older people living in the community present a pattern very similar to that for all cases, with rates higher for women than for men, especially for the oldest age groups.

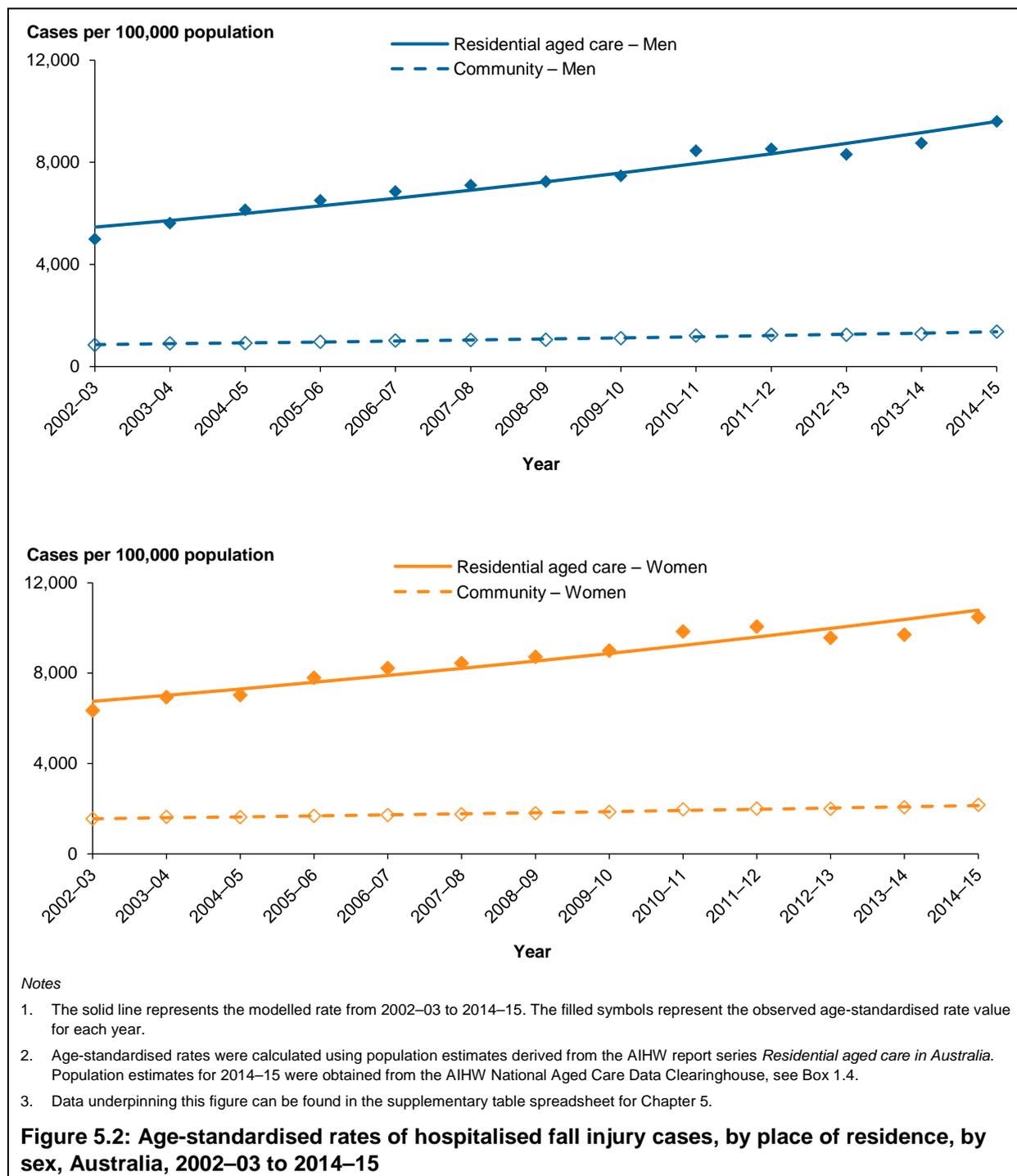


## How have the places where fall injuries occurred changed over time?

The 2 most common places of occurrence recorded for hospitalised fall injury cases for people aged 65 and over are the home and in residential aged care. Figure 5.2 presents the rates over time for fall injury cases resulting in hospitalisation that had been recorded as occurring in residential aged care or in the home.

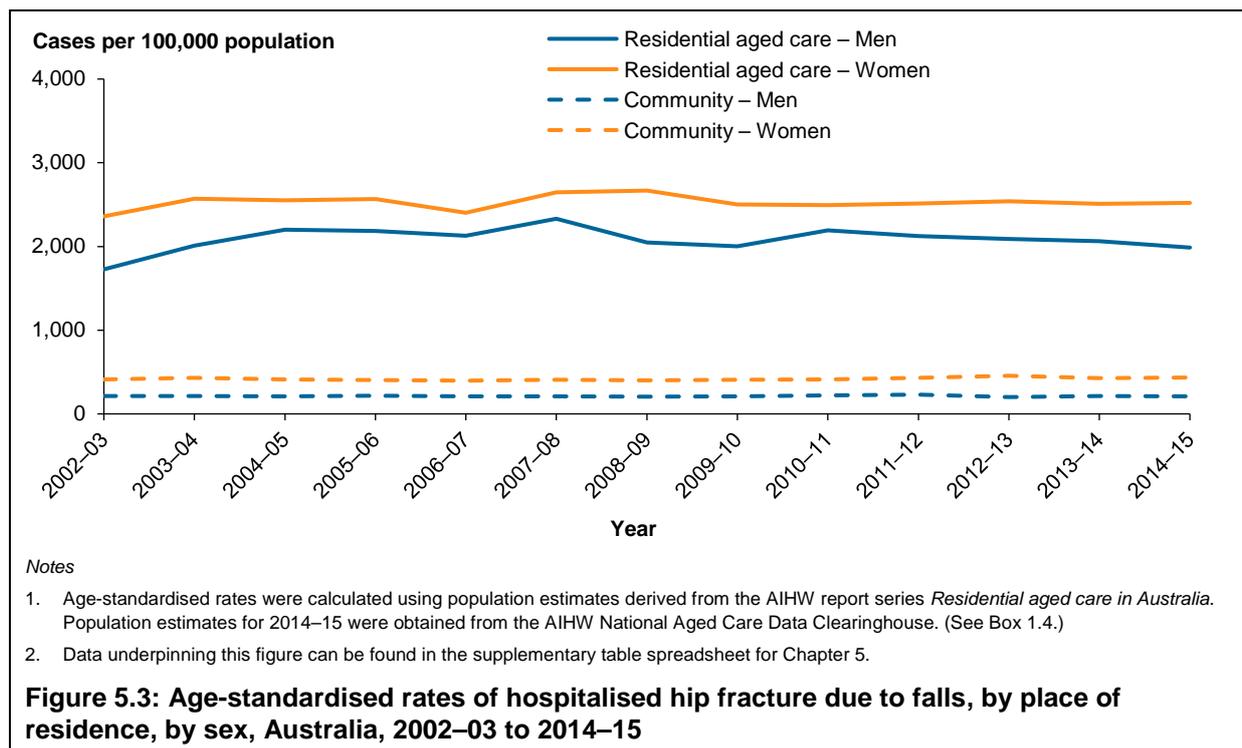
In each year of the analysis, residents of residential aged care had considerably higher rates of fall-related injury than people falling in the home, and both sets of rates increased significantly over the study period. Age-standardised rates of *Falls* for those aged 65 and over occurring in the home increased significantly between 2002–03 and 2014–15 (men: an increase of 3.9% per year, 95% CI: 3.6–4.2,  $p < 0.001$ ; women: 2.7% per year, 95% CI: 2.5–2.9,  $p < 0.001$ ). However, rates of *Falls* that occurred in an aged care facility increased faster (men: 4.8% per year, 95% CI: 4.2–5.4,  $p < 0.001$ ; women: 4.0% per year, 95% CI: 3.3–4.6,  $p < 0.001$ ).

Higher rates of fall-related injuries in residents of residential aged care are not surprising, given the higher levels of frailty in this population relative to people of the same age who remain resident in the community. The faster annual increase in rates of falls for residents of residential aged care—and the widening difference in injury risk—suggest a continuing need for interventions designed for the aged care setting.

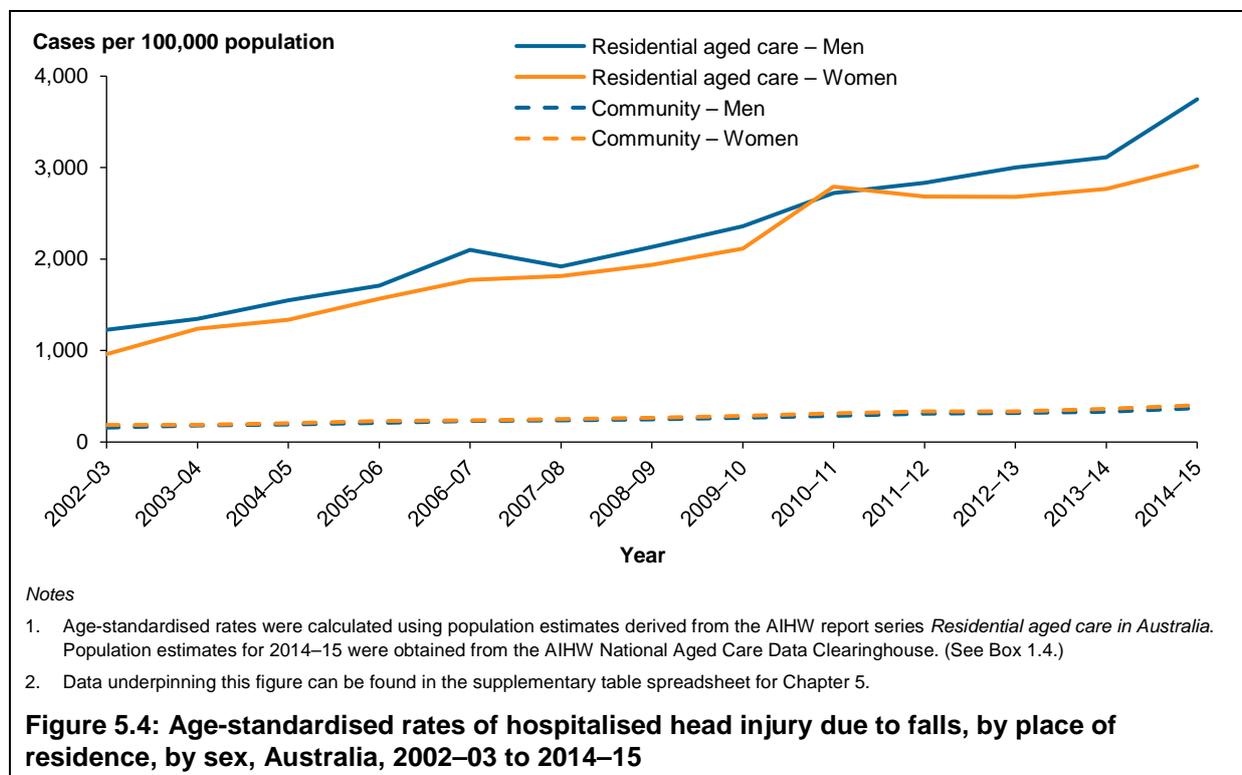


### Changes in type of injury by place over time

Rates of *Hip fractures* due to *Falls* were also much higher for residents of residential aged care than for people falling at home (Figure 5.3). Nevertheless, there were no substantial changes in rates of *Hip fracture* for either sex in either setting in the period from 2002–03.



Rates of *Head* injury due to *Falls* were much higher for residents of residential aged care than for people falling at home (Figure 5.4). Strong upward trends in rates were observed for *Head* injuries due to falls, particularly for people in residential aged care.



## Remoteness of usual residence

The rate of hospitalised fall injury cases varied with remoteness of usual residence (Figure 5.5). Typically, rates for most external causes are considerably higher for *Remote* and *Very remote* zones (AIHW: Pointer 2015). In contrast, age-adjusted rates of fall-related injury vary less across remoteness areas and are higher in *Major cities*. Due to small case numbers, remoteness of usual resident categories *Remote* and *Very remote* have been combined. The rate for residents of *Major cities* (3,213 per 100,000 population) was higher, compared with each other region.

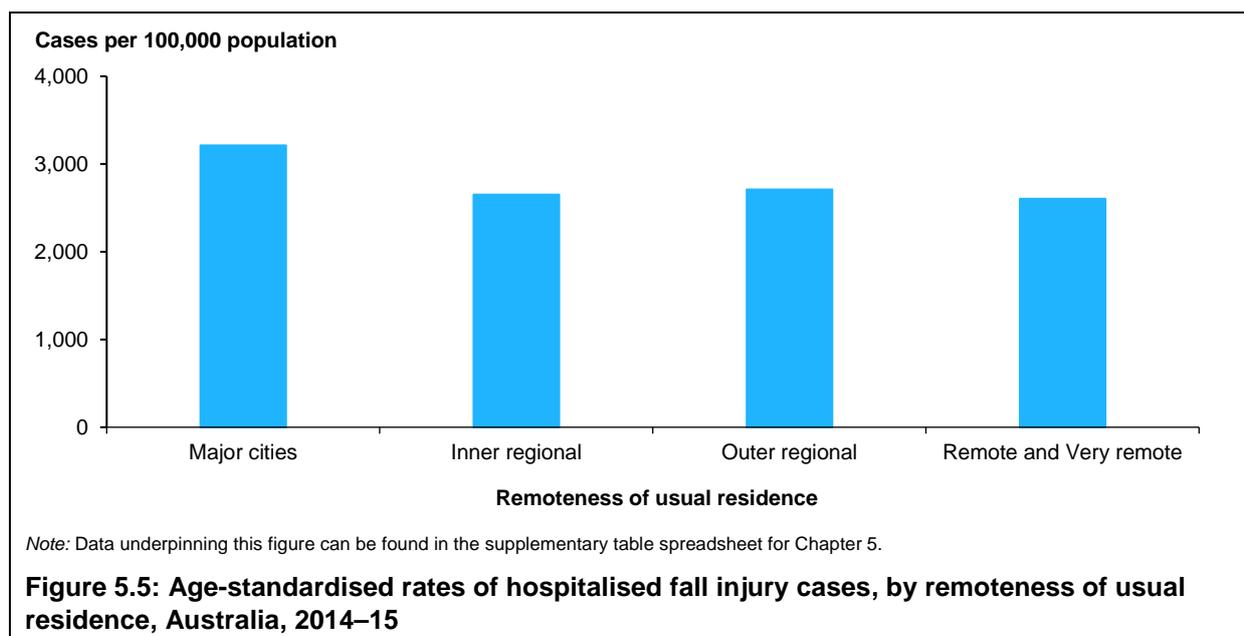


Figure 5.6 presents rates of *Hip fracture* due to *Falls* in older people, by remoteness of residence. There was little variation by remoteness of usual residence, with the highest rate of *Hip fracture* cases observed for residents of *Outer regional* areas (546 per 100,000 population).

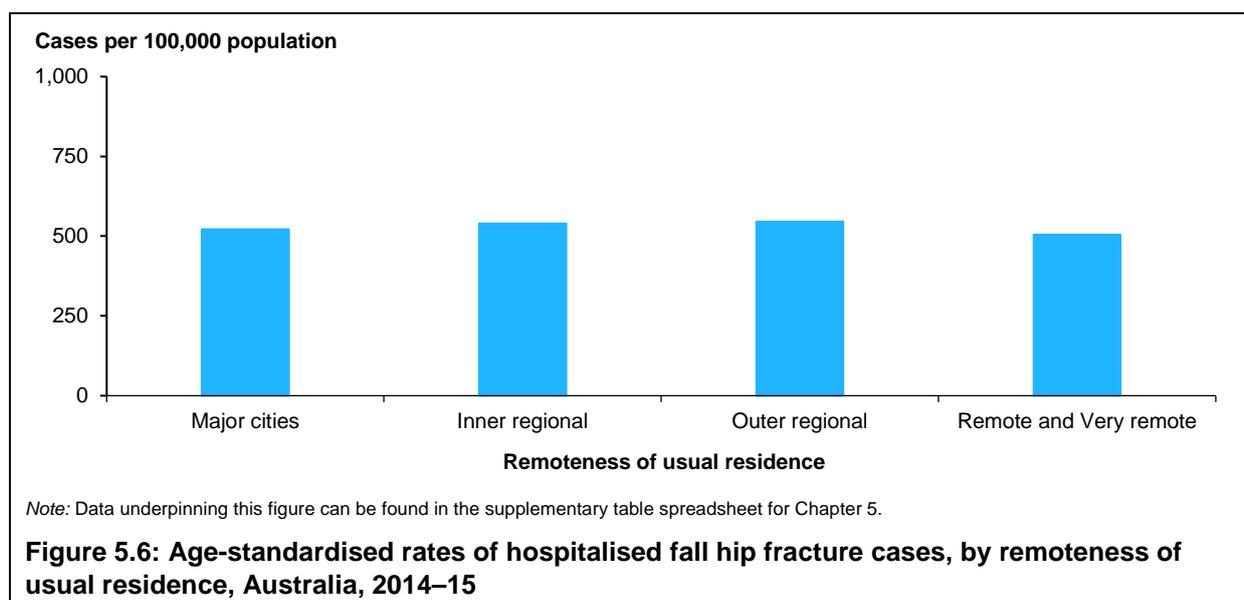
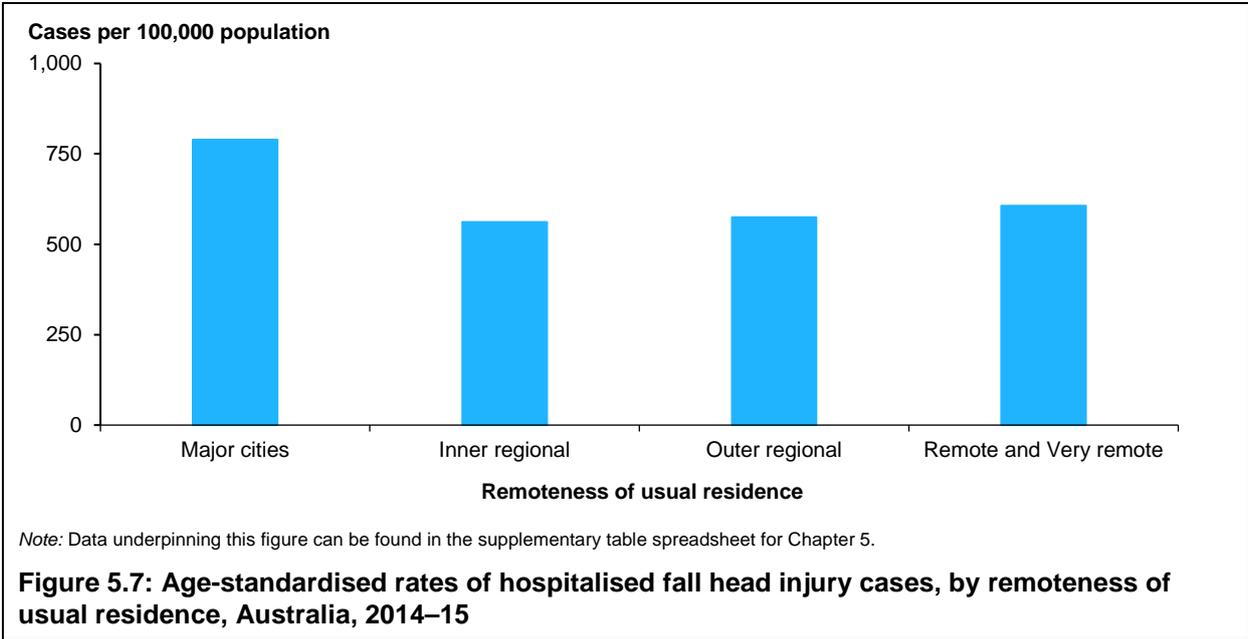


Figure 5.7 shows that the pattern for *Head* injuries due to *Falls* in 2014–15 was similar to that for all types of fall-related cases, in that the highest rate of *Head* injury due to *Falls* cases was observed for residents of *Major cities* (789 per 100,000 population).



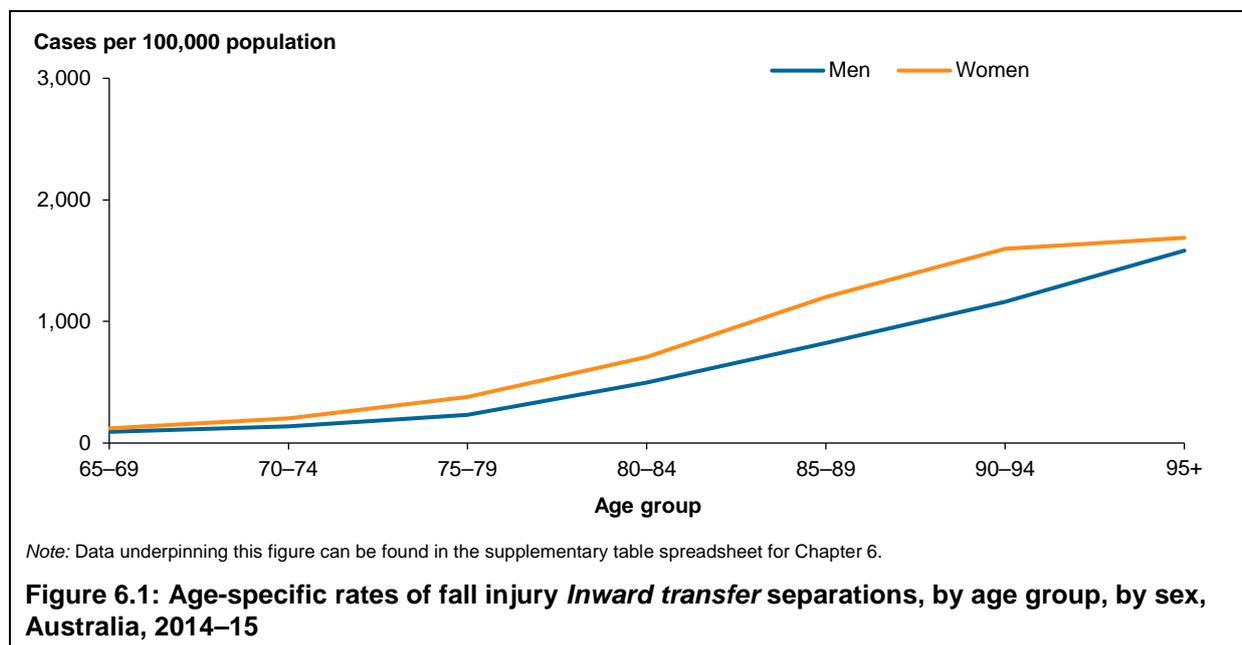
## 6 Additional episodes of hospital care due to falls by older people

The previous chapters described numbers and rates of cases of hospitalised injury due to *Falls* in older people, based on the initial hospitalisation for each person having a fall. Many cases involve transfers between hospitals and follow-up care. This represents additional care of older people who have sustained injuries due to *Falls*, rather than additional cases. These types of fall-related hospital care are the subject of this chapter.

### Fall injury inward transfer separations

A total of 12,946 fall injury *Inward transfer* separations were identified for the 2014–15 study period. These transfers occurred at an age-standardised rate of 354 separations per 100,000 population, about the same as that reported for previous years. As for fall injury cases, these *Inward transfer* separations occurred at a higher rate for women (409 per 100,000) than for men (283 per 100,000), with women accounting for 67% (8,611) of all fall injury *Inward transfer* separations.

Age-specific rates of fall injury *Inward transfer* separations were similar for men and women by age group (Figure 6.1). Rates were higher among the older age groups with the highest rates for men and women aged 95 or over (1,583 separations per 100,000 population and 1,688 separations per 100,000 population, respectively).

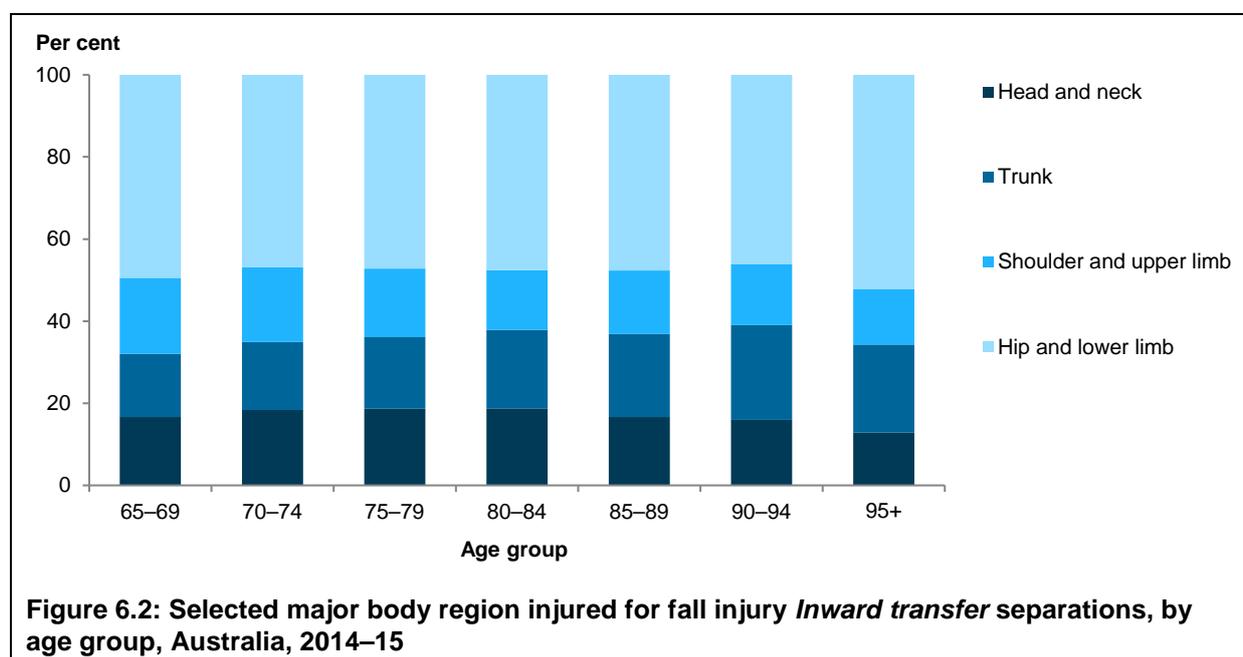


Over a third of fall injury *Inward transfers* were injuries to the *Hip and thigh*, a much higher proportion than for all fall injury cases (34% of *Inward transfer* separations, see Table 6.1). *Head* injuries were a relatively common principal diagnosis for *Inward transfers*; however they accounted for a much lower proportion than they did for fall injury cases (14% versus 24% respectively). *Head injuries* accounted for a larger proportion of *Inward transfer* separations among men (20%), compared with women (11%).

**Table 6.1: Body region injured for fall injury *Inward transfer* separations, by sex, Australia, 2014–15**

Body region injured by principal diagnosis	Men		Women		People	
	Count	%	Count	%	Count	%
Head	834	19.2	920	10.7	1,754	13.5
Neck	200	4.6	206	2.4	406	3.1
Thorax	381	8.8	465	5.4	846	6.5
Abdomen, lower back, lumbar spine and pelvis	486	11.2	1,057	12.3	1,543	11.9
Shoulder and upper arm	319	7.4	907	10.5	1,226	9.5
Elbow and forearm	157	3.6	588	6.8	745	5.8
Wrist and hand	87	2	103	1.2	190	1.5
Hip and thigh	1,339	30.9	3,107	36.1	4,446	34.3
Knee and lower leg	432	10	1,052	12.2	1,484	11.5
Ankle and foot	37	0.9	109	1.3	146	1.1
Other, multiple and incompletely specified body regions	10	0.2	24	0.3	34	0.3
Injuries not described in terms of body region	53	1.2	73	0.8	126	1
<b>Total</b>	<b>4,335</b>	<b>100</b>	<b>8,611</b>	<b>100</b>	<b>12,946</b>	<b>100</b>

An analysis of body region injured, by age, for fall injury *Inward transfer* separations is shown in Figure 6.2. There was very little difference by age other than a slightly higher proportion of *Hip and lower limb* injuries among the oldest group.

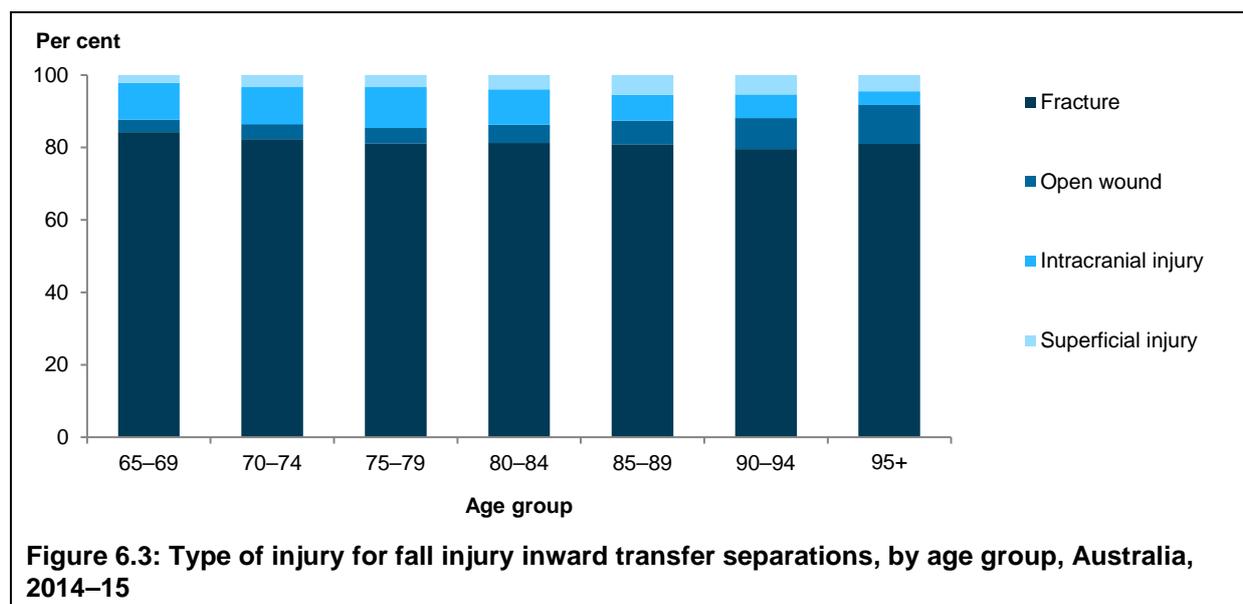


About three-quarters (73%) of all fall injury *Inward transfer* separations involved a *Fracture* (Table 6.2), which accounted for the largest proportion of injuries for both men (63%) and women (77%), although the proportion of women with a *Fracture* was slightly higher. *Intracranial injury* (8%) and *Open wound* (5%) were the next most common injuries associated with fall injury *Inward transfer* separations.

**Table 6.2: Type of injury for fall injury *Inward transfer* separations, by sex, Australia, 2014–15**

Type of injury	Men		Women		People	
	Count	%	Count	%	Count	%
Fracture	2,750	63.4	6,653	77.3	9,403	72.6
Dislocation	49	1.1	98	1.1	147	1.1
Soft-tissue injury	118	2.7	139	1.6	257	2.0
Open wound	283	6.5	385	4.5	668	5.2
Intracranial injury	563	13.0	447	5.2	1,010	7.8
Internal organ or vessel of trunk	62	1.4	47	0.5	109	0.8
Burn	0	0.0	0	0.0	0	0.0
Superficial injury	162	3.7	324	3.8	486	3.8
Poisoning or toxic effect	0	0.0	0	0.0	0	0.0
Other specified nature of injury	151	3.5	198	2.3	349	2.7
Unspecified nature of injury	197	4.5	320	3.7	517	4.0
<b>Total</b>	<b>4,335</b>	<b>100</b>	<b>8,611</b>	<b>100</b>	<b>12,946</b>	<b>100</b>

Figure 6.3 shows that *Fractures* among fall injury *Inward transfers* varied little by age. Diagnoses of *Intracranial injury* were more common for younger age groups, while principal diagnoses of *Open wound* and *Superficial injury* were more common for older age groups.



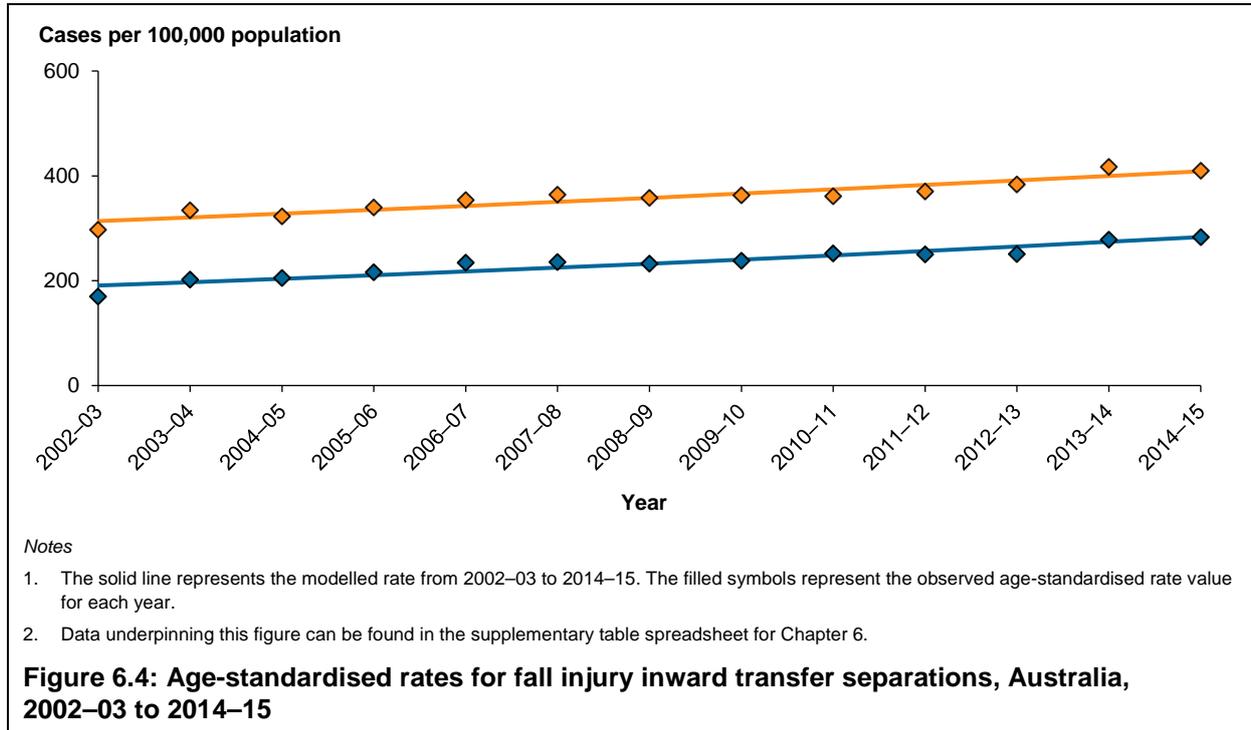
**Figure 6.3: Type of injury for fall injury inward transfer separations, by age group, Australia, 2014–15**

As for fall injury cases, the vast majority of *Inward transfers* were attributed to 3 external causes: *Fall on same level from slipping, tripping and stumbling* (30% of *Inward transfer* separations); *Other fall on same level* (21%); and *Unspecified fall* (32%) (data not shown).

## How have fall injury inward transfer separations changed over time?

Age-standardised rates of fall injury *Inward transfer* separations were observed to have significantly increased over the period to June 2015 (Figure 6.4). The rate of fall injury

Inward transfer separations for men increased by a greater magnitude (3.3% per year, 95% CI: 2.7–4.0,  $p < 0.001$ ) than for women (2.2%, 95% CI: 1.8–2.7,  $p < 0.001$ ).

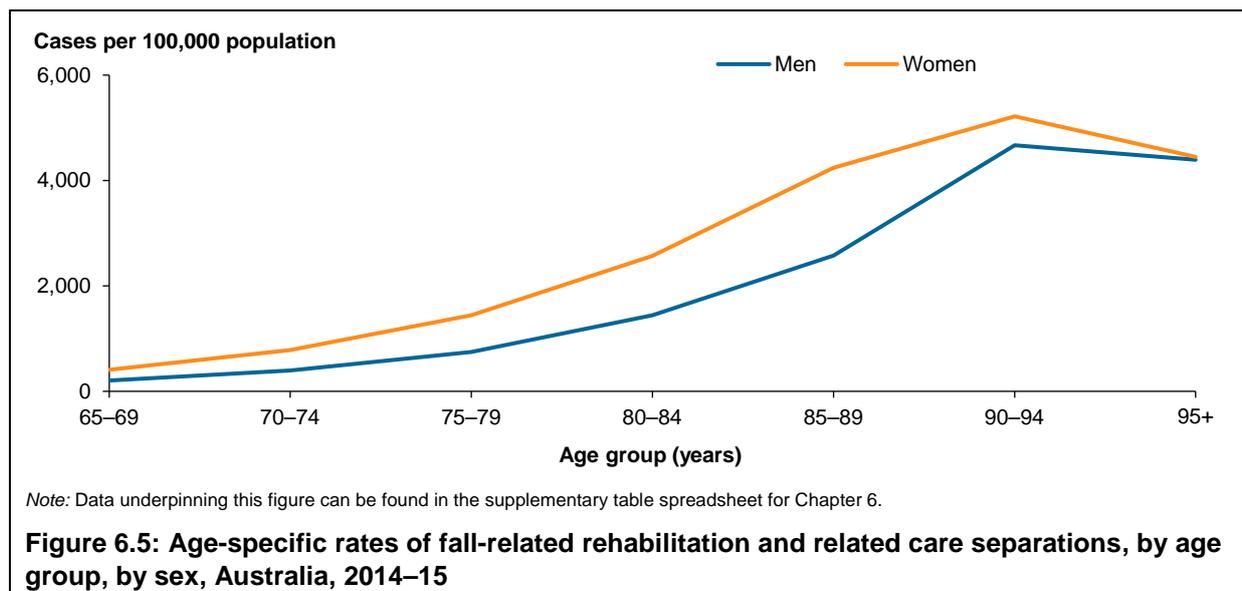


## Fall-related rehabilitation and related care separations

Many fall injury cases require rehabilitation and related care. This aspect of hospital care is typically recorded in a different separation record to the acute care phase. Many are coded with a principal diagnosis from ICD-10-AM Chapter 21: 'Factors influencing health status and contact with health services'. We class separations having 1 of 4 specific Chapter 21 principal diagnoses—as well as an *Injury* additional diagnosis, and a *Fall* external cause—as being hospital care related to an injurious fall (see Appendix A: Data issues). These *Fall-related rehabilitation and related care separations* must be included for an accurate assessment of the admitted patient care provided due to fall-related injury.

More than 40,000 *Fall-related rehabilitation and related care* separations were identified for people aged 65 and over in 2014-15 (43,559). These 43,559 *Fall-related rehabilitation and related care* separations represented 1% of all hospital separations for the older population in 2014-15, and nearly three-quarters involved women (30,337 separations, or 70%). Most *Fall-related rehabilitation and related care* separations (38,758 separations, or 89%) had a principal diagnosis of Z50 *Care involving use of rehabilitation procedures*.

The age-standardised rate of *Fall-related rehabilitation and related care* separations was 1,197 separations per 100,000 population. The age-standardised rate for women (1,465 separations per 100,000) was much higher than that for men (867 per 100,000). Figure 6.5 shows that, as with most other types of fall-related hospital care, age-specific rates of *Fall-related rehabilitation and related care* separations in 2014-15 increased considerably with age, for both men and women, until very old age.



## How have fall-related rehabilitation and related care separations changed over time?

Age-standardised rates of *Fall-related rehabilitation and related care separations* increased significantly over the period to June 2015 (Figure 6.6). The rate of increase of *Fall-related rehabilitation and related care separations* was twice that of fall-related *Inward transfer separations*. For men, the rate of *Fall-related rehabilitation and related care separations* increased by 7.1% per year (95% CI: 5.3-8.9,  $p < 0.001$ ), while the increase for women was 6.4% per year (95% CI: 4.7-8.1,  $p < 0.001$ ).

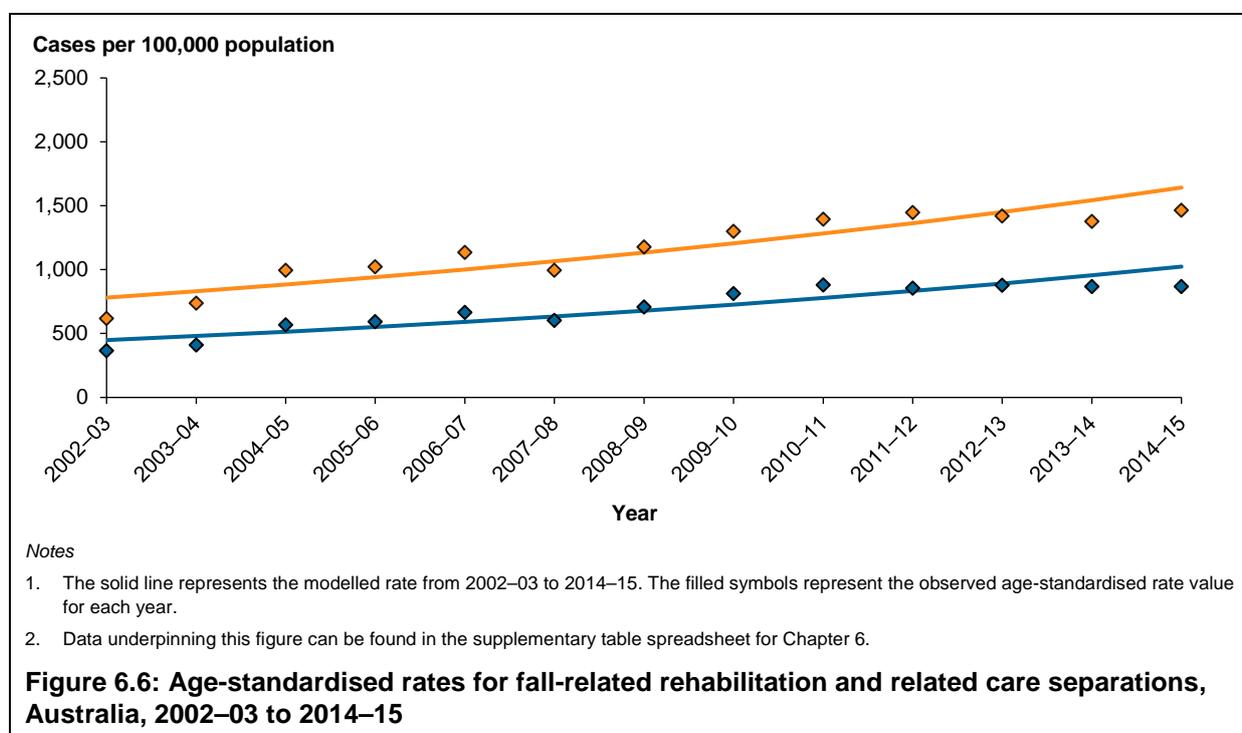
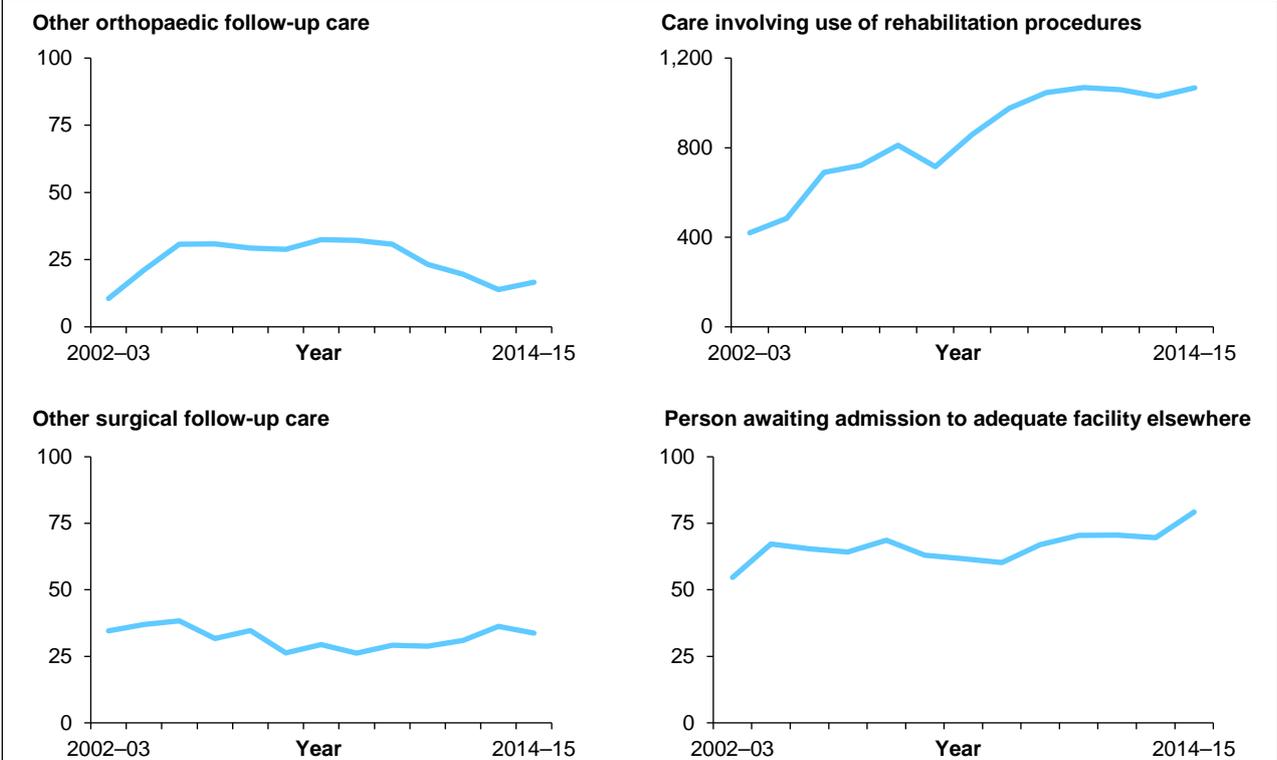


Figure 6.7 shows the age-standardised rates for *Fall-related rehabilitation and related care separations*, by each of the main principal diagnoses over the period. A major contributor to the substantial increase for *Fall-related rehabilitation and related care separations* seen above was the increasing rate of those records with a principal diagnosis of Z50 *Care involving use of rehabilitation procedures*.



- Notes
1. For each chart, the y-axis represents separations per 100,000 population.
  2. Data underpinning this figure can be found in the supplementary table spreadsheet for Chapter 6.

**Figure 6.7: Age-standardised rates for fall-related rehabilitation and related care separations, by principal diagnosis, Australia, 2002-03 to 2014-15**

We caution against interpreting the rises in rates shown in the previous figures as necessarily representing more admitted patient care for fall-related injuries on hospitals. They could be due to more complete recording of when episodes of follow-up care are related to falls. That is, what may be increasing is the number of separations per fall event (more transfers and more—or more identifiable—episodes of follow-up care), whereas overall length of stay for fall-related injuries may remain similar over time. Without person-linked data, it is difficult to investigate patterns of admitted patient episodes per case; however, information on trends in length of stay is provided in the next section.

## Length of stay

About one and a half million (1,470,663) patient days were required for hospital care related to injurious falls (that is, fall injury cases, *Inward transfers* and *Fall-related rehabilitation and related care* separations) by people aged 65 and over in 2014–15 (Table 6.3). This figure represents 11% of all patient days for people aged 65+ in 2014–15.

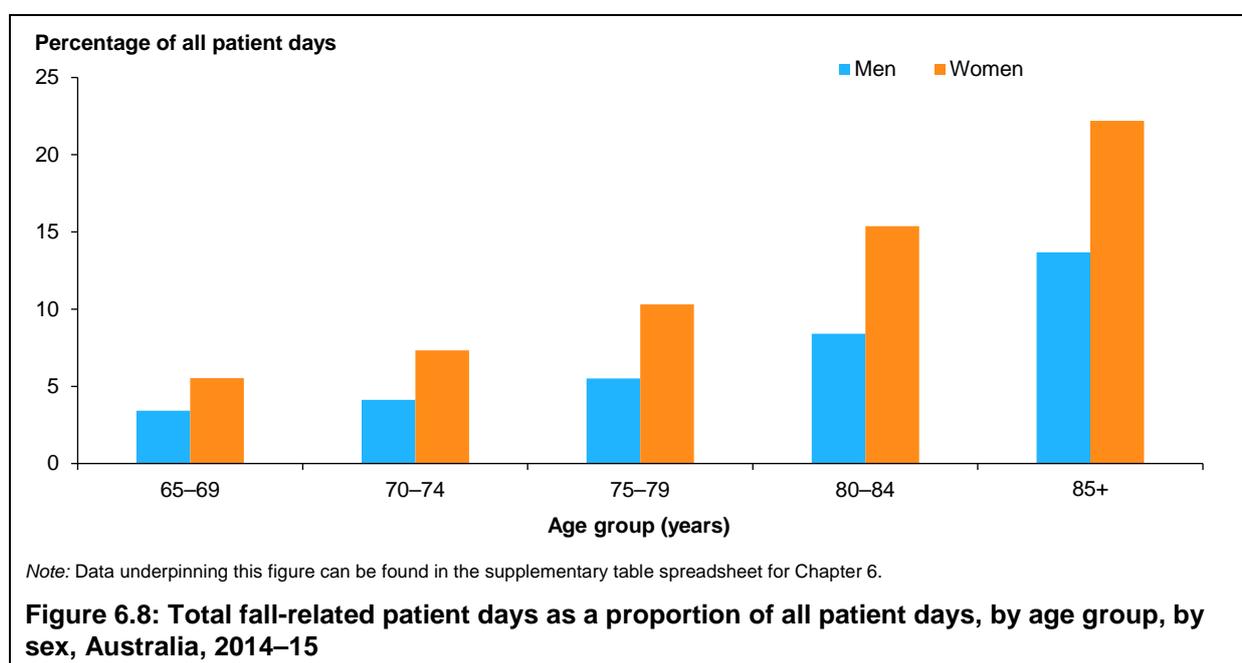
**Table 6.3: Total patient days for fall-related hospitalisations, by sex, Australia, 2014–15**

Type of fall-related hospitalisation	Men	Women	People	% of fall-related	% of all patient days 65+(a)
Fall injury cases	209,363	426,254	635,617	43.2	4.5
Fall injury inward transfer separations	55,035	111,083	166,118	11.3	1.2
Fall-related rehabilitation and related care separations	218,138	450,790	668,928	45.5	4.8
<b>Total fall-related hospitalisations</b>	<b>482,536</b>	<b>988,127</b>	<b>1,470,663</b>	<b>100</b>	<b>10.5</b>

(a) Patient days for total episodes due to all causes at ages 65+

Data source: Australian hospital statistics 2014–15 (AIHW 2016).

The patient days for fall-related separations in 2014–15, as a proportion of all patient days for any cause, increased with age for both men and women (Figure 6.8). For people aged 85 and over, fall-related separations accounted for nearly one-fifth of the total number of patient days for this age group (19%). Differences were evident by sex, with much higher proportions of patient days attributed to injurious falls among women in 2014–15.



## Total mean length of stay

As described above, this report considers 3 groups of hospital separations that contribute to the admitted patient care provided due to a fall-related injury: fall injury *Inward transfers* and *Fall-related rehabilitation and related care* episodes are typically preceded by an initial episode for *Acute care of a fall injury* case. Accordingly, a valid estimate of the average total

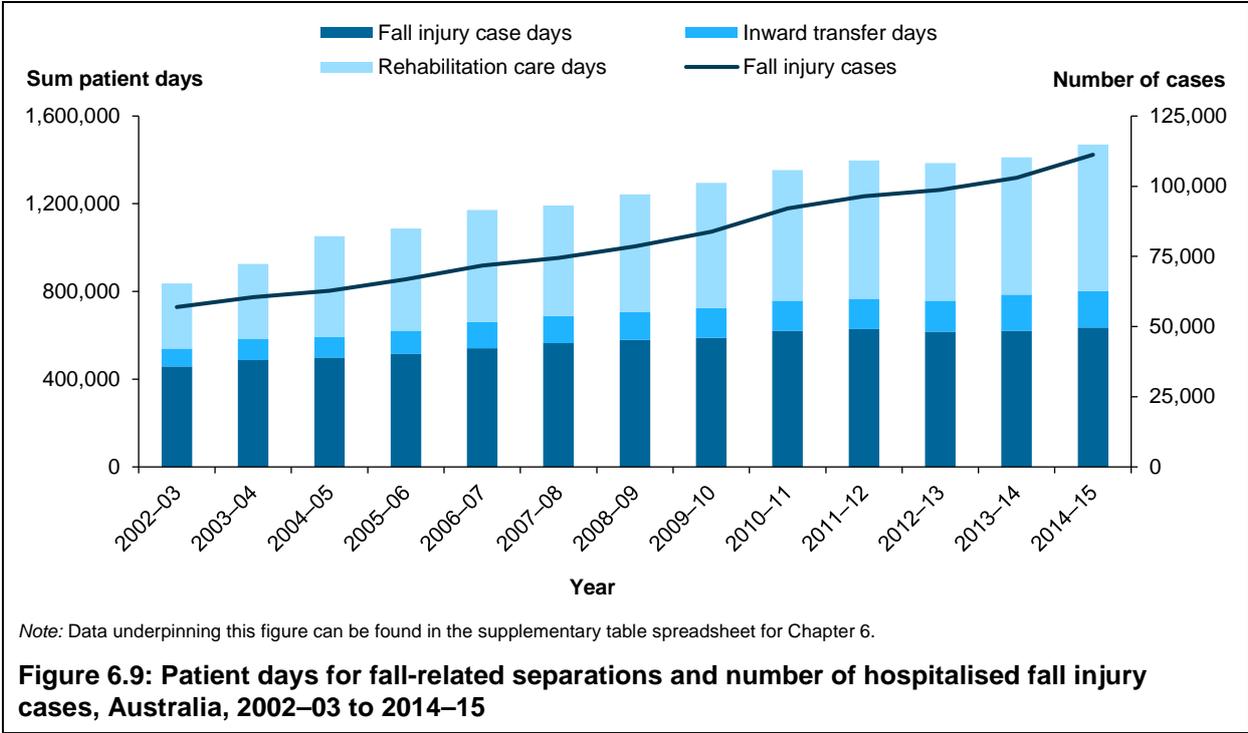
duration of hospital care for admitted incidents of fall-related injury should include the patient days for all 3 of these types of record. That is, a mean total length of stay may be calculated by dividing the sum number of patient days reported for fall-related separations by the number of cases for the period. On this basis, the estimated total mean length of stay for fall injury cases in 2014–15 (111,222 cases) was 13 days.

### How has length of stay for fall injury changed over time?

The number of patient days for all hospital care attributable to fall-related injury (that is, fall-related cases, transfers and follow-up care) increased substantially over the 13 years 2002–03 to 2014–15 (Figure 6.9). Commensurate with the increasing numbers of cases, all fall-related hospital care increased, from 837,042 patient days in 2002–03 to 1,470,663 patient days in 2014–15.

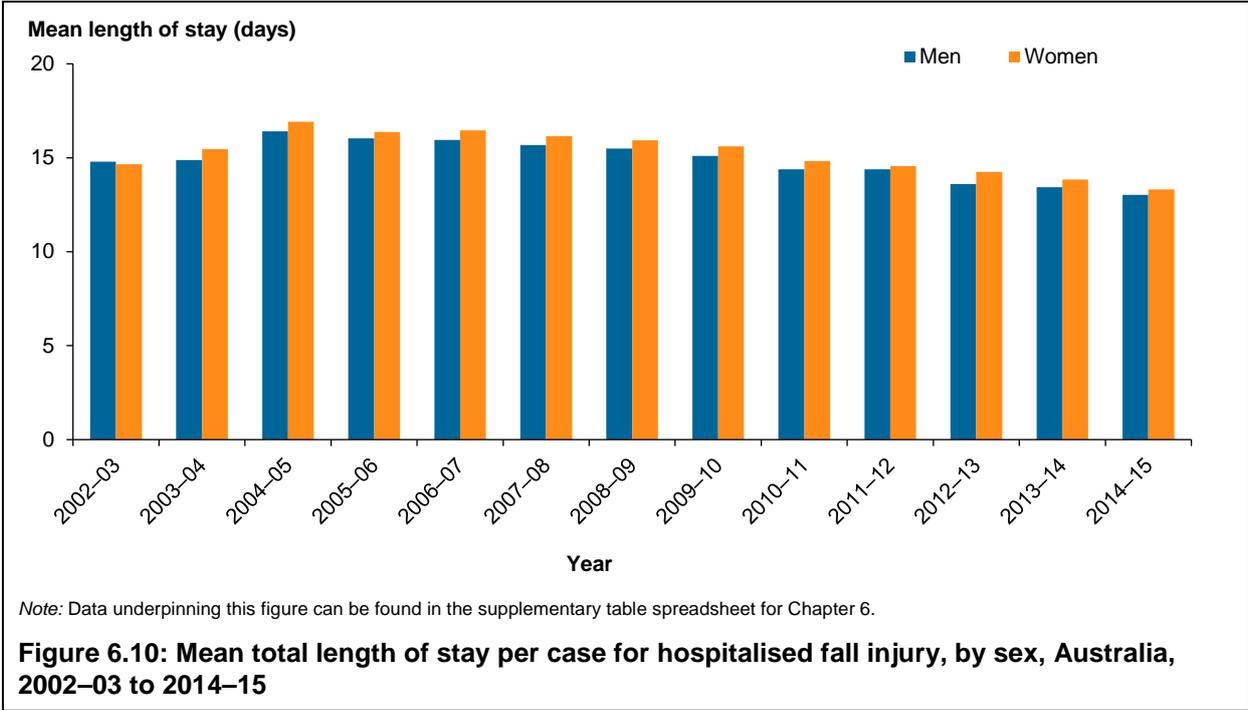
The initial episode of admitted patient care for each fall injury case accounted for 55% of fall-related patient days in 2002–03. This proportion fell during the study period to 43% in 2014–15 because of marked increases in the number of patient days due to *Fall-related rehabilitation and related care* separations.

The annual number of patient days for fall injury cases was 457,518 patient days in 2002–03, rising to 635,617 patient days in 2014–15, an increase of about one-third. The annual number of patient days for fall injury *Inward transfer* and *Fall-related rehabilitation and related care* separations more than doubled over the 11-year study period, however. Fall injury *Inward transfers* accounted for 82,917 patient days in 2002–03, compared with 166,118 patient days in 2014–15, while *Fall-related rehabilitation and related care* accounted for 296,607 patient days in 2002–03, compared with 668,928 patient days in 2014–15.



More *Fall* cases were hospitalised in each year over the 13 years 2002–03 to 2014–15 and many more patient days were provided, in aggregate, for the care for these injuries. However, this is not to say that each fall injury case required an increasing level of hospital care (that is, a longer stay in hospital) over the study period.

Figure 6.10 shows that the estimated mean total length of stay per case (all patient days attributable to *Falls*, divided by the number of cases for the year) was very similar, for both men and women, at the beginning of the study period as at the end. For men and women together, this was a mean of 14.7 days per case in 2002–03 and 13.2 days per case in 2014–15. There has been a gradual decline in mean total length of stay over the period for both men and women. The change in the mix of types of *Fall* injuries observed over the study period may have been a factor in the decrease in length of stay for an increasing rate of hospitalised fall injury.



# Appendix A: Data issues

## Data sources

The data on hospital separations were from the Australian Institute of Health and Welfare's (AIHW) National Hospital Morbidity Database (NHMD). Comprehensive information on the quality of the data for 2014–15 is available in *Australian hospital statistics 2014–15* (AIHW 2016) and the data quality statement below. Nearly all fall injury cases admitted to hospitals in Australia are thought to be included in the NHMD data reported.

In 2014–15, diagnoses and external causes of injury were recorded using the 8th edition of the *International statistical classification of diseases and related health problems, 10th revision, Australian modification* ICD-10-AM (NCCC 2012). It comprises classifications of diseases and external causes of injuries and poisoning, based on the World Health Organization's version of ICD-10.

Data covering the period 2002 to 2015 were coded according to 8 editions of the ICD-10-AM. Changes across the ICD-10-AM over the revisions have not impacted on the analysis overall. Where analyses have been limited to specific editions of the ICD-10-AM, due to changes to the coding, this has been noted within the text.

The ICD-10-AM classification is hierarchical, with 19 disease chapters which are divided into a large number of more specific disease groups (represented by 3-character codes). Chapter 19 provides codes for injury conditions, such as *Fracture of neck of femur*. External causes of morbidity and mortality comprise Chapter 20 of the ICD-10-AM and are used in conjunction with injury diagnoses to describe the mechanism of injury (for example, injury due to a transport crash or, as in this report, injury due to a fall) and the role of human intent (for example, unintentional injuries or intentional self-harm).

Denominators for most age-specific and age-standardised rates are estimated resident population (ERP) values as at 31 December of the relevant year. Australian ERPs for 30 June 2001 (persons, by 5-year age groups, concluding with the same oldest group present in the population denominator data) were used as the standardising population throughout the report. Data from other sources, mostly based on ERPs, were used as denominators for rates by remoteness of usual residence, Indigenous status and residence in residential aged care (see 'Rates', below).

## Selection criteria

This report describes the incidence of fall-related injuries newly occurring in the older Australia population and which resulted in admission to a hospital (*Fall* injury cases). For some purposes, particularly concerning length of stay and total patient days, several other types of fall-related separation records warrant attention. This section describes the criteria that were used to select NHMD records to achieve these purposes.

## Period

This report is restricted to admitted patient episodes that ended in the period 1 July 2014 to 30 June 2015 for the single-year analyses and admitted patient episodes that ended in the period 1 July 2002 to 30 June 2015 for the multi-year trend analyses.

## Fall cases

Fall injury cases were defined as all NHMD records that met all of the following 4 criteria:

- The patient was aged 65 or older when admitted.
- The principal diagnosis was in the range S00–T75 or T79, which includes all of the ICD-10-AM *Injury* chapters except ‘Complications of surgical and medical care, not elsewhere classified’; ‘Adverse effects, not elsewhere classified’; and ‘Sequelae of injuries, of poisoning and of other consequences of external causes’.
- The first-reported external cause code was in the range W00–W19 *Falls*.
- The mode of admission was not a transfer from another hospital.

Selection has been based on principal diagnosis because this refers to the condition ‘chiefly responsible for occasioning the episode of admitted patient care’ (AIHW 2016). The first-reported external cause code was chosen as a selection criterion, as this is most likely to be related to the principal diagnosis.

## Inward transfer separations

Fall injury *Inward transfers* were defined as all NHMD records that met all of the following 4 criteria:

- The patient was aged 65 or older when admitted.
- The principal diagnosis was in the range S00–T75 or T79.
- The first-reported external cause code was in the range W00–W19 *Falls*.
- The mode of admission was a transfer from another hospital.

Fall injury *Inward transfer* separations are not included in estimates of the number of older people who sustained a serious injury due to a fall because, as inward transfers from one acute hospital to another, they probably represented a second episode of admitted patient care following an initial episode of admitted patient care for a particular fall injury event. The inclusion of these records in case counts would be likely to lead to over-counting.

*Inward* transfer separations were analysed separately from cases, but included in measures of patient days and length of stay due to fall-related injuries.

## Fall-related rehabilitation and related care separations

It is likely that many separations following an episode of admitted patient care recognisable as an injury case are coded with a principal diagnosis from ICD-10-AM Chapter 21: ‘Factors influencing health status and contact with health services’, particularly for older people with fall injuries. Most such separations are coded as Z50 *Care involving use of rehabilitation procedures*. Rehabilitation episodes in hospital can be identified using the Hospital Service Care Type indicator (METeOR identifier: 584408). In this instance, we have chosen to use ‘principal diagnosis’ to identify rehabilitative care, in order to encompass a somewhat broader group of separations. Such separations contribute a non-trivial proportion of hospital care due to falls by older people.

In this report, *Fall-related rehabilitation and related care* separations were defined as all NHMD records that met all of the following 4 criteria:

- The patient was aged 65 or older when admitted.

- The principal diagnosis was Z47 (*Other orthopaedic follow-up care*), Z48 (*Other surgical follow-up care*), Z50 (*Care involving use of rehabilitation procedures*) or Z75.1 (*Person awaiting admission to adequate facility elsewhere*).
- At least 1 additional diagnosis was in the range S00–T75 or T79.
- At least 1 external cause code was in the range W00–W19 *Falls*.

### **‘Other fall-related’ separations**

The NHMD contains other records, not meeting the criteria for fall-related cases, *Inward transfers* or *Fall-related rehabilitation and related care*, which include 1 or more external cause codes in the range W00–W19 *Falls*, as well as 1 or more injury diagnoses in the range S00–T75 or T79. The role of the injurious fall in bringing about the episode in hospital is less clear for this type of record than for the types defined above and, as such, analysis of these separations is presented in ‘Appendix B: Falls as additional diagnoses’ rather than in the body of the report.

These *Other fall-related* separations are defined as all NHMD records that met all of the following 4 criteria:

- The patient was aged 65 years or older when admitted.
- Additional diagnosis was in the range S00–T75 or T79.
- Any external cause code was in the range W00–W19 *Falls*.
- The record did not satisfy the criteria for *Fall injury case*, *Inward transfer* or *Fall-related rehabilitation and related care* separations.

### **‘Tendency to fall’ separations**

Also presented in ‘Appendix B: Falls as additional diagnoses’ is analysis of separations containing the diagnosis code R29.6 *Tendency to fall, not elsewhere classified*. The ICD-10-AM has included the diagnosis code R29.6 since 1 July 2006, replacing the R29.81 *Other and unspecified symptoms and signs involving the nervous and musculoskeletal systems—falls* code used in earlier editions of the classification (NCCC 2012). The coding standard for R29.6 describes the ‘tendency to fall because of old age or other unclear health problems’, (NCCC 2012). Falls due to difficulty in walking, dizziness and giddiness, syncope and collapse or causing injury are explicitly excluded. Further, the coding standards specify that R29.6 should not be applied in cases of known injury or when a medical condition is found to be the cause of the falls. Nevertheless, a relatively small number of records containing *Fall injury* codes (for example, *Fall injury case* separations, *Fall-related rehabilitation and related care* separations) also contain code R29.6 as an additional diagnosis (13,195 in 2014–15). To avoid double-counting, we have omitted records already included elsewhere in the report from the analysis of *Tendency to fall* separations presented in ‘Appendix B: Falls as additional diagnoses’.

In this report, ‘tendency to fall’ separations were defined as all NHMD records that met all of the following 3 criteria:

- The patient was aged 65 years or older when admitted.
- Any diagnosis variable contained an R29.6 code.
- The separation was not classed as a *Fall injury case*, *Inward transfer*, *Fall-related rehabilitation and related care* or *Other fall-related* separation.

## Estimating incident cases

Each record in the NHMD refers to a single episode of admitted patient care in a hospital. Some fall 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 1 hospital, then transferred to another
- a person has an episode of admitted patient 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 the 'same fall' injury case to be recognised as such. Hence, there is potential for some cases to be counted more than once when 2 or more NHMD records are 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 to estimate fall injury cases in this report makes use of the *Mode of admission* variable, which indicates whether the episode of admitted patient care commenced 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 meets the selection criteria for *Fall* injury cases, so are omitted from our estimates of case counts.

This procedure should largely correct for overestimation of cases due to the double-counting of transfers, but will not correct for overestimation that is due to re-admissions.

## Length of stay

Older people who have been injured as a result of a fall often require long stays in hospitals, frequently involving more than 1 episode of admitted patient care. Analyses restricted to incident cases (the first admission to hospital after a fall and the focus of the first part of this report) do not fully account for the extent of admitted patient health-service utilisation among this group. Multiple episodes of admitted patient care for a single fall event also make it difficult to estimate the total duration of care, in terms of days of patient care, attributable to an injurious fall.

The patient days in hospital attributable to a fall injury include those associated with 3 of the types of record defined above: *Fall* injury cases, fall injury *Inward transfers* and *Fall-related rehabilitation and related care* separations. Length of stay values reported here are sums of these 3 types (except where specified as being limited to 1 of these types).

Mean length of stay values were calculated as the sum of patient days for these 3 types of record, divided by the number of fall injury cases.

Note that this method does not include the patient days, potentially attributable to fall-related injury, associated with the remaining 2 types of record distinguished in this report: *Other fall-related* and *Tendency to fall* separations.

## Rates

### Age standardisation

Rates of *Falls* were generally age-standardised. This adjustment allows for comparison without distortion due to population group differences, such as those that may occur due to

the ageing of the Australian population over time. Direct standardisation was used, taking the Australian population in 2001 as the standard (ABS 2003) and using 5-year age groups extending to the oldest age permitted by both the case data and the population denominator data. Age-standardising national rates for the period commencing 2002–03 were based on 5-year age groups to 95.

### **Changes in rates due to changes in underlying population data**

All populations, except those used for analyses by Indigenous status, are based on the 2011 Census data. The age-standardised rates (per 100,000 population) presented in this report for the years 2002–03 to 2014–15 in time-series tables have been calculated using ‘rebased’ ERPs. Therefore, the separation rates reported for 2002–03 to 2014–15 in this report are not comparable to the separation rates presented in earlier hospitalised injury statistics reports.

## **Population denominators**

### **General population**

Where possible, rates were calculated using the final ERP as at 31 December in the relevant year as the denominator (for example, 31 December 2006 for 2006–07 data). Where tables of 31 December ERPs were not available but tables of 30 June ERPs were available, population denominators were calculated as the average of 30 June estimates for adjacent years.

Where possible, rates were calculated using denominator data in 5-year age groups from 65–69 to an oldest group aged 95 years and over. Some population denominator data were not available with these age groups, so populations by remoteness of usual residence and Indigenous status were available in 5-year groups to 85 and over.

Negative binomial regression modelling for all trends in rates of *Fall* incident cases used denominator data in 5-year age groups from 65–69 up to an oldest group aged 95 years and over, unless otherwise specified.

### **Community and residential aged care population**

Rates of *Falls* occurring in the home or in residential aged care were calculated using denominator data reflecting the estimated place of residence for the population. Population estimates of residents of residential aged care were obtained from the AIHW report series *Residential aged care in Australia* (AIHW 2012) and *Residential aged care and aged care packages in the community* (AIHW 2013b, 2014b). In the most recent year, 2014–15 population estimates were obtained from the AIHW National Aged Care Data Clearinghouse.

The populations resident in residential aged care as at 30 June in adjacent years were averaged to estimate this population as at 31 December, the mid-point of the financial years analysed. The number of people aged 65 and over who were resident in the community was then estimated by subtracting the number of residents of residential aged care from the general population (as at 31 December).

### **Indigenous population**

Measuring the rate of injury in the Indigenous population is not straightforward. Population estimates for Indigenous Australians have varied considerably over time. The increases in the Indigenous population between censuses are not entirely due to demographic factors such as births, deaths and migration: they are also due, in part, to changes in propensity to identify as Indigenous and to improved enumeration (ABS 2013a).

Separation rates by Indigenous status were directly age-standardised, using the projected Indigenous population (low series) as at 30 June 2014, based on the 2006 Census data. The population for *Other Australians* was based on the ERPs as at 30 June 2014, based on the 2006 Census data.

Population denominators for *Other Australians* were derived by subtracting the Indigenous population from the total Australian ERP (of the states and territories eligible for inclusion), as at 31 December of the relevant year.

### **Changes in rates due to changes in underlying population data**

All populations, except those used for analyses by Indigenous status, are based on the 2011 Census data. The age-standardised rates (per 100,000 population) presented in this report for the years 2002–03 to 2014–15 in time-series tables have been calculated using ‘rebased’ ERPs. Therefore, the separation rates reported for 2002–03 to 2014–15 in this report are not comparable with the separation rates presented in earlier hospitalised injury statistics reports.

### **Estimated change in rates over time**

Estimated trends in rates of fall-related separations were reported as annual percentage change, obtained using negative binomial regression modelling using Stata 13 (StataCorp 2013).

Confidence intervals (95%, based on a Poisson assumption about the number of cases in a time period) have been placed around rates in trends analyses as a guide to the size of variation. Chance variation alone would be expected to lead to a rate outside the interval only once in 20 occasions.

The use of the terms ‘significant’ or ‘significantly’ throughout this report indicates an outcome which was *statistically* significant ( $p < 0.05$  or less).

## **Classification of remoteness area**

Data on geographical location of the patient’s usual place of residence and of the hospital location are defined using the Australian Bureau of Statistics (ABS) Australian Statistical Geography Standard (ASGS). Data on remoteness area of usual residence are defined using the ABS’s ASGS Remoteness Structure 2011 (ABS 2011).

Australia can be divided into several regions based on distance from urban centres, which is considered to determine the range and types of services available. In this report, *Remoteness area* refers to the place of usual residence of the person who was admitted to hospital, assigned on the basis of the reported Statistical Local Area (SLA) of residence.

Remoteness category definitions were based on the Accessibility/Remoteness Index of Australia (ARIA). According to this method, remoteness is an index applicable to any point in Australia, based on road distance from urban centres of 5 sizes. The reported areas are defined using the following ranges of the Index:

*Major cities* (for example, Sydney, Geelong, Gold Coast), ARIA index 0 to 0.2

*Inner regional* (for example, Hobart, Ballarat, Coffs Harbour), ARIA index  $>0.2$  and  $\leq 2.4$

*Outer regional* (for example, Darwin, Cairns, Coonabarabran), ARIA index  $>2.4$  and  $\leq 5.92$

*Remote* (for example, Alice Springs, Broome, Strahan), ARIA index of >5.92 and ≤10.53

*Very remote* (for example, Coober Pedy, Longreach, Exmouth), ARIA index >10.53.

Most SLAs lie entirely within 1 of the 5 areas. If this was so for all SLAs, then each record could simply be assigned to the area in which its SLA lies. However, some SLAs overlap 2 or more of the areas. Records with these SLAs were assigned to remoteness areas in proportion to the area-specific distribution of the resident population of the SLA according to the 2006 Census. Each record in the set having a particular SLA code was randomly assigned to one or other of the remoteness areas present in it, in proportion to the resident population of that SLA.

## Indigenous status

In this report, the terms *Indigenous* and *Other Australians* are used to refer to persons identified as such in Australian hospital separations data and population data collections. Separations for which Indigenous status was *Not stated* have been included in the category *Other Australians*.

### Quality of Indigenous status data

The AIHW report *Indigenous identification in hospital separations data: quality report* (AIHW 2013) presents the latest findings on the quality of Indigenous identification in hospital separations data in Australia, based on studies conducted in public hospitals during 2011. Private hospitals were not included in the assessment. The results of the study indicate that, overall, the quality of Indigenous identification in hospital separations data was similar to that achieved in a previous study (AIHW 2010). However, the survey for the 2013 report was performed on larger samples for each jurisdiction/region and is therefore considered more robust than in the previous study.

The report recommends using data from all jurisdictions in national analyses of Indigenous admitted patient care for data from 2010–11 onwards. Therefore, the trend analyses presented in this report commence from 2010–11.

## Suppression of small cell counts in data tables

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

The AIHW is committed to reporting that maximises the value of information released for users, while being statistically reliable and meeting legislative requirements as described above. Data have been suppressed to avoid attribute disclosure, and some measures have been suppressed if there were fewer than 100 separations in the category being presented (for example, for length of stay and separation rates). Data (cells) in tables may be suppressed in order to maintain the privacy or confidentiality of a person or organisation, or because a proportion or other measure is related to a small number of events and may therefore not be reliable.

## 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 summary: National Hospital Morbidity Database 2014–15

The National Hospital Morbidity Database (NHMD) is a compilation of episode-level records from admitted patient morbidity data collection systems in Australian hospitals. The data supplied are based on the Admitted Patient Care National Minimum Data Set (APC NMDS) and include demographic, administrative and length of stay data, as well as data on the diagnoses of the patients, the procedures they underwent in hospital and external causes of injury and poisoning; see <<http://meteor.aihw.gov.au/content/index.phtml/itemId/394102>>.

The purpose of the APC NMDS is to collect information about care provided to admitted patients in Australian hospitals. The scope of the NMDS is episodes of care for admitted patients in all public and private acute and psychiatric hospitals; free-standing day hospital facilities; and alcohol and drug treatment centres in Australia. Hospitals operated by the Australian Defence Force, corrections authorities and in Australia's off-shore territories are not in scope but some are included.

The reference period for this data set is 2014–15. The data set includes records for admitted patient separations between 1 July 2014 and 30 June 2015.

A complete data quality statement for the NHMD is available online at <[meteor.aihw.gov.au](http://meteor.aihw.gov.au)>.

### Summary of key issues

- The NHMD is a comprehensive data set 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 2014–15, almost all public hospitals provided data for the NHMD: the exception was an early parenting centre in the Australian Capital Territory. The great majority of private hospitals also provided data, the exception being the private free-standing day hospital facilities in the Australian Capital Territory.
- There is some variation between jurisdictions as to whether hospitals that predominantly provide public hospital services, but are privately owned and/or operated, are reported as public or private hospitals. In addition, hospitals may be re-categorised as 'public' or 'private' between or within years.
- Revised definitions for care types were implemented from 1 July 2013, with the aim of improving comparability in care-type assignment between jurisdictions. Therefore, information presented by care type may not be comparable with data presented for earlier periods.

- Data on *State of hospitalisation* should be interpreted with caution because of cross-border flows of patients. This is particularly the case for the Australian Capital Territory: in 2014–15, about 18% of separations for Australian Capital Territory hospitals were for patients who resided in New South Wales.
- Although there are national standards for data on hospital services, there are some variations in how hospital services are defined and counted—between public and private hospitals, among the states and territories, and over time. (For example, there is variation in admission practices for some services, such as chemotherapy and endoscopy.) As a result, people receiving the same type of service may be counted as same-day admitted patients in some hospitals and as non-admitted patients in other hospitals. In addition, some services are provided by hospitals in some jurisdictions and by non-hospital health services in other jurisdictions. The national data on hospital care does not include care provide by non-hospital providers, such as community health centres.
- 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.
- Between 2010–11 and 2014–15, there were changes in coverage or data supply for New South Wales, Victoria, Queensland and Western Australia that may affect the interpretation of the data:
  - For New South Wales, increases in the numbers of separations reported for private hospitals are, in part, accounted for by improvement in the coverage of reporting.
  - For Victoria, between 2011–12 and 2012–13, a relatively large decrease in public hospital separations reflects a change in Victoria’s emergency department admission policy.
  - For Queensland, between 2013–14 and 2014–15, a relatively large increase in same-day separations in public hospitals partly reflects a change in admission practices for chemotherapy in some hospitals.
  - For Western Australia, between 2012–13 and 2013–14, the relatively large decrease in public hospital separations may reflect a change in Western Australia’s emergency department admission policy, which resulted in fewer admissions.
- The Indigenous status data in the NHMD for all states and territories are considered to be of sufficient quality for statistical reporting. In 2011–12, an estimated 88% of Indigenous patients were correctly identified in public hospitals (AIHW 2013). In the publication *Admitted patient care 2014–15: Australian hospital statistics*, the overall quality of the data provided for Indigenous status is considered to be in need of some improvement, and varied between states and territories. It is unknown to what extent Indigenous Australians might be under-identified in private hospital admissions data.

# Appendix B: Falls as additional diagnoses

## ‘Other fall-related’ separations

An additional 39,363 episodes of hospital care involving people aged 65 and over were identified as *Other fall-related* separations in 2014–15. These records contained an injury diagnosis and a *Falls* external cause but were not *Fall* cases, *Inward transfers* or *Fall-related rehabilitation and related care* separations. It is possible that some of these separations represent patients who fell while in hospital. These *Other fall-related* separations represented 0.9% of the total number of hospital separations for people aged 65 and over in 2014–15. Compared with other separations covered in this report, a relatively low proportion of *Other fall-related* separations involved women (19,998 separations, or 51%).

The age-standardised rate of *Other fall-related* separations was 1,089 per 100,000 population in 2014–15. Unlike the separations attributable to *Falls* in this report (that is, *Fall* injury cases; *Inward transfers*; and *Fall-related rehabilitation and related care*), the age-standardised rate of *Other fall-related* separations was higher for men than for women (1,265 per 100,000, compared with 962 per 100,000, respectively). The rate-ratio was 1.3 *Other fall-related* separations for men for every such separation for women. Further, the age-specific rates for men were higher than those for women for every age group.

One in 5 *Other fall-related* separations (7,262, or 18%) had a principal diagnosis from ICD-10-AM Chapter 9: ‘Diseases of the circulatory system’ and a similar number (7,263, or 19%) had a principal diagnosis from Chapter 18: ‘Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified’ (see Table B1).

*Other fall-related* separations resulted in a total of 473,018 patient days in 2014–15.

**Table B1: Principal diagnosis for ‘other fall-related’ separations, by sex, Australia, 2014–15**

Principal diagnosis	Men		Women		People	
	Count	%	Count	%	Count	%
Certain infectious and parasitic diseases	725	3.7	789	3.9	1,514	3.8
Neoplasms	1,493	7.7	936	4.7	2,429	6.2
Diseases of the blood, blood-forming organs, and certain disorders involving the immune mechanism	284	1.5	272	1.4	556	1.4
Endocrine, nutritional and metabolic diseases	611	3.2	646	3.2	1,257	3.2
Mental and behavioural disorders	1,347	7.0	1,461	7.3	2,808	7.1
Diseases of the nervous system	882	4.6	681	3.4	1,563	4.0
Diseases of the eye and adnexa	31	0.2	45	0.2	76	0.2
Diseases of the ear and mastoid process	53	0.3	112	0.6	165	0.4
Diseases of the circulatory system	3,593	18.6	3,669	18.3	7,262	18.4
Diseases of the respiratory system	2,283	11.8	1,764	8.8	4,047	10.3
Diseases of the digestive system	837	4.3	800	4.0	1,637	4.2
Diseases of the skin and subcutaneous tissue	647	3.3	645	3.2	1,292	3.3
Diseases of the musculoskeletal system and connective tissue	883	4.6	1,272	6.4	2,155	5.5
Diseases of the genitourinary system	1,014	5.2	1,420	7.1	2,434	6.2
Congenital malformations, deformations and chromosomal abnormalities	7	0.0	1	0.0	8	0.0
Symptoms, signs and abnormal clinical and laboratory findings, n.e.c.	3,456	17.8	3,807	19.0	7,263	18.5
Injury, poisoning and consequences of external causes	634	3.3	636	3.2	1,270	3.2
Factors influencing health status	585	3.0	1,042	5.2	1,627	4.1
<b>Total</b>	<b>19,365</b>	<b>100</b>	<b>19,998</b>	<b>100</b>	<b>39,363</b>	<b>100</b>

## ‘Tendency to fall’ separations

A total of 37,325 hospital separations for people aged 65 and over in 2014–15 included the diagnosis code R29.6 *Tendency to fall, not elsewhere classified*. Small numbers of these records are included in this report as fall injury cases, *Inward transfers*, follow-up care or *Other fall-related* separations.

Of the 37,325 *Tendency to fall* separations for people aged 65 and over in 2014–15, slightly more than half (19,606, or 52%) involved women. The age-standardised rate of *Tendency to fall* separations for all people aged 65 and over was 1,034 per 100,000 population and the rate of was higher for men (1,177 per 100,000 population) than for women (944 per 100,000).

Four in every 10 *Tendency to fall* separations (15,097, or 40%) had a principal diagnosis from ICD-10-AM Chapter 21: ‘Factors influencing health status and contact with health services’. Principal diagnoses from Chapter 18: ‘Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified’ were also relatively common (7,528, or 20%) (see Table B2.)

*Tendency to fall* separations resulted in a total of 368,585 patient days in 2014–15.

**Table B2: Principal diagnosis for 'tendency to fall' separations, by sex, Australia, 2014–15**

Principal diagnosis	Men		Women		People	
	Count	%	Count	%	Count	%
Certain infectious and parasitic diseases	324	1.8	290	1.5	614	1.6
Neoplasms	758	4.2	521	2.7	1,279	3.4
Diseases of the blood, blood-forming organs, and certain disorders involving the immune mechanism	98	0.5	107	0.5	205	0.5
Endocrine, nutritional and metabolic diseases	295	1.6	342	1.7	637	1.7
Mental and behavioural disorders	887	5.0	889	4.5	1,776	4.7
Diseases of the nervous system	655	3.7	499	2.5	1,154	3.1
Diseases of the eye and adnexa	12	0.1	18	0.1	30	0.1
Diseases of the ear and mastoid process	21	0.1	53	0.3	74	0.2
Diseases of the circulatory system	1,251	7.0	1,280	6.5	2,531	6.8
Diseases of the respiratory system	1,190	6.7	827	4.2	2,017	5.4
Diseases of the digestive system	340	1.9	312	1.6	652	1.7
Diseases of the skin and subcutaneous tissue	210	1.2	255	1.3	465	1.2
Diseases of the musculoskeletal system and connective tissue	605	3.4	859	4.4	1,464	3.9
Diseases of the genitourinary system	600	3.4	892	4.5	1,492	4.0
Congenital malformations, deformations and chromosomal abnormalities	0	0.0	2	0.0	2	0.0
Symptoms, signs and abnormal clinical and laboratory findings, n.e.c.	3,530	19.7	3,998	20.4	7,528	20.1
Injury, poisoning and consequences of external causes	214	1.2	254	1.3	468	1.2
Factors influencing health status	6889	38.5	8208	41.9	15,097	40.3
<b>Total</b>	<b>17,879</b>	<b>100</b>	<b>19,606</b>	<b>100</b>	<b>37,485</b>	<b>100</b>

# Glossary

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 (NMDs). METeOR can be viewed on the AIHW website at <www.aihw.gov.au>.

**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:** See **care type**.

**acute care hospital:** See **establishment type**.

**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 2 or more populations.

**care type:** The care type defines the overall nature of a clinical service provided to an admitted patient during an episode of admitted patient care (*Admitted care*), or the type of service provided by the hospital for boarders or posthumous organ procurement (*Care other than admitted care*). METeOR identifier: 491557.

*Admitted patient care* consists of the following categories:

- acute care
- rehabilitation care
- palliative care
- geriatric evaluation and management
- psychogeriatric care
- maintenance care
- newborn care
- other admitted patient care—this is where the principal clinical intent does not meet the criteria for any of the above.

*Care other than admitted care* includes:

- posthumous organ procurement
- hospital boarder.

**episode of admitted patient care:** The period of admitted patient care between a formal or statistical admission and a formal or statistical separation, characterised by only 1 care type (see **care type** and **separation**). METeOR identifier: 491557 (Care type), METeOR identifier: 268956 (Episode of admitted patient care).

**establishment type:** Type of establishment (defined in terms of legislative approval, service provided and patients treated) for each separately administered establishment. METeOR identifier: 269971.

**external cause:** The environmental event, circumstance or condition as the cause of injury, poisoning and other adverse effect. METeOR identifier: 514295.

**hospital:** A health care facility established under Australian Government, 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.

**hospital-in-the-home care:** Provision of care to hospital admitted patients in their place of residence as a substitute for hospital accommodation. Place of residence may be permanent or temporary. METeOR identifier: 327308.

**Inpatient:** See **admitted patient**. METeOR identifier: 268957.

**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.

**length of stay:** The length of stay of an overnight patient is calculated by subtracting the date the patient is admitted from the date of separation and deducting days the patient was on leave. A same-day patient is allocated a length of stay of 1 day. METeOR identifier: 269982.

**mode of admission:** The mechanism by which a person begins an episode of admitted patient care. For example, an admitted patient transferred from another hospital or a statistical admission representing an episode type change. METeOR identifier: 269976.

**mode of separation:** Status at separation of person (that is, discharge/transfer/death) and place to which person is released (where applicable). METeOR identifier: 270094.

**patient days:** The total number of days for all patients who were admitted for an episode of admitted patient care and who separated during a specified reference period. A patient who is admitted and separated on the same day is allocated 1 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. METeOR identifier: 514273.

**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. See also **establishment type**.

**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. See also **establishment type**.

**residential aged care:** Residential aged care provides permanent care in residential aged care facilities for people who have frailty or disability (such as medical conditions or loss of physical, cognitive or social functioning) and can no longer be supported to live at home, as well as time-limited respite care for people still living at home.

**same-day patient:** An admitted patient who is admitted and separates on the same date.

**separation:** An episode of admitted patient care for an **admitted patient**, 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 admitted patient care, either by being discharged, dying, transferring to another hospital or changing type of care.

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## Related publications

Related reports can be downloaded free from the AIHW publications website <<http://www.aihw.gov.au/publications/>>. The website also includes information on ordering printed copies.

The following AIHW publications relating to falls by older Australians might also be of interest:

- AIHW: Bradley C 2013. Trends in hospitalisations due to falls by older people, Australia 1999–00 to 2010–11. Injury research and statistics no. 84. Cat. no. INJCAT 160. Canberra: AIHW.
- AIHW: Tovell A, Harrison JE & Pointer S 2014. Hospitalised injuries in older Australians: 2011–12. Injury research and statistics series 90. Cat. no. INJCAT 166. Canberra: AIHW.
- AIHW 2015. Musculoskeletal fact sheet: osteoarthritis. Arthritis series no. 22. Cat. no. PHE 186. Canberra: AIHW.
- AIHW: Kreisfeld R, Pointer S & Bradley C 2017. Trends in hospitalisations due to falls by older people, Australia 2002–03 to 2012–13. Injury research and statistics series no. 106. Cat. no. INJCAT 182. Canberra: AIHW.
- Karmel R, Lloyd J and Anderson P 2008. Movement from hospital to residential aged care. Data linkage series no. 6. Cat. no. CSI 6. Canberra: AIHW.



This report focuses on trends in fall-related hospital care for people aged 65 and over from 2002–03 to 2014–15. Age-standardised rates of hospitalised fall injury cases increased over the period 2002–03 to 2014–15 for both men (3% per year) and women (2%). There was a decrease in the rate of hip fractures due to falls (–2% per year) between 2002–03 and 2014–15. In contrast, falls resulting in head injuries increased at a particularly high rate (7% per year).

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