



**MONASH**  
University

**UNINTENTIONAL  
(ACCIDENTAL)  
HOSPITAL-TREATED  
INJURY VICTORIA  
2015/16**

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Health  
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Services

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## Abbreviations

DHHS	Department of Health and Human Services
ED	Emergency Department
VAED	Victorian Admitted Episodes Dataset
VEMD	Victorian Emergency Minimum Dataset

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# UNINTENTIONAL (ACCIDENTAL) HOSPITAL – TREATED INJURY IN VICTORIA 2015/16

This is the fifteenth in a series of regular E-bulletins that provide an overview of the injury profile for Victoria. This edition provides an overview of unintentional hospital-treated injury in 2015/16 utilising two injury surveillance datasets that separately record hospital admissions and Emergency Department (ED) presentations for injury.

The case selection criterion used in this edition remains the same as the previous edition except for the exclusion of planned repeat admissions when accounting for incidents. These were episodes where a patient had multiple day-treatment admissions for the same injury within a course of 30 days, with the admission type indicating it was a “planned” admission.

## SUMMARY RESULTS

### ALL AGES

- The age-standardised annual rate of injury admissions increased significantly by 3.7% per year over the 10-year period 2006/07 to 2015/16.
- The age-standardised annual rate of injury ED presentations increased significantly by 0.7% per year over the 10-year period 2006/07 to 2015/16.
- In 2015/16 males were overrepresented, accounting for 55% of admissions and 58% of ED presentations.
- Falls were the leading cause of injury among admissions and ED presentations, accounting for 46% of admissions and 37% of ED presentations.
- The home was the most common setting for injury among admissions and ED presentations: 26% of hospital admissions and 40% of ED presentations.
- Fracture to upper limb was the most common injury for both admissions and ED presentations (18% and 12%, respectively).

### CHILDREN (0-14 YEARS)

- In 2015/16, in total 14,103 children were admitted to Victorian hospitals and at least 92,369 presented to Victorian EDs for unintentional injury.
- The age-standardised annual rate of injury admissions among children aged 0-14 years increased significantly by 3.2% per year over the 10-year period 2006/07 to 2015/16.
- The age-standardised annual rate of injury ED presentations among children aged 0-14 years increased significantly by 1.4% per year over the 10-year period 2006/07 to 2015/16.
- In 2015/16 males were overrepresented, accounting for 62% of admissions and 58% of ED presentations.
- Falls were the leading cause of both injury admissions (47%) and ED presentations (46%).
- Twenty five percent of hospital admissions and almost half of ED presentations (46%) were for injuries that occurred in the home. Children were also commonly injured in schools and other public buildings (13% of admissions and 12% of ED presentations) and sports and athletics areas (9% each of admissions and ED presentations).
- Fracture to upper limb was the most common injury for both admissions and ED presentations among children (30% and 17%, respectively).

### ADOLESCENTS AND YOUNG ADULTS (15-24 YEARS)

- In 2015/16, in total 13,027 adolescents and young adults were admitted to Victorian hospitals and at least 54,411 presented to Victorian EDs for unintentional injury.
- The age-standardised annual rate of injury admissions among adolescents and young adults increased significantly by 3.1% per year over the 10-year period 2006/07 to 2015/16.
- The age-standardised annual rate of injury ED presentations among adolescents and young adults remained fairly stable over the 10-year period 2006/07 to 2015/16.
- In 2015/16 males were overrepresented, accounting for 72% of admissions and 67% of ED presentations.
- Transport was the leading cause of injury admissions (22%) followed by falls (19%) and hit/struck/crush (17%). Among ED presentations, falls was the leading cause of injury (27%) followed by hit/struck/crush (26%) and transport (9%). Cutting & piercing injuries accounted for around 10% of both admissions and ED presentations.
- Sports and athletics areas (21%) and the road, street and highway (15%) were the most common settings for adolescent and young adult injuries resulting in hospital admission whereas the home (24%) and sports and athletics areas (20%) were the leading settings for injuries resulting in ED presentation.
- Fracture to upper limb was the most common injury among adolescent and young adult hospital admissions (20%), while dislocation, sprain & strain to lower limb was the more common reason for ED presentations (14%).

## ADULTS (25-64 YEARS)

- In 2015/16, in total 41,028 adults were admitted to Victorian hospitals while at least 127,963 presented to Victorian EDs for unintentional injury.
- The age-standardised annual rate of injury admissions among adults increased significantly by 4.1% per year over the 10-year period 2006/07 to 2015/16.
- The age-standardised annual rate of injury ED presentations among adults remained fairly stable over the 10-year period 2006/07 to 2015/16.
- Males were overrepresented in 2015/16, accounting for 63% of admissions and 61% of ED presentations.
- The leading cause of adult hospital-treated injury was falls: 28% of hospital admissions and 27% of ED presentations. Other major causes were hit/struck/crush (10% of admissions and 18% of ED presentations), cutting and piercing (11% of admissions and 12% of ED presentations) and transport (21% of admissions and 9% of ED presentations).
- Eighteen percent of hospital admissions and 37% of ED presentations were for injuries that occurred in the home. Other major settings for injury were: working for income (14% of admissions and 15% of ED presentations) and road/street/highway (15% of admissions and 9% of ED presentations).
- Fracture to upper limb was the most common injury among adult hospital admissions (18%) while dislocation, sprain & strain to lower limb and open wound to upper limb were the more common reasons for ED presentations (10% each).

## OLDER ADULTS (65+ YEARS)

- In 2015/16, in total 35,493 older adults were admitted to Victorian hospitals and at least 45,407 presented to Victorian EDs for unintentional injury.
- The age-standardised annual rate of injury admissions among older adults increased significantly by 3.8% per year over the 10-year period 2006/07 to 2015/16.
- The age-standardised annual rate of injury ED presentations among older adults increased significantly by 1.5% per year over the 10-year period 2006/07 to 2015/16.
- In 2015/16 females were overrepresented, accounting for 64% of admissions and 58% of ED presentations.
- Falls accounted for more than three-quarters of hospital admissions (77%) and more than half of ED presentations (61%) among older adults.
- Forty three percent of hospital admissions and more than half of ED presentations (54%) were for injuries that occurred in the home. Other common settings for injuries were residential institutions (17% of admissions and 8% of ED presentations) and the road/street/highway (8% of admissions and 7% of ED presentations).
- Fracture to lower limb was the most common injury among older adult hospital admissions (21%) and among ED presentations (13%).

Table 1: Summary results for 2015/16

	ALL	CHILD (0-14 YEARS)	ADOLESCENT (15-24 YEARS)	ADULTS (25-64 YEARS)	OLDER ADULTS (65+ YEARS)
ADMISSIONS					
n	103,651	14,103	13,027	41,028	35,493
Rate/100,000	1,728.1	1,283.1	1,645.1	1,280.5	3,931.0
Age standardised rate/100,000	1,653.4	1,284.3	1,645.3	1,270.6	3,794.1
Rate change (% per year)	3.7	3.2	3.1	4.1	3.8
% males	54.8	62.1	72.2	62.8	36.1
Leading cause (%)	Falls (46.1)	Falls (47.1)	Transport (22.3)	Falls (27.8)	Falls (76.8)
Most common setting (%)	Home (26.1)	Home (24.8)	Sports (21.3)	Home (18.2)	Home (42.5)
Most common injury (%)	Fracture upper limb (18.1)	Fracture upper limb (29.9)	Fracture upper limb (20.0)	Fracture upper limb (17.6)	Fracture lower limb (20.6)
% of all serious injury cases (row %)	n/a	1.1	3.0	12.8	83.1
ED PRESENTATIONS					
n	320,150	92,369	54,411	127,963	45,407
Rate/100,000	5,337.7	8,403.8	6,871.2	3,993.8	5,029.1
Age standardised rate/100,000	5,395.0	8,413.6	6,912.6	3,998.5	4,936.9
Rate change (% per year)	0.7	1.4	stable	stable	1.5
% males	58.2	57.6	66.6	60.7	41.8
Leading cause (%)	Falls (37.3)	Falls (45.8)	Falls (26.5)	Falls (27.3)	Falls (60.6)
Most common setting (%)	Home (39.7)	Home (45.6)	Home (24.0)	Home (37.0)	Home (54.2)
Most common injury (%)	Fracture upper limb (11.7)	Fracture upper limb (17.2)	Dislocation, sprain & strain to lower limb (13.9)	Dislocation, sprain & strain to lower limb & Open wound to upper limb (9.6 & 10.0)	Fracture lower limb (12.9)

### Notes:

- 1) Rate change (% per year) refers to the average change in age standardised rate over 10 years: 2006/07 to 2015/16.
- 2) Red highlighted cells represent an increase and yellow represents no statistically significant change ( $p < 0.05$ ).
- 3) A serious injury is defined as one with an ICD based Injury Severity Score (ICISS) of less than or equal to 0.941 (see Box 1 in Appendix 1 for details).
- 4) Percentage of serious injuries is based solely on hospital admissions as this measure is not available in the ED presentation data.

# INTRODUCTION

This E-bulletin provides information on unintentional hospital-treated injury in 2015/16. There were 114,381 injury hospital admissions in Victoria in 2015/16, 90.6% of which were unintentional (n=103,651). The remaining injury cases were either intentional i.e. self-harm or assault (7.8%, n=8,864) or of other or undetermined intent (1.6%, n=1,866). In this same year, there were 403,065 injury cases presenting to Victorian hospital EDs, 79.4% of which were unintentional (n=320,150), 4% were intentional (self-harm or assault) (n=15,842) and 16.6% were of other or undetermined intent (n=67,073).

## METHOD

### DATA SOURCES

Hospital admissions data were extracted from the Victorian Admitted Episodes Dataset (VAED) and ED presentations data from the Victorian Emergency Minimum Dataset (VEMD). The VAED records all hospital admissions in public and private hospitals in the state of Victoria and the VEMD records all presentations to Victorian public hospitals with 24-hour emergency departments<sup>1</sup>.

### CASE SELECTION CRITERIA

Cases were selected if the admission (VAED) or presentation (VEMD) date occurred in the financial year 2015/16, if gender was male or female<sup>2</sup>, and if the injury was unintentional (VAED: external cause code in the range V00-X59, VEMD: human intent=1). Hospital admission cases were selected only if the first occurring diagnosis code was a community injury (see Box 2 in Appendix 2) and the episode was an incident (i.e., the case was not a statistical separation from another unit within the same hospital or an inward transfer from another hospital and not a repeat admission for the same injury). ED presentation case selection was restricted to incident cases: return visits and pre-arranged visits were excluded.

In order to minimise the influence of the hospital admission policy change in 2012/13 on the trend in admissions over time, cases that spent the entire episode in the ED were removed from the VAED (see Box 3 in Appendix 2).

For ease of comparison, VEMD causes, where possible, were recoded to match VAED cause groups.

The age groups (0-14, 15-24, 25-64, 65+ years) have been selected to match those in the National Injury Prevention and Safety Promotion Plan: 2004 - 2014 (NIPSPP Plan).

See Appendix 2 for a detailed explanation of the case selection criteria.

### RATES AND TRENDS ANALYSIS

Rates per 100,000 population were calculated for the 10-year period 2006/07 to 2015/16 for the VAED and the VEMD. The denominators used for calculating rates were December population estimates from the Australian Bureau of Statistics. Age standardisation of rates was carried out using 5-year age groups and the direct method. The standard population used was the Victorian resident population at 31 December, 2001.

Time trends in the rate of admissions/ED presentations were modelled using Poisson models, as the annual number of events as a function of time in years (continuous), age group and gender, with the log of the annual Victorian residential population as offset.

Time trend results are presented as the modelled % change in rate per year, calculated as: percentage change =  $[e^{\alpha} - 1] \times 100\%$  where  $\alpha$  is the parameter estimate of year, in the Poisson model. A trend was considered to be statistically significant if the p-value of the slope of the regression model was less than 0.05. The analyses were conducted using the PROC GENMOD procedure in SAS V9.4.

For further discussion of data sources and issues refer to Appendix 2.

*Note: The terms "admissions" and "presentations" in succeeding sections of this report refers to "injury admissions" and "injury presentations"; results are limited to the State of Victoria.*

<sup>1</sup> Currently 38 hospitals contribute to the VEMD (Bass Coast Regional Health was added to the collection in July 2011)

<sup>2</sup> Intersex cases were excluded in the VEMD case selection due to data confidentiality concerns related to small numbers.

# ALL AGES

An overview of unintentional hospital-treated injury in Victoria during 2015/16 is provided in Table 2. Overall, there were 103,651 admissions and 320,150 ED presentations.

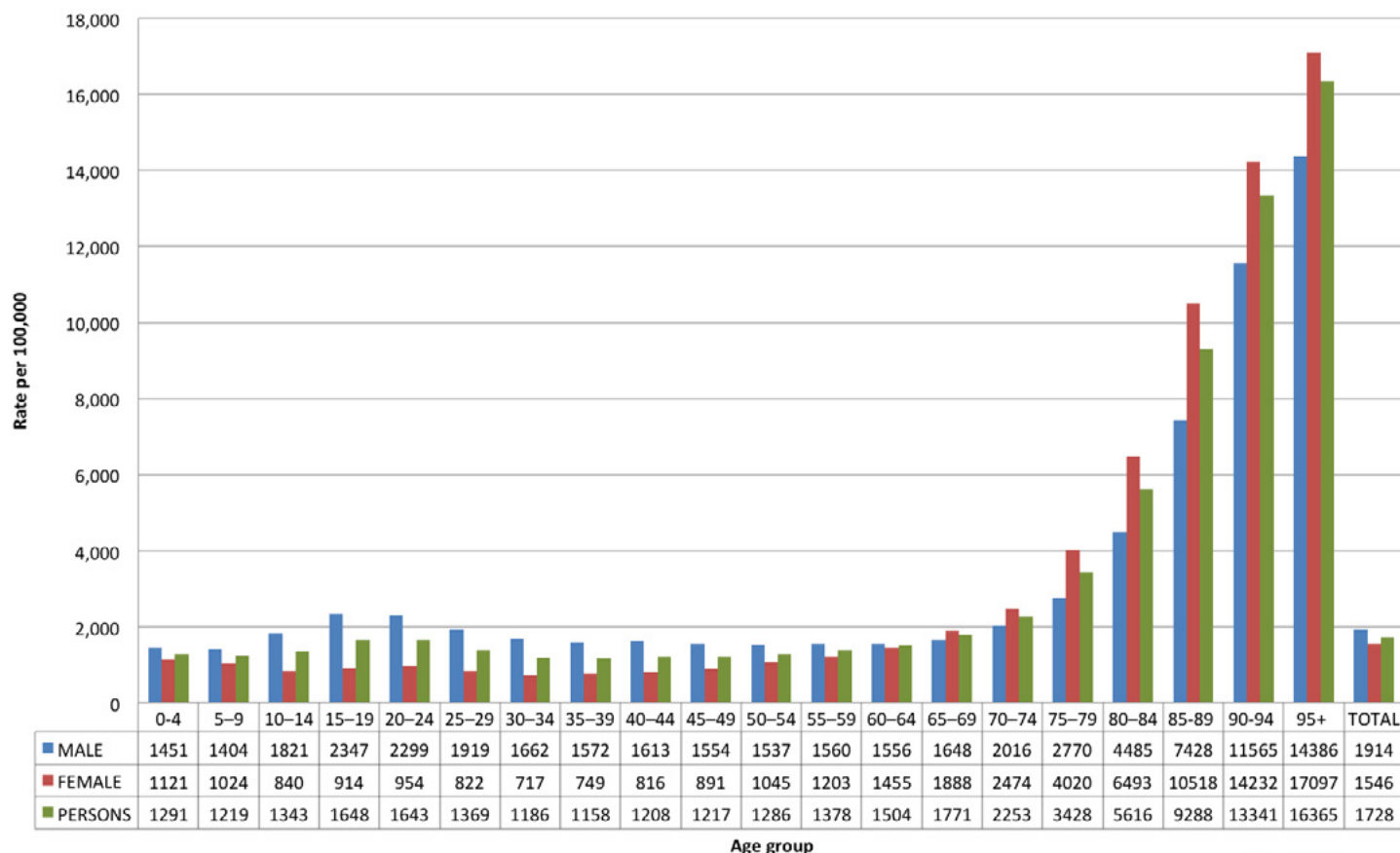
- The annual age standardised hospital admission rate was highest in older adults (3,794.1 per 100,000 population) and lowest in adults (1,270.6 per 100,000).
- The annual age standardised ED presentation rate was highest in children (8,413.6 per 100,000 population) and lowest in adults (3,998.5 per 100,000).

Hospital admission injury rates by age and gender for Victoria in 2015/16 are shown in Figure 1. Age-specific hospital admitted injury rates rose after childhood, were higher in adolescents and young adults than in adults and peaked in older adults. The overall male age-specific hospital admitted injury rate was higher than the female rate in all 5-year age groups up to age 64 years.

Table 2: Hospital treated injury frequency, age-specific and standardised annual rates per 100,000 population, by broad age group, Victoria 2015/16

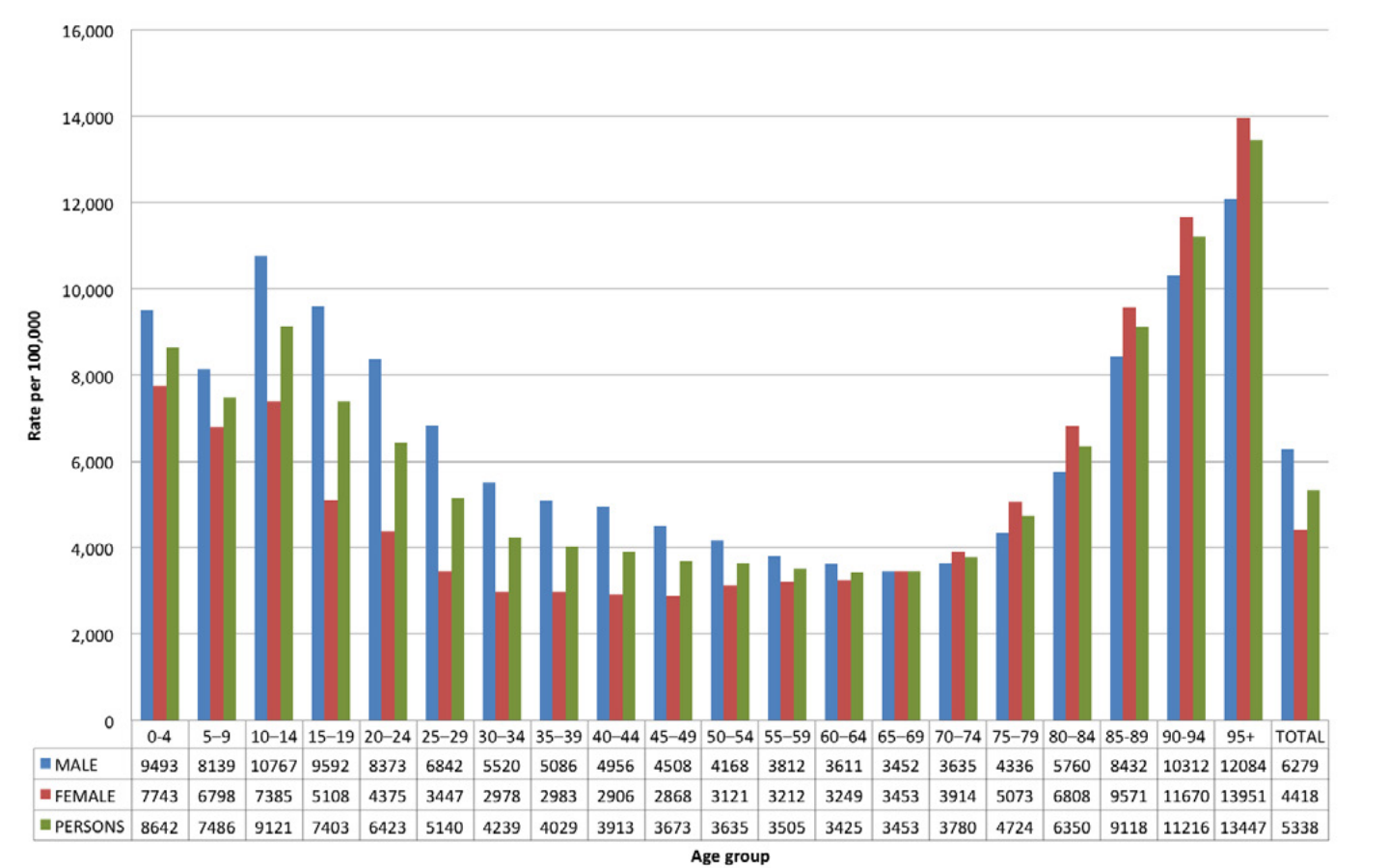
AGE GROUP	HOSPITAL ADMISSIONS			ED PRESENTATIONS (INCLUDES SUBSEQUENT ADMISSIONS)		
	n	Rate/ 100,000 population	Age standardised rate per 100,000 population	n	Rate/ 100,000 population	Age standardised rate per 100,000 population
Children 0-14 years	14,103	1,283.1	1,284.3	92,369	8,403.8	8,413.6
Adolescents and young adults 15-24 years	13,027	1,645.1	1,645.3	54,411	6,871.2	6,912.6
Adults 25-64 years	41,028	1,280.5	1,270.6	127,963	3,993.8	3,998.5
Older adults 65+ years	35,493	3,931.0	3,794.1	45,407	5,029.1	4,936.9
All	103,651	1,728.1	1,653.4	320,150	5,337.7	5,395.0

Figure 1: Age-specific hospital admitted injury rates by age group and gender, Victoria 2015/16



ED presentation injury rates by age and gender for Victoria in 2015/16 are shown in Figure 2. Age-specific injury ED presentation rates were high among children (0-9 years) and particularly high among older children (10-14 years); then decreased throughout the adolescent and adult age groups until age 65 then increased again. The overall male age-specific injury ED presentations rate was higher than the female rate in all 5-year age groups up to age 64 years.

Figure 2: Age-specific injury ED presentation rates by age group and gender, Victoria 2015/16





An overview of severity of unintentional injury hospital admissions by age group is provided in Table 3. Serious injury cases are defined using the International Classification of Disease based Injury Severity Score (ICISS) which reflects threat to life (see Box 1 in Appendix 1).

- Adults aged 25-64 years accounted for 40% of unintentional hospital admissions in 2015/16, and older adults aged 65+ accounted for 34% of injury admissions during this period. Children (0-14 years) accounted for 14% of injury admissions and adolescents & young adults (15-24 years) accounted for 13% of injury admissions during 2015/16.

- Older adults aged 65+ years accounted for the majority of serious injury admissions (82.3%, n=12,552). They also accounted for more than two-thirds of hospital bed-days (68%, 400,338 days).
- Those aged 75-94 years accounted for almost a quarter of all unintentional injury hospital admissions (23.2%) and were particularly over-represented when serious injuries and bed-days are taken into account (65.5% and 52.1%, respectively).

Table 3: Unintentional injury hospital admissions by age group: frequency, serious injury cases and hospital bed days (2015/16)

	FREQUENCY		SERIOUS INJURY CASES		HOSPITAL BED-DAYS	
	n	%	n	%	n	%
0-4	4,971	4.8	69	0.5	6,465	1.1
5-9	4,502	4.3	42	0.3	5,953	1.0
10-14	4,630	4.5	63	0.4	7,230	1.2
0-14	14,103	13.6	174	1.1	19,648	3.3
15-19	5,968	5.8	222	1.5	12,870	2.2
20-24	7,059	6.8	281	1.8	16,163	2.8
15-24	13,027	12.6	503	3.3	29,033	5.0
25-34	11,772	11.4	475	3.1	27,736	4.7
35-44	9,717	9.4	415	2.7	28,237	4.8
45-54	9,803	9.5	484	3.2	33,061	5.6
55-64	9,736	9.4	647	4.2	48,223	8.2
25-64	41,028	39.6	2,021	13.3	137,257	23.4
65-74	9,908	9.6	1,891	12.4	77,442	13.2
75-84	12,142	11.7	4,319	28.3	143,949	24.6
85-94	11,968	11.5	5,670	37.2	161,325	27.5
95+	1,475	1.4	672	4.4	17,622	3.0
65+	35,493	34.2	12,552	82.3	400,338	68.3
Total	103,651	100.0	15250	100.0	586,276	100.0



## TREND

- During the 10-year period 2006/07 to 2015/16, there were on average 77,796 injury admissions and at least 284,236 injury ED presentations per year in Victoria. The average age-standardised annual rates were 1,347 admissions and 5,159 ED presentations per 100,000 population.
- The age-standardised annual rate of injury admissions increased by 3.7% per year during the ten years (Figure 3). The modelled trend in rate showed a statistically significant annual increase of 3.9% [95% CI 2.9 to 4.9%].
- The age-standardised annual rate of injury ED presentations increased by 0.7% per year (Figure 4). The modelled trend in rate showed a statistically significant annual increase of 0.7% [95% CI 0.2 to 1.2%].

Figure 3: Trend in injury hospital admission rates per 100,000 population, Victoria 2006/07-2015/16

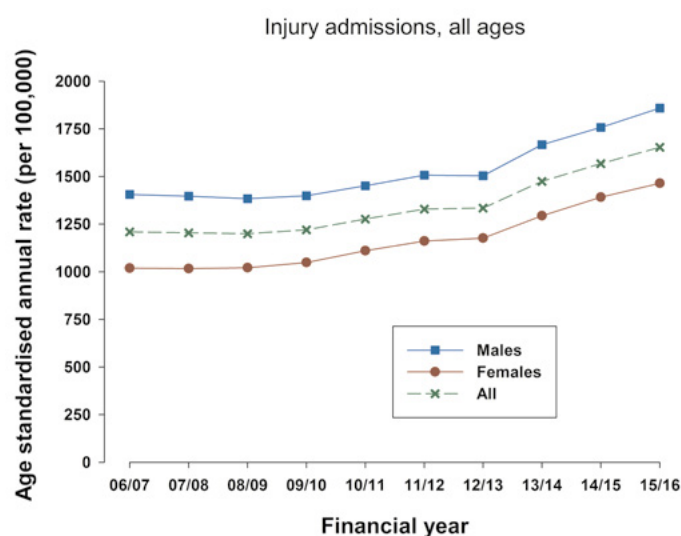
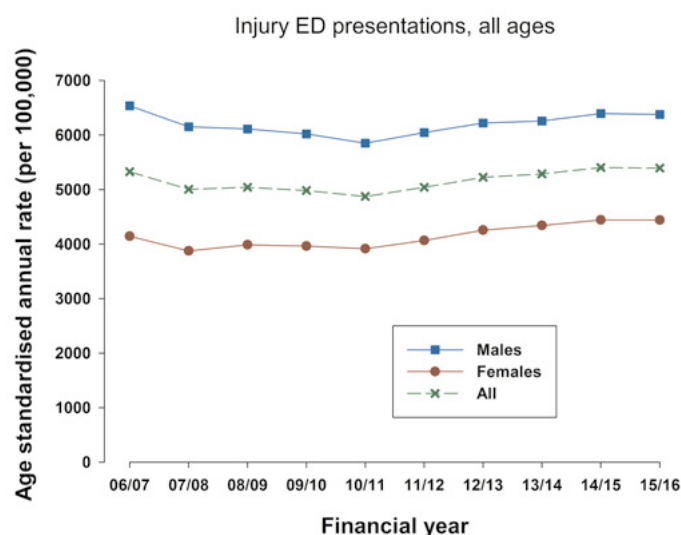


Figure 4: Trend in injury ED presentation rates per 100,000 population, Victoria 2006/07-2015/16



## HOSPITAL TREATED INJURY — GENDER AND AGE

- Males were overrepresented accounting for 55% of all injury admissions (n= 56,759) and 58% of ED presentations (n=186,141) in Victoria in 2015/16.
- Seventy-four percent (n=76,521) of hospital admissions occurred among persons aged 25 years and older; just over half of those admitted were aged 25-64 years (n=41,028) and 46% were aged 65 years and above (n= 35,493). Adults aged 25-64 years accounted for 40% of ED presentations (n=127,963).
- Males accounted for more hospital admissions and ED presentations than women in all age groups up to 64 years. However, in the 65 years and older group, females accounted for more hospital admissions and ED presentations than males (Figure 5 & Figure 6).

Figure 5: Injury hospital admissions by gender and age, Victoria 2015/16

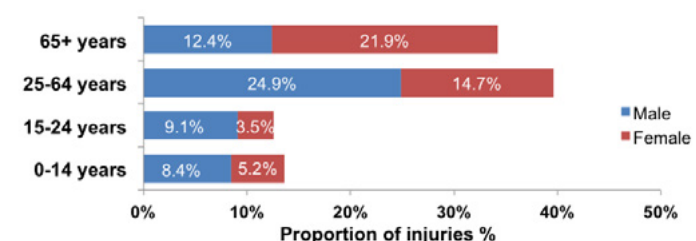
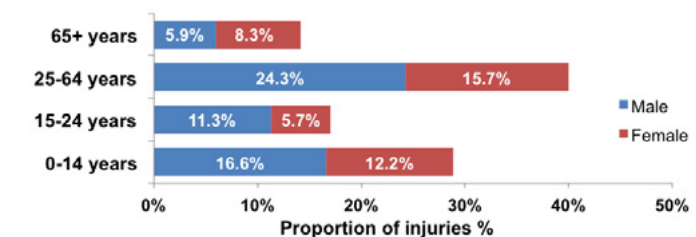


Figure 6: Injury ED presentations by gender and age, Victoria 2015/16



- The age standardised rate of injury hospital admission and ED presentation was higher for males than females: 1,858.6 vs. 1,463.9 per 100,000 for admissions and 6,376.6 vs 4,440.0 per 100,000 for ED presentations.

- The age standardised hospital admission rate per 100,000 population was highest in older adults (3,794.1) and lowest in adults (1,270.6). In contrast, the ED presentation rate per 100,000 population was highest in children (8,413.6) and lowest in adults (3,998.5) (Table 4).

Table 4: Frequency, age-specific and age standardised rates of injury hospital admissions and ED presentations by gender and age, Victoria 2015/16

AGE GROUP	GENDER	HOSPITAL ADMISSIONS			ED PRESENTATIONS		
		n	Rate per 100,000 population	Age standardised rate per 100,000 population	n	Rate per 100,000 population	Age standardised rate per 100,000 population
0-14 years	Male	8,752	1,551.2	1,560.8	53,249	9,437.8	9,466.3
	Female	5,351	1,000.3	992.2	39,120	7,313.1	7,301.3
	All	14,103	1,283.1	1,284.3	92,369	8,403.8	8,413.6
15-24 years	Male	9,412	2,321.1	2323.2	36,211	8,930.1	8,983.6
	Female	3,615	935.6	934.0	18,200	4,710.4	4,740.0
	All	13,027	1,645.1	1,645.3	54,411	6,871.2	6,912.6
25-64 years	Male	25,765	1,631.8	1,629.1	77,697	4,920.8	4,934.7
	Female	15,263	939.2	919.1	50,266	3,093.2	3,079.3
	All	41,028	1,280.5	1,270.6	127,963	3,993.8	3,998.5
65+ years	Male	12,830	3,083.9	2,894.9	18,984	4,563.1	4,414.3
	Female	22,663	4,655.0	4,577.5	26,423	5,427.3	5,384.7
	All	35,493	3,931.0	3,794.1	45,407	5,029.1	4,936.9
All	Male	56,759	1,914.5	1,858.6	186,141	6,278.6	6,376.6
	Female	46,892	1,545.9	1,463.9	134,009	4,418.0	4,440.0
	All	103,651	1,728.1	1,653.4	320,150	5,337.7	5,395.0

## LEADING CAUSES OF INJURY

- Four of the five major causes of injury admissions and injury ED presentations were the same (falls, transport, hit/struck/crush injuries, cutting/piercing), but the ranking on frequency of cases was different (Figure 7 & Figure 8).
- The leading cause of both hospital admissions and ED presentations was falls. Falls accounted for 46% (n=47,736) of hospital admissions and 37% (n=119,259) of ED presentations.
- Transport accounted for 14% of admissions (n=14,599) but just 7% of presentations (n=21,111) which indicates that transport injuries were relatively severe.
- Hit/struck/crush injuries accounted for 9% of admissions (n=9,431) but a higher proportion of ED presentations (19%, n=59,207).
- Cutting and piercing injuries accounted for 7% of admissions (n=7,440) and 8% of ED presentations (n=25,802).
- The fifth ranking cause of injury-related admissions was overexertion and/or strenuous movements (3%, n=3,470) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (4%, n=13,983).

Figure 7: Injury hospital admissions by cause, Victoria 2015/16

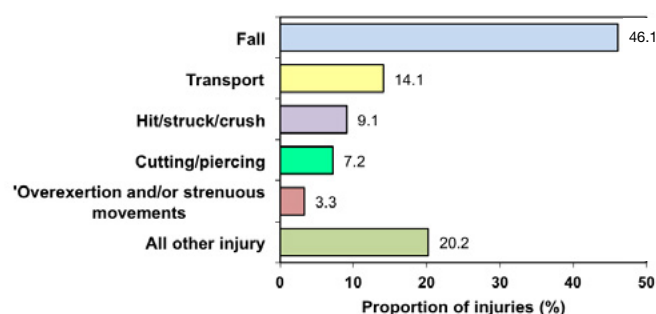
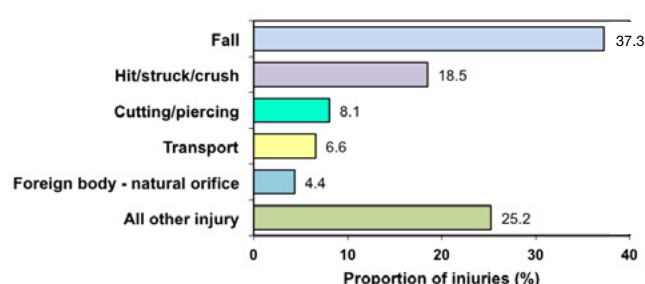


Figure 8: Injury ED presentations by cause, Victoria 2015/16



Note: "Other specified" and "unspecified" cases were included in the 'all other injuries' category regardless of their ranking

## MAJOR INJURY TYPE (BODY SITE AND NATURE OF INJURY)

Figure 9 and Figure 10 show the five most common specific injury types for hospital admissions and ED presentations.

- Fracture to the upper limb accounted for 18% (n=18,803) of hospital admissions and 12% (n=37,336) of ED presentations.
- Fracture to the lower limb was the second most common type of injury requiring hospital admission (13%, n=13,849).
- Dislocations, sprains and strains to the lower limb (9%, n=28,943) and upper limb (8%, n=25,687) were common among ED presentations.
- Fracture to the trunk accounted for 6% of admissions (n=6,302).
- Open wounds to the head/face/neck accounted for 6% of admissions (n=5,952) and 6% of ED presentations (n=20,393). Open wounds to the upper limb accounted for 6% of admissions (n=5,818) and 7% of ED presentations (n=21,975).

Figure 9: Major injury type, hospital admissions, Victoria, 2015/16

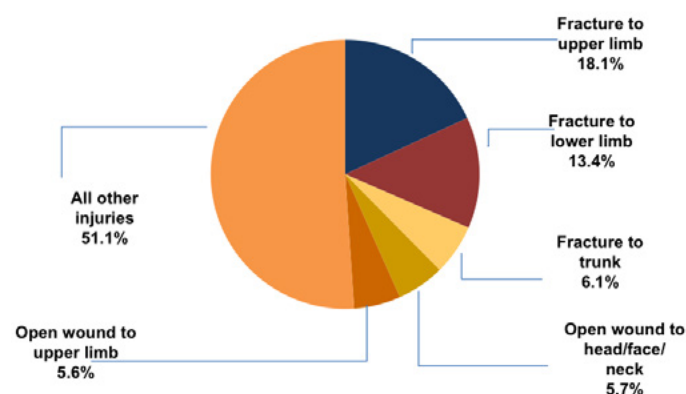
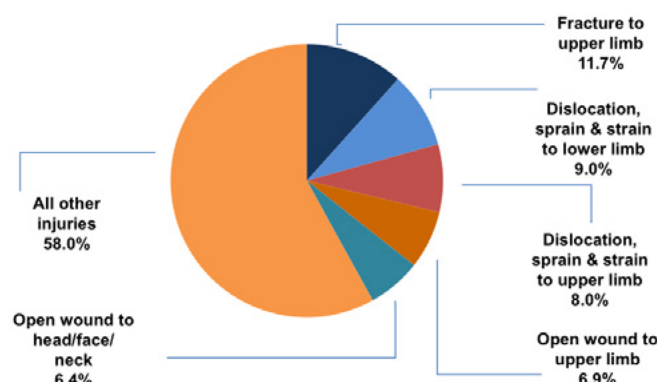


Figure 10: Major injury type, ED presentations Victoria 2015/16



SETTING

- In 2015/16, 26% (n=27,056) of all injuries requiring hospital admission and 40% (n=127,109) of injuries resulting in ED presentation occurred in the home.
- Injuries also commonly occurred on roads/streets/highways (11% of admissions and 7% of ED presentations), while working for income (7% of admissions and 8% of ED presentations) and in sports settings (7% of admissions and 9% of ED presentations). Around 6% of admissions resulted from injuries that occurred in residential institutional settings (Figure 11 & Figure 12).

Figure 11: Injury hospital admissions by setting, Victoria 2015/16

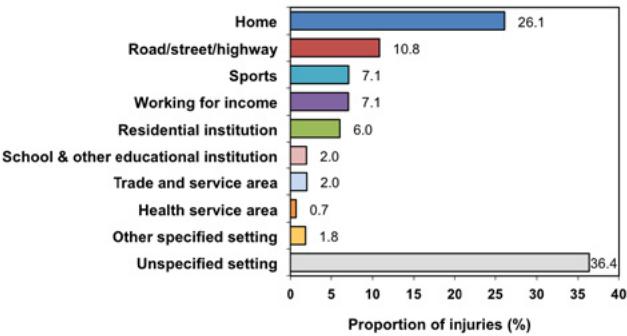


Figure 12: Injury ED presentations by setting, Victoria 2015/16

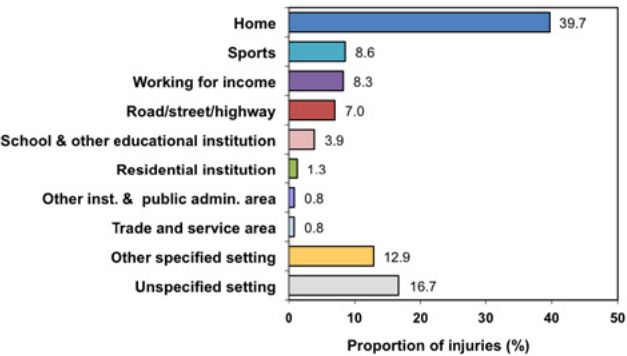


Table 5: Ranking of causes of injury hospital admissions by age groups

Rank	Age groups (years)													
	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	95+	
1	fall 2,330 46.9%	fall 2,498 55.5%	fall 1,820 39.3%	transport 1,262 21.1%	transport 1,649 23.4%	transport 2,724 23.1%	transport 2,167 22.3%	fall 2,814 28.7%	fall 4,417 45.4%	fall 6,103 61.6%	fall 9,401 77.4%	fall 10,421 87.1%	fall 1,341 90.9%	
2	hit/struck/crush 834 16.8%	hit/struck/crush 669 14.9%	hit/struck/crush 893 19.3%	fall 1,215 20.4%	fall 1,196 16.9%	fall 2,051 17.4%	fall 2,129 21.9%	transport 1,997 20.4%	transport 1,552 15.9%	transport 918 9.3%	transport 680 5.6%	unspec. unintention. 470 3.9%	unspec. unintention. 42 2.8%	
3	unspec. unintention. 381 7.7%	transport 392 8.7%	transport 773 16.7%	hit/struck/crush 1,157 19.4%	hit/struck/crush 1,093 15.5%	unspec. unintention. 1,680 14.3%	unspec. unintention. 1,311 13.5%	unspec. unintention. 1,358 13.9%	unspec. unintention. 1,038 10.7%	unspec. unintention. 873 8.8%	unspec. unintention. 640 5.3%	transport 306 2.6%	hit/struck/crush 27 1.8%	
4	foreign body 310 6.2%	cutting/piercing 261 5.8%	unspec. unintention. 485 10.5%	unspec. unintention. 1,025 17.2%	unspec. unintention. 1,045 14.8%	hit/struck/crush 1,615 13.7%	cutting/piercing 1,234 12.7%	cutting/piercing 994 10.1%	cutting/piercing 785 8.1%	cutting/piercing 477 4.8%	hit/struck/crush 296 2.4%	hit/struck/crush 201 1.7%	transport 22 1.5%	
5	cutting/piercing 277 5.6%	unspec. unintention. 249 5.5%	cutting/piercing 235 5.1%	cutting/piercing 477 8.0%	cutting/piercing 869 12.3%	cutting/piercing 1,553 13.2%	hit/struck/crush 983 10.1%	hit/struck/crush 786 8.0%	hit/struck/crush 505 5.2%	hit/struck/crush 372 3.8%	ovrext./ stren.mmts 293 2.4%	ovrext./ stren.mmts 172 1.4%	ovrext./ stren.mmts 16 1.1%	
6	poisoning 245 4.9%	foreign body 155 3.4%	nat./envir./ animals 121 2.6%	ovrext./ stren.mmts 253 4.2%	ovrext./ stren.mmts 292 4.1%	ovrext./ stren.mmts 586 5.0%	ovrext./ stren.mmts 550 5.7%	nat./envir./ animals 491 5.0%	nat./envir./ animals 412 4.2%	ovrext./ stren.mmts 336 3.4%	cutting/piercing 209 1.7%	poisoning 111 0.9%	foreign body 10 0.7%	
7	nat./envir./ animals 173 3.5%	nat./envir./ animals 144 3.2%	ovrext./ stren.mmts 113 2.4%	other spec. unintention. 151 2.5%	nat./envir./ animals 229 3.2%	nat./envir./ animals 430 3.7%	nat./envir./ animals 379 3.9%	ovrext./ stren.mmts 476 4.9%	ovrext./ stren.mmts 338 3.5%	nat./envir./ animals 280 2.8%	nat./envir./ animals 195 1.6%	nat./envir./ animals 89 0.7%	cutting/piercing 7 0.5%	
8	fires/burns/ scalds 163 3.3%	fires/burns/ scalds 41 0.9%	other spec. unintention. 54 1.2%	poisoning 128 2.1%	poisoning 222 3.1%	poisoning 364 3.1%	poisoning 318 3.3%	machinery 250 2.6%	foreign body 215 2.2%	foreign body 179 1.8%	poisoning 161 1.3%	foreign body 67 0.6%	fires/burns/ scalds * *	
9	transport 157 3.2%	ovrext./ stren.mmts 31 0.7%	foreign body 52 1.1%	nat./envir./ animals 113 1.9%	other spec. unintention. 149 2.1%	machinery 235 2.0%	machinery 212 2.2%	poisoning 245 2.5%	machinery 166 1.7%	poisoning 160 1.6%	foreign body 140 1.2%	cutting/piercing 62 0.5%	nat./envir./ animals * *	
10	choking/suffoc. 43 0.9%	poisoning 27 0.6%	poisoning 29 0.6%	fires/burns/ scalds 66 1.1%	machinery 117 1.7%	other spec. unintention. 208 1.8%	foreign body 152 1.6%	foreign body 164 1.7%	poisoning 155 1.6%	machinery 96 1.0%	fires/burns/ scalds 52 0.4%	fires/burns/ scalds 24 0.2%	poisoning * *	
11	drowning 19 0.4%	other spec. unintention. 16 0.4%	fires/burns/ scalds 26 0.6%	foreign body 65 1.1%	foreign body 88 1.2%	foreign body 147 1.2%	fires/burns/ scalds 127 1.3%	fires/burns/ scalds 101 1.0%	fires/burns/ scalds 79 0.8%	fires/burns/ scalds 48 0.5%	machinery 33 0.3%	choking/suffoc. 19 0.2%	machinery * *	
12	machinery 17 0.3%	machinery 7 0.2%	machinery 12 0.3%	machinery 45 0.8%	fires/burns/ scalds 79 1.1%	fires/burns/ scalds 133 1.1%	other spec. unintention. 126 1.3%	other spec. unintention. 89 0.9%	other spec. unintention. 49 0.5%	other spec. unintention. 39 0.4%	choking/suffoc. 22 0.2%	other spec. unintention. 12 0.1%	other spec. unintention. * *	
13	ovrext./ stren.mmts 14 0.3%	drowning 6 0.1%	drowning 9 0.2%	explosions/ firearms 6 0.1%	explosions/ firearms 18 0.3%	explosions/ firearms 25 0.2%	explosions/ firearms 16 0.2%	choking/suffoc. 18 0.2%	choking/suffoc. 13 0.1%	choking/suffoc. 17 0.2%	other spec. unintention. 17 0.1%	machinery 10 0.1%	choking/suffoc. 0 0.0%	
14	other spec. unintention. 8 0.2%	choking/suffoc. * *	choking/suffoc. * *	drowning * *	choking/suffoc. 7 0.1%	drowning 14 0.1%	choking/suffoc. 8 0.1%	explosions/ firearms * *	drowning 6 0.1%	explosions/ firearms * *	drowning * *	drowning * *	drowning 0 0.0%	
15	explosions/ firearms 0 0.0%	explosions/ firearms * *	explosions/ firearms * *	choking/suffoc. * *	drowning 6 0.1%	choking/suffoc. 7 0.1%	drowning 5 0.1%	drowning * *	explosions/ firearms 6 0.1%	drowning * *	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms 0 0.0%	
All	4,971	4,502	4,630	5,968	7,059	11,772	9,717	9,803	9,736	9,908	12,142	11,968	1,475	

\* small numbers have been suppressed due to data confidentiality concerns



Table 6: Ranking of causes of injury ED presentations by age groups

Rank	Age groups (years)												
	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	95+
1	fall	fall	fall	fall	hit/struck/crush	fall	fall	fall	fall	fall	fall	fall	fall
	14,510	13,890	13,896	7,994	6,589	9,763	8,016	8,398	8,809	8,691	9,517	8,372	958
	43.6%	50.2%	44.2%	29.8%	23.9%	22.6%	24.6%	29.3%	37.5%	48.3%	63.0%	75.4%	79.0%
2	hit/struck/crush	hit/struck/crush	hit/struck/crush	hit/struck/crush	fall	hit/struck/crush	hit/struck/crush	hit/struck/crush	hit/struck/crush	other spec. unintent.	unspec. unintent.	unspec. unintent.	unspec. unintent.
	5,457	5,467	8,261	7,448	6,445	9,588	6,200	4,503	2,793	1,923	1,509	960	103
	16.4%	19.8%	26.3%	27.8%	23.4%	22.2%	19.0%	15.7%	11.9%	10.7%	10.0%	8.7%	8.5%
3	other spec. unintent.	other spec. unintent.	other spec. unintent.	other spec. unintent.	cutting/piercing	cutting/piercing	cutting/piercing	other spec. unintent.	other spec. unintent.	unspec. unintent.	other spec. unintent.	other spec. unintent.	other spec. unintent.
	4,102	2,544	3,333	3,095	3,199	5,498	3,928	3,223	2,484	1,823	1,252	605	49
	12.3%	9.2%	10.6%	11.5%	11.6%	12.7%	12.0%	11.3%	10.6%	10.1%	8.3%	5.5%	4.0%
4	unspec. unintent.	unspec. unintent.	unspec. unintent.	transport	other spec. unintent.	other spec. unintent.	other spec. unintent.	cutting/piercing	unspec. unintent.	hit/struck/crush	hit/struck/crush	hit/struck/crush	hit/struck/crush
	2,567	1,634	2,181	2,230	2,934	4,579	3,745	3,067	2,342	1,555	858	443	45
	7.7%	5.9%	6.9%	8.3%	10.6%	10.6%	11.5%	10.7%	10.0%	8.6%	5.7%	4.0%	3.7%
5	foreign body	cutting/piercing	transport	unspec. unintent.	transport	transport	unspec. unintent.	unspec. unintent.	cutting/piercing	cutting/piercing	cutting/piercing	transport	transport
	2,297	1,278	1,504	2,139	2,870	4,224	3,149	2,932	2,247	1,349	559	227	18
	6.9%	4.6%	4.8%	8.0%	10.4%	9.8%	9.7%	10.2%	9.6%	7.5%	3.7%	2.0%	1.5%
6	cutting/piercing	foreign body	cutting/piercing	cutting/piercing	unspec. unintent.	unspec. unintent.	transport	transport	transport	transport	transport	cutting/piercing	cutting/piercing
	1,316	1,007	1,163	1,979	2,269	3,820	2,978	2,582	1,808	951	550	208	11
	4.0%	3.6%	3.7%	7.4%	8.2%	8.8%	9.1%	9.0%	7.7%	5.3%	3.6%	1.9%	0.9%
7	fires/burns/ scalds	transport	nat./envir./ animals	foreign body	foreign body	foreign body	foreign body	foreign body	foreign body	foreign body	foreign body	foreign body	foreign body
	1,216	838	359	576	1,199	2,362	1,966	1,691	1,337	760	331	98	10
	3.7%	3.0%	1.1%	2.1%	4.3%	5.5%	6.0%	5.9%	5.7%	4.2%	2.2%	0.9%	0.8%
8	nat./envir./ animals	nat./envir./ animals	foreign body	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	nat./envir./ animals	poisoning
	774	503	349	435	719	1,247	964	919	759	438	236	79	10
	2.3%	1.8%	1.1%	1.6%	2.6%	2.9%	3.0%	3.2%	3.2%	2.4%	1.6%	0.7%	0.8%
9	poisoning	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds	poisoning	poisoning	nat./envir./ animals
	602	318	234	406	603	967	763	617	399	194	139	59	6
	1.8%	1.2%	0.7%	1.5%	2.2%	2.2%	2.3%	2.2%	1.7%	1.1%	0.9%	0.5%	0.5%
10	transport	poisoning	poisoning	poisoning	poisoning	poisoning	poisoning	poisoning	machinery	poisoning	fires/burns/ scalds	fires/burns/ scalds	fires/burns/ scalds
	331	120	89	378	498	678	496	351	256	152	88	33	2
	1.0%	0.4%	0.3%	1.4%	1.8%	1.6%	1.5%	1.2%	1.1%	0.8%	0.6%	0.3%	0.2%
11	choking/suffoc.	choking/suffoc.	choking/suffoc.	machinery	machinery	machinery	machinery	machinery	poisoning	machinery	machinery	machinery	choking/suffoc.
	49	21	26	96	224	413	356	315	225	125	57	7	0
	0.1%	0.1%	0.1%	0.4%	0.8%	1.0%	1.1%	1.1%	1.0%	0.7%	0.4%	0.1%	0.0%
12	drowning	machinery	machinery	choking/suffoc.	choking/suffoc.	choking/suffoc.	choking/suffoc.	choking/suffoc.	choking/suffoc.	choking/suffoc.	drowning	choking/suffoc.	drowning
	40	17	26	19	30	46	28	29	19	17	5	*	0
	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	*	0.0%
13	machinery	drowning	drowning	drowning	drowning	drowning	drowning	drowning	drowning	drowning	choking/suffoc.	drowning	explosions/ firearms
	*	*	*	12	14	23	*	*	*	11	*	*	0
	*	*	*	0.0%	0.1%	0.1%	*	*	*	0.1%	*	*	0.0%
14	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	explosions/ firearms	machinery
	*	*	*	5	6	8	*	*	*	5	*	*	0
	*	*	*	0.0%	0.0%	0.0%	*	*	*	0.0%	*	*	0.0%
All	33,284	27,649	31,436	26,812	27,599	43,216	32,611	28,645	23,491	17,994	15,104	11,097	1,212

\* small numbers have been suppressed due to data confidentiality concerns

# CHILDREN (0-14 YEARS)

## TREND

- During the 10-year period 2006/07 to 2015/16 there were on average 10,606 injury admissions and 78,961 injury ED presentations per year among children aged up to and including 14 years. Average age-standardised injury rates were 1,032 admissions and 7,684 ED presentations per 100,000 children per year.
- The age-standardised annual rate of injury admissions among children aged 0-14 years increased by 3.2% per year during the ten years. The modelled trend in rate showed a statistically significant annual increase of 3.4% [95% CI 2.0 to 4.8%].
- The age-standardised rate of injury ED presentations among children aged 0-14 years increased by 1.4% per year. The modelled trend in rate showed a statistically significant annual increase of 1.5% [95% CI 0.8 to 2.1%].
- The modelled age-specific rates of injury admissions among the age groups 0-4, 5-9 and 10-14 years showed annual increases of 4.5%, 3.1% and 2.6%, respectively (each age-specific modelled trend was statistically significant; however, the increase mainly occurred in 2013/14 to 2015/16: age specific rates shown in Figure 13).
- The modelled age-specific rate of injury ED presentations among the age groups 0-4, 5-9 and 10-14 years showed annual increases of 1.3%, 1.8% and 1.3% respectively (each age-specific modelled trend was statistically significant; however, the increase mainly occurred in 2011/12 to 2015/16: age specific rates shown in Figure 14).

Figure 13: Trend in injury hospital admission rates per 100,000 children, Victoria 2006/07-2015/16

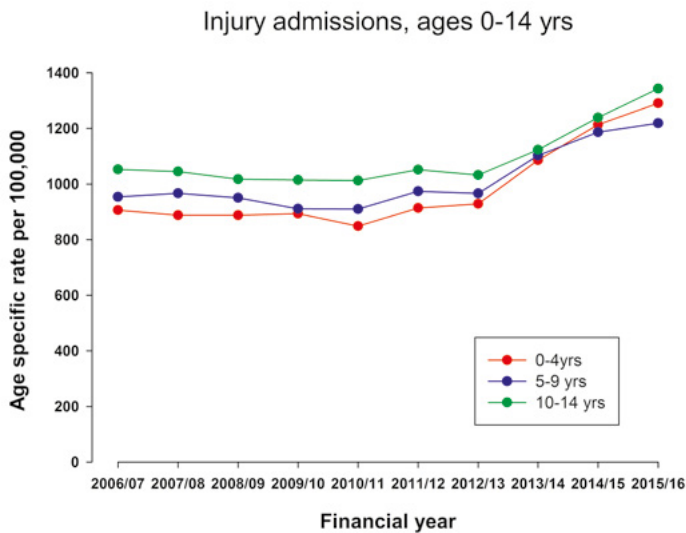
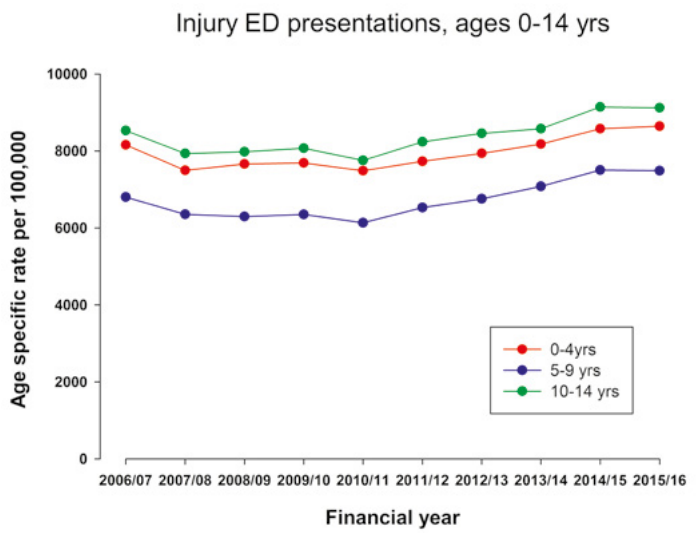


Figure 14: Trend in injury ED presentation rates per 100,000 children, Victoria 2006/07-2015/16





## HOSPITAL TREATED INJURY — GENDER AND AGE

- Males were overrepresented in child hospital-treated injury cases, accounting for 62% of admissions (n=8,752) and 58% of ED presentations (n=53,249) in 2015/16 (Figure 15 & Figure 16).
- Child injury admissions and ED presentations were fairly evenly distributed across the 5-year age groups.
  - Children aged 0-4 years accounted for 35% of child admissions and 36% of child ED presentations.
  - Children aged 5-9 years accounted for 32% of child admissions and 30% of child ED presentations.
  - Children aged 10-14 years accounted for 33% of child admissions and 34% of child ED presentations.
- Child injury admission and ED presentation rates were higher for males than females: 1,551.2 vs. 1,000.3 per 100,000 population (admissions) and 9,437.8 vs. 7,313.1 per 100,000 population (ED presentations).
- Table 7 shows that age-specific hospital admission rates for children were fairly equal across age groups whereas there was a high rate of ED presentations in the 10-14 age group, followed by the 0-4 age group.

Figure 15: Child injury hospital admissions by gender and age, Victoria 2015/16

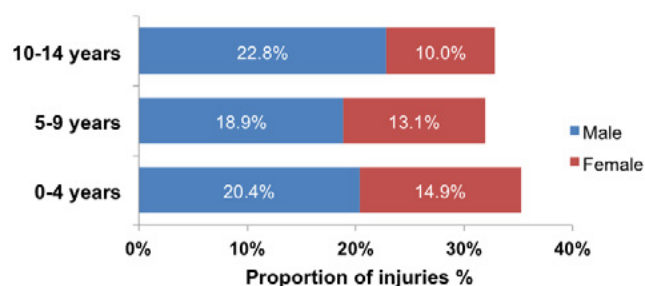


Figure 16: Child injury ED presentations by gender and age, Victoria 2015/16

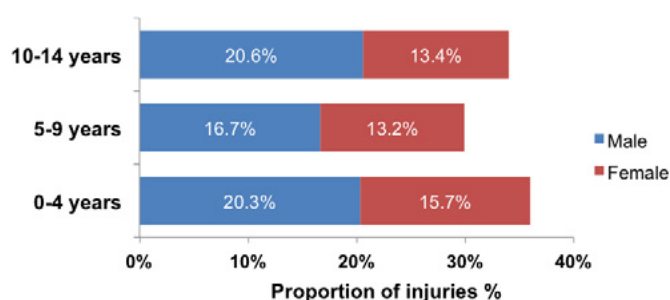


Table 7: Frequency and age-specific rate of injury admissions and ED presentations in children by gender and age, Victoria 2015/16

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	Rate per 100,000 population	n	Rate per 100,000 population
0-4 years	Male	2,871	1,451.2	18,782	9,493.4
	Female	2,100	1,121.3	14,502	7,743.2
	All	4,971	1,290.7	33,284	8,642.3
5-9 years	Male	2,661	1,404.3	15,423	8,139.0
	Female	1,841	1,023.6	12,226	6,798.0
	All	4,502	1,218.9	27,649	7,486.0
10-14 years	Male	3,220	1,820.6	19,044	10,767.4
	Female	1,410	840.3	12,392	7,385.3
	All	4,630	1,343.4	31,436	9,120.9
All	Male	8,752	1,551.2	53,249	9,437.8
	Female	5,351	1,000.3	39,120	7,313.1
	All	14,103	1,283.1	92,369	8,403.8

## LEADING CAUSES OF INJURY

- The five leading causes of injury in children were the same for hospital admissions and ED presentations, although the ranking on frequency of cases was different (Figure 17 & Figure 18).
- The leading cause of child injury admissions and ED presentations was falls, accounting for 47% of hospital admissions (n=6,648) and 46% of ED presentations (n=42,296).
- Hit/struck/crush injuries were the next major cause of injury accounting for 17% of admissions (n=2,396) and 21% of ED presentations (n=19,185).
- Transport accounted for 9% of admissions (n=1,322) and only 3% of ED presentations (n=2,673).
- Foreign body in a natural orifice, e.g. ear, nose, eye injuries, and cutting and piercing related injuries accounted for 4% and 6% of admissions (n=517 & n=773), respectively, and 4% each of ED presentations (n=3,653 & n=3,757).

Figure 17: Child injury hospital admissions by cause, Victoria 2015/16

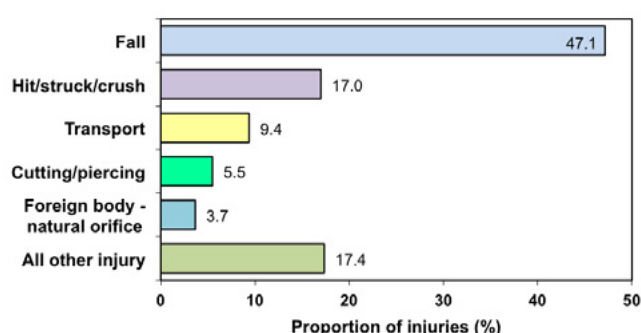
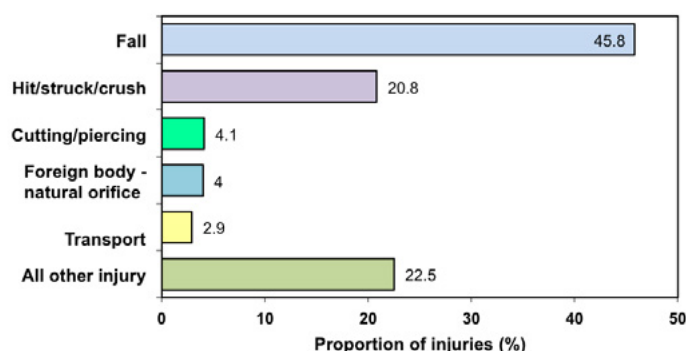


Figure 18: Child injury ED presentations by cause, Victoria 2015/16



Note: 'Other specified' and 'unspecified' cases were included in the 'all other injuries' category regardless of their ranking

## MAJOR INJURY TYPE (BODY SITE AND NATURE OF INJURY)

Figure 19 & Figure 20 show the five most common injury types for child injury admissions and ED presentations.

- Fracture to the upper limb accounted for 30% (n=4,212) of admissions and 17% (n=15,886) of ED presentations.
- Open wounds to the head/face/neck accounted for 12% each of admissions (n=1,748) and ED presentations (n=10,731).
- Other and unspecified injury to head, face or neck was common among hospital admissions (9%, n=1,271), as was fracture to the lower limb (6%, n=829) and intracranial injury (5%, n=760). Other types of injuries were more common among ED presentations, namely dislocations, sprains & strains to the upper limb (11%, n=10,117), and the lower limb (7%, n=6,356) and superficial injury to head/face/neck (7%, n=6,573).

Figure 19: Major injury type, child hospital admissions, Victoria 2015/16

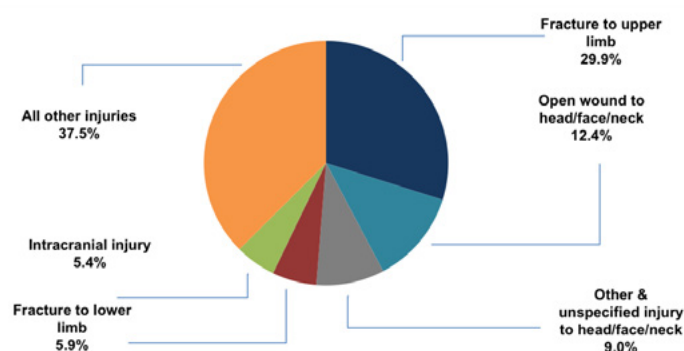
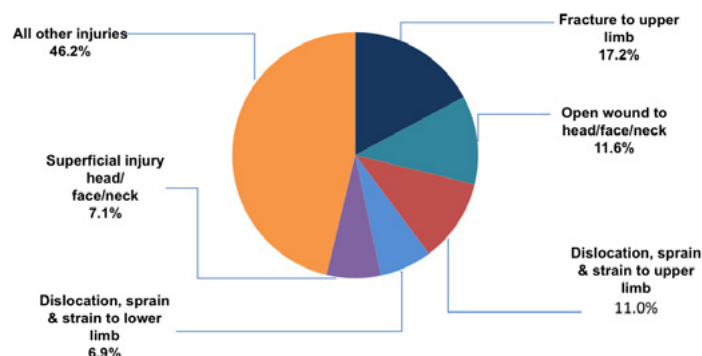


Figure 20: Major injury type, child ED presentations, Victoria 2015/16



SETTING

- Setting where the injury occurred was unspecified in 42% of child injury admissions and 15% of child injury ED presentations
- Twenty-five percent (n=3,497) of all injuries among children requiring hospital admission and 46% (n=42,083) of injuries resulting in ED presentation occurred in the home (Figures 21 & 22).
- Children were also commonly injured in schools and educational settings (13% of admissions and 12% of ED presentations) and sports settings (9% each of both admissions and ED presentations).

Figure 21: Child injury hospital admissions by setting, Victoria 2015/16

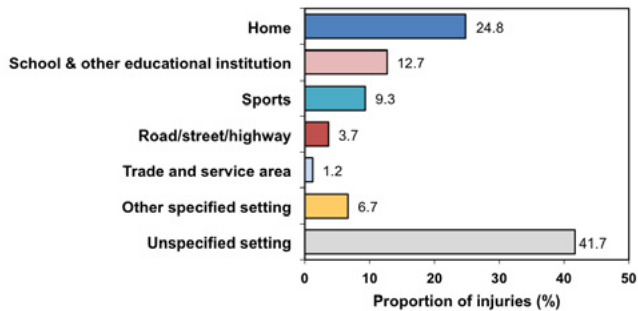
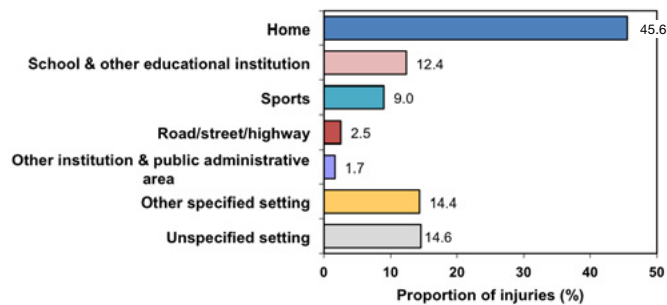


Figure 22: Child injury ED presentations by setting, Victoria 2015/16



# ADOLESCENTS AND YOUNG ADULTS (15-24 YEARS)

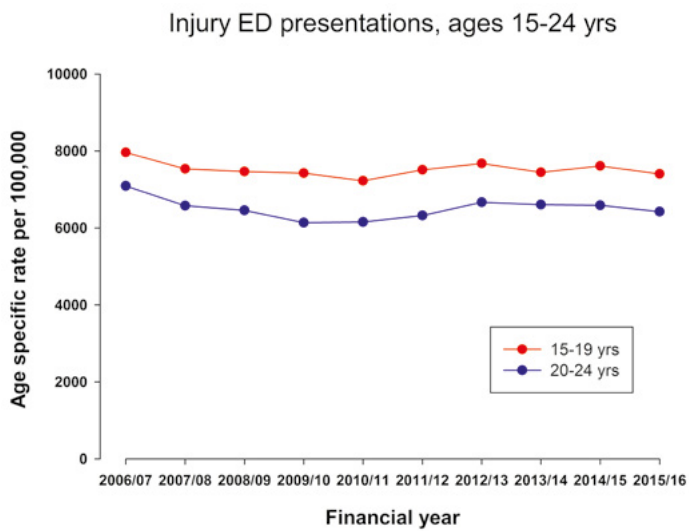
## TREND

- During the 10-year period 2006/07 to 2015/16, there were on average 10,424 injury admissions and 53,094 injury ED presentations per year among adolescents and young adults aged 15-24 years. The average age-standardised injury rates were 1,368 admissions and 7,013 ED presentations per 100,000 adolescents and young adults per year.
- The age-standardised annual rate of injury admissions among adolescents and young adults increased by 3.1% per year during the ten years. The modelled trend in rate showed a statistically significant annual increase of 3.3% [95% CI 2.4 to 4.2%].
- The age-standardised rate of injury ED presentations among adolescents and young adults decreased by 0.3% per year. The modelled trend in rate showed a non-significant annual decrease of 0.3% [95% CI -0.7 to 0.2%].
- The modelled age-specific rates of injury admissions among the age groups 15-19 and 20-24 years showed annual increases of 2.6% and 3.8%, respectively (each age-specific modelled trend was statistically significant; however, the increase was most pronounced in 2013/14 to 2015/16: age specific rates shown in Figure 23).
- The modelled age-specific rates of injury ED presentations among the age groups 15-19 and 20-24 years both showed an annual decrease of 0.3% (not significant) (age specific rates shown in Figure 24).

Figure 23: Trend in injury hospital admission rates per 100,000 adolescent & young adults, Victoria 2006/07-2015/16



Figure 24: Trend in injury ED presentation rates per 100,000 adolescent & young adults, Victoria 2006/07-2015/16



## HOSPITAL TREATED INJURY — GENDER AND AGE

- Males were overrepresented in hospital-treated injury cases among adolescents and young adults, accounting for 72% of hospital admissions (n=9,412) and 67% of ED presentations (n=36,211) in 2015/16 (Figure 25 & Figure 26).
- Adolescent and young adult injury hospital admissions and ED presentations were fairly evenly spread across both the 5-year age groups.
- Among adolescents and young adults, age-specific injury admission and ED presentation rates were higher for males than females: 2,321.1 vs. 935.6 per 100,000 population; 8,930.1 vs. 4,710.4 per 100,000 population (Table 8).
- The admission rates were quite similar across the two 5-year age groups while the ED presentation rate was higher in the 15-19 age group than the 20-24 age group.

Figure 25: Adolescent and young adult hospital admissions by gender and age, Victoria 2015/16

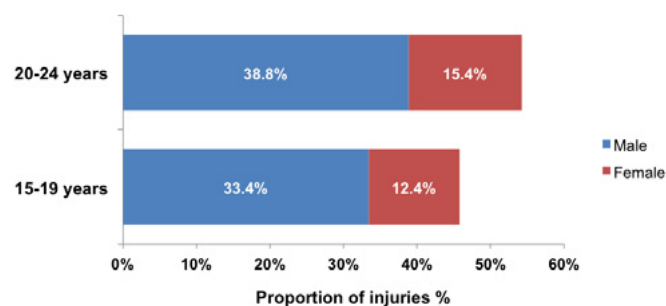


Figure 26: Adolescent and young adult ED presentations by gender and age, Victoria 2015/16

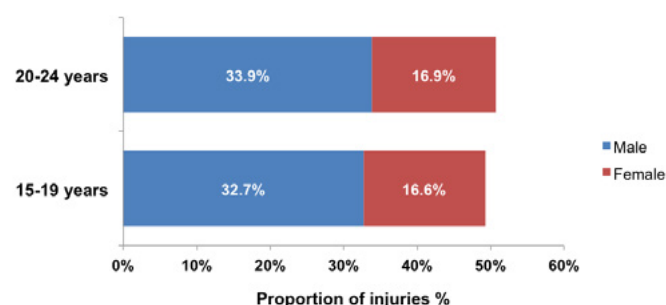


Table 8: Frequency and age-specific rate of injury admissions and ED presentations in adolescents and young adults by gender and age, Victoria 2015/16

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	Rate per 100,000 population	n	Rate per 100,000 population
15-19 years	Male	4,352	2,347.2	17,784	9,591.8
	Female	1,616	914.3	9,028	5,107.7
	All	5,968	1,647.9	26,812	7,403.3
20-24 years	Male	5,060	2,299.1	18,427	8,372.6
	Female	1,999	953.6	9,172	4,375.5
	All	7,059	1,642.7	27,599	6,422.7
All	Male	9,412	2,321.1	36,211	8,930.1
	Female	3,615	935.6	18,200	4,710.4
	All	13,027	1,645.1	54,411	6,871.2

## LEADING CAUSES OF INJURY

- Four of the five leading causes of adolescent and young adult injury were the same for admissions and ED presentations although the ranking on frequency of cases was different (Figure 27 & Figure 28).
- Transport was the leading cause of adolescent and young adult hospital admissions (22%, n=2,911) but only accounted for 9% of ED presentations (n=5,100).
- Falls was the second most common cause of hospital admissions (19%, n=2,411), and the leading cause of ED presentations (27%, n=14,439) in this age group.
- Hit/struck/crush injuries accounted for 17% of hospital admissions (n=2,250) and 26% of ED presentations (n=14,037).
- Cutting and piercing injuries accounted for 10% of admissions (n=1,346) and 10% of ED presentations (n=5,178).
- The fifth ranking cause of adolescent and young adult hospital admissions was overexertion and strenuous movements (4%, n=545) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (3%, n=1,775).

Figure 27: Adolescent and young adult injury hospital admissions by cause, Victoria 2015/16

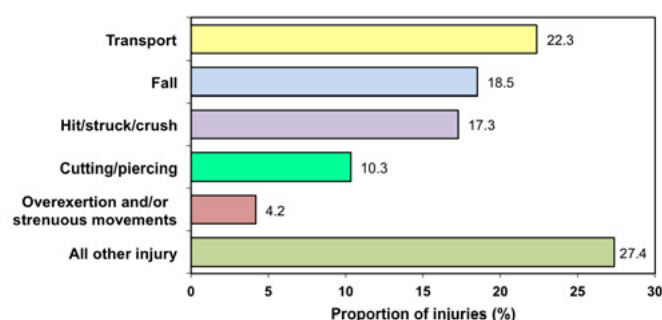
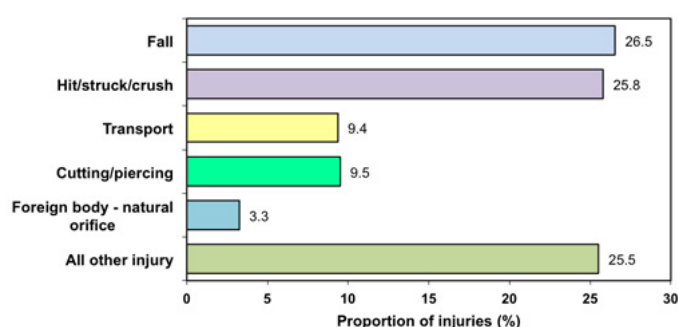


Figure 28: Adolescent and young adult injury ED presentations by cause, Victoria 2015/16



Note: 'Other specified' and 'unspecified' cases were included in the 'all other injuries' category regardless of their ranking

## MAJOR INJURY TYPE (BODY SITE AND NATURE OF INJURY)

Figure 29 & Figure 30 show the five most common injury types for adolescent and young adult hospital admissions and ED presentations.

- Fracture to the upper limb accounted for 20% (n=2,605) of injury admissions and 10% of ED presentations (n=5,511).
- Fracture to the lower limb (9%, n=1,126) and dislocations, sprains and strains to the lower limb (10%, n=1,232) were common among admissions.
- Dislocations, sprains and strains to the lower limb (14%, n=7,580), and the upper limb (10%, n=5,412) and open wounds to the upper limb (8%, n=4,427) were common among ED presentations.

Figure 29: Major injury type, adolescent and young adult hospital admissions, Victoria 2015/16

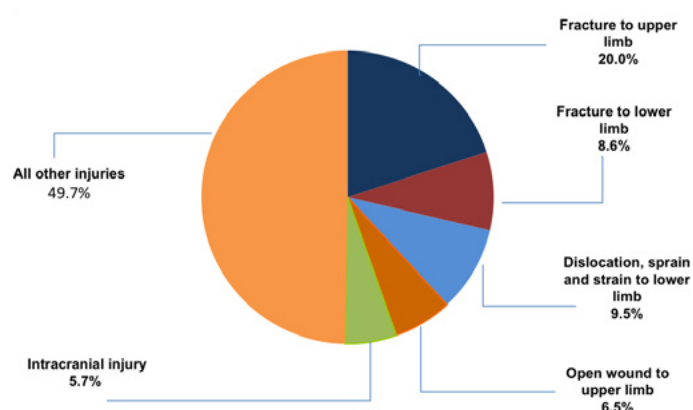
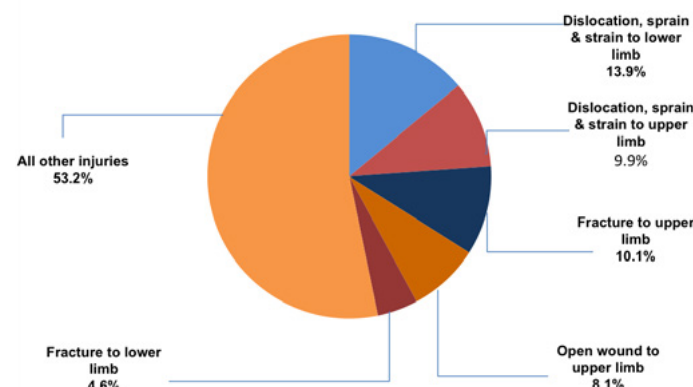


Figure 30: Major injury type, adolescent and young adult ED presentations, Victoria 2015/16



SETTING

- Setting where the injury occurred was unspecified in 39% of adolescent and young adult injury admissions and 19% of ED presentations.
- Sports (21%, n=2,779) and the road, street and highway (15%, n=1,900) settings were the most common places of occurrence resulting in hospital admission (Figure 31). Other common settings were working for income (10%, n=1,331) and the home (8%, n=1,000).
- Among ED presentations, the home (24%, n=13,040) and sports settings (20%, n=10,940) were the most common places of injury occurrence (Figure 32). Other common settings were working for income (12%, n=6,426) and road/street and highway (9%, n=4,705).

Figure 31: Adolescent and young adult injury hospital admissions by setting, Victoria 2015/16

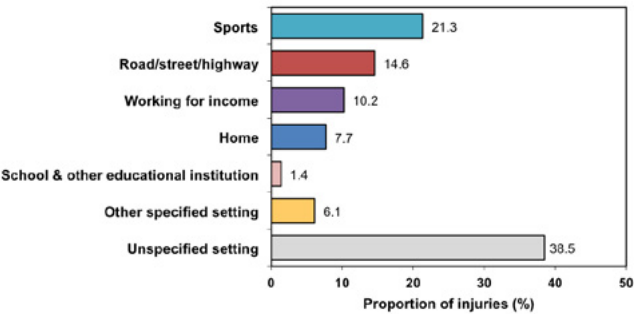
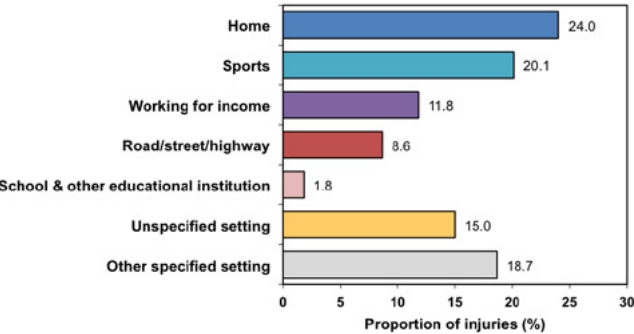


Figure 32: Adolescent and young adult injury ED presentations by setting, Victoria 2015/16





# ADULTS (25-64 YEARS)

## TREND

- During the 10-year period 2006/07 to 2015/16, there were on average 30,543 injury admissions and 115,071 injury ED presentations per year among adults aged 25-64 years. The average age-standardised injury rates were 1,015 admissions and 3,888 ED presentations per 100,000 adults per year.
- The age-standardised annual rate of injury admissions among adults increased by 4.1% per year during the ten years. The modelled trend in rate showed a statistically significant annual increase of 4.4% [95% CI 3.4 to 5.3%].
- The age-standardised rate of injury ED presentations among adults increased by 0.3% per year. The modelled trend in rate showed a non-significant annual increase of 0.4% [95% CI -0.2 to 1.0%].
- The modelled age-specific rates of injury admissions among the age groups 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64 years showed annual increases of 3.8, 3.2, 3.2, 4.7, 4.8, 5.2, 5.1, and 5.0%, respectively (each statistically significant) (age specific rates shown in Figure 33).
- The modelled age-specific rates of injury ED presentations showed annual decreases of -0.6% (not significant), -1.1% (significant) and 0.6% (not significant), in the age groups 25-29, 30-34, 35-39 years. In the age groups 40-44, 45-49, 50-54, 55-59, and 60-64 years, modelled rates increased statistically significantly by 0.8, 1.0, 1.9, 1.6 and 1.9%, respectively (age specific rates shown in Figure 34).

Figure 33: Trend in injury hospital admission rates per 100,000 adults, Victoria 2006/07-2015/16

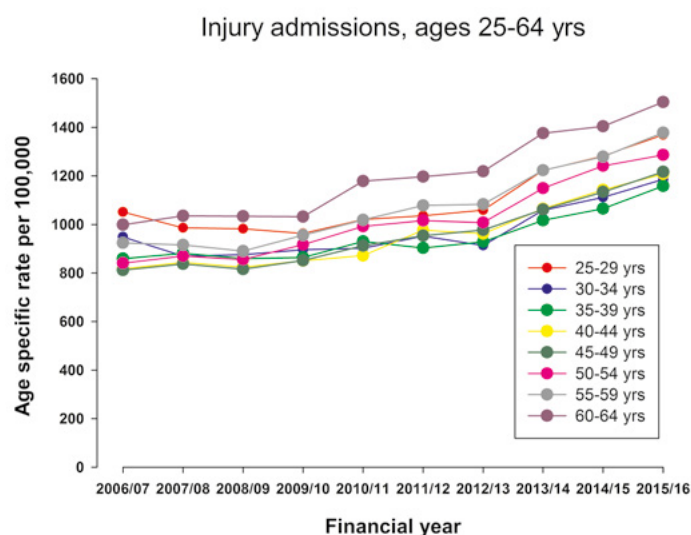
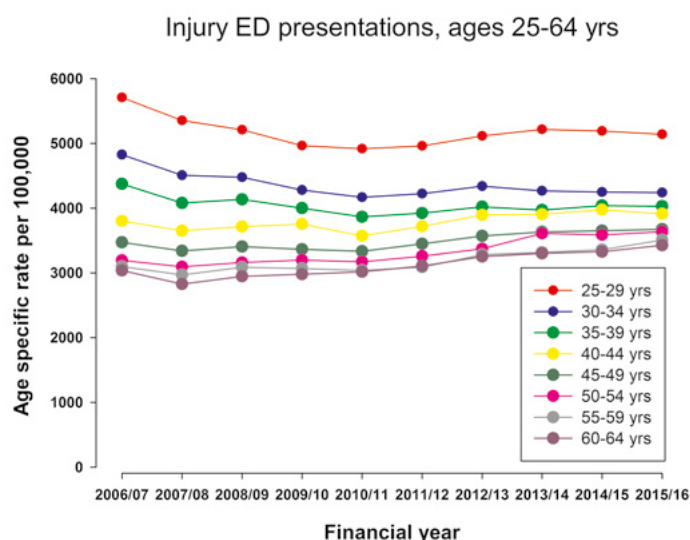


Figure 34: Trend in injury ED presentation rates per 100,000 adults, Victoria 2006/07-2015/16



## HOSPITAL TREATED INJURY — GENDER AND AGE

- Males were overrepresented in hospital-treated injury cases in adults aged 25 to 64 years, accounting for 63% of hospital admissions (n=25,765) and 61% of ED presentations (n=77,697) in 2015/16 (Figure 35 & Figure 36).
- The proportion of injuries was fairly evenly distributed among all age groups for admissions whereas a decrease can be seen with increasing age for ED presentations.
- The total age-specific injury admission and ED presentation rates were higher for males compared with females: 1,631.8 vs. 939.2 per 100,000 adults (admissions) and 4,920.8 vs. 3,093.2 per 100,000 adults (presentations).
- Overall rates (male and female combined) were highest in the 55-64 years age group for admissions and the 25-34 years group for ED presentations (Table 9).

Figure 35: Adult injury hospital admissions by gender and age, Victoria 2015/16

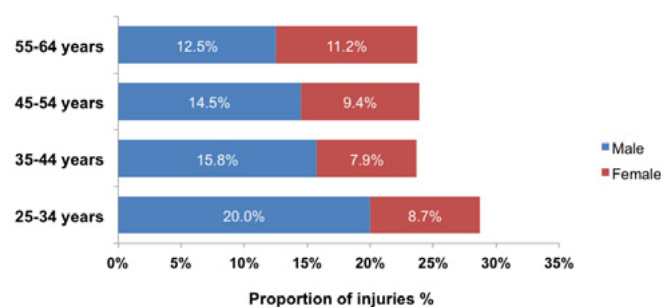


Figure 36: Adult injury ED presentations by gender and age, Victoria 2015/16

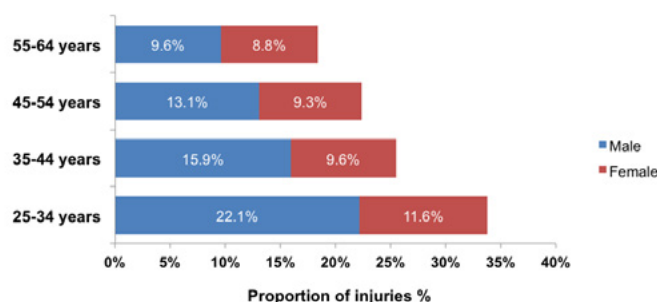


Table 9: Frequency and age-specific rate of injury admissions and ED presentations in adults by gender and age, Victoria 2015/16

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	Rate per 100,000 population	n	Rate per 100,000 population
25-34 years	Male	8,209	1,791.6	28,338	6,184.6
	Female	3,563	769.3	14,878	3,212.3
	All	11,772	1,277.7	43,216	4,690.5
35-44 years	Male	6,464	1,592.7	20,378	5,020.9
	Female	3,253	783.0	12,233	2,944.4
	All	9,717	1,183.1	32,611	3,970.5
45-54 years	Male	5,945	1,545.9	16,700	4,342.6
	Female	3,858	966.1	11,945	2,991.3
	All	9,803	1,250.6	28,645	3,654.2
55-64 years	Male	5,147	1,558.2	12,281	3,717.9
	Female	4,589	1,322.0	11,210	3,229.3
	All	9,736	1,437.1	23,491	3,467.5
All	Male	25,765	1,631.8	77,697	4,920.8
	Female	15,263	939.2	50,266	3,093.2
	All	41,028	1,280.5	127,963	3,993.8

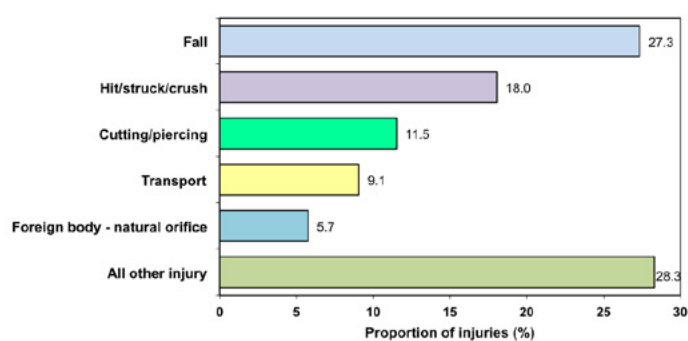
## LEADING CAUSES OF INJURY

- Four of the five leading causes of adult injury were the same for admissions and ED presentations although the ranking on frequency of cases was different (Figure 37 & Figure 38).
- The leading cause of adult injury admissions and ED presentations was falls accounting for 28% (n=11,411) of hospital admissions and 27% (n=34,986) of ED presentations.
- Transport accounted for 21% of admissions (n=8,440) but only 9% of ED presentations (n=11,592).
- Cutting and piercing injuries accounted for 11% of admissions (n=4,566) and 12% of ED presentations (n=14,740).
- Hit/struck/crush injuries accounted for just 10% of admissions (n=3,889) but 18% of ED presentations (n=23,084).
- The fifth ranking cause of hospital admissions was overexertion and/or strenuous movements related injury (5%, n=1,950) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (6%, n=7,356).

Figure 37: Adult injury hospital admissions by cause, Victoria 2015/16



Figure 38: Adult injury ED presentations by cause, Victoria 2015/16



Note: 'Other specified' and 'unspecified' cases were included in the 'all other injuries' category regardless of their ranking

## MAJOR INJURY TYPE (BODY SITE AND NATURE OF INJURY)

- Figure 39 and Figure 40 show the five most common injury types for adult hospital admissions and ED presentations.
- Fracture to the upper limb accounted for 18% (n=7,240) of admissions. Fracture to the lower limb was the second most common type of injury requiring hospital admission (11%, n=4,584), followed by open wound to upper limb (7%, n=3,052) and dislocations, sprains and strains to lower limb and injury to muscle and tendon in upper limb (5% each, n=2,211 & n=2,155).
- Open wounds to the upper limb (10%, n=12,845), dislocations, sprains and strains to the lower limb (10%, n=12,326) and fracture to the upper limb (9%, n=11,082) were the most common types of injury among ED presentations.

Figure 39: Major injury type, adult hospital admissions, Victoria 2015/16

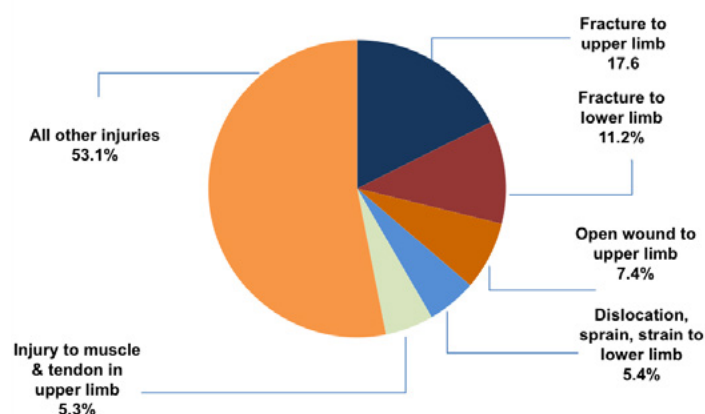
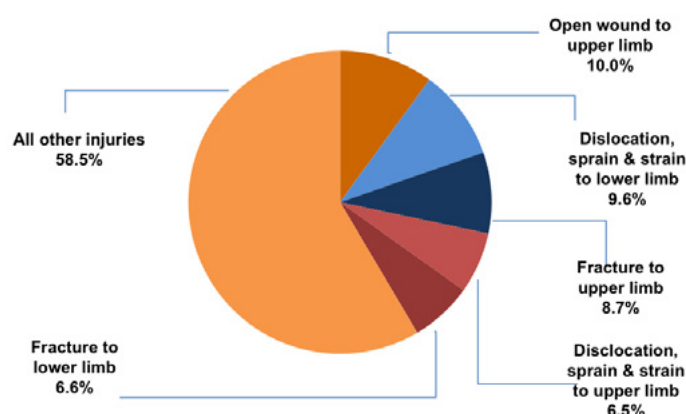


Figure 40: Major injury type, adult ED presentations, Victoria 2015/16



## SETTING

- Setting where the injury occurred was unspecified in 39% of adult injury admissions and 18% of adult injury ED presentations.
- Eighteen percent of injuries requiring hospital admission (n=7,464) and 37% of injuries resulting in ED presentation (n=47,383) occurred in the home (Figure 41 & Figure 42).
- Other settings where injuries to adults commonly occurred were:
  - Working for income (14% of admissions (n=5,648) and 15% of ED presentations (n=19,529))
  - Roads, streets and highways (15% of admissions (n=6,136) and 9% of ED presentations (n=12,033))
  - Sports and athletics setting (7% of admissions (n=3,004) and 6% of ED presentations (n=7,956)).

Figure 41: Adult injury hospital admissions by setting, Victoria 2015/16

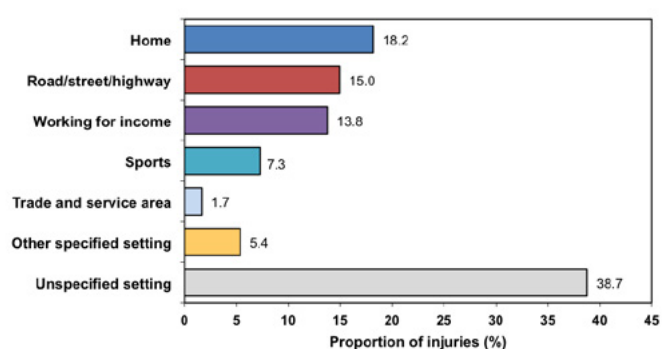
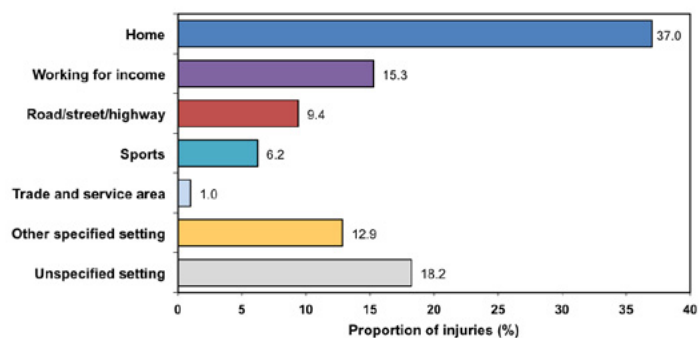


Figure 42: Adult injury ED presentations by setting, Victoria 2015/16



# OLDER ADULTS (65 YEARS AND OLDER)

## TREND

- During the 10-year period 2006/07 to 2015/16, there were on average 26,223 injury admissions and 37,110 injury ED presentations per year among older adults aged 65 years and above. The average age-standardised injury rates were 3,163 admissions and 4,590 ED presentations per 100,000 older adults per year.
- The age-standardised annual rate of injury admissions among older adults increased by 3.8% per year, during the ten years. The modelled trend in rate showed a statistically significant annual increase of 4.0% [95% CI 3.5 to 4.4%].
- The age-standardised annual rate of injury ED presentations among older adults increased by 1.5% per year. The modelled trend in rate showed a statistically significant annual increase of 1.6% [95% CI 1.3 to 1.9%].
- The modelled age-specific rates of injury admissions among the age groups 65-69, 70-74, 75-79, 80-84, 85-89, 90-94 and 95+ years showed annual increases of 5.5, 4.8, 3.8, 3.4, 3.5, 2.9 and 3.6%, respectively (each statistically significant) (age specific rates shown in Figure 43).
- The modelled age-specific rates of injury ED presentations among the age groups 65-69, 70-74, 75-79, 80-84 and 85-89 years showed significant annual increases of 2.1, 1.8, 1.5, 1.5, and 1.5%, respectively. In the 90-94 and 95+ age groups, the average annual increases of 0.6 and 0.3% (respectively) were not statistically significant (age specific rates shown in Figure 44).

Figure 43: Trend in injury hospital admission rates per 100,000 older adults, Victoria 2006/07-2015/16

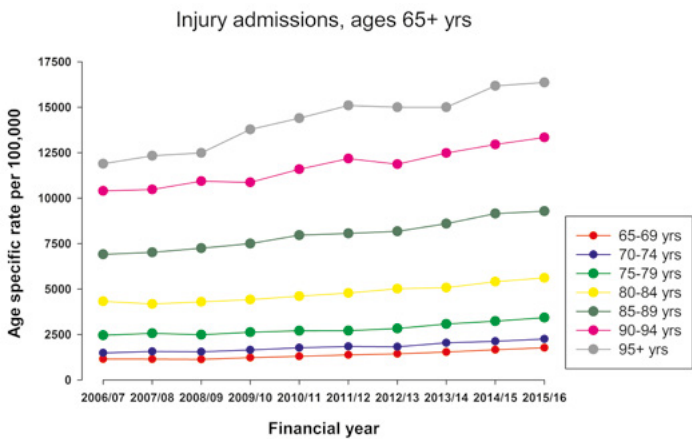
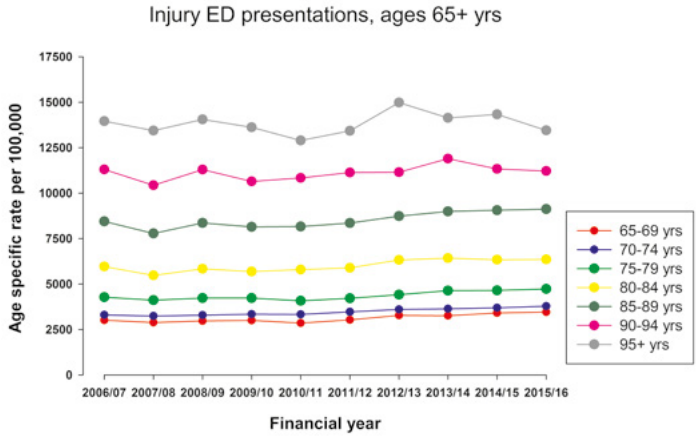


Figure 44: Trend in injury ED presentation rates per 100,000 older adults, Victoria 2006/07-2015/16



## HOSPITAL TREATED INJURY — GENDER AND AGE

- Females were overrepresented in hospital treated injury cases among persons aged 65 years and older. They accounted for 64% of hospital admissions (n=22,663) and 58% of ED presentations (n=26,423) in 2015/16 (Figure 45 & Figure 46).
- The highest proportion of admissions to hospital occurred among those aged 75-84 and 85-94 years. Persons aged 65-74 years accounted for most of the injury ED presentations among older adults. The number of ED presentations declined with increasing age.
- The overall age-specific rate of injury admission and ED presentation was higher for females than males: 4,655.0 vs. 3,083.9 per 100,000 population (admissions) and 5,427.3 vs. 4,563.1 per 100,000 population (presentations) (Table 10).
- The rate of admissions and ED presentations increased with age.

Figure 45: Older adult injury hospital admissions by gender and age, Victoria 2015/16

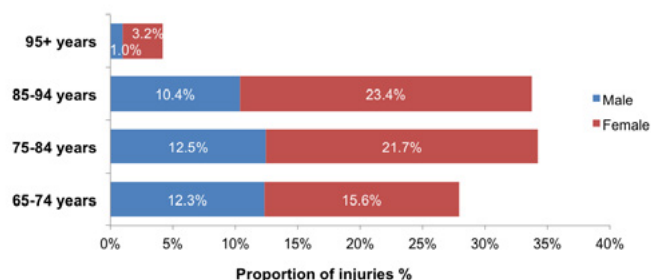


Figure 46: Older adult injury ED presentations by gender and age, Victoria 2015/16

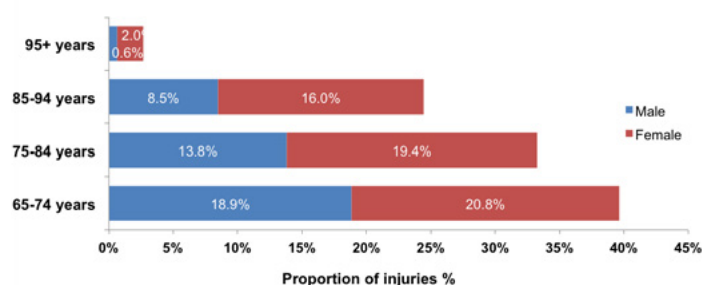


Table 10: Frequency and age-specific rate of older adult injury hospital admissions and ED presentations by gender and age, Victoria 2015/16

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	Rate per 100,000 population	n	Rate per 100,000 population
65-74 years	Male	4,380	1,805.7	8,654	3,530.6
	Female	5,528	2,141.0	9,430	3,652.2
	All	9,908	1,978.6	17,994	3,593.5
75-84 years	Male	4,424	3,456.4	6,279	4,905.7
	Female	7,718	5,098.3	8,825	5,829.6
	All	12,142	4,346.1	15,104	5,406.3
85-94 years	Male	3,676	8,539.9	3,847	8,937.2
	Female	8,292	11,729.8	7,250	10,255.8
	All	11,968	10,522.5	11,097	9,756.7
95+	Male	350	14,385.5	294	12,083.8
	Female	1,125	17,097.3	918	13,951.4
	All	1,475	16,365.3	1,212	13,447.2
All	Male	12,830	3,083.9	18,984	4,563.1
	Female	22,663	4,655.0	26,423	5,427.3
	All	35,493	3,931.0	45,407	5,029.2

## LEADING CAUSES OF INJURY

- The leading cause of injury admissions and ED presentations for older adults was falls. Falls accounted for more than three-quarters of hospital admissions (77%, n=27,266) and more than half of ED presentations (61%, n=27,538) in this age group (Figure 47 & Figure 48).
- Transport was the second most common cause of hospital admission (5%, n=1,926) and the cause of 4% of ED presentations (n=1,746). The second most common cause for ED presentations in this age group was hit/struck/crush (6%, n=2,901).
- The third leading cause of admissions was hit/struck/crush (3%, n=896), whereas for ED presentations it was cutting and piercing (5%, n=2,127).
- Overexertion and/or strenuous movements and cutting and piercing each accounted for 2% of admissions (n=817 & 755) while injuries caused by a foreign body in a natural orifice, e.g. ear, nose, eye, accounted for 3% (n=1,199) of ED presentations.

Figure 47: Older adult injury hospital admissions by cause, Victoria 2015/16

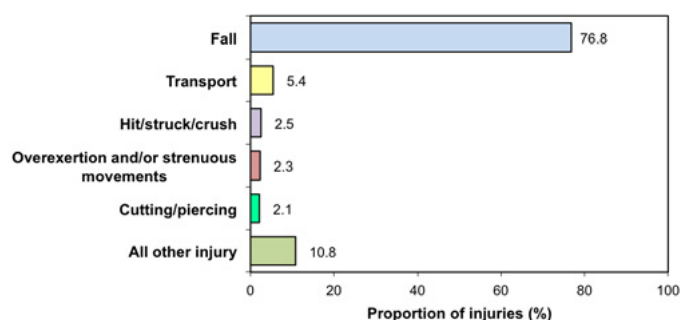
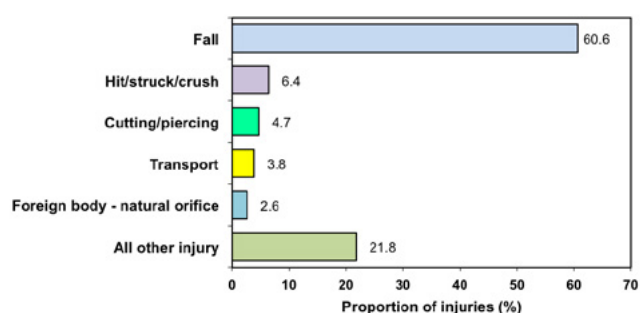


Figure 48: Older adult injury ED presentations by cause, Victoria 2015/16



Note: 'Other specified' and 'unspecified' cases were included in the 'all other injuries' category regardless of their ranking

## MAJOR INJURY TYPE (BODY SITE AND NATURE OF INJURY)

Figure 49 & Figure 50 show the five most common injury types for older adult hospital admissions and ED presentations.

- Fracture to the lower limb accounted for 21% of injury hospital admissions (n=7,310) and 13% (n=5,850) of ED presentations.
- Fracture to the upper limb accounted for 13% (n=4,746) of hospital admissions and 11% (n=4,857) of ED presentations. Fractures to the trunk were also common among hospital admissions (12%, n=4,135).
- Open wounds to the head/face/neck accounted for 7% (n=2,475) of hospital admissions and 6% (n=2,824) of ED presentations.
- Dislocations, sprains and strains to the lower limb (6%, n=2,681) and open wound to upper limb (5%, n=2,415) were also common among ED presentations.

Figure 49: Major injury type, older adult hospital admissions, Victoria 2015/16

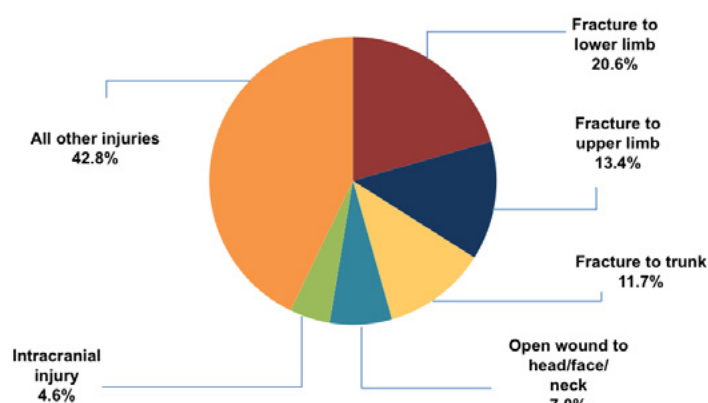
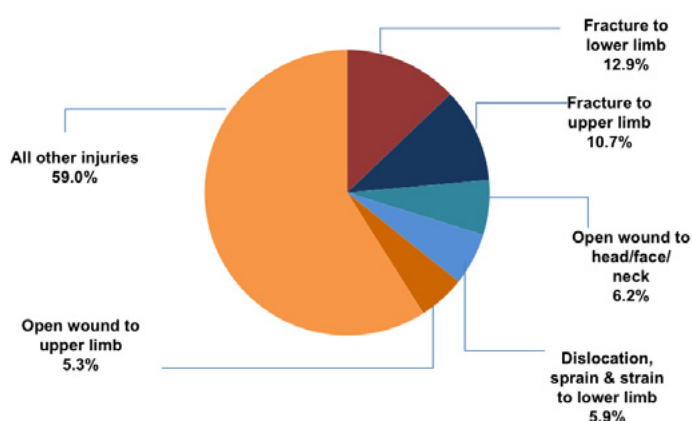


Figure 50: Major injury type, older adult ED presentations, Victoria 2015/16





## SETTING

- Setting where the injury occurred was unspecified in 25% of older adult injury admissions and 19% of older adult injury ED presentations.
- Around 43% of older adult injuries requiring hospital admission (n=15,095) and more than half of ED presentations (54%, n=24,603) occurred in the home (Figure 51 & Figure 52).
- Other settings where injuries to older adults commonly occurred were:
  - Residential institutions (17% of admissions (n=5,872) and 8% of ED presentations (n=3,438))
  - Roads, streets and highways (8% of admissions (n=2,675) and 7% of ED presentations (n=3,360))
  - Trade and service areas (3% of admissions (n=1,058)).

Figure 51: Older adult injury hospital admissions by setting, Victoria 2015/16

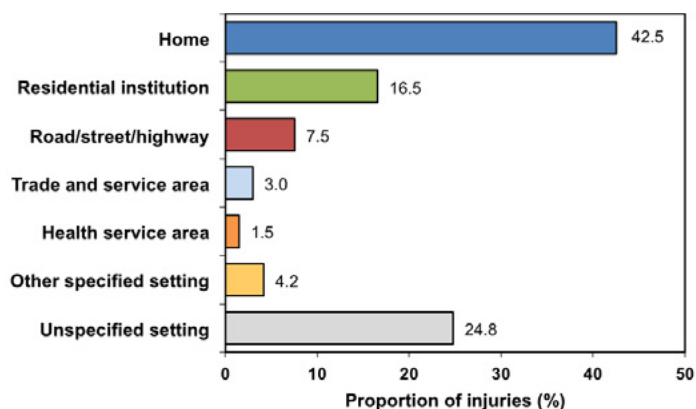
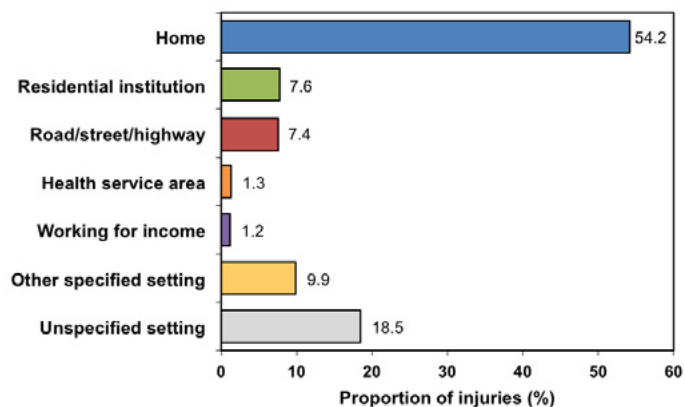


Figure 52: Older adult injury ED presentations by setting, Victoria 2015/16



# APPENDIX 1: VISU DEFINITIONS

**'Injury':** Injury is commonly defined as: 'any unintentional or intentional damage to the body ... caused by acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals, and ionizing radiation interacting with the body in amounts or at rates that exceed the threshold of human tolerance'.

**'Unintentional injury':** Injuries that are unintended, often described as 'accidents'. We try to avoid using the term 'accidents' as it implies that injuries are random events due to chance.

**'Intentional injury':** Injuries that are the result of intended acts by people i.e., harm of one person by another (assault, homicide, neglect) or self-harm.

An injury **'death'** is defined as an injury or poisoning by an external cause (transport crash, fall, suicide, drowning etc.) that results in a person dying either in or out of hospital. In Victoria (and in other Australian States and Territories) all deaths by external causes must be reported to the State Coroner.

An injury **'hospital admission'** is defined as an injury or poisoning that results in the person being admitted to an inpatient bed (a ward, short stay observation unit, emergency medical unit, medical assessment and planning unit, intensive care bed, mental health bed or coronary care unit) and subsequently discharged alive either on the same day (after at least 4 hours from the time patient management commences) or after one or more nights' stay in a hospital bed. Prior to July 2012 this definition included patients who had their entire care within the ED. From July 2012 if the patient's entire care was provided within a designated emergency department or urgent care centre then the patient is no longer classified as an admission.

An injury **'emergency department (ED) presentation'** is defined as an injury or poisoning that results in a person presenting to a hospital emergency department for treatment who is triaged (assessed for urgency), including those patients who leave before treatment commences.

For the purposes of this E-bulletin, age groups are defined as follows to match those in the National Injury Prevention and Safety Promotion Plan. A child is defined as a person aged 0-14 years, an adolescent and young adult is a person aged 15-24 years, an adult is a person aged 25-64 years and an older adult is a person aged 65 years and above.



## BOX 1: SETTINGS DEFINITION AND INJURY SEVERITY

### Settings definitions

The settings are mutually exclusive. For hospital admissions all settings are defined exclusively by location coding except working for income. Working for income cases are defined by activity code OR compensable status. Further, preference is given to activity so cases with an activity recorded as working for income are defined as working for income and removed from the setting of their location code. For ED presentations text descriptions were also used to identify some settings that were not covered by existing location or activity coding (i.e., area of still water/ stream of water/ large area of water/ beach & forest/ desert/ other specified countryside).

- (1) **'Home'** includes injuries occurring in homes, drive-ways, apartments, boarding houses, caravans, farmhouses, swimming pools/tennis courts in private residences.
- (2) **'Sports setting'** includes injuries occurring at any sports and athletics area.
- (3) **'Road/street/highway'** includes injuries occurring on roadways, sidewalks and cycle-ways next to roads.
- (4) **'Residential institution'** includes injuries occurring in prisons, juvenile detention centres, military camps, orphanages, aged care facilities (nursing home/old people's home/retirement village). Most hospitalisations for this setting were for injury occurring in aged care facilities (93%).
- (5) **'Working for income'** includes injuries occurring while the person was engaged in paid work or transportation to and from such activities.
- (6) **'Health service area'** includes injuries occurring to any person (i.e., patient, visitor) in hospitals, health centres, day procedure centres, hospices, outpatient clinics. Data presented here exclude 'medical injuries' as is normal practice for VISU injury reports. Persons working for income are not included as they are already counted in the working for income setting.
- (7) **'Trade and service area'** includes injuries occurring in shops/ stores, commercial garages, office buildings, cafes/hotels/ restaurants, airports, bus/radio/railway/television stations.
- (8) **'School & other educational institution'** includes injuries occurring in boarding/residential schools, colleges, day nurseries, institutes for higher education/universities, kindergartens.
- (9) **'Other institution & public administrative area'** includes injuries occurring in buildings (including adjacent grounds) used by the general public such as assembly hall, church, cinema, clubhouse, court house, dancehall, gallery, library, movie house, museum, music hall, opera house, public hall, theatre, youth centre.
- (10) **'Area of still water/ stream of water/ large area of water/ beach'** includes injuries occurring at a dam, fen, marsh/ swamp, pond, pool, reservoir, brook, canal, creek, river, stream, bay, lake, ocean, sea, foreshore, sand dunes.

- (11) **'Farm'** includes injuries occurring in farm buildings/ranches or on land under cultivation, excluding the farm home.
- (12) **'Forest/ desert/ other specified countryside'** includes injuries occurring in a forest, desert, cave, gorge, mountain, outback, prairie, and wilderness.
- (13) **'Other specified location'** includes injuries occurring in campsites, public place NOS, park NOS, railway line, zoo, parking lot, town camps.
- (14) **'Unspecified setting'** includes injuries occurring in an unspecified place of occurrence.

### Injury severity: definition of 'serious' injury

Each hospital admission record was given an International Classification of Disease (ICD)-based Injury Severity Score (ICISS) (Osler et al, 1996). The ICISS is a score between 0 and 1 and involves estimating probability of death for ICD injury diagnosis codes in a patient's hospital record (Osler et al., 1996). Determining an ICISS score involves calculating a Diagnosis-specific Survival Probability (DSP) for each individual injury diagnosis, using a large sample of injured people. A DSP is the proportion of cases with a certain injury diagnosis in which the patient does not die, or in other words, a given DSP represents the likelihood that a patient will survive a particular injury. Each patient's final ICISS score can be calculated by multiplying the probabilities of surviving each of their injuries individually or by using only the probability of surviving the 'worst' injury. A severity threshold can then be used to classify hospitalisations as either 'serious' or 'non-serious'. VISU considers an injury to be 'serious' if the ICISS is less than or equal to 0.941, this is equivalent to a survival probability of 94.1% or worse – meaning the injured person has a probability of death (when admitted) of at least 5.9% (Davie & Cryer, 2007). For this edition the severity scores have been calculated using DSPs derived using Victorian data. In addition, only the injury with the highest 'threat-to-life' and has been used and the ICISS score has also been adjusted for age (Clapperton et.al, 2014).

Davie G, Cryer C & Langley J. (2007). *Improving the predictive ability of ICD-based injury severity score. Injury Prevention. 14:250-5.*

Osler T, Rutledge R, Deis J & Bedrick E. (1996). *ICISS: An International Classification of Disease-9 based Injury Severity Score. Journal of Trauma: Injury, Infection and Critical Care. 41:380–388.*

Stephenson S, Langley J, Henley G & Harrison J. (2003). *Diagnosis-based injury severity scaling: a method using Australian and New Zealand hospital data coded to ICD-10-AM. Injury research and statistics series, no. 20, Australian Institute of Health and Welfare, Adelaide.*

Clapperton A, D'Elia A & Day L. *SERIOUS INJURY IN VICTORIA: PART 1: Development and validation of a severity of injury measure using Victorian administrative data; PART 2: Trends in serious road traffic injury hospitalisations, Victoria, 2000-2012/13. Report to VicRoads, April 2014. Monash Injury Research Institute.*

# APPENDIX 2: VISU DATA SOURCES AND CASE SELECTION

## 1. HOSPITAL ADMISSIONS

### 1.1 Source: Victorian Admitted Episodes Dataset (VAED)

Hospital admission unit record data are annually supplied to VISU by the Victorian Department of Health and Human Services (DHHS). Injury records are identified by VISU as those with an ICD-10-AM injury code (S00-T98) or external cause code (U50-Y98) in any one of the 40 diagnosis codes. The resultant file is cleaned, checked and merged with the VISU-held VAED dataset.

From July 1998, cases recorded on the VAED are coded to ICD-10-AM, the WHO International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification. ICD-10-AM has been developed by the National Centre for Classification in Health in Queensland with assistance from clinicians and clinical coders to ensure that the classification is current and appropriate for Australian clinical practice. The Australian Modifications of ICD-10 are generally updated every two years. Up to June 30 1998, cases were coded to ICD-9-CM. The external causes chapters of ICD-9-CM and ICD-10-AM describe the causes of injury, poisoning and adverse events (complications of medical and surgical care). Adverse events and sequelae (late effects) of external causes of morbidity and mortality are usually not included in VISU reports.

The VAED data items held by VISU include:

#### 1.1.1 Demographic/administrative items

- Age, gender, postcode, suburb and local government area of residence
- Country of birth
- Date of admission, date of separation (discharge) and length of hospital stay (in days)
- Separation type (patient destination on discharge from hospital): separation and transfer to acute hospital /extended care, death, separation to private residence,/accommodation, separation and transfer to aged care residential facility, separation and transfer to mental health residential facility etc.

#### 1.1.2 Injury surveillance items

Up to 40 ICD-10-AM codes from any or all of the chapters of the ICD-10-AM manual can currently be assigned to each record. These codes are then used to derive the following injury surveillance variables that are added to the VISU-VAED dataset.

- Cause of injury – transport, fall, poisoning etc. Coded to ICD-10-AM Chapter XX: External Causes of Morbidity and Mortality (V00-Y34)]
- Place of occurrence i.e. location of injury - home, road, street or highway etc. [Coded to ICD-10-AM Chapter XX: External Causes of Morbidity and Mortality (Y92.0-Y92.9)]
- Activity when injured - sports, leisure, work etc. [Coded to ICD-10-AM Chapter XX: External Causes of Morbidity and Mortality (U50-U73)]
- Human intent – unintentional; intentional-assault, neglect, self-harm; undetermined intent. Intent information is derived from the external cause of injury code.
- Injury diagnosis i.e. exact injury code – superficial injury of scalp, fracture of neck of femur etc. (Coded to ICD-10-AM Chapter 19 Injury, Poisoning and Consequences of External Cause S00-T98)
- Body region injured – head, thorax, shoulder, upper arm etc. Body region information is derived from the injury diagnosis variables.

- **Nature of main injury** - open wound, fracture, dislocation/sprain/strain etc. Nature of main injury is derived from the injury diagnosis variables.
- **Comorbidities** – co-occurrence of injury with other diseases and conditions that can happen by chance or because there is some association between them (for example, suicide and mental disorders, drowning or hot water scalds and epilepsy). Co-morbidities are derived from the diagnosis variables (Coded to ICD-10-AM Chapters 1-17).

### 1.2 Case selection (for this report):

#### Case selection for incidents

- Victorian hospital admissions recorded on the VAED occurring 1 July 2015 to 30 June 2016, coded according to the 9th edition of ICD-10-AM (NCCH, July 2015).
- Cases with an external cause of morbidity in ICD-10-AM range V00-X59 (i.e. unintentional section of Chapter XX External causes of morbidity and mortality).
- Cases with a community injury (in ICD 10 AM range S00-T75 or T79) in the first diagnosis code (see Box 2).
- Mode of admission has any value except those indicating that transfer from another hospital has occurred or that the record is a 'statistical separation'- a change of care type within a hospital. The aim of these omissions is to reduce over-counting of cases and to provide an estimated incidence of admission.
- Patients admitted for day-treatments for the same injury within a course of 30 days, with an admission type indicating it was a "planned" admission were removed. These included for example procedures such as hyperbaric oxygen therapy.
- VAED cases recorded as not having spent the entire episode in the ED (see Box 3).

#### Case selection for bed-days

Each record in the VAED refers to a single episode of care in a hospital and some injuries result in more than one episode in hospital and therefore more than one VAED record. The VAED does not include information designed to enable the set of records belonging to an injury case to be recognised as such. Hence, there is potential for some incident injury cases to be counted more than once. Therefore for incident estimates, transfers within and between hospitals, as well as rehabilitation cases and those admitted for planned day-treatments, were excluded. The episodes omitted to reduce overestimation of incident cases were, however, included when providing estimates of bed-days.

- Cases with a principal diagnosis as an injury in the ICD-10-AM code range S00-T75.9, T79-T79.9, T89-T98.99 (these codes exclude medical injury) or was one of two relevant rehabilitation codes - Z094 (follow-up examination after treatment of a fracture) or Z509 (care involving use of rehabilitation procedure, unspecified). Cases with rehabilitation codes in the principal diagnosis codes were only included if one of the above injury diagnosis codes was also recorded in the patient's hospital record.

## BOX 2: COMMUNITY INJURY

Most injuries occur in settings such as car crashes, inter-personal violence, sporting and recreational activities, and work and these can be referred to as 'community injury' (Australian Institute of Health and Welfare 2012). Community injuries are the main subject of this report so cases selected are specific to those with a community injury in the principal diagnosis code (i.e., ICD-10-AM codes S00-T75 and T79).

## BOX 3: CHANGE TO VICTORIAN HOSPITAL ADMISSION POLICY

In July 2012 the Victorian Hospital Admission Policy changed significantly so that episodes of care delivered entirely within a designated emergency department or urgent care centre could no longer be categorised as an admission regardless of the amount of time spent in the hospital. Previously, these types of episodes could be categorised as an admission if the length of time in the hospital was four hours or more. This has had the effect of reducing the number of admissions recorded on the VAED post 2012/13 financial year.

In order to minimise the influence of the hospital admission policy change on trends in the admissions data, VAED cases recorded as spending the entire episode in the ED have been removed from the entire time period.

## 2. EMERGENCY DEPARTMENT PRESENTATIONS

### 2.1 Source: Victorian Emergency Minimum Dataset (VEMD)

The Victorian Injury Surveillance System began in the Royal Children's Hospital in 1988. It expanded to adult hospitals over time with a large boost in 1995 when the Department of Human Services absorbed the injury surveillance minimum dataset into the Victorian Emergency Minimum Dataset (VEMD) that collects demographic, administrative and clinical data from public hospitals. From January 2004, VEMD data are collected by all 38 Victorian public hospitals that provide a 24-hour ED service. In July 2011 Bass Coast Regional Health began contributing to the VEMD taking the total contributing hospitals to 38.

Emergency Department presentations for injury are extracted from the VEMD by the Victorian DHHS and are supplied annually in unit record format to VISU. Data for this edition of the E-bulletin were coded to the Victorian Emergency Minimum Dataset (VEMD) User Manual 20th Edition, published by the DHHS. Prior to the hospital admission policy change in 2012/13, the VEMD contained cases that were treated and discharged from the ED within 4 hours from the time patient management commenced (i.e. 'non-admissions') and cases that were defined as 'admissions' according to the Victorian hospital admission policy at the time (cases physically transferred to another unit in the same hospital and those treated entirely within the ED for longer than 4 hours). Post 2012/13 cases that are treated entirely within the ED for longer than 4 hours are not considered as admissions (see Box 3).

When the data file is received by VISU, it is cleaned, checked and merged with the VISU-VEMD injury surveillance dataset.

The VEMD data items held by VISU include:

### 2.1.1 Demographic/administrative items

- Age, gender, postcode, suburb and local government area of residence
- Country of birth, preferred language spoken at home
- Time and date of presentation to ED
- Departure status (patient destination on discharge from ED i.e. admitted to ward, died within ED, discharged home, discharged to residential care etc.)
- Referred to on departure (outpatients, local medical officer i.e. GP, home nursing service, scheduled review in ED etc.)

### 2.1.2 Injury surveillance items

- Human intent (unintentional, assault, self-harm etc.)
- Cause of injury (fall, poisoning etc.)
- Place where injury occurred i.e. location of injury (home, road, street or highway etc.)
- Activity when injured (sports, leisure, work etc.)
- Nature of main injury
- Body region injured
- Description of injury event ('narrative')

### 2.2 Case selection (for this report)

- Victorian hospital ED presentations recorded on the VEMD occurring 1 July 2015 to 30 June 2016 coded according to the Victorian Emergency Minimum Dataset (VEMD) User Manual 20th edition.
- Cases with a gender coded as intersex were excluded in the VEMD case selection due to data confidentiality concerns related to small numbers.
- Cases coded as unintentional injury (VEMD human intent=1).
- Incident cases (excludes return visits and pre-arranged visits).



# TAKE ACTION...



## YOU'RE INVITED TO THE 13TH AUSTRALASIAN INJURY PREVENTION AND SAFETY PROMOTION CONFERENCE

The Australian Injury Prevention Network (AIPN), the Australian Collaboration for Research into Injury in Sport and its Prevention (ACRISP) and Federation University Australia, invite you to attend the 13th Australasian Injury Prevention and Safety Promotion Conference.

This is the premier injury prevention conference for Australia and the Asia Pacific region and will be held at:

**The Mercure Hotel  
and Convention Centre,  
Ballarat, Victoria,  
13 – 15 November 2017.**

With a theme of “Take Action”, the Conference will be a multi-disciplinary event featuring representatives from all facets of injury prevention and safety promotion including research, teaching, practice and policy.

### **Why should you attend?**

The conference is expected to attract over 250 delegates including health professionals, researchers, students, policy makers, medical practitioners, local, state and commonwealth government officers, workplace health and safety professionals and other interested people. These delegates will each have an opportunity to share knowledge and ideas and to form fruitful networks and new partnerships.

