



MONASH
University

UNINTENTIONAL HOSPITAL TREATED INJURY VICTORIA 2017/18

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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 HOSPITAL-TREATED INJURY IN VICTORIA 2017/18

This is the nineteenth 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 2017/18 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.

SUMMARY RESULTS

There were 129,237 injury cases admitted to Victorian hospitals in 2017/18 of which 91% were unintentional (n=117,593). At least 409,463 injury cases presented to Victorian EDs, 83.9% of which were unintentional (n=343,561).

TABLE 1: SUMMARY RESULTS FOR 2017/18

	ALL	CHILDREN (0-14 YEARS)	ADOLESCENTS AND YOUNG ADULTS (15-24 YEARS)	ADULTS (25-64 YEARS)	OLDER ADULTS (65+ YEARS)
ADMISSIONS					
n	117,593	15,242	14,562	46,718	41,071
Rate/100,000	1,841.5	1,296.4	1,722.2	1,377.3	4,222.9
Age standardised rate/100,000	1,753.7	1,296.6	1,728.2	1,363.4	4,077.3
Rate change (% per year)	4.7	4.5	4.2	5.4	4.5
% males	54.4%	61.1%	70.5%	61.9%	37.7%
Leading cause (%)	Falls (46.9)	Falls (47.0)	Transport (22.1)	Falls (29.1)	Falls (77.1)
Most common setting (%)	Home (25.1)	Home (23.8)	Sports (20.9)	Home (17.1)	Home (41.2)
Most common injury (%)	Fracture upper limb (17.4)	Fracture upper limb (28.3)	Fracture upper limb (19.5)	Fracture upper limb (17.2)	Fracture lower limb (18.9)
% of all serious injury cases (row %)	n/a	1.1	2.9	13.6	82.4
ED PRESENTATIONS					
n	343,561	98,274	55,637	137,899	51,751
Rate/100,000	5,380.2	8,358.9	6,580.0	4,065.6	5,321.0
Age standardised rate/100,000	5,419.9	8,364.1	6,660.9	4,055.1	5,232.0
Rate change (% per year)	1.0	1.9	-0.4	0.7	1.9
% males	57.7%	57.7%	65.4%	60.0%	43.0%
Leading cause (%)	Falls (37.6)	Falls (44.3)	Falls (26.7)	Falls (27.9)	Falls (60.9)
Most common setting (%)	Home (39.8)	Home (47.8)	Home (23.3)	Home (36.1)	Home (52.7)
Most common injury (%)	Fracture to upper limb (11.7)	Fracture upper limb (16.7)	Dislocation, sprain & strain to lower limb 13.8)	Dislocation, sprain & strain to lower limb (9.7)	Fracture lower limb (12.4)

Notes:

- 1) Rate change (% per year) refers to the modelled annual change in rate over 10 years: 2008/09 to 2017/18.
- 2) Blue highlighted cells represent an increase and green represents a decrease (statistically significant at 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.

ALL AGES

- The annual rate of injury admissions increased statistically significantly by 4.7% per year over the 10-year period 2008/09 to 2017/18.
- The annual rate of injury ED presentations increased statistically significantly by 1.0% per year over the 10-year period 2008/09 to 2017/18.
- In 2017/18 males were overrepresented, accounting for 54.4% of admissions and 57.7% of ED presentations.
- Falls were the leading cause of injury among admissions and ED presentations, accounting for 46.9% of admissions and 37.6% of ED presentations.
- The home was the most common setting for injury among admissions and ED presentations: 25.1% of hospital admissions and 39.8% of ED presentations.
- Fracture to upper limb was the most common injury for both admissions and ED presentations (17.4% and 11.7%, respectively).

CHILDREN (0-14 YEARS)

- In 2017/18, in total 15,242 children were admitted to Victorian hospitals and at least 98,274 presented to Victorian EDs for unintentional injury.
- The annual rate of injury admissions among children aged 0-14 years increased statistically significantly by 4.5% per year over the 10-year period 2008/09 to 2017/18.
- The annual rate of injury ED presentations among children aged 0-14 years increased statistically significantly by 1.9% per year over the 10-year period 2008/09 to 2017/18.
- In 2017/18 males were overrepresented, accounting for 61.1% of admissions and 57.7% of ED presentations.
- Falls were the leading cause of both injury admissions (47.0%) and ED presentations (44.3%).
- Twenty four percent of hospital admissions and almost half of ED presentations (47.8%) were for injuries that occurred in the home. Children were also commonly injured in schools and other educational institutions (13.2% of admissions and 13.6% of ED presentations) and sports and athletics areas (8.9% each of admissions and ED presentations).
- Fracture to upper limb was the most common injury for both admissions and ED presentations among children (28.3% and 16.7%, respectively).

ADOLESCENTS AND YOUNG ADULTS (15-24 YEARS)

- In 2017/18 in total 14,562 adolescents and young adults were admitted to Victorian hospitals and at least 53,637 presented to Victorian EDs for unintentional injury.
- The annual rate of injury admissions among adolescents and young adults increased statistically significantly by 4.2% per year over the 10-year period 2008/09 to 2017/18.
- The annual rate of injury ED presentations among adolescents and young adults decreased statistically significantly by -0.4% per year over the 10-year period 2008/09 to 2017/18.
- In 2017/18 males were overrepresented, accounting for 70.5% of admissions and 65.4% of ED presentations.
- Transport was the leading cause of injury admissions (22.1%) followed by falls (19.0%) and hit/struck/crush (16.8%). Among ED presentations, hit/struck/crush was the leading cause of injury (26.7%) followed by falls (26.1%) and transport (8.7%). Cutting & piercing injuries accounted for 10.6% of admissions and 9.6% of ED presentations.

- Sports and athletics areas (20.9%) and the road, street and highway (14.7%) were the most common settings for adolescent and young adult injuries resulting in hospital admission whereas the home (23.3%) and sports and athletics areas (19.5%) 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 (19.5%), while dislocation, sprain & strain to lower limb was the most common reason for ED presentations (13.8%).

ADULTS (25-64 YEARS)

- In 2017/18, in total 46,718 adults were admitted to Victorian hospitals while at least 137,899 presented to Victorian EDs for unintentional injury.
- The annual rate of injury admissions among adults increased statistically significantly by 5.4% per year over the 10-year period 2008/09 to 2017/18.
- The annual rate of injury ED presentations among adults increased statistically significantly by 0.7% per year over the 10-year period 2008/09 to 2017/18.
- Males were overrepresented in 2017/18, accounting for 61.9% of admissions and 60% of ED presentations.
- The leading cause of adult hospital-treated injury was falls: 29.1% of hospital admissions and 27.9% of ED presentations. Other major causes were hit/struck/crush (8.9% of admissions and 18.2% of ED presentations), cutting and piercing (10.3% of admissions and 11% of ED presentations) and transport (20.4% of admissions and 8.5% of ED presentations).
- Seventeen percent of hospital admissions and 36.1% of ED presentations were for injuries that occurred in the home. Other major settings for injury were: working for income (13.8% of admissions and 14.9% of ED presentations) and road/street/highway (15.4% of admissions and 9% of ED presentations).
- Fracture to upper limb was the most common injury among adult hospital admissions (17.2%) while dislocation, sprain & strain to lower limb (9.7%) and open wound to upper limb were the most common reasons for ED presentations (9.4%).

OLDER ADULTS (65+ YEARS)

- In 2017/18, in total 41,071 older adults were admitted to Victorian hospitals and at least 51,751 presented to Victorian EDs for unintentional injury.
- The age-standardised annual rate of injury admissions among older adults increased statistically significantly by 4.5% per year over the 10-year period 2008/09 to 2017/18.
- The age-standardised annual rate of injury ED presentations among older adults increased statistically significantly by 1.9% per year over the 10-year period 2008/09 to 2017/18.
- In 2017/18 females were overrepresented, accounting for 62.3% of admissions and 57% of ED presentations.
- Falls accounted for more than three-quarters of hospital admissions (77.1%) and more than half of ED presentations (60.9%) among older adults.
- Forty one percent of hospital admissions and more than half of ED presentations (52.7%) were for --injuries that occurred in the home. Other common settings for injuries were residential institutions (17.6% of admissions and 7.88% of ED presentations) and the road/street/highway (7.7% of admissions and 6.7% of ED presentations).
- Fracture to lower limb was the most common injury among older adult hospital admissions (18.9%) and among ED presentations (12.4%).

INTRODUCTION

This E-bulletin provides information on unintentional hospital-treated injury in 2017/18. There were 129,237 injury hospital admissions in Victoria in 2017/18, 91% of which were unintentional (n=117,593). The remaining injury cases were either intentional i.e. self-harm or assault (7.6%, n=9,805) or of other or undetermined intent (1.4%, n=1,839). In this same year, there were 409,463 injury cases presenting to Victorian hospital EDs, 83.9% of which were unintentional (n=343,561), 3.8% were intentional (self-harm or assault) (n=15,616) and 12.3% were of other or undetermined intent (n=50,286).

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 departments¹.

CASE SELECTION CRITERIA

Cases were selected if the admission (VAED) or presentation (VEMD) date occurred in the financial year 2017/18, if gender was male or female², 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 1) 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 1).

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 2008/09 to 2017/18 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 30 June, 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: $\text{percentage change} = [e^{\alpha} - 1] \times 100\%$ where α 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, particularly issues relating to the Victorian hospital admission policy change and how this may have influenced admission trends, please refer to Appendix 1.

Note:

The terms “admissions” and “presentations” in succeeding sections of this report refer to “injury admissions” and “injury presentations”; results are limited to the State of Victoria.

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

2. Intersex cases were excluded in the VAED and VEMD case selection due to data confidentiality concerns related to small numbers.

ALL AGES

TREND

- During the 10-year period 2008/09 to 2017/18, there were on average 88,091 injury admissions and 298,156 injury ED presentations per year in Victoria. The average age-standardised annual rates were 1,446 admissions and 5,168 ED presentations per 100,000 population.
- The age-standardised annual rates of **injury admissions** are shown in Figure 1. The modelled trend in rate showed a statistically significant annual increase of 4.7% [95% CI 3.7 to 5.8%].
- The age-standardised annual rates of injury **ED presentations** are shown in Figure 2. The modelled trend in rate showed a statistically significant annual increase of 1.0% [95% CI 0.5 to 1.5%].

FIGURE 1: TREND IN INJURY HOSPITAL ADMISSION RATES PER 100,000 POPULATION, VICTORIA 2008/09-2017/18

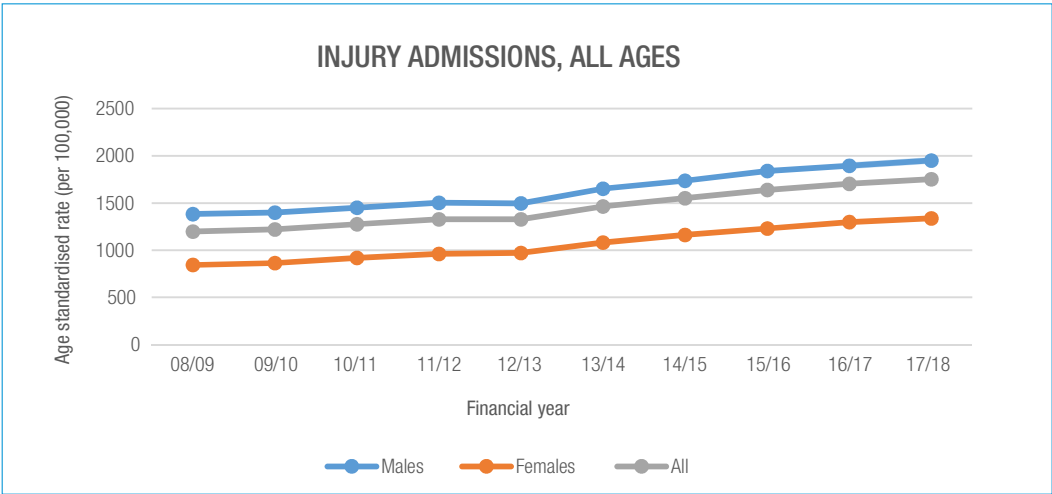
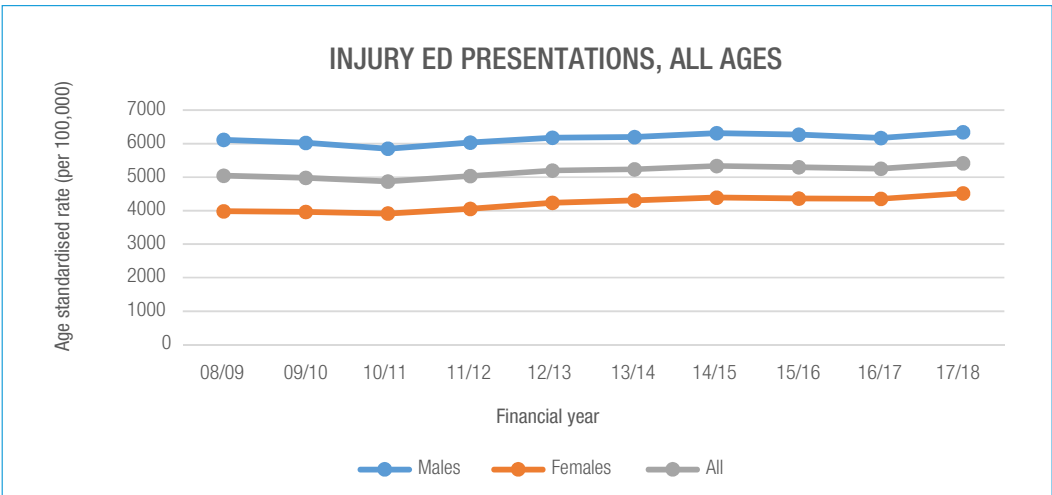


FIGURE 2: TREND IN INJURY ED PRESENTATION RATES PER 100,000 POPULATION, VICTORIA 2008/09-2017/18



HOSPITAL TREATED INJURY - GENDER AND AGE

- Males were overrepresented accounting for 54.4% of all injury admissions (n= 63,982) and 57.7% of ED presentations (n=198,117) in Victoria in 2017/18.
- Seventy-five percent (n=87,789) of hospital admissions occurred among persons aged 25 years and older; forty percent of those admitted were aged 25-64 years (n=46,718) and 35% were aged 65 years and above (n= 41,071). Adults aged 25-64 years accounted for 40% of ED presentations (n=137,899).
- 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 3 & Figure 4).

FIGURE 3: INJURY HOSPITAL ADMISSIONS BY GENDER AND AGE, VICTORIA 2017/18

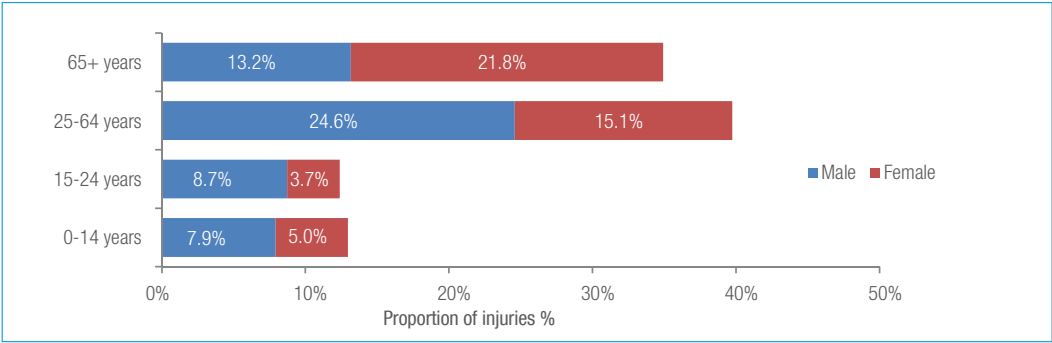
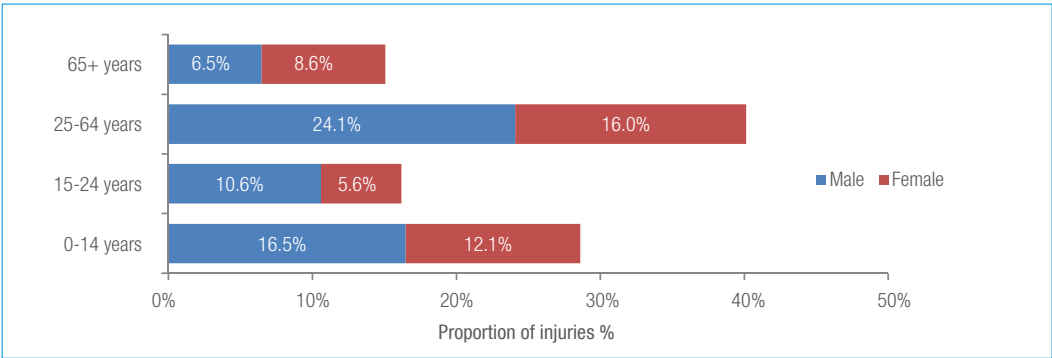


FIGURE 4: INJURY ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18



An overview of unintentional hospital-treated injury in Victoria during 2017/18 is provided in Table 2. Overall, there were 117,593 admissions and 343,561 presentations.

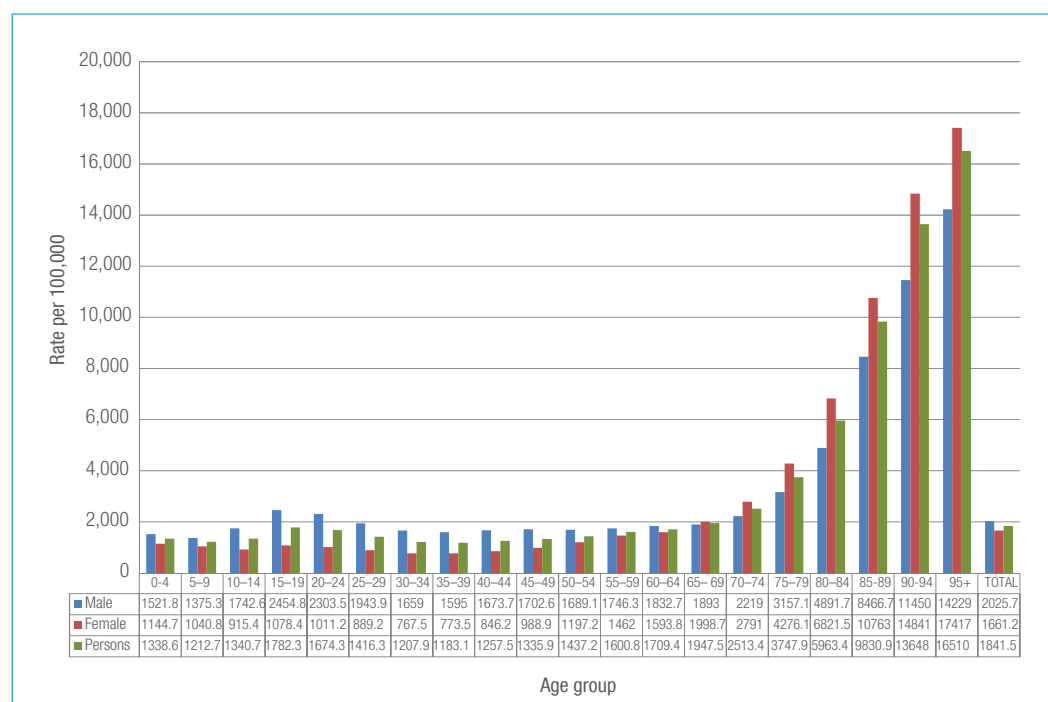
- The age standardised rate of injury hospital admission and ED presentation was higher for males than females: 1,950.9 vs. 1,572.3 per 100,000 for admissions and 6,345.6 vs 4,518.8 per 100,000 for ED presentations.
- The age standardised hospital admission rate per 100,000 population was highest in older adults (4,077.3) and lowest in children (1,296.6). In contrast, the age standardised ED presentation rate per 100,000 population was highest in children (8,364.1) and lowest in adults (4,055.1) (Table 2).

TABLE 2: FREQUENCY, AGE-SPECIFIC AND AGE STANDARDISED RATES OF INJURY HOSPITAL ADMISSIONS AND ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18

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	9,316	1,541.4	1,547.1	56,664	9,375.6	9,396.0
	Female	5,926	1,037.3	1,031.1	41,610	7,283.4	7,270.5
	All	15,242	1,296.4	1,296.6	98,274	8,358.9	8,364.1
15-24 years	Male	10,269	2,370.5	2,379.3	36,411	8,405.2	8,509.8
	Female	4,293	1,041.1	1,044.7	19,226	4,662.5	4,721.1
	All	14,562	1,722.2	1,728.2	55,637	6,580.0	6,660.9
25-64 years	Male	28,912	1,730.7	1,722.7	82,786	4,955.7	4,949.1
	Female	17,806	1,034.4	1,011.2	55,113	3,201.7	3,177.0
	All	46,718	1,377.3	1,363.4	137,899	4,065.6	4,055.1
65+ years	Male	15,485	3,438.0	3,214.6	22,256	4,941.3	4,775.5
	Female	25,586	4,899.9	4,835.2	29,495	5,648.5	5,627.8
	All	41,071	4,222.9	4,077.3	51,751	5,321.0	5,232.0
All	Male	63,982	2,025.7	1,950.9	198,117	6,272.5	6,345.6
	Female	53,611	1,661.2	1,572.3	145,444	4,506.8	4,518.8
	All	117,593	1,841.5	1,753.7	343,561	5,380.2	5,419.9

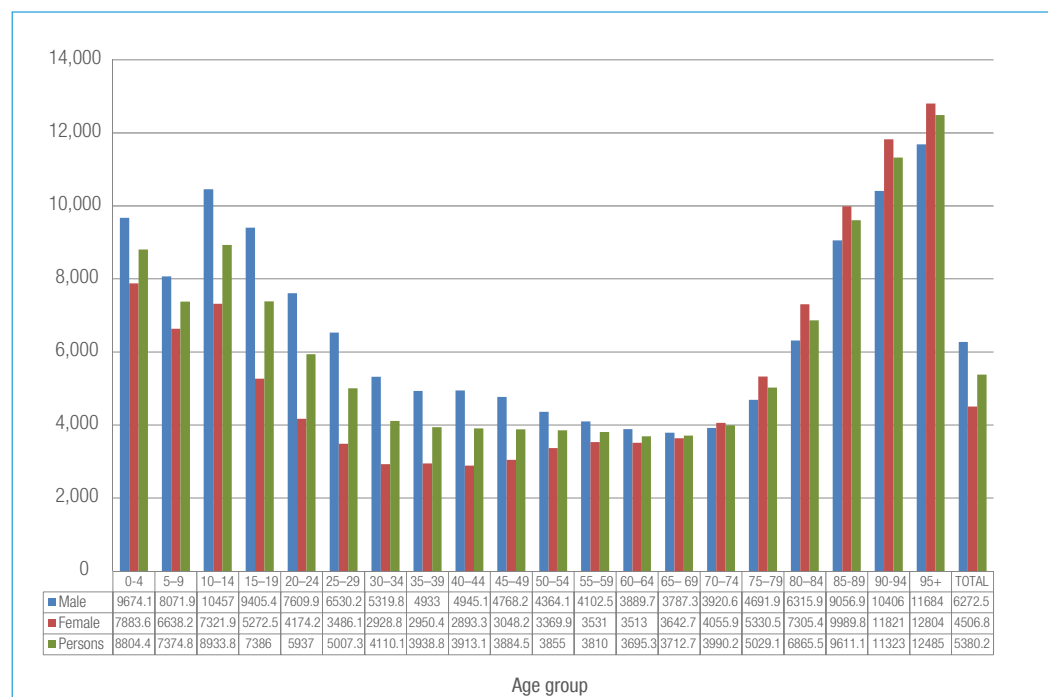
Hospital admission injury rates by age and gender for Victoria in 2017/18 are shown in Figure 5. Age-specific hospital admitted injury rates rose after childhood, were higher in adolescents and young adults than in adults and peaked in older adults. The overall male age-specific hospital admitted injury rate was higher than the female rate in all 5-year age groups up to age 64 years.

FIGURE 5: AGE-SPECIFIC HOSPITAL ADMITTED INJURY RATES BY AGE GROUP AND GENDER, VICTORIA 2017/18



ED presentation injury rates by age and gender for Victoria in 2017/18 are shown in Figure 6. 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, peaking at 95 years and over. The overall male age-specific injury ED presentations rate was higher than the female rate in all 5-year age groups up to age 70 years.

FIGURE 6: AGE-SPECIFIC INJURY ED PRESENTATION RATES BY AGE GROUP AND GENDER, VICTORIA 2017/18



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 46.9% (n=55,193) of hospital admissions and 37.6% (n=128,139) of ED presentations.
- Transport accounted for 13.9% of admissions (n=16,359) but just 6.2% of presentations (n=21,231).
- Hit/struck/crush injuries accounted for 8.6% of admissions (n=10,117) but a higher proportion of ED presentations (18.5%, n=63,221).
- Cutting and piercing injuries accounted for 6.8% of admissions (n=8,029) and 7.9% of ED presentations (n=26,871).
- The fifth ranking cause of injury-related admissions was natural/environmental/animals (3.2%, n=3,778) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (4.4%, n=15,131).

FIGURE 7: INJURY HOSPITAL ADMISSIONS BY CAUSE, VICTORIA 2017/18

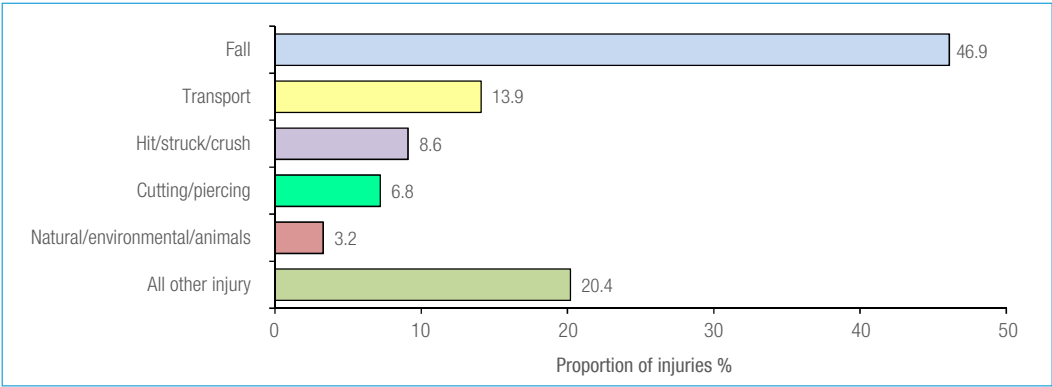
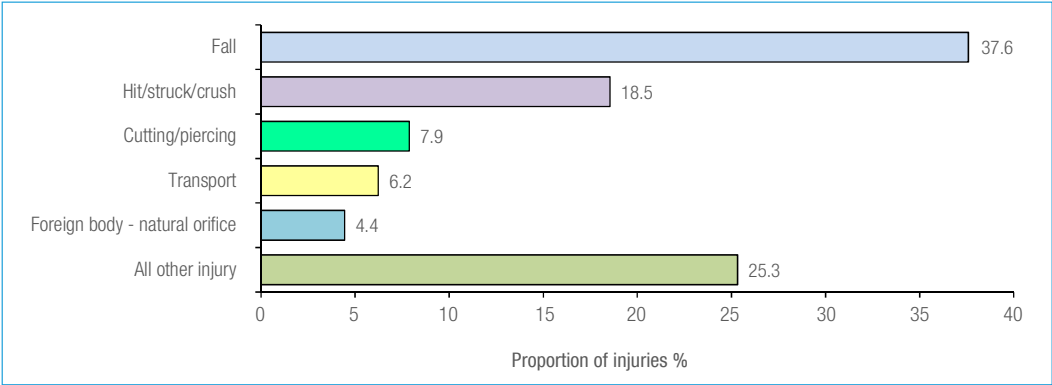


FIGURE 8: INJURY ED PRESENTATIONS BY CAUSE, VICTORIA 2017/18



Note: "Other specified" and "unspecified" cases were included in the 'All other injury' 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 17.4% (n=20,496) of hospital admissions and 11.7% (n=40,164) of ED presentations.
- Fracture to the lower limb was the second most common type of injury requiring hospital admission (12.7%, n=14,910) and accounted for 6.5% of ED presentations (n=22,291).
- Dislocations, sprains and strains to the lower limb (8.8%, n= 30,290) and upper limb (7.7%, n=26,355) were common among ED presentations.
- Fracture to the trunk accounted for 6.5% of admissions (n=7,567).
- Open wounds to the head/face/neck accounted for 6.1% of admissions (n=7,126). Open wounds to the upper limb accounted for 5.8% of admissions (n=6,865) and 6.5% of ED presentations (n=22,411)

FIGURE 9: MAJOR INJURY TYPE, HOSPITAL ADMISSIONS, VICTORIA, 2017/18

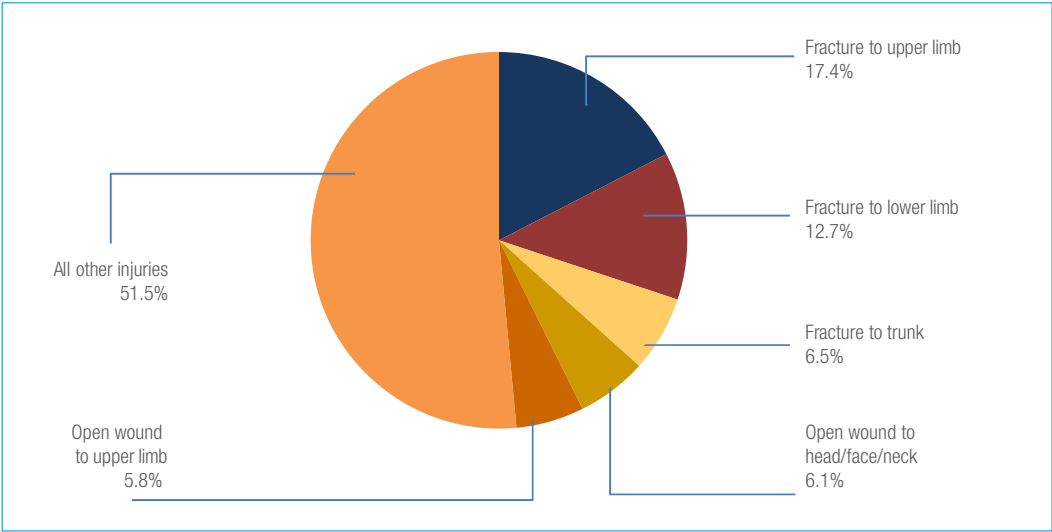
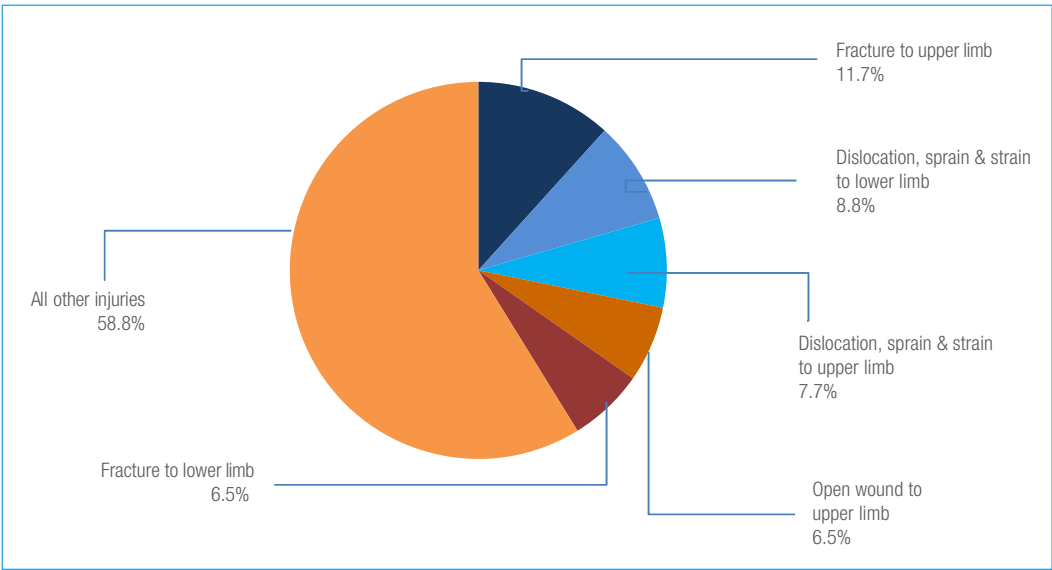


FIGURE 10: MAJOR INJURY TYPE, ED PRESENTATIONS, VICTORIA 2017/18



SETTING

- In 2017/18, 25.1% (n=29,539) of all injuries requiring hospital admission and 39.8% (n=136,750) of injuries resulting in ED presentation occurred in the home.
- Injuries also commonly occurred on roads/streets/highways (11.1% of admissions and 6.5% of ED presentations), while working for income (7.2% of admissions and 8.2% of ED presentations) and in sports settings (6.6% of admissions and 8.1% of ED presentations). Around 6.5% of admissions resulted from injuries that occurred in residential institutional settings (Figure 11 & Figure 12).

FIGURE 11: INJURY HOSPITAL ADMISSIONS BY SETTING, VICTORIA 2017/18

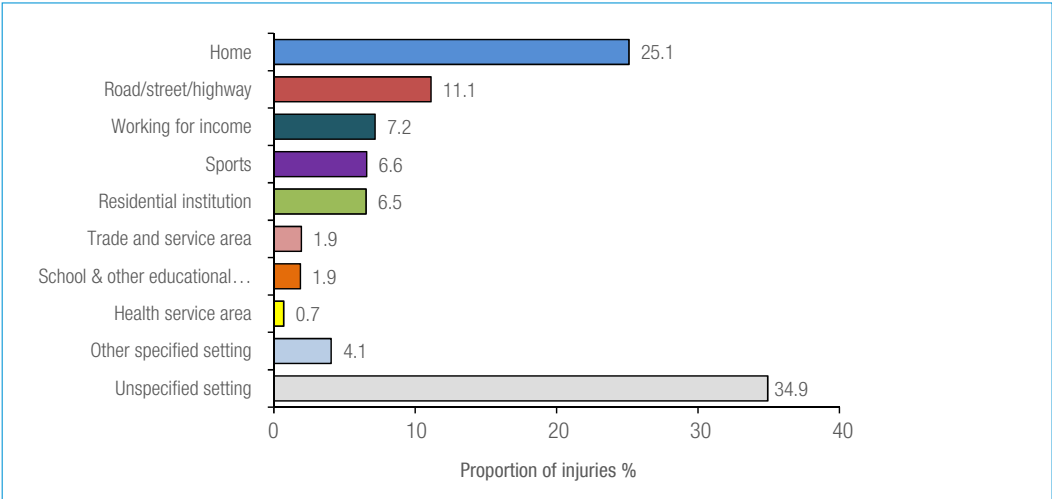
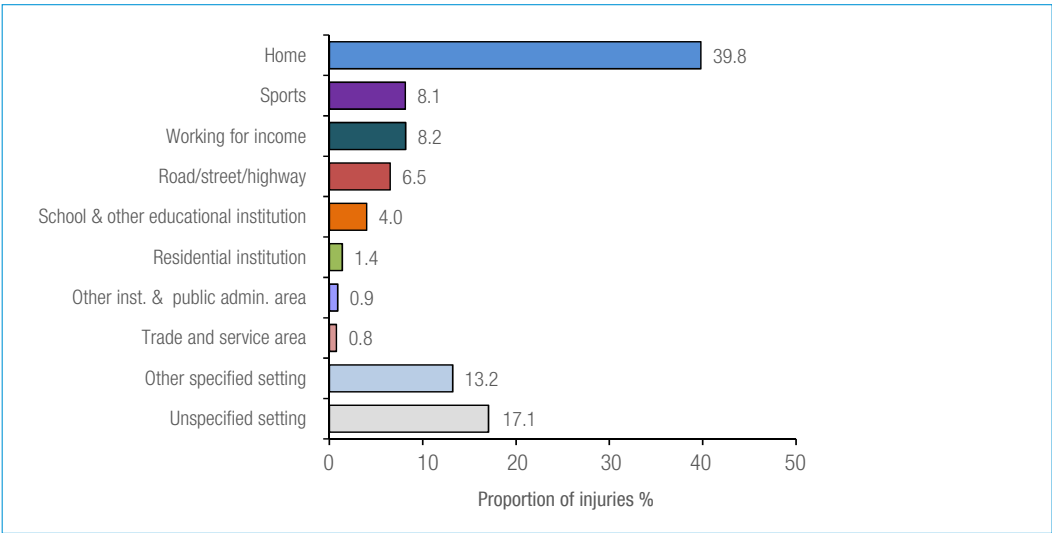


FIGURE 12 INJURY ED PRESENTATIONS BY SETTING, VICTORIA 2017/18



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 39.7% of unintentional hospital admissions in 2017/18, and older adults aged 65+ accounted for 34.9% of injury admissions during this period. Children (0-14 years) accounted for 13% of injury admissions and adolescents & young adults (15-24 years) accounted for 12.4% of injury admissions during 2017/18.
- Older adults aged 65+ years accounted for the majority of serious injury admissions (82.4%, n=13,493). They also accounted for more than two-thirds of hospital bed-days (67%, 409,476 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 (63.2% and 50%, respectively).

TABLE 3: UNINTENTIONAL INJURY HOSPITAL ADMISSIONS BY AGE GROUP: FREQUENCY, SERIOUS INJURY CASES AND HOSPITAL BED DAYS (2017/18)

	FREQUENCY		SERIOUS INJURY CASES		HOSPITAL BED-DAYS	
	n	%	n	%	n	%
0-4	5,441	4.6	85	0.5	6,971	1.1
5-9	4,848	4.1	34	0.2	6,405	1.0
10-14	4,953	4.2	68	0.4	20,285	1.1
0-14	15,242	13.0	187	1.1	30,205	3.3
15-19	6,687	5.7	187	1.1	12,508	2.0
20-24	7,875	6.7	286	1.8	17,176	2.8
15-24	14,562	12.4	473	2.9	29,684	4.9
25-34	13,196	11.2	502	3.1	31,596	5.2
35-44	10,489	8.9	431	2.6	27,967	4.6
45-54	11,259	9.6	547	3.3	36,086	5.9
55-64	11,774	10.0	751	4.6	55,748	9.1
25-64	46,718	39.7	2,231	13.6	151,757	24.8
65-74	11,947	10.2	2,289	14.0	83,613	13.7
75-84	13,955	11.9	4,641	28.3	146,139	23.9
85-94	13,278	11.3	5,715	34.9	159,481	26.1
95+	1,891	1.6	848	5.2	20,243	3.3
65+	41,071	34.9	13,493	82.4	409,476	67.0
Total	117,593	100.0	16,384	100.0	611,202	100.0

TABLE 4: RANKING OF CAUSES OF INJURY HOSPITAL ADMISSIONS BY AGE GROUPS

RANK	AGE GROUPS (YEARS)												
	0-4yrs	5-9yrs	10-14yrs	15-19yrs	20-24yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs	85-94yrs	95+yrs
1	fall 2,552 46.9%	fall 2,680 55.3%	fall 1,937 39.1%	fall 1,345 20.7%	transport 1,879 23.9%	transport 3,118 23.6%	transport 2,380 22.7%	fall 3,481 30.9%	fall 5,344 45.4%	fall 7,334 61.4%	fall 10,997 78.8%	fall 11,585 87.2%	fall 1,732 91.6%
2	hit/struck/ crush 894 16.4%	hit/struck/ crush 698 14.4%	hit/struck/ crush 960 19.4%	transport 1,344 20.2%	fall 1,423 18.1%	fall 2,403 18.2%	fall 2,335 22.3%	transport 2,266 20.1%	transport 1,817 15.4%	transport 1,204 10.1%	unspec. unintent. 788 5.6%	unspec. unintent. 590 4.4%	unspec. unintent. 70 3.7%
3	unspec. unintent. 385 7.1%	transport 410 8.5%	transport 759 15.3%	hit/struck/ crush 1,279 19.6%	unspec. unintent. 1,281 16.3%	unspec. unintent. 2,025 15.3%	unspec. unintent. 1,553 14.8%	unspec. unintent. 1,555 13.8%	unspec. unintent. 1,307 11.1%	unspec. unintent. 1,108 9.3%	transport 708 5.1%	transport 316 2.4%	hit/struck/ crush 18 1.0%
4	poisoning 310 5.7%	unspec. unintent. 308 6.4%	unspec. unintent. 550 11.1%	unspec. unintent. 1,212 17.6%	hit/struck/ crush 1,173 14.9%	hit/struck/ crush 1,717 13.0%	cutting/ piercing 1,224 11.7%	cutting/ piercing 890 10.1%	cutting/ piercing 890 7.6%	cutting/ piercing 573 4.8%	hit/struck/ crush 314 2.3%	hit/struck/ crush 242 1.8%	transport 15 0.8%
5	foreign body 296 5.4%	cutting/ piercing 256 5.3%	cutting/ piercing 265 5.4%	cutting/ piercing 585 8.2%	cutting/ piercing 956 12.1%	cutting/ piercing 1,570 11.9%	hit/struck/ crush 1,018 9.7%	hit/struck/ crush 810 7.2%	hit/struck/ crush 592 5.0%	hit/struck/ crush 402 3.4%	ovext./ stren. mmts 267 1.9%	ovext./ stren. mmts 163 1.2%	ovext./ stren. mmts 14 0.7%
6	cutting/ piercing 292 5.4%	foreign body 162 3.3%	ovext./ stren. mmts 152 3.1%	ovext./ stren. mmts 277 4.1%	ovext./ stren. mmts 326 4.1%	ovext./ stren. mmts 657 5.0%	ovext./ stren. mmts 558 5.3%	nat./envir./ animals 590 5.2%	nat./envir./ animals 545 4.6%	nat./envir./ animals 395 3.3%	cutting/ piercing 219 1.6%	poisoning 99 0.7%	poisoning 12 0.6%
7	nat./envir./ animals 206 3.8%	nat./envir./ animals 158 3.3%	nat./envir./ animals 128 2.6%	nat./envir./ animals 199 2.6%	nat./envir./ animals 229 2.9%	nat./envir./ animals 538 4.1%	nat./envir./ animals 500 4.8%	ovext./ stren. mmts 472 4.2%	ovext./ stren. mmts 388 3.3%	ovext./ stren. mmts 348 2.9%	nat./envir./ animals 210 1.5%	foreign body 76 0.6%	cutting/ piercing 11 0.6%
8	fires/burns/ scalds 188 3.5%	fires/burns/ scalds 52 1.1%	other spec. unintent. 69 1.4%	other spec. unintent. 114 2.2%	poisoning 205 2.6%	poisoning 333 2.5%	poisoning 289 2.8%	poisoning 254 2.3%	machinery 215 1.8%	foreign body 196 1.6%	poisoning 178 1.3%	nat./envir./ animals 73 0.5%	foreign body 8 0.4%
9	transport 188 3.5%	poisoning 43 0.9%	foreign body 62 1.3%	poisoning 113 1.9%	other spec. unintent. 130 1.7%	machinery 244 1.8%	machinery 220 2.1%	machinery 225 2.0%	poisoning 214 1.8%	poisoning 162 1.4%	foreign body 122 0.9%	cutting/piercing 54 0.4%	nat./envir./ animals 7 0.4%
10	choking/ suffoc. 39 0.7%	ovext./ stren. mmts 34 0.7%	poisoning 24 0.5%	foreign body 71 1.1%	machinery 120 1.5%	other spec. unintent. 222 1.7%	foreign body 158 1.5%	foreign body 201 1.8%	foreign body 206 1.7%	machinery 92 0.8%	fires/burns/ scalds 48 0.3%	fires/burns/ scalds 33 0.2%	machinery * *
11	drowning 35 0.6%	other spec. unintent. 16 0.3%	fires/burns/ scalds 16 0.3%	machinery 68 0.7%	fires/burns/ scalds 82 1.0%	foreign body 170 1.3%	other spec. unintent. 119 1.1%	fires/burns/ scalds 125 1.1%	fires/burns/ scalds 158 1.3%	fires/burns/ scalds 74 0.6%	machinery 43 0.2%	other spec. unintent. 24 0.2%	other spec. unintent. * *
12	ovext./ stren. mmts 24 0.4%	machinery 12 0.2%	machinery 11 0.2%	fires/burns/ scalds 47 0.7%	foreign body 56 0.7%	fire/ burns/ scalds 150 1.1%	fire/ burns/ scalds 103 1.0%	other spec. unintent. 97 0.9%	other spec. unintent. 77 0.7%	other spec. unintent. 34 0.3%	other spec. unintent. 33 0.2%	choking/suffoc. 16 0.1%	fires/burns/ scalds 0 0.0%
13	other spec. unintent. 20 0.4%	drowning 11 0.2%	explosions/ firearms 8 0.2%	drowning 21 0.1%	explosions/ firearms 10 0.1%	explosions/ firearms 24 0.2%	explosions/ firearms 15 0.1%	choking/ suffoc. 24 0.2%	choking/ suffoc. 12 0.1%	choking/ suffoc. 17 0.1%	choking/ suffoc. 23 0.1%	machinery * *	choking/ suffoc. 0 0.0%
14	machinery 12 0.2%	choking/suffoc. 8 0.2%	drowning 7 0.1%	explosions/ firearms * *	choking/ suffoc. * *	drowning 13 0.1%	choking/ suffoc. 9 0.1%	explosions/ firearms * *	drowning * *	drowning * *	explosions/ firearms * *	explosions/ firearms * *	drowning 0 0.0%
15	explosions/ firearms 0 0.0%	explosions/ firearms 0 0.0%	choking/ suffoc. 5 0.1%	choking/ suffoc. * *	drowning * *	choking/ suffoc. 12 0.1%	drowning 8 0.1%	drowning * *	explosions/ firearms * *	explosions/ firearms * *	drowning * *	drowning 0 0.0%	explosions/ firearms 0 0.0%
All	5,441	4,848	4,953	6,687	7,875	13,196	10,489	11,259	11,774	11,947	13,955	13,278	1,891

Note: (1) nat./envir./ animals= natural/environmental/animals; choking/suffoc.= choking/suffocate; other unintent.= other specified unintentional; unspec.unintent.= unspecified unintentional;
(2) Frequency less than 5 has been suppressed with an ***. Other cells in the same row and/or column may be suppressed in order to maintain confidentiality.

TABLE 5: RANKING OF CAUSES OF INJURY ED PRESENTATIONS BY AGE GROUPS

RANK	AGE GROUPS (YEARS)												
	0-4yrs	5-9yrs	10-14yrs	15-19yrs	20-24yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs	85-94yrs	95+yrs
1	fall 15,047 42.0%	fall 14,526 49.3%	fall 13,952 42.3%	hit/struck/ crush 8,070 29.1%	hit/struck/ crush 6,806 24.4%	fall 10,511 22.9%	fall 8,310 24.6%	fall 9,439 30.0%	fall 10,275 38.4%	fall 10,177 48.9%	fall 10,928 63.1%	fall 9,223 75.6%	fall 1,204 84.2%
2	other spec. unintent. 5,761 16.1%	hit/struck/ crush 5,650 19.2%	hit/struck/ crush 8,750 26.5%	fall 7,901 28.5%	fall 6,646 23.8%	hit/struck/ crush 10,348 22.6%	hit/struck/ crush 6,537 19.3%	hit/struck/ crush 4,969 15.8%	hit/struck/ crush 3,199 11.9%	unspec. unintent. 2,163 10.4%	unspec. unintent. 1,760 10.2%	unspec. unintent. 1,022 8.4%	unspec. unintent. 96 6.7%
3	hit/struck/ crush 5,573 15.6%	other spec. unintent. 3,385 11.5%	other spec. unintent. 4,395 13.3%	other spec. unintent. 3,442 12.4%	cutting/ piercing 3,332 11.9%	cutting/ piercing 5,489 12.0%	cutting/ piercing 4,016 11.9%	other spec. unintent. 3,511 11.2%	other spec. unintent. 2,919 10.9%	other spec. unintent. 2,154 10.3%	other spec. unintent. 1,423 8.2%	other spec. unintent. 720 5.9%	hit/struck/ crush 43 3.0%
4	foreign body 2,612 7.3%	unspec. unintent. 1,477 5.0%	unspec. unintent. 1,869 5.7%	transport 2,141 7.7%	other spec. unintent. 2,922 10.5%	other spec. unintent. 4,865 10.6%	other spec. unintent. 3,921 11.6%	unspec. unintent. 3,274 10.4%	unspec. unintent. 2,744 10.2%	hit/struck/ crush 1,796 8.6%	hit/struck/ crush 1,014 5.9%	hit/struck/ crush 466 3.8%	other spec. unintent. 41 2.9%
5	unspec. piercing 2,260 6.3%	cutting/ piercing 1,338 4.5%	transport 1,571 4.8%	unspec. unintent. 2,104 7.6%	transport 2,691 9.6%	transport 4,229 9.2%	unspec. unintent. 3,427 10.1%	cutting/ piercing 3,256 10.3%	cutting/ piercing 2,439 9.1%	cutting/ piercing 1,481 7.1%	cutting/ piercing 632 3.7%	cutting/ piercing 223 1.8%	cutting/ piercing 13 0.9%
6	cutting/ piercing 1,371 3.8%	foreign body 1,216 4.1%	cutting/ piercing 1,264 3.8%	cutting/ piercing 2,017 7.3%	unspec. unintent. 2,418 8.7%	unspec. unintent. 4,216 9.2%	transport 2,980 8.8%	transport 2,662 8.5%	transport 1,906 7.1%	transport 1,098 5.3%	transport 574 3.3%	transport 203 1.7%	poisoning 11 0.8%
7	fires/burns/ scalds 1,191 3.3%	transport 811 2.8%	foreign body 425 1.3%	foreign body 603 2.2%	foreign body 1,116 4.0%	foreign body 2,558 5.6%	foreign body 2,022 6.0%	foreign body 1,853 5.9%	foreign body 1,374 5.1%	foreign body 851 4.1%	foreign body 374 2.2%	foreign body 122 1.0%	transport 10 0.7%
8	nat./envir./ animals 796 2.2%	nat./envir./ animals 528 1.8%	nat./envir./ animals 388 1.2%	nat./envir./ animals 472 1.7%	nat./envir./ animals 665 2.4%	nat./envir./ animals 1,369 3.0%	nat./envir./ animals 979 2.9%	nat./envir./ animals 1,112 3.5%	nat./envir./ animals 914 3.4%	nat./envir./ animals 569 2.7%	nat./envir./ animals 314 1.8%	nat./envir./ animals 106 0.9%	foreign body 5 0.3%
9	poisoning 588 1.6%	fires/burns/ scalds 347 1.2%	fires/burns/ scalds 217 0.7%	fires/burns/ scalds 434 1.6%	fires/burns/ scalds 575 2.1%	fires/burns/ scalds 963 2.1%	fires/burns/ scalds 727 2.2%	fires/burns/ scalds 611 1.9%	fires/burns/ scalds 465 1.7%	fires/burns/ scalds 198 1.0%	poisoning 123 0.7%	poisoning 56 0.5%	nat./envir./ animals 5 0.3%
10	transport 355 1.0%	poisoning 100 0.3%	poisoning 89 0.3%	poisoning 361 1.3%	poisoning 474 1.7%	poisoning 748 1.6%	poisoning 485 1.4%	poisoning 429 1.4%	machinery 279 1.0%	poisoning 155 0.7%	fires/burns/ scalds 108 0.6%	fires/burns/ scalds 37 0.3%	fires/burns/ scalds * *
11	choking/ suffoc. 161 0.4%	choking/ suffoc. 55 0.0%	choking/ suffoc. 48 0.1%	machinery 114 0.4%	machinery 239 0.9%	machinery 472 1.0%	machinery 350 1.0%	machinery 318 1.0%	poisoning 227 0.8%	machinery 150 0.7%	machinery 52 0.3%	machinery 8 0.1%	choking/ suffoc. * *
12	drowning 53 0.2%	drowning 29 0.0%	machinery 19 0.1%	choking/ suffoc. 32 0.1%	choking/ suffoc. 26 0.1%	choking/ suffoc. 52 0.1%	choking/ suffoc. 18 0.1%	drowning 25 0.1%	choking/ suffoc. 15 0.1%	choking/ suffoc. 11 0.1%	choking/ suffoc. 6 0.0%	choking/ suffoc. * *	machinery 0 0.0%
13	machinery 18 0.0%	machinery * *	drowning * *	drowning * *	drowning * *	drowning 29 0.1%	drowning * *	choking/ suffoc. * *	drowning * *	drowning 11 0.1%	drowning * *	drowning * *	drowning 0 0.0%
14	explosions/ firearms 0 0.0%	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms 5 0.0%	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms * *	explosions/ firearms 0 0.0%	explosions/ firearms * *	explosions/ firearms 0 0.0%	explosions/ firearms * *
All	35,786	29,483	33,005	27,712	27,925	45,854	33,791	31,482	26,772	20,814	17,313	12,194	1,430

Note: (1) nat./envir./ animals= natural/environmental/animals; choking/suffoc.= choking/suffocate; other unintent.= other specified unintentional; unspec.unintent.= unspecified unintentional;
(2) Frequency less than 5 has been suppressed with an ***. Other cells in the same row and/or column may be suppressed in order to maintain confidentiality.

CHILDREN (0-14 YEARS)

TREND

- During the 10-year period 2008/09 to 2017/18 there were on average 11,686 injury admissions and 83,745 injury ED presentations per year among children aged up to and including 14 years. Average age-standardised injury rates were 1,087 admissions and 7,808 ED presentations per 100,000 children per year.
- The rate of **injury admissions** among children aged 0-14 years increased during the ten years. The modelled trend in rate showed a statistically significant annual increase of 4.5% [95% CI 3.3 to 5.7%].
- The rate of **injury ED presentations** among children aged 0-14 years increased during the ten years. The modelled trend in rate showed a statistically significant annual increase of 1.9% [95% CI 1.5 to 2.4%].
- The age-specific rates of **injury admissions** and **injury ED presentations** among the age groups 0-4, 5-9 and 10-14 years are shown in Figures 13 and 14, respectively.

FIGURE 13: TREND IN INJURY HOSPITAL ADMISSION RATES PER 100,000 CHILDREN, VICTORIA 2008/09-2017/18

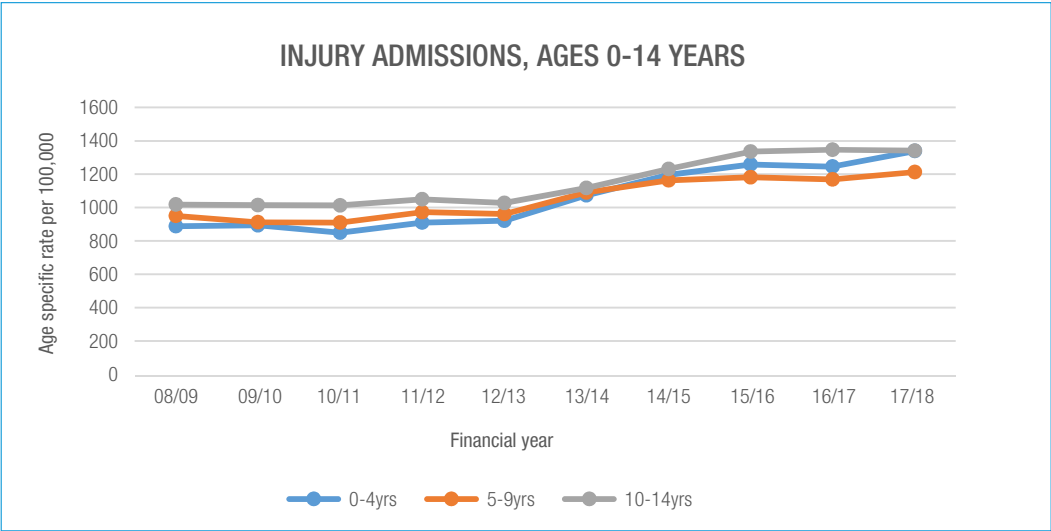
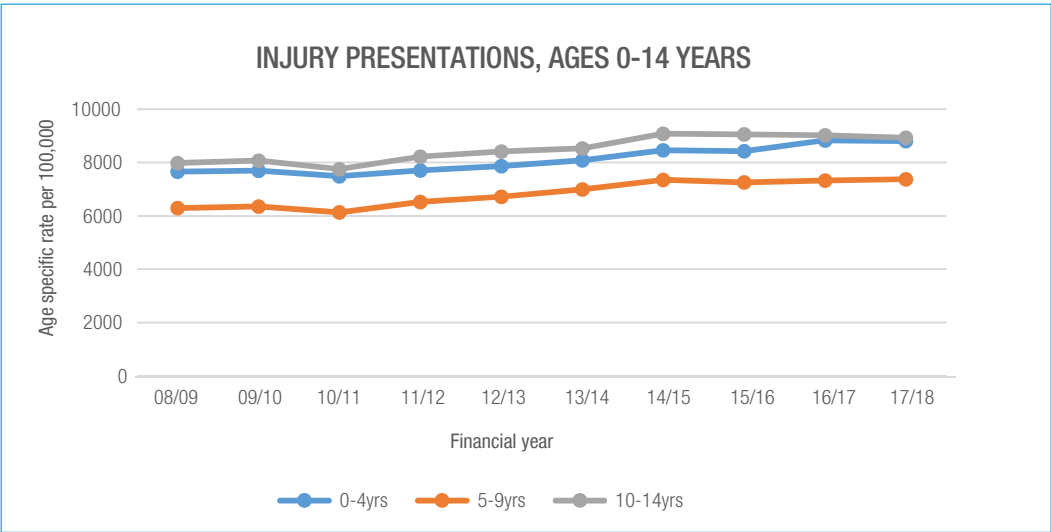


FIGURE 14: TREND IN INJURY ED PRESENTATION RATES PER 100,000 CHILDREN, VICTORIA 2008/09-2017/18



HOSPITAL TREATED INJURY - GENDER AND AGE

- Males were overrepresented in child hospital-treated injury cases, accounting for 61.1% of admissions (n=9,316) and 57.7% of ED presentations (n=56,664) in 2017/18 (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 35.7% of child admissions and 36.4% of child ED presentations.
- Children aged 5-9 years accounted for 31.8% of child admissions and 30% of child ED presentations.
- Children aged 10-14 years accounted for 32.5% of child admissions and 33.6% of child ED presentations.

FIGURE 15: CHILD INJURY HOSPITAL ADMISSIONS BY GENDER AND AGE, VICTORIA 2017/18

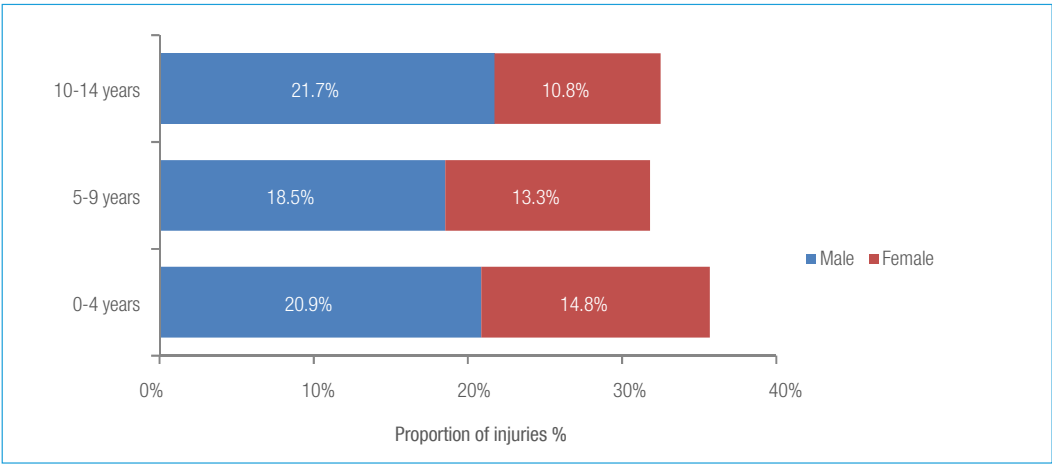
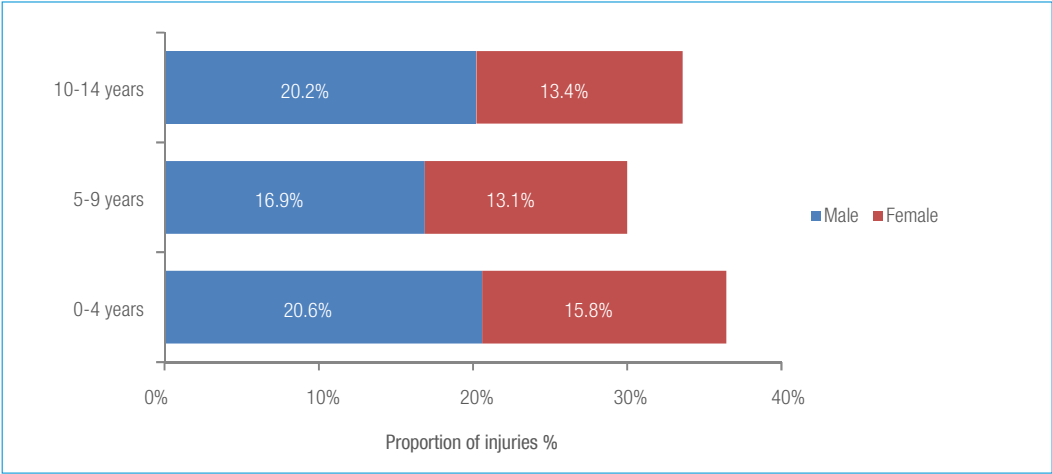


FIGURE 16: CHILD INJURY ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18



- Child injury admission and ED presentation rates were higher for males than females: 1,541.4 vs. 1,037.3 per 100,000 population (admissions) and 9,375.6 vs. 7,283.4 per 100,000 population (ED presentations).
- Table 6 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.

TABLE 6: FREQUENCY AND AGE-SPECIFIC RATE OF INJURY ADMISSIONS AND ED PRESENTATIONS IN CHILDREN BY GENDER AND AGE, VICTORIA 2017/18

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	RATE PER 100,000 POPULATION	n	RATE PER 100,000 POPULATION
0-4 years	Male	3,181	1,521.8	20,221	9,674.1
	Female	2,260	1,144.7	15,565	7,883.6
	All	5,441	1,338.6	35,786	8,804.4
5-9 years	Male	2,825	1,375.3	16,580	8,071.9
	Female	2,023	1,040.8	12,903	6,638.2
	All	4,848	1,212.7	29,483	7,374.8
10-14 years	Male	3,310	1,742.6	19,863	10,456.9
	Female	1,643	915.4	13,142	7,321.9
	All	4,953	1,340.7	33,005	8,933.8
All	Male	9,316	1,541.4	56,664	9,375.6
	Female	5,926	1,037.3	41,610	7,283.4
	All	15,242	1,296.4	98,274	8,358.9

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=7,169) and 44.3% of ED presentations (n=43,525).
- Hit/struck/crush injuries were the next major cause of injury accounting for 16.7% of admissions (n=2,552) and 20.3% of ED presentations (n=19,973).
- Transport accounted for 8.9% of admissions (n=1,357) and only 2.8% of ED presentations (n=2,737).
- Foreign body in a natural orifice, e.g. ear, nose, eye injuries, and cutting and piercing related injuries accounted for 3.4% and 5.3% of admissions (n=520 & n=813), respectively, and 4.3% and 4.0% of ED presentations, respectively (n=4,253 & n=3,973).

FIGURE 17: CHILD INJURY HOSPITAL ADMISSIONS BY CAUSE, VICTORIA 2017/18

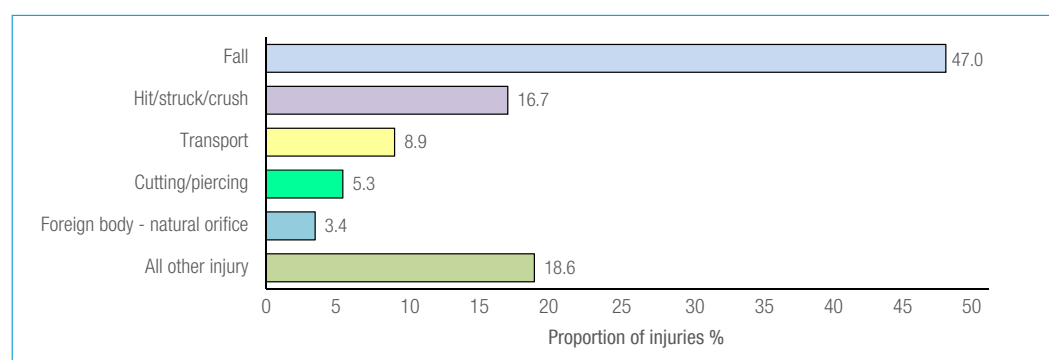
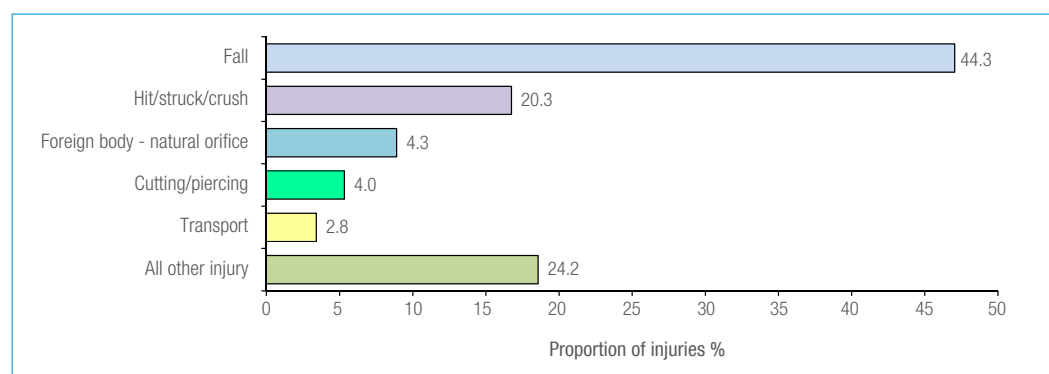


FIGURE 18: CHILD INJURY ED PRESENTATIONS BY CAUSE, VICTORIA 2017/18



Note: 'Other specified' and 'unspecified' cases were included in the 'All other injury' 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 28.3% (n=4,311) of admissions and 16.7% (n=16,433) of ED presentations.
- Open wounds to the head/face/neck accounted for 12.4% of admissions (n=1,886) and 10.7% of ED presentations (n=10,564).
- Other and unspecified injury to head, face or neck was common among hospital admissions (8.6%, n=1,310), as was intracranial injury (6.7%, n=1,020) and fracture to the lower limb (5.8%, n=883). Other types of injuries most common among ED presentations were dislocations, sprains & strains to the upper limb (9.9%, n=9,713), and the lower limb (6.4%, n=6,296) and superficial injury to head/face/neck (7.8%, n=7,700).

FIGURE 19: MAJOR INJURY TYPE, CHILD HOSPITAL ADMISSIONS, VICTORIA 2017/18

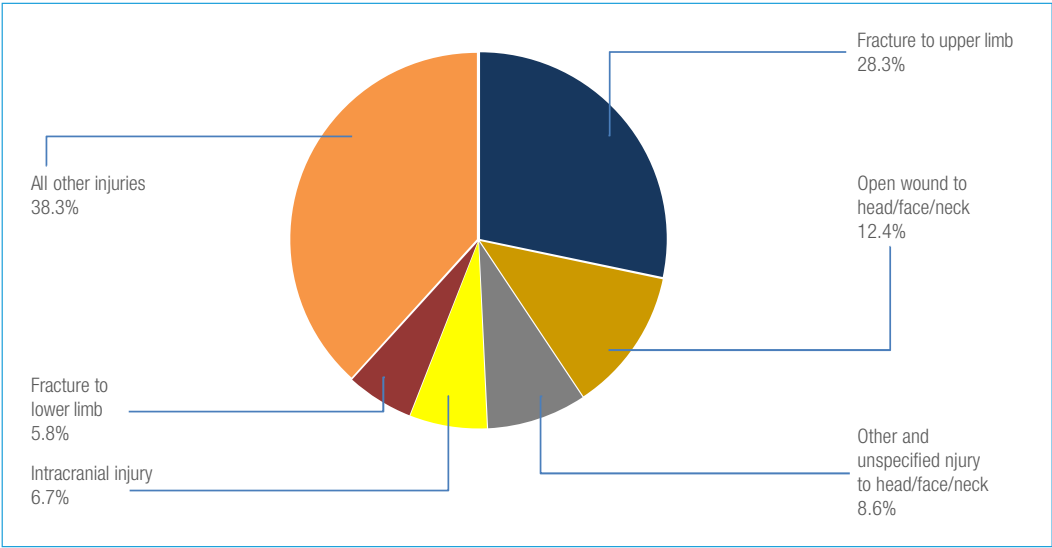
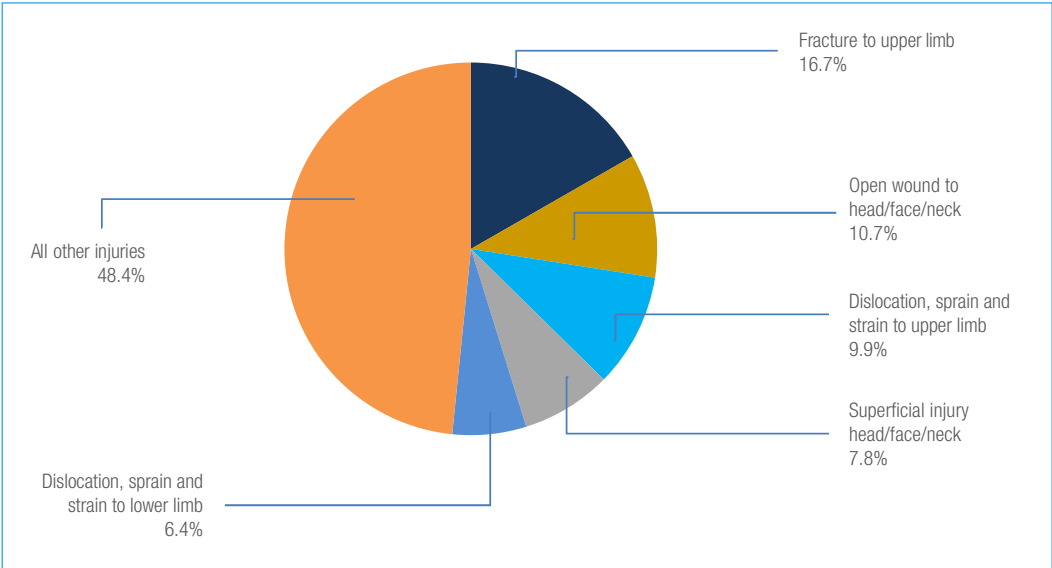


FIGURE 20: MAJOR INJURY TYPE, CHILD ED PRESENTATIONS, VICTORIA 2017/18



SETTING

- Setting where the injury occurred was unspecified in 42.4% of child injury admissions and 11.3% of child injury ED presentations
- Injuries among children requiring hospital admission were most likely to occur in the home, accounting for 23.8% (n=3,635) of admissions and 47.8% (n=46,745) of ED presentations (Figure 21 & 22).
- Children were also commonly injured in schools and educational settings (13.2% of admissions and 13.6% of ED presentations) and sports settings (8.9% each of both admissions and ED presentations).

FIGURE 21: CHILD INJURY HOSPITAL ADMISSIONS BY SETTING, VICTORIA 2017/18

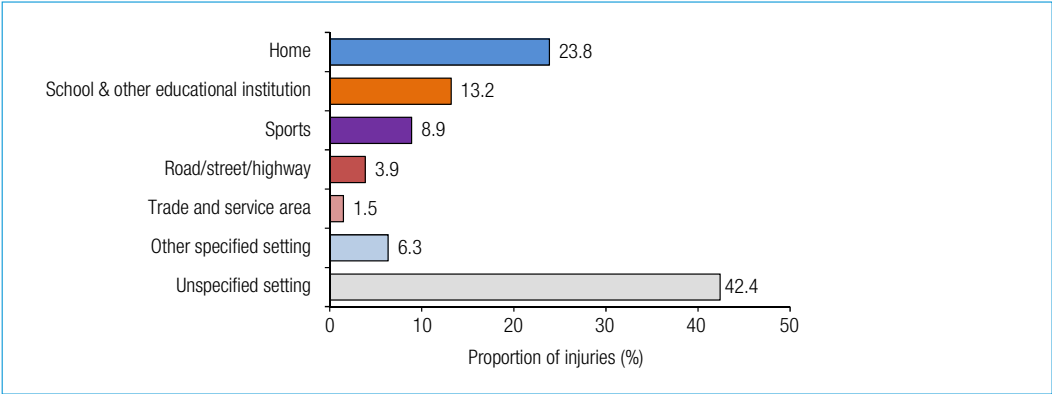
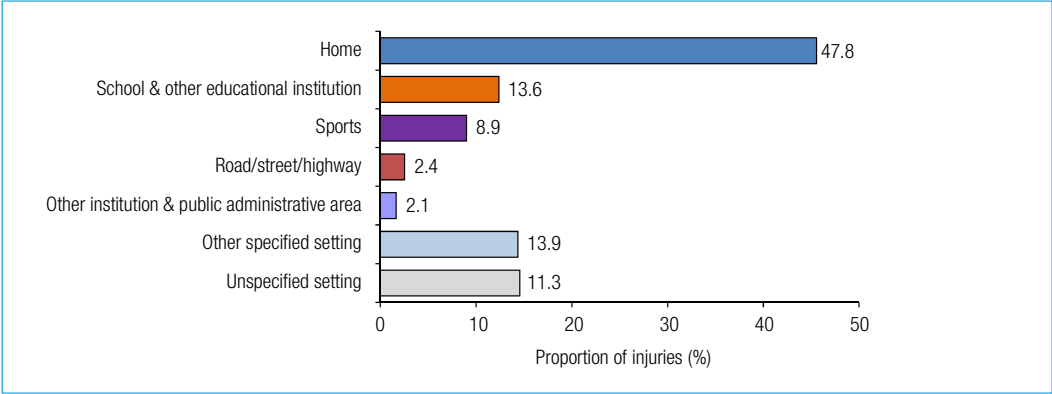


FIGURE 22: CHILD INJURY ED PRESENTATIONS BY SETTING, VICTORIA 2017/18



ADOLESCENTS AND YOUNG ADULTS (15-24 YEARS)

TREND

- During the 10-year period 2008/09 to 2017/18, there were on average 11,435 injury admissions and 53,483 injury ED presentations per year among adolescents and young adults aged 15-24 years. The average age-standardised injury rates were 1,442 admissions and 6,813 ED presentations per 100,000 adolescents and young adults per year.
- The rate of **injury admissions** among adolescents and young adults increased during the ten years. The modelled trend in rate showed a statistically significant annual increase of 4.2% [95% CI 3.3 to 5.1%].
- The rate of **injury ED presentations** among adolescents and young adults decreased during the ten years. The modelled trend in rate showed an annual decrease of -0.4% [95% CI -0.8 to 0.0%].
- The age-specific rates of **injury admissions** and **injury ED presentations** among the age groups 15-19 and 20-24 years are shown in figures 23 and 24, respectively.

FIGURE 23: TREND IN INJURY HOSPITAL ADMISSION RATES PER 100,000 ADOLESCENT & YOUNG ADULTS, VICTORIA 2008/09-2017/18

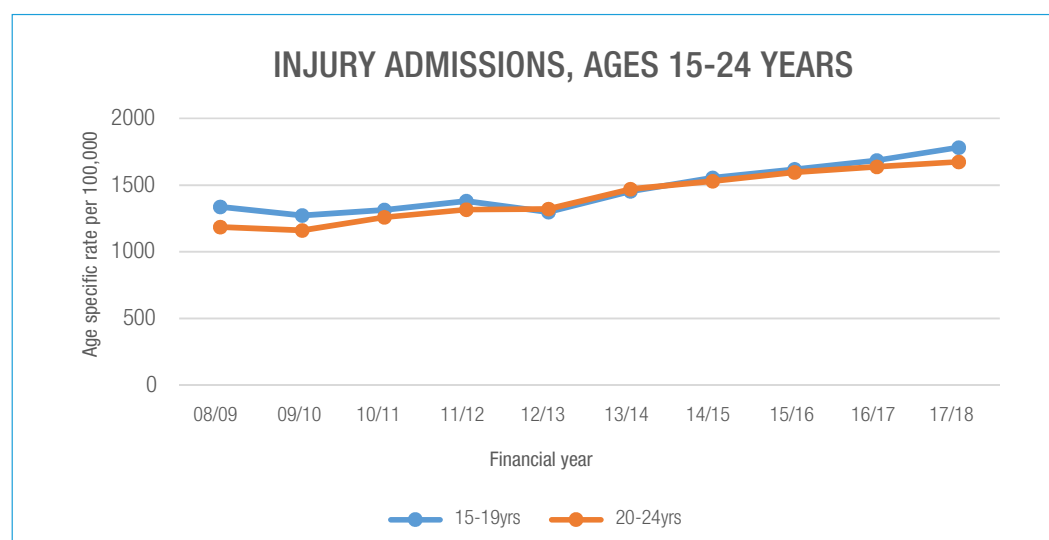
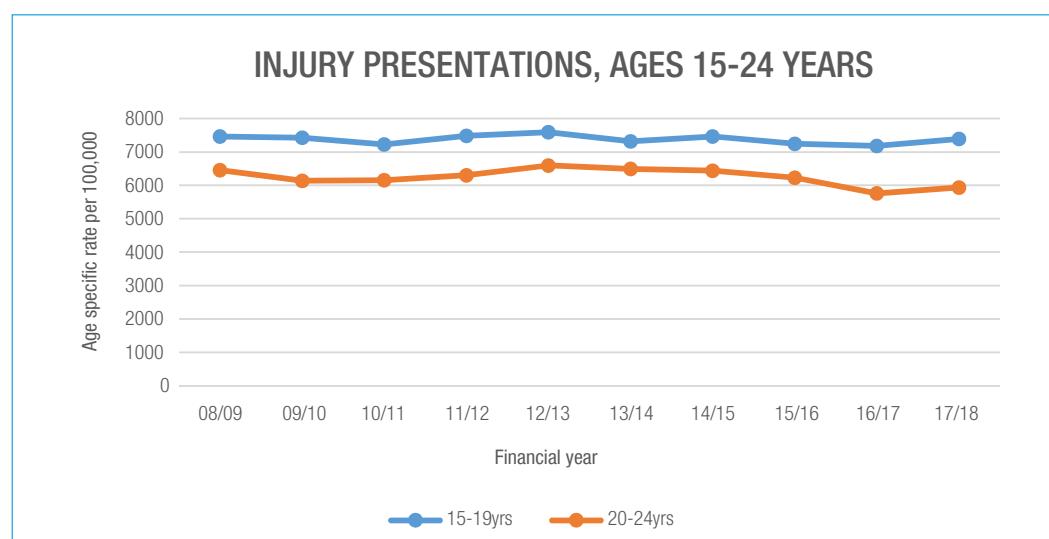


FIGURE 24: TREND IN INJURY ED PRESENTATION RATES PER 100,000 ADOLESCENT & YOUNG ADULTS, VICTORIA 2008/09-2017/18



HOSPITAL TREATED INJURY - GENDER AND AGE

- Males were overrepresented in hospital-treated injury cases among adolescents and young adults, accounting for 70.5% of hospital admissions (n=10,269) and 65.4% of ED presentations (n=36,411) in 2017/18 (Figure 25 & Figure 26).
- Among hospital admissions there was a higher proportion in the 20-24 year age group (54.1%) compared to the 15-19 year age group (45.9%). ED presentations were evenly spread across both the 5-year age groups.

FIGURE 25: ADOLESCENT AND YOUNG ADULT HOSPITAL ADMISSIONS BY GENDER AND AGE, VICTORIA 2017/18

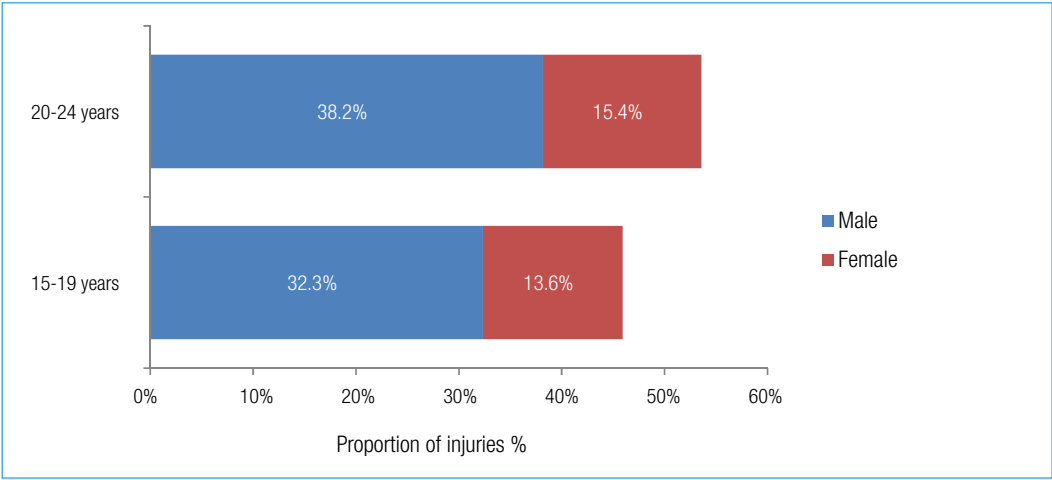
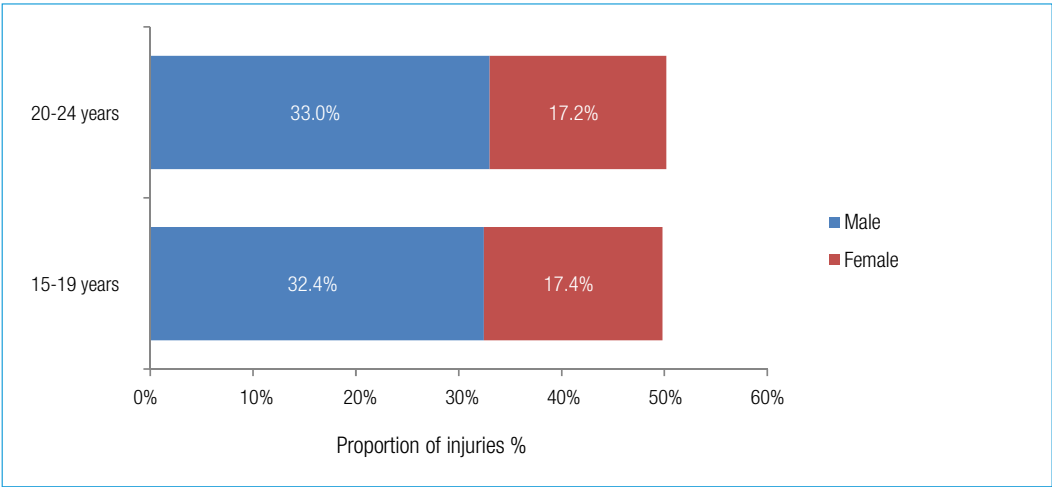


FIGURE 26: ADOLESCENT AND YOUNG ADULT ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18



- Among adolescents and young adults, age-specific injury admission and ED presentation rates were higher for males than females: 2,370.5 vs. 1,041.1 per 100,000 population; 8,405.2 vs. 4,662.5 per 100,000 population (Table).
- For both admissions and ED presentations, the rates per 100,000 population were higher in the 15-19 age group than the 20-24 age group.

TABLE 7: FREQUENCY AND AGE-SPECIFIC RATE OF INJURY ADMISSIONS AND ED PRESENTATIONS IN ADOLESCENTS AND YOUNG ADULTS BY GENDER AND AGE, VICTORIA 2017/18

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	RATE PER 100,000 POPULATION	n	RATE PER 100,000 POPULATION
15-19 years	Male	4,710	2,454.8	18,046	9,405.4
	Female	1,977	1,078.4	9,666	5,272.5
	All	6,687	1,782.3	27,712	7,386.0
20-24 years	Male	5,559	2,303.5	18,365	7,609.9
	Female	2,316	1,011.2	9,560	4,174.2
	All	7,875	1,674.3	27,925	5,937.0
All	Male	10,269	2,370.5	36,411	8,405.2
	Female	4,293	1,041.1	19,226	4,662.5
	All	14,562	1,722.2	55,637	6,580.0

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 (22.1%, n=3,223) but only accounted for 8.7% of ED presentations (n=4,832).
- Falls was the second most common cause of hospital admissions (19%, n=2,768), and ED presentations (26.1%, n=14,547) in this age group.
- Hit/struck/crush injuries accounted for 16.8% of hospital admissions (n=2,452) and were the leading cause of ED presentations (26.7%, n=14,876).
- Cutting and piercing injuries accounted for 10.6% of admissions (n=1,541) and 9.6% of ED presentations (n=5,349).
- The fifth ranking cause of adolescent and young adult hospital admissions was overexertion and strenuous movements (4.1%, n=603) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (3.1%, n=1,719).

FIGURE 27: ADOLESCENT AND YOUNG ADULT INJURY HOSPITAL ADMISSIONS BY CAUSE, VICTORIA 2017/18

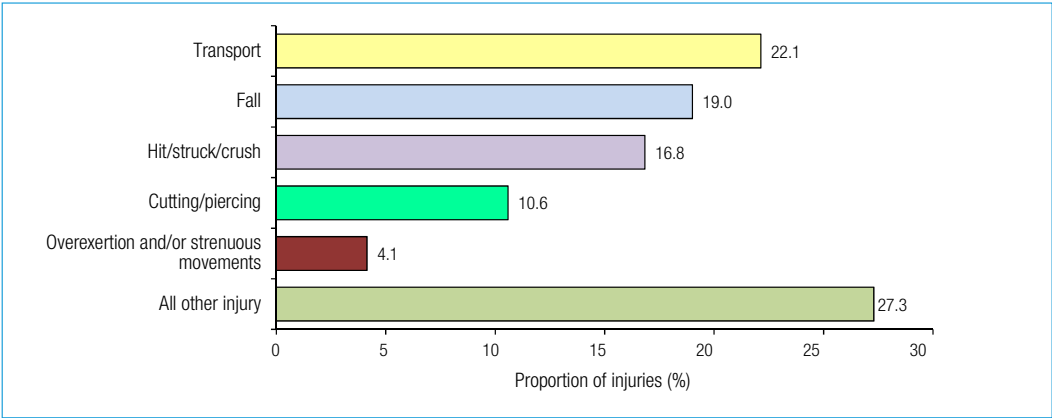
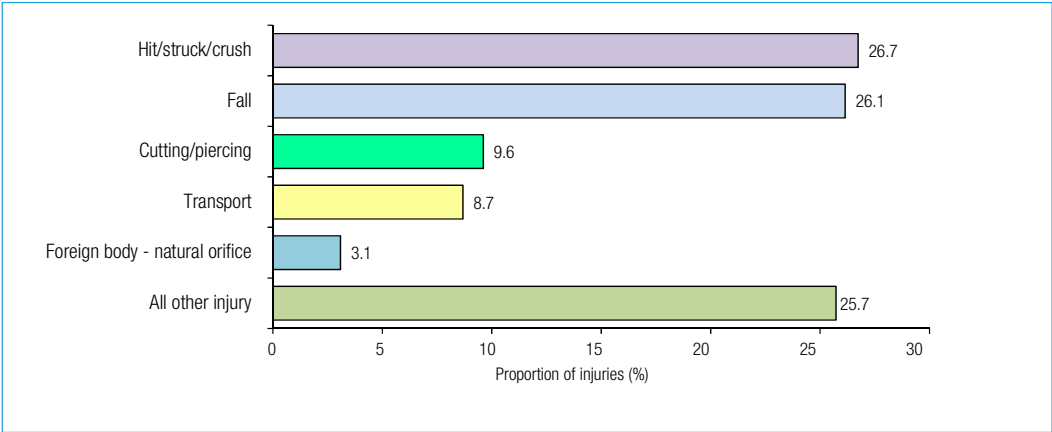


FIGURE 28: ADOLESCENT AND YOUNG ADULT INJURY ED PRESENTATIONS BY CAUSE, VICTORIA 2017/18



Note: 'Other specified' and 'unspecified' cases were included in the 'All other injury' 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 19.5% (n=2,835) of injury admissions and 10.5% of ED presentations (n=5,816).
- Dislocations, sprains and strains to the lower limb (9.5%, n=1,377) and fractures to the lower limb (8.2%, n=1,187) were common among admissions.
- Dislocations, sprains and strains to the lower limb (13.8%, n=7,689), and the upper limb (10.1%, n=5,611) and open wounds to the upper limb (7.8%, n=4,361) were common among ED presentations.

FIGURE 29: MAJOR INJURY TYPE, ADOLESCENT AND YOUNG ADULT HOSPITAL ADMISSIONS, VICTORIA 2017/18

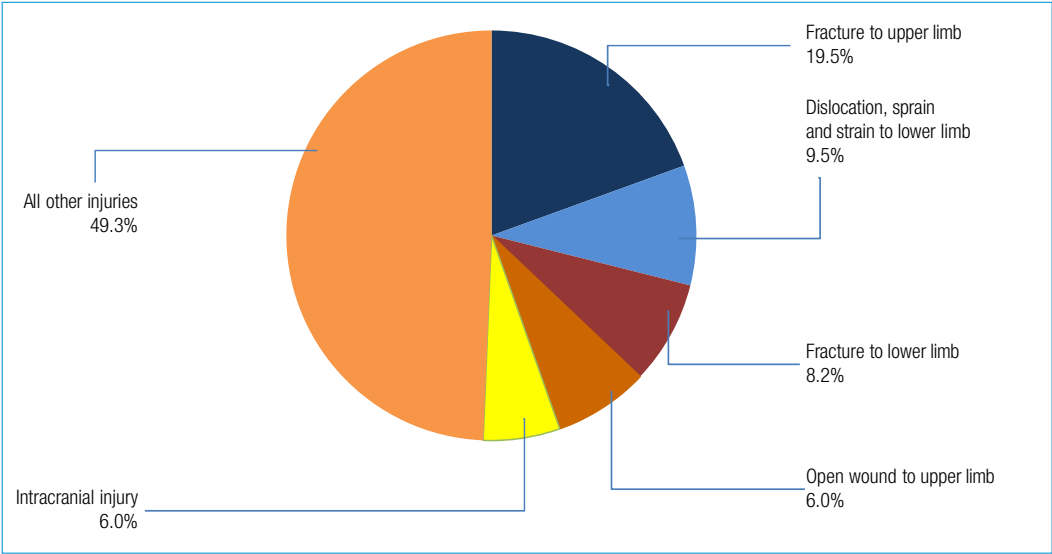
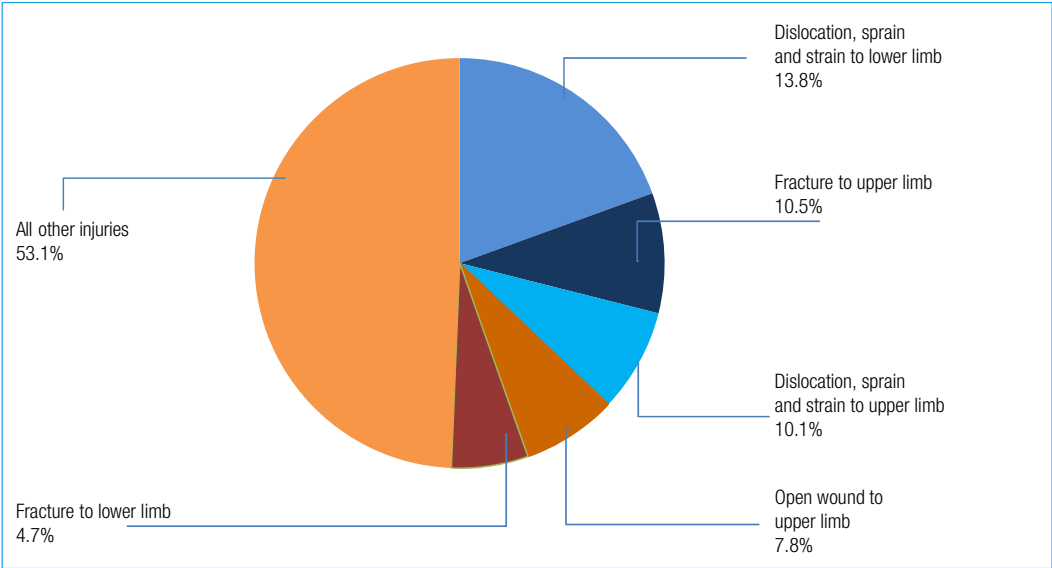


FIGURE 30: MAJOR INJURY TYPE, ADOLESCENT AND YOUNG ADULT ED PRESENTATIONS, VICTORIA 2017/18



SETTING

- Setting where the injury occurred was unspecified in 39.1% of adolescent and young adult injury admissions and 16.5% of ED presentations.
- Sports (20.9%, n=3,044) and the road, street and highway (14.7%, n=2,139) settings were the most common places of occurrence resulting in hospital admission (Figure 31). Other common settings were working for income (11%, n=1,605) and the home (6.9%, n=1,004).
- Among ED presentations, the home (23.3%, n=12,988) and sports settings (19.5%, n=10,850) were the most common places of injury occurrence (Figure 32). Other common settings were working for income (12.3%, n=6,860) and road/street and highway (7.7%, n=4,304).

FIGURE 31: ADOLESCENT AND YOUNG ADULT INJURY HOSPITAL ADMISSIONS BY SETTING, VICTORIA 2017/18

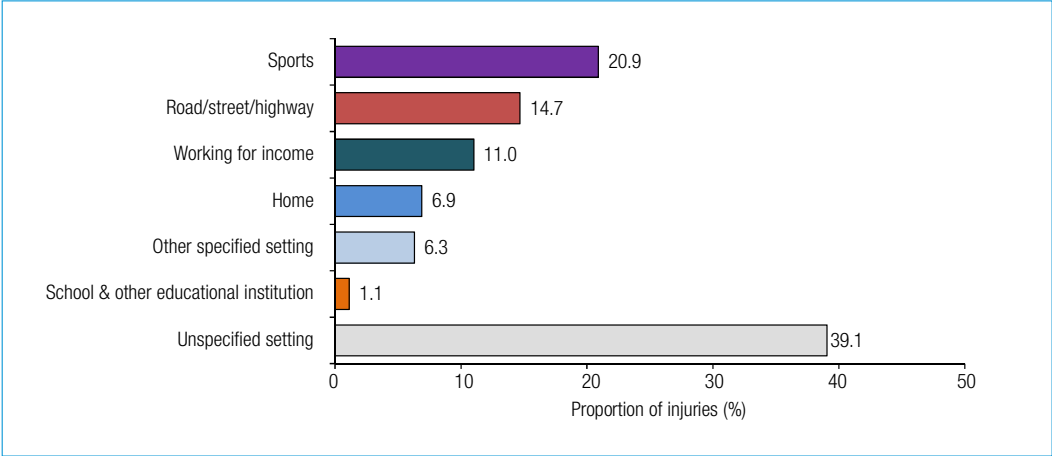
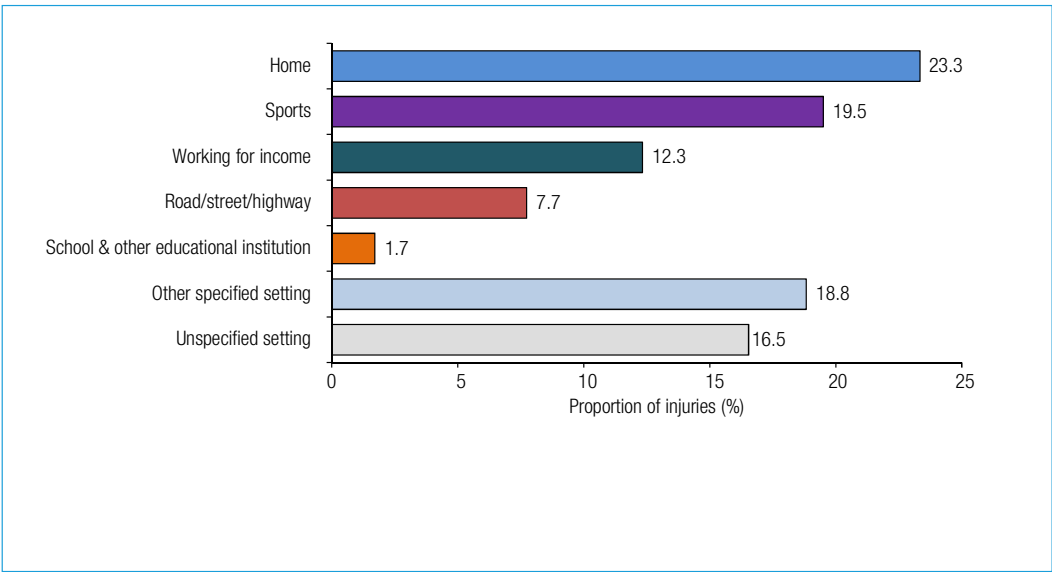


FIGURE 32: ADOLESCENT AND YOUNG ADULT INJURY ED PRESENTATIONS BY SETTING, VICTORIA 2017/18



ADULTS (25-64 YEARS)

TREND

- During the 10-year period 2008/09 to 2017/18, there were on average 34,711 injury admissions and 120,125 injury ED presentations per year among adults aged 25-64 years. The average age-standardised injury rates were 1,101 admissions and 3,877 ED presentations per 100,000 adults per year.
- The rate of injury admissions among adults increased during the ten years. The modelled trend in rate showed a statistically significant annual increase of 5.4% [95% CI 4.5 to 6.4%].
- The rate of injury ED presentations among adults increased during the ten years. The modelled trend in rate showed a (slight) annual increase of 0.7% [95% CI 0.1 to 1.3%].
- The age-specific rates of injury admissions and injury ED presentations among the age groups 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64 years are shown in figures 33 and 34, respectively.

FIGURE 33: TREND IN INJURY HOSPITAL ADMISSION RATES PER 100,000 ADULTS, VICTORIA 2008/09-2017/18

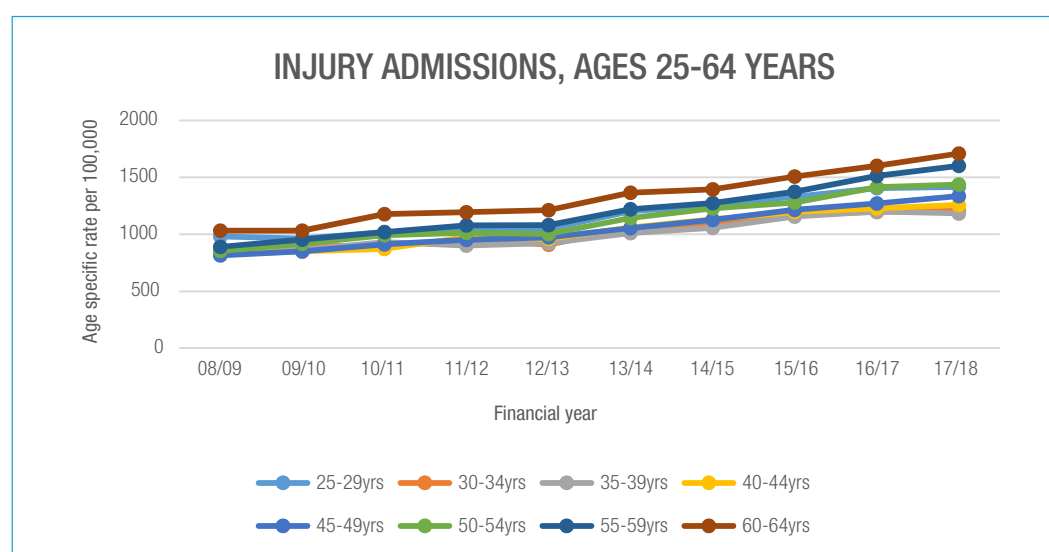
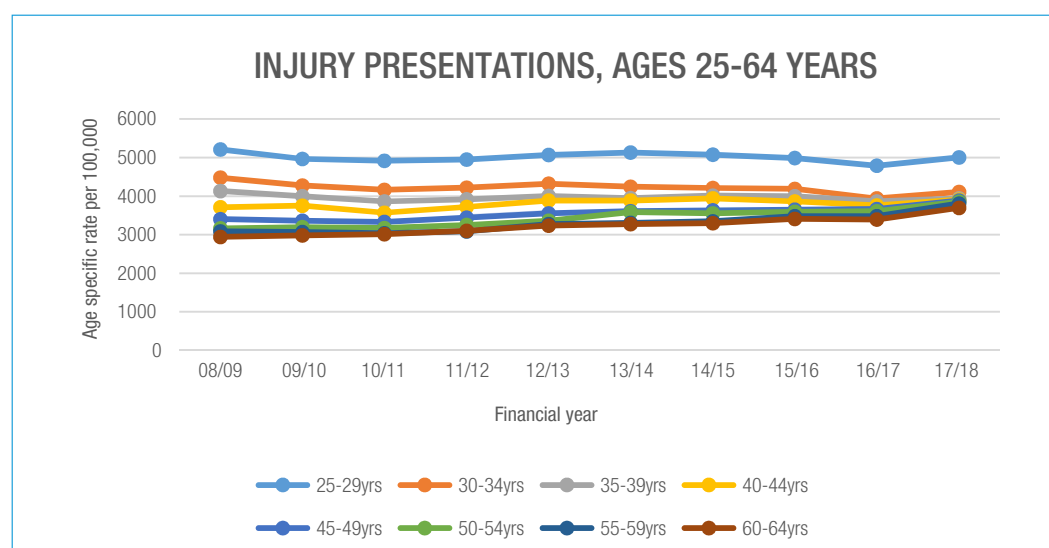


FIGURE 34: TREND IN INJURY ED PRESENTATION RATES PER 100,000 ADULTS, VICTORIA 2008/09-2017/18



HOSPITAL TREATED INJURY - GENDER AND AGE

- Males were overrepresented in hospital injury data for adults aged 25 to 64 years, accounting for 61.9% of hospital admissions (n=28,912) and 60% of ED presentations (n=82,786) in 2017/18 (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.

FIGURE 35: ADULT INJURY HOSPITAL ADMISSIONS BY GENDER AND AGE, VICTORIA 2017/18

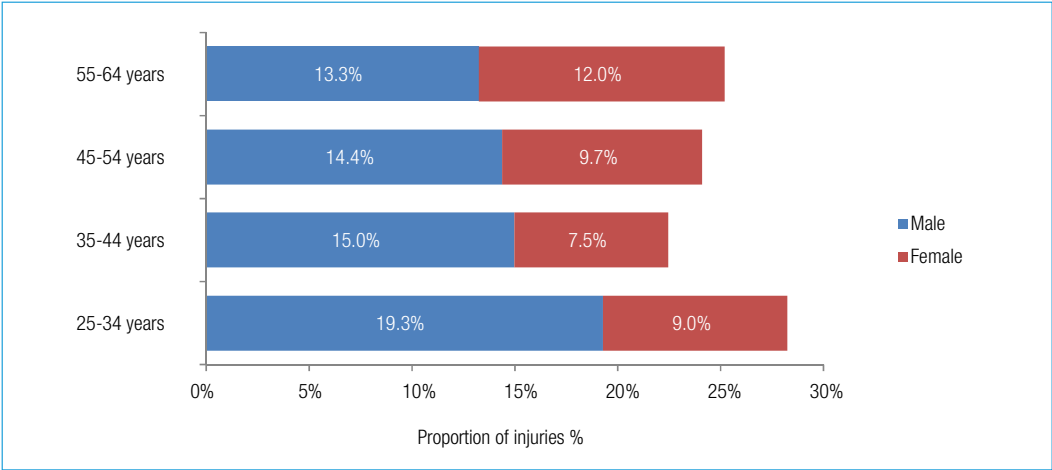
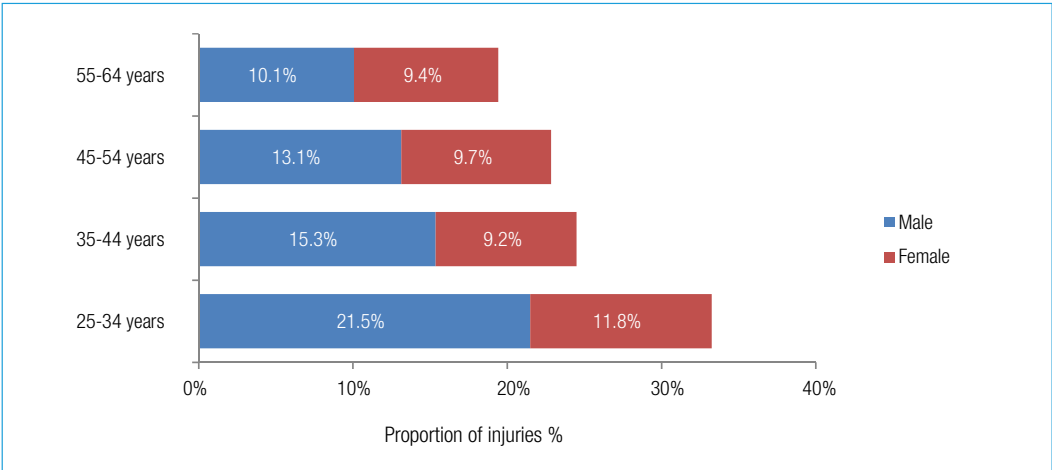


FIGURE 36: ADULT INJURY ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18



- The total age-specific injury admission and ED presentation rates were higher for males compared with females: 1,730.7 vs. 1,034.4 per 100,000 adults (admissions) and 4,955.7 vs. 3,201.7 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 8).

TABLE 8: FREQUENCY AND AGE-SPECIFIC RATE OF INJURY ADMISSIONS AND ED PRESENTATIONS IN ADULTS BY GENDER AND AGE, VICTORIA 2017/18

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	RATE PER 100,000 POPULATION	n	RATE PER 100,000 POPULATION
25-34 years	Male	9,007	1,803.3	29,633	5,932.9
	Female	4,189	828.4	16,221	3,207.9
	All	13,196	1,312.9	45,854	4,562.0
35-44 years	Male	6,995	1,632.7	21,159	4,938.8
	Female	3,494	808.5	12,632	2,922.9
	All	10,489	1,218.8	33,791	3,926.5
45-54 years	Male	6,719	1,696.2	18,124	4,575.3
	Female	4,540	1,088.0	13,358	3,201.3
	All	11,259	1,384.2	31,482	3,870.4
55-64 years	Male	6,191	1,786.7	13,870	4,002.9
	Female	5,583	1,524.3	12,902	3,522.5
	All	11,774	1,651.9	26,772	3,756.0
All	Male	28,912	1,730.7	82,786	4,955.7
	Female	17,806	1,034.4	55,113	3,201.7
	All	46,718	1,377.3	137,899	4,065.6

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 29.1% (n=13,608) of hospital admissions and 27.9% (n=38,535) of ED presentations.
- Transport accounted for 20.4% of admissions (n=9,536) but only 8.5% of ED presentations (n=11,777).
- Cutting and piercing injuries accounted for 10.3% of admissions (n=4,818) and 11% of ED presentations (n=15,200).
- Hit/struck/crush injuries accounted for just 8.9% of admissions (n=4,137) but 18.2% of ED presentations (n=25,053).
- Hit/struck/crush injuries accounted for just 8.9% of admissions (n=4,137) but 18.2% of ED presentations (n=25,053).
- The fifth ranking cause of hospital admissions was natural/environmental/animals related injury (4.7%, n=2,173) whereas for ED presentations it was injuries caused by a foreign body in a natural orifice e.g. ear, nose, eye (5.7%, n=7,807).

FIGURE 37: ADULT INJURY HOSPITAL ADMISSIONS BY CAUSE, VICTORIA 2017/18

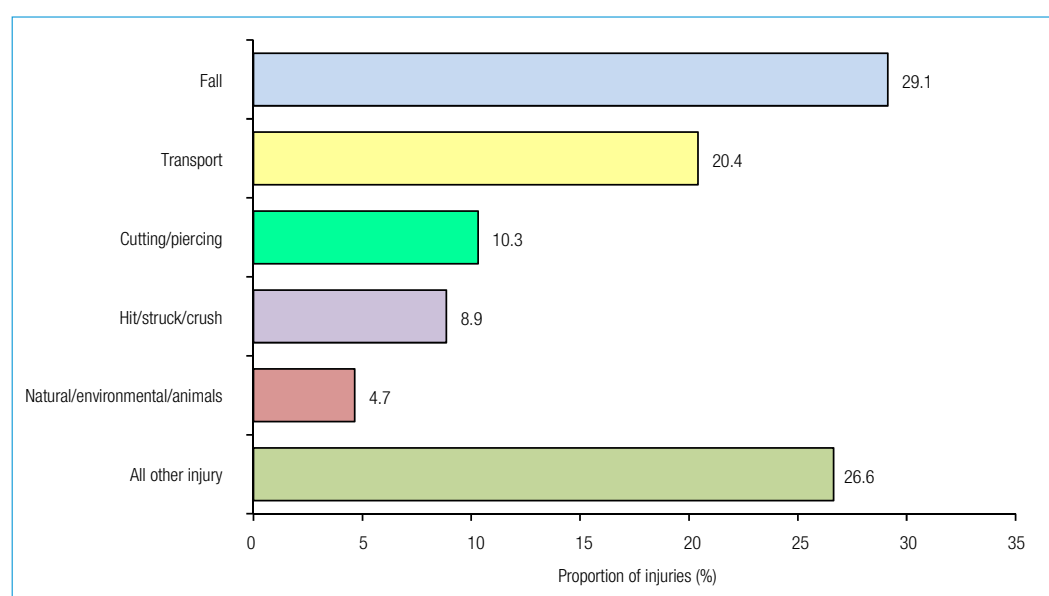
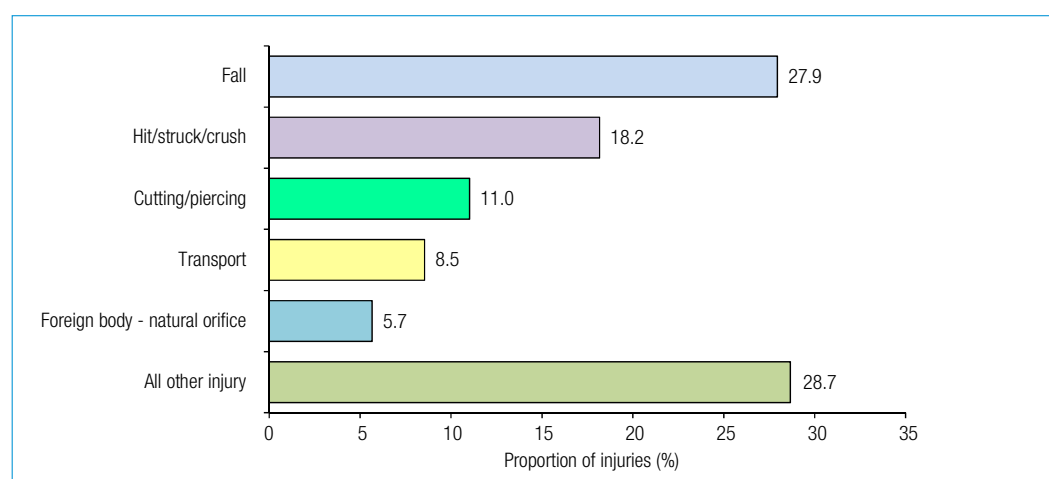


FIGURE 38: ADULT INJURY ED PRESENTATIONS BY CAUSE, VICTORIA 2017/18



Note: 'Other specified' and 'unspecified' cases were included in the 'All other injury' 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 17.2% (n=8,054) of admissions. Fracture to the lower limb was the second most common type of injury requiring hospital admission (10.9%, n=5,074), followed by open wound to upper limb (7.7%, n=3,620).
- Dislocations, sprains and strains to the lower limb (9.7%, n=13,359), open wounds to the upper limb (9.4%, n=13,013), and fracture to the upper limb (9%, n=12,425) were the most common types of injury among ED presentations.

FIGURE 39: MAJOR INJURY TYPE, ADULT HOSPITAL ADMISSIONS, VICTORIA 2017/18

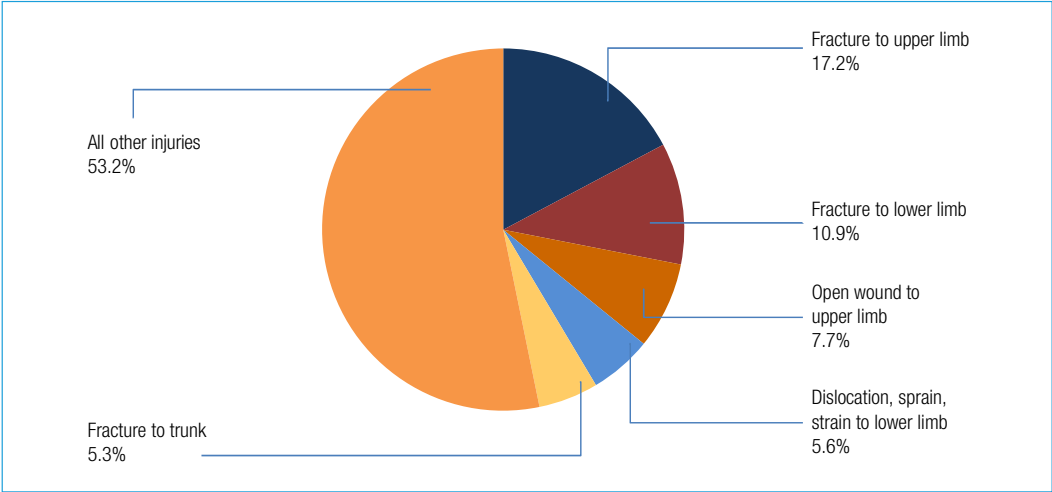
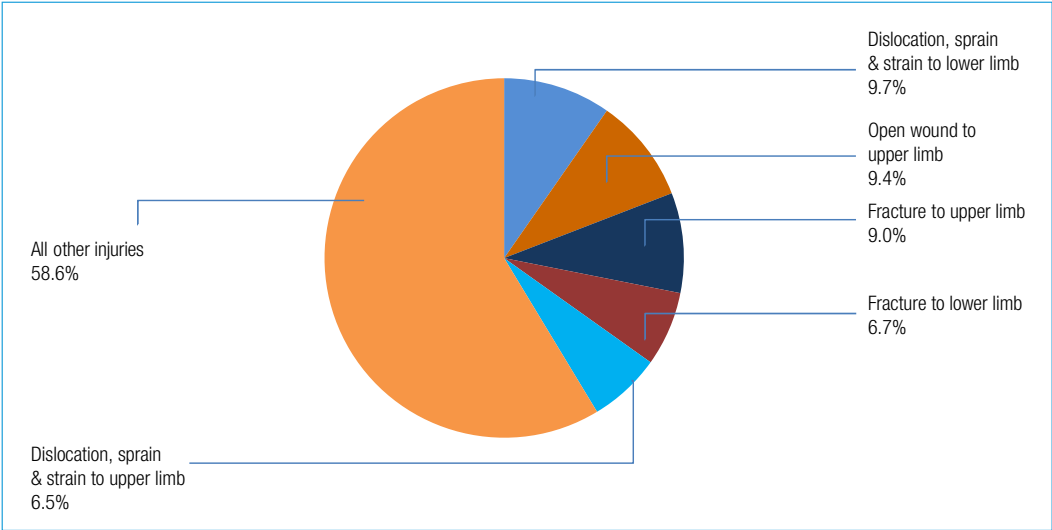


FIGURE 40: MAJOR INJURY TYPE, ADULT ED PRESENTATIONS, VICTORIA 2017/18



SETTING

- Setting where the injury occurred was unspecified in 39.8% of adult injury admissions and 19.9% of adult injury ED presentations.
- Seventeen percent of injuries requiring hospital admission (n=7,998) and 36.1% of injuries resulting in ED presentation (n=49,764) occurred in the home (Figure 41 & Figure 42).
- Other settings where injuries to adults commonly occurred were:
 - Working for income (13.8% of admissions (n=6,453) and 14.9% of ED presentations (n=20,558)
 - Roads, streets and highways (15.4% of admissions (n=7,199) and 9% of ED presentations (n=12,356)
 - Sports and athletics setting (6.6% of admissions (n=3,075) and 5.8% of ED presentations (n=8,038).

FIGURE 41: ADULT INJURY HOSPITAL ADMISSIONS BY SETTING, VICTORIA 2017/18

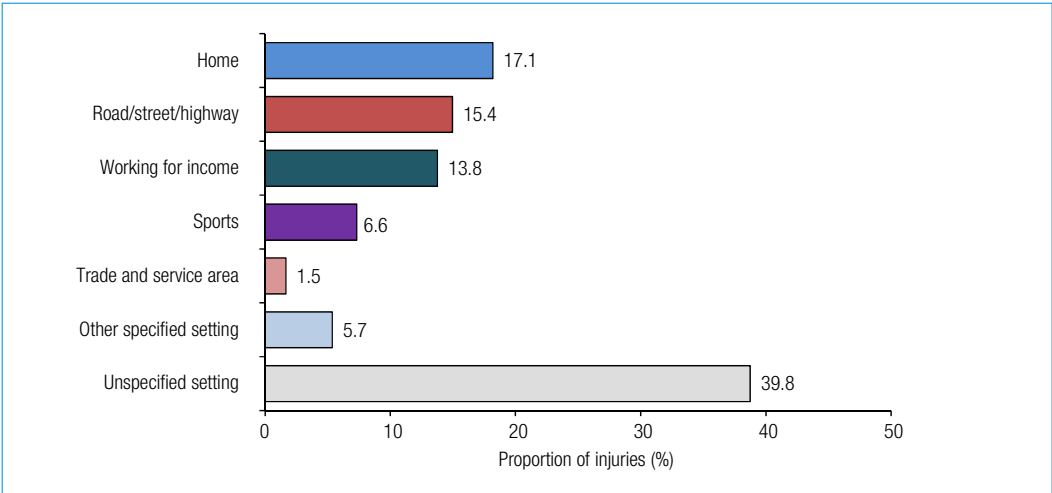
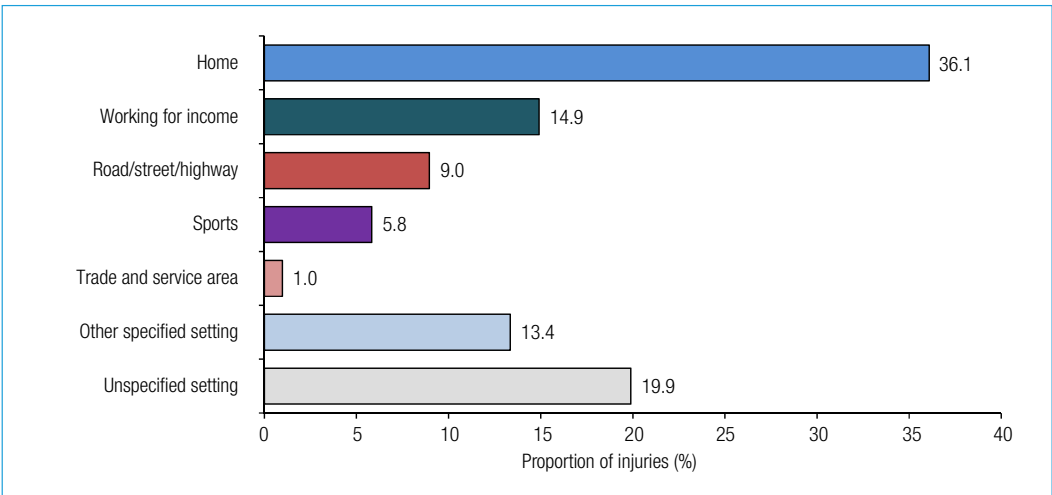


FIGURE 42: ADULT INJURY ED PRESENTATIONS BY SETTING, VICTORIA 2017/18



OLDER ADULTS (65 YEARS AND OLDER)

TREND

- During the 10-year period 2008/09 to 2017/18, there were on average 30,259 injury admissions and 40,804 injury ED presentations per year among older adults aged 65 years and above. The average age-standardised injury rates were 3,412 admissions and 4,721 ED presentations per 100,000 older adults per year.
- The rate of **injury admissions** among older adults increased during the ten years. The modelled trend in rate showed a statistically significant annual increase of 4.5% [95% CI 4.0 to 4.9%].
- The rate of injury **ED presentations** among older adults increased during the ten year. The modelled trend in rate showed a statistically significant annual increase of 1.9% [95% CI 1.6 to 2.3%].
- The age-specific rates of **injury admissions** and **injury ED presentations** among the age groups 65-69, 70-74, 75-79, 80-84, 85-89, 90-94 and 95+ years are shown in figures 43 and 44, respectively.

FIGURE 43: TREND IN INJURY HOSPITAL ADMISSION RATES PER 100,000 OLDER ADULTS, VICTORIA 2008/09-2017/18

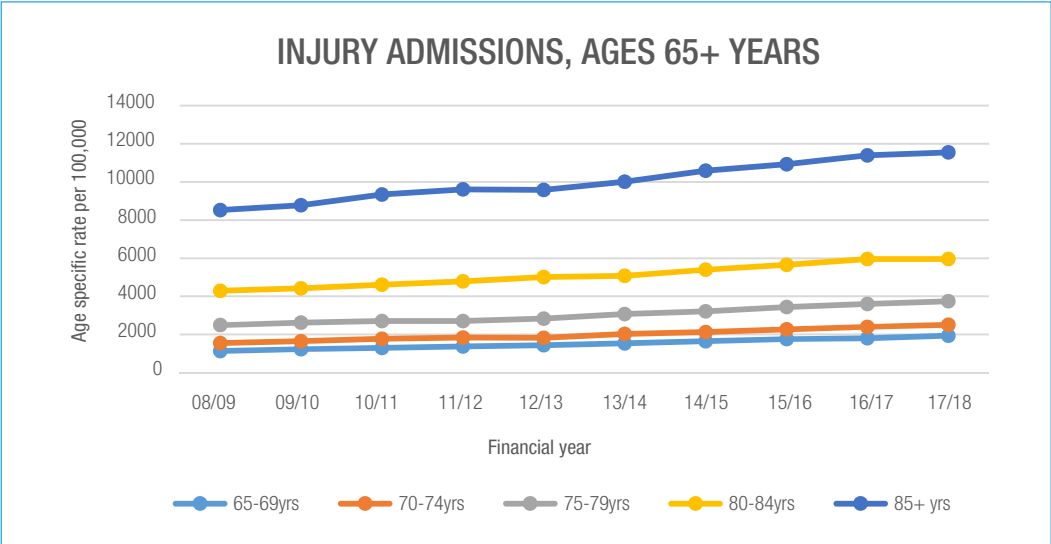
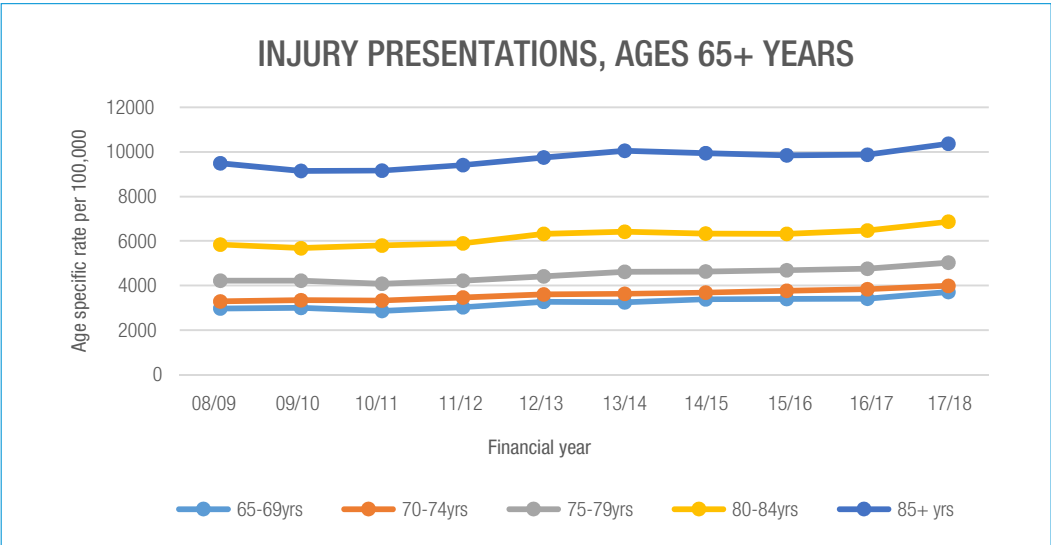


FIGURE 44: TREND IN INJURY ED PRESENTATION RATES PER 100,000 OLDER ADULTS, VICTORIA 2008/09-2017/18



HOSPITAL TREATED INJURY - GENDER AND AGE

- Females were overrepresented in hospital injury data for persons aged 65 years and older. They accounted for 62.3% of hospital admissions (n=25,586) and 57% of ED presentations (n=29,495) in 2017/18 (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.

FIGURE 45: OLDER ADULT INJURY HOSPITAL ADMISSIONS BY GENDER AND AGE, VICTORIA 2017/18

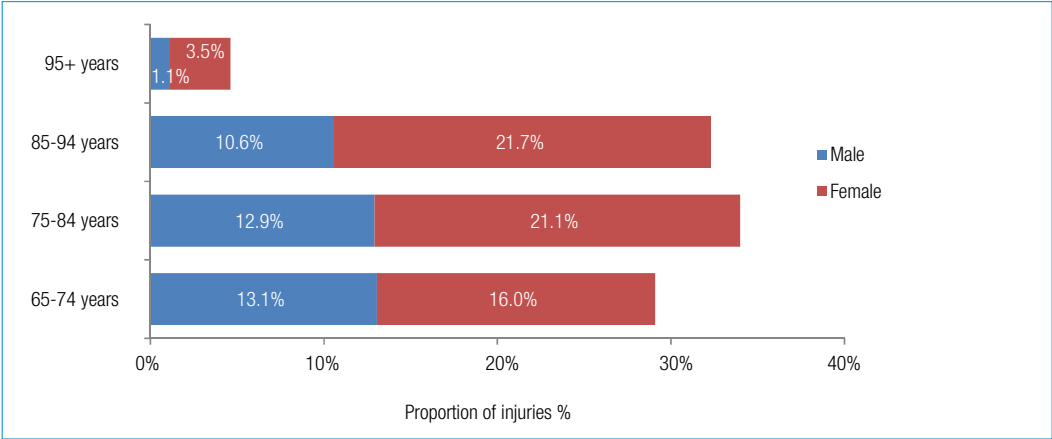
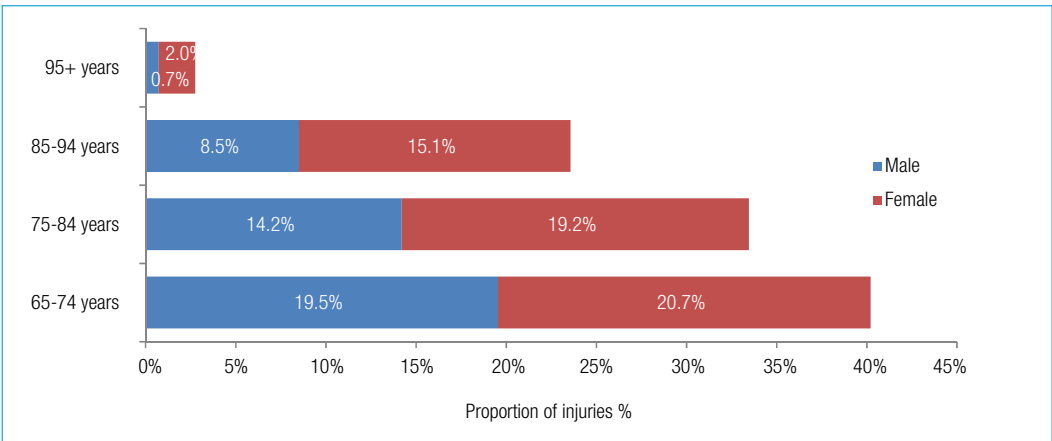


FIGURE 46: OLDER ADULT INJURY ED PRESENTATIONS BY GENDER AND AGE, VICTORIA 2017/18



- The overall age-specific rate of injury admission and ED presentation was higher for females than males: 4,899.9 vs. 3,438.0 per 100,000 population (admissions) and 5,648.5 vs. 4,941.3 per 100,000 population (presentations) (Table 9).
- The rate of admissions and ED presentations increased with age among older adults.

TABLE 9: FREQUENCY AND AGE-SPECIFIC RATE OF INJURY ADMISSIONS AND ED PRESENTATIONS IN OLDER ADULTS BY GENDER AND AGE, VICTORIA 2017/18

AGE GROUP	GENDER	HOSPITAL ADMISSIONS		ED PRESENTATIONS	
		n	RATE PER 100,000 POPULATION	n	RATE PER 100,000 POPULATION
65-74 years	Male	5,364	2,040.4	10,115	3,847.5
	Female	6,583	2,356.0	10,699	3,829.1
	All	11,947	2,203.0	20,814	3,838.0
75-84 years	Male	5,305	3,583.3	7,357	5,343.7
	Female	8,650	5,365.9	9,956	6,176.0
	All	13,955	4,669.1	17,313	5,792.6
85-94 years	Male	4,352	9,344.5	4,403	9,454.0
	Female	8,926	12,167.4	7,791	10,620.2
	All	13,278	11,071.2	12,194	10,167.3
95+ years	Male	464	14,228.8	381	11,683.5
	Female	1,427	17,417.3	1,049	12,803.6
	All	1,891	16,509.5	1,430	12,484.7
All	Male	15,485	3,438.0	22,256	4,941.3
	Female	25,586	4,899.9	29,495	5,648.5
	All	41,071	4,222.9	51,751	5,321.0

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 (77.1%, n=31,648) and more than half of ED presentations (60.9%, n=31,532) in this age group (Figure 47 & Figure 48).
- Transport was the second most common cause of hospital admission (5.5%, n=2,243) and the cause of 3.6% of ED presentations (n=1,885). The second most common cause for ED presentations in this age group was hit/struck/crush (6.4%, n=3,319).
- The third leading cause of admissions was hit/struck/crush (2.4%, n=976), whereas for ED presentations it was cutting and piercing (4.5%, n=2,349).
- Cutting and piercing and overexertion and/or strenuous movements each accounted for around 2% of admissions (n=857 and 792), while injuries caused by a foreign body in a natural orifice, e.g. ear, nose, eye, accounted for 2.6% (n=1,352) of ED presentations.

FIGURE 47: OLDER ADULT INJURY HOSPITAL ADMISSIONS BY CAUSE, VICTORIA 2017/18

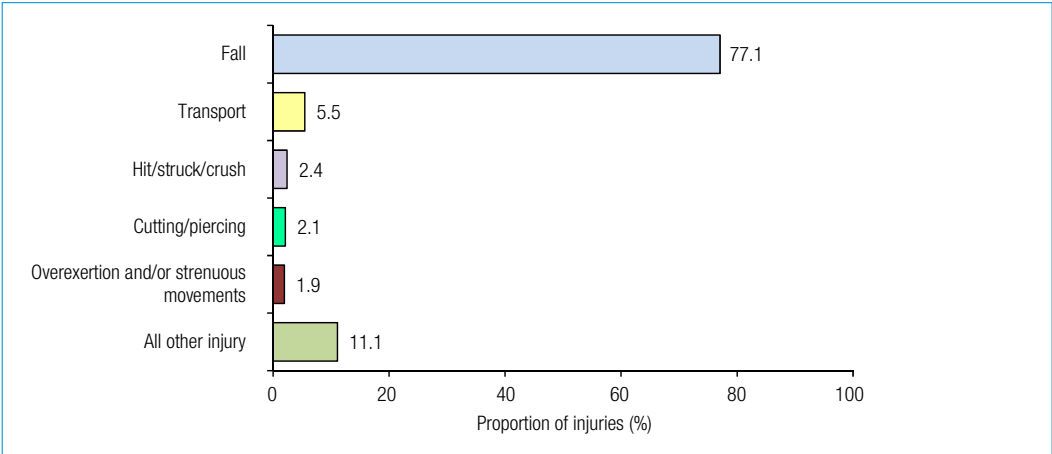
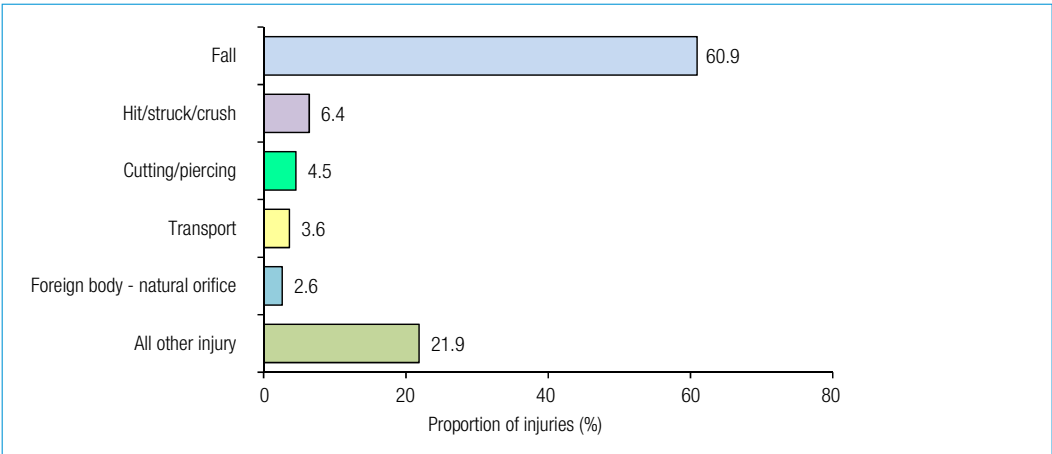


FIGURE 48: OLDER ADULT INJURY ED PRESENTATIONS BY CAUSE, VICTORIA 2017/18



Note: 'Other specified' and 'unspecified' cases were included in the 'All other injury' 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 18.9% of injury hospital admissions (n=7,766) and 12.4% (n=6,434) of ED presentations.
- Fracture to the upper limb accounted for 12.9% (n=5,296) of hospital admissions and 10.6% (n=5,490) of ED presentations. Fractures to the trunk were also common among hospital admissions (11.6%, n=4,776).
- Open wounds to the head/face/neck accounted for 7.9% (n=3,246) of hospital admissions and 5.8% (n=3,001) of ED presentations.
- Intracranial injuries accounted for 4.5% (n=1,855) of hospital admissions but were not a major cause of injury among ED presentations.
- Dislocations, sprains and strains to the lower limb (5.7%, n=2,946) and superficial wounds to the head/face/neck (5.5%, n=2,828) were also common among ED presentations.

FIGURE 49: MAJOR INJURY TYPE, OLDER ADULT HOSPITAL ADMISSIONS, VICTORIA 2017/18

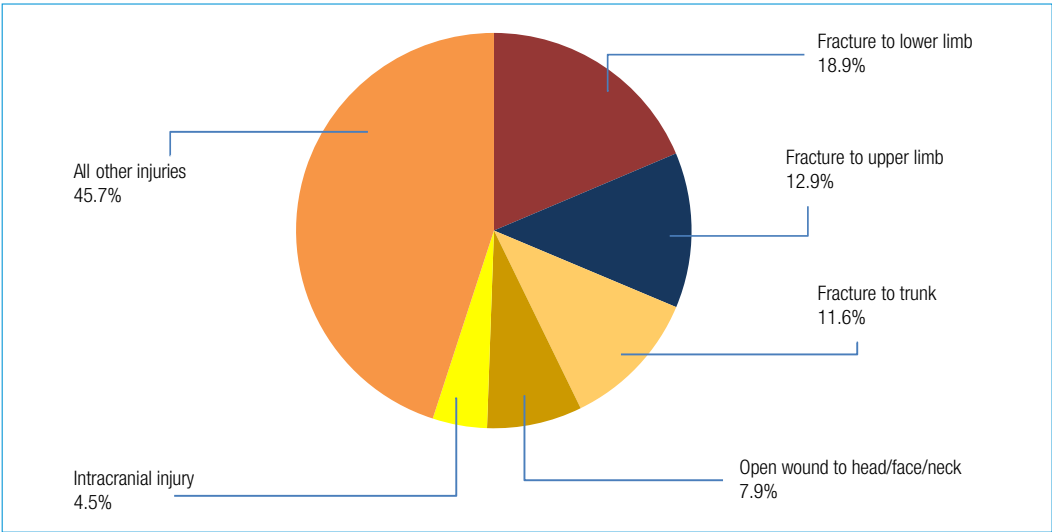
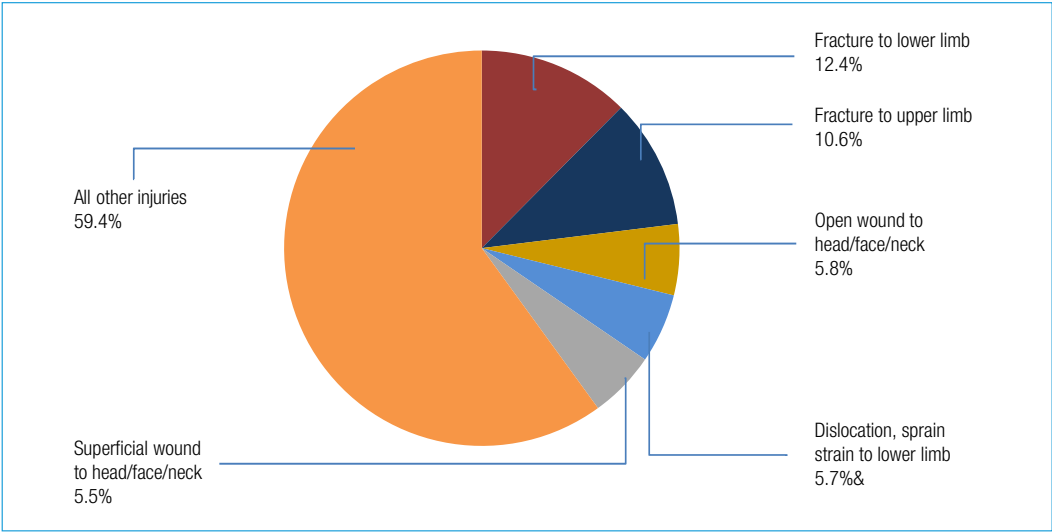


FIGURE 50: MAJOR INJURY TYPE, OLDER ADULT ED PRESENTATIONS, VICTORIA 2017/18



SETTING

- Setting where the injury occurred was unspecified in 25.1% of older adult injury admissions and 20.6% of older adult injury ED presentations.
- Around 41% of older adult injuries requiring hospital admission (n=16,902) and more than half of ED presentations (52.7%, n=27,253) occurred in the home (Figure 51 & Figure 52).
- Other settings where injuries to older adults commonly occurred were:
 - - Residential institutions (17.6% of admissions (n=7,235) and 7.8% of ED presentations (n=4,056))
 - - Roads, streets and highways (7.7% of admissions (n=3,147) and 6.7% of ED presentations (n=3,455))
 - - Trade and service areas (2.9% of admissions (n=1,174).

FIGURE 51: OLDER ADULT INJURY HOSPITAL ADMISSIONS BY SETTING, VICTORIA 2017/18

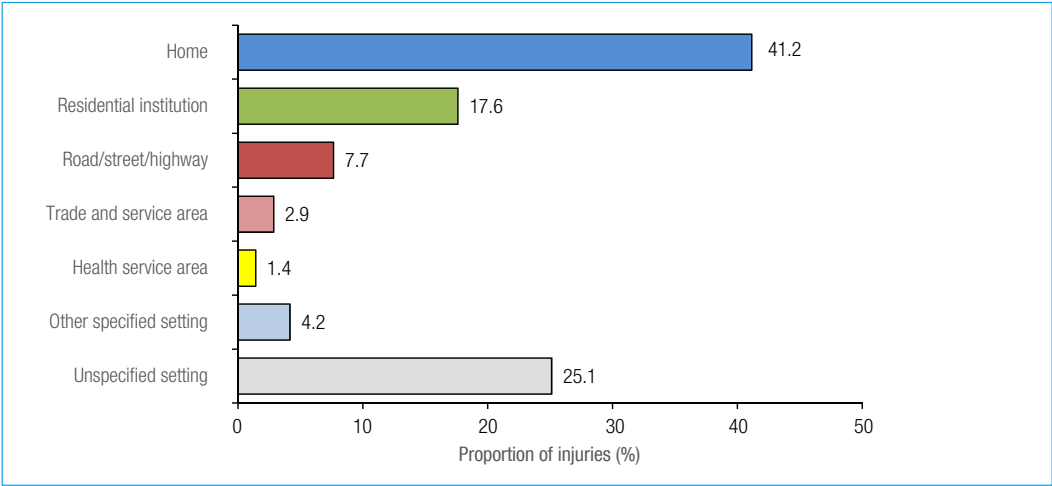
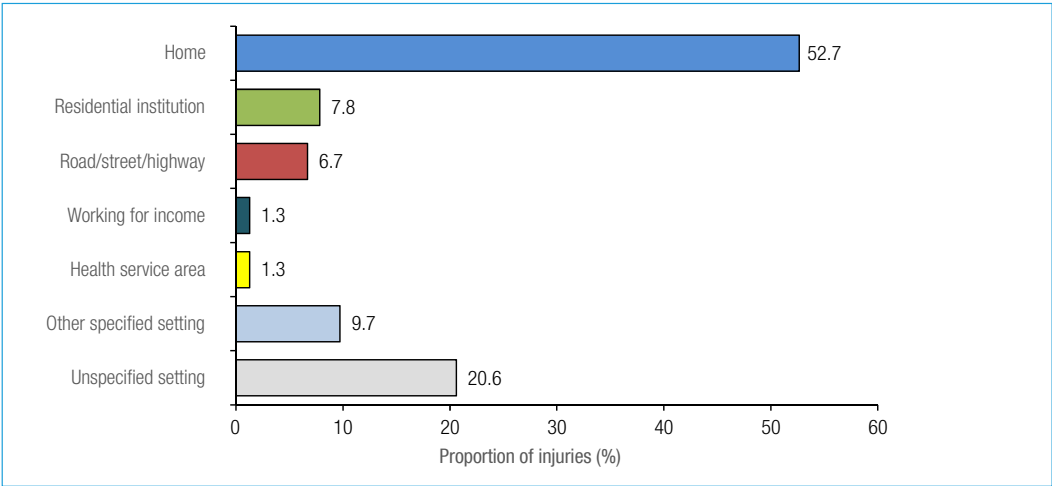


FIGURE 52: OLDER ADULT INJURY ED PRESENTATIONS BY SETTING, VICTORIA 2017/18



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: DEFINITION OF SETTINGS 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. Note that within this report categories 10, 11 and 12 are included in 'other specified location'.

(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.

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 or T79).

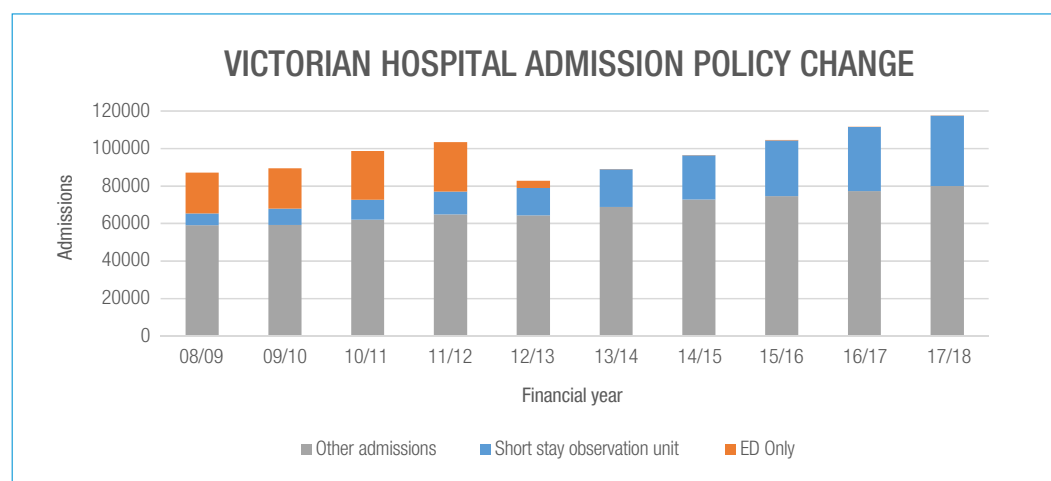
BOX 3: VICTORIAN HOSPITAL ADMISSION POLICY

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. This method, however, may results in an overestimation of the increase in admissions over time. Short Stay Observation Unit only admissions have increased substantially before, during and following the admission policy change in 2012, as shown in Figure A1.

FIGURE A1. NUMBER OF INJURY ADMISSIONS TO VICTORIAN HOSPITALS IN 2008/09 TO 2017/18. ADMISSIONS THAT WERE LIMITED TO STAY IN THE ED AND ADMISSIONS THAT WERE LIMITED TO STAY IN SHORT STAY OBSERVATION UNITS ARE SHOWN SEPARATELY.



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 injury surveillance 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. The external causes chapters of 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 2017 to 30 June 2018, coded according to the 10th edition of ICD-10-AM (NCCH, July 2015).
- Cases with a gender coded as 'intersex' have been removed from this report due to data confidentiality concerns related to small numbers.
- 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 in Appendix 1).
- 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 and removal of catheters etc.
- VAED cases recorded as not having spent the entire episode in the ED (see Box 3 in Appendix 1).

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 one 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.

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 22nd 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-held 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 and 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 2017 to 30 June 2018 coded according to the Victorian Emergency Minimum Dataset (VEMD) User Manual 22nd edition.
- Cases with a gender coded as 'intersex' have been removed from this report 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).



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How to access VISU data

VISU collects and analyses information on injury problems to underpin the development of prevention strategies and their implementation. VISU analyses are publicly available for teaching, research and prevention purposes. Requests for information can be lodged via the data request form on the VISU website (www.monash.edu/muarc/visu) or by contacting the VISU office by phone (03 9905 1805).

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The Victorian Injury Surveillance Unit (VISU) is a research unit within the Monash University Accident Research Centre (MUARC). VISU is supported by the Victorian Government.