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Serious unintentional injury involving a railway train or tram, Australia, 2009–10 to 2013–14

Flinders UNIVERSITY

INJURY RESEARCH AND STATISTICS SERIES NO. 101

Australian Government
Australian Institute of Health and Welfare

Authoritative information and statistics to promote better health and wellbeing

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Number 101

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2009–10 to 2013–14

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Abbreviations

AIHW	Australian Institute of Health and Welfare
CI	confidence interval
ICD	International Classification of Diseases
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, tenth revision, Australian Modification
METeOR	Metadata Online Registry
NHMD	National Hospital Morbidity Database

Symbols

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

Summary

This report presents information on cases of serious unintentional injury involving a railway train or tram for the 5-year period from 2009–10 to 2013–14. It includes all injuries that were serious enough to require hospitalisation but did not result in death.

Serious unintentional injury involving a railway train

In the 5-year period, there were 812 cases of serious unintentional injury in Australia involving a train, an average of 162 per year. Victoria (37%), New South Wales (36%) and Queensland (14%) accounted for almost 88% of these cases.

Age-standardised rates of serious injury involving a train declined by an annual average of 3.7% over the 12-year period from 2002–03 to 2013–14.

In the 5-year period, age-specific serious injury rates tended to be higher for those aged 70 and over, for both sexes.

Occupants of trains made up 71% of all serious injury cases involving a train, with the most common circumstance of injury in the 5-year period being injury while boarding or alighting (24%).

Serious unintentional injury due to level crossing collisions

Of the 812 cases of serious unintentional injury in Australia involving a train, 178 people were seriously injured due to a level crossing collision, an average of 36 per year. Victoria accounted for just over half (51%) of serious injury cases related to level crossing collisions, followed by Queensland (16%) and New South Wales (14%).

Age-standardised rates of serious injury due to level crossing collisions declined by an annual average of 6% over the 12-year period from 2002–03 to 2013–14.

In the 5-year period, serious injury rates were highest among young adults (aged 20–24).

The most common circumstances of injury involved pedestrians injured in a collision with a train (42%) and car occupants injured in a collision with a train (39%).

Serious unintentional injury involving a tram

In the 5-year period, there were 397 cases of serious unintentional injury in Australia involving a tram, an average of 80 per year. Victoria (83%), New South Wales (6%) and Queensland (5%) accounted for over 94% of these cases.

Age-standardised rates of serious injury involving a tram declined by an annual average of 2.7% over the 12-year period from 2002–03 to 2013–14.

In the 5-year period, the most common circumstances of unintentional injury involving trams were injury while boarding or alighting (42%) and injury due to a fall in a tram (40%).

Those aged 65 and over accounted for almost 64% of those seriously injured while boarding and alighting from a tram, and for over 68% of those seriously injured due to a fall in a tram.

1 Introduction

The primary purpose of this publication is to provide a national overview of serious non-fatal injury in Australia involving a railway train or tram in the period 2009–10 to 2013–14, including level crossing collisions. Trends in non-fatal injury rates are examined over a 12-year period, 2002–03 to 2013–14. This report includes all injuries that were serious enough to require hospitalisation but did not result in death.

The definition of transport injury used in this report includes only unintentional injuries. Hence, cases reported as being due to intentional self-harm, assault or of undetermined intent are excluded (see Table A2 in Appendix A for further information on how many of such cases may be rail related). See Appendix A also for notes on the methodology employed and for the meaning of technical terms used in this report.

This is the fifth report on the topic of serious injury in Australia involving a railway train, using a rolling 5-year observational period. It is the first report in this series to include data on serious injury involving a tram. It has a similar scope to that of the previous reports (AIHW 2007, 2008, 2009, 2012b). The literature review of the earliest of these reports (AIHW 2007) considers in detail the characteristics of major railway disasters, level crossing crashes, suicide and attempted suicide, injury to railways trespassers and boarding and alighting injuries. Thus, these issues are either not examined here or mentioned only briefly.

Confidence intervals (CIs) are provided for estimated trends in rates, which are subject to non-sampling random variation. In this instance, variation can be large when case numbers are small. Further information is provided in Appendix A.

1.2 Railway collisions

In 2011–12, state rail authorities recorded 146 derailments, 14 train–train collisions, 2 train–rolling stock collisions, 62 train–person collisions (13 collisions at level crossings), 125 train–infrastructure collisions and 60 train–road vehicle collisions (49 collisions at level crossings) (ATSB 2012).

Between 2002–03 and 2011–12, there were 350 Australian unintentional rail fatalities, of which 139 (40%) occurred in Victoria and 110 (31%) occurred in New South Wales (ATSB 2012).

Level crossing collisions

There are at least 23,000 level crossings in Australia (RISSB 2009). Approximately 95% are road crossings, with the remainder being solely for pedestrian use. Over half of all road crossings are private or maintenance road crossings, usually equipped with passive warning devices such as ‘stop’ or ‘give way’ signs. The remainder are public road crossings. One-third of public road crossings are actively controlled; that is, they are equipped with flashing lights and boom gates to manage road traffic movement (ONRSR 2014).

Between 2002–03 and 2011–2012, there were 601 collisions between trains and road vehicles and 92 collisions between trains and pedestrians at level crossings (ATSB 2012). A definition of the different types of level crossings follows.

Types of level crossings

The intersection between a public or private roadway or footpath and a railway track at the same level ('at-grade intersection') in Australia is commonly called a level crossing. There are several types of level crossing:

- active level crossings with automatic warning systems such as flashing lights, bells and/or boom gates (as well as static signage)
- passive level crossings that usually have a crossbuck (railway crossing sign) and a 'give way' sign, inverted red triangle or 'stop' sign
- occupational or accommodation crossings between private property and public roads
- maintenance crossings
- illegal crossings (Standing Committee on Transport and Regional Services 2004).

2 Serious unintentional injury involving a railway train

From 2002–03 to 2013–14, there were 2,044 cases of serious unintentional injury in Australia involving a railway train, an average of 170 per year (Table 5.1.1). For 2013–14, the number of serious injury cases was higher than the annual average number of cases over this period in New South Wales and Western Australia, but lower for the other jurisdictions (Figure 2.1.1).

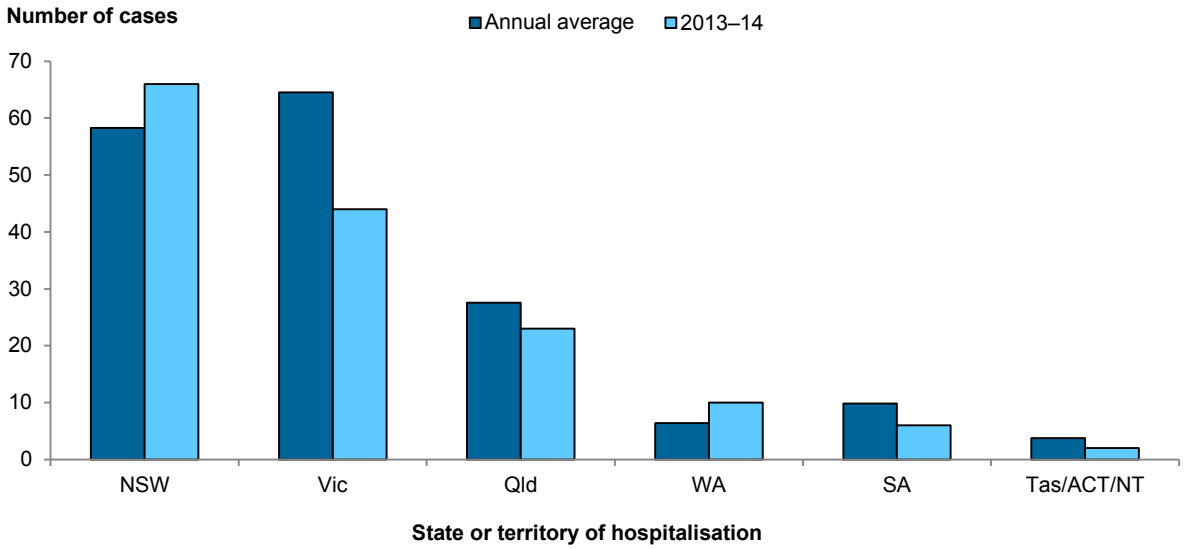


Figure 2.1.1: Number of serious unintentional injury cases involving a railway train, by state or territory of hospitalisation, Australia, 2002–03 to 2013–14

For the period of interest for this report—2009–10 to 2013–14, 812 people were seriously injured, an average of 162 per year. This includes people seriously injured due to level crossing collisions.

In total, there were 903 admissions to hospital for rail-related injuries for an estimated 830 people, of whom 18 died while in hospital. These deaths are presumed to have been included in estimates of fatal rail-related injury provided elsewhere by organisations such as the Australian Transport Safety Bureau and are omitted from the seriously injured counts in Table 5.1.1 and throughout the report.

Results must be interpreted with caution as there is potential for variation over time in hospital admission practice, especially for lower severity cases. A change in admission policy occurred in Victoria, which decreased the number of admitted cases in 2012–13 and 2013–14 compared with previous years (see Appendix A).

Victoria (37%, 304 cases), New South Wales (36%, 295 cases) and Queensland (14%, 112 cases) accounted for almost 88% of seriously injured cases involving a train. For the period from 2009–10 to 2011–12, New South Wales accounted for 38% of passenger train kilometres, Victoria 26% and Western Australia 14% (ATSB 2012). Case counts and trends over 12 years in the rates of serious injury involving a train are shown in Table 5.1.2 and Figure 5.1.1.

Age-standardised rates of serious unintentional injury involving a train per 100,000 population declined by an annual average of 3.7% [95%CI: 1.8%, 5.5%] over the 12-year period from 2002–03 to 2013–14. For males, rates declined by an annual average of 3.1% [95%CI: 1.8%, 5.5%] over the 12-year period; for females, rates declined at an annual average of 4.3% [95%CI: 1.9%, 6.7%]. Note that the change in admission policy in Victoria might have contributed to the observed declines.

Table 5.1.3 presents the number of serious unintentional injury cases per billion passenger kilometres travelled over the 3-year period from 2009–10 to 2011–12 (ARA 2013). In 2011–12, 7.1 train occupants were seriously injured in a transport crash involving a train per billion passenger kilometres travelled. For comparison, most European countries recorded rates for 2012 of between
zero (0) and 5 serious injuries per billion passenger kilometres travelled for rail passengers (Eurostat 2016). The highest rates of close to 5.0 serious injuries per billion passenger kilometres were seen for Hungary, Poland and Slovakia, while a number of countries (including the United Kingdom, Germany, Italy and France) recorded rates of 0.1 or less. The European rates included only patients whose stay in hospital was more than 24 hours; so, excluding cases from the Australian data whose length of stay in hospital was less than 24 hours, the rate for Australia in 2011–12 decreases to approximately 5 serious injuries per billion passenger kilometres travelled.

For the period from 2009–10 to 2013–14, the total number of serious unintentional injury cases was largest for those aged 20–24, with 73 cases (Figure 5.1.2). For males, cases were most numerous for those aged 20–24, with 51 serious injury cases. For females, however, cases were most numerous for those aged 80–84, with 48 serious injury cases. Serious injury rates were highest in the oldest age groups for both males and females (Figure 5.1.3).

2.1 Circumstances of injury

Nationally, for the period from 2009–10 to 2013–14, train occupants made up 71% (n = 575) of the serious unintentional injury cases involving a train (Table 5.1.4). The most common circumstances of injury involving a railway train (including occupants of railway trains, pedestrians and occupants of other vehicles) were:

- a person injured while boarding or alighting from a train (24%)
- an occupant of a train injured by a fall from a train (19%)
- an occupant of a train injured by a fall in a train (17%)
- a pedestrian injured in a collision with a train (16%).

Just under half (49%) of all serious injuries sustained due to a collision between a pedestrian and a train occurred in Victoria. For New South Wales, just over 86% of serious injury cases involving train were occupants of a train.

Males accounted for 56% of serious injury cases involving a train (Table 5.1.5).

Over 6% (52) of serious injury cases involving a train had their episode of hospital care funded by workers compensation (Table 5.1.6). Of these cases, 75% were occupants of a train and 88% were male. Just over half (52%) were working in the transport and storage industry at the time of injury. Of the 760 cases not covered by workers compensation, almost 3% (20) were working for income at the time of injury, while for 88% (670) of cases, the activity at the time of injury was not specified.

The most prominent circumstances of serious injury cases involving a train vary with age (Table 5.1.7). Ninety-two per cent (92%) of those aged 65 and over who were seriously injured were occupants of a train, compared with only around half (53%) of those aged 15–44. Those aged 65 and over also accounted almost half (48%) of those seriously injured while boarding and alighting from a train and almost 57% of those seriously injured due to a fall in a train.

The 5 most frequent circumstances of serious injury involving a train accounted for over 85% of all serious injury involving a train (Table 5.1.8). Almost two-thirds of females injured by a fall in a train were aged 65 and over while over half of females injured while boarding or alighting from a train or injured by a fall from a train were also aged 65 and over.

2.2 Length of hospital stay

From 2009–10 to 2013–14, there were 6,422 patient days in hospital due to serious unintentional injury involving a train, at an average of 1,284 patient days per year. Serious injury involving a train accounted for less than 0.1% of all injury-related patient days in hospital for the same period (11,191,147) and 0.58% of patient days for unintentional injury due to transport (1,107,678).

Mean length of stay can be used as a crude indicator of severity of injury. The mean length of stay for serious unintentional injury involving a train was 7.8 days for males, 8.0 days for females and 7.9 days for persons. These are longer than the mean length of stay of 3.3 days for males, 4.8 days for females and 4.0 days for all community injury cases where separation occurred in 2009–10 (AIHW 2012a).

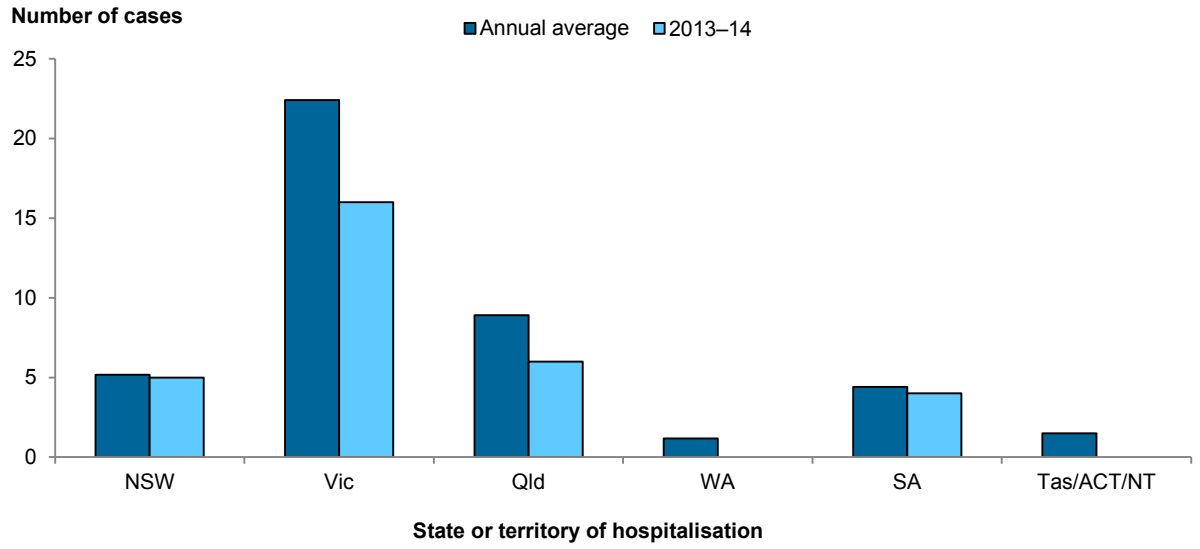
3 Serious unintentional injury due to level crossing collisions

3.1 Scope

The intersection between a public or private roadway or footpath and a railway track at the same level ('at-grade intersection') in Australia is commonly called a level crossing. This section focuses on serious non-fatal unintentional injury cases due to a collision between a train and a pedestrian or road vehicle 'in traffic' (as per International Classification of Diseases-ICD-codes), which is assumed to represent level crossings. Such cases form a subset (22%) of the cases in the earlier part of this report dealing with all non-fatal serious injury cases involving rail transport crashes. For a list of the codes included, see Appendix A.

Number and rate of serious injury

From 2002–03 to 2013–14, there were 526 cases of serious unintentional injury in Australia due to transport collisions involving a railway train at a level crossing, an average of 44 per year (Table 5.2.1). For 2013–14, the number of serious injury cases was lower than the annual average number of cases over this period in all jurisdictions (Figure 3.1.1).



Note: Small counts have been suppressed.

Figure 3.1.1: Number of serious unintentional injury cases due to level crossing collisions, by state or territory of hospitalisation, Australia, 2009–10 to 2013–14

For the period of interest for this report—from 2009–10 to 2013–14, 178 people were seriously injured, an average of 36 per year. There was a relatively even spread of serious injury cases over the 12-month periods. Victoria accounted for just over half (51%) of level crossing serious injury cases with 91, followed by Queensland (16%, 28 cases) and New South Wales (14%, 25 cases).

Results must be interpreted with caution as there is potential for variation over time in hospital admission practice, especially for lower severity cases. A change in admission policy occurred in Victoria which decreased the number of admitted cases in 2012–13 and 2013–14 compared with previous years (see Appendix A).

Over the period from 2002–03 to 2013–14, close to one-third of rail-related serious injury cases for Victoria (35%) and Queensland (32%) involved collisions at a level crossing, compared with 9% for New South Wales.

The proportion of all non-fatal cases that were specified as occurring in traffic (assumed to be at level crossings) differed by jurisdiction and was lowest for New South Wales. Cases not specified as either traffic or non-traffic might include some cases where a person was seriously injured in a level crossing traffic crash. Hence, the counts and proportions of cases occurring in traffic may be underestimates.

Case counts and trends over 12 years in the rates of serious unintentional injury due to collisions involving a train at a level crossing are shown in Table 5.2.2 and Figure 5.2.1. Age-standardised rates per 100,000 population of serious injury due to transport collisions involving a train at a level crossing declined by an annual average of 6.0% [95%CI: 3.0%, 8.8%] over the 12-year period from 2002–03 to 2013–14. For males, rates declined by an annual average of 5.4% [95%CI: 1.6%, 9.0%] over the 12-year period while, for females, rates declined by an annual average of 6.8% [95%CI: 2.1%, 11.3%]. Note that the change in hospital admission policy in Victoria might have contributed to the observed declines.

The number of people seriously injured in a level crossing collision was low in children and at ages 55 and older; it was highest at ages 20–24, with 27 cases (Figure 5.2.2).

Age-specific serious injury rates due to level crossing collisions were highest for those aged 20–24, with 0.33 cases per 100,000 population (Figure 5.2.3). Similar patterns were observed for both males and females.

Circumstances of injury

In the 5 years from 2009–10 to 2013–14, 42% (74) of serious unintentional injury cases due to level crossing collisions were pedestrians injured in a collision with a train and 39% (69) were car occupants injured in a collision with a train (Table 5.2.3). Of car occupants, 55% were injured in Victoria and 22% in Queensland; of pedestrians, 49% were injured in Victoria.

In the 5-year period, 68% (121) of serious unintentional injury cases due to level crossing collisions were male (Table 5.2.4). Males predominated in most circumstances although case numbers for some circumstances of injury were too small for meaningful interpretation.

The majority (87%) of serious unintentional injury cases due to a level crossing collision were of 'working age' (aged 15–64) (Table 5.2.5). Unlike all rail-related injuries, where those aged 65 and over comprised almost one-third of people injured, people aged 65 and over accounted for 10% of those seriously injured due to a level crossing collision.

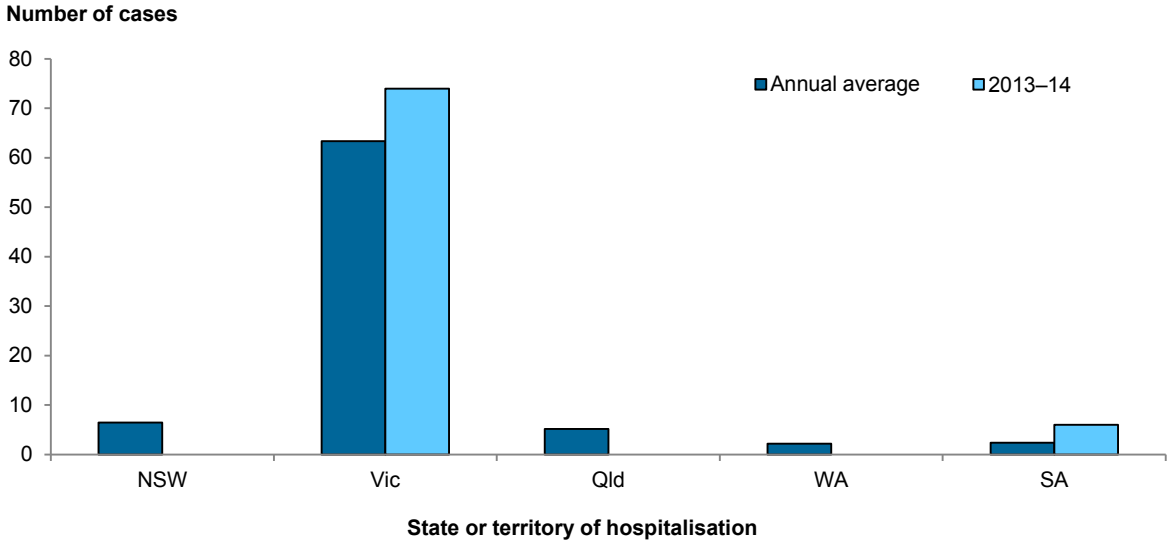
Length of hospital stay

In the period 2009–10 to 2013–14, there were 1,346 patient days in hospital due to serious unintentional injury involving a train at a level crossing—an average of 269 patient days per year.

The mean length of stay for people seriously injured in a level crossing collision was 6.7 days for males, 9.5 days for females and 9.2 days for persons. This was similar to the mean length of stay for serious injury involving a train (7.8, 8.0 and 7.9 days for males, females and persons, respectively), and much longer than that reported for community injuries overall, where the mean length of stay in 2009–10 was 3.3, 4.8 and 4.0 days for males, females and persons, respectively (AIHW 2012a).

4 Serious unintentional injury involving a tram

From 2002–03 to 2013–14, there were 964 cases of serious unintentional injury in Australia involving a tram, an average of 80 per year (Table 5.3.1). For 2013–14, the number of serious injury cases was higher than the annual average number of cases over this period in Victoria and South Australia, but lower for the other jurisdictions (Figure 4.1.1).



Notes

1. Counts for Tasmania and the Australian Capital Territory are not shown due to small numbers. There were no cases for the Northern Territory.
2. Small counts for other jurisdictions have been suppressed.

Figure 4.1.1: Number of serious unintentional injury cases involving a tram by state or territory of hospitalisation, Australia, 2002–03 to 2013–14

For the period of interest for this report—2009–10 to 2013–14, 397 people were seriously injured, an average of 80 per year. (In total, there were 427 admissions to hospital for tram-related injuries for an estimated 399 people, of whom 2 died while in hospital. Victoria (83%, 331 cases), New South Wales (6%, 24 cases) and Queensland (5%, 19 cases) accounted for over 94% of seriously injured cases involving a tram in the 5 years to 2013–14. Case counts and trends over 12 years in the rates of serious injury involving a tram are shown in Table 5.3.2 and Figure 5.3.1.

Results must be interpreted with caution as there is potential for variation over time in hospital admission practice, especially for lower severity cases. A change in admission policy occurred in Victoria which decreased the number of admitted cases in 2012–13 and 2013–14 compared with previous years (see Appendix A). This change is especially noteworthy for injury involving a tram, as 83% of the reported cases occurred in this state.

Age-standardised rates of serious unintentional injury involving a tram per 100,000 population declined by an annual average of 2.7% [95%CI: 0.5%, 5.0%] over the 12-year

period from 2002–03 to 2013–14. For males, rates declined by an annual average of 4.2% [95%CI: 0.8%, 7.5%] over the 12-year period, while, for females, there was no statistically significant change. Note that despite the change in hospital admission policy in Victoria, case counts for Victoria were higher for the last 2 years of the 12-year period than for most previous years.

For the period from 2009–10 to 2013–14, the total number of serious unintentional injury cases was largest at age 80–84, with 68 cases (Figure 5.3.2). For males, cases were most numerous for those aged 85 and over, with 28 serious injury cases. For females, cases were most numerous for those aged 80–84, with 46 serious injury cases. Serious injury rates were highest in the oldest age groups for males and females (Figure 5.3.3). Over 61% of seriously injured cases involving a tram were aged 65 and older. The equivalent figure for seriously injured cases involving a railway train was 32%.

4.1 Circumstances of injury

The most common circumstances of serious unintentional injury involving a tram were being injured while boarding or alighting (42%) and falling while being an occupant in a tram (40%) (Table 5.3.3). Females accounted for 61% of serious injury cases involving a tram (Table 5.3.4). The equivalent figure for serious injury cases involving a train was 44%.

The most prominent circumstances of serious unintentional injury involving a tram vary with age (Table 5.3.5). People aged 65 and older accounted for more than half of cases that occurred while boarding and alighting or due to a fall in a tram, but just one-fifth of cases in other circumstances.

4.2 Length of hospital stay

From 2009–10 to 2013–14, there were 2,098 patient days in hospital due to serious unintentional injury involving a tram—at an average of 420 patient days per year.

Mean length of stay can be used as a crude indicator of severity of injury. The mean length of stay for serious injury involving a tram was 4.8 days for males, 5.6 days for females and 5.3 days for persons. These are longer than the mean length of stay of 3.3 days for males, 4.8 days for females and 4.0 days for all community injury cases where separation occurred in 2009–10 (AIHW 2012a).

5 Tables and charts

5.1 Serious unintentional injury involving a railway train

Number and rate of serious injury cases

Table 5.1.1: Number of serious unintentional injury cases involving a railway train, by state or territory of hospitalisation, Australia, 2002–03 to 2013–14

Year of hospitalisation	NSW	Vic	Qld	WA	SA	Tas/ACT/NT[(a)]	Australia
2002–03	85	69	19	n.p.	17	n.p.	193
2003–04	59	75	25	n.p.	3	n.p.	170
2004–05	61	53	67	n.p.	15	n.p.	202
2005–06	53	65	24	n.p.	14	n.p.	164
2006–07	54	76	24	8	14	5	181
2007–08	37	64	30	5	10	6	152
2008–09	55	68	30	7	7	3	170
2009–10	55	67	18	7	7	5	159
2010–11	58	76	21	11	7	3	176
2011–12	54	62	25	10	10	9	170
2012–13	62	55	25	6	8	0	156
2013–14	66	44	23	10	6	2	151
Annual average	**58.3**	**64.5**	**27.6**	**6.4**	**9.8**	**3.8**	**170.3**

(a) Case counts for Tasmania, the Australian Capital Territory and the Northern Territory have been combined due to low numbers.

Note: For counts by calendar year, see Appendix B.

Table 5.1.2: Age-standardised rates per 100,000 population and number of serious unintentional injury cases involving a railway train, by sex and year, Australia, 2002–03 to 2013–14

	Age-standardised rate per 100,00 population											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	1.07	0.88	1.22	0.90	1.00	0.86	0.86	0.83	0.86	0.93	0.77	0.68
Females	0.91	0.80	0.78	0.67	0.70	0.56	0.66	0.59	0.66	0.54	0.52	0.56
Persons	0.98	0.86	1.01	0.81	0.88	0.72	0.79	0.73	0.79	0.75	0.68	0.65
	Case numbers											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	101	87	118	90	102	90	92	90	95	104	88	79
Females	92	83	84	74	79	62	78	69	81	66	68	72
Persons	193	170	202	164	181	152	170	159	176	170	156	151

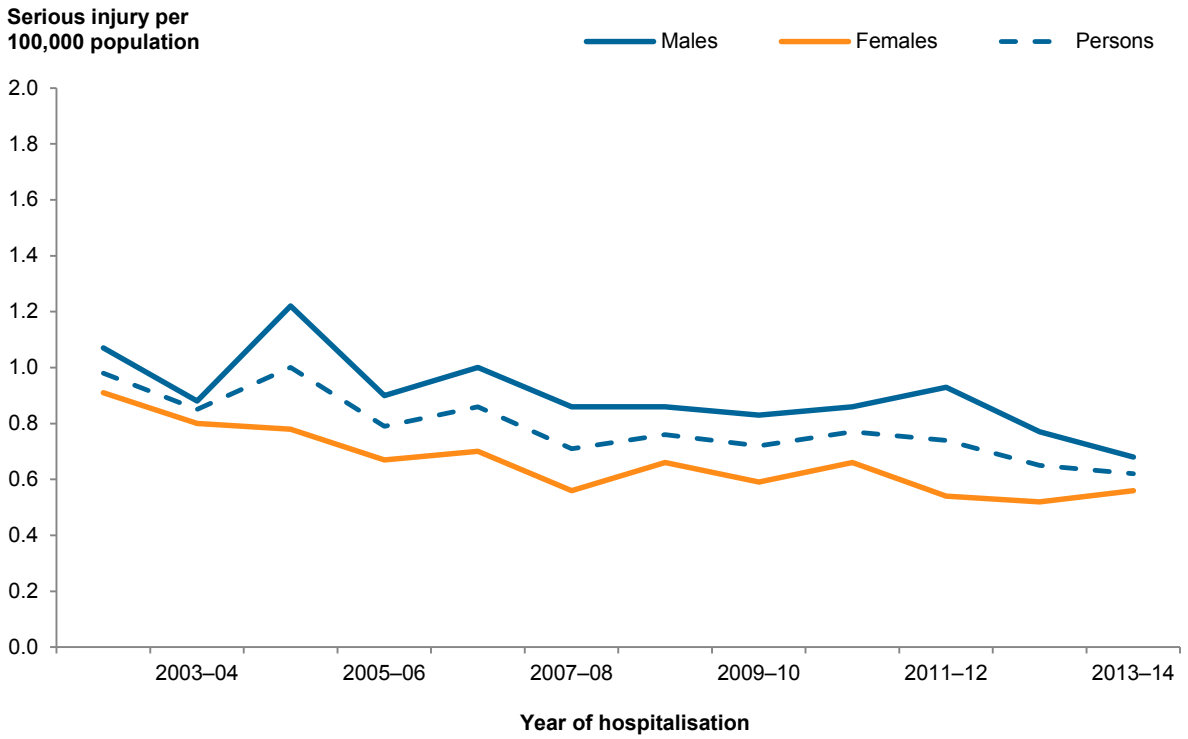


Figure 5.1.1: Age-standardised rates of serious unintentional injury involving a railway train, Australia, 2002–03 to 2013–14

Table 5.1.3: Serious unintentional injury rates per billion passenger kilometres travelled for injury involving a railway train, Australia 2009–10 to 2011–12

Seriously injured	Train occupants[a]	Passenger kilometres (billion)[b]	Injury rate per billion passenger kilometres travelled
2009–10	104	14.39	7.2
2010–11	127	14.86	8.6
2011–12	107	15.18	7.1

(a) 'Train occupants' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

(b) Sourced from the Australian Rail Industry Report 2012 (ARA 2013).

Note: Data not shown for 2012–13 and 2013–14 due to unavailability of information on passenger kilometres travelled for these years.

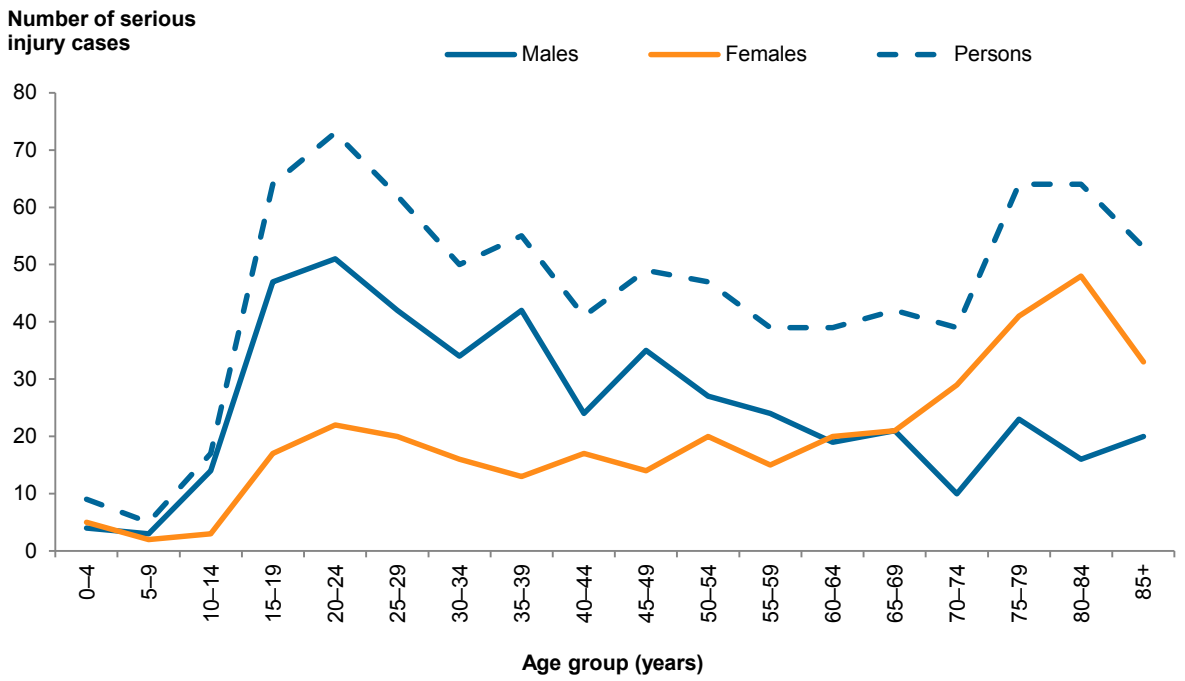
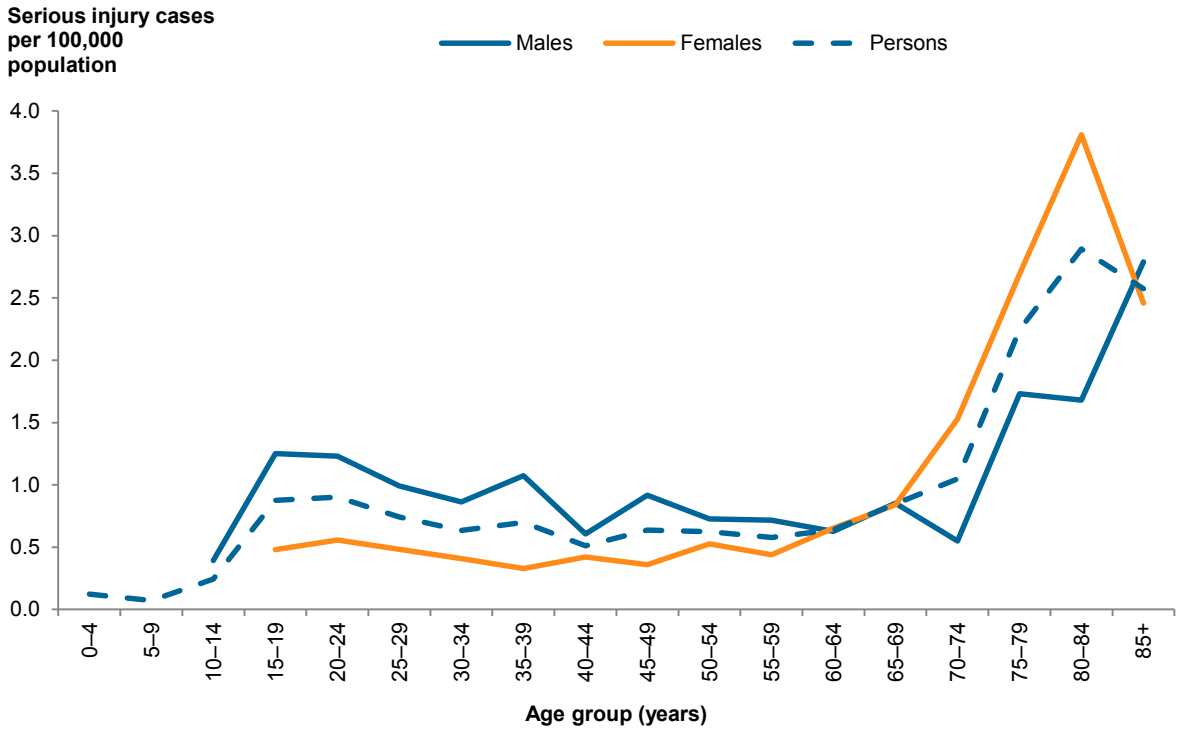


Figure 5.1.2: Number of serious unintentional injury cases involving a railway train, by age group and sex, Australia, 2009–10 to 2013–14



Note: Rates based on small counts have been suppressed.

Figure 5.1.3: Age-specific rates of serious unintentional injury involving a railway train, Australia, 2009–10 to 2013–14

Circumstances of injury

Table 5.1.4: Number of serious unintentional injury cases involving a railway train, by circumstance of injury and state or territory of hospitalisation, Australia, 2009–10 to 2013–14

Circumstance of injury	NSW	Vic	Qld	WA	SA	Tas/ACT/NT[a]	Australia
Pedestrian injured in collision with train	29	65	11	10	10	8	133
Pedal cyclist injured in collision with train	0	6	0	0	2	0	8
Motor cyclist injured in collision with train	1	4	2	0	0	1	8
Car occupant injured in collision with train	8	39	15	n.p.	6	n.p.	73
Occupant of other motor vehicle[b] injured in collision with train	2	3	7	n.p.	2	n.p.	15
Occupant of train[c] injured:							
in collision with motor vehicle	1	9	2	0	1	0	13
in collision with other object	4	2	2	0	0	0	8
in collision with rolling stock	2	4	0	0	0	2	8
while boarding or alighting from train	82	72	20	12	8	1	195
by fall in train	65	41	18	9	5	3	141
by fall from train	76	45	22	6	2	0	151
in derailment without antcedent collision	3	1	4	0	1	1	10
in other and unspecified railway accident	22	13	9	n.p.	1	n.p.	49
Total	**295**	**304**	**112**	**44**	**38**	**19**	**812**

(a) Case counts for Tasmania, the Australian Capital Territory and the Northern Territory have been combined due to low numbers.

(b) 'Occupant of motor vehicle' includes any occupant of a heavy transport vehicle, pick-up truck or van, bus or three-wheeled motor vehicle.

(c) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.1.5: Number of serious unintentional injury cases involving a railway train, by circumstance of injury, by sex, Australia, 2009–10 to 2013–14

Circumstance of injury	Males	Females	Total
Pedestrian injured in collision with train	102	31	133
Pedal cyclist injured in collision with train	7	1	8
Motor cyclist injured in collision with train	8	0	8
Car occupant injured in collision with train	43	30	73
Occupant of other motor vehicle[(a)] injured in collision with train	11	4	15
Occupant of train[(b)] injured:			
in collision with motor vehicle	8	5	13
in collision with rolling stock	7	1	8
in collision with other object	8	0	8
while boarding or alighting from train	83	112	195
by fall in train	52	89	141
by fall from train	83	68	151
in derailment without antecedent collision	6	4	10
in other and unspecified railway accident	38	11	49
Total	**456**	**356**	**812**

(a) 'Occupant of motor vehicle' includes any occupant of a heavy transport vehicle, pick-up truck or van, bus or three-wheeled motor vehicle.

(b) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.1.6: Number of serious unintentional injury cases involving a railway train, by circumstance of injury, by whether or not hospitalisation was funded by workers compensation, Australia, 2009–10 to 2013–14

	Workers compensation[a]		
Circumstance of injury	**No**	**Yes**	**Total**
Pedestrian injured in collision with train	130	3	133
Pedal cyclist injured in collision with train	8	0	8
Motor cyclist injured in collision with train	8	0	8
Car occupant injured in collision with train	66	7	73
Occupant of other motor vehicle[b] injured in collision with train	12	3	15
Occupant of train[c] injured:			
in collision with motor vehicle	8	5	13
in collision with rolling stock	4	4	8
in collision with other object	5	3	8
while boarding or alighting from train	189	6	195
by fall in train	138	3	141
by fall from train	145	6	151
in derailment without antecedent collision	7	3	10
in other and unspecified railway accident	40	9	49
Total	**760**	**52**	**812**

(a) Includes cases where source of hospital funding = workers compensation.

(b) 'Occupant of motor vehicle' includes any occupant of a heavy transport vehicle, pick-up truck or van, bus or three-wheeled motor vehicle.

(c) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.1.7: Number of serious unintentional injury cases involving a railway train, by circumstance of injury, by age group, Australia, 2009–10 to 2013–14

	Age group (years)					
Circumstance of injury	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Total**
Pedestrian injured in collision with train	6	40	54	23	10	133
Pedal cyclist injured in collision with train	0	2	3	3	0	8
Motor cyclist injured in collision with train	0	5	2	1	0	8
Car occupant injured in collision with train	4	21	30	10	8	73
Occupant of other motor vehicle[(a)] injured in collision with train	1	4	2	6	2	15
Occupant of train[(b)] injured:						
in collision with motor vehicle	0	2	6	4	1	13
in collision with rolling stock	0	3	3	2	0	8
in collision with other object	0	2	2	4	0	8
while boarding or alighting from train	8	19	41	34	93	195
by fall in train	3	6	21	31	80	141
by fall from train	5	19	29	38	60	151
in derailment without antecedent collision	0	3	2	3	2	10
in other and unspecified railway accident	4	11	13	15	6	49
Total	**31**	**137**	**208**	**174**	**262**	**812**

(a) 'Occupant of motor vehicle' includes any occupant of a heavy transport vehicle, pick-up truck or van, bus or three-wheeled motor vehicle.

(b) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.1.8: Number of serious unintentional injury cases involving a railway train, top five circumstances of injury, by age group and sex, Australia, 2009–10 to 2013–14

	Age group (years)					
Circumstance of injury	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Total**
Person injured while boarding or alighting from train						
Males	5	11	22	13	32	83
Females	3	8	19	21	61	112
Occupant of train[(a)] injured by fall from train						
Males	4	15	20	21	23	83
Females	1	4	9	17	37	68
Pedestrian injured in collision with train						
Males	3	32	41	20	6	102
Females	3	8	13	3	4	31
Occupant of train[(a)] injured by fall in train						
Males	1	4	12	14	21	52
Females	2	2	9	17	59	89
Car occupant injured in collision with train						
Males	4	10	21	6	2	43
Females	0	11	9	4	6	30
Total	**26**	**105**	**175**	**136**	**251**	**693**

(a) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

5.2 Serious unintentional injury due to level crossing collisions

Number and rate of serious injury cases

Table 5.2.1: Number of serious unintentional injury cases due to level crossing collisions, by state or territory of hospitalisation, Australia, 2002–03 to 2013–14

Year of hospitalisation	NSW	Vic	Qld	WA	SA	Tas/ACT/NT[(a)]	Australia
2002–03	3	25	10	0	12	0	50
2003–04	10	28	9	n.p.	0	n.p.	50
2004–05	3	29	12	0	6	1	51
2005–06	2	22	10	n.p.	7	n.p.	44
2006–07	9	30	7	n.p.	7	n.p.	58
2007–08	2	24	12	n.p.	4	n.p.	45
2008–09	8	20	19	n.p.	1	n.p.	50
2009–10	7	23	3	n.p.	4	n.p.	40
2010–11	4	20	4	n.p.	3	n.p.	34
2011–12	5	19	8	n.p.	4	n.p.	44
2012–13	4	13	7	n.p.	1	n.p.	26
2013–14	5	16	6	n.p.	4	n.p.	34
Total	**62**	**269**	**107**	**17**	**53**	**18**	**526**
Annual average	**5.2**	**22.4**	**8.9**	**1.4**	**4.4**	**1.5**	**43.8**
Proportion of all rail transport cases (%)	**8.9**	**34.8**	**32.3**	**22.1**	**44.9**	**40.0**	**25.7**

(a) Case counts for Tasmania, the Australian Capital Territory and the Northern Territory have been combined due to low numbers.

Note: For counts by calendar year, see Appendix B.

Table 5.2.2: Age-standardised rates per 100,000 population and number of serious unintentional injury cases due to level crossing collisions, by sex and year, Australia, 2002–03 to 2013–14

	Age-standardised rate per 100,00 population											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	0.37	0.26	0.32	0.25	0.40	0.25	0.21	0.22	0.27	0.26	0.15	0.18
Females	0.14	0.24	0.19	0.19	0.16	0.18	0.26	0.15	0.04	0.13	0.08	0.11
Persons	0.26	0.25	0.25	0.22	0.28	0.21	0.23	0.18	0.15	0.20	0.11	0.15
	Case numbers											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	36	26	32	25	41	26	22	24	30	29	17	21
Females	14	24	19	19	17	19	28	16	4	15	9	13
Persons	50	50	51	44	58	45	50	40	34	44	26	34

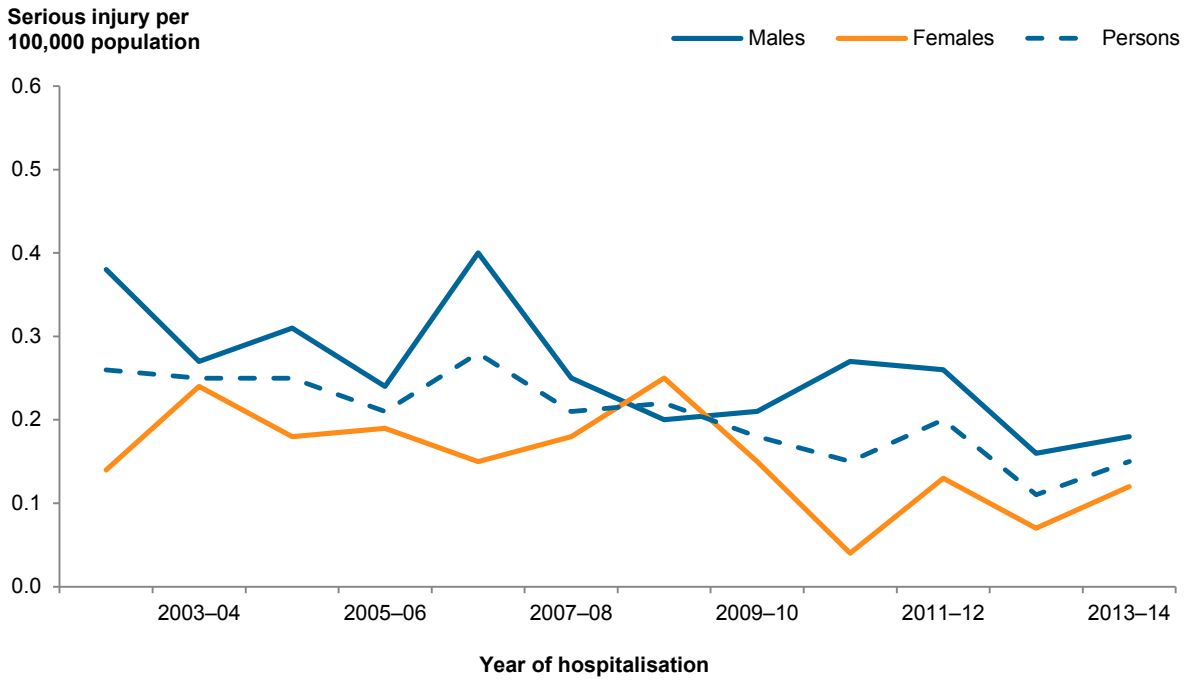


Figure 5.2.1: Age-standardised rates of serious unintentional injury due to level crossing collisions, by sex, Australia, 2002–03 to 2013–14

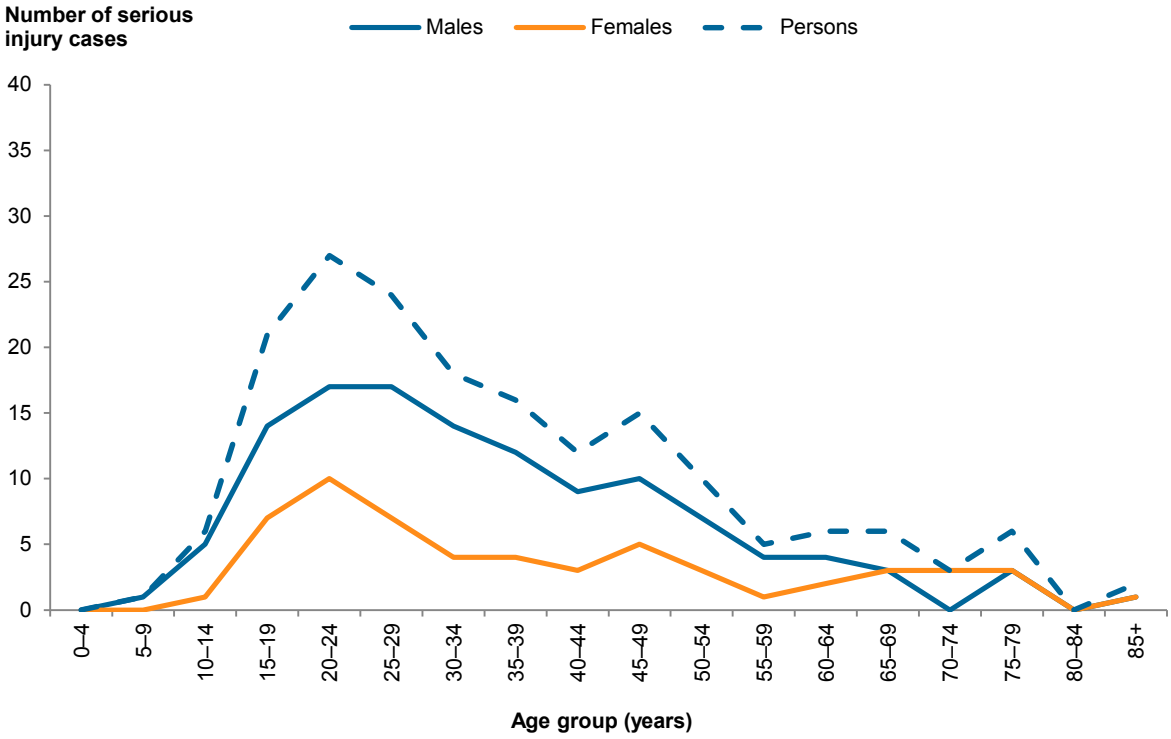
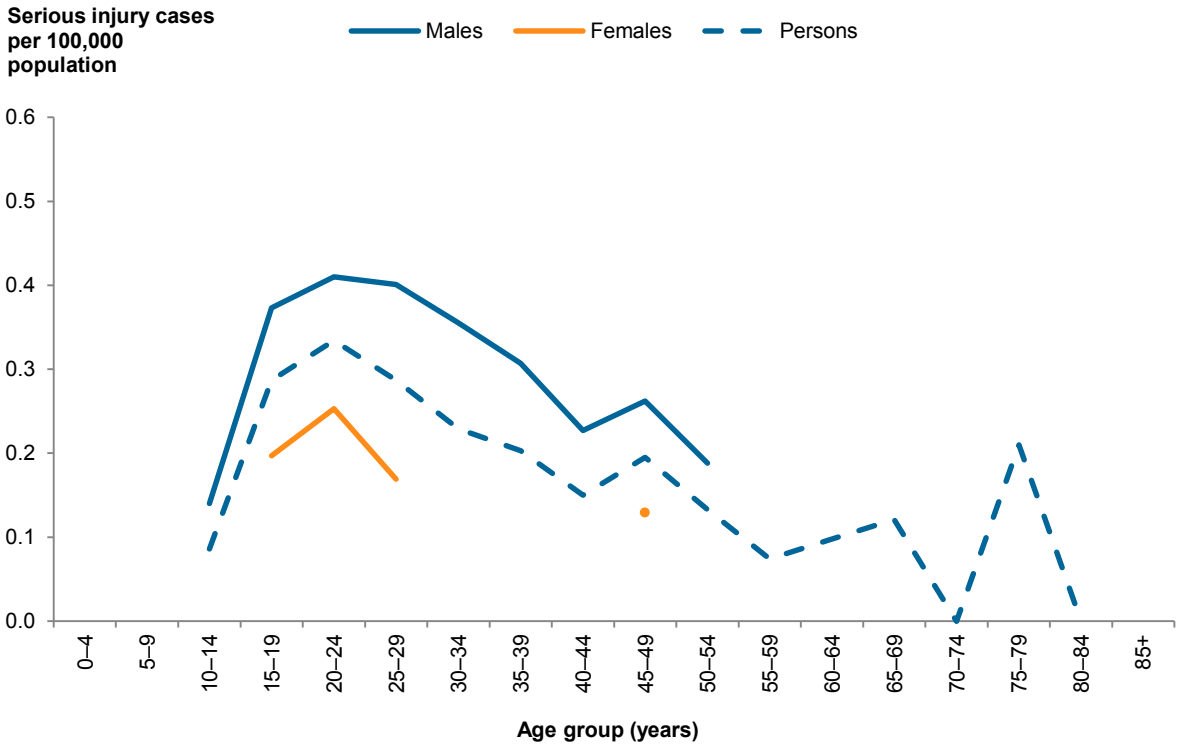


Figure 5.2.2: Number of serious unintentional injury cases due to level crossing collisions, by age group and sex, Australia, 2009–10 to 2013–14



Note: Rates based on small counts have been suppressed.

Figure 5.2.3: Age-specific rates of serious unintentional injury cases due to level crossing collisions, by sex, Australia, 2009–10 to 2013–14

Table 5.2.3: Number of serious unintentional injury cases due to level crossing collisions, by circumstance of injury, by state or territory of hospitalisation, Australia, 2009–10 to 2013–14

Circumstance of injury	NSW	Vic	Qld	WA	SA	Australia[a]
Pedestrian injured in collision with train	15	36	4	7	8	74
Pedal cyclist injured in collision with train	0	6	0	0	2	8
Motor cyclist injured in collision with train	1	2	1	0	0	5
Car occupant injured in collision with train	7	38	15	n.p.	n.p.	69
Occupant of pick-up truck or van injured in collision with train	0	0	2	0	0	2
Occupant of heavy transport vehicle injured in collision with train	1	0	4	n.p.	n.p.	7
Occupant of three-wheeled motor vehicle injured in collision with train	0	0	0	0	1	1
Occupant of train[b] injured in collision with motor vehicle	1	9	2	0	0	12
Total	**25**	**91**	**28**	**12**	**16**	**178**

(a) Includes cases for Tasmania and the Northern Territory. There were no cases for the Australian Capital Territory.

(b) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.2.4: Number of serious unintentional injury cases due to level crossing collisions, by circumstance of injury, by sex, Australia, 2009–10 to 2013–14

Circumstance of injury	Males	Females	Persons
Pedestrian injured in collision with train	55	19	74
Pedal cyclist injured in collision with train	7	1	8
Motor cyclist injured in collision with train	5	0	5
Car occupant injured in collision with train	39	30	69
Occupant of pick-up truck or van injured in collision with train	2	0	2
Occupant of heavy transport vehicle injured in collision with train	5	2	7
Occupant of three-wheeled motor vehicle injured in collision with train	1	0	1
Occupant of train[(a)] injured in collision with motor vehicle	7	5	12
Total	**121**	**57**	**178**

(a) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

Table 5.2.5: Number of serious unintentional injury cases due to level crossing collisions, by circumstance of injury, by age group, Australia, 2009–10 to 2013–14

	Age group (years)					
Circumstance of injury	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Total**
Pedestrian injured in collision with train	3	19	30	15	7	74
Pedal cyclist injured in collision with train	0	2	3	3	0	8
Motor cyclist injured in collision with train	0	2	2	1	0	5
Car occupant injured in collision with train	3	21	28	9	8	69
Occupant of pick-up truck or van injured in collision with train	0	1	0	1	0	2
Occupant of heavy transport vehicle injured in collision with train	1	1	1	3	1	7
Occupant of three-wheeled motor vehicle injured in collision with train	0	0	0	1	0	1
Occupant of train[(a)] injured in collision with motor vehicle	0	2	6	3	1	12
Total	**7**	**48**	**70**	**36**	**17**	**178**

(a) 'Occupant of train' includes any occupant of a train, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a train or a person boarding or alighting from a train.

5.3 Serious unintentional injury involving a tram

Number and rate of serious unintentional injury

Table 5.3.1: Number of serious unintentional injury cases involving a tram, by state or territory of hospitalisation and year, Australia, 2002–03 to 2013–14

Year of hospitalisation	NSW	Vic	Qld	WA	SA	Australia[(a)]
2002–03	14	62	7	n.p.	n.p.	86
2003–04	n.p.	68	8	n.p.	6	88
2004–05	5	63	6	n.p.	n.p.	81
2005–06	11	53	3	n.p.	n.p.	72
2006–07	5	49	6	n.p.	n.p.	65
2007–08	4	62	n.p.	n.p.	0	70
2008–09	12	72	11	n.p.	n.p.	105
2009–10	5	62	8	n.p.	n.p.	77
2010–11	4	60	n.p.	n.p.	0	68
2011–12	6	63	2	n.p.	n.p.	75
2012–13	5	72	3	n.p.	n.p.	85
2013–14	n.p.	74	4	n.p.	6	92
Total	**78**	**760**	**62**	**26**	**29**	**964**
Annual average	**6.5**	**63.3**	**5.2**	**2.2**	**2.4**	**80.3**

(a) Includes cases for Tasmania and the Australian Capital Territory. There were no cases for the Northern Territory.

Note: For counts by calendar year, see Appendix B.

Table 5.3.2: Age-standardised rates per 100,000 population and number of serious unintentional injury cases involving a tram, by sex and year, Australia, 2002–03 to 2013–14

	Age-standardised rate per 100,00 population											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	0.41	0.42	0.30	0.34	0.33	0.27	0.36	0.21	0.22	0.29	0.32	0.34
Females	0.47	0.47	0.51	0.37	0.30	0.40	0.61	0.49	0.39	0.37	0.43	0.45
Persons	0.44	0.44	0.40	0.35	0.31	0.33	0.49	0.35	0.31	0.33	0.37	0.40
	Case numbers											
Sex	**2002–03**	**2003–04**	**2004–05**	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
Males	40	41	30	34	34	28	39	23	24	33	36	39
Females	46	47	51	38	31	42	66	54	44	42	49	53
Persons	86	88	81	72	65	70	105	77	68	75	85	92

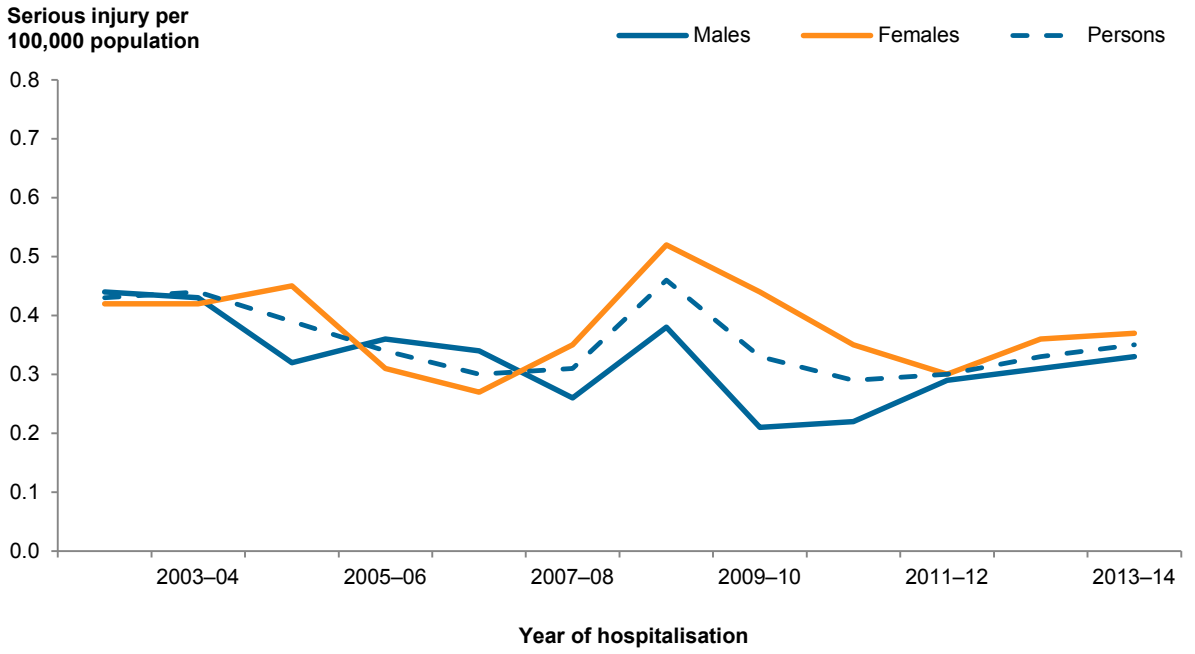


Figure 5.3.1: Age-standardised rates of serious unintentional injury involving a tram, Australia, 2002–03 to 2013–14

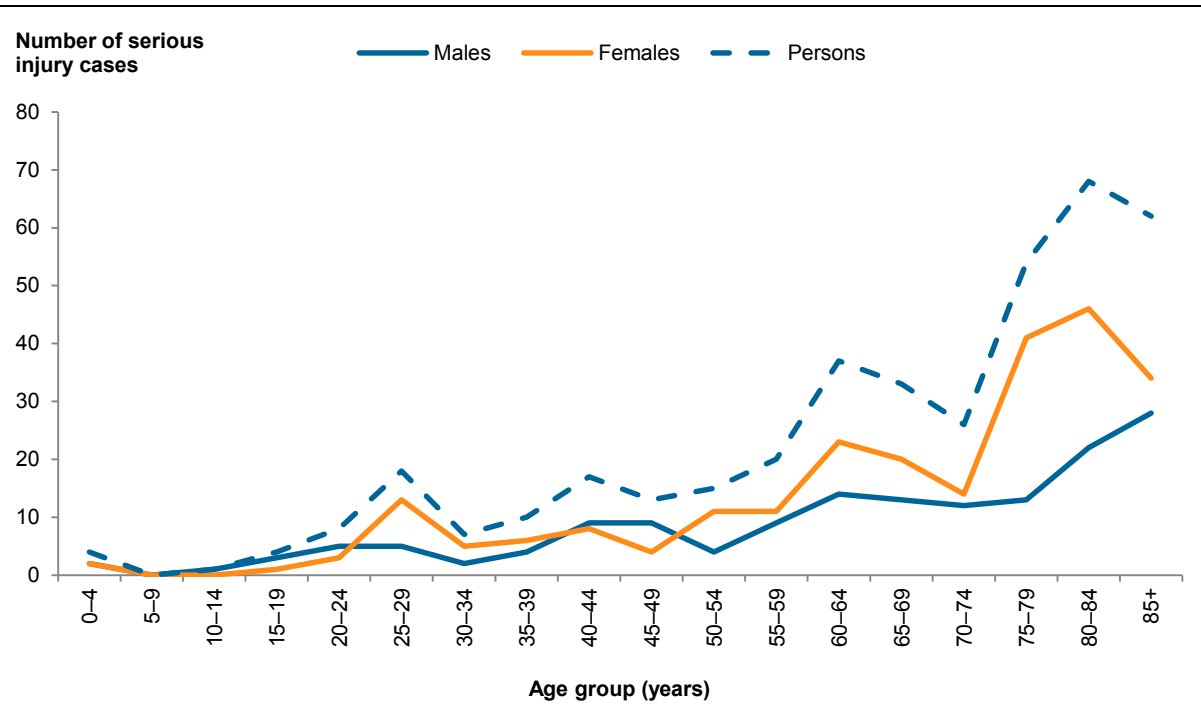
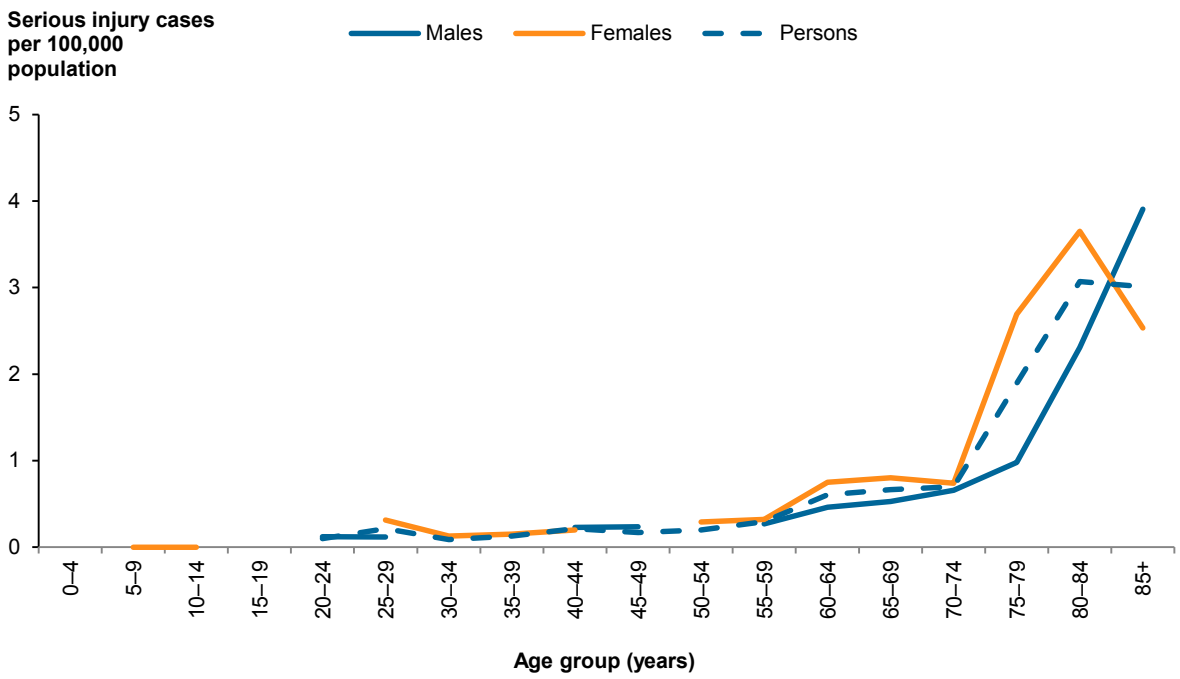


Figure 5.3.2: Number of serious unintentional injury cases involving a tram, by age group and sex, Australia, 2009–10 to 2013–14



Note: Rates based on small counts have been suppressed.

Figure 5.3.3: Age-specific rates of serious unintentional injury involving a tram, by sex, Australia, 2009–10 to 2013–14

Table 5.3.3: Number of serious unintentional injury cases involving a tram, by circumstance of injury, by state or territory of hospitalisation, Australia, 2009–10 to 2013–14

Circumstance of injury	NSW	Vic	Qld	WA	SA	Australia[a]
Occupant of tram[b] injured:						
in collision with motor vehicle	2	7	n.p.	n.p.	0	14
in collision with other object	3	3	0	0	0	n.p.
while boarding or alighting	7	135	12	5	7	166
by fall in tram	3	150	1	0	3	157
by fall from tram	4	14	4	0	2	24
in derailment without antecedent collision	0	1	0	0	0	1
in other specified transport accident	3	11	0	0	1	16
in unspecified traffic accident	2	10	n.p.	n.p.	0	13
Total	**24**	**331**	**19**	**9**	**13**	**397**

(a) Includes cases for the Australian Capital Territory. There were no cases for Tasmania and the Northern Territory.

(b) 'Occupant of tram' includes any occupant of a tram, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a tram or a person boarding or alighting from a tram.

Table 5.3.4: Number of serious unintentional injury cases involving a tram, by circumstance of injury, by sex, Australia, 2009–10 to 2013–14

Circumstance of injury	Males	Females	Persons
Occupant of tram[(a)] injured:			
in collision with motor vehicle	7	7	14
in collision with other object	2	4	6
while boarding or alighting	64	102	166
by fall in tram	65	92	157
by fall from tram	6	18	24
in derailment without antecedent collision	1	0	1
in other specified transport accident	5	11	16
in unspecified traffic accident	5	8	13
Total	**155**	**242**	**397**

(a) 'Occupant of tram' includes any occupant of a tram, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a tram or a person boarding or alighting from a tram.

Table 5.3.5: Number of serious unintentional injury cases involving a tram, by circumstance of injury, by age group, Australia, 2009–10 to 2013–14

	Age group (years)					
Circumstance of injury	**0–14**	**15–24**	**25–44**	**45–64**	**65+**	**Total**
Occupant of tram[(a)] injured:						
in collision with motor vehicle	1	0	2	9	3	14
in collision with other object	0	0	1	3	2	6
while boarding or alighting	0	4	27	29	106	166
by fall in tram	2	1	11	36	107	157
by fall from tram	1	3	5	5	10	24
in derailment without antecedent collision	0	0	0	1	0	1
in other specified transport accident	0	3	5	1	7	16
in unspecified traffic accident	1	1	1	2	8	13
Total	**5**	**12**	**52**	**85**	**243**	**397**

(a) 'Occupant of tram' includes any occupant of a tram, including a driver, a passenger (that is, any occupant other than the driver), a person on the outside of a tram or a person boarding or alighting from a tram.

Appendix A: Data issues

National hospital separations data were sourced from the AIHW's National Hospital Morbidity Database (NHMD). The data were coded according to the sixth, seventh and eighth editions of *International statistical classification of diseases and related health problems, tenth revision, Australian modification* (ICD-10-AM) (NCCH 2008, 2010, 2013). A 'separation' is a term used in Australian hospitals to refer to a formal, or statistical process, by which an episode of care for an admitted patient ceases (see Glossary). An 'episode of care' is a period of health care characterised by only one care type. For the layperson, this is perhaps best understood as a stay in a particular ward in a hospital. For example, a person who is in an intensive care ward and is then transferred to a rehabilitation ward will have undergone two episodes of care and hence have had two separations within the hospital.

'Seriously injured' is defined for this report as an injury that results in the person being admitted to hospital, and subsequently discharged alive, either on the same day or after staying for 1 or more nights in a hospital bed (that is, deaths in hospital are excluded). Discharge from hospital can include transfer to home, to another acute-care hospital and to another form of care (for example, rehabilitation). Hence, a method has been used in this report to reduce over-counting of injury cases by omitting separations in which the mode of admission is recorded as being by transfer from another acute-care hospital, on the grounds that such cases are likely to result in two or more separation records for the same injury.

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

- Australian hospital separations occurring between 1 July 2009 and 30 June 2014
- Principal Diagnosis in the ICD-10-AM range S00–T98 in Chapter XIX 'Injury, poisoning and certain other consequences of external causes' codes
- first reported external cause of injury containing one of the following ICD-10-AM 'Rail transport accident' codes: V05, V15, V25, V35, V45, V55, V65, V75, V80.6, V81, V87.6 and V88.6 or 'Streetcar (tram) transport accident' code: V82
- mode of admission has any value except the one indicating that transfer from another acute-care hospital has occurred
- mode of separation has any value except the one indicating that the person died while in hospital.

Cases with a Principal Diagnosis other than injury, and cases in which an external cause code for rail transport or tram transport appears only as an additional external cause code, were excluded on the grounds that injury due to a rail or tram transport accident was not recorded as being the main reason for admission to hospital.

Application of these criteria resulted in selection of the number of records shown in Table A1.

Table A1: Selection criteria for hospital records of rail-related and tram-related transport injury

Separation occurring from 1 July 2009 to 30 June 2014	Number of records
Records with an ICD-10-AM 'Rail or tram transport accident' code[(a)] as external cause anywhere in the record[(b)]	1,842
Records with a 'Rail or tram transport accident' as first reported external cause[(c)], and	1,805
injury as a Principal Diagnosis (S00–T98), and	1,330
excluding cases transferred from another acute-care hospital, and	1,229
excluding deaths in hospital	1,209

(a) A record is a 'Rail or tram transport accident' if it has an external cause of V05, V15, V25, V35, V45, V55, V65, V75, V80.6, V81, V82, V87.6, V88.6.

(b) There were 37 records with a first reported external cause code of another type of injury (for example, complications of surgical and medical care, a transport accident without mention of being rail-related, other unintentional injuries, falls, assault etc.) but a second or subsequent external cause code of rail-related or tram-related transport.

(c) There were 475 cases with a first reported external cause code of a 'Rail transport accident' but a Principal Diagnosis outside of the injury range (S00–T98). The most common Principal Diagnosis was Care involving use of rehabilitation procedure, unspecified (Z50.9, *n* = 294).

Hospital cases were defined as being due to level crossing collisions if they contained a first reported external cause code of: V05.1, V15.[4,5,9], V25.[4,5,9], V35.[5,6,7,9], V45.[5,6,7,9], V55.[5,6,7,9], V65.[5,6,7,9], V75.[5,6,7,9], V81.1 or V87.6.

Key: In the list shown above, V15.[4,5,9] includes all cases where the first reported external cause code is V15 and having a fourth character of either 4, 5 or 9.

These codes should be used only for 'traffic' crashes in which a road vehicle or a pedestrian had collided with a railway vehicle on a public road (that is, originating on, terminating on, or involving a vehicle partially on a public road). This combination of circumstances is most likely to occur for level crossing crashes. It could, however, also occur in other circumstances; for example, if a railway runs along a road reserve. (A road reserve is defined as an area of land between property boundaries, including roads, lanes, carparks, footpaths, bridges, reserves and nature strips.) Note that in the inclusion criteria for a level crossing collision, all but V05.1 specify that a collision occurred between a road vehicle and a railway train or railway vehicle. The code V05.1 specifies a collision between a pedestrian and a railway train or railway vehicle in traffic; that is, on a public road.

This is the first in this series of reports to include serious unintentional injury involving a streetcar (tram). The data include some cases reported as tram-related injury hospitalisations for Western Australia, Tasmania and the Australian Capital Territory, despite no tramway systems for public transport operating in these jurisdictions in the period covered by this report (though a few old trams were preserved and operated by recreation/tourism bodies). Terms including tram, trolleybus, streetcar, railcar and light railway lack standard definitions and these forms of transport may not always be clearly distinguished from one another in relation to external cause coding, or coding might be in error. It is also possible that a case sustained in a jurisdiction with trams results in a hospital episode in a jurisdiction that does not have trams for public transport. No tram-related injury hospitalisations were reported for the Northern Territory.

National hospital separations data include information on the state and territory of hospitalisation for the person admitted to hospital and the state and territory of usual residence, but not the location of the crash or where the injury was sustained. There are

advantages and disadvantages in choosing either state and territory of hospitalisation or state and territory of usual residence when reporting jurisdiction. In this report, we have reported serious injury counts by state and territory of hospitalisation.

There are a number of cases that may be rail related but which are not included in the selection criteria as specified in Table A1. These are cases involving railway trains or trams, but are unrelated to the hazards associated with the means of transportation; they include examples such as a fight on a train or a train involved in a cataclysm. People injured while performing maintenance or repairs to railway vehicles or trams were excluded, unless injured by another vehicle in motion.

Cases were also excluded if the person was injured as a result of a collision with a train but the intent has been ascribed as intentional self-harm, assault or undetermined. Table A2 lists the number of serious injury cases due to self-harm, assault and undetermined intent that involve a collision between a person and a moving object, or a crash between a motor vehicle and another specified vehicle; the ICD-10-AM inclusion notes state this can include a railway train or tram. It should be noted that the ICD-10-AM codes listed in Table A2 do not identify the vehicle type. It is likely that some of these cases are rail related, but it is not possible to distinguish them using the ICD-10-AM codes.

Table A2: Serious injury cases due to intentional self-harm, assault or undetermined intent that resulted from a collision with a moving object or vehicle, Australia 2009–10 to 2013–14

External cause of injury		Number of cases
X81	Intentional self-harm by jumping or lying before moving object	218
X82.2	Intentional self-harm by other specified crashing of motor vehicle, non-traffic	4
X82.8	Intentional self-harm by other specified crashing of motor vehicle, traffic	50
Y02	Assault by pushing or placing victim before moving object	25
Y03.2	Assault by other specified crashing of motor vehicle, non-traffic	37
Y03.8	Assault by other specified crashing of motor vehicle, traffic	60
Y31	Falling, lying or running before or into moving object, undetermined intent	151
Y32.2	Other specified crashing of motor vehicle, undetermined intent, non-traffic	2
Y32.8	Other specified crashing of motor vehicle, undetermined intent, traffic	0
Total		**547**

Population denominators

Case count data were combined for a 5-year observational period and rates were calculated using, as the denominator, the combined total of the estimated 31 December resident populations for the 5 individual years. The rates in tables 5.1.2, 5.2.2 and 5.3.2 and in figures 5.1.1, 5.2.1 and 5.3.1 were calculated using, as the denominator, the final estimate of the estimated resident population as at 31 December in each relevant year (for example, 31 December 2010 for 2010–11 data). Direct standardisation was used to age-standardise rates, using the Australian population in 2001 as the standard (ABS 2003) in line with AIHW policy. Age-standardised rates and trend analysis were calculated in Stata version 14.0 statistical software using the –dstdize- and –nbreg- commands, respectively (StataCorp 2015).

Quantifying variability in the counts presented in this report

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

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

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

Some of the topics for which results are reported compare groups that vary widely in case count, influenced by differences in population size. In this situation, year-to-year changes in counts or rates for the smaller population groups may be subject to large random variation. There is potential to misinterpret such fluctuations as meaningful rises or falls in occurrence.

In this and similar situations, guidance is provided to readers on how much variation of values can be expected due to random variation of small counts. CIs are calculated for this purpose. In this report, CIs were calculated using the Stata –nbreg- command (CIs around slope of trend) (StataCorp 2015).

Suppression of small cell counts in data tables

The AIHW operates under a strict privacy regime, which has its basis in Section 29 of the *Australian Institute of Health and Welfare Act 1987* (Cwlth) (AIHW Act). Section 29 of the AIHW Act requires that confidentiality of data relating to people (living and deceased) and organisations be maintained. The *Privacy Act 1988* (Cwlth) governs confidentiality of information about living individuals.

The AIHW is committed to reporting that maximises the value of information released for users while being statistically reliable and meeting legislative requirements described above. Data (cells) in tables may be suppressed in order to maintain the privacy or confidentiality of a person or organisation, or because a proportion or other measure is related to a small number of events and may therefore not be reliable.

For Western Australia, cell counts in tables that have fewer than 5 cases have been suppressed. In instances where only one cell in a row or column has a count of less than 5, counts of one or more other cells in the same row or column have generally also been suppressed. The abbreviation 'n.p.' has been used in these tables to denote these suppressions. For these tables, the totals include the suppressed information.

Age-standardised rates for small cell counts have been suppressed since these rates are subject to high year to year variability and may be easily misinterpreted.

Change in Victorian admission policy

Counts of admitted cases depend, in part, on the criteria or policies used to specify admission. The definition used in Victoria changed, beginning with cases whose episode of hospital care ended on 1 July 2012. The effect of the change was to decrease the number of admitted cases compared with the count that would have been obtained if the former criterion had continued to be used. This change affects all types of cases that are cared for in the emergency department, including injury cases.

Information is not available that would allow calculation of the exact number of cases that would have been reported in 2012–13 under the former criterion. Nor has a method been identified that allows exact calculation of the number of cases that would have been counted in the years before 2012–13 if the new Victorian criterion had been applied then (AIHW 2015).

Errors, inconsistencies and uncertainties

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

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

Data quality statement: National Hospital Morbidity Database

This section provides a summary of key issues relevant to interpreting the NHMD. Further information on the quality of the data for earlier years is available in relevant editions of the AIHW's *Australian hospital statistics*.

The full AIHW Data Quality Statement for the NHMD is accessible at

<http://meteor.aihw.gov.au/content/index.phtml/itemId/611030>.

Summary of key issues

- The NHMD is a comprehensive data set that has records for all separations of admitted patients from essentially all public and private hospitals in Australia.
- A record is included for each separation, not for each patient, so patients who separated more than once in the year have more than one record in the NHMD.
- For 2013–14, almost all public hospitals provided data for the NHMD. The exception was an early parenting centre in the Australian Capital Territory. The great majority of private hospitals also provided data, the exceptions being the private free-standing day hospital facilities in the Australian Capital Territory.

- There was some variation between jurisdictions as to whether hospitals that predominantly provide public hospital services, but are privately owned and/or operated, are reported as public or private hospitals. As well, hospitals may be re-categorised as public or private between or within years.
- There was apparent variation among jurisdictions in the use of statistical discharges and in the assignment of care types (for example, when a patient's care type changes from acute care to rehabilitation) which may affect the comparability of the data. However, revised definitions for care types were implemented from 1 July 2013 with the aim to improve comparability in care type assignment among jurisdictions. Therefore, information presented by care type may not be comparable with data presented for earlier periods.
- There was variation between states and territories in the reporting of separations for Newborns (without qualified days or with a mixture of qualified and unqualified days).
- Data on state of hospitalisation should be interpreted with caution because of cross-border flows of patients. This is particularly the case for the Australian Capital Territory. In 2013–14, about 18% of separations for Australian Capital Territory hospitals were for patients who resided in New South Wales.
- Variations in admission practices and policies lead to variation among providers in the number of admissions for some conditions.
- Caution should be used in comparing diagnosis, procedure and external cause data over time, as the classifications and coding standards for those data can change over time.
- The Indigenous status data in the NHMD for all states and territories are considered of sufficient quality for statistical reporting for 2010–11, 2011–12, 2012–13 and 2013–14. In 2011–12, an estimated 88% of Indigenous patients were correctly identified in public hospitals. The overall quality of the data provided for Indigenous status is considered to be in need of some improvement, and varied between states and territories.

Appendix B: Serious injury counts by calendar year

Tables B1 to B3 are equivalent to tables 5.1.1, 5.2.1 and 5.3.1 in this report, except that data are reported for calendar years instead of financial years. Calendar year 2013 was the latest that could be reported at the time of writing because data on separations after 30 June 2014 were not available.

Table B1: Number of serious unintentional injury cases involving a train, Australia, 2002 to 2013, by state or territory of hospitalisation

Year	NSW	Vic	Qld	WA	SA	Tas/ACT/NT[(a)]	Australia
2002	70	71	13	8	19	2	183
2003	76	80	30	n.p.	4	n.p.	197
2004	69	59	63	n.p.	11	n.p.	209
2005	54	62	26	n.p.	14	n.p.	163
2006	54	67	27	9	13	4	174
2007	42	75	22	5	13	4	161
2008	50	64	33	5	9	7	168
2009	55	58	22	9	8	1	153
2010	53	78	19	8	6	4	168
2011	62	78	26	11	9	8	194
2012	59	61	21	7	9	4	161
2013	59	38	24	9	8	2	140
Annual average	**58.6**	**65.9**	**27.2**	**6.8**	**10.3**	**3.9**	**172.6**

(a) Case counts for Tasmania, the Australian Capital Territory and the Northern Territory have been combined due to low numbers.

Table B2: People seriously injured due to level crossing collisions, Australia, 2002 to 2013, by state or territory of hospitalisation

Year	NSW	Vic	Qld	WA	SA	Tas/ACT/NT[(a)]	Australia
2002	6	23	5	n.p.	9	n.p.	47
2003	4	26	10	0	4	1	45
2004	9	30	11	n.p.	4	n.p.	56
2005	2	24	13	0	7	3	49
2006	6	22	8	n.p.	7	n.p.	48
2007	6	33	7	n.p.	3	n.p.	52
2008	4	20	17	0	4	2	47
2009	9	19	10	n.p.	3	n.p.	44
2010	5	24	4	n.p.	n.p.	0	36
2011	5	24	7	n.p.	5	n.p.	46
2012	2	15	8	n.p.	1	n.p.	33
2013	4	13	4	n.p.	n.p.	0	27
Annual average	**5.2**	**22.8**	**8.7**	**1.6**	**4.4**	**1.6**	**44.2**

(a) Case counts for Tasmania, the Australian Capital Territory and the Northern Territory have been combined due to low numbers.

Table B3: Number of serious unintentional injury cases involving a tram, Australia, 2002 to 2013, by state or territory of hospitalisation

Year	NSW	Vic	Qld	WA	SA	Australia[(a)]
2002	9	58	8	n.p.	n.p.	81
2003	10	68	7	n.p.	n.p.	91
2004	3	62	6	7	7	81
2005	7	51	n.p.	n.p.	3	67
2006	10	52	6	n.p.	n.p.	71
2007	4	68	2	n.p.	n.p.	79
2008	9	54	10	n.p.	n.p.	80
2009	7	67	8	n.p.	n.p.	87
2010	7	65	4	n.p.	n.p.	78
2011	3	67	3	n.p.	n.p.	77
2012	5	59	3	0	2	69
2013	5	77	n.p.	n.p	6	94
Annual average	**6.6**	**62.3**	**5.2**	**2.0**	**2.6**	**79.6**

(a) Includes cases for Tasmania and the Australian Capital Territory. There were no cases for the Northern Territory.

Glossary

Definitions in this glossary contain an identification number from the Metadata Online Registry (METeOR). METeOR is Australia's central repository for health, community services and housing assistance metadata, or 'data about data'. It provides data definitions for topics related to health and community services and specifications for related national minimum data sets, such as those forming the basis of this report. METeOR can be viewed on the AIHW website at <www.aihw.gov.au>.

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

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

Care type: The overall nature of a clinical service provided to an admitted patient during an episode of care (admitted care). METeOR identifier: 270174.

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

External cause: The environmental event, circumstance or condition causing the injury, poisoning or other adverse effect. METeOR identifier: 361926.

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

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

Length of stay: A measure calculated by subtracting the date the patient is admitted to a hospital from the date of separation, and deducting days the patient was on leave. A same-day patient is allocated a length of stay of 1 day. METeOR identifier: 269982.

Patient days: The total number of days for patients who were admitted for an episode of care and who separated during a specified reference period. A patient who is admitted and separated on the same day is allocated 1 patient day. METeOR identifier: 270045.

Principal Diagnosis: The diagnosis established after study to be chiefly responsible for occasioning an episode of admitted patient care. METeOR identifier: 391326.

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

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Related publications

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AIHW: Henley G & Harrison J 2009. Serious injury due to land transport accidents involving a railway train, Australia 2002–03 to 2006–07. Injury research and statistics series no. 54. Cat. no. INJCAT 130. Canberra: AIHW.

Henley G & Harrison J 2012b. Serious injury due to land transport accidents involving a railway train, Australia 2004–05 to 2008–09. Injury research and statistics series no. 68. Cat. no. INJCAT 144. Canberra: AIHW.

This report presents information on hospitalisations in Australia due to unintentional serious injury involving a train or tram for the 5-year period from 2009–10 to 2013–14. Over this 5-year period, there were 812 cases of serious injury involving a train (178 due to a level crossing collision), an average of 162 per year. Over the same period, there were 397 cases of serious injury involving a tram.