





# Kidsafe WA Childhood Injury Research Report: Road Injuries



PARTNER

#### Suggested Citation:

© Kidsafe WA

Waddell, G, McKenna, J, Skarin D. Kidsafe WA Childhood Injury Bulletin Research Report: Road Injuries. Perth (WA): Kidsafe WA (AU); 2017 June.

# CONTENTS

Road Injuries at a Glance	1
Introduction	2
Passenger	3
Pedestrian	5
Wheeled Pedestrians	7
Cyclist	9
Motorcyclist	11
Driveway Run Overs	13
Hot Cars	14
Discussion	15
References	16

# **ROAD INJURIES AT A GLANCE**

**14,290** Children were seen in the Princess Margaret Hospital Emergency Department (PMH ED) for a road injury from July 2006 to June 2016

# **Injury Causes**



Wheeled Pedestrian 38.0%



Cyclist 33.7%



Passenger 13.3%



Motorcyclist 6.3%



Pedestrian 5.2%

# 99.4%

Road injuries were unintentional

# 570

Children were rescued from locked vehicles by RAC from June 2014 to May 2015





**1,191** Children per year are seen in the PMH ED for a road injury

Road injuries account for **8.4%** of all injury presentations to PMH ED

There is a male to female ratio of **2:1** for road injury presentations







**19.5%** Cyclists wore a helmet at the time of the injury

### INTRODUCTION

#### Kidsafe WA

Kidsafe WA is the leading independent not-for-profit organisation dedicated to promoting safety and preventing childhood injuries and accidents in Western Australia. Injuries are the leading cause of death in Australian children aged one to fourteen, accounting for nearly half of all deaths in this age group. More children die of injury than die of cancer, asthma and infectious diseases combined. Many of these deaths and injuries can be prevented. Kidsafe WA works in the community to educate and inform parents and children on staying safe at home, at play and on the road.

#### Injury Surveillance Paediatric Hospital Data

Princess Margaret Hospital for Children (PMH) is the only paediatric hospital in Western Australia and is the reference centre for paediatric illness and injury for the state. Every year approximately 63,000 children present to the PMH Emergency Department (ED). The PMH Injury Surveillance System is designed to capture data related to all children presenting with an injury. This research report provides a summary of all road injuries captured by the database between July 2006 and June 2016.

#### **Road Injuries**

Children are at significant risk of road injuries in Australia, with transport-related injuries one of the leading causes of death in children under the age of 15<sup>1</sup>. It is estimated that 1.39 million people die each year from transport-related injuries globally<sup>1</sup>, with children accounting for 186,300 of these deaths<sup>2</sup>. In the 2008/09 financial year alone, there were over 7,000 injuries to Australian children under the age of 15 caused by land transport accidents<sup>3</sup>.

The road setting poses a number of injury risks, particularly to children. Road injuries often involve motor vehicles but may also involve motorcyclists, pedestrians, cyclists and wheeled pedestrians; the vast majority of these injuries are unintentional. The road setting is not limited to traffic areas on public roads and carparks, but also settings such as driveways, farm areas, nature reserves and skate parks.

A range of developmental, environmental and demographic factors increase a child's risk of injury on the road. At a young age, children's cognitive skills and motor function are not fully developed, resulting in them being more susceptible to injuries from transport related causes<sup>24</sup>. Their vulnerability is also increased by factors such as their small stature, their inability to assess risks, lack of supervision, lack of adequate safety restraints or protective equipment, and lack of understanding of road rules<sup>5</sup>. Demographic factors such as gender, ethnicity and socioeconomic status have also been shown to increase the risk of transport related injuries<sup>4</sup>.

The major road injury concerns to children that will be discussed in this report include injuries to passengers of motor vehicles, pedestrians, cyclists, motorcyclists, small-wheeled device users, driveway run overs and hot car entrapment.

## PASSENGER

Motor vehicle crashes are one of the most common causes of injury in Australian children under the age of 15, accounting for over a third of injury related deaths<sup>6</sup>. In 2010 alone, 145 children under the age of 15 were injured when occupying a motor vehicle as a passenger in Australia<sup>7</sup>. The majority of these children were aged between 5 to 14 years old, with this age group accounting for over two thirds of injuries in this category<sup>7</sup>.

#### **EMERGENCY DEPARTMENT PASSENGER INJURY PRESENTATIONS**

Over the ten year period from July 2006 to June 2016, 1,900 children presented to the PMH ED for injuries caused while occupying a motor vehicle as a passenger (Figure 1). This accounts for 13.3 percent of all road injury presentations to the PMH ED. The data includes injuries that occurred to children while occupying a motor vehicle, including cars, quad bikes and go-carts.

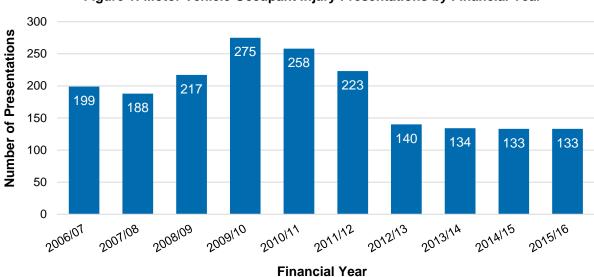


Figure 1: Motor Vehicle Occupant Injury Presentations by Financial Year

#### Age and Gender Distribution

The age distribution for motor vehicle related injuries was fairly even, with the highest number of injuries occurring in the 5 to 9 year old age group (33.0%, n=621), followed by the 10 to 14 years age group (32.6%, n=613). The 0 to 4 years age group was only marginally less, accounting for nearly a third of injuries at 30.3 percent (n=569). Children aged 15 years and over accounted for significantly fewer injuries than other age groups (4.2%, n=77) which is likely due to an increased use of non-paediatric hospitals by adolescents.

The gender proportions for motor vehicle occupant injuries are even, with males and females accounting for 49.2 percent (n=925) and 50.8 percent (n=955) of injuries respectively.

#### Safety Equipment

Of the 1,900 children injured as a motor vehicle occupant 48.3 percent were using some form of safety equipment. These included seatbelts (31.6%, n=600), approved child car restraints (13.7%, n=261) and helmets (2.8%, n=53). No safety equipment was used in 9.9 percent (n=189) of injuries and for the remainder the use of safety equipment was unknown (41.8% n=794).

#### **Triage Category**

Every child that presents to the PMH ED is allocated a triage category based on the urgency of medical attention required (Table 1). The majority of motor vehicle occupant related injury presentations were triaged as Urgent (43.6%, n=828), Semi-Urgent (25.6%, n=487) and Emergency (19.7%, n=375). Just over 10 percent were assigned a Resuscitation triage category (n=207), and none were triaged as Non-Urgent.

Category	Seen within (minutes)
(1) Resuscitation	0
(2) Emergency	10
(3) Urgent	30
(4) Semi-Urgent	60
(5) Non-Urgent	120

#### Table 1: Triage Category

#### Activity

Of all motor vehicle occupant injuries, 12.1 percent were taking part in a sports activity (n=230). As seen in Figure 2, the most common sporting activity in motor vehicle occupant injuries was quad biking (72.6%, n=167), followed by go-carting (23.5%, n=54). In addition, 2.6 percent were riding motorcycles (n=6). Detailed data on child injuries occurring on motorcycles is available later in this report.

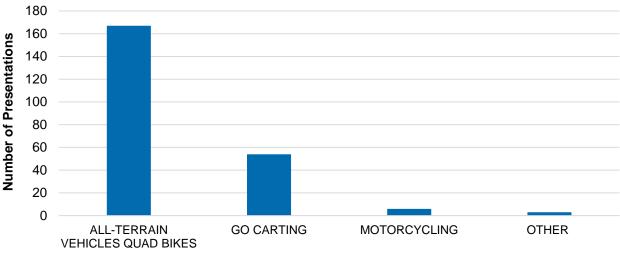


Figure 2: Motor Vehicle Occupant Injury Presentations by Sporting Activity



#### Location of Injury

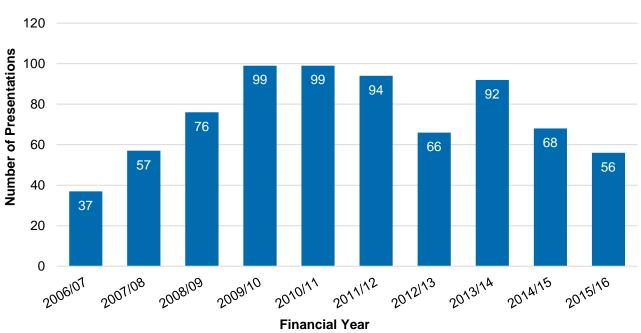
The most common location for motor vehicle occupant injuries is the public roadway, footpath and cycleway (73.2%, n=1,390). The location was unknown for approximately one fifth of the injuries (20.5%, n=389). Other locations included open nature area (1.7%, n=32), primary production area or farm (1.1%, n=21), home - outdoors (1.1%, n=20), public parking area or transport facility (0.7%, n=13), and public building, recreational or cultural area (n=0.5%, n=9).

### PEDESTRIAN

Pedestrian injuries are a large problem amongst children, with over 700 Australian children injured as pedestrians during the 2008/09 period<sup>3</sup>. Compared to other road users pedestrians have been shown to be more likely to sustain a high threat to life injury than any other road user group<sup>3</sup>.

#### **EMERGENCY DEPARTMENT PEDESTRIAN INJURY PRESENTATIONS**

Over the ten year period from July 2006 to June 2016, 744 children reported to the PMH ED for pedestrian related injuries (Figure 3). This accounts for 5.2 percent of all road related injuries to the PMH ED. The number of pedestrian injury presentations have reduced since the 2013/14 financial year, however there is still great scope for reduction with the average number of presentations sitting at approximately 74 injuries per year.



#### Figure 3: Pedestrian Injury Presentations by Financial Year

#### **Triage Category**

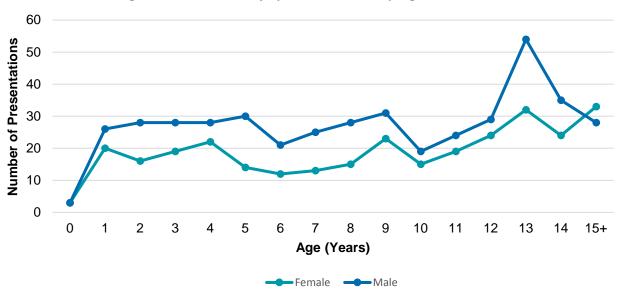
Over a third of pedestrian related injuries were triaged as Urgent (36.3%, n=270). Following this, 24.7 percent were triaged as Semi-Urgent (n=184), and 23.3 percent were triaged as an Emergency (n=173). The remainder were triaged as Resuscitation (n=117, 15.7%), requiring immediate attention. No presentations were triaged as Non-Urgent.

#### **Outcome of Attendance**

Nearly half of all pedestrian injury presentations required a ward or inpatient unit admission (48.8%, n=363). This is 3.3 times higher than the baseline injury admission rate of 14.9 percent<sup>8</sup>, highlighting the seriousness of pedestrian injuries. Approximately one third of injury presentations departed with treatment complete (32.9%, n=345), and the remainder were either admitted to short stay, or did not wait for treatment.

#### Age and Gender Distribution

Other than children under the age of 1, the risk of pedestrian injury remains stable until early adolescence, particularly peaking in 13 year old males (n=54, 7.3%) (Figure 4). Overall, males were at greater risk (59.0% n=437) of pedestrian injury compared to females (41.0% n=304).





#### Location of Injury

Pedestrian injuries commonly occur on public roadways, footpaths or cycleways, with 59.5 percent of pedestrian injuries occurring in these areas (n=443) (Figure 5). Other common locations included public parking area or transport facilities (5.4%, n=40) and the home (10.3%, n=77). Within the home, the outdoors was the most commonly specified location for pedestrian injury to occur (5.5%, n=41).

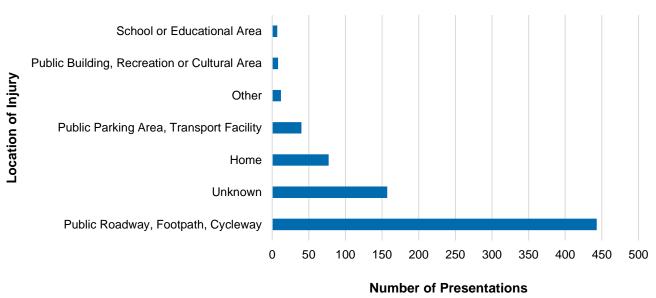


Figure 5: Pedestrian Injury Presentations by Location

### WHEELED PEDESTRIAN

Wheeled pedestrians or Small-Wheeled Devices (SWDs) refer to equipment such as skateboards, scooters, roller blades and hover boards. A Queensland study conducted at two children's hospitals from 2012-13 found 5.3 percent of all trauma admissions were attributed to SWDs, and that the most common SWD injury was due to scooters and skateboards<sup>9</sup>.

#### **EMERGENCY DEPARTMENT WHEELED PEDESTRIAN INJURY PRESENTATIONS**

From July 2006 to June 2016, there were 5,427 wheeled pedestrian injury presentations to PMH ED (Figure 6). Wheeled pedestrian injuries account for 38.0 percent of all road injuries making them the most common cause of road-related injury.

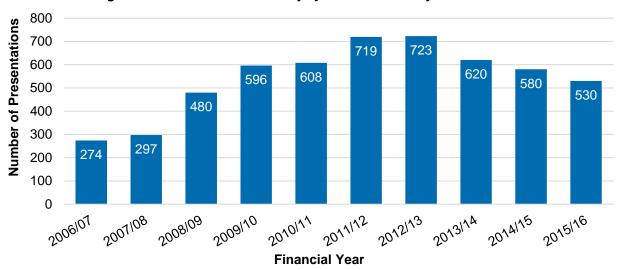
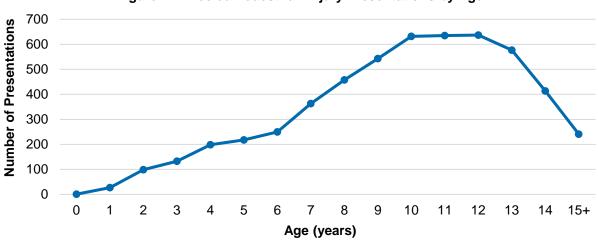


Figure 6: Wheeled Pedestrian Injury Presentations by Financial Year

#### Age and Gender Distribution

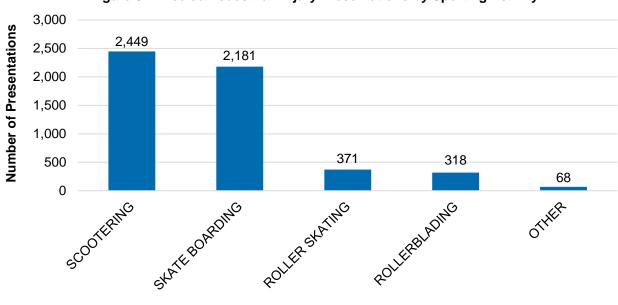
Males are far more likely to be injured as a wheeled pedestrian, accounting for 67.1 percent of injuries (n=3,643) when compared to females (32.9%, n=1,784). Figure 7 shows that presentations increase as a function of age, peaking in 12 year olds (n=637) and declining from age 13 onwards. The decrease is most likely due to an increased use of adult hospitals by adolescents, or lower rates of small-wheeled device use.

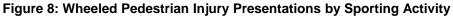




#### **Sporting Activity**

Scootering was the most common sporting activity associated with wheeled pedestrian injury (45.4%, n=2,449), followed by skateboarding (40.5%, n=2,181), roller blading and roller skating (12.8%, n=689) (Figure 8).





**Sporting Activity** 

#### Safety Equipment

Fewer than 5 percent of wheeled pedestrian injuries had a record of using any safety equipment (n=239). Of those who were wearing safety equipment, helmets were the most common piece of equipment (n=216, 90.4%). No safety equipment was used in 9.5 percent of injuries (n=516), and unknown in 83.5 percent of the cases (n=4,533).

#### **Triage Category**

The majority of wheeled pedestrian injuries were triaged as Semi-Urgent (78.0%, n=4,235), followed by Urgent (18.7%, n=1,017). The remainder were triaged as Emergency (2.7%, n=148), Non-Urgent (0.3%, n=14) or Resuscitation (0.2%, n=13).

#### **Outcome of Attendance**

The majority of injury presentations departed PMH ED with treatment completed (80.2%, n=4,353). A further 15.3 percent were admitted to ward or inpatient unit (n=832) and 3.4 percent were admitted to short stay (n=184). The wheeled pedestrian injury admission rate is not substantially higher than the overall injury admission rate (14.9%). The remainder were transferred to other hospitals or departments, did not wait for treatment, or were discharged to clinic.

## CYCLIST

Cycling is a great activity for all ages that promotes physical activity and reduces car emissions, It can however be dangerous for riders, particularly children, Nationally, over 4,000 children under the age of 18 years old were injured whilst riding a pedal cycle in 2008/09<sup>3</sup>, and children under 16 years old accounted for 18 percent of all fatal injuries to cyclists from 2006 to 2008<sup>10</sup>.

#### **EMERGENCY DEPARTMENT CYCLIST INJURY PRESENTATIONS**

From July 2006 to June 2016, 4,809 children presented to PMH ED for cycling injuries (Figure 9). Unlike other road injury categories, the number of cycling injuries has remained steady over the past ten years. Cycling injuries are the second most common road injury type seen at PMH ED, accounting for 33.7 percent (n=4,809) of all road injuries.



#### Figure 9: Cyclist Injury Presentations by Financial Year

#### Safety Equipment

Of the safety equipment that was recorded for cyclist injury presentations, helmets were the most common type recorded (19.5%, n=935), with a small amount using other specified equipment (0.3%, n=13). Just over 10 percent were recorded as using no safety equipment at all (n=511). The majority of recorded safety equipment was unknown or had an inadequate description (68.2%, n=3,277), or safety equipment was not applicable (1.4%, n=66).

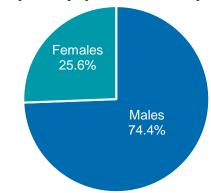
#### Location of Injury

The most common location for cyclist injury presentations over the ten year period was other place (41.4%, n=1.991), which refers to locations that were unknown or did not fit into any other categories. Following this, the most common location for cyclist injuries was the public roadway, footpath or cycleway, accounting for over one guarter of all cyclist injury presentations (29.1%, n=1,400). Other locations were cycling injuries frequently occurred were the home (16.0%, n=771), public building, recreation or cultural area (5.9%, n=283), and sports and athletics area (2.8%, n=134).

#### Age and Gender Distribution

Following a similar pattern to the age distribution of wheeled pedestrian injury presentations (Figure 7), cycling injuries increase each year of age up to a peak in 12 year olds (n=509) and then reduce in teenage years.

Males are at far higher risk of cycling injuries compared to females (Figure 10). Of all cycling injury presentations over the ten year period, males accounted for three quarters (74.4%, n=3,578), and females only accounted for the remaining quarter (25.6%, n=1,231).



#### Figure 10: Cyclist Injury Presentations by Gender

#### Triage Category

The majority of cyclist injury presentations were triaged as Semi-Urgent on arrival to PMH ED (n=3,327) (Figure 11). Secondary to this was the triage category of Urgent (n=1,227), followed by Emergency (n=204) and Resuscitation (n=37). The least common triage category was Non-Urgent (n=13).

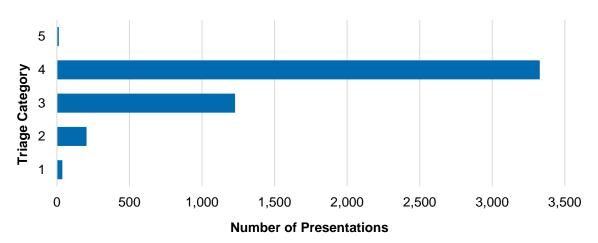


Figure 11: Cyclist Injury Presentations by Triage Category

#### **Outcome of Attendance**

Following a cycling injury, most children were able to depart PMH ED with treatment completed (71.6%, n=3,444). Almost one quarter were admitted to ward or inpatient unit (24.6%, n=1,182), which is 1.6 times higher than the baseline injury admission rate for total injuries (14.9%). The remainder were admitted to short stay (2.1%, n=102), did not wait for treatment (0.8%, n=38), or were referred on to another PMH department (0.6%, n=28).

## MOTORCYCLIST

The use of motorcycles is a popular activity among children. Whilst motorcycling is more common in adolescents, children as young as five years old are presenting to hospitals in Australia for motorcycling injuries<sup>11</sup>. Data from Victoria has shown an increase in motorcycling injuries by almost 10 percent per year<sup>11</sup>. Kidsafe WA recommend children under 16 years of age do not operate or ride as a passenger on motorcycles.

#### EMERGENCY DEPARTMENT MOTORCYLIST INJURY PRESENTATIONS

From July 2006 to June 2016, 901 children presented to the PMH ED for a motorcycling related injury (Figure 12). These account for 6.3 percent of all road injuries in the ten year period. Despite a small decline in recent years, the number of motorcyclist injuries each year

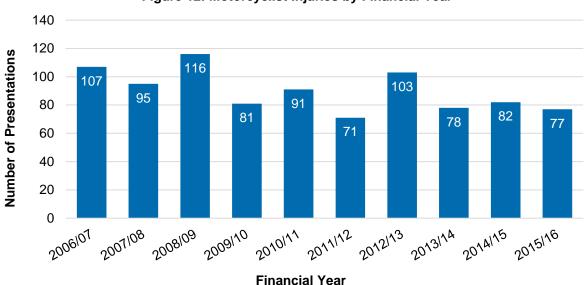


Figure 12: Motorcyclist Injuries by Financial Year

is relatively consistent over the ten year period, averaging 90 injury presentations per year.

#### Age and Gender Distribution

The highest rates of motorcycling injuries were seen in the 10 to 14 years age group, which accounted for 62.9 percent of all presentations (n=567). Following this was the 4 to 9 years age group (21.5%, n=194), the 15 years and over age group (12.3%, n=111), and the 0 to 4 years age group (3.2%, n=29). The number of injury presentations in the older age group is likely to be an underestimate since adolescents are more likely to present to adult hospitals.

There is a significant difference in gender distribution for motorcyclist injury presentations, with males accounting for a large majority of all presentations (86.7%, n=781) and females accounting for the small amount of remaining presentations (13.3%, n=120).

#### Safety Equipment

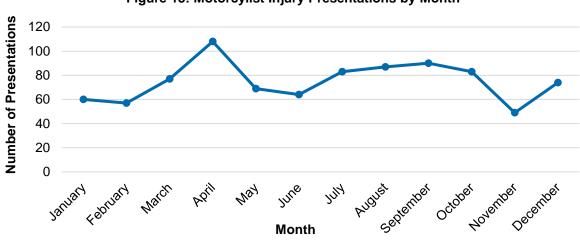
In more than half of all motorcycling injury presentations the use of safety equipment was unknown (59.4%, n=535). Just under one third reported wearing a helmet (31.6%, n=285), a small proportion did not wear any safety equipment (6.7%, n=60), and a minority wore protective clothing (1.6%, n=14).

#### Location of Injury

The location for over half of motorcycling injury presentations was unknown (52.8%, n=476). The most common known locations were public roadway, footpath or cycleway (14.3%, n=129), and open nature area (11.9%, n=107). The remainder included farms, home, and sports areas.

#### Month of Injury

April was overrepresented among motorcycle injuries (n=108) (Figure 13). Other, higherthan-average (n=75) months included August, September and October (n=87, n=90, and n=83 respectively). Some of the high injury months overlap with school holidays (e.g. April), which may explain their over-representation.





#### **Triage Category**

The most common triage category for motorcycling related injury presentations was Semi-Urgent (46.3%, n=417), with the Urgent category also frequently recorded (37.4%, n=337). The remaining presentations were triaged as Emergency (11.9%, n=107) and Resuscitation (4.4%, n=40). No injuries were coded as Non-Urgent. Of note is the high percentage of injuries triaged as Emergency or Resuscitation, which highlights the vulnerability of motorcyclists especially given the substantial number of motorcyclists reporting not using any safety equipment.

#### **Outcome of Attendance**

Over half of all injury presentations were admitted to ward or inpatient unit for treatment (52.6%, n=474), this is 3.5 times higher than the baseline injury admission rate (14.9%). A small proportion were admitted to short stay (1.8% n=16). The remainder departed ED with treatment complete (44.1%, n=397). In addition to being more likely to be triaged as emergency/resuscitation, the high admission rate for motorcycling injuries reflects the severity of the injuries.

#### Safety Equipment

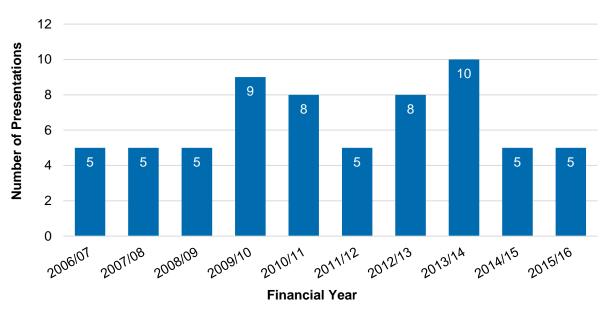
Safety equipment use was unknown in the majority of presentations (59.4%, n=535). Almost a third were reported or recorded as wearing a helmet (31.6%, n=285), a small portion did not wear any safety equipment (6.7%, n=60), and a minority wore protective clothing (1.6%, n=14).

## DRIVEWAY RUN OVERS

Driveway run overs are a significant problem in child road injuries, particularly in younger children aged under five years old<sup>13</sup>. These often occur when a child is unintentionally driven over by a moving vehicle<sup>14</sup>, commonly occurring at the child's home or a relative's home<sup>13</sup> and with the driver being a parent or relative in the majority of cases<sup>15 16</sup>. Studies of injury data has found that injuries sustained from driveway run overs are often severe, and are estimated to account for at least one quarter of pedestrian injuries presenting to hospital in Australia and New Zealand<sup>13, 14, 17</sup>. From 2001 to 2010 in Australia, there were 60 deaths caused by driveway run overs in 0 to 4 year olds<sup>13</sup>.

#### EMERGENCY DEPARTMENT DRIVEWAY RUN OVER INJURY PRESENTATIONS

Over the ten year period from July 2006 to June 2016, a total of 65 children presented to the PMH ED for injuries from driveway run overs (Figure 14). The number of driveway run overs varies each year and was highest in 2013/14 financial year (n=10). Overall there is an average of 7 presentations per year for driveway run over injuries.





#### Age and Gender Distribution

The majority of driveway run over injuries were in 0 to 4 year olds, with this age group accounting for 41.5 percent of all injuries (n=27). The second most frequent age group injured in driveway run overs was 10 to 14 year olds (27.7%, n=18), followed by 5 to 9 year olds (24.6%, n=16).

Males were at greater risk of sustaining injuries from driveway run overs, accounting for 63.1 percent of all presentations (n=41). Females accounted for the remaining 36.9 percent (n=24).

#### **Triage Category**

Semi-Urgent was the most common triage category of driveway run over injury presentations (41.5%, n=27). This was followed by Urgent (27.7%, n=18) and Emergency (21.5%, n=14). The remainder were triaged as Resuscitation (9.2%, n=6), and no presentations were triaged as Non-Urgent.

### HOT CARS

Children being left in hot cars is a significant issue in Australia, particularly in summer months. When outside temperatures reach 30°C, temperatures inside vehicles can reach up to 70°C, and children locked in vehicles are at high risk of heat related injuries in these dangerous temperatures. There is also a risk of strangulation from child car restraints if a child becomes distressed when in a hot car and tries to remove their restraint. Due to the nature of children being left in hot cars, many do not present to a hospital for treatment. For this section of the report, data from RAC Roadside Assistance call-outs has been utilised alongside PMH ED data to analyse hot car related injuries.

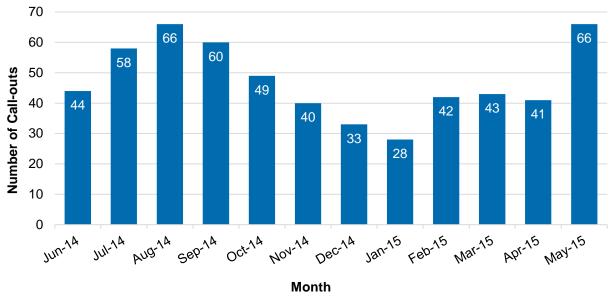
#### **EMERGENCY DEPARTMENT HOT CAR INJURY PRESENTATIONS**

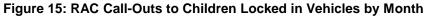
A small amount of children presented to the PMH ED for a hot car related injury from July 2006 to June 2016. A total of seven hot car related injury presentations were seen over the ten year period, and all of the children presenting were under the age of three. The majority were diagnosed with heat related illness, and all were sent home following treatment. When comparing the PMH ED injury presentations to the RAC call-out data, the low numbers highlight that the majority of cases may not report to a hospital following incidents, or may have reported to a General Practitioner instead.

#### RAC ROADSIDE ASSISTANCE HOT CAR CALL-OUTS

Data from RAC's Roadside Assistance call-outs shows that from June 2014 to May 2015, a total of 570 children were rescued from a locked vehicle<sup>12</sup> (Figure 15). In this period the highest number of call-outs were seen in August and May, with 66 children being rescued in each of these months. There was an overall average of 48 children rescued from locked cars each month. Fortunately the lowest numbers of callouts were seen in the summer months of December (n=33) and January (n=28), when ambient temperatures are often in excess of 30°C.

As this data only takes into account RAC Roadside Assistance call-outs and no other means of rescues, these numbers are only a small snapshot of the state and are therefore an underestimation of the total number of children locked in vehicles.





### DISCUSSION

Road injuries are a significant issue among Australian children. From July 2006 to June 2016, a total of 14,290 children presented to the PMH ED for road-related injuries, which accounted for 8.4 percent of all injury presentations. Compared to adults, children are more at risk of injury within the road setting due to a range of developmental, environmental and physical factors<sup>5</sup>. Injuries within the road setting include those occurring to children that are pedestrians, cyclists, motorcyclists, small-wheeled device users, driveway run overs, and as passengers within a vehicle, as well as children trapped in hot cars.

Injuries occurring to children using small-wheeled devices were the most common roadrelated injury, accounting for 38.0 percent of all road injury presentations. Among them scooters and skateboards were the most commonly used equipment, accounting for 45.4 percent and 40.5 percent of all wheeled pedestrian injuries respectively. Fewer than 5 percent of wheeled pedestrian injuries recorded using any safety equipment at the time of injury. This highlights the need for accurate data recording at triage, as well as an increased use of safety equipment when using wheeled devices. Unlike cycling, there are currently no laws in place in Western Australia governing the use of helmets among small-wheeled device users. Due to the large number of injuries occurring there have been many suggestions to mandate the use of safety equipment for these devices<sup>9</sup>.

Cycling injuries were the second most common injury, accounting for 33.7 percent of all road injuries. The use of safety equipment was higher in cycling injuries than small-wheeled device injuries, but still remained relatively low at 19.5 percent. Similarly to wheeled pedestrian injuries, this highlights the importance of the promotion and use of safety equipment.

Males are at far higher risk of road injury than females, accounting for twice the number of road injury presentations than females. The largest difference between male and female presentations was evident in motorcycling injuries, with males accounting for 86.7 percent of presentations. The only category that did not follow this pattern was motor vehicle passenger injuries, which was roughly equal between each gender. The overrepresentation of males can possibly be attributed to males often being more adventurous, risk-taking, and having a higher level of activity than females<sup>5</sup>.

Most childhood road injuries are preventable, therefore implementing appropriate strategies to reduce children's risk of injury in the road setting is of large importance. Many prevention programs and campaigns exist throughout the world with the aim of reducing road injuries, which involve education, advocacy, infrastructure improvements and changes to legislation. Valuable measures that assist in reducing the risk of road injuries include ensuring that children are supervised at all times, knowledge of the road rules, and the use of appropriate safety restraints and equipment.

Kidsafe WA have a range of road safety resources outlining methods of prevention. For more information on how to reduce the risk of road-related injuries visit: <a href="http://www.kidsafewa.com.au/road">www.kidsafewa.com.au/road</a>.

### REFERENCES

1. Li, Q., Alonge, O., & Hyder, A.A. (2016). Children and road traffic injuries: can't the world do better? Arch Dis Child, 1, 1-8.

2. World Health Organization. (2015). *Ten Strategies for Keeping Kids Safe on the Road*. Retrieved December 2016 from

http://www.who.int/roadsafety/week/2015/Ten\_Strategies\_For\_Keeping\_Children\_Safe\_on\_the\_Road.pdf

3. Henley, G., & Harrison, J.E. (2012). Serious injury due to land transport, Australia 2008-09. Injury research and statistics series no. 67. Cat. no. INJCAT 143. Canberra: AIHW.

4. Waters, S., Baker, S., & Bruce, K. (2012). *National Practices for Early Childhood Road Safety Education*. Perth, Australia: Edith Cowan University, Child Health Promotion Research Centre.

5. Fraser, E., McKeever, R.S., Campbell, L., & McKenzie, K. (2012). Bicycle safety for children and young people: an analysis of child deaths in Queensland. *Journal of the Australasian College of Road Safety*, 23(2), 14-19.

6. Reeve, K., Zurynski, Y.A., Elliot, E.J., & Bilston, L. (2007). Seatbelts and the law: how well do we protect Australian children? *MJA*, *186*(12), 635-638.

7. Henley, G., & Harrison, J.E. (2015). *Trends in serious injury due to road vehicle traffic crashes, Australia 2001 to 2010.* Research and statistics series no. 89. Cat. no. INJCAT 165. Canberra: AIHW.

8. Abdulelhadi, M., McKenna, J., & Skarin D. (2016). Kidsafe WA Childhood Injury Bulletin: Annual Report 2015-2016. Perth, Australia: Kidsafe WA.

9. Kaddis, M., Stockton, K., & Kimble, R. (2016). Trauma in children due to wheeled recreational devices. *Journal of Paediatrics and Child Health*, 52, 30-33.

10. Soole, D., Lennon, A., & Haworth, N. (2011). Parental beliefs about supervising children when crossing roads and cycling. *International Journal of Injury Control and Safety Promotion*, 18, 29-36.

11. Bevan, C., Babl, F., Bolt, P., & Sharwood, L. (2008). The increasing problem of motorcycle injuries in children and adolescents. *Medical Journal of Australia, 189,* 17-20.

12. RAC. (2015). Roadside Assistance Call-Out Data: Hot Car Rescue Jobs June 2014 - May 2015.

13. Armstrong, K., Thunstrom, H., & Davey, J. (2013). Towards a structured understanding of caregivers' safety behaviour in the domestic and driveway setting. *Accident Analysis and Prevention, 52*, 39-43.

14. Shepherd, M., Austin, P., & Chambers, J. (2010). Driveway runover, the influence of built environment: A case control study. *Journal of Paediatrics and Child Health, 46,* 760-767.

15. Hsiao, K.H., Newbury, C., Bartlett, N., Dansey, R., Morreau, P., & Hamill, J. (2009). Paediatric driveway runover injuries: time to redesign? *The New Zealand Medical Journal,* 122(1298), 1-6.

16. Byard, R. & Jensen, L. (2009). Toddler run-overs – a persistent problem. *Journal of Forensic and Legal Medicine*, *16*, 202-203.

17. Pinkney, K.A., Smith, A., Mann, N.C., Mower, K.A., Davis, A., & Dean, J.M. (2006). Risk of pediatric backover injuries in residential driveways by vehicle type. *Pediatric Emergency Care*, 22(6), 402–407.



www.kidsafewa.com.au