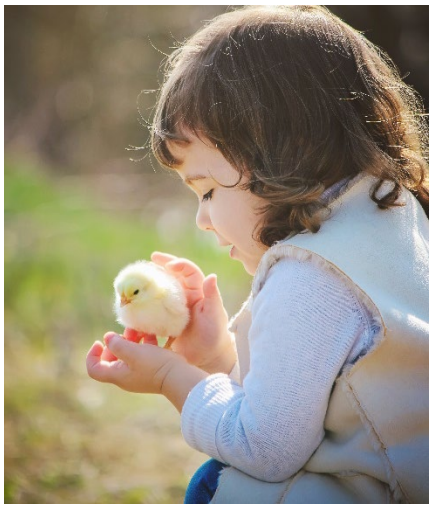
Child Accident Prevention Foundation of Australia
Western Australia



Kidsafe WA Childhood Injury Report: Injuries to Children in Regional Locations 2011-2015

Partner:

Government of **Western Australia**
Department of **Health**

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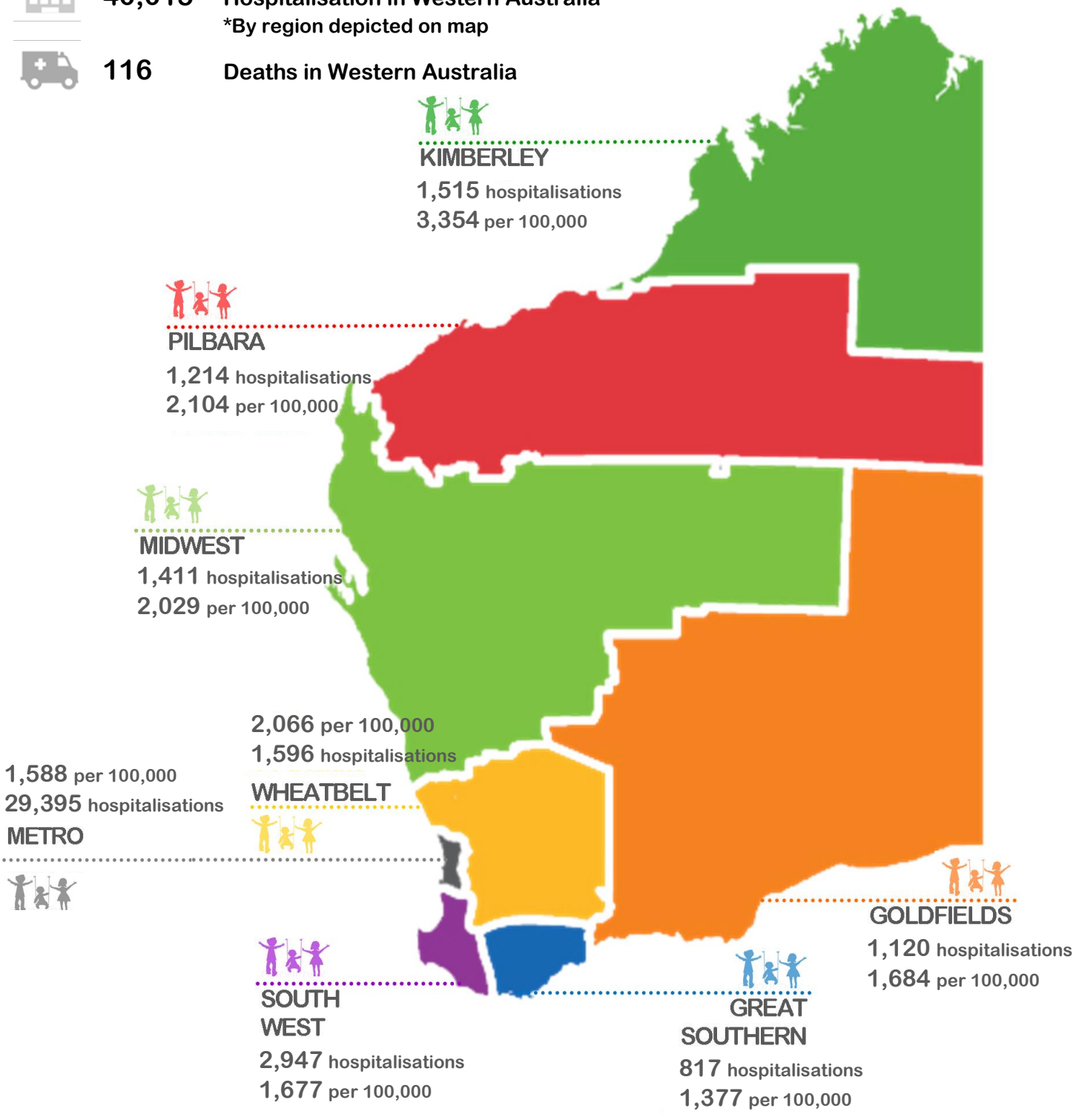


INTRODUCTION

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.

Epidemiology Branch, Department of Health Western Australia
Hospitalisation and death data utilised in this report was obtained from the Epidemiology Branch of the Department of Health Western Australia through the HealthTracks reporting software. The Epidemiology Branch is responsible for the collection and analysis of a wide range of population health data for Western Australia.

Perth Children's Hospital Emergency Department
The Emergency Department data utilised in this report was obtained from the Perth Children's Hospital Emergency Department (PCH ED) Injury Surveillance System (ISS). PCH is the only paediatric hospital in Western Australia and is the reference centre for paediatric illness and injury for the state. Every year approximately 60,000 children present to the Emergency Department (ED). The ISS is designed to capture all PCH ED injury presentations in children aged 0 to 16 years of age. This research report provides a summary of the Injury Surveillance System data collected at PMH and PCH between January 2011 and December 2015 relating to injuries occurring to children residing in regional locations within WA. While this data does not take into account all Emergency Department presentations in Western Australia, it offers a useful snapshot of injury occurrences.

Injuries to Children in Regional Locations
Injury is a leading cause of death in children aged between 0 and 14 years in Australia, as well as a major cause of hospitalisation.[1] In Western Australia, over 27 children die each year from preventable injuries, whilst a further 7,000 are hospitalised.[2]

Children residing in regional and remote areas are considerably more likely to be hospitalised for injury in comparison to children residing in metropolitan areas.[3] Of particular concern are the incidence of transport accidents (2.6 times more likely), burns and scalds (3.1 times more likely) and intentional self harm (1.5 times more likely)[3]. Furthermore, the injury hospitalisation rate for children residing in remote or very remote areas was almost 90 percent higher than metropolitan areas across Australia during 2010-11.[1]

Regional and remote areas of Western Australia are diverse both in terms of geography and demography, and as a result provide a range of challenges for both injury prevention and treatment.[4] The prevalence of certain occupations in regional areas such as farming and mining have been known to significantly increase the risk of death and serious injury.[4] Small populations spread across large areas can add difficulty to injury prevention initiatives. And similarly distance to adequate medical facilities can lead to considerable time to retrieve injured people and provide them with the appropriate care.[4]

Injury-related Deaths

Between 2011 and 2015 there were 116 recorded injury-related deaths in children residing in Western Australia (Table 1). Children under the age of five account for the largest number of childhood deaths relating to injury, followed by children aged between 10 and 14 years (Table 2).

Table 1: Number and Age-adjusted Rate (per 100,000 population) of Injury-related Deaths in Children in Western Australia aged 0-14 years, 2011-2015

Year	Injury-related Deaths (n (AAR))
2011	22 (4.82)
2012	24 (4.97)
2013	32 (6.53)
2014	19 (NA*)
2015	19 (NA*)

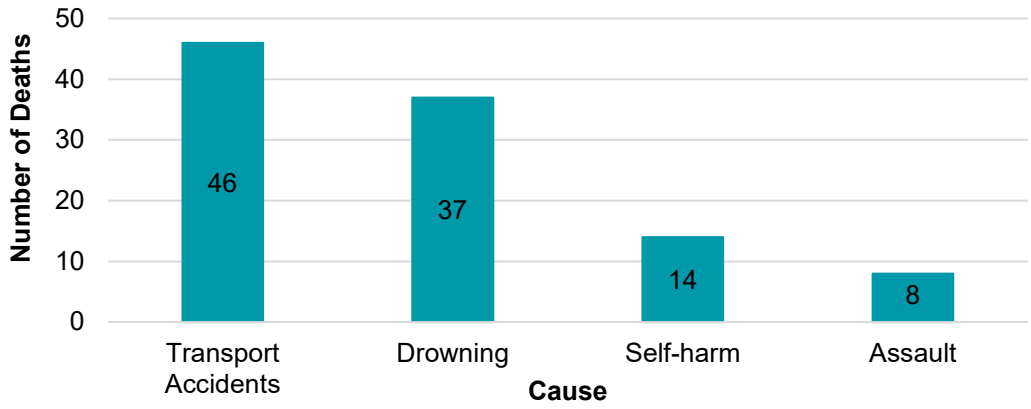
*Number of cases too small to generate a reliable result
AAR = Age-adjusted Rate

Table 2: Number and Age-adjusted Rate (per 100,000 population) of Injury-related Deaths in Children in Western Australia aged 0-14 years by Age Group, 2011-2015

Age Group	Injury-related Deaths in Female Children (n (AAR))	Injury-related Deaths in Male Children (n (AAR))	Injury-related Deaths (n (AAR))
0 - 4 years	26 (NA*)	29 (NA*)	55 (NA*)
5 - 9 years	NA* (NA*)	NA* (NA*)	15 (NA*)
10 - 14 years	19 (NA*)	23 (NA*)	42 (NA*)

The leading causes of injury related death were transport accidents (39.7%, n=46), Drowning (31.9%, n=37) and Self-harm (12.1%, n=14) (Figure 1).

Figure 1: Number of Injury-related Deaths in Children in Western Australia Aged 0-14 years by Cause, 2011-2015



Injury-related Hospitalisations

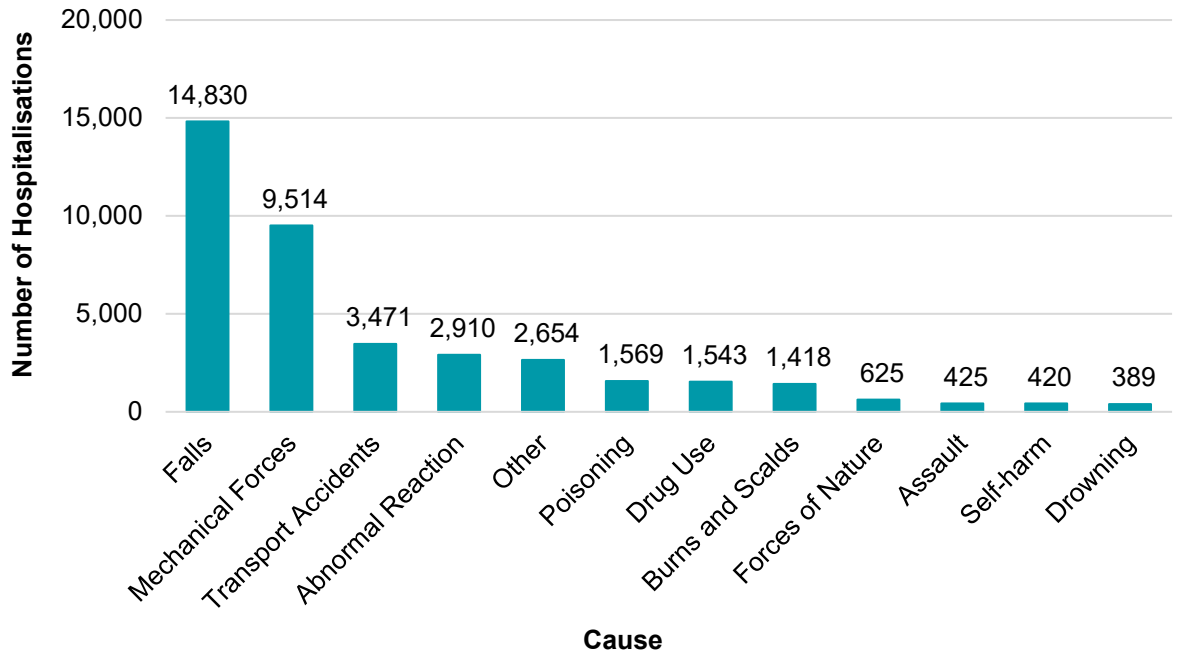
Over the five year period 40,015 children were hospitalised in Western Australia for an injury. Children aged between 0 and 4 years account for the highest number of injury-related hospitalisations accounting for 40.0 percent (n=15,998), followed by children aged between 10 to 14 (30.3%, n=12,125) and 5 to 9 years (29.7%, n=11,892) (Table 3). Age-adjusted rates per 100,000 population show a reduction in injury-related hospitalisations across all childhood age groups from 2011 to 2015. Of children that were hospitalised for injury, 61.0 percent (n=24,404) were male and 39.0 percent (n=15,611) female.

Table 3: Number and Age-adjusted Rate (per 100,000 population) of Injury-related Hospitalisations in Children in Western Australia aged 0-14 years by age Group, 2011-2015

Age Group	2011 (n (AAR))	2012 (n (AAR))	2013 (n (AAR))	2014 (n (AAR))	2015 (n (AAR))
0 - 4 years	3,209 (2,051.59)	3,342 (2,055.40)	3,305 (1,963.86)	3,209 (1,870.47)	2,933 (1,690.86)
5 - 9 years	2,242 (1,518.39)	2,441 (1,583.42)	2,416 (1,500.93)	2,363 (1,431.32)	2,430 (1,439.29)
10 - 14 years	2,514 (1,687.36)	2,576 (1,705.73)	2,454 (1,605.52)	2,285 (1,485.39)	2,296 (1,477.30)

The leading cause of injury-related hospitalisation in children is accidental falls (37.1%, n=14,829), followed by mechanical forces (23.8%, n=9,514) which can include collision, crush and striking based injuries (Figure 2). Transport accidents (8.7%, n=3,471) also account for a high number of injuries.

Figure 2: Number of Injury-related Hospitalisations in Children in Western Australia Aged 0-14 years by Cause, 2011-2015



Area of Residence

Based on Age-adjusted rate per 100,000 population, the Kimberley region had the highest rate of hospitalisation due to injury (AAR=3,353.59), followed by the Pilbara (AAR=2,103.60), the Wheatbelt (AAR=2,069.69) and the Midwest (AAR=2,028.59) (Table 4). The Great Southern (AAR=1,376.54) had the lowest rate of hospitalisation due to injury in Western Australia.

Table 4: Number and Age-adjusted Rate (per 100,000 population) of Injury-related Hospitalisations in Children aged 0-14 years by Region, 2011-2015

Region	2011 (n (AAR))	2012 (n (AAR))	2013 (n (AAR))	2014 (n (AAR))	2015 (n (AAR))	Total (n (AAR))
Metropolitan	5,831 (1,681.83)	6,052 (1,677.40)	6,017 (1,606.64)	5,843 (1,524.68)	5,652 (1,451.78)	29,395 (1,588.47)
Great Southern	175 (1,476.32)	190 (1,612.26)	160 (1,342.96)	129 (1,081.38)	163 (1,369.76)	817 (1,376.54)
Goldfields	256 (1,901.08)	241 (1,792.93)	228 (1,715.78)	212 (1,601.38)	183 (1,407.43)	1,120 (1,683.72)
Kimberley	284 (3,144.52)	336 (3,715.66)	299 (3,284.84)	281 (3,108.24)	315 (3,515.49)	1,515 (3,353.59)
Midwest	266 (1,918.92)	288 (2,073.18)	292 (2,083.01)	306 (2,193.43)	259 (1,874.42)	1,411 (2,028.59)
Pilbara	243 (2,116.07)	254 (2,163.19)	255 (2,177.84)	236 (2,086.54)	226 (1,974.36)	1,214 (2,103.60)
South West	574 (1,700.19)	671 (1,945.70)	642 (1,815.05)	523 (1,453.70)	537 (1,472.46)	2,947 (1,677.42)
Wheatbelt	336 (2,135.33)	327 (2,096.58)	282 (1,842.60)	327 (2,137.97)	324 (2,133.99)	1,596 (2,065.69)
Total	**7,965 (2,008.79)**	**8,359 (2,134.00)**	**8,175 (1,982.42)**	**7,857 (1,897.09)**	**7,659 (1,899.16)**	**40,015 (1,984.70)**

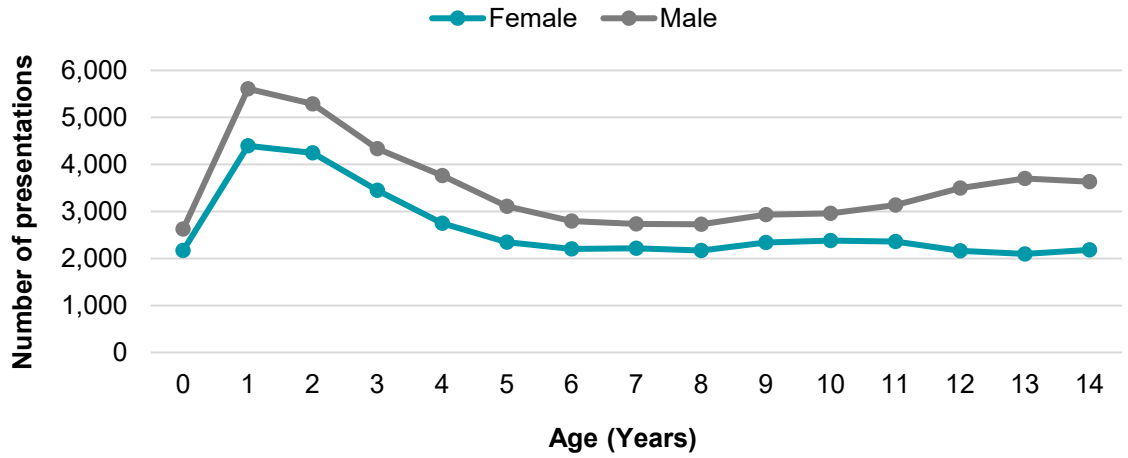
Injury-related Emergency Department Presentations

During the five year period between 2011 and 2015 a total of 92,323 children presented to the Perth Children's Hospital Emergency Department (PCH ED) as a result of an injury.

Demographic Data

Similarly to hospitalisations, children under the age of five accounted for the highest number of injury-related presentations accounting for 41.8 percent (n=38,619) (Figure 3). This was followed by children between the ages of 10 and 14 (30.4%, n=28,104) and 5 and 9 (27.7%, n=25,567). Males presented to PCH ED more frequently than females accounting for 57.3 percent (n=52,895) of presentations. Of children presenting to the PCH ED for injury, 4.1 percent (n=3,769) identify as Aboriginal the remainder are either undetermined or other.

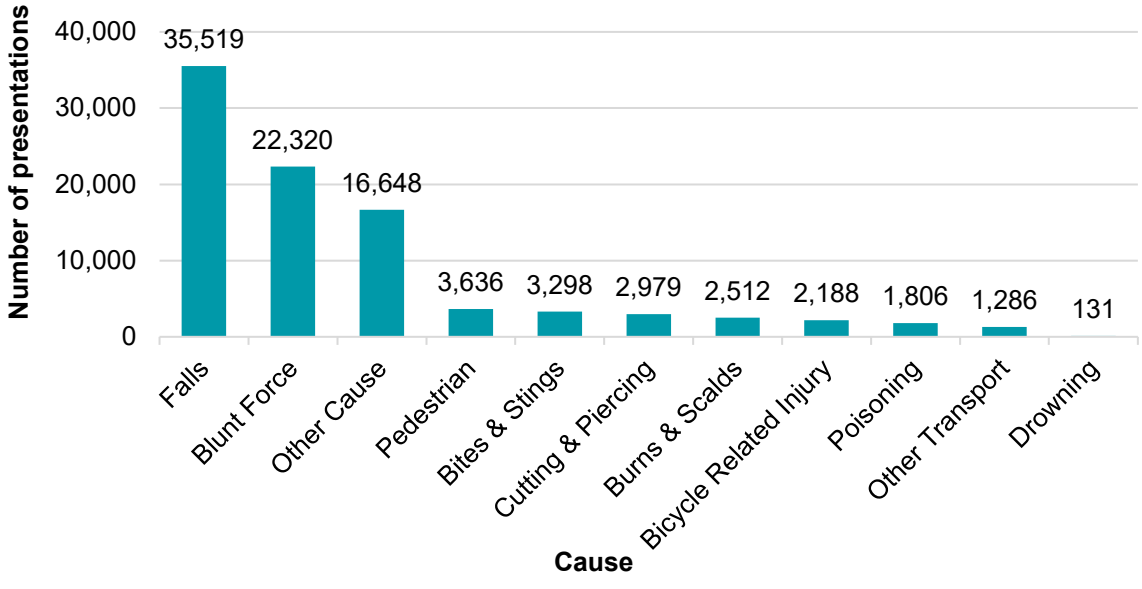
Figure 3: Number of Injury-related PCH ED Presentations in Children Aged 0-14 years by Age and Gender, 2011-2015



Injury Data

The leading cause of injury-related ED presentations in children is falls (38.5%, n=35,519), followed by blunt force (24.2%, n=22,320) which can include collision, crush and striking based injuries (Figure 4).

Figure 4: Number of Injury-related PCH ED Presentations in Children Aged 0-14 years by Cause, 2011-2015

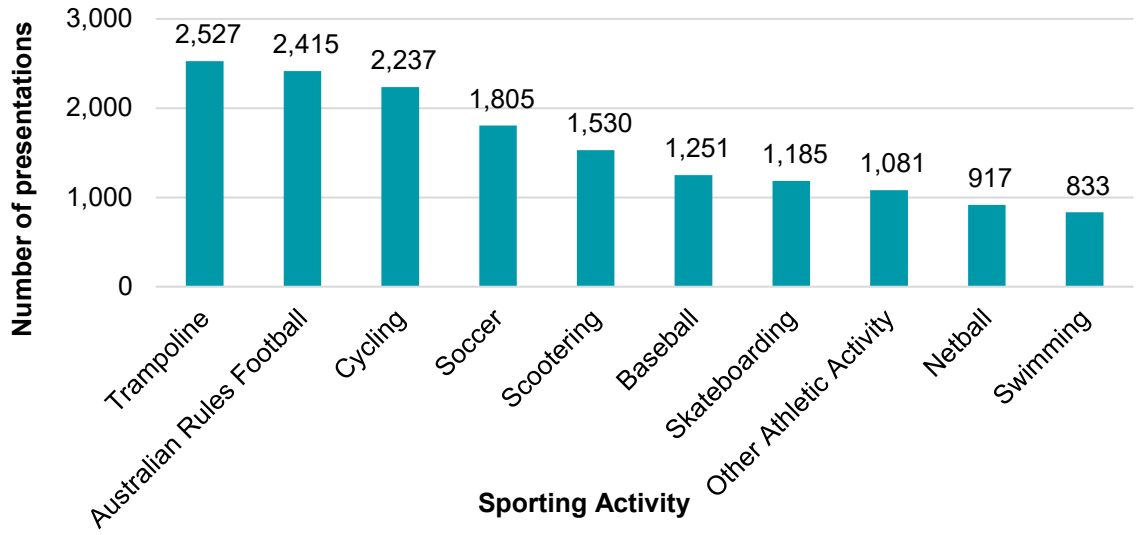


The majority of injuries to children presenting to PCH ED occurred as a result of unintentional circumstances (97.7%, n=90,178). The remainder were recorded as either alleged assault (0.6%, n=548), intentional self harm (1.2%, n= 1,139) or undetermined (0.5%, n=458).

Over half of all injury-related presentations are recorded as occurring in an unknown location (55.4%, n=51,173). Where a location is known, the Home is the most commonly associated location for injury to occur (22.6%, n=20,863), followed by School (10.5%, n=9,651) and Recreational and Cultural Areas (4.8%, n=4,421).

Sporting activities were related to 21.6 percent (n=19,956) of injuries to PCH ED. The most common sporting activities include trampolining (12.7%, n=2,527), Australian rules football (12.1%, n=2,415) and cycling (11.2%, n=2,237) (Figure 5).

Figure 5: Number of Injury-related PCH ED Presentations in Children Aged 0-14 years by Sporting Activity, 2011-2015



Assessment Data

Every child that presents to PCH ED is allocated a triage category based on the seriousness of the injury and medical attention required (Table 5). The majority of presentations were allocated a triage category of 4 - Semi-urgent (77.8%, n=71,829) followed by 3 - Urgent (18.6%, n=17,198) and 2 - Emergency (2.7%, n=2,521). Only a small number of presentations were triaged as either Resuscitation (0.5%, n=495) or Non-Urgent (0.3%, n=273).

Table 5: PCH ED Triage Table

Triage Category	Seen Within (Minutes)
(1) Resus	0
(2) Emergency	10
(3) Urgent	30
(4) Semi-urgent	60
(5) Non-urgent	120

Most children that presented to PCH ED with an injury were referred by themselves or a relative (84.6%, n=78,151). The remainder were referred by a general practitioner (6.4%, n=5,880) or another hospital (5.9%, n=5,483).

The majority of children were able to depart the PCH ED with treatment complete (83.2%, n=76,845). A further 15.7 percent (n=14,513) were admitted to hospital for additional treatment. A small number of presentations did not wait for treatment (1.0%, n=890) and the remainder were unknown (0.1%, n=75).

Area of Residence

The largest number of children presenting to PCH ED were recorded as residing within the Perth Metropolitan Area (94.0%, n=86,768) (Table 6). Just under five percent of children resided within regional Western Australia (4.6%, n=4,268) and the remainder were either interstate, international or unknown.

Table 6: Number of Injury-related PCH ED Presentations in Children Aged 0-14 years by Region, 2011-2015

Region	2011	2012	2013	2014	2015	Total
Metropolitan	17,155	17,281	17,308	18,104	16,920	86,768
Great Southern	58	57	86	63	58	322
Goldfields	70	85	78	60	56	349
Kimberley	63	80	54	68	77	342
Midwest	115	127	114	124	102	582
Pilbara	103	106	121	80	94	504
South West	143	130	118	123	117	631
Wheatbelt	373	282	256	303	324	1,538
Other	249	301	243	278	216	1,287
Total	**18,329**	**18,449**	**18,378**	**19,203**	**17,964**	**92,323**

The remainder of this report examines injury presentations to PCH ED by regional location. Postcode was used to determine health region reflecting place of residence rather than the place of injury occurrence.

PERTH METROPOLITAN AREA

Perth is Western Australia's state capital and largest populated city. The Perth Metropolitan area is divided into the North, South and East Metropolitan Health Services, covering around 10,000 square kilometres. Health Services and Hospitals in the Metropolitan region include Peth Children's Hospital, Sir Charles Gairdner, Osborne Park, King Edward Memorial, Kalamunda, Midland, Armadale, Bentley, Fiona Stanley, Fremantle, Rockingham and Royal Perth Hospital.[5]

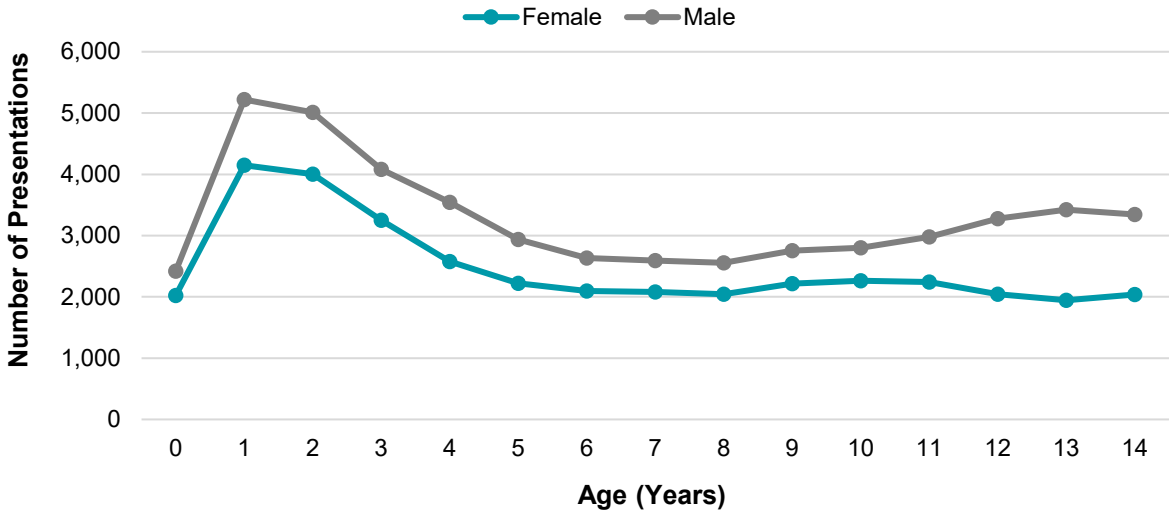
Injury-related Hospitalisation
Over the five year period 29,395 children (1,588.47 per 100,000 population) were hospitalised in the Perth Metropolitan Area for an injury. Males accounted for 60.8 percent (n=17,885) of hospitalisations and females the remaining 39.2 percent (n=11,510). Aboriginal children accounted for 5.0 percent of hospitalisations (n=1,471).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 86,768 children residing in the Perth Metropolitan Area presented to the PCH ED as a result of an injury, representing 94.0 percent of injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to PCH ED (41.8%, n=30,158), followed by children aged between 10 and 14 years (30.4%, n=26,355) and children between 5 and 9 (27.8%, n=24,138) (Figure 6). Males presented to PCH ED more frequently (57.5%, n=49,585) than females. Aboriginal children accounted for 3.2 percent (n=2,831) of presentations.

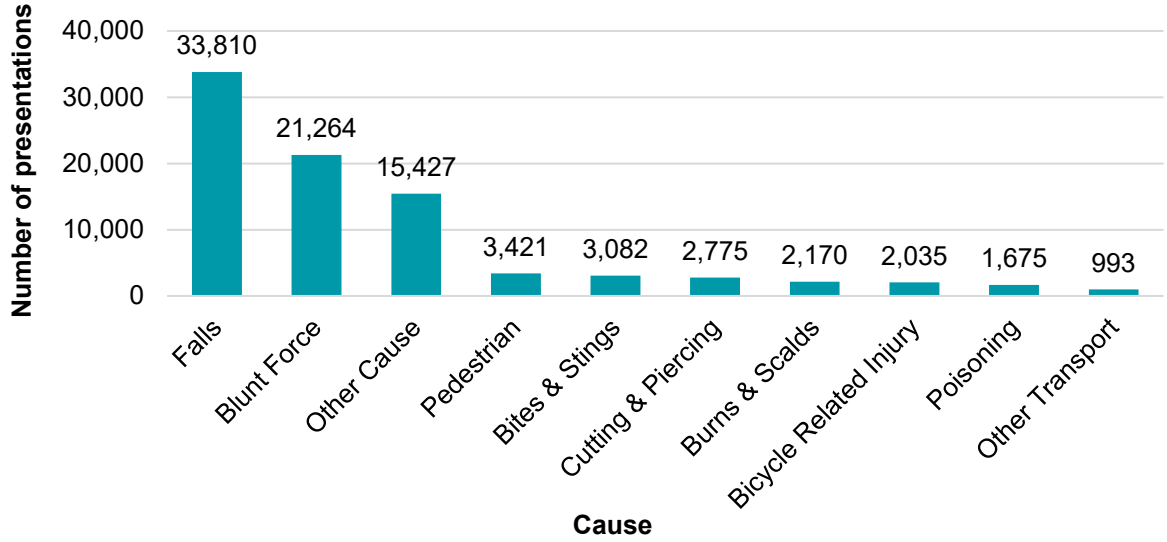
Figure 6: Number of Injury-related PCH ED Presentations in Children Aged 0-14 years Residing in the Metro Area by Age and Gender, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (39.0%, n=33,810) followed by Blunt Force (24.5%, n=21,264), Other Cause (17.8%, n=15,427) and Pedestrian-related Injuries (3.9%, n=3,421) (Figure 7). Unintentional injuries accounted for 97.7 percent (n=84,788) of presentations to PCH ED. This was followed by intentional self-harm (1.2%, n=1,070), alleged assault (0.6%, n=494) or unknown (0.5%, n=416).

Figure 7: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Metro Area by Cause, 2011-2015



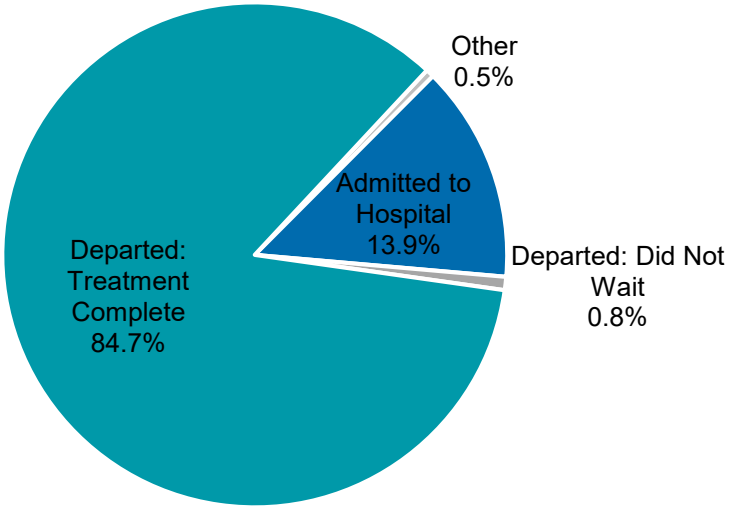
The Home is the most commonly associated location for injury to occur (23.0%, n=19,983), followed by School (10.7%, n=18) and Recreational and Cultural Areas (4.8%, n=4,180).

Assessment Data

Most children that presented to PCH ED with an injury were referred by themselves or a relative (86.5%, n=75,051), followed by a general practitioner (6.4%, n=5,564), and other hospital (4.4%, n=3,781).

A large proportion of children residing in the Perth Metropolitan Area were allocated a triage category of Semi-urgent (78.7%, n=68,278), followed by Urgent (18.1%, n=15,673) and Emergency (2.5%, n=2,211). Most of the children that presented to PCH ED for injuries in the Perth Metropolitan area were discharged after treatment was complete (84.7%, n=73,499) and a further 13.9 percent (n=12,070) of children were admitted to hospital for further treatment (Figure 8).

Figure 8: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Metro Area by Outcome of Attendance, 2011-2015



GREAT SOUTHERN

The Great Southern region is located on the southern coast of Western Australia. Albany is the region's major population centre located a 409km drive from Perth. Other main towns include Katanning, Denmark, Mt Barker, Kojonup, Gnowangerup and Ravensthorpe.[6] The region covers 39,000 sq km, representing 1.5 percent of the of the state's total area.[6] The Great Southern has the fifth biggest population accounting for 2.4 percent of the state's population, with children aged 0-14 years making up 19 percent of the region's population and Aboriginal people 4.5 percent of the population.[7] There are 10 hospitals throughout the Great Southern region, with major facilities located in Albany.[6]

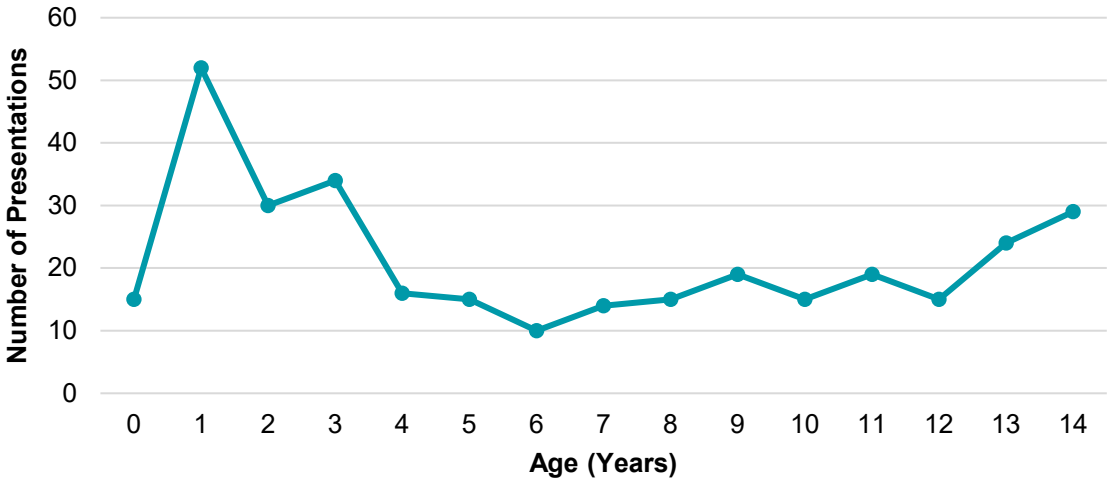
Injury-related Hospitalisation
Over the five year period 817 children (1376.5 per 100,000 population) were hospitalised in the Great Southern for an injury. Males accounted for 62.2 percent (n=508) of hospitalisations and females the remaining 37.8 percent (n=309). Aboriginal children accounted for 9.5 percent of hospitalisations (n=78).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 322 children residing in the Great Southern presented to PCH ED as a result of an injury. This represents 7.5 percent of injury presentations from regional WA and 0.3 percent of total injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to the PCH ED (45.6%, n=147), followed by children aged between 10 and14 years (31.7%, n=102) and children between 5 and 9 (22.7%, n=73) (Figure 9). Similarly to hospitalisations, males presented to PCH ED more frequently than females accounting for 59.6 percent (n=192) of presentations. Aboriginal children accounted for 16.1 percent (n=52) of presentations.

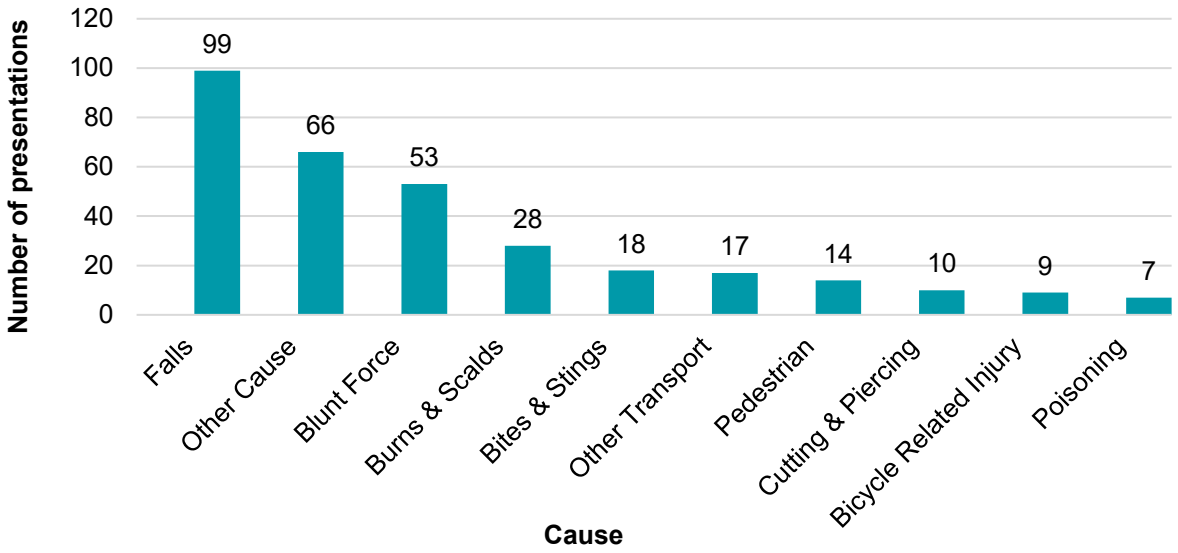
Figure 9: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Great Southern by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (30.7%, n=99), followed by Other Cause (20.5%, n=66), Blunt Force (16.4%, n=53) and Burns and Scalds (8.7%, n= 28) (Figure 10).

Figure 10: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Great Southern by Cause, 2011-2015

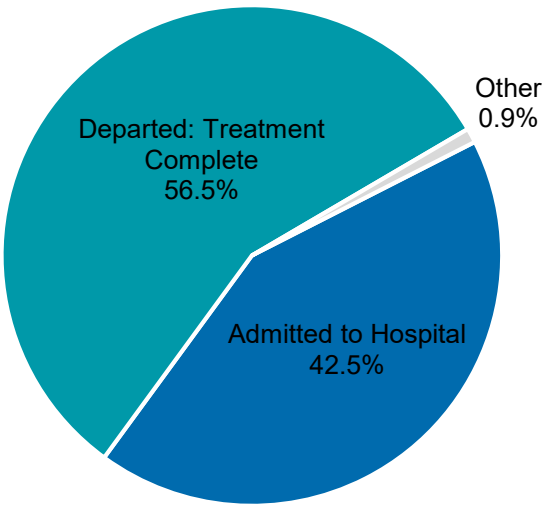


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the Great Southern (96.8%, n=312). The Home is the most commonly associated location for injury to occur (20.8%, n=67), followed by School (5.5%, n=18) and Recreational and Cultural Areas (5.3%, n=17).

Assessment Data

Most children that presented to PCH ED with an injury were referred by themselves or a relative (63.6%, n=205). The remainder were referred by another hospital (27.3%, n=88) or a general practitioner (6.2%, n=20). Nearly two-thirds of Great Southern children were allocated a triage category of Semi-urgent (62.4%, n=201), followed by Urgent (28.6%, n=92) and Emergency (6.5%, n=21). Fifty-five percent of children were able to depart the ED with treatment complete (55.3%, n=178). A further 37.9% (n=122) of children were admitted to hospital for further treatment (Figure 11).

Figure 11: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Great Southern by Outcome of Attendance, 2011-2015



GOLDFIELDS

The Goldfields is located in the south eastern corner of Western Australia. Kalgoorlie/Boulder is the region's major population centre located a 595km drive from Perth. Other main towns include Coolgardie, Leonora and Esperance. The region covers 770,488 sq km and is the largest region within WA.[8] The Goldfields has the second smallest population accounting for 2.1 percent of the state's population, with children aged 0-14 years making up 22 percent of the region's population and Aboriginal people 12 percent of the population.[9] There are five hospitals throughout the Goldfields, with major facilities located in Kalgoorlie and Esperance.[8]

Injury-related Hospitalisation

Over the five year period 1,120 children (1,683.72 per 100,000 population) were hospitalised in the Goldfields for an injury. Males accounted for 60.1 percent (n=673) of hospitalisations and females the remaining 39.9 percent (n=447). Aboriginal children accounted for 26.8 percent of hospitalisations (n=300).

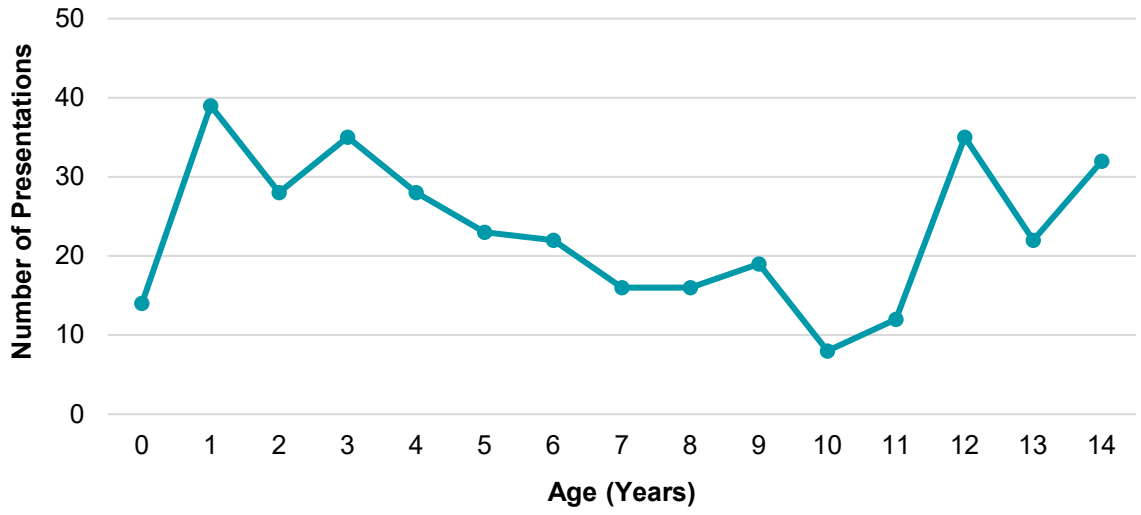
Injury-related Emergency Department Presentations

Between 2011 and 2015, 349 children residing in the Goldfields presented to PCH ED as a result of an injury. This represents 8.2 percent of injury presentations from regional WA and 0.4 percent of total injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to PCH ED (41.3%, n=144), followed by children aged between 10 and14 years (31.2%, n=109) and children between 5 and 9 (27.5%, n=96) (Figure 12). Similarly to hospitalisations, males presented to PCH ED more frequently than females accounting for 61.6 percent (n=215) of presentations. Aboriginal children accounted for 24.3 percent (n=85) of presentations.

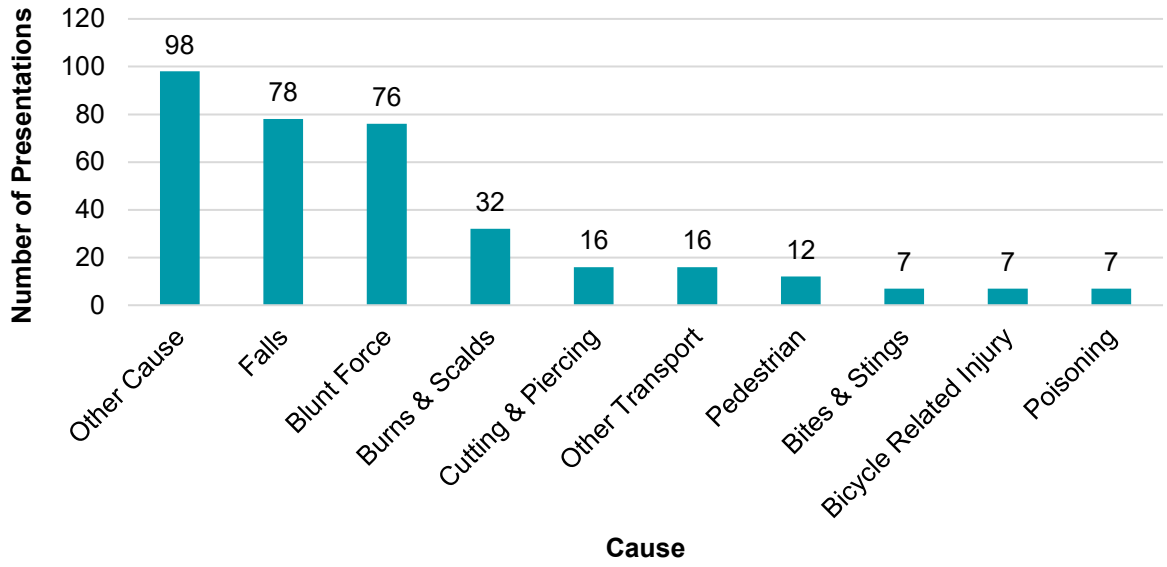
Figure 12: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Goldfields by Age, 2011-2015



Injury Data

Other Cause is the leading cause of injury-related ED presentations (28.1%, n=98), followed Falls by (22.4%, n=78), Blunt Force (21.8%, n=76) and Burns and Scalds (9.2%, n= 32) (Figure 13).

Figure 13: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Goldfields by Cause, 2011-2015

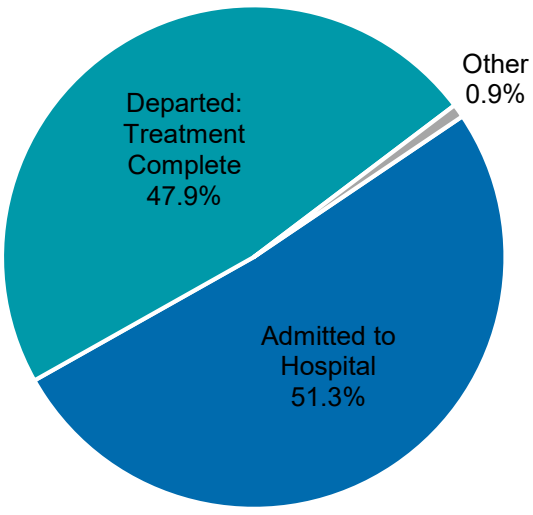


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the Goldfields (96.5%, n=337). The Home is the most commonly associated location for injury to occur (12.3%, n=43), followed by School (7.1%, n=25) and Recreational and Cultural Areas (2.6%, n=9).

Assessment Data

Over half of all children that presented to PCH ED with an injury were referred by themselves or a relative (55.6%, n=194). The remaining children were predominately referred by another hospital (37.5%, n=131) or a general practitioner (4.9%, n=17). Nearly two-thirds of Goldfields children were allocated a triage category of Semi-urgent (63.0%, n=220), followed by Urgent (29.8%, n=104) and Emergency (5.2%, n=18). More than half of children were admitted to hospital for further treatment (51.3%, n=179). A further 47.9 percent (n=167) of children were able to depart the ED with treatment complete (Figure 14).

Figure 14: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Goldfields by Outcome of Attendance, 2011-2015



KIMBERLEY

The Kimberley is the most northern region in WA and covers 424,517 sq km. Broome is the region's major population centre located a 2,239km drive from Perth. Other main towns include Derby, Wyndham, Kununurra, Fitzroy Crossing and Halls Creek.[10] The Kimberley has the smallest population accounting for 1.4 percent of the state's population, with children aged 0-14 years making up 25 percent of the region's population and Aboriginal people 45 percent of the population.[11] There are 6 hospitals throughout the Kimberley, with major facilities located in Broome.[10]

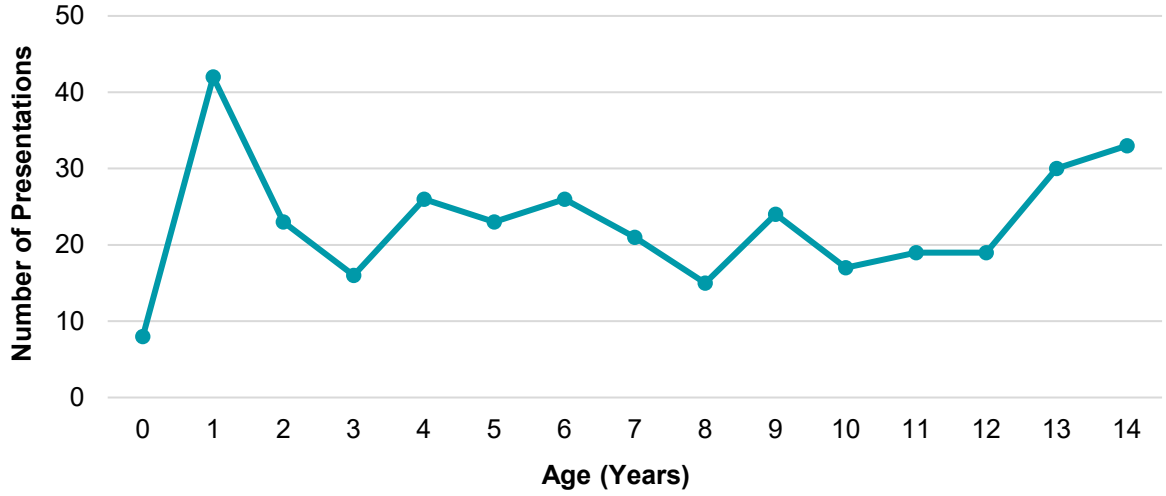
Injury-related Hospitalisation
Over the five year period 1,515 children (3,353.59) per 100,000 population) were hospitalised in the Kimberley for an injury. Males accounted for 60 percent (n=909) of hospitalisations and females the remaining 40.0 percent (n=606). Aboriginal children accounted for 78.3 percent of hospitalisations (n=1,187).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 342 children residing in the Kimberley presented to PCH ED as a result of an injury. This represents 8.0 percent of injury presentations from regional WA and 0.4 percent of total injury presentations.

Demographic Data

Children between the ages of 10 and 14 accounted for the highest number of injury presentations to PCH ED (34.5%, n=118) followed by children under the age of five (33.6%, n=115), and children aged between 5 and 9 (31.9%, n=109). Unlike other regions the number of injuries remains fairly consistent across all age groups (Figure 15). Similarly to hospitalisations, males presented to PCH ED more frequently than females accounting for 58.5 percent (n=200) of presentations. Aboriginal children accounted for 59.4 percent (n=203) of presentations.

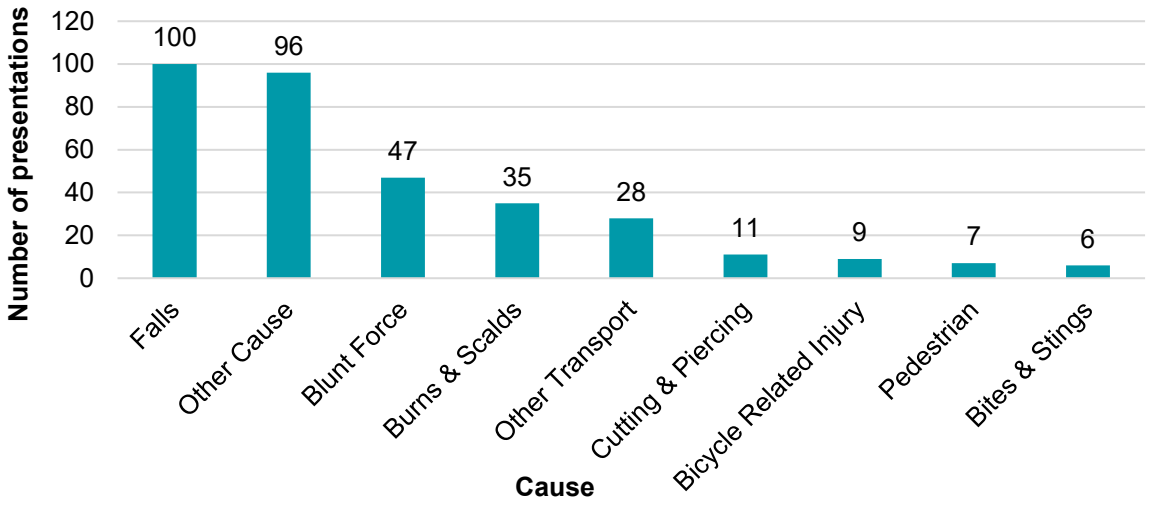
Figure 15: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Kimberley by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (29.2%, n=100), followed by Other Cause (28.1%, n=96), Blunt Force (13.7%, n=47) and Burns and Scalds (10.2%, n= 35) (Figure 16).

Figure 16: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Kimberley by Cause, 2011-2015

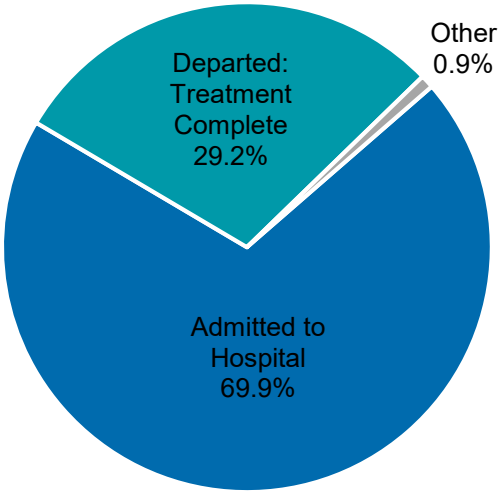


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the Kimberley (97.6%, n=334). The Home is the most commonly associated location for injury to occur (9.9%, n=34), followed by School (4.1%, n=14) and Road, Footpath, Cycleway or Parking (3.5%, n=12).

Assessment Data

Over half of all children that presented to PCH ED with an injury were referred by another hospital (50.3%, n=172). The remaining children were predominately referred by themselves or a relative (42.1%, n=144) or a general practitioner (3.8%, n=13). Nearly two-thirds of Kimberley children were allocated a triage category of Semi-urgent (63.5%, n=217), followed by Urgent (29.2%, n=100) and Emergency (4.1%, n=14). A large proportion of children were admitted to hospital for further treatment (69.9%, n=239). A further 29.2 percent (n=100) of children were able to depart the ED with treatment complete (Figure 17).

Figure 17: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Kimberley by Outcome of Attendance, 2011-2015



MIDWEST

The Midwest is located in the northern middle section of Western Australia covering 470,000 sq km. Geraldton is the region's major population centre located a 425km drive from Perth. Other main towns include Exmouth, Carnarvon, Meekatharra and Morawa.[12] The Midwest has the fourth biggest population accounting for 2.5 percent of the state's population, with children aged 0-14 years making up 20 percent of the region's population and Aboriginal people 13 percent of the population.[13] There are seven hospitals throughout the Midwest, with major facilities located in Geraldton.[12]

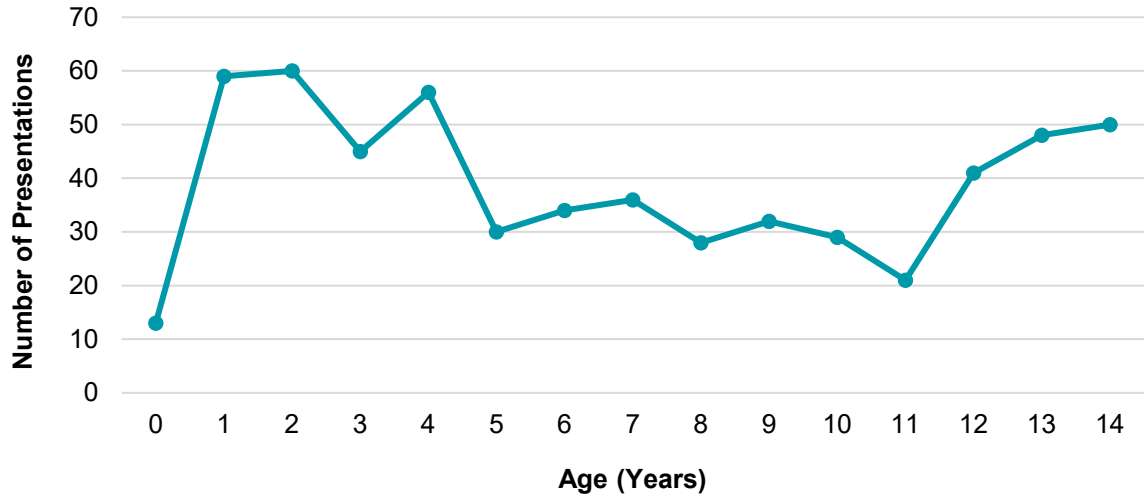
Injury-related Hospitalisation
Over the five year period 1,411 children (2,028.59 per 100,000 population) were hospitalised in the Midwest for an injury. Males accounted for 61.2 percent (n=864) of hospitalisations and females the remaining 38.8 percent (n=547). Aboriginal children accounted for 31.8 percent of hospitalisations (n=448).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 582 children residing in the Midwest presented to PCH ED as a result of an injury. This represents 13.6 percent of injury presentations from regional WA and 0.6 percent of total injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to the PCH ED (40.0%, n=233), followed by children aged between 10 and14 years (32.5%, n=189) and children between 5 and 9 (27.5%, n=160) (Figure 18). Similarly to hospitalisations, males presented to the PCH ED more frequently than females accounting for 62.2 percent (n=362) of presentations. Aboriginal children accounted for 28.9 percent (n=168) of presentations.

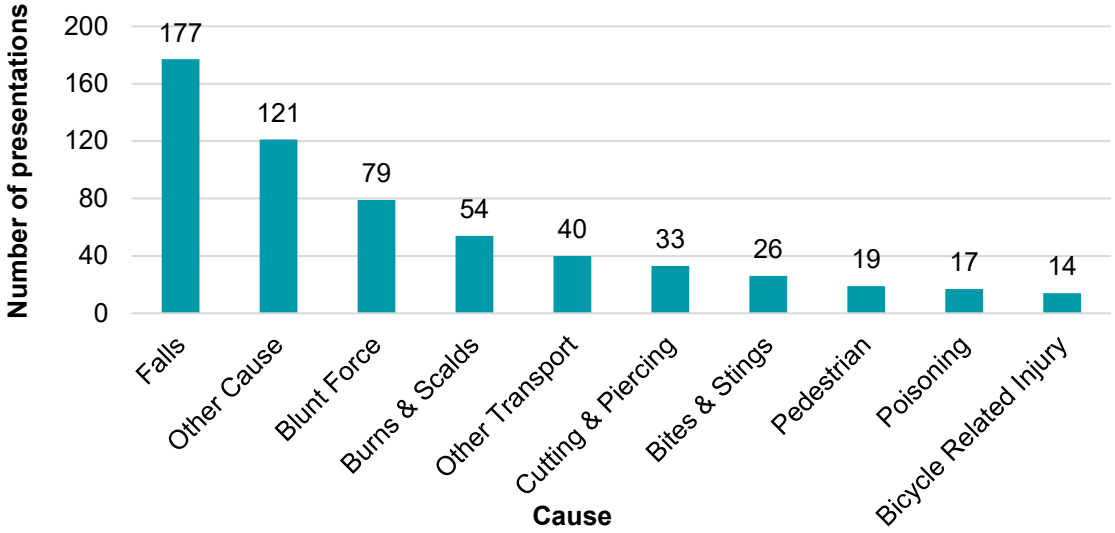
Figure 18: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Midwest by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (30.4%, n=177), followed by Other Cause (20.8%, n=121), Blunt Force (13.6%, n=79) and Burns and Scalds (9.3%, n= 54) (Figure 19).

Figure 19: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Midwest by Cause, 2011-2015

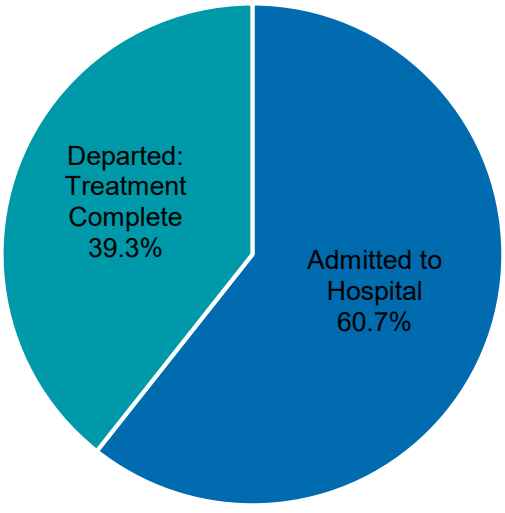


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the Kimberley (97.9%, n=570). The Home is the most commonly associated location for injury to occur (15.1%, n=88), followed by School (4.0%, n=23) and Road, Footpath, Cycleway or Parking (3.6%, n=21).

Assessment Data

Almost half of all children that presented to PCH ED with an injury were referred by another hospital (47.6%, n=277). The remaining children were predominately referred by themselves or a relative (45.4%, n=264) or a general practitioner (4.6%, n=27). Just over 60 percent of Midwest children were allocated a triage category of Semi-urgent (60.1%, n=350), followed by Urgent (31.4%, n=183) and Emergency (6.2%, n=36). A large proportion of children were admitted to hospital for further treatment (60.7%, n=353). A further 39.3 percent (n=229) of children were able to depart the ED with treatment complete (Figure 20).

Figure 20: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Midwest by Outcome of Attendance, 2011-2015



PILBARA

The Pilbara is the second most northern region in Western Australia and covers 507,896 sq km. Karratha is the region's major population centre located a 1,538km drive from Perth. Other main towns include Port Hedland, Newman, Onslow, Tom Price, Paraburdoo and Roebourne.[14] The Pilbara has the third smallest population ahead of only the Kimberley and Goldfield regions. It accounts for 2.4 percent of the state's population, with children aged 0-14 years making up 20 percent of the region's population and Aboriginal people 16 percent of the population.[15] There are seven hospitals throughout the Pilbara region, with major facilities located in South Hedland.[14]

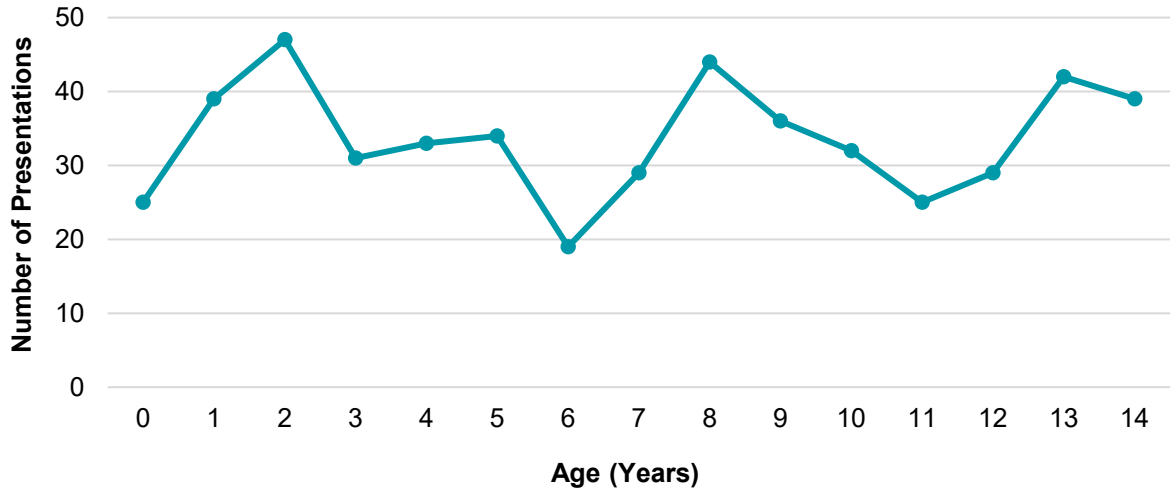
Injury-related Hospitalisation
Over the five year period 1,214 children (2,103.6 per 100,000 population) were hospitalised in the Pilbara for an injury. Males accounted for 62.9 percent (n=763) of hospitalisations and females the remaining 37.1 percent (n=451). Aboriginal children accounted for 41.4 percent of hospitalisations (n=502).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 504 children residing in the Kimberley presented to PCH ED as a result of an injury. This represents 11.8 percent of injury presentations from regional WA and 0.5 percent of total injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to the PCH ED (34.7%, n=175), followed by children aged between 10 and 14 years (33.1%, n=167) and children between 5 and 9 (32.1%, n=162) (Figure 21). Similarly to the Kimberley the number of injuries remains fairly consistent across all age groups. Males presented to PCH ED more frequently than females accounting for 62.7 percent (n=316) of presentations. And Aboriginal children accounted for 31.3 percent (n=158) of presentations.

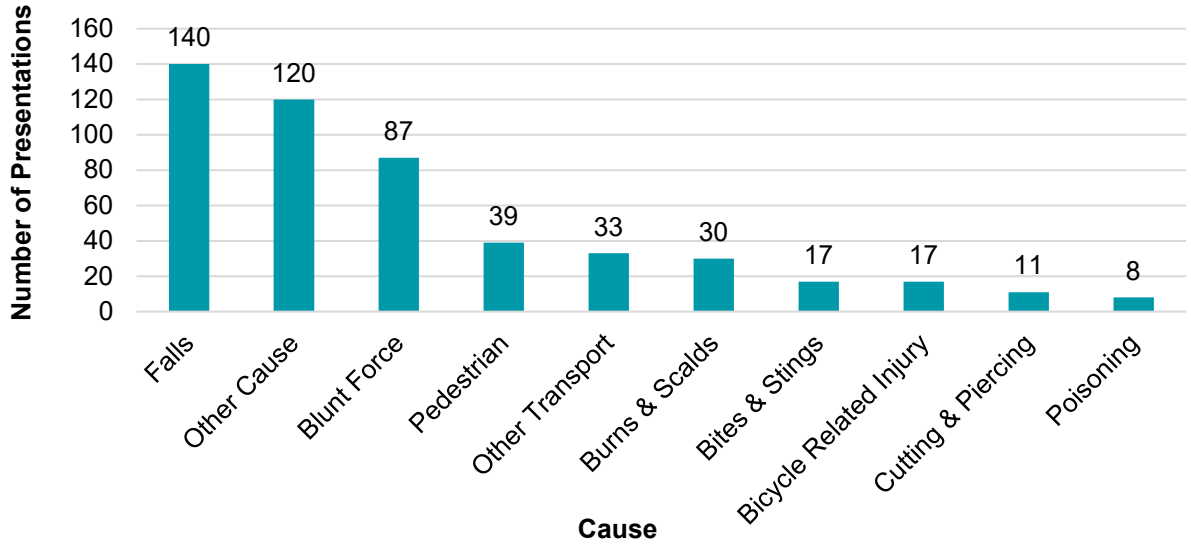
Figure 21: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Pilbara by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (27.8%, n=140), followed by Other Cause (23.8%, n=120), Blunt Force (17.3%, n=87) and Pedestrian-related injuries (7.7%, n=39) (Figure 22).

Figure 22: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Pilbara by Cause, 2011-2015

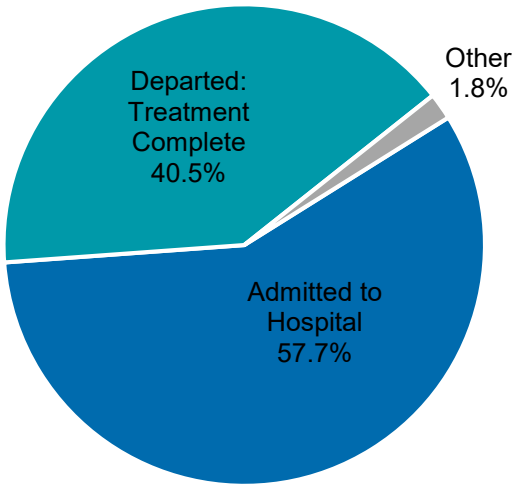


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the Pilbara (97.2%, n=490). The Home is the most commonly associated location for injury to occur (14.9%, n=75), followed by School (5.6%, n=28) and Recreation or Cultural Area (4.6%, n=13).

Assessment Data

Almost half of all children that presented to PCH ED with an injury were referred by another hospital (47.0%, n=237). The remaining children were predominately referred by themselves or a relative (43.5%, n=219) or a general practitioner (6.3%, n=32). Just over 60 percent of Pilbara children were allocated a triage category of Semi-urgent (60.5%, n=305), followed by Urgent (30.8%, n=155) and Emergency (6.2%, n=31). Over half of all Pilbara children were admitted to hospital for further treatment (57.7%, n=291). A further 40.5 percent (n=204) of children were able to depart the ED with treatment complete (Figure 23).

Figure 23: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Pilbara by Outcome of Attendance, 2011-2015



SOUTH WEST

The South West region is located on the south-west corner of Western Australia and covers 23,998 sq km. Busselton is the region's major population centre located a 221km drive from Perth. Other main towns include Bunbury, Collie, Manjimup and Margaret River.[16] The South West has the second biggest population after the Perth Metropolitan Area accounting for 7 percent of the state's population, with children aged 0-14 years making up 20.6 percent of the region's population and Aboriginal people 2.6 percent of the population.[17] There are 12 hospitals throughout the South west region, with major facilities located in Bunbury.[16]

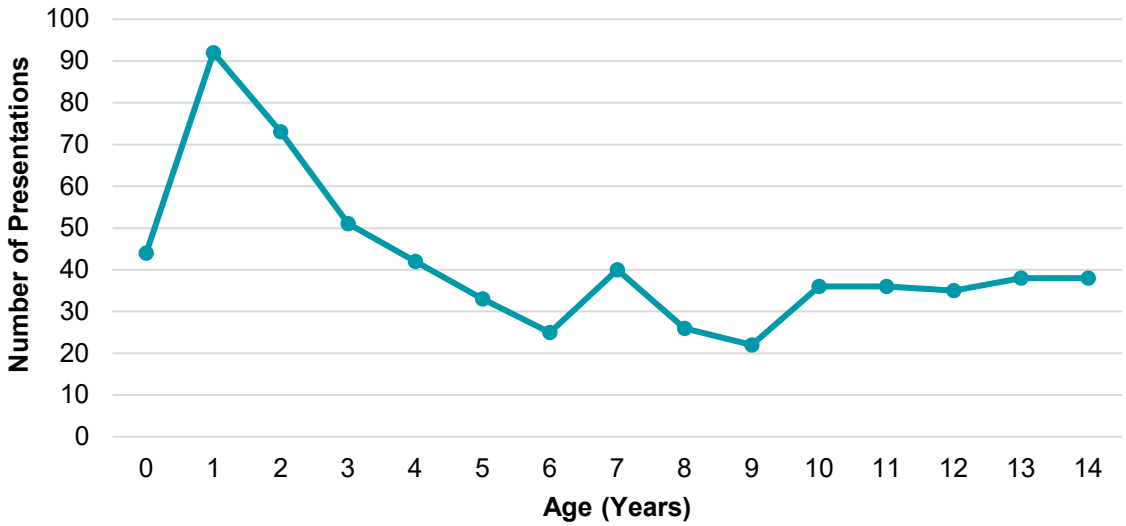
Injury-related Hospitalisation
Over the five year period 2,947 children (1,677.42 per 100,000 population) were hospitalised in the South West for an injury. Males accounted for 60.4 percent (n=1,781) of hospitalisations and females the remaining 39.6 percent (n=1,166). Aboriginal children accounted for 5.0 percent of hospitalisations (n=148).

Injury-related Emergency Department Presentations
Between 2011 and 2015, 631 children residing in the South West presented to PCH ED as a result of an injury. This represents 14.8 percent of injury presentations from regional WA and 0.7 percent of total injury presentations.

Demographic Data

Children under the age of five accounted for the highest number of injury presentations to PCH ED (47.9%, n=302), followed by children aged between 10 and 14 years (29.0%, n=183) and children between 5 and 9 (23.1%, n=146) (Figure 24). Males presented to PCH ED more frequently than females accounting for 56.4 percent (n=356) of presentations. And Aboriginal children accounted for 5.9 percent (n=37) of presentations.

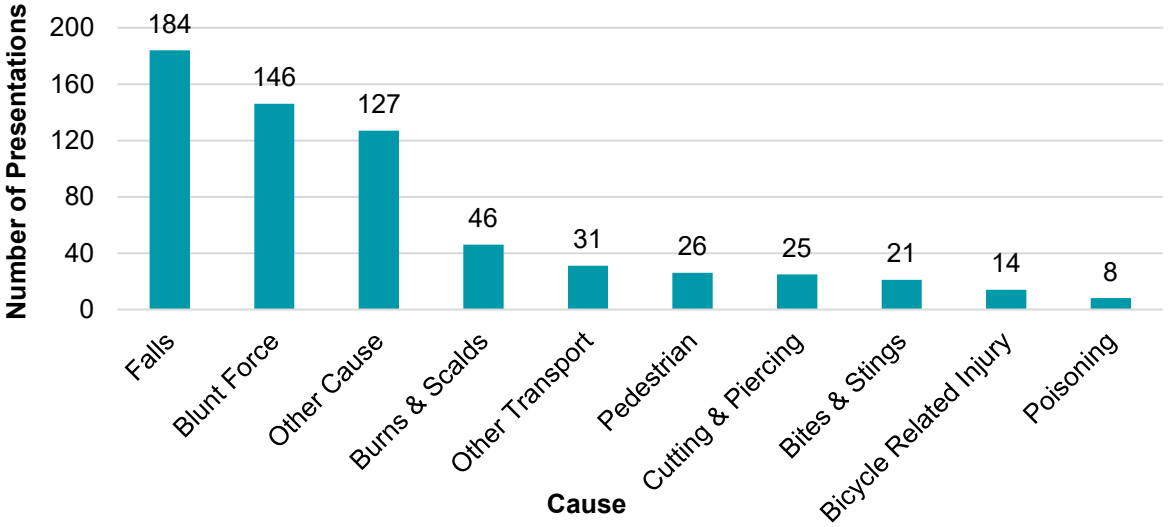
Figure 24: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the South West by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (29.2%, n=184), followed by Blunt Force (23.1%, n=146), Other Cause (20.1%, n=127) and Burns and Scalds (7.3%, n=46) (Figure 25).

Figure 25: Number of Injury-related PCH ED Presentations in children Aged 0-14 Years Residing in the South West by Cause, 2011-2015

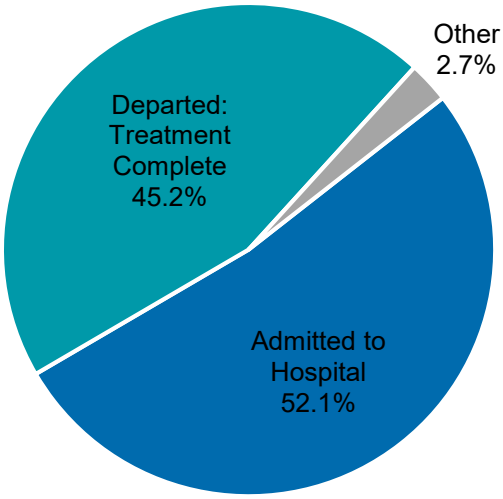


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the South West (96.4%, n=608). The Home is the most commonly associated location for injury to occur (19.7%, n=124), followed by School (5.5%, n=35) and Recreation or Cultural Area (4.4%, n=28).

Assessment Data

The majority of all children that presented to PCH ED with an injury were referred by themselves or a relative (53.2%, n=336). The remaining children were predominately referred by another hospital (39.1%, n=247) or a general practitioner (4.4%, n=28). Over half of South West children were allocated a triage category of Semi-urgent (55.3%, n=349), followed by Urgent (34.4%, n=217) and Emergency (7.9%, n=50). Similarly over half of all South West children were admitted to hospital for further treatment (52.1%, n=329). A further 45.1 percent (n=285) of children were able to depart the ED with treatment complete (Figure 26).

Figure 26: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the South West by Outcome of Attendance, 2011-2015



WHEATBELT

The Wheatbelt region partially surrounds the eastern and northern parts of the Perth Metropolitan Area and extends to meet the Midwest, Goldfields, South West and Great Southern Regions of Western Australia. It covers 155,256 sq km. Northam is the region's major population centre located a 97km drive from Perth. Other main towns include Narrogin, Merredin, Moora, Bindoon, Jurien Bay, York and Toodyay.[18] The Wheatbelt has the third biggest population after the Perth Metropolitan Area and South West. It accounts for 3 percent of the state's population, with children aged between 0 and 14 years making up 18.9 percent of the region's population and Aboriginal people 6 percent of the population.[19] There are 22 hospitals throughout the Wheatbelt region, with district hospitals located in Narrogin, Merredin, Northam and Moora.[18]

Injury-related Hospitalisation

Over the five year period 1,596 children (2,069.29 per 100,000 population) were hospitalised in the Wheatbelt for an injury. Males accounted for 64.0 percent (n=1,021) of hospitalisations and females the remaining 36.0 percent (n=575). Aboriginal children accounted for 15.6 percent of hospitalisations (n=249).

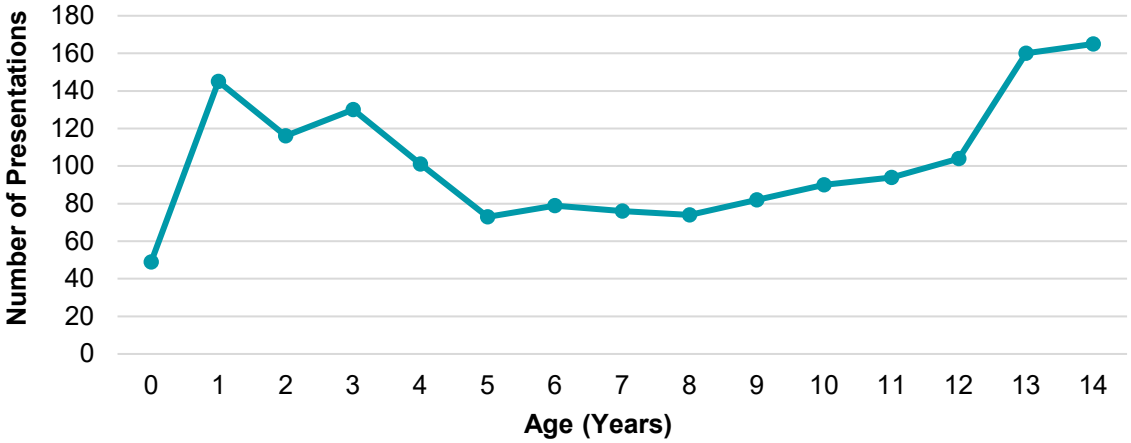
Injury-related Emergency Department Presentations

Between 2011 and 2015, 1,538 children residing in the Wheatbelt presented to PCH ED as a result of an injury. This represents 36.0 percent of injury presentations from regional WA and 1.7 percent of total injury presentations.

Demographic Data

Children aged between 10 and 14 years (39.9%, n=613) accounted for the highest number of injury presentations to PCH ED, followed by children under the age of five (35.2%, n=541) and children between 5 and 9 (25.0%, n=384) (Figure 27). Of particular contrast to the Perth Metropolitan and the South West, there is a rise in injury presentations in young adolescent children aged 13 and 14 years. Similarly to hospitalisations, males presented to PCH ED more frequently than females accounting for 58.6 percent (n=902) of presentations. Aboriginal children accounted for 12.8 percent (n=197) of presentations.

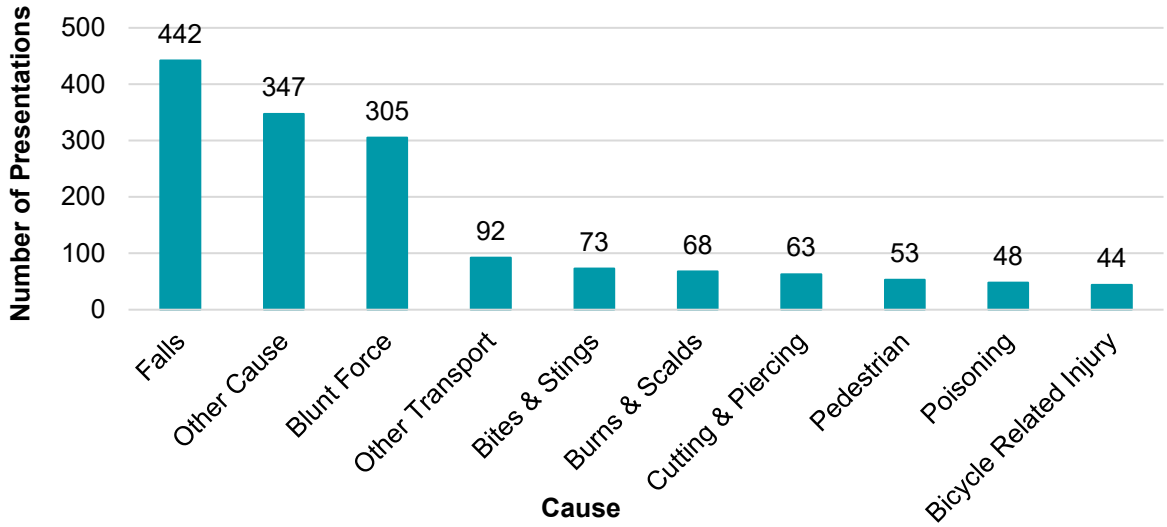
Figure 27: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Wheatbelt by Age, 2011-2015



Injury Data

Falls are the leading cause of injury-related ED presentations (28.7%, n=442), followed by Other Cause (22.6%, n=347), Blunt Force (19.8%, n=305) and Other Transport (6.0%, n=92) (Figure 28).

Figure 28: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Wheatbelt by Cause, 2011-2015

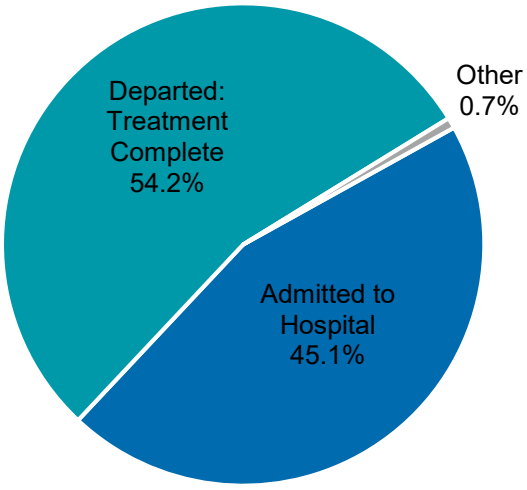


Unintentional injuries accounted for the majority of presentations to PCH ED from children residing in the South West (96.3%, n=1,481). The Home is the most commonly associated location for injury to occur (16.4%, n=253), followed by School (7.7%, n=119) and Recreation or Cultural Area (3.7%, n=57). Of note 5.1 percent (n=13) of home injuries are specifically identified as occurring on a farm.

Assessment Data

The majority of all children that presented to PCH ED with an injury were referred by themselves or a relative (58.8%, n=904). The remaining children were predominately referred by another hospital (30.1%, n=463) or a general practitioner (9.0%, n=138). Nearly two-thirds of Wheatbelt children were allocated a triage category of Semi-urgent (63.1%, n=970), followed by Urgent (28.3%, n=435) and Emergency (6.6%, n=101). Over half of all Wheatbelt children were able to depart the ED with treatment complete (54.2%, n=834). A further 45.1 percent (n=693) of children were admitted to hospital for further treatment (Figure 29).

Figure 29: Number of Injury-related PCH ED Presentations in Children Aged 0-14 Years Residing in the Wheatbelt by Outcome of Attendance, 2011-2015



DISCUSSION

Based on the findings of this report during the five year period between 2011 and 2015, each year in Western Australia approximately 23 children died as a result of injury, 8,000 were hospitalised and a further 18,500 present to the Perth Children's Hospital Emergency Department.

As remoteness in Western Australia increases so too does the rate of injury-related hospitalisations and emergency department presentations.[20] Possible factors contributing to the increase in injuries in regional areas include;

- Exposure to occupational hazards such as farming and mining
- Exposure to a diverse range of environmental hazards
- Increased levels of long-distance vehicle travel
- Sparse populations across large land areas can add difficulty in the delivery of injury prevention initiatives
- Further distances to adequate medical facilities
- Greater proportion of populations at a high risk of injury such as Aboriginal and low Socio-economic

Children residing in regional and remote Western Australia are over-represented in injury-related hospitalisations accounting for 26.5 percent when the population of people residing in regional or remote WA is only 20.8 percent. Particular over-representation is seen in the Kimberley, Midwest and Wheatbelt regions. Due to the small number of injury-related deaths in children in the data utilised, further analysis into area of residence was not completed for fatalities.

In addition to hospitalisations this report primarily focuses on injury-related presentations to PCH ED occurring to children residing in regional locations within WA. A number of factors may influence the number of presentations by children living outside the Perth Metropolitan Area. This can include both the proximity to Perth and available health facilities within the region. From 2011 to 2015 there were 4,268 children who presented to PCH ED that resided in a regional location. This accounts for 4.6 percent of total injury-related presentations.

Across all WA regions including the Perth Metropolitan Area, males were consistently over-represented for injury and account for a male: female gender ratio of approximately 3:2. Age group however did show some variation throughout the regions. As a whole, and for the majority of regions children under the age of five were most at risk of injury. Within the Kimberley and Wheatbelt regions young adolescents aged 10 to 14 were at greater risk of injury. Often as children get older they begin to develop more independence and the activities they participate in start to change. Particularly in farming communities, older children may be given tasks that are not suitable for their age and developmental ability.

Data from this report consistently shows that Aboriginal children are at a higher risk of injury than non-Aboriginal children. Although there are varying population numbers of Aboriginal people across the state, within each region Aboriginal children were over-represented in both hospitalisations and emergency department presentations. The greatest over-representation of injuries was seen in the Kimberley, Pilbara and Midwest. Additional analysis of injury to Aboriginal children can be found in the *Kidsafe WA Childhood Injury Report: Injuries to Aboriginal Children 2011-2015*.

Falls and Blunt Force were the most common causes of injury across the state. Of note was the increase in proportion of burn and scald injuries in regional WA compared to the Perth Metropolitan Area. Burns and Scalds were particularly prevalent in the Kimberley, Midwest and Goldfields. Associated risk factors for burns and scalds include lower socio-economic status, increased exposure to open fires and burn hazards within the home as well as cigarette, alcohol and drug use.[21]

As a whole most children are referred to PCH ED by themselves or a relative, however as the distance between PCH and a region increases so too does the likelihood to be referred by another hospital. Children from the Kimberly, Pilbara and Midwest were most likely to be referred by another hospital. Referral from another hospital, particularly a regional hospital, to PCH is often associated with severe traumatic injuries and local medical facilities that are unable to treat those injuries.

Similarly children presenting PCH ED from regional WA were more likely to be allocated a higher severity triage category of Resuscitation, Emergency or Urgent in comparison to children residing within the Perth Metropolitan Area. Over half of all children residing in regional WA were also required to be admitted to hospital for further treatment of their injuries compared to less than 15 percent of children residing in the Perth Metropolitan Area. Hospitalisation rates following an ED presentation were highest in children residing the Kimberley, Midwest and Pilbara regions.

Priorities for Prevention

The large size and diverse nature of Western Australia can increase the difficulty in preventing childhood injuries. In order to overcome some of the challenges, Kidsafe WA suggest the following priorities for prevention:

- Continued consultation with regional health professionals to offer support through professional development and targeted initiatives
- Increased access to injury prevention resource through face-to-face and online digital initiatives
- Provide culturally appropriate information with a specific focus on injuries to Aboriginal children and children of low socio-economic status
- Raise awareness within communities of the regional specific causes and methods of prevention for burn and scald injuries
- Educate children and young people on how to stay safe on and around country roads
- Promote the use of child car restraints and direct parents and carers to qualified child car restraint installers in their region
- Promote farm safety specific resources in agricultural communities
- Continued collection of regional specific data
- Continued analysis of data through the production and dissemination of injury reports to support policy and interventions for child injury prevention

Kidsafe WA aims to continue working with regional communities to ensure injury prevention initiatives are inclusive and accessible to the needs of all regional populations in Western Australia.

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