

Injury Surveillance Annual Report

July 2008 to June 2009



With the support of:



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

In conjunction with:

Princess Margaret Hospital
Emergency Department

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Injury Surveillance Data is collected by the Emergency Department at Princess Margaret Hospital for children and provided to Kidsafe WA on a quarterly basis for the preparation of the WA Childhood Injury Surveillance Bulletins.

The following WA Childhood Injury Surveillance Bulletins were prepared by Kidsafe WA in conjunction with Princess Margaret Hospital for 2008 to 2009. Copies are available on the Kidsafe WA website www.kidsafewa.com.au

July 2008:	Top 5 injuries to children: Why do they occur & how can they be prevented?
October 2008:	Gender variations in injury (0-12yrs)
January 2009:	Animal related injuries
April 2009:	Sporting Injuries

Our thanks go to:

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We also acknowledge the Department of Health for its ongoing financial support.

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1. EXECUTIVE SUMMARY

Princess Margaret Hospital for Children (PMH) as the tertiary paediatric centre for Western Australia remains the major referral centre for injured children. This is the fourth annual report using the revised Injury Surveillance coding system.

The financial year 2008-09 saw 56,055 children present to the Emergency Department, of these 15,217 (27%) suffered an injury. This represents a 5.03% decrease in total Emergency Department presentations when compared with the previous financial year (2007-08) in which a total of 59,021 children presented to the Emergency Department.

Injury presentations for the year, 15,217 (27%) were slightly above the long-term average of 25% of total presentations, but showed a significant increase (26%) in injury numbers when compared with the previous financial year (2007-08) which saw a total of 12,054 injury presentations.

The male to female presentation ratio for injury, 3 to 2 respectively, remains constant. The preschool age group (children less than 5 years of age) continue to dominate injury presentations, representing 42.5% of total injury presentations to PMH.

The majority of injured children presenting to PMH reside within the metropolitan area of Perth (98.6%) and are not of Aboriginal/Torres Strait Islander descent (94.2%).

The majority of injuries occur in or around the child's home (50.5%) with the school/day care centre (8.6%) being the second most common location specified. Falls remain the dominant injury cause (37%) followed by Other Blunt Force (19.5%). The overall rate of admission following an injury was 18.8%, however rural children were 3 times more likely to be admitted to PMH following an injury presentation.

In conclusion, the financial year 2008-09 saw the total Emergency Department and injury presentations continue to increase at a percentage far greater than projected. Further investigations would be required to determine why this increase is occurring and how we can work to prevent it.

2. INTRODUCTION

Princess Margaret Hospital for Children (PMH) is the only tertiary paediatric centre for Western Australia and is thus the reference centre for paediatric illness and injury for the state. Although the catchment zone may potentially be the entire state, it does not see all children requiring hospital treatment in any given year. Many will be treated at regional hospitals and medical centres. On average, approximately 55,000 children present to PMH seeking medical assistance from the hospital's Emergency Department each year. The majority of these children will be under 6 years of age.

Paediatric Injury surveillance is the systematic collection of data related to all children presenting to the Emergency Department with an injury. A modified version of the International Classification of External Causes of Injury (ICECI), version 1.1a is currently used to code injury presentations. The ICECI is a member of the World Health Organisation's (WHO) Family of International Classifications. The five major data elements collected are: cause, human intent, location of injury, activity and injury factor. This report provides a summary of all the paediatric injury surveillance data collected during the 2008-09 financial year.

The PMH Emergency Department uses the Emergency Department Information System (EDIS) version 9.31.000.01, a computer-based database to record and collate all details of children presenting to the hospital's Emergency Department. It is a real time electronic database used to record and manage patient data. The system has been in operation since January 1998 and is subject to quality assurance checking to ensure data accuracy and integrity. The EDIS database is accessible via the hospital's network at terminals within the Emergency Department.

3. METHOD OF DATA COLLECTION

A triage nurse initially assesses the children presenting to the Emergency Department of PMH. All clinical information and basic demographic details are recorded together with the child's triage code, an indication of the level of "emergency", based upon their reason for presentation. Children presenting due to injury then have injury surveillance data collected, based on the following fields: date, time and cause of injury, intent of injury, place of injury, activity when injured and any appropriate injury factor. One full-time Injury Surveillance Officer is employed at PMH to monitor and analyse the injury data.

3.1 DATA ACCURACY AND COMPLETENESS

PMH is committed to the provision of quality data for health professionals and other interested parties. Daily validation of injury data fields is undertaken by the Injury Surveillance Officer to ensure the accuracy of data. This involves the checking for null or missing data fields and identifying any misclassification of data.

3.2 LIMITATIONS

The data contained in this report represents the paediatric population that presents to PMH and as such comparisons made on a state or other basis must be done with due care. The data used for this report is reliant on the accuracy of those entering data within EDIS and the effectiveness of quality validation by the Injury Surveillance Officer. As such, it may be subject to coding bias and associated skewing of injury data. Finally there is scope for inadequate or under reporting of injury data.

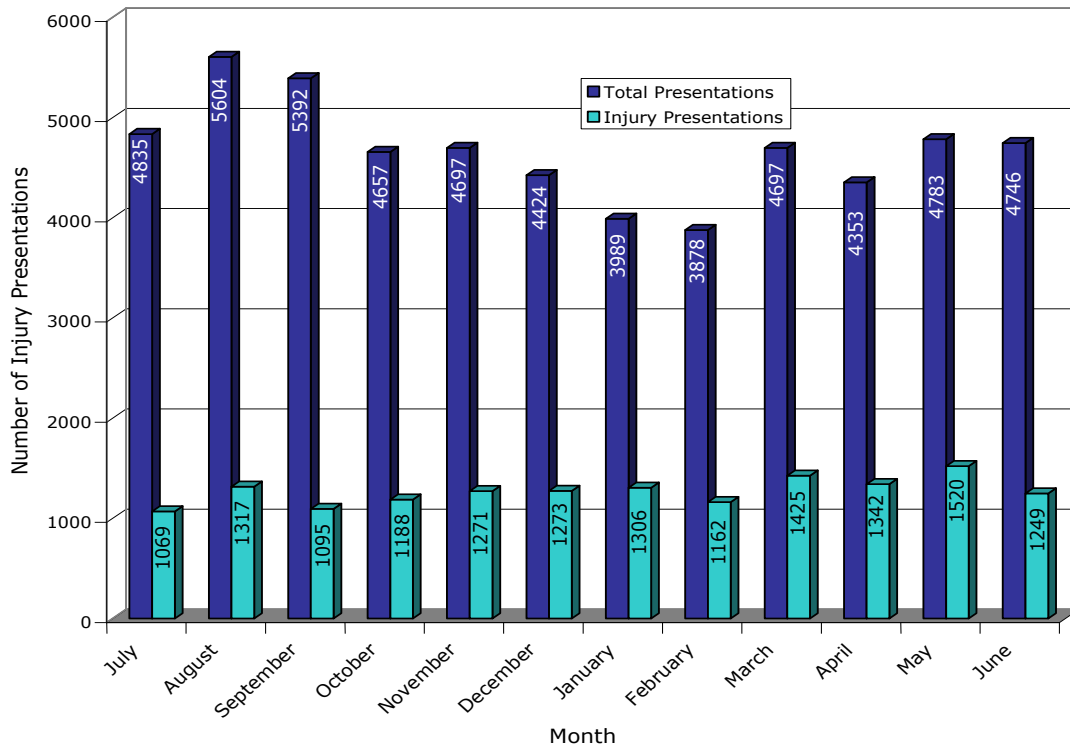
4. DEMOGRAPHIC DATA

4.1 TOTAL EMERGENCY DEPARTMENT PRESENTATIONS DUE TO INJURY, JULY 2008 TO JUNE 2009

The financial year saw a total of 56,055 presentations to the Emergency Department of PMH, with Figure 1 showing the monthly breakdowns. This represented a slight decrease of 5.03% when compared to presentations seen during the previous financial year (59,021 in 2007-08).

The yearly cycle experienced within total presentations to the Emergency Department is clearly evident with the winter peak and summer trough.

Figure 1 Number of ED presentations July 08 – June 09

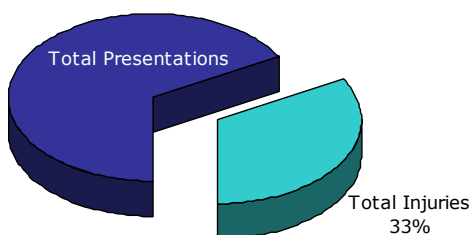


Injury presentations for the year (n=15,217), were slightly above the long-term average of 25% of total presentations, however there was an increase in injury numbers on the previous financial year (n=12,054).

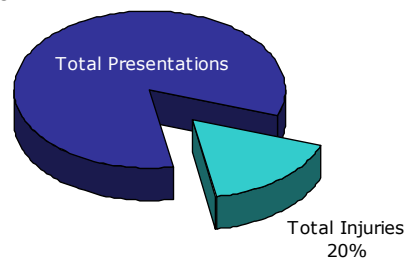
Monthly injury presentations show no obvious seasonal cycle, however a cycle is noted when injury presentations are viewed as a percentage of total monthly presentations (Figure 2), with a January peak of 33% and a September trough of 20%.

Figure 2 Highest & Lowest Injury Presentations as a percentage of Total presentations January 09 & September 08

January 2009



September 2008



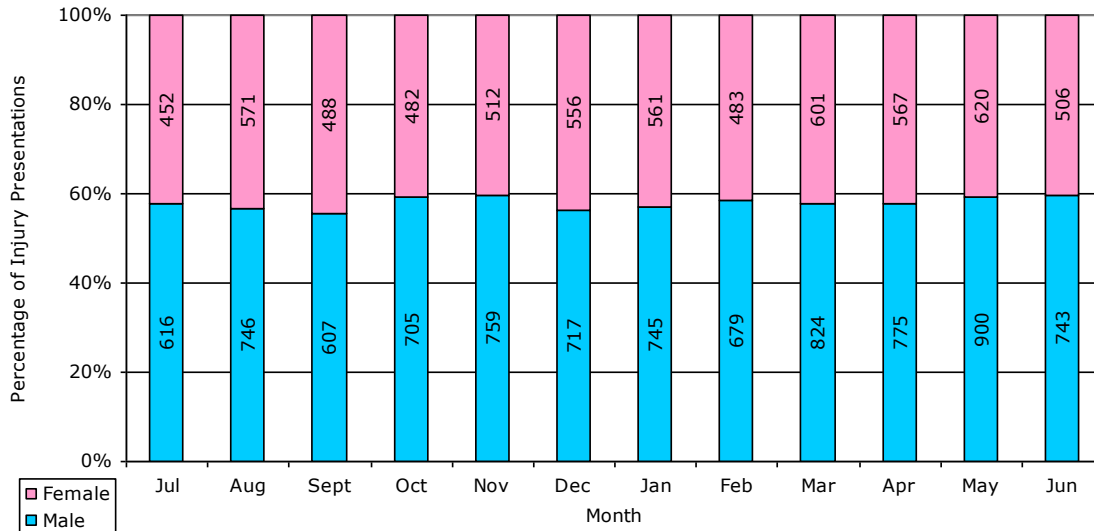
4.2 AGE AND SEX DISTRIBUTION

Male: Injuries accounted for 28.0% of Total Male Presentations (n =31,463)

Female: Injuries accounted for 26.0% of Total Female Presentations (n = 24,583)

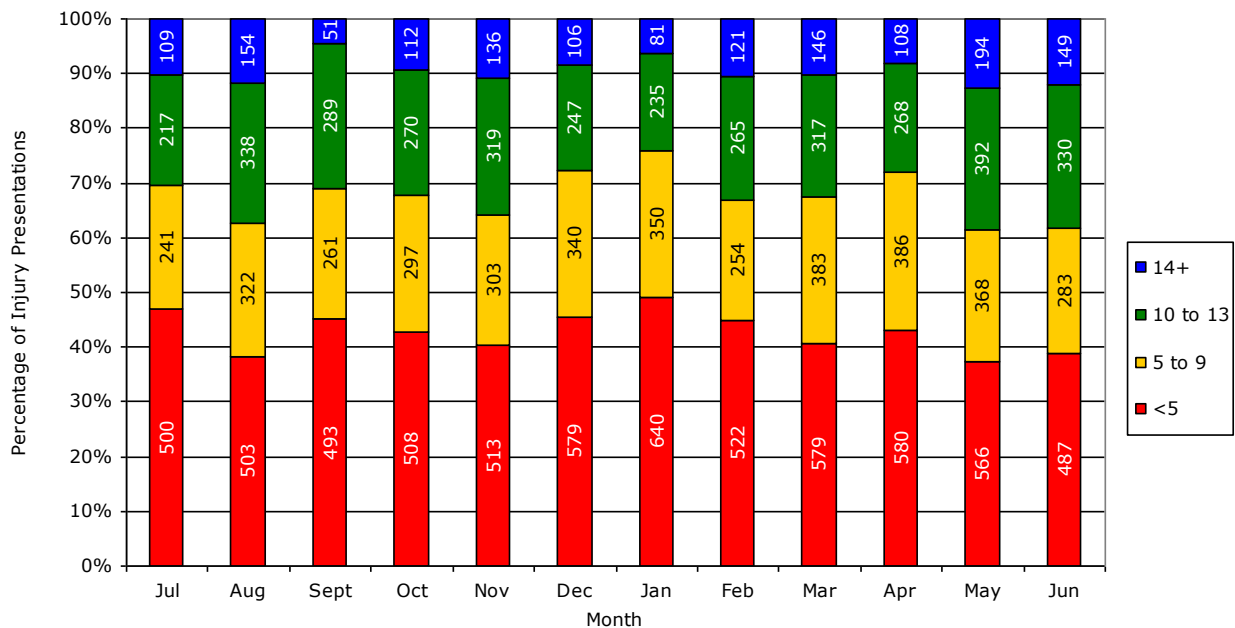
During this reporting period nine presentations to PMH ED were recorded as gender unknown, of these two were injury presentations. With these two presentations excluded, Males represented 58% of injury presentations (n=8,818) and females 42% (n=6,399). These percentages are consistent with the known gender injury ratio of 3:2. Figure 3 displays the monthly breakdown of presentations. The increasing number of presentations each year does not impact the gender ratio, and there is little variation throughout the year. September saw the highest percentage of female presentations (44.6%), with November being the highest for males (59.7%).

Figure 3 Sex Distribution July 08 – June 09



The pre-school age group, those under 5 years of age, remained the dominant group representing 42.5% (n=6,470) of total injury presentations to PMH. Children under 10 years of age represented 67.4% (n=10,258) of total injury presentations. Figure 4 shows the monthly breakdown by age groupings. Injury Presentations for children under 5 years of age peak in summer (December to February), with children in the older age groups peaking in autumn (March to May). Males dominated injury presentations in all age groups. Teenagers (children aged 13+) represent a smaller percentage (15%) due to the predictable trailing off to adult medical services.

Figure 4 Age Distribution July 08 – June 09



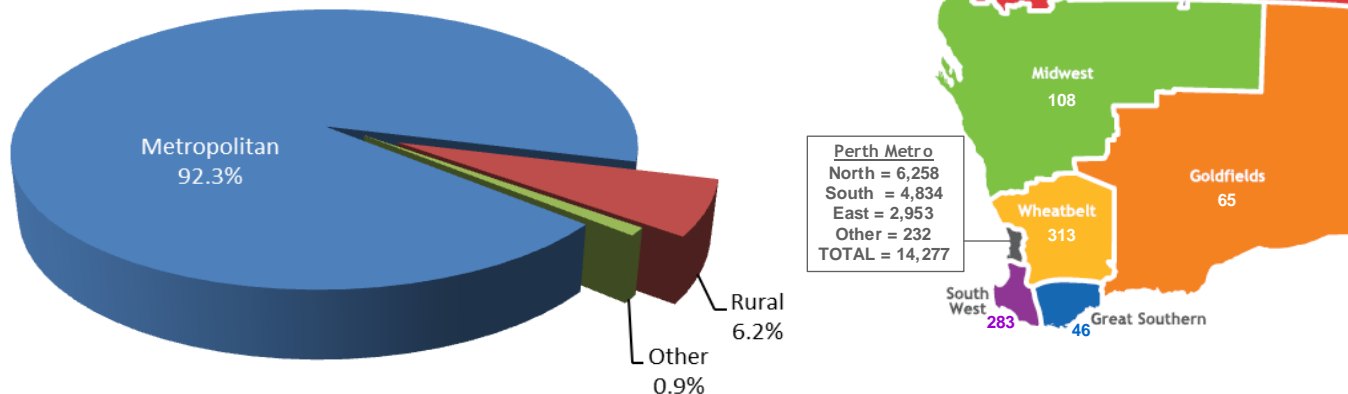
4.3 AREA OF RESIDENCE

Metro: (n = 14,045)

Rural/Remote: (n = 940)

Other (Interstate/Overseas): (n = 232)

Figure 5 Area of residence (Based on home postcode)

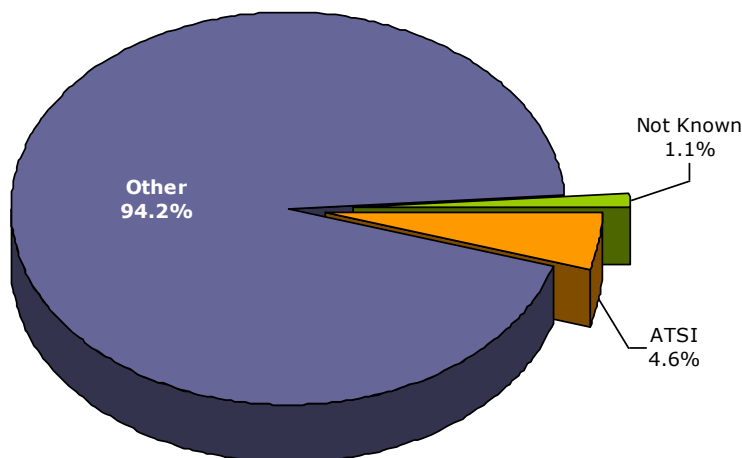


Children with a Perth metropolitan residential postcode represent the majority (92.3%) of injured children seen by the Emergency Department, as shown in Figure 5. Males from outside the metropolitan region had a slightly higher proportion of presentations to PMH and a higher proportion of presentations in most age groupings. Rural presentations recorded a 1.4% increase from the previous financial year compared to a 2.1% decrease in presentations from the Perth metropolitan area.

4.4 ETHNICITY

Children of Aboriginal or Torres Strait Island decent represented 4.6% of children attending the Emergency Department during the past financial year. There were no significant gender or age grouping differences between Aboriginal and non-aboriginal children, however 12.7% of presentations from rural regions were children of Aboriginal descent. A significant 13.8% of alleged assault injuries occurred to Aboriginal children, with 9.6% of all intentional injury presentations for the year being Aboriginal children.

Figure 6 Ethnicity

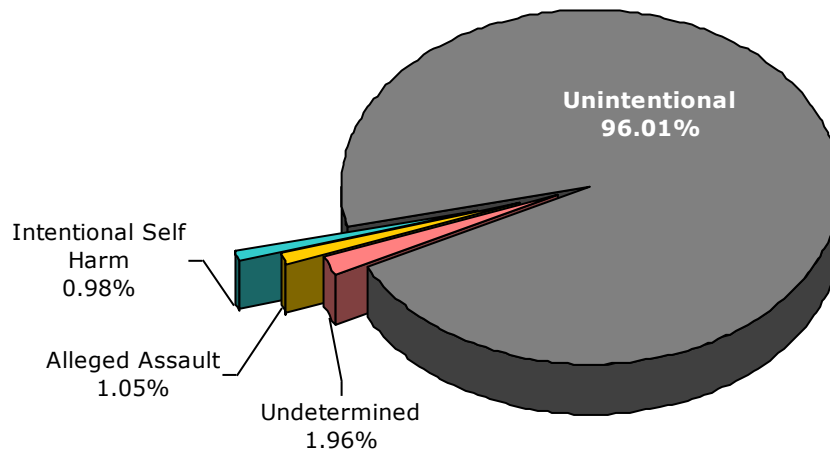


5. INJURY DATA

5.1 INJURY INTENT

The greatest proportion of injury presentations to Princess Margaret Hospital continues to be as a result of unintentional injuries. For 2008-09 unintentional injuries accounted for 96% of presentations as shown in Figure 7. Intentional Self Harm and Assault injury presentations were more prominent in the older age groups, while children who reside in the metropolitan region present for intentional and alleged assaults at numbers twice those from rural regions.

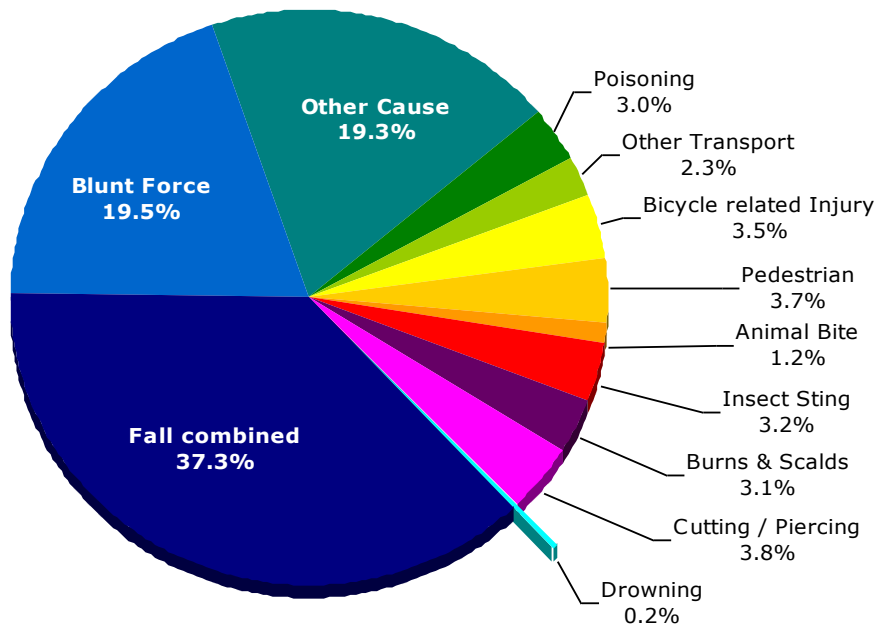
Figure 7 Injury Presentation by Human Intent



5.2 MAIN CAUSE OF INJURY

During the past financial year, falls remained the leading cause of injury (see Figure 8), though at a slightly reduced percentage to previous years. The order of injury cause has also changed, predominantly due to changes in the grouping of transport related injury causes and the inclusion of a Wheeled Pedestrians category (now included under the heading "Pedestrian" when injury cause is summarised). This has resulted in the Other Transport injuries reducing by half, and Pedestrian injuries increasing from 0.5% in 2007-08 to 3.7% in 2008-09. Insect Sting presentations to PMH ED also rose from 1.7% in 2007-08 to 3.2% in 2008-09.

Figure 8 Main cause of injury



5.3 PLACE OF INJURY

Children presenting to PMH are most commonly injured in the home or its surrounds (n=7,728) as shown in Figure 9. This is a continuing trend for injury presentations. This year 21% of injury presentations to PMH ED were coded as "Other Place" which include those where a location is not specified or does not fit into the existing categories. When excluding the Other Place code the next two most common locations for injuries to occur are School / Daycare centres (n=1,324) and Recreational/Cultural Areas (n=978). These three locations accounted for 3 in every 5 injuries. Males were the most commonly injured at each location. As the children age, injuries increasingly occur outside the home environment.

Figure 9 Place of Injury

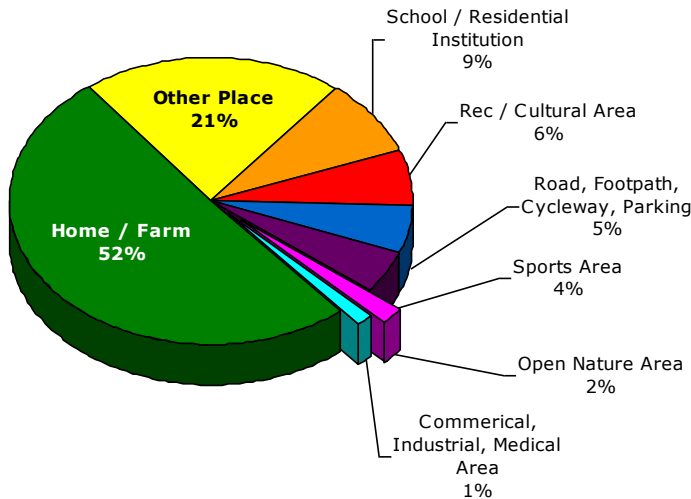
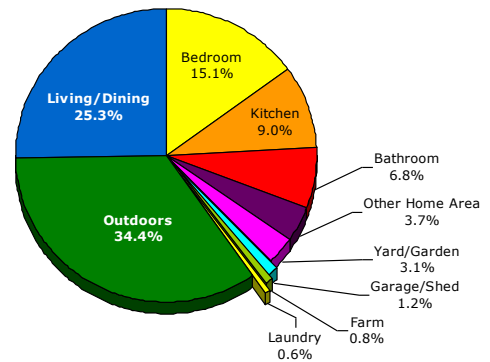


Figure 9a Place of Injury within the Home



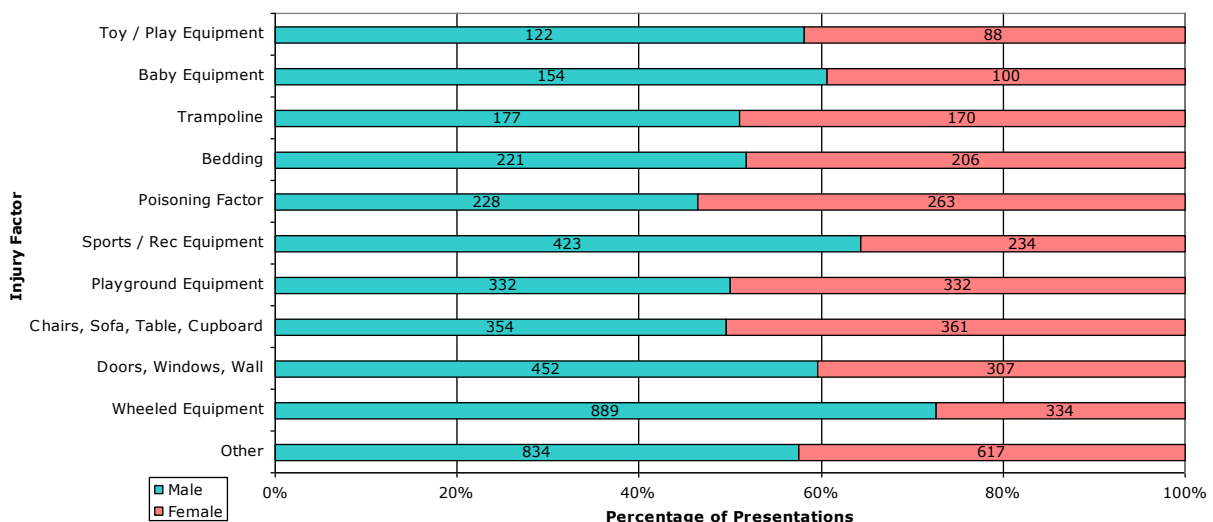
With home being the most common place for injury and representing more than 50% of all injury presentations to PMH ED. Figure 9a shows where within the home these injuries were most likely to occur. The Outdoors (n=1,571) being the most common place within the home environment, followed by the Living/Dining Area (n=1,156).

5.4 EQUIPMENT/OTHER FACTORS INVOLVED IN INJURY

When looking at factors involved in child injuries, by excluding the "Other" category, Wheeled Equipment (17%) was the most common injury factor recorded. Boys were 3 times more likely to be injured while using wheeled equipment than girls. Poisoning Factors were higher in girls than boys, while Playground equipment was an exact 50/50 gender split.

It must be noted that over half of all injury presentations (52.7%) did not have an associated injury factor recorded. Figure 10 shows the breakdown of recorded injury factors by gender.

Figure 10 Injury Factor

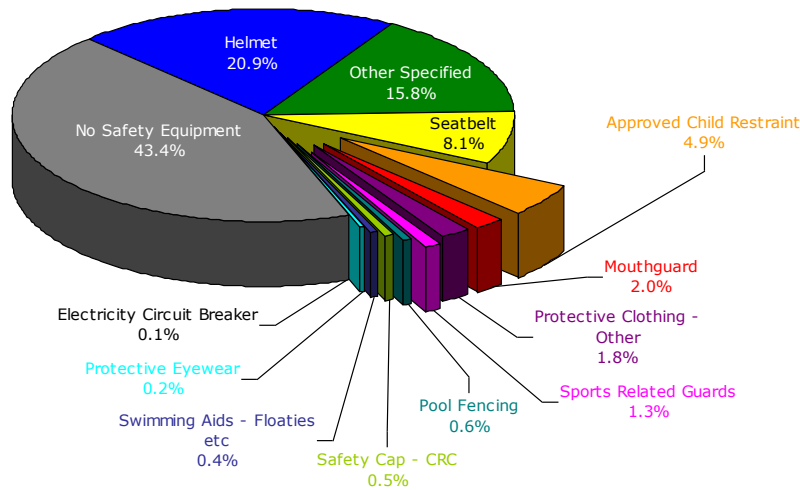


5.5 USE OF SAFETY EQUIPMENT

The use of safety equipment during activities can help reduce the risk & severity of an injury. Of the 15,217 injury presentations to PMH ED, only 23.7% recorded the use or non use of relevant safety equipment with the remaining 76.3% of injury presentations to PMH ED coded as Not Applicable. Of this 23.7% recorded under use of safety equipment, 17.5% were coded as unknown or inadequate description, resulting in only 948 cases with a safety equipment coding.

Of the 948 cases a total of 43.4% were identified as No Safety equipment being used, these are for cases where a piece of safety equipment should have been in place eg. A helmet; seatbelt or child restraint or electrical safety switch. Figure 11 shows the breakdown of recorded safety equipment usage.

Figure 11 Safety Equipment

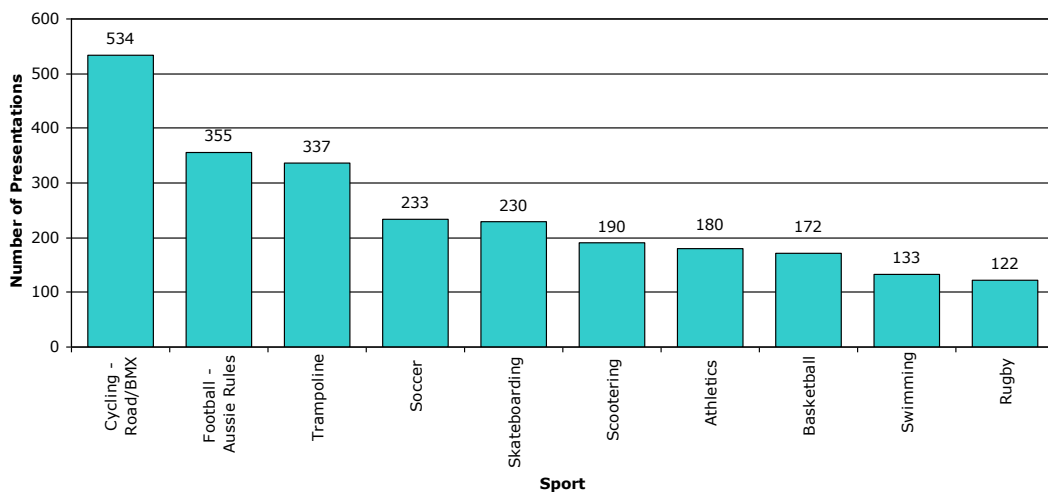


5.6 SPORTS

A total of 3,198 (21%) injury presentations to PMH ED were recorded as occurring during a sporting activity. With a total of 44 Sporting codes these can be grouped into the most common sport resulting in an injury presentation to PMH ED during 2008-09 was cycling which was made up of Cycling – BMX (n=87) and Cycling – Road (n=447). Interestingly only 23% of Cycling injury presentations were recorded as wearing a helmet; a further 13% were identified as not using any safety equipment and more than 50% the safety equipment usage was unknown or an inadequate description was provided.

After Cycling the next highest sport resulting in presentations to PMH ED was Australian Rules Football (n2008-09=355), followed by Trampolines (n=337). Figure 12 shows the top ten sports resulting in injuries that attended PMH ED in 2008-09.

Figure 12 Top Ten Sport Injuries

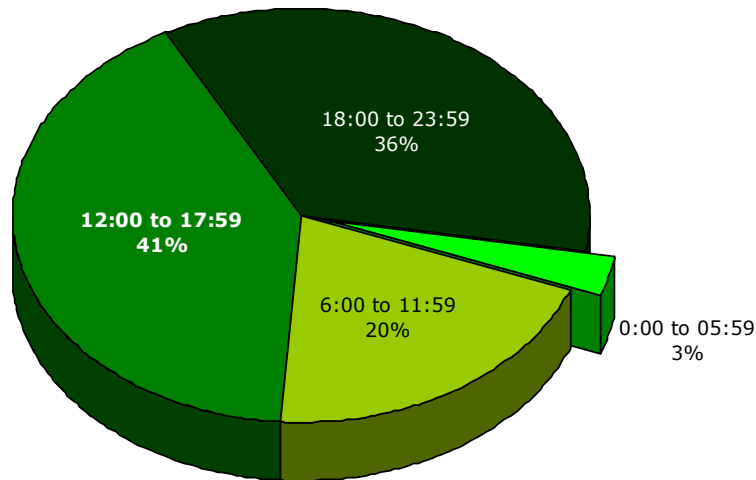


6. Assessment and Treatment Data

6.1 TIME FACTORS

The majority of injured children (77%) present between midday and midnight each day, as displayed in Figure 13. The peak period for presentations to PMH Emergency Department is between 16:00 and 21:00 (33%) with the highest number of children presenting between 18:00 – 18:59 (n=1,345).

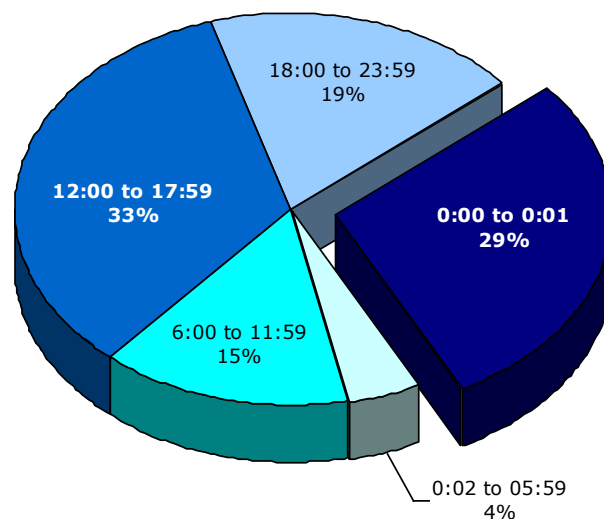
Figure 13 Time of presentation



Usually the time of injury doesn't peak during the 0:00 to 05:59 time period, however during 2008-09 a total of 4,626 presentations were recorded as having an injury time occurring during this period. Closer analysis found that 85% of the presentations occurring during this period were recorded as occurring at 0:01 (n=3,955) which may have been either a miscoding during this period or that the time of 0:01 has been used to record the time of injury when injury time is unknown. Further investigation found that almost all injuries coded as occurring at 0:01 then recorded "unknown injury time" in the triage description.

For this reason the additional time period of 0:00 to 0:01 has been added to create 5 time periods in Figure 14.

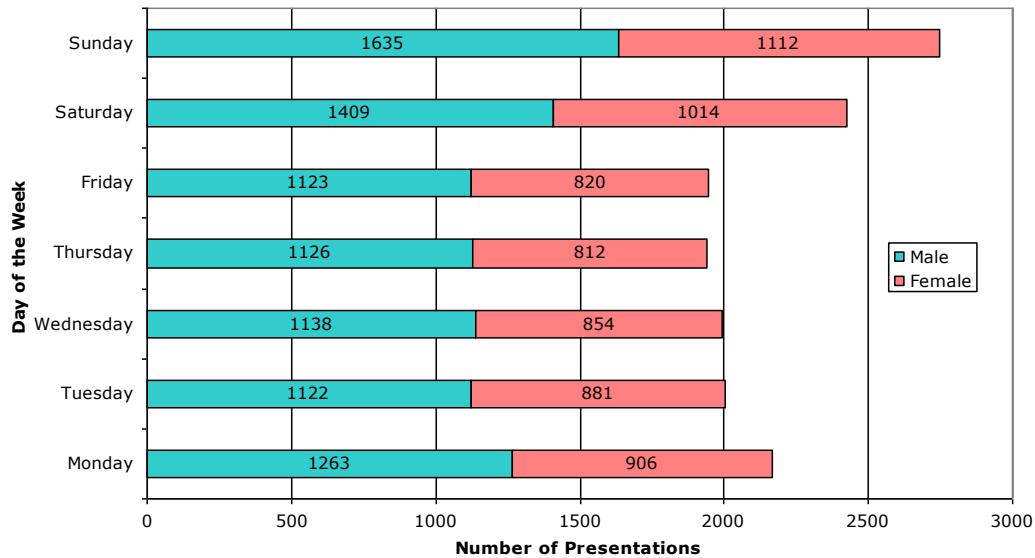
Figure 14 Time of injury



When excluding the time period of 0:00 to 0:01, 48% of injuries were shown to have occurred between noon and 6pm with a peak period between 12 noon and 1pm and again between 4pm and 7pm. This correlates with the time periods of meal preparation, after school and before the evening meal. A comparison between the time of injury and time of presentation shows a time lag between time of injury and presentation.

6.2 DAY OF ATTENDANCE

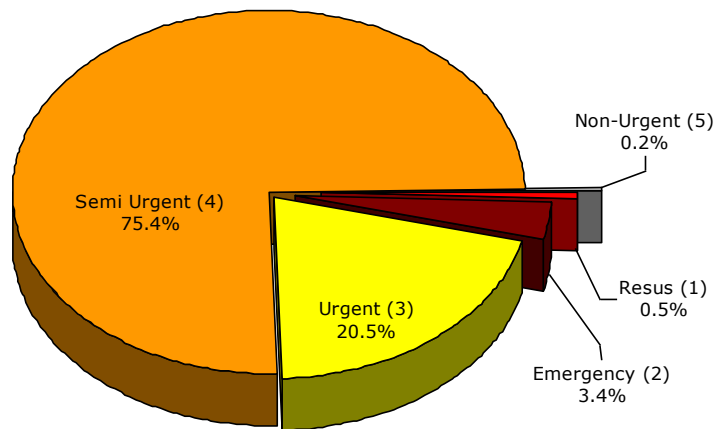
Figure 15 Day of attendance



The weekend saw the highest presentations during the year (34%), with a peak on Sundays and a trough on Thursday. The male:female ratio approached the historical 3:2 ratio on each day during this year (See Figure 15).

6.3 TRIAGE CATEGORY

Figure 16 Triage category



The majority of children (95.9%) are given a triage category of either semi-urgent or urgent, as shown in Figure 16. These are injuries deemed to require medical attention within 1 hour of being triaged. There was no identified difference between the sexes or age grouping with reference to triage code.

The triage category (code) is a reflection on the urgency for medical intervention, as shown in Table 1.

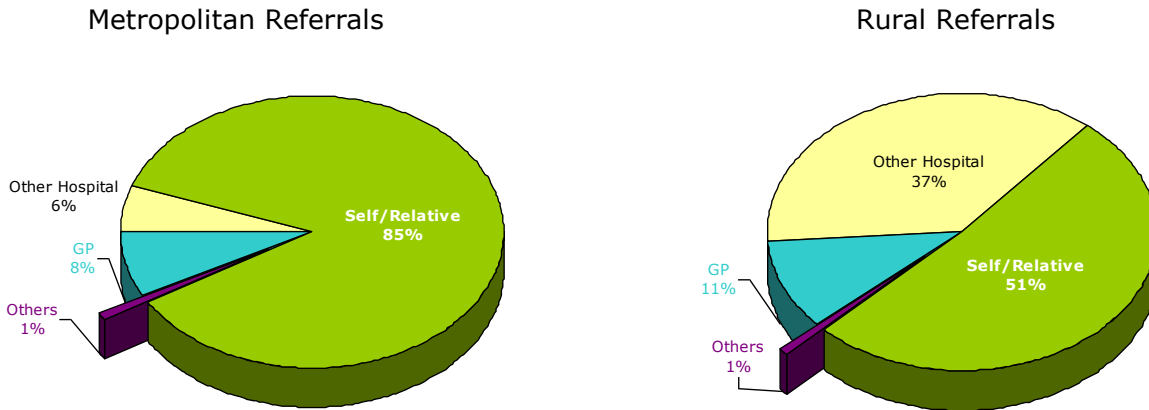
Table 1: Triage categories

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

6.4 SOURCE OF REFERRAL

The vast majority of children (85%) present without referral from another medical source, with a further 14% having been reviewed by either their local GP or another hospital. A significantly higher proportion of rural children present to PMH after medical review as shown in Figure 17, with these children up to 6 times more likely to have been reviewed in their nearest hospital.

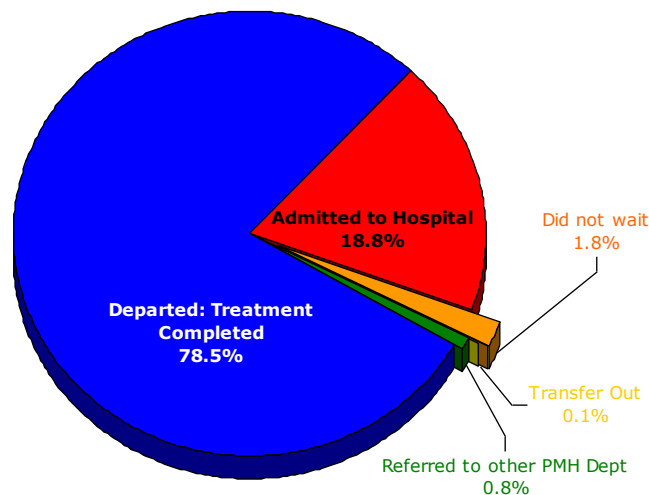
Figure 17 Source of referral



6.5 OUTCOME OF ATTENDANCE

In the majority of cases (98%) children received treatment for their injuries within the Emergency Department at PMH. Of these, nearly 4 in 5 were subsequently discharged home after their treatment. 18.8% were admitted to PMH, 1.8% did not wait for treatment and 0.1% were transferred to another hospital as shown in Figure 18. There were also no injury presentations to PMH ED coded as Died in ED or Dead on Arrival in the 2008-09 data.

Figure 18 Outcome of attendance



There was a significant difference in admissions between children from rural and metropolitan regions. Rural children were 2.5 times more likely to be admitted to PMH following an injury presentation (with 45.6% of children from a rural postcode being admitted to PMH) and half as likely to leave before treatment, than those from the metropolitan region.

7. Discussion

The collection of injury data plays a vital role in the development of strategies to prevent or minimise childhood injury. It relies on an efficient and reliable computer system and the co-operation of nursing, clerical and medical staff within the Emergency Department of PMH. Through the analysis of this collected data, injury trends and changes can be noted and the effectiveness of injury prevention programs ascertained.

In 2008-09 there was a 5.03% decrease in the total number of PMH Emergency Department presentations from the previous years high. Unfortunately, we continued to see an increase in the number of injury presentations recorded on the EDIS system. This increase, combined with the decrease in total presentations, saw injuries as a proportion of total presentations return to just above the long term average of 25%.

There were several changes in the cause and nature of injuries during the 2008/09 period. The following causes recorded a three-fold increase in the number of presentations compared to the previous three years: Non Venomous Insect Bites/Stings; Other Threat to Breathing; Poisoning by Chemical as a Liquid; and Physical Overexertion. Physical overexertion is not immediately obvious as a cause of injury. It is therefore possible that the increase in presentation figures in 2008-09 simply reflects more accurate inclusion in the ISS, as staff became more aware and familiar with the categories.

Injury presentations recorded with the causes Venomous Insect Bites/Stings; Other Cause; and Wheeled Pedestrians doubled during 2008-09. Wheeled equipment such as scooters and skateboards have long been popular with children. Recently, new products such as ripsticks have become available in Australia, however these only account for a small proportion of wheeled pedestrian injuries. Too many children are presenting with wheeled pedestrian injuries who were not wearing any items of safety equipment. It is likely that had they been using safety equipment such as helmets and wrist guards, they would not have sustained injuries warranting a visit to PMH.

The increasing numbers of child injury presentations to PMH requires further investigation to determine whether or not there has been a real increase in injury occurrence. Given that injuries as a proportion of total presentations has remained stable, it is likely that the increase in raw numbers does not indicate an increase in injury rates. Possible reasons for the increase in numbers include an overall increase in population in WA; a high annual birth rate; a decrease in local services; or an inability to get an appointment to see local GP's. All of these would increase the number of children seen at PMH ED, without truly increasing the rate of injury.

This is the first Annual Report that reports on the use of safety equipment codes and sports injury codes. As more data is collected and assigned to these codes in the coming years, it is envisioned that the codes will become more refined. This will result in a greater understanding of how certain injuries occur and why they may be more severe than others.

While preparing the 2008-09 Annual Report it was identified that there were also discrepancies in the time of injury recordings. When compared to reports produced in previous years, this large percentage of injuries occurring at 0:00 to 0:01 time slot was unheard of and during this period accounted for 29% of all injury presentations. Simple checks were undertaken while completing the 2008-09 report to see whether they were linked to a computer glitch that may have occurred at one time, however the injuries are evenly proportioned over the entire 12 month period. However closer examination of the Triage Description found that almost all the injuries coded with an injury time of 0:01 had a noted "unknown injury time" in the triage description.

With the proportion of injury presentations returning to the long term average of one quarter and the number of injury presentations remaining consistently high, this highlights the need for the continued presence of organisations such as Kidsafe WA and a continuing focus on the prevention of childhood injuries, particularly unintentional injuries.

Every day there is a new group of first time parents in WA who need information and education about child injury prevention. The prevention of childhood injuries needs to be adequately resourced to reduce the burden that childhood injuries place on the health system now and into the future. New approaches to promoting the preventability of major child injuries also need to be investigated in an attempt to engage new parents and halt the increasing number of children sustaining unintentional injuries.

8. Future Recommendations

The injury data collection at PMH continues to evolve with changes made as appropriate. Following on from recent additions and alterations to the data collection process, coding changes have again been implemented.

Although all care is taken to provide consistent data analysis, regular staff changes and individual interpretations may alter the way the data is coded and reported. Constant improvements to the EDIS system and education for the staff utilising the system will hopefully help make any future staff changes smooth transition. It is hoped that any future additions and amendments will provide greater access to injury data so that comparisons may be made with data collected and analysed in previous years.

The WA Childhood Injury Surveillance Bulletins are developed by Kidsafe WA in consultation with the Princess Margaret Hospital Emergency Department Injury Surveillance Office and funded by the WA Department of Health.

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