QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland. QISU publications and data are available on request for research, prevention and education activities.

HOSPITALS:
Mater Children's, Mater Adult, Queen Elizabeth II Jubilee, Princess Alexandra, Redland, Logan, Royal Children's, Mount Isa, Mackay Base, Mackay Mater, Proserpine, Sarina, Clermont, Dysart and Moranbah.

QISU STAFF
Director – A. Prof. Rob Pitt, Paediatric Emergency Director, QISU Director, Mater Children's Hospital
Manager – Elizabeth Miles
Data Analyst – Richard Hockey
Marketing/Safe Communities Consultant – Dawn Spinks
Paediatric Emergency Fellow – Dr Ruth Barker
Coding /Admin – Patricia Smith, Linda North

INJURY BULLETIN
No 77 June 2003

Addressing Childhood Injury in Mackay: a Safe Communities Initiative

Dr Dale Hanson, Tom & Dorothy Cook Research Fellow, James Cook University,
Kelly Hart, Senior Project Officer, CHIPP, Tropical Public Health Unit Network, Queensland Health,
Kathryn McFarlane, Senior Health Promotion Officer, Tropical Public Health Unit Network,
Queenland Health, Anthony Carter, Ph.D. Candidate, James Cook University.
Richard Hockey, Data Analyst, QISU, Elizabeth Miles, Manager, QISU.

Summary
- Injury is the leading cause of death in children, accounting for one-third of all deaths in those aged 1 to 14 years (compared with 3% of deaths in adults).
- In the Mackay and Moranbah Health Service Districts, childhood injury results in an average of 4 deaths, 1,260 hospitalisations and 3,343 Emergency Departments (EDs) presentations per year.
- There were 16,715 injury presentations to regional EDs involving children during the 5-year study period (1998 to 2002), 5,007 (30%) in children aged 0-4.
- Immersion incidents (drowning / near drowning) resulted in 4 deaths and 13 ED presentations.
- Transport incidents resulted in 14 deaths and 1,998 ED presentations in children. Three deaths and 231 ED presentations occurred in children aged 0-4. Leading causes of ED presentation in children of this age were bicycle (41%), motor vehicle passenger (34%), & pedestrian (13%) injuries.
- Falls resulted in one death and 5,550 ED presentations. 1,953 occurred in children aged 0-4. The most important causes of falls in children of this age were nursery equipment, playground equipment, stairs, balconies and windows, trampolines, and beds including bunk beds.
- Poisoning resulted in 398 ED presentations, 313 in children aged 0-4. Half were the result of poisoning by medications and half due to household chemicals.
- Burns resulted in 486 ED presentations, most commonly from hot object burns (214), scalds (174) and flame burns (53).
- Childhood development is rapid and dynamic. Accordingly, the type of injury children suffer is equally dynamic. Each type of injury has its own distinctive age demographic. Significant causes of injury in children aged 0-4 also involve children of primary school age. Interventions targeting young children may be more effective in the context of interventions simultaneously aimed at older children.
Introduction

Injury is the leading cause of death in children (persons under the age of 15)\(^1\). It is responsible for one third of childhood deaths in Queensland, half of these occurring in children aged 0-4\(^2\). Childhood injury death rates in Queensland are higher than all other Australian states with the exception of the Northern Territory\(^1\).

Children aged 0-4 years are at greater risk of being hospitalised due to injury than any other age group\(^3\).

Three of the four priority injury prevention issues endorsed in the National Injury Prevention Plan\(^4\) are concerned with injury prevention in childhood:

- falls in children,
- drowning in children,
- poisoning in children.

The Queensland Government’s Human Services CEO’s Committee Child Injury Prevention Project (CHIPP) \(^3\) jointly sponsored by the Department of Emergency Services and Queensland Health is establishing two demonstration child injury prevention projects in Mackay and Mt Isa using the WHO Safe Communities model. This project provides an excellent opportunity to reduce harm through injury to children living in the Mackay and Moranbah Health Service Districts (MMHSD).

The Mackay Whitsunday Safe Communities Project\(^6\) is a community based safety promotion project established in February 2000. The project aims to co-ordinate a systematic, inter-sectoral, sustained response to injury in the region. Queensland Injury Surveillance Unit (QISU) is assisting by profiling injury patterns in the MMHSD so that the community can identify priorities and develop solutions.

This report reviews the patterns of childhood injury in the MMHSD. It seeks to identify strategic opportunities to reduce childhood injury in the region, with a particular focus on injury affecting children aged 0-4.

Results

The MMHSD reported 26 childhood deaths due to injury during the period from 1994 to 2000, an average of 4 deaths per year. In children aged 0-4 the leading causes of death were drowning (4) followed by transport (3) and falls (1).

In the 4 year period from July 1998 until June 2002 there were 5,040 hospitalisations in the MMHSD due to injury in children (an average of 1260 hospitalisations per year). 1,331 (26%) were in children less than 5 years of age.

The Mackay Injury Surveillance Network was established in September 1997 as part of the QISU’s network\(^5\). This population based network collects surveillance data from all Emergency Departments (EDs) in the MMHSD. The network reported 57,532 injury presentations to the region in the five year study period (January 1998 to December 2002). 16,715 (29%) were in children less than 15 years old (an average of 3,343 presentations per year). Childhood ED injury presentation rates in the MMHSD are high compared with a similar surveillance network in South Brisbane (Figure 1).

In the MMHSD ED injury presentations initially peak in the toddler age group, and after a slight reduction in early primary school children, rise again in adolescence (Figure 2).

Drowning

Four deaths due to drowning were reported in the MMHSD in the 5 year period from 1994 to 2000; all were children aged 0-4 years. Three of these incidents occurred in domestic swimming pools while one occurred in the bath.

There have been 13 presentations to regional EDs due to near drowning between 1998 and 2002, 10 occurring in children less than 5 years of age (Table 1).
Bike Education programs (currently offered to primary school children in the region through the Police Citizens Youth Club),
2. Lobby for the provision of bike paths and safe riding areas,
3. Encourage parents to stop children under 5 years of age from riding bicycles on roads,
4. Promote the use of bike helmets.

The best opportunity for reducing harm from motor vehicle crashes is to increase the effective use of child restraints:
1. Promote use of Queensland Ambulance Service program for the correct fitting of baby capsules and child restraints,
2. Encourage the disposal of old capsules and restraints and educate target groups of the dangers of using equipment that has been involved in an impact.

Strategies aimed at reducing pedestrian injury include:
1. Education programs teaching safe road use for pedestrians,
2. “Walking bus” programs, providing adult supervised walking from home to school,
3. Promotion of the new Department of Housing ‘Smart House’ design for all new dwellings which recommends driveways and garages be situated separately from child accessible areas,
4. Encourage installation of fencing between driveways and play and living areas in houses.

Falls
Falls are the leading cause of ED injury presentations in children. There were 5,550 ED presentations due to falls in the region over the study period which accounted for 33% of all ED injury presentations. 1,953 of these occurred in children aged 0-4 (39% of ED injury presentations in this age group).

High falls (> 1 metre) are more likely to result in hospitalisation and occur in younger children at a rate almost double that of older children (367.7 vs 688.3 per 100,000 per year). Examination of the causes of high falls provides a strategic focus for initial analysis and planning of interventions. Table 3 (page 4) lists the major injury factors associated with high falls by age group.

Table 2: QISU ED presentations and hospitalisations, children (0-14 years) by type of fall (1998 - 2002)

<table>
<thead>
<tr>
<th></th>
<th>ED Presentations</th>
<th>Hospitalisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Falls</td>
<td>4496</td>
<td>425 (9.5%)</td>
</tr>
<tr>
<td>High Falls</td>
<td>1054</td>
<td>217 (20.6%)</td>
</tr>
</tbody>
</table>

Table 1: QISU near drowning ED presentations for 0-4 years and 0-14 years by place (1998 - 2002)
<table>
<thead>
<tr>
<th>Major injury factor</th>
<th>All ages</th>
<th>&lt;1 yoa</th>
<th>1-4 yoa</th>
<th>5-11 yoa</th>
<th>12-14 yoa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery Product</td>
<td>No</td>
<td>%</td>
<td>Rates*</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Pram</td>
<td>3</td>
<td>0.3</td>
<td>1.7</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Baby walker</td>
<td>18</td>
<td>1.7</td>
<td>10.0</td>
<td>18</td>
<td>27.7</td>
</tr>
<tr>
<td>High Chair</td>
<td>8</td>
<td>0.8</td>
<td>4.4</td>
<td>4</td>
<td>6.2</td>
</tr>
<tr>
<td>Cot</td>
<td>5</td>
<td>0.5</td>
<td>2.8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Change Table</td>
<td>11</td>
<td>1.1</td>
<td>6.1</td>
<td>8</td>
<td>12.3</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>45</td>
<td>4.3</td>
<td>25.0</td>
<td>31</td>
<td>47.7</td>
</tr>
<tr>
<td><strong>Toy / Playground Equip</strong></td>
<td>20</td>
<td>1.9</td>
<td>11.1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tricycle</td>
<td>3</td>
<td>0.3</td>
<td>1.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other Toy</td>
<td>1</td>
<td>0.1</td>
<td>0.6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Flying Fox</td>
<td>15</td>
<td>1.4</td>
<td>8.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Monkey Bars</td>
<td>89</td>
<td>8.4</td>
<td>49.4</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Slide</td>
<td>36</td>
<td>3.4</td>
<td>20.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Swing</td>
<td>34</td>
<td>3.2</td>
<td>18.9</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other Playground Equip</td>
<td>24</td>
<td>2.3</td>
<td>13.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>222</td>
<td>21.2</td>
<td>123.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Furnishing</strong></td>
<td>Total</td>
<td>2</td>
<td>0.2</td>
<td>1.1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Appliance</strong></td>
<td>Total</td>
<td>130</td>
<td>12.3</td>
<td>72</td>
<td>8</td>
</tr>
<tr>
<td><strong>Transport related falls</strong></td>
<td>Total</td>
<td>29</td>
<td>2.7</td>
<td>16.1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Sport</strong></td>
<td>Total</td>
<td>125</td>
<td>11.8</td>
<td>69</td>
<td>0</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td>Total</td>
<td>151</td>
<td>14.3</td>
<td>84</td>
<td>0</td>
</tr>
<tr>
<td><strong>Natural Object / animal</strong></td>
<td>Total</td>
<td>156</td>
<td>14.8</td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>Tree / plant</td>
<td>Total</td>
<td>13</td>
<td>1.2</td>
<td>7.2</td>
<td>0</td>
</tr>
<tr>
<td>Dropped by human</td>
<td>Total</td>
<td>15</td>
<td>1.5</td>
<td>8.3</td>
<td>1</td>
</tr>
<tr>
<td>Other natural object</td>
<td>Total</td>
<td>184</td>
<td>17.4</td>
<td>102</td>
<td>5</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>Total</td>
<td>231</td>
<td>21.9</td>
<td>128</td>
<td>19</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Total</td>
<td>8</td>
<td>0.8</td>
<td>4.4</td>
<td>0</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td>Total</td>
<td>17</td>
<td>1.6</td>
<td>9.4</td>
<td>0</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>1054</td>
<td>95.4</td>
<td>65</td>
<td>332</td>
<td>17</td>
</tr>
</tbody>
</table>
Six strategic areas for intervention are evident. In order of priority, they are:

1. Falls involving nursery equipment – 45% of high falls in children under 1 year old. Of particular importance were falls from baby walkers (28%), change tables (12%) and high chairs (6%). Falls from prams and strollers account for 11% of low falls in children under 1 year old.
2. Falls from stairs – 25% of high falls in children less than 1 year old, 16% of high falls in children aged 0-4.
3. Falls from playground equipment - 15% of high falls in children aged 0-4. Leading causes include slides (6%), monkey bars (5%) and swings (3%).
4. Falls from trampolines – 14% of high falls in children aged 0-4.
5. Falls from balconies and windows – 1 death, 9% of high falls in children aged 0-4.
6. Falls from beds – bunk beds account for 7% of high falls in children 0-4. Falls from beds account for 22% of low falls in children less than 1 year old and 7% of low falls in children aged 0-4.

Effective interventions to prevent falls include:

1. Nursery furniture
   - Promote the removal of baby walkers and unsafe nursery equipment
   - Educate and motivate local retailers and second-hand dealers to supply goods which are compliant with current Australian Standards
   - Devise checklists for consumers to assist in the identification of unsafe nursery products.
2. Playground equipment
   - Obtain support from Local Government and State and Private Schools for the installation and maintenance of 'safer playgrounds'
   - Conduct an audit of playgrounds situated in public parks, schools, preschool and childcare centres.
   - Devise a playground safety checklist to be distributed to all child care centres and home carers.
3. Stairs
   - Promote the use of stair guards.
4. Trampolines
   - Encourage supervision of children aged 0-4
   - Clarify and promote rules for using trampolines
   - Promote the use of protective padding
   - Provide advice on appropriate positioning of trampolines including safe fall zone.
5. Balconies & windows
   - Encourage builders and property owners to comply with Australian standards for balcony rails and window guards.
6. Bunk Beds
   - Encourage retailers and second hand dealers to comply with Australian standards and provide point of sale advice,
   - Discourage use by children aged less than 6 years.

Poisonings

There were 398 ED presentations due to poisoning over the 5 year study period. 313 occurred in children aged 0-4 (6.3% of all ED injury presentations in this age group). Half were the result of poisoning by medications and half due to household chemicals. Fifty four percent of ED poisoning presentations were admitted to hospital. Poisoning accounted for 11.9% of all ED injury admissions in children.

Interventions useful in reducing unintentional poisonings include:

1. Extend the use of child resistant closures to include essential oils and all household chemicals,
2. Promote the installation of and use of child resistant poisons cabinets in all homes,
3. Promote use of non toxic household chemicals for cleaning, pest control and personal hygiene,
4. Encourage the effective disposal of unwanted household chemicals and medications,
5. Provide poisons centre information and contact numbers to households.

Burns

There were 486 ED presentations due to burns (Table 4). Of the 441 thermal burns, 219 were in children aged 0-4 (4.3% of injury presentations in that age group). 8.1% of ED thermal burn presentations required admission to hospital.

A disproportionate number of hot object burns (eg irons, vehicle exhausts) presented to the non-urban hospitals in the MMHSD (Table 5).

<table>
<thead>
<tr>
<th>ED presentations</th>
<th>Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot object burns</td>
<td>214</td>
<td>44.0%</td>
</tr>
<tr>
<td>Scalds</td>
<td>174</td>
<td>35.8%</td>
</tr>
<tr>
<td>Flame burns</td>
<td>53</td>
<td>10.9%</td>
</tr>
<tr>
<td>Chemical burns</td>
<td>19</td>
<td>3.9%</td>
</tr>
<tr>
<td>Sunburn</td>
<td>17</td>
<td>3.5%</td>
</tr>
<tr>
<td>Friction burns</td>
<td>9</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

Table 4: QISU child (0-14 years) ED presentations by type of burn (1998-2002)
Table 5: QISU child (0-14 years) ED presentations for hot object burns, Mackay city and non-urban hospitals (1998 - 2002)

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>ED presentations</th>
<th>ED presentation rate (per 100,000 per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mackay city</td>
<td>94</td>
<td>290.4</td>
</tr>
<tr>
<td>Non-urban</td>
<td>119</td>
<td>702.9</td>
</tr>
</tbody>
</table>

Effective interventions to reduce the occurrence of burns include:
1. Promote installation of smoke alarms and safety switches in rental properties and older dwellings,
2. Increase number of homes with hot water temperature regulation (thermostat reduction / tempering valves),
3. Educate and engage support of local plumbers and electricians to promote safety devices,
4. Encourage local retailers/suppliers to stock and promote safety products (e.g., stove guards),
5. Encourage installation of stove top rail guards,
6. Promote and provide samples of spill proof mugs for use around young children.

Discussion

In the MMHSD injury resulted in an average of 4 deaths, 1260 hospitalisations and 3343 ED presentations per year.

This paper identifies strategic opportunities to reduce harm from injury to children living in the MMHSD, particularly injury affecting children aged 0-4.

While the predominate focus of this analysis has been on children aged 0-4, it is clear that many significant causes of injury in children in this age group also affect children of primary school age. Childhood development is rapid and dynamic; the patterns of injury observed in this study reflect this dynamism. Each injury type has a unique demographic footprint. It is unhelpful to analyse injury causation and plan interventions based on 5 year age groups in a phase of human development that is so rapidly evolving.

Some interventions targeting children aged 0-4 may be more effective in the context of interventions simultaneously aimed at older children.

Mass media campaigns and targeted education programs work best in the context of a broad integrated approach. Effective interventions seek to develop and strengthen community self-sufficiency while at the same time producing social and environmental changes that reduce the risk of injury.

The Mackay Whitsunday Safe Communities Project is a community based safety promotion project established in February 2000. The project aims to co-ordinate a systematic, inter-sectoral, sustained response to injury in the region. By involving the community in finding their own solutions, it hopes to be a catalyst for structural, sociological and political change that empowers the community, to change their environment and their behaviour to reduce the risk of injury.

In Mackay a unique combination of: QISU population based local surveillance system to inform strategic planning, the expertise of two tertiary universities (James Cook University and University of Queensland), an established credible community based action group, state government commitment and a full time local project co-ordinator, provide our community with its best opportunity to work together to reduce the incidence of childhood injury in our community.

Conclusion

Injury is an important cause of morbidity for children living in the Mackay and Moranbah Health Service District. The Human Services CEO’s Committee Child Injury Prevention Project provides an excellent opportunity to reduce harm through injury to children in the Mackay community.

References