Injuries – the ‘disease model’

- Explore epidemiology
- Identify risk factors
- Establish countermeasures
- Assess effectiveness of countermeasures
Translating the findings of effective interventions

- Analysis in the United States—child injury deaths could be reduced by 33% if effective practices were adopted in other settings.
- Injury messages need to be appropriate to the environmental and social conditions within a particular country and targeted at local needs.
Barriers to injury prevention

- Lack of good data
- Lack of funding for research and programmes
- Lack of training in the field
- Lack of awareness in policy makers
Facilitators for injury prevention

- Growing evidence base of what work
- WHO World Report on Child Injury Prevention
- WHO European Report on Child Injury Prevention
Global Call to Action

World Health Organisation and UNICEF’s child injury prevention strategy.

“We have had great success in fighting diseases that kill and maim children. We can’t sit and watch children die or become severely disabled due to injuries that can be prevented. It is time to take an active approach to preventing injuries.”
WHAT IS DIFFERENT ABOUT CHILDREN?
**Childhood Injuries**

**The Road Environment**
- Pedestrian
- Cyclist
- Car occupants

**The Home Environment**
- Falls
- Burns and scalds
- House Fires
- Poisoning
- Lacerations
- Suffocation
- Drowning

**The Pre-School/ School Environment**
- Falls
- Burns
- Scalds
- Lacerations
- Poisoning

**The Leisure Environment**
- Drowning
- Playground Injuries
- Sports Injuries
Children’s vulnerability to injury

Children’s psychological and behavioural characteristics make them vulnerable

- Cognitive skills
- Playing
- Risk taking
Deaths from unintentional injury have a steeper social gradient than any other cause of death in childhood.

Deaths from fire and flame have the steepest social gradient, followed by pedestrian injuries.

The gap between the social classes is widening in relation to injury mortality.
Ireland – Injury deaths for children (1-19 years) in the EU
WHO mortality Database. 5 year average of the latest available years (2000-2004)
Childhood (0-14) injury mortality is unequally distributed across Europe.

Children in low-middle income countries are at 4.3 times the risk of dying from injuries than people in high income countries (HIC).

Source: WHO, Health for All database, June 2004
Deaths in children aged 0-14 years
WHO European Region, 2002

DEATHS FROM:
Unintentional injury (24,719)
Intentional injury (3,281)

Injury and violence

N= 27,900

DEATHS FROM:
Tuberculosis
HIV / AIDS
Pertussis
Polio
Diphtheria
Measles
Tetanus
Meningitis
Diabetes Mellitus
Asthma
Nephritis
Leukaemia
Lymphoma

N=21,545
Objectives:

1. Establish accurate mortality statistics for the paediatric population (<15yrs) in Ireland over an eight year period from 2006-2013.

2. Determine the prevalence and characteristics of intentional and unintentional injury related deaths.

Method:

Retrospective analysis of cause of death information on all deaths registered with the CSO from 2006-2013 and examination of autopsy reports.
Total number of deaths in 1-14yr olds = 939.

Leading cause of death (28%) is accident and injury.

Most are unintentional with the highest rate observed in 1-4yr olds.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Unintentional injury</th>
<th>Suicide</th>
<th>NAI/Interpersonal violence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>rate</td>
<td>number</td>
</tr>
<tr>
<td>&lt; 1 yr</td>
<td>17</td>
<td>2.9</td>
<td>0</td>
</tr>
<tr>
<td>1-4yrs</td>
<td>83</td>
<td>3.9</td>
<td>0</td>
</tr>
<tr>
<td>5-9yrs</td>
<td>45</td>
<td>1.8</td>
<td>1</td>
</tr>
<tr>
<td>10-14yrs</td>
<td>69</td>
<td>3.0</td>
<td>35</td>
</tr>
<tr>
<td>15-19yrs</td>
<td>37</td>
<td>6.7</td>
<td>35</td>
</tr>
<tr>
<td>1-14yrs</td>
<td>197</td>
<td>2.6</td>
<td>36</td>
</tr>
</tbody>
</table>
### External causes of death by cause and age, 2006-2013.

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>1-4yrs</th>
<th>5-9yrs</th>
<th>10-14yrs</th>
<th>15-19yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td><strong>Road Traffic Accident</strong></td>
<td>33</td>
<td>36.3</td>
<td>20</td>
<td>37.0</td>
</tr>
<tr>
<td><strong>Drowning</strong></td>
<td>4</td>
<td>4.4</td>
<td>4</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>Burns/inhalation of smoke (house fires)</strong></td>
<td>8</td>
<td>8.8</td>
<td>7</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>High Falls</strong></td>
<td>7</td>
<td>7.7</td>
<td>3</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Asphyxiation by choking (food)</strong></td>
<td>4</td>
<td>4.4</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Farm accidents</strong></td>
<td>4</td>
<td>4.4</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Accidental strangulation</strong></td>
<td>6</td>
<td>6.6</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Deliberate self harm</strong></td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Non accidental injury (NAI)</strong></td>
<td>6</td>
<td>6.6</td>
<td>8</td>
<td>14.8</td>
</tr>
<tr>
<td><strong>Accidents with other vehicles</strong></td>
<td>6</td>
<td>6.6</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Medical misadventure</strong></td>
<td>2</td>
<td>2.2</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Drug toxicity</strong></td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Other accidents</strong></td>
<td>7</td>
<td>7.7</td>
<td>5</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Other external causes</strong></td>
<td>4</td>
<td>4.4</td>
<td>1</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Total number of deaths: 91, 54, 108, 73
A REVIEW OF TRAFFIC & NON-TRAFFIC RELATED CHILD PEDESTRIAN FATALITIES IN IRELAND 2006-2011

Karina Hamilton¹, Cliona McGarvey¹, Tom Matthews¹, Alf Nicholson²

¹ National Paediatric Mortality Register,
² Dept. of Paediatrics, RCSI, CUH, Temple St.
Results

- Total number of pedestrian deaths 0-16 yrs = 45
- Gender: Male Predominance (62% Male vs. 38% Female)
- Age: 53% 1-4 yrs, 16% 5-9 yrs, 29% 10-14 yrs, 2% 14-16 yrs
- Daily Distribution: Highest Proportion on Saturday (27%)
- Seasonal Distribution: Highest Proportion in Summer (45% July-September)
Paediatric pedestrian injury - pattern of residential location and deprivation

Health Atlas Ireland

Z-46911 OSI 030601
Pedestrian fatality risk as a function of the impact speed of a car.
Child Pedestrian Injuries by Hour of Day and Day of Week, 1996-2000

0-10 10-20 20-30 30-40 40-50
Conclusions

- Preventative action is needed to address non-traffic related pedestrian deaths particularly driveway rollovers

- Measures should include:
  - Adequate supervision of children
  - Separation of driveway from play areas
  - Installation of reversing cameras and object vicinity sensors in vehicles
  - Education of parents and caregivers
PASSENGER INJURIES
Fig 1. Predicted risk of serious injury for each restraint/seating position group. Inapprop indicates inappropriate; Approp, appropriate.

Effects of Seating Position and Appropriate Restraint Use on the Risk of Injury to Children in Motor Vehicle Crashes
Dennis R. Durbin, Irene Chen, Rebecca Smith, Michael R. Elliott and Flaura K. Winston
Pediatrics 2005;115:e305-e309
DOI: 10.1542/peds.2004-1522
Compliance with road safety rules

- Enforcement levels need to be high and maintained
- Apprehension with swift administration of penalties
- Speed cameras -> automated fines
- Enforce BAC limits -> random (1 in 10 drivers/yr)
- Public education without enforcement has negligible effect
A ‘silent revolution’ in Ireland in the past 15 years

The Road Safety Education / Enforcement Model

- **Education** → **Change Attitudes**
- **Enforcement** → **Change Behaviour**

- Shape the climate of public opinion
- Build community support for enforcement
Carseats at different ages

Rearward-Facing Baby Seat
- Weight: For babies up to 13kgs (29lbs)
- Approximate Age Range: Birth to 12-15 months

Forward-Facing Child Seat
- Weight: 9-18kgs (20-40lbs)
- Approximate Age Range: 9 months - 4 years

Booster Seat
- Weight: 15-25kgs (33-55lbs)
- Approximate Age Range: 4-6 years
Do not forget

- 6 – 12 year olds
- Booster cushion
- Frequently non-compliant
- Risk of lap belt injuries

**Booster Cushion**

**Weight**
22-36kgs (48-79lbs)

**Approximate Age Range**
6-11/12 years

Booster cushions do not have an integral harness to hold the child in place. The adult seat belt goes around the child and the seat. So it is important that the seat belt is correctly adjusted.
Reducing road-related injuries in Irish children (Archiv Dis Child 2011)

- Total
  - 1996-2000: 5928
  - 2004-2008: 3659
  - Reduction: 38%

- Minor Injuries
  - 1996-2000: 5063
  - 2004-2008: 3230
  - Reduction: 36%

- Serious Injuries
  - 1996-2000: 712
  - 2004-2008: 347
  - Reduction: 51%

- Fatal Injuries
  - 2004-2008: 82
  - Reduction: 46%
Cyclists

Cyclist Injuries

Cyclist Fatalities

607
223
63%

25
6
76%
Annual Trend in Injury Mortality Rates

Deaths per 100,000

- All Injuries
- RTAs

2007: 4.5
2008: 5.4
2009: 5.3
2010: 3.6
2011: 2.9
2012: 2.6
2013: 2.4

- 0.0
- 1.0
- 2.0
- 3.0
- 4.0
- 5.0
- 6.0

2007 2008 2009 2010 2011 2012 2013

P<0.05
P<0.01
Enforcement is the key!
Summary

- Significant progress has been made
- We all have an important advocacy role
- Data collection is required
- Emulate the methods of those countries successful in reducing road-related injuries