Risk factors for road traffic injuries in children

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Road traffic injuries (RTIs) in children: The facts

- 875,000 deaths every year from unintentional injuries.
- RTIs are the leading cause of death (720 deaths per day).
- 262,000 deaths among those aged 0–19 years – almost 30% of all injury deaths and nearly 2% of all deaths among children.
- In 2004, the South-East Asia, African Regions and the LMICs of the WPR accounted for two thirds of all road traffic deaths among children.
- Africa and the Eastern Mediterranean regions have the highest rates of fatalities from RTIs in under 20 years.
- About 33% of all child deaths are pedestrians, while 65% are car occupants or bicycle or motorcycle riders.
RTI mortality rates per 100,000 children by WHO region, 2004

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## Fatal child RTI rates per 100,000 population and estimated number of deaths by sex and World region, 2004

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<tr>
<th>Region/Country</th>
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<th>Americas</th>
<th>South-East Asia</th>
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<td>Boys</td>
<td>9.0</td>
<td>1.8</td>
<td>5.0</td>
<td>7.1</td>
<td>0.8</td>
<td>5.5</td>
<td>10.7</td>
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<td>Girls</td>
<td>5.4</td>
<td>0.7</td>
<td>1.8</td>
<td>5.2</td>
<td>0.3</td>
<td>2.4</td>
<td>1.6</td>
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<tr>
<td>Total</td>
<td>19.9</td>
<td>8.7</td>
<td>7.7</td>
<td>7.4</td>
<td>5.2</td>
<td>8.3</td>
<td>18.3</td>
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<td>RTI deaths × 1000</td>
<td>79.7</td>
<td>8.0</td>
<td>16.7</td>
<td>52.4</td>
<td>4.7</td>
<td>11.4</td>
<td>2.3</td>
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<td>% of global mortality due to RTIs</td>
<td>30.4</td>
<td>3.0</td>
<td>6.4</td>
<td>20.0</td>
<td>1.8</td>
<td>4.3</td>
<td>0.9</td>
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### Notes
- These data refer to those under 20 years of age.
- HIC = High-income countries; LMIC = Low-income and middle-income countries.
Children are at greater risk

- They are not just little adults.
- They live in a world built for adults.
- Strong association between injuries and
  - A child's age
  - Developmental stage
  - How he/she interacts with the world
  - Activities undertaken
Risk factors

- Most of the factors that increase the risk of road traffic injuries for the general population do so similarly for children.

- However, there are also risk factors that are specific to children.
child-related risk factors

- **Pre-event**
  - Age;
  - gender;
  - lack of supervision;
  - risk-taking;
  - impulsive behaviour;
  - disobedience;
  - Lack of police enforcement.

- **Post-event**
  - Child’s lack of resilience or flexibility;
  - Child’s general condition;
  - Lack of access to appropriate health care;
  - Post-injury complications

- **Event**
  - Size and physical development of child;
  - Lack of equipment to protect occupants, or equipment improperly used;
  - Underlying conditions in child.
Socioeconomic environment risk factors

- **Pre-event**
  - Poverty;
  - single-parent family;
  - large family size;
  - poor maternal education;
  - lack of awareness of risks among caregivers, childcare providers and educators.

- **Event**
  - Lack of safety culture in the car and on the road.

- **Post-event**
  - Lack of culture of supporting injured people;
  - no first aid given at scene
Child-related factors

- Physical development
- Cognitive development
- Risk-taking behaviour
- Peer influence
- Gender
- Type of road user (Pedestrians, Occupants, Bicyclists, Motorcyclists, Young drivers)
- Risk perception
- Lack of supervision
- Poverty
- Environmental factors
- Lack of prompt treatment
- Vehicle-related factor
Physical development

- The pattern and rates of injuries change with children physical, psychological and behavioural development and the risk varies as the child acquires new skills.

- Children's field of vision is more limited than that of adults.

- They are shorter, so that they do not have the same ability to assess a traffic situation and because they are small in stature they are not so easily seen by motorists.

- Children aged less than nine years show remarkably little awareness of the factors that make crossing the road dangerous.
**Cognitive development**

- The developmental processes taking place in children have an effect on their ability to make safe decisions in the road environment, and these processes are closely related to age.

- These cognitive processes are more developed in children aged 11 years and older who appear to be able to recognize a given road location as dangerous and show judgment that allows them to be safe on the roads.
Risk-taking behaviour

- The occurrence of accidental injuries is influenced by human behaviour.
- Behavioural characteristics such as risk-taking behaviour, aggression and hyperactivity appear to play a major role on injuries among children.
- Sex differences in injury rates could be caused by differences in behaviours. Boys are more likely to engage in risky behaviours than girls.
- Reason for higher injury rates among boys may be the different rate at which motor co-ordination and maturity develop in boys compared with girls, or the more daring attitude often exhibited by boys.
- Girls compared to boys have a greater tendency to behave safe.
Peer influence

- For many young people, peers are of significant importance and can be the primary source of the social norms with which they strive to conform.

- Social norms, including peer pressure and the emphasis placed on rebellion in the culture of young people, can affect the manner in which young people drive a vehicle.

- Direct peer pressure may be exerted on the driver’s behaviour through the influence of a passenger.
Gender

- There is a strong relationship between gender, road safety behaviour and road traffic injury (male-to-female ratio ranging between 3:1 and 5:1).
- The causes of childhood injuries are many and the sex differences are complex and difficult to explain.
- Boys are exposed to more hazardous situations.
- Boys are more likely to play in the street and are less likely to be accompanied by an adult.
- Boys show greater rate of hyperactivity or risky behaviours.
- Girls mature faster than boys and may be less willing to take risks than boys.
- Their perception to risks are greater than boys.
Type of road user

- There is no specific age at which children can be said to be safe road users as pedestrians, car occupants, bicyclists, motorcyclists or as young drivers.
Risk perception

- People respond to the hazards that they perceive. If their perceptions are faulty, efforts at personal, public and environmental protection are likely to be misdirected.

- Perception of risk, is a typical process of interpretation, a process of making sense of a complex world in order to plan, choose and act in that world.

- A lack of perception contributes to unexpected systematic failures.

- Individuals perceive risks in relation to their wider beliefs about risk and the more general implications that these have in their lives. For instance, children’s beliefs about a risk issue such as crossing a busy road alone may include assessment of both the immediate and longer term consequences of accepting or not accepting the risk.

- Older children, boys and more deprived children have less perception of the dangers of outdoor activities.

- The proportion of occasions when parents agreed with children’s assessment of their risk perception is low.
Lack of adults’ supervision

- Parental supervision is an important factor related to childhood injuries.
- For activities that children have difficulty in coping with, like crossing a busy road, parental permission for children’s independence might increase the risk of injuries.
- Sometimes there is no substitute for appropriate parental supervision for children RTI prevention.
- Differences in children’s and parents’ understanding of what activities are permissible and in their judgements about the appropriate age for children’s independent activities, may partly underline in injury patterns.
Poverty

- The socioeconomic status of a family affects the likelihood of a child or young adult being killed or injured in a road traffic crash, with those children from poorer backgrounds at greater risk.
Environmental factors

- Our environment has been built-up by adults and mainly For Adults!!
- The risk of death varies with different environments. For example, amongst children, travelling by a bicycle is more dangerous than travelling by bus.
- What parents think about their outdoor physical environment can affect their attitudes and whether they allow their children to play outside without an adult.
- Therefore, if they have an inaccurate judgement the safety of their local environment it may increase the risk of children's outdoor accidents.
- Socio-economic status is important in explaining the difference in rates of children's injuries between low and high risk areas.
- Children living and playing in the most deprived environments both at home and playing in street are at increased risk for injury.
Lack of prompt treatment

- Good recovery from RTIs depends on the availability, accessibility and quality of trauma care services.

- Such services are either not available or else are limited in scope and capacity in many low-income and middle-income countries.

- The most critical problems in relation to pre-hospital and emergency care are:
  - a lack of first-aid services and trained personnel;
  - unsafe modes of transportation to reach emergency care;
  - the long delay between the time of injury and reaching a hospital;
  - inappropriate referral services;
  - the absence of a triage system.

- The availability of good rehabilitation services is also an important requirement for the proper recovery of children following a road traffic injury.
Vehicle-related factor

- Given the small stature of children and/or poor vehicle design is an important risk factor for child RTI.
- The standard design of a vehicle can have a major effect on the risk and severity of injuries sustained by a child pedestrian.
- In particular, bumpers are being redesigned so as to prevent a pedestrian’s head making contact with the front window, by allowing the impact to be absorbed by a softer bonnet.
- The adaptations of vehicle design that have successfully reduced the incidence and severity of injuries are now being modified to benefit children.
RTIs: What works?

- Minimum drinking-age laws.
- Lower BAC limits for novice drivers and zero tolerance.
- Graduated driver licensing systems.
- Motorcycle and bicycle helmets
- Seat-belt and child-restraint laws
- Speed reduction.
- Separating road users.
- Daytime running lights for motorcycles
- Graduated driver licensing systems
Thank you for your attention