



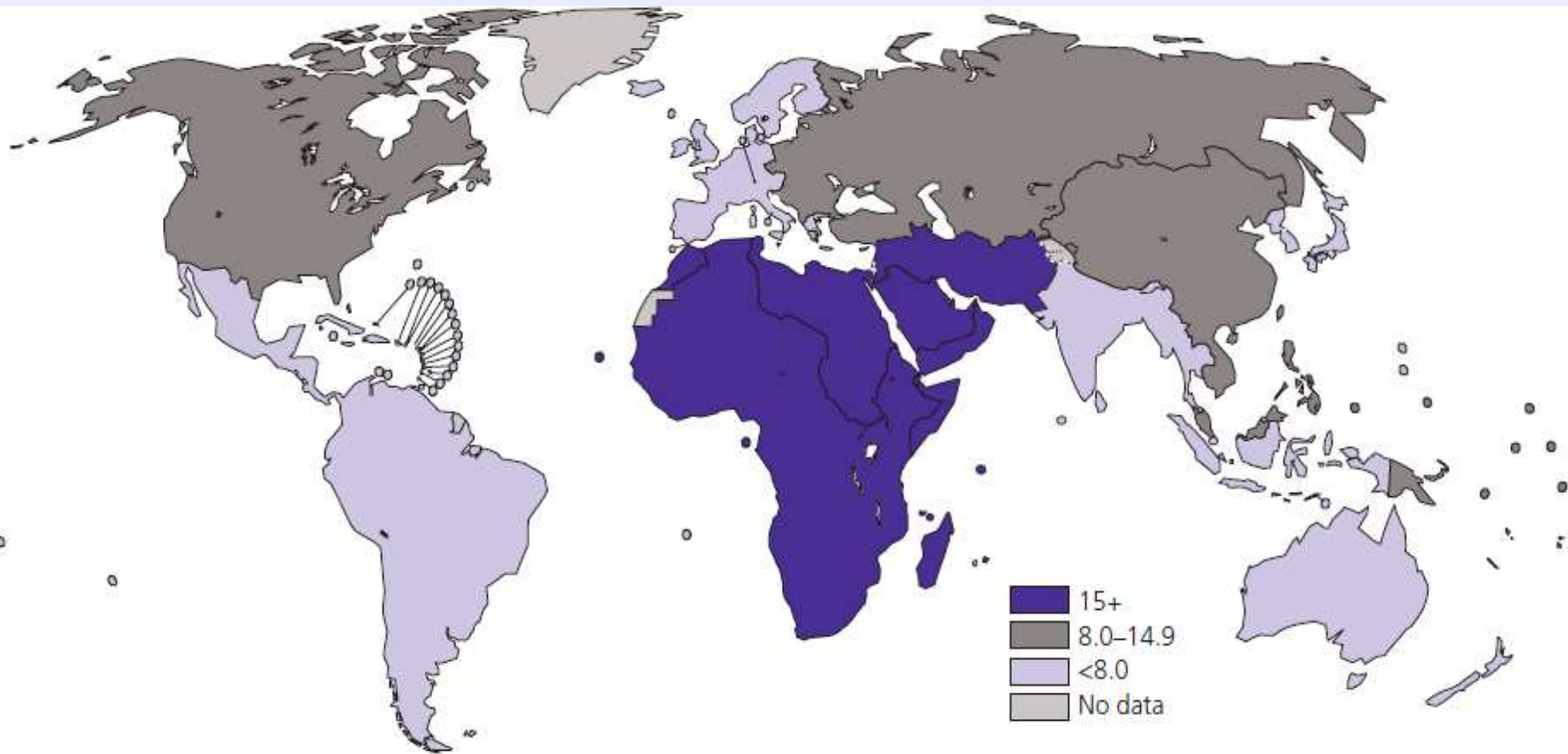
# Risk factors for road traffic injuries in children

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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



Africa		Americas		South-East Asia	Europe		Eastern Mediterranean		Western Pacific	
LMIC	HIC	LMIC	LMIC	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC
<b>19.9</b>	<b>8.7</b>	<b>7.7</b>		<b>7.4</b>	<b>5.2</b>	<b>8.3</b>	<b>18.3</b>	<b>17.4</b>	<b>4.2</b>	<b>8.6</b>

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

	Africa		Americas		South-East Asia		Europe		Eastern Mediterranean		Western Pacific		World	
	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC	
<b>Boys</b>	<b>9.0</b>	<b>1.8</b>	<b>5.0</b>	<b>7.1</b>	<b>0.8</b>	<b>5.5</b>	<b>10.7</b>	<b>9.0</b>	<b>1.7</b>	<b>17.5</b>	<b>1.8</b>	<b>9.8</b>		
<b>Girls</b>	<b>5.4</b>	<b>0.7</b>	<b>1.8</b>	<b>5.2</b>	<b>0.3</b>	<b>2.4</b>	<b>1.6</b>	<b>4.5</b>	<b>0.7</b>	<b>9.9</b>	<b>0.6</b>	<b>5.7</b>		
<b>Total</b>	<b>19.9</b>	<b>8.7</b>	<b>7.7</b>	<b>7.4</b>	<b>5.2</b>	<b>8.3</b>	<b>18.3</b>	<b>17.4</b>	<b>4.2</b>	<b>8.6</b>	<b>7.0</b>	<b>11.1</b>		
<b>RTI deaths × 1000</b>	<b>79.7</b>	<b>8.0</b>	<b>16.7</b>	<b>52.4</b>	<b>4.7</b>	<b>11.4</b>	<b>2.3</b>	<b>41.1</b>	<b>1.9</b>	<b>43.6</b>	<b>262.4</b>			
<b>% of global mortality due to RTIs</b>	<b>30.4</b>	<b>3.0</b>	<b>6.4</b>	<b>20.0</b>	<b>1.8</b>	<b>4.3</b>	<b>0.9</b>	<b>15.6</b>	<b>0.7</b>	<b>16.6</b>	<b>100%</b>			

a 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.

## ● Event

- Size and physical development of child;
- Lack of equipment to protect occupants, or equipment improperly used;
- Underlying conditions in child.

## ● Post-event

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

# 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 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

