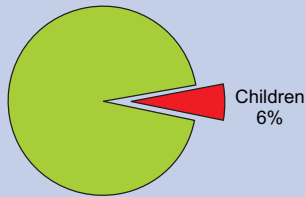
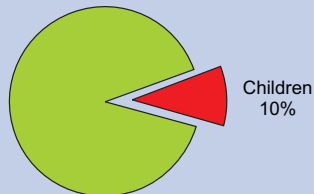




Fatal



Non-Fatal



Why children are vulnerable to injuries?

- ❖ The various stages of growth and development in children are associated with particular types of injuries, based on the milestones they achieve at different ages.
- ❖ Due to the rapidly changing lifestyles and increasing motorization, children like all others come in contact with large number of motorized vehicles on roads that are designed and built without keeping their needs in mind.
- ❖ The body parts of children being in a phase of growth and due to relative softness of tissues, are more vulnerable to the impact of injury.
- ❖ Some of the characteristics of children like smaller body size, vision, hearing, and limited risk perception, makes them more susceptible to be involved in traffic crashes, burns, poisoning, drowning & others and also affects the injury outcomes.
- ❖ The psychological characteristics of children like impulsiveness, curiosity, experimentation, lack of knowledge on judgement of distance/ speed, low levels of concentration, makes them vulnerable for injuries and to neglect safety issues.
- ❖ Children move from a phase of protected environment and traveling with parents/elder siblings to states of independent travel along with an urge to take risks, experiment with various devices/products thus increasing their vulnerability to all types of injuries.(4)

100 children die in TN school fire

A blaze that started in the kitchen of a school crammed with nearly 900 children created a ghastly inferno which killed at least 100 students, most of them between 8 and 10 years old, and some staff and left 30 others battling for life in this town on Friday.

July 17, 2004, Times of India, Bangalore, Page 1



26 schoolchildren, staff injured in bus accident

A school excursion turned tragic on Saturday morning, when the school bus toppled near Kengeri bus depot, leaving at least 26 students and staff members injured.

Dec 3 2006, Times of India, Bangalore, Page 3.



Police inspect the school bus after the accident

Did we learn anything from such incidents to prevent them from happening again and again?

Children are the future of every country and all societies strive to ensure their health and safety. India is home to nearly 500 million young people among whom children less than 15 years are 37% (370 million) (1). Since India's independence, continuous efforts have been made to improve the status of children. The large burden of communicable, infectious and nutritional disorders is gradually on the decline due to massive efforts and investments by successive Indian governments, even though it is an unfinished agenda. Parallel to these changes, it is also becoming apparent that children saved from diseases of yesterday are becoming victims of injury on road, at home and in public, recreational places.

As per WHO estimates, nearly 950,000 children die in the world due to an injury each year. (2). The burden of child injuries in India is not clearly known, as injury information has not received much importance. National Crime Records Bureau data and few independent studies reveal that nearly 15 - 20 % of injury deaths occur among children (3). For every death, nearly 30 to 40 children are hospitalized and are discharged with varying level of disabilities. The number of children sustaining minor injuries can only be guessed, as the problem is huge and phenomenal. The outcome from injuries is significant since it occurs in the younger age, thereby affecting long-term growth and development of children. Children with disabilities after an injury lead life with persistent disabilities for the rest of their life. Injuries lead to poor academic performance at a time when education is receiving a major thrust. The socioeconomic hardships and psychosocial disabilities are huge and largely unmeasured. As injury burden, pattern, determinants and outcome varies from region to region, it is essential to understand these characteristics to formulate effective child safety policies and programmes.

Larger policies and programmes in transport, housing, environment, education, urban and rural development and others do not consider needs and limitations of children. Consequently, children share the same environment

that is designed for adults. Further, child injury problem is unrecognized and hidden in the larger agenda of communicable and infectious disease control, and are not considered as health problems. At the same time, absence of efforts within and outside health sector makes it difficult to lead larger advocacy and prevention efforts.

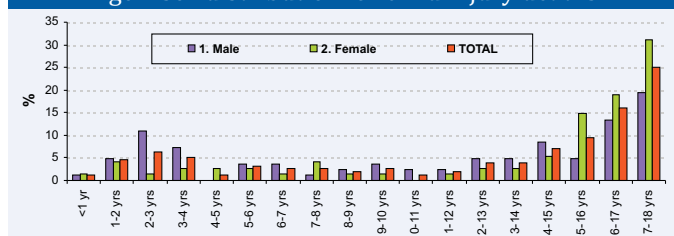
The problem

The burden of child injuries in India is not clearly known. As per NCRB report of 2006, there were 22,766 deaths (<14 years) due to injuries among children (5). However, a recent national review on burden of injuries in India revealed that, nearly 8.2% of deaths and 20-25% of hospitalizations occur among children (3), based on few hospital and population based studies. In the same year, there were deaths among 1,133 children in Karnataka. As child injuries are not examined separately in Bengaluru, the problem is unclear.

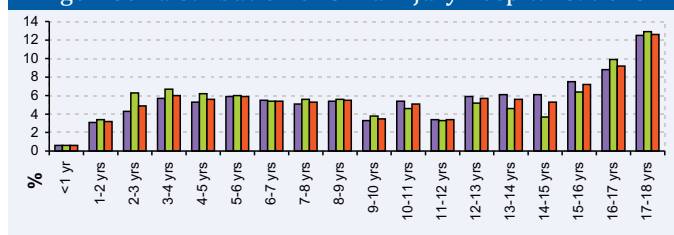
One-year data from Bengaluru injury surveillance programme showed that (6):

- ❖ 209 children below the age of 18 years died in Bengaluru due to an injury.
- ❖ In the same period, there were 5,505 children brought to hospitals with an injury.
- ❖ The ratio of fatal to nonfatal injuries was 1:27.
- ❖ The male to female ratio was 3:1 among deaths and 2:1 in hospital registered children.
- ❖ Highest number deaths and injuries occurred in 17 – 18 yrs age groups to the extent of 26% in fatal and 13% in non – fatal cases.
- ❖ Majority of the children belonged to average socio-economic households and were studying in schools.

Age – Sex distribution for child injury deaths



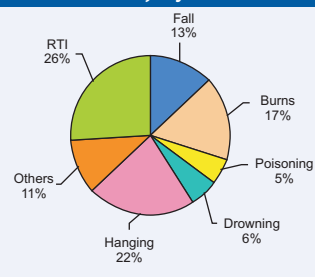
Age – Sex distribution of Child injury hospitalisations



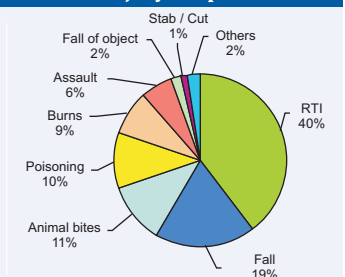
Profile and pattern

The type and causes of injury varies according to age, sex, socioeconomic status, several physiological factors, place and location, nature of products used, and extent of protective mechanisms. Thus, several types of injuries like road traffic injuries, falls, burns, drowning, poisoning, fall of objects, intentional injuries like interpersonal violence and deliberate self harm are commonly seen.

Causes of injury deaths



Causes of injury hospitalizations



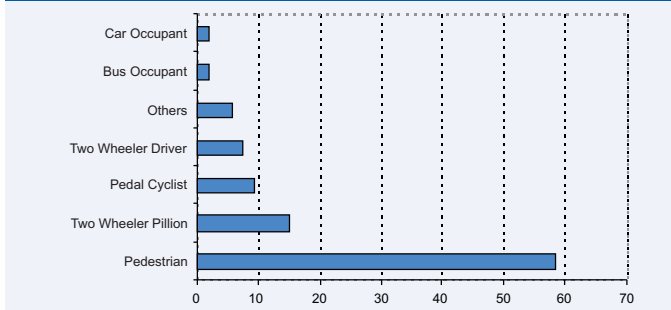
- ❖ Among deaths, nearly one fourth were due to road traffic injuries. With children graduating from using roads under parental / caregivers' supervision to independently walking, cycling, traveling on motorbikes or on public transport, RTIs increase over a period of time with number of environment, vehicle and person related factors. Self-inflicted injury due to hanging commonly in the older children or those accompanied with parental suicides was responsible for another quarter of deaths. These two were closely followed by burns (17%), falls (13%), drowning and poisoning (6% and 5%).
- ❖ For every child death, there were 27 children brought to partner hospitals during one-year. The causes were similar varying with age and other factors. Every third child brought to the casualty department was due to a road traffic injury (40%), while every fifth injured child was due to a fall. Animal bites (dog bites in particular) and poisoning were responsible for nearly 10% of hospitalizations, each. Burns (9%) and assault (6%) due to interpersonal violence were other leading causes of child injury hospitalization.
- ❖ The number of nonfatal injuries would be much higher as data from those children seen in other hospitals (only 21 hospitals were included in BISP), general practitioners, managed at home have not been included. Thus, it is estimated that the city of Bengaluru would witness, on an average, 250 deaths and nearly 10,000 children hospitalised every year.

Risk factors

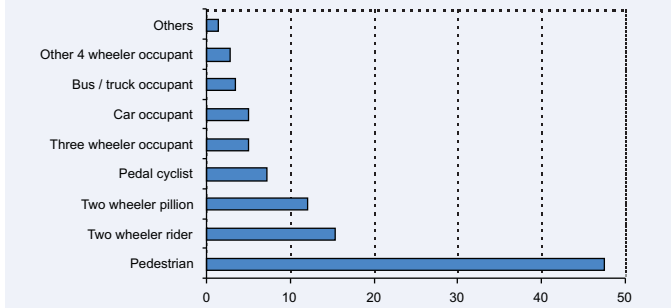
The risk factors for various injury causes are different as per age and sex. Commonly used products in routine environments result in different type of injuries.

- ❖ Road traffic injuries being the leading cause for deaths and hospitalisation were seen to a higher extent in male children (79%) and in 14 – 18 yrs age group (33%). Majority of the crashes had occurred within the city, most commonly during 12pm to 6pm (38% in fatal cases and 44% in non fatal cases). Deaths and injuries had occurred while children were walking, crossing the road or while playing on the roads. Children were commonly killed and injured as pedestrians, on two wheelers or on bicycles. Collision with two wheelers and cars was the commonest pattern to the extent of 35% and 11%, respectively.
- ❖ Falls were the second leading cause for injury hospitalization among children and the commonest places of falls was home (70%)

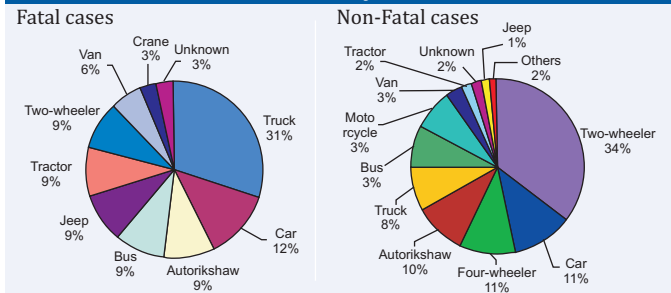
Road user categories in fatal cases (%)



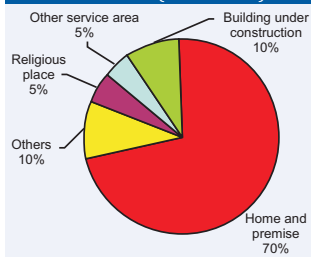
Road user categories in non-fatal cases (%)



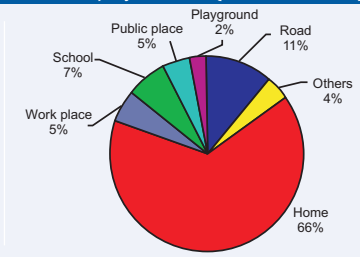
Hit by



Place of falls (fatal cases)



Place of injury for falls (non-fatal cases)



- ❖ Burns were commonly due to kitchen fires, stove bursts, spillage of hot liquids etc. 90% of the burn injuries occurred at home.
- ❖ Poisoning was commonly due to accidental or intentional consumption of organophosphorus compounds and drugs, and occurred at home.
- ❖ Animal bites were generally due to dog bites. Dog bites in Bengaluru were an issue of intense media and policy debates in recent months.

Emergency care

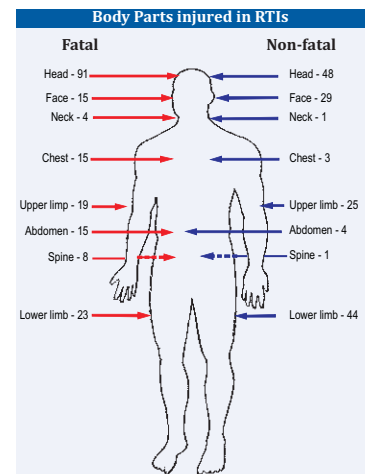
When even a child is injured or killed, the outpouring of public reaction is beyond imagination, as no one would like a child to be injured or killed. Thus, it is common to see buses being burnt, stones pelted and property damaged in any injury that involves a child. Children are rushed to the nearby hospitals to get appropriate and timely care. However, a number of problems exist in delivery of both

emergency and acute hospital care. A number of critical factors like notification, first aid care, triage, safe transportation, proper referral, and other aspects were found to be deficient as per the data from BISP.

- ❖ First aid responders were virtually absent, and doctors and nurses were the first to provide any first aid; 3% of fatal cases received care within an hour.
- ❖ The commonest and the first place of first aid was the nearby hospital in 92% of road traffic injury patients, and this was mainly in the public (47%) and private hospital (45%).
- ❖ 44% of injured children were transported in a private vehicle and 32% in an auto rickshaw; ambulances were mainly used for inter-hospital referrals.
- ❖ Referral from one hospital to another was a common practice as more than 70% had visited more than one hospital prior to reaching the definitive hospital.
- ❖ Triage was commonly absent at or immediately after the crash, even in the hospitals.
- ❖ Only 26% were brought to hospitals in less than 1 hour, while 13% reached a hospital in less than 3 hours.

Impact

The type, nature, severity and outcome depends on collision, injury patterns, type of body organs involved and the amount of energy transfer in injury.



- ❖ Vital organs of the body like head, face, chest and abdomen were injured in number of deaths and hospitalised children. Head injury was common across all injury causes and was seen in 91 % of killed and 48% of hospitalised road the traffic injuries. Falls generally resulted in injury to head and face and upper and lower limbs. Internal injuries to parts of digestive system and nervous system were common in poisonings. Burns resulted in shock, hemorrhage, septicemia and others.
- ❖ Nearly half the children brought to hospitals had moderate (45%) and severe (17%) types of injuries, requiring intensive and long-term management.
- ❖ Even though disabilities were not documented in the present programme, previous studies highlight that nearly all seriously injured patients, 50% of moderately injured and 20% of mild injuries are discharged from the hospitals with varying levels of disabilities, requiring short-term and long-term rehabilitation services. Results from recently completed study on traumatic brain injury in Bengaluru has shown that nearly 23% of children were having difficulties with schooling and day-to-day activities with 38% having psychosocial problems on a regular basis (7).

Prevention and control

Child safety promotion and injury prevention requires an integrated and coordinated approach between all concerned ministries and departments. Since child injuries happen due to several causes, the solutions will also be several. Multiple interventions need to be implemented in an integrated manner to obtain maximum results as each one contributes for decreasing injuries to a certain extent. Road safety and home safety should be given high importance to reduce child deaths and injuries. Several known and proven interventions are provided in related fact sheets and public health alerts.

- ❖ Road safety needs to be strengthened with a specific focus on children, as child road users have limited or no experience of being safe on roads on their own, especially young children. In view of this, the road and environment needs to be child friendly with places for walking and cycling, to be considered at the time of design of roads.
- ❖ Young children should be specifically taken care by parents or caregivers while they are on roads.
- ❖ Proven Road safety interventions like speed management, reducing drinking and driving, traffic calming measures, greater emphasis on public transportation, traffic separation, better design of roads, safe pedestrian walking and crossing facilities, etc., will have huge benefits in saving lives of children.
- ❖ Specific and well-designed programmes on safe transport of children to schools based on data, interaction with teachers and parents and provision of safe and convenient buses need to be promoted to reduce individual exposure of children on roads.
- ❖ All vehicles transporting school children should be in yellow or orange colour to increase their visibility on the roads.
- ❖ Parents should avoid seating their children on the front seat of passenger cars and, as far as possible on two wheelers.
- ❖ Children should be encouraged to wear protective helmets from the time they are young; it becomes a good practice when the child becomes an adult and

begins using vehicles on his/her own. Programmes that are specific, targeted, continuous and focused should be developed in schools rather than general awareness activities.

- ❖ Fall injuries can be reduced with a set of counter-measures like parental supervision of children, antiskid flooring, improving standards in construction of houses (for balconies, railings, etc.) and others.
- ❖ All dangerous and harmful products like drugs, organophosphorus components, and lethal chemicals should be kept away from the reach of children. All medicinal bottles should come in childproof containers with strict warning and labels.
- ❖ Capacity strengthening and training of all professionals (especially personnel from police, transport, health, education, public works, urban - rural development , etc.,) involved in child safety and welfare activities should be promoted.
- ❖ Public awareness and parental understanding to accept safety in day-to-day living should be increased.
- ❖ Improvement of trauma care facilities in hospitals to provide efficient and standard trauma care for injured children.
- ❖ Strengthening the rehabilitation facilities for bringing back injured children to optimum functioning.
- ❖ Increased research to better understand injury causes and patterns among children.

Implementation of combined and integrated interventions through a systems approach is the key to save children in India. It is the joint responsibility of governments, industry, professionals, media and people to promote injury prevention and safety promotion in India. In the coming years, the travel and transport patterns and ways of living are going to change due to a number of external and internal factors. Progress in child survival and safety cannot be achieved without inclusion of injury prevention and control in the larger public health agenda and in all child health programmes. Child injuries need proper recognition, policy initiatives and programme development and evaluation. Every opportunity needs to be seized to incorporate child injury prevention apart from developing specific initiatives. Child health without child injury prevention is no longer acceptable. (8)

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<p>Bengaluru Injury / Road Traffic Injury Surveillance Programme is a collaborative Programme between Bengaluru City Police, 25 hospitals, Bengaluru Metropolitan Transport Corporation and Bruhat Bengaluru Mahanagara Palike. The programme is coordinated and implemented by National Institute of Mental Health & Neuro Sciences and facilitated by Indian Council of Medical Research and World Health Organization, India office. The programme aims at reducing / preventing injuries, improving trauma care and strengthening rehabilitation services.</p>										
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