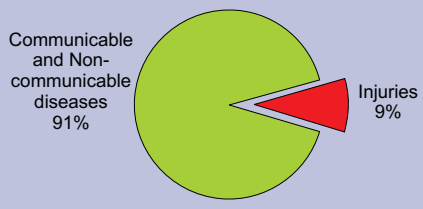
# NIMHANS BISP fact sheet

# INJURY

- **5000 deaths and hospitalizations of more than 1,00,000 persons due to an injury during 2007, in Bengaluru.**
- **In larger public-sector hospitals, every fifth patient in the casualty was due to an injury.**
- **Every three out of four injured /killed persons was a young male.**
- **Road traffic injuries are the leading and commonest cause of deaths and hospitalizations.**
- **It is estimated that 1.1 million deaths and 22 million hospitalizations are likely to occur in India in 2010.**




- **Pedestrian knocked dead near airport; two buses set ablaze**

  Sep15, 2008 , Times Of India Bangalore, Times City; Page 3
- **3 – yr – old run over; mob stones BMTC buses**

  Jan 21, 2008, Times of India Bangalore, Times City Page 3
- **Buses stoned, cops beaten up Accident sparks tension**

  Jan 18, 2008, Deccan Herald Bangalore, Page 2
- **Fire accident at textile unit**

  July 14, 2008, Times of India Bangalore, Times City Page 3
- **Six – year – old falls from escalator at mall**

  Jul 2, 2007, Times of India Bangalore, Front Page, Page 1
- **Infosys trainee commits suicide**

  Oct 7, 2008, Deccan Herald, Bangalore, Page 4
- **14 floors of tower under construction collapse**

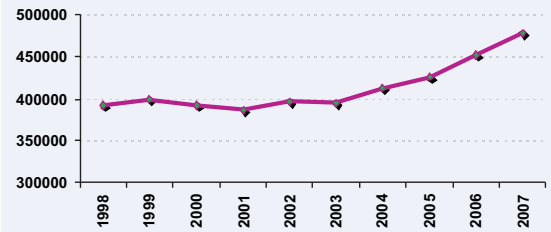
  Oct 28, 2008, Times of India Bangalore, Front Page, Page 1

As Indian society changes rapidly, reading, listening or even experiencing an injury has become a day-to-day event. The demographic, social, economic and epidemiological changes are greatly influencing the health of the Indian populace. With the decline of communicable and infectious diseases, injuries are increasing at a rapid pace and have become a leading public health problem. Globalization, modernization, motorization, industrialization, migration, impact of media & changing values and lifestyles of people are all contributing to the increasing occurrence of injuries on road, at home, in workplace and in other areas.

Injuries are commonly referred to as accidents, acts of God, result of bad times, sins of past life, and by other names. However, by scientific definition, an injury means 'the occurrence of body damage due to sudden transfer of energy from physical, chemical, mechanical, thermal and radiant methods beyond the physiological tolerance of an individual' (1). This sudden transfer of energy results in damage to body organs and injuries to vital parts of the body. Injuries are non-random events, occurring due to an interaction between people, product(s) and environment; acute in nature, vary in severity and can be repetitive. This scientific understanding has revolutionized our understanding of injuries, and hence, it has been possible to develop suitable remedial measures for prevention and control.

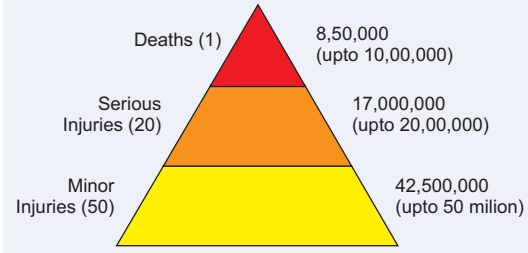
## The problem

**Deaths due to injuries in India from 1998 to 2007**

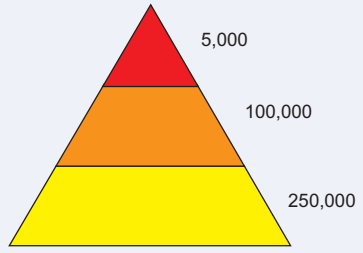



- It was estimated that injuries resulted in nearly a million deaths and 20 million hospitalizations for serious injuries in 2005 (2). The number of mild injuries is estimated to be more than 50 times of deaths. If left unchecked and in a 'do-nothing' scenario, injury deaths will cross 1.5 million and 50 million hospitalizations by the year 2015.
- As per NCRB 2007, there were 5,03,842 deaths and 15,24,034 injuries.
- In Karnataka, 34,378 deaths and nearly 1,95,000 hospitalizations were reported in 2007 as per Crime Records Bureau Report (3).
- In Bengaluru, as per data from Bengaluru Injury Surveillance Programme (BISP) (4).
  - Injury deaths have increased from 2152 in 2000 to 4334 by 2007.
  - An estimated 5000 deaths and more than 1,00,000 hospitalizations occurred in 2007. The number of minor injuries resulting in contact

**India Injury Pyramid**




**Bengaluru Injury pyramid**



with a health centre could be in the range of 2,50,000 – 3,00,000 every year.

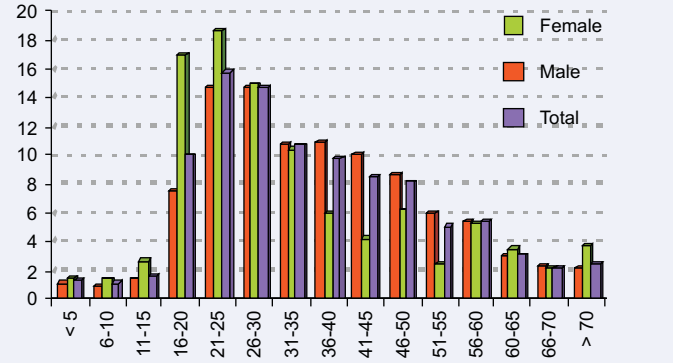
- One in every 10 deaths in the city of Bengaluru was due to an injury.
- 1/5 of casualty registrations, 10% of admissions and 30% of hospital deaths were due to injuries.
- In larger public-sector hospitals, every fifth patient in the casualty was due to an injury.

## Profile and pattern

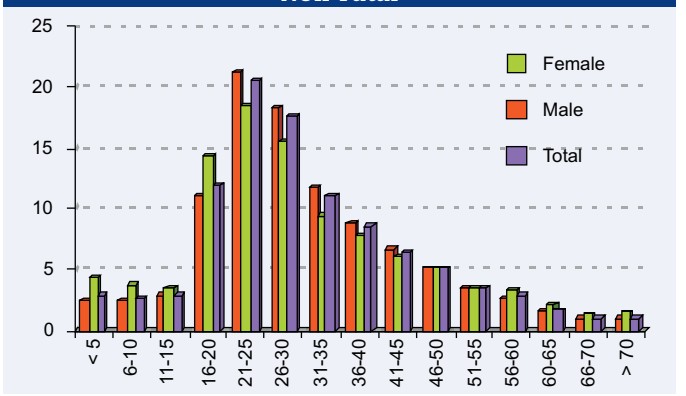
In contrast to other public health problems, injuries are a problem of the young. While deaths in early years are due to communicable, infectious and nutritional disorders, and, deaths in elderly commonly due to neuro-degenerative, endocrine and metabolic disorders, the young and middle-aged groups are primarily affected by injuries. BISP data showed that nearly three fourths of these deaths occurred

- In the younger and middle-aged people (16 to 44 years)
- Predominantly among men (women were also affected depending on cause)
- More commonly among poor and middle-income sections of society

**Fatal**



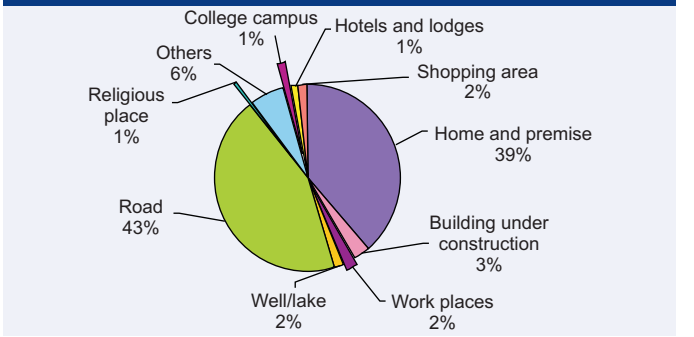

**Non-Fatal**




Injuries occur in all places where people travel, live, work and play. Generally, injuries occur in urban, rural, slum and transitional areas, but are reported more from urban areas. In Bengaluru,

- 43% of deaths and 57% injuries occurred on roads.
- More than a third of deaths and one fourth of serious injuries occurred at home.
- Schools, workplace, religious place and others were also common places of injury occurrence.

**Fatal**

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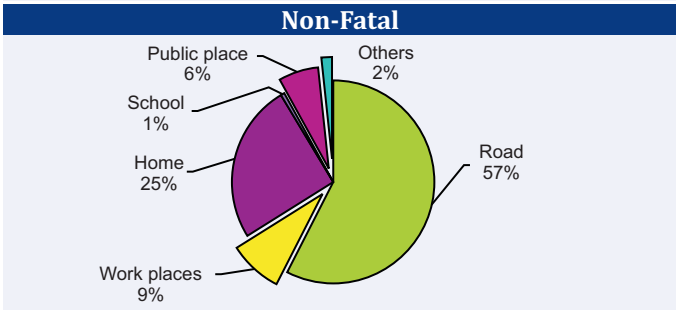
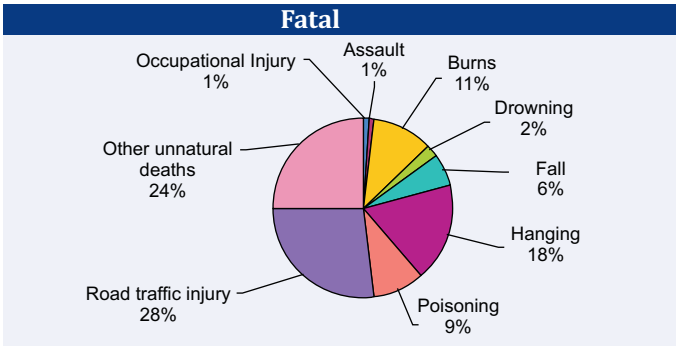


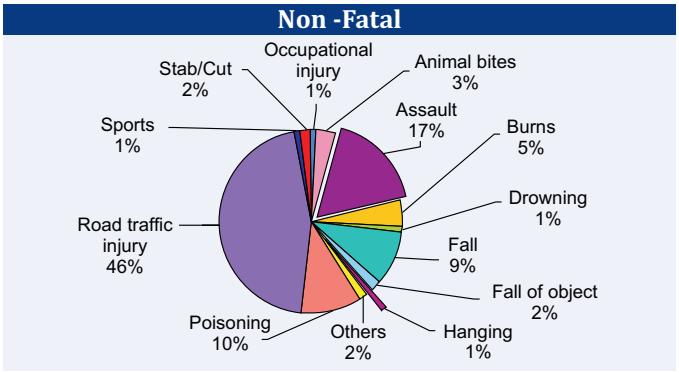

Injury occurs due to complex interaction of product (vehicles, equipments, machinery and day-to-day products), environment (road, home, work place, etc.,) and people in different situations. Based on intent, Injury can be intentional or unintentional. Unintentional injuries include road traffic injuries, falls, burns, poisoning, drowning, animal bites, fall of objects, sports injuries, injury in workplaces and injury in unnatural situations like different disasters. Suicides, violence of different types and assaults are considered intentional injuries since the intent is to harm oneself or others. The BISP data revealed that:

- Road traffic injuries were the leading and commonest cause of deaths (28%) and hospitalizations (46%). Pedestrians, two-wheeler occupant and bicyclists were at an increased risk.
- Hanging (18%), burns (11% and 5%) and poisoning (9% & 10%) were the other leading cause of deaths and hospitalization, respectively.
- Based on intent, suicides accounted for *27*% of injury deaths and 10% of hospital registrations.
- Significant number of non-fatal injuries was often unintentional in nature.

A risk is an increased probability of injury occurrence in the presence or absence of a given factor. The risk factors for injury vary as per the cause and the extent of exposure. Commonly, general risk factors include younger age, being male, from lower socio-economic strata, use of hazardous and unsafe products, risk prone environment, non-use of safety equipments, lack of proper trauma care and several others.

Selectively, alcohol was one single factor cutting across all types of injuries. Bengaluru data revealed that nearly 8% of deaths and 9% of hospitalized injuries occurred while the person was under the influence of alcohol. This number is likely to be higher as alcohol information was poorly documented in both police and hospital reports. NIMHANS studies (5, 6) have documented greater presence of alcohol among injuries and deaths (25-35%) in both hospital and population based studies.




## Emergency care

Prehospital and emergency care, acute hospital care and post hospital care make a significant impact in saving the lives of injured and reducing severity from injuries. With reference to emergency care, BISP data showed that -

- Care at crash / injury site and soon after occurrence of injury was provided for only 7% of fatal and 2% of non-fatal injuries.
- Every third person (33%) died at injury site and 15% enroute to the hospital.
- Serious injuries due to road crashes, hanging, drowning and lethal poisoning resulted in both early deaths and long-term hospitalizations.
- Only 30% reached a hospital within one hour of injury and nearly half reached within three hours.
- Three out of four injured persons reached a hospital by a private vehicle or an auto rickshaw, while ambulances were used by less than 1/5 of those injured.
- Government and public hospitals were the commonest place of care for majority of people.
- More than 70% of fatally injured and nearly 90% of non-fatal injured visited more than one hospital.
- Injury to head and face, upper and lower limbs were more frequent in road traffic injuries and falls.
- Nearly one fourth had sustained polytrauma.

## Impact

Any injury, especially those resulting in hospitalization and/or death is a very traumatic experience for an individual and his/her family. The loss of near and dear ones are extremely difficult to bear by any individual and difficult to capture. The pain, agony and suffering are phenomenal for the affected individual and his / her family.

- Even with a simplistic classification of injury severity, 47% were moderate and 20% severe in nature.
- Injuries place enormous burden on the health system in terms of care, investigations, management and rehabilitation.
- Emotional and psychosocial problems after an injury are immense, varying with injury cause and persisting even after an individual recovers from injury.
- Loss of work in productive ages, loss of education for youngsters and loss of income for affected person will have longstanding consequences on the family.
- The economic impact is huge and unmeasured. Road traffic injuries alone are estimated to cost 3% of GDP (approximately Rs.55, 000 crores at 2000 prices) in India (7). The total direct and indirect economic losses to injuries can be huge and needs more research.

## Prevention and control

Research and evaluation in many parts of the world have revealed that injuries are predictable and preventable (8). Many high-income countries have demonstrated a major reduction in injury deaths and hospitalizations by combined approaches of:

- Modifying/improving/making safer vehicles and products by product design and engineering measures,
- Strict enforcement of safety laws and regulations,
- Improving and strengthening trauma care practices,
- Increasing awareness in the society to accept safety as a pattern of life, and
- Developing mechanisms to promote safety.

The prevention and control of injury varies as per cause and relates to applying specific measures for products, environment and people through a systems approach. Developing specific measures for what can be done before, during and after an injury as applicable to people, products and the environment, as shown in Haddon's Matrix below (9), helps in developing -- implementing specific measures for injury prevention and control.

**Example of Haddon's matrix as applied to two wheeler road traffic injury**

| | Human | Vehicle | Environment |
|---|---|---|---|
| **Pre-event** | Increase awareness about safe driving, helmet wearing, drink driving etc. | Increase visibility of vehicle | Implement safety features on roads |
| **Event** | Early transfer to hospital and required care | Better braking systems of two wheelers | Crash protective road side stationary objects |
| **Post-event** | Rehabilitate and improve health care services | Improve safety technologies and components | Facilities for early rescue of injured persons |

Based on last three to four decades of research, experience from large number of programmes and lessons learnt in different communities, it is now evident that injuries of all types can be reduced even with available knowledge and understanding. Many High Income Countries of the world have registered a major decline in Road Traffic Injuries and all other injuries. The new understanding reveals that injury prevention and control -

- Is possible and feasible.
- Needs Political commitment, Policy maker's cooperation, Professional's participation, and Public involvement along with contribution by Press.
- Requires an independent lead agency with authority, status and resources to guide – develop – coordinate – implement – and evaluate safety issues, policies and programmes.
- Is dependent on development of institutional mechanisms, joint coordinated activities, independent monitoring and supervision of policies and programmes along with research.
- Should be implemented on a public health approach of identifying the problem, delineating risk factors, implementing the right interventions & evaluating them for cost effectiveness - sustainability - culture specificity and measured by actual reduction of deaths and injuries.
- Requires a careful understanding of situation – circumstances – context of injury occurrence by systematic research to clearly delineate modifiable / preventable risk factors.
- Is an intersectoral activity with combined inputs and joint efforts from all sectors like transport, police, health, industry, product manufacturers, social welfare, education, information, media and others.
- Is an integrated activity, as multiple interventions need to be combined and implemented to get greater benefits, maximize success and reduce costs.
- Is based on combined approaches of, engineering, enforcement, education, emergency care & evaluation.
- Should be based on programmes developed on local, regional and national analysis of data collected through well-designed information systems and research inputs.
- Requires implementation of more and more passive countermeasures, as these are more beneficial given the limitations of human behaviour.
- Requires increased resources to be invested in prevention and control to see that our society has safe people, safe vehicles, safe products & safe environments with adequate support and care for injured.
- Should have active participation of all health professionals (trauma care physicians and surgeons from all specialties, nursing professionals, public health specialists and others) in providing care, leading advocacy, conducting research, training people and measuring the impact of interventions.
- Requires systematic monitoring and evaluation of all policies, programmes and interventions to measure decline in actual reduction of deaths, hospitalizations, disabilities and economic losses.
- Is not possible if, unspecific, adhoc, knee jerk reactions and populist measures are promoted.

It is essential to note that injuries occur everywhere and planners / policy makers / professionals should take a lead role in developing and implementing injury prevention and safety promotion policies and programmes to prevent deaths and disabilities due to injuries. A scientific and systems approach to injury prevention and control is urgently required in India. Loss of young lives and broken heads and limbs need not occur every day. The society needs to make conscious effort to make people safe on roads, at home, in workplaces and in all public areas. A Systems approach by - integration, coordination, intersectoral approaches and scientific data inputs promotes development of safer societies. It is the joint and collective responsibility of Government, industry, professionals and people. Children and young people saved today from diseases of the past will only be victims of injury in the coming years. We need to awaken to this growing epidemic and should act now.

**Do you know? How many deaths & hospitalisations occur due to injuries in your state/city?**

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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.


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