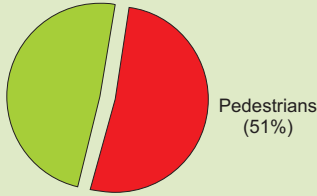
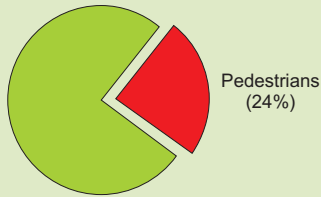




Fatal RTIs



Non-Fatal RTIs



Data from BISP revealed that, nearly half of road deaths and one fourth of hospital registrations due to RTIs were amongst pedestrians. More than half of injured and killed pedestrians were young men in 16 to 45 age group. Collision with heavy vehicles like buses/trucks and medium sized vehicles like cars/jeeps resulted in higher deaths. Two thirds had moderate to severe injury and first aid care was not available for most of the fatally or non-fatally injured pedestrians at crash site.

Mr. S, aged 34 years, was shopping on the evening prior to Diwali festival with his family. His wife and children alighted from the car, crossed the road and were waiting for him while he found a parking place. After parking his car, he was crossing the road in a hurry and could not judge the speed of the oncoming car. He was knocked down a few meters from the nearby traffic light area. He was hospitalized for brain contusion and fracture of lower limb bones. He spent 2 months in a private hospital, spent nearly Rs. 1,50,000 and still cannot sit and work for longer hours.

Incidents like these are extremely common on the roads of Bengaluru. Walking is a significant mode of transport and all human beings are pedestrians for varying time periods on roads, even though motorization is increasing at a rapid pace. Right from the early days - till the person is unable to move, walking remains an important mode of travel. Even people who use cars and motorcycles, depending on their need, walk for shorter or longer distances. Walking is indeed found to be healthy as it helps in prevention and control of some non-communicable diseases like diabetes, obesity, hypertension, cardiac problems and others. In a country with large population, it is common to see more people walking on roads in both cities and rural areas.

Large number of people including children, elderly, disabled, pregnant mothers and others use roads regularly. When large numbers of such people use roads, the environment and operating vehicles need to be safe, so that pedestrians are not injured and killed. In recent years, pedestrian safety has assumed greater importance as reports indicate that pedestrians are the single largest category of those injured and killed in road crashes in India. (1)

The problem

Recent reports indicate that pedestrians in Bangalore face a daunting task in using roads and footpaths and the pedestrian safety index is 0.63, way below other metros. (2)

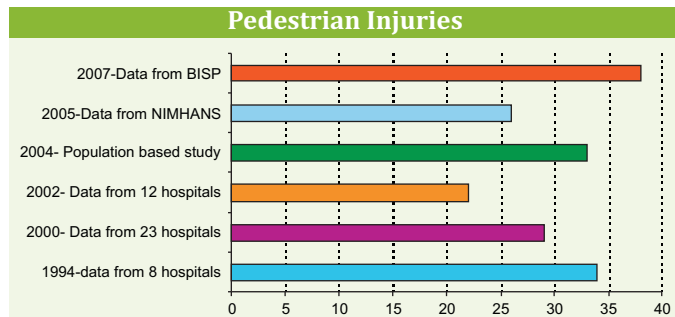
As per data from National crime records bureau, 10,125 pedestrian deaths were reported for the year 2007 in India.(3). Karnataka was one among the top 10 states (6th place) with highest number of pedestrian deaths (692). This information maybe biased as police reports report on the impacting vehicle, rather than the road user category of the person killed and injured, and hence, pedestrian deaths and injuries are definitely higher than reported figures.

Walkability Index	
City	Index
Chandigarh	0.91
New Delhi	0.87
Mumbai	0.85
Ahmedabad	0.85
Kolkata	0.81
Pune	0.81
Chennai	0.77
Hyderabad	0.68
Nagpur	0.66
Patna	0.65
Jaipur	0.64
Bengaluru	0.63
Surat	0.62
Kanpur	0.59
Kochi	0.57

Walkability index is calculated as (W1 x availability) + (W2 x facility rating); W1 and W2 are parametric weights, assumed as 50% for both. The availability is the footpath length / length of major roads in the city and facility rating is the score based on the opinion on available pedestrian facilities. The higher the index, is the better pedestrian facilities in that city (2).

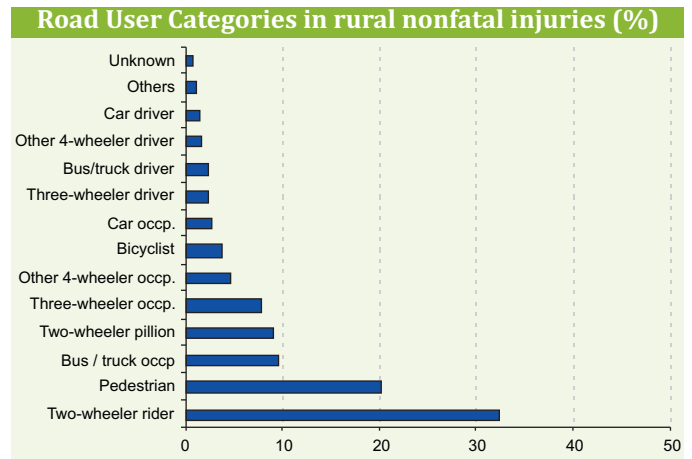
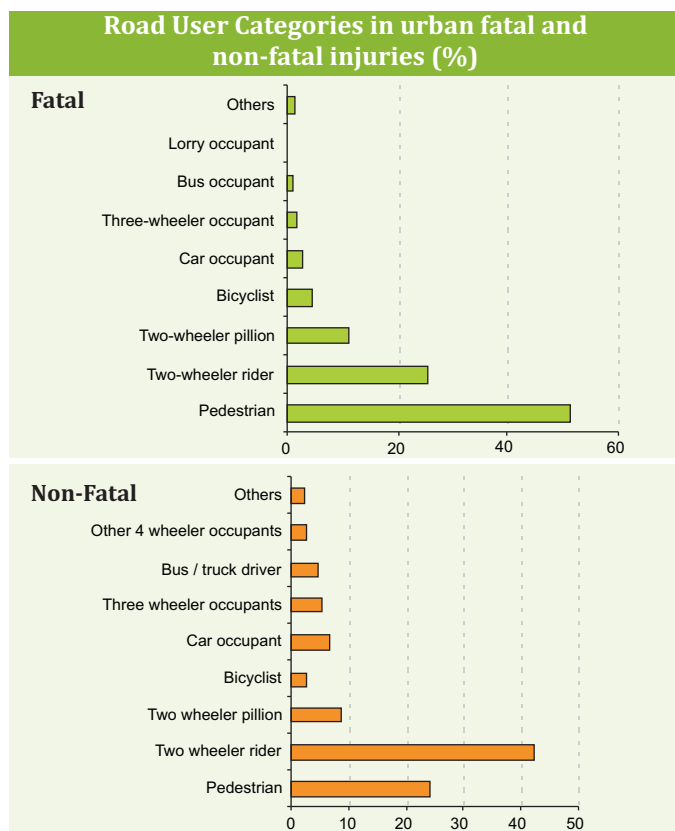


A national review has shown that nearly 60 per cent of deaths and injuries on national highways are among pedestrians (4), and hospital-based studies indicate pedestrian deaths to vary from 22% to 35%, and population based studies reveal that 1/3rd to 1/4th of road deaths are among pedestrians (1). The precise number of pedestrians injured and killed is difficult to ascertain and could be approximately 40,000 deaths annually in India.



Source : 5 – 10

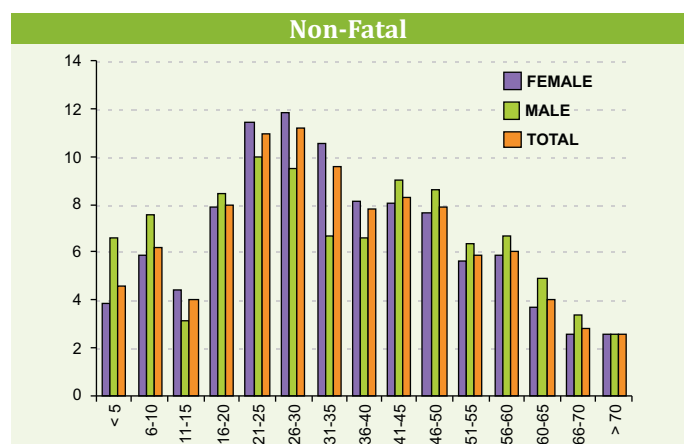
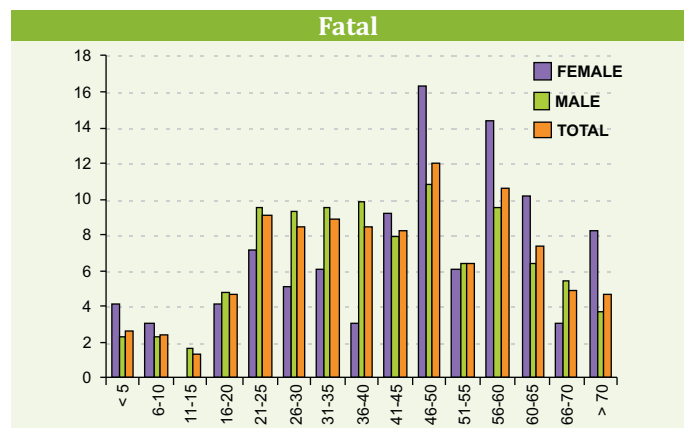
Data collected under the Bengaluru injury surveillance programme for one year (10) indicate that pedestrians contributed for half of deaths and one fourth of hospital registrations. In one year, 485 deaths and 6,313 hospitalizations were reported from police and hospitals, respectively. The real number of hospitalizations could be more as only 21 hospitals were included and many would have sought care in smaller hospitals and general practitioners. It is estimated that in Bengaluru city, on an average, 550 pedestrians are killed and more than 10,000 injured and hospitalized every year, in a ratio of 1: 20. The number of those sustaining minor injuries is difficult to estimate and could be around 40 – 50,000 every year. In rural areas, pedestrians accounted for one fifth of non fatal RTIs.



Profile and pattern

BISP data revealed that

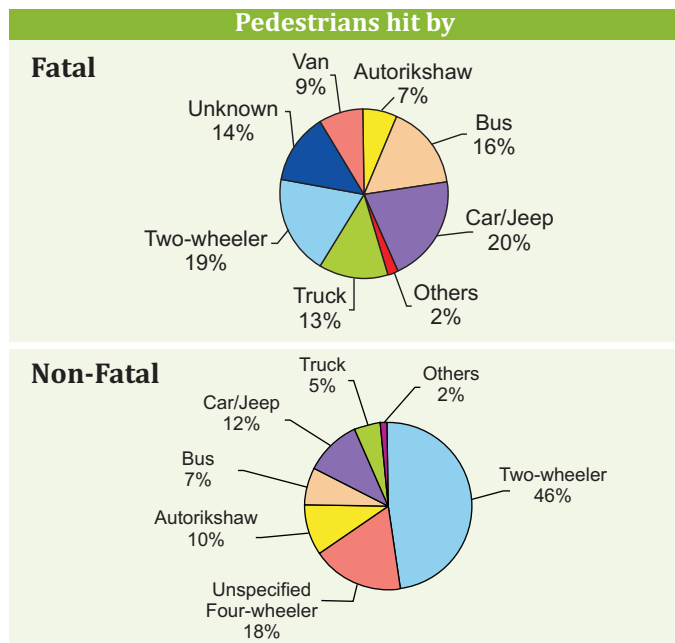
- ❖ 6% of fatal and 15% non-fatal pedestrian injuries occurred in children < 15 yrs.
- ❖ 51% of killed and 58% of injured were young men in the age group of 16 to 45 years. Women were involved more in extremes of age groups.
- ❖ 17% of pedestrian deaths and 10% of non fatal injuries were among elderly.
- ❖ Males were frequently injured or died as pedestrians in road crashes in a ratio of 3:1.
- ❖ Majority were with lesser education, belonged to skilled and unskilled categories and with moderate income levels.
- ❖ The situation in rural areas was no different with pedestrians coming second in non fatal injuries.



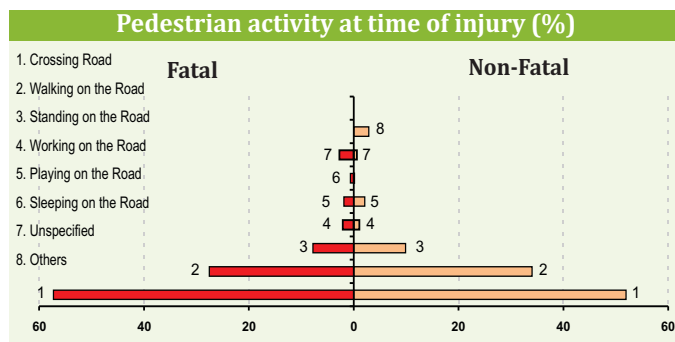
Risk factors

Information on crash characteristics and mechanisms help in understanding injury patterns and to develop interventions.

- Among deaths - 1/5 of pedestrians were hit by cars, followed by two-wheelers (19%) and buses (18%), while in nonfatal pedestrian injuries 46% were hit by two wheelers, 18% by four wheelers (including unspecified 4-wheeler, truck, van, tractor), and buses (7%). Due to greater energy transfer in crashes between pedestrians and heavy vehicles (like buses and trucks) the mortality and severity of injuries were higher.



- At the time of crash, 88% of pedestrians were either crossing or walking on the road.



- Alcohol involvement was documented in 2.5% percent of deaths and 5% percent of nonfatal injuries. In reality this is an underestimate, as alcohol information is not documented in real terms. Further, the extent of drivers under alcohol influence who collided with pedestrians was not known. Earlier NIMHANS studies have reported that drivers under the influence of alcohol injure and kill many pedestrians (7).
- Every other pedestrian death occurred either at the crash site (24%) or during transportation (21%).
- Pedestrian deaths were higher in the outer areas of city, while injuries were more in central parts of city.



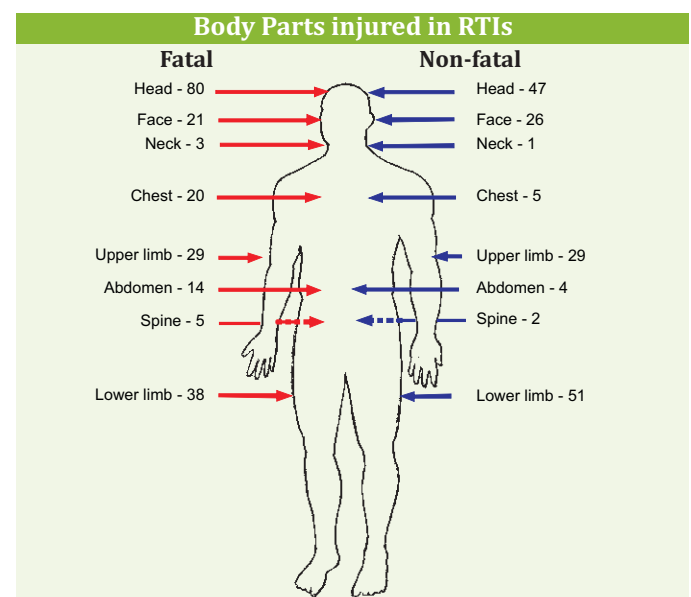
- Speeding vehicles were found to be a major cause for pedestrian deaths and injuries. Further information through focused research is required.
- Specific vehicle, road related and pedestrian factors need to be understood by well designed studies to identify specific factors.

Emergency care

- First aid care was not available for most of the fatally or non-fatally injured pedestrians at crash site.
- 99% of the injured pedestrians were provided first aid by doctors in the nearest hospital.
- Of the injured, 50% were taken to government hospitals and 43% to private hospitals.
- 46% of the injured reached hospitals directly on their own, while 27% and 22% were referred from government and private hospitals, respectively.
- Among the injured, 36% reached the hospital by private vehicles (taxi), 32% by autorickshaw and 22% by ambulance (mainly for inter-hospital referrals). Almost all injured pedestrians visited at least 1 hospital before reaching a definite hospital.

Impact

- Injury to vital organs like brain, chest and abdomen was more frequent among deaths with nearly 80% sustaining an injury to vital organs



- ❖ In nonfatal injuries, injury to head and face, lower limbs and upper limbs were present in 47%, 26%, 51%, 29%, respectively. Injury to chest and abdomen was seen in 34% of fatal and 9% of nonfatal injuries.
- ❖ One third of injuries were mild, while nearly half were moderate in severity with 16% being severe in nature
- ❖ Polytrauma was documented in 17% of nonfatal injuries.

Prevention and control

Escalating vehicle population on the roads of Bengaluru coupled with crumbling infrastructural facilities will make it difficult for pedestrians to move in the coming years. Road conflicts are bound to increase significantly along with an increase in pedestrian deaths and injuries. Pedestrian safety should be an integral component of larger city road safety programme, policy and with an action plan. Some strategies likely to yield benefits are

- ❖ Provision of safe walking places in the city with walkable footpaths.
- ❖ Elevated and visible designated areas for crossing of roads in all possible places.
- ❖ Separation of pedestrian movement from heavy moving traffic in all possible places.
- ❖ Design of safer highways with separation of pedestrians and slow moving vehicles.
- ❖ Speed control by road design, traffic calming and enforcement on highways, in residential areas and near traffic generators like educational institutions, business places, hospitals etc.,
- ❖ Control of drinking and driving among vehicle users.
- ❖ Recognizing heavy pedestrian movement areas and appropriate traffic management schemes.

- ❖ Increasing visibility of people and vehicles on roads.
- ❖ Improving public transportation facilities.
- ❖ Strengthening trauma care facilities in hospitals.
- ❖ Pedestrian education programmes for safe walking, road crossing and to walk facing the traffic at all times.
- ❖ Increasing research inputs to develop pedestrian safety programmes.

In a country with huge population and majority being pedestrians (even vehicle owners become pedestrians depending on length and purpose of travel), safe road environments are very much essential. Safe facilities for walking and crossing the road should be provided that will be used maximally by all people. Pedestrians should simultaneously be educated to use these facilities for their safety. Necessary binding of the two should be done with legislation and enforcement strategies. Better traffic management, increased visibility and speed control strategies will further enhance safety of people on roads. Undoubtedly, safety on roads is the fundamental right of every citizen.

The city definitely needs people friendly roads. Increasing vehicular volumes does not necessarily warrant road conflicts resulting in deaths, injuries and disabilities. Implementing pedestrian safety programmes require a skillful mix of road engineering and enforcement measures along with education for people to accept changes. Developing and implementing these measures should be based on good quality data so that interventions can be monitored and evaluated. The real impact should be seen by an actual reduction in pedestrian deaths and injuries. The city authorities need to give higher importance for pedestrian safety in the coming days.

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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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For further details contact: Dr. Gururaj at guru@nimhans.kar.nic.in / epiguru@yahoo.com

