

DEVELOPMENT OF A FEASIBILITY MODULE FOR ROAD TRAFFIC INJURY SURVEILLANCE

**Coordinated by the Division of Non-Communicable Diseases,
Indian Council of Medical Research**

And

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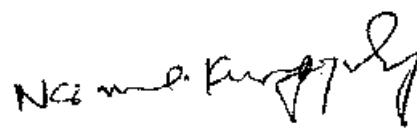
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Foreword



Road Traffic injuries have emerged as a major cause of public health problem in the last decade adding to the existing burden of communicable and non-communicable diseases in the world. It is estimated that each year globally 1.4 million people are killed and more than 20-50 million persons are injured due to road traffic crashes. According to World Health Organization report, 2005, if the current trend continues Road Traffic Injuries will be the third leading contributor to the global burden of disease by the year 2020. The situation is all the more alarming in the developing countries that constitute 80% of the world population. South East Asia has one-third of Road Traffic fatalities occurring in the world. The situation in India is also alarming, needing the attention of the decision makers. In India 1.06 lakhs deaths occur due to road traffic accidents annually which are nearly 10% of the total road traffic deaths in the world. The rising trend of injuries is to a large extent attributed to increasing urbanization, motorization, inadequately designed urban and rural roads, rural-urban migration, inadequate enforcement norms, drunken driving, road rage and a large number of other factors. Pedestrians and bicyclists account for 70% of the road deaths while 25% of the deaths are among motorized two wheeler riders. These figures are still underestimates, as a large percentage of deaths and injuries go unreported.

The paucity of surveillance data leads to under-estimates of the size of the actual problem. It is essential to implement an effective and sustainable hospital information management system for monitoring trends, prioritization of interventions and advocacy. Good quality data is a major prerequisite for effective planning and intervention. The Indian Council of Medical Research has been conducting epidemiological and health research studies in areas of public health importance. The problem of road traffic injuries has been a major concern that has been addressed at several fora. The Council was instrumental in bringing together major stakeholders to address this problem in a workshop with the support of WHO in 2006. Following this, a model for prospective injury surveillance was tested for its feasibility in Bangalore and Pune. The study has identified several issues that need to be addressed while planning for integrating with the existing system. A detailed analysis of the findings from the two centres has been able to reveal the extent, nature and types of injuries that are reported at the hospitals. This study has also given data on the providers of first aid, mode of transportation and management of the injured. With additional resources, training and manpower it is possible to integrate the injury surveillance system into the existing health system.



Prof. N.K. Ganguly
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Preface



The global mortality burden of Injuries is 17% percent of the total mortality due to all causes. Road Traffic Injuries accounts for 25% of these deaths. More than eighty-five percent of these deaths occur among the people living in the low and middle income countries. In addition to death and injury, traffic accidents in these countries cost \$65 billion to \$100 billion annually. These costs include loss of income and the burden placed on families to care for their injured relatives. In India, official figures state that more than 1 lakh deaths and 4.5 lakh injuries have occurred during 2006 alone. This is indeed a matter of grave concern since the victims are mainly young men and boys. Men aged less than 25 years are nearly three times as likely to be killed in a road-traffic accident as compared to women of that age. The young are also at risk due to driving drunk, driving too fast and inexperience. Our roads are not designed to allow pedestrians, bikes, cars and bigger vehicles to share space. Better road planning, wearing helmets, tougher police enforcement against traffic violations and better pre-hospital care are among the measures that would reduce road traffic injury and death. There is also scarcity of a systematic data capture system that can determine the trends, assess the effectiveness of new intervention policies, identify black spots, vulnerable road users, regional variations etc. A good data capture system must include data from death statistics, hospital emergency care units, police reports and other sources.

In the absence of such a data capture system, ICMR undertook a feasibility study to identify an organized method of injury data collection from different sources. This study was carried out in National Institute of Mental Health and NeuroSciences, Bangalore and B.J. Medical College, Pune for one year during November 2006- October 2007. The findings have shown that prospective surveillance of injury morbidity and mortality is possible using the existing health systems if the hospital information management system is improved. The technique has provided leads for incorporating injury surveillance into the ongoing Integrated Disease Surveillance Program of the Ministry of Health. It can be made sustainable through continuous motivation and training of the stakeholders viz. emergency staff, police, transport, health workers etc. The findings of the study have re-emphasized the immediate need of a surveillance system for injuries in India and identified key issues related to Injury Surveillance. I congratulate all the nodal officers of the participating hospitals and the principal investigators of NIMHANS, Bangalore and BJMC, Pune for carrying out the study within the stipulated time.

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Introduction

Background

Road Traffic injuries are the eleventh leading cause of human deaths in the world. According to the World Report on Road Traffic Injury Prevention¹ nearly 1.2 million people die and 20-50 million persons are injured and disabled for the rest of their lives every year globally due to road traffic crashes. These account for 2.1% of the total global mortality and 23% of the mortality due to all injuries in the world. Eighty five percent of these fatalities occur in low and middle income countries that results in huge financial drains making a major dent in a country's economy to the tune of 1-2 % of the GDP. The injured and disabled survivors on the other hand suffer from adverse social, physical and psychological effects. Official reports in India² indicate that in 2006, 3.94 million road accidents had occurred of which 1,05,725 people were killed and 4.5 million were injured. These constitute 33.6% of the total accidental deaths in the country due to natural and unnatural causes. The death rate in India is 35 per 1000 vehicles, the highest in the world. These estimates are still not actual since many accidents go unreported due to lack of an organized system of injury data collection in the country. The high crash rate is compounded by the non-existence of organized care for the seriously injured. It is estimated that the potentially treatable injury cases are six times more likely to die in India than in any other organized system due to inadequate trauma care systems. Road safety in India is the responsibility of the Transport Ministry and the Police Department, with the role of Health Ministry mostly being limited to provision of trauma care following road crashes.^{3,4}

Recognizing the burden that Road Traffic Injuries make on the economic, social and health care system, it is crucial to address its causes and consequences. Many governmental and non-governmental organizations, Ministries of Transport and of Health, Environmentalists, Public Health experts and urban planners have expressed concern on this burgeoning problem. The issue has been highlighted in leading national dailies, programs, debates and seminars which have ranked this among the top few in the list of priorities in the national agenda.

It is well known that Road Traffic injuries is a multi-sectoral problem and integrates several sectors like the transport, urban development, road engineering, police, health and emergency care, NGOs, insurance, driver licensing, motor driving institutes and automobile manufacturers. Hence addressing the issue of traffic injuries requires the support of these agencies in sharing

vital information. The Indian Council of Medical Research, which is a pioneering organization for Biomedical and Health Research, has been concerned about the growing health problem due to Road Traffic Injuries. Over the last one decade it has attempted to bring these stakeholders on a common platform so as to discuss the problem and arrive at a consensus on information sharing. Now with the changing scenario at the governmental departments, it is possible to build an integrated strategy for public health intervention and prevention programmes. National bodies, NGOs, the transport sector, public and private health sector, legislative sector, and National highways have been addressing road injuries at their own level. It is essential to bring all of them together to develop a comprehensive programme for effective policies and programmes. The World Health Organization has called the nations to generate activities targeted towards reducing the magnitude of injuries and deaths due to road accidents. One of the means of targeting resources and attention of the policy makers towards this issue is to generate authentic, good quality data. Since the health sector bears the major brunt, it becomes all the more imperative for health research organizations like ICMR to address this issue at the highest priority by strengthening the Health Information System.

Recognizing the need of the hour, ICMR, with the support of WHO for the first time organized a workshop on Road Traffic Injuries in July 2006. Invited representatives from multiple agencies shared their ideas and experiences on research activities and data capture mechanism in Road Traffic Injuries. The participants actively deliberated on the need for initiating an Injury Surveillance System. They also suggested initiating multicentric epidemiological surveys to address local and regional level planning purposes. To develop a system of data capture from multiple agencies, it was suggested that initially a short term feasibility study for developing a module for Road Traffic Injuries be undertaken at two or three centres. Based on the experience gained from this study, a larger study could be initiated at a national level. The twin centre pilot study on “Developing a feasibility module for Road Traffic Injury Surveillance” in Pune and Bangalore was initiated with this objective in mind. It tested the practicability of undertaking hospital based injury surveillance in rural-urban areas. Efforts were also made to integrate information from the police and the transport sector by providing the requisite training to the agency staff. The findings from the study have provided significant leads towards setting up a National Injury Surveillance System. It has also brought to light several issues that need to be addressed before initiating such a system in the health sector.

National Burden of Road Traffic Injuries

The number of road accidents in India is second only to China which reported 4, 50,254 road accidents and 98,738 deaths in 2005⁵. The true numbers may be much more than the officially reported figures as accidents in India are reported by disparate data sources. Gross underreporting and absence of a systematic injury data collection system further adds to the lack of authentic information. According to the experts at the National Transportation Planning and Research Centre (NTPRC) the number of road accidents in India is three times higher than that prevailing in developed countries. The number of accidents per 1000 vehicles in India is as high as 35 while the figure ranges from 4 to 10 in developed countries. The National Crime Record Bureau in its annual report has informed that a total of 4, 23,426 traffic accidents were reported during 2006 of which 3, 94,432 (93.0%) were road accidents. Some facts from the NCRB report (2006) are as follows:

- **361** deaths and 1253 injuries per day due to Traffic Accidents
- **290** deaths per day and 1241 injuries per day due to Road Accidents
- **71** deaths and 12 injuries per day due to Rail - Road and other Railway Accidents
- **65** deaths per day by Truck/ Lorry and 52 deaths by Two-wheeler
- **297** deaths due to accidents per day in the age group 0-29 years
- **286** deaths due to accidents per day in the age group 30-44 years
- **279** deaths due to accidents per day in the age group 45 years & above
- Nearly **two-third (60.5%)** of all persons killed in accidents in the country was between 15 to 44 years.
- Maximum 'Road Accidents' (**62,023**) occurred between 3 p.m. to 6 p.m.

In 2006, accidental deaths in children below 14 years (that comprise 30.4% of the population) were about 7.1 % of the total deaths. Males were three times more affected than females. Truck/Lorry accidents comprised 23% of the total accidents and in Delhi 24% victims were pedestrians. Several studies in Bangalore and Haryana have shown that injury problems are much higher than the official reported figures.

Studies in India have found that a majority of accidents occur either due to the driver's error or due to the negligence of the safety norms. Driver fatigue, drunken driving, dangerous overtaking, lane cutting, jumping of signals, erratic parking can be counted as major causes for

the calamities on the roads. Poor road infrastructure, inappropriate urban design, lack of compliance with traffic regulations, inadequate enforcements have also contributed to this increase. There is very poor link between traffic crashes and hospital outcomes that results in high rates of underreporting. The poorest are the least likely to report. Pedestrians, bicyclists and motorized two wheelers have been identified as the most vulnerable group constituting 60-80% of road fatalities in India. Two wheelers, motorized (70%) and non-motorized (10-35%) vehicles are the main component of Indian traffic. Less than 1 in 40 families own a car. It has also been observed that fatal crashes with pedestrians, bicyclists and motorized two-wheelers involved buses and trucks were in higher proportion (50- 70%) than non fatal crashes. Occupants of two wheelers and occupants of public and private transport is another group of people constituting the majority, to be affected in road traffic injuries⁷. On highways, occupants of cars are the most vulnerable group, next to pedestrians⁸.

Road traffic injuries impact the family's productive opportunities as the male members who are the earning members of the family are the main victims. This may even result in the family falling into abject poverty to meet the health expenses of the injured⁹. Road related accidents cost India Rs 5000 millions every year, but there is no sign of any possible intervention. To despair, there is no available record of precisely how much developmental money is lost due to road related accidents, and how much compensation is paid to road accident victims. Of course, a number of projects are on across the country to provide timely and effective relief to the victims of road accidents. For instance, in Bangalore the Manipal Hospital has joined hands with the hospitals on highways and launched a project named Operation Sanjivini aimed at providing emergency assistance to accident victims on the highways. As part of the Operation Sanjivini the hospitals on the highways in association with the local NGOs will position well equipped ambulances at almost every 50-km stretch of the highways.

On the other hand Dr Subroto Das and his wife Sushmita have launched an ambitious Highway Research Project (HRP) as part of the Lifeline Foundation, a voluntary organization. Significantly so far under HRP more than 400 persons with critical injuries and over 300 people with major injuries have been saved. Based in Vadodara, HRP reaches to the accident spot immediately on getting the message. It has launched 14 projects for highway accident victims in the states of Goa, Kamataka, West Bengal and Kerala. This is claimed of be one of the first of its kind in the whole of South Asia. The Emergency Management and Research Institute is another initiative that was launched in 2005 in Hyderabad in the trademark of "108" by the

Byrraju and Satyam Foundation. Their focus is on the 'Platinum 10 minutes' by providing fully-equipped, air-conditioned ambulances complete with defibrillators, ventilators and echo cardiograms. It has till now saved more than 3500 lives with an average response time of less than 30 minutes. It is the most comprehensive, integrated and successful emergency management model which every state is trying to replicate in the country.

Despite encouraging advancements in post-accident care, there is still a lot to be done to reduce the magnitude of injuries and deaths on the Indian roads. WHO in its report has identified major steps in this direction. Improving the quality of information is one such step. Authentic data on morbidity and mortality will surely help in addressing issue related to prevention, resource allocation, manpower development and formulation of policies and programs. In India, along with the resources provided for curative services, a substantial amount should be earmarked for road safety and prevention of road traffic injuries. Resources allocated under trauma care are focusing on building and equipping high-tech hospitals. We need to have more trained and skilled manpower for prevention in this country both at the medical college level and in health care institutions. In this scenario, intervention strategies that need to be developed require scientific basis, should be sustainable over time, and geared towards making a change in the safety graph of RTIs.

Method

The overall coordination of the project was done by the Division of Non-Communicable Diseases. The following activities were carried out:

- Regular monitoring through e-mail and telephone with the two centres
- Development of the initial proforma and data entry format
- Preparation of the tabulation and analysis plan
- Data consistency and error checks, scrutiny and analysis of the data for the two centres

At the two centres the study was undertaken by the Department of Epidemiology, NIMHANS (WHO Collaborating centre for Injury Prevention and Control) in the city of Bangalore and the Department of Preventive Social Medicine, BJMC, Pune. While the Bangalore centre has been conducting research activities on all types of injuries for the past one decade, the Pune centre had shown keen interest in this activity. The study was conducted in four phases:

Phase I: Preparatory phase (3 months)

NIMHANS, Bangalore and BJMC, Pune were the main surveillance centres. These two centres then identified and gathered information from nearby hospitals, medical centres and nursing homes in the vicinity. Sensitization meetings were held with the medical superintendent and the directors of these institutions. Pamphlets and brochures providing information on the proposed activity and its intended benefits were circulated to motivate these hospitals to participate in the study. During this process, the centres also tried to persuade the police and transport department and NGOs to provide their inputs and share their data capture format. A series of stakeholders training programmes and review meetings were held in which doctors, medical superintendents, police nodal persons, emergency care medical personnel and nurses participated actively. They discussed the data capture format and the parameters on which information was to be collected. Various methods of linking the forms between departments, data collection components and feedback mechanisms were discussed. Thereafter written consent was obtained from each of participating hospitals to be a part of the surveillance network and identify the nodal persons. These nominations were then reviewed along with the inventory on case loads, staffing patterns and infrastructural capacity of these hospitals. A letter of appeal from ICMR was sent to each of the participating hospitals for their support and cooperation for the smooth conduct of the programme.

Phase II: Data collection phase (3 months)

Once the nodal officers were sufficiently sensitized and trained for filling up the forms, the project staff from the main surveillance centres collected the data in the data capture format prepared for this purpose (Annexure I and Annexure II) with the close support of the Nodal Officers. After the data was scrutinized for completeness and data errors it was entered into the computer at the main centres. The coordinating unit at the Division of NCD, ICMR created data entry template in Epi-info (Windows version) and distributed it to the centres. The data analysis plan was also prepared at the coordinating unit after consultation with the principal investigators.

Phase III: Data collection by trained hospital staff (3 months)

The initial 3 months of data was collected by the project staff while the remaining three months of data was collected by the trained hospital and agency staff under the close supervision of the project staff.

Phase IV: Report preparation (3 months)

The two centres prepared separate reports of their centre's findings. These reports highlighted the mechanism of surveillance in the centres, the problems and expectations of the participating hospitals and level of acceptance and sustainability of the programme in the long run in the Hospital Information System. The raw data from both the centres was cleaned and processed for range and consistency checks. Information on the staffing pattern, training programmes, the number of persons trained and the level of acceptability of the programme was obtained from the respective centres. Salient findings from the two centres were tabulated at the coordinating unit, Division of NCD, ICMR.

Data Collection Format

The Data Collection Format (Questionnaire) used in Pune and Bangalore are given in Appendix I and II respectively. The format is divided into three sections viz.

Section A: Personal details of the injured

Section B: Brief details of injury

Section C: Details of road traffic injury

Section D: Pre-hospital care aspects

Section E: Injury Management and Outcome

Each item in these sections is explained in detail in the instruction manual prepared for this purpose (Appendix III). Data received from the two centres was cleaned and processed using the statistical package SPSS (Version 15.0) in the coordinating unit, Division of NCD, ICMR.

A one-day workshop was organized by the coordinating unit with the support of WHO in New Delhi on November 26, 2007 to share the findings of the study with major stakeholders. The participants were the Advisory Group Members, the Principal Investigators, Representatives from the Vital Registration System, Ministry of Health, Consultants from Orthopedics and Emergency Care and the Director, Central Bureau of Health Information. The methodology and findings of the study was discussed among the members. Issues related to networking of the hospitals, linking of other agencies, data collection and compilation, data repository and government directives was discussed. A set of recommendations for future course of action were outlined.

Observations

Characteristics of the participating hospitals

Table A1, A2 shows the participating hospitals and their casualty staffing pattern in the two centres. In Pune, 12 hospitals with more than 100 beds strength participated while in Bangalore 21 hospitals participated in the study. Over 80% of these hospitals were private/private teaching hospitals. Hospital information system in most of the hospitals was manual while a few of them reported using both manual and electronic means (Table B1, B2). The largest hospital in Pune was the Sassoon hospital that registered a total casualty load of 25,232 cases during the study period of six months (April-September, 2007). Of these 9122 (36.0%) were injuries of various kinds. In Bangalore on the other hand, Bhagwan Mahavir Jain hospital registered the largest load of casualty cases (430-450 patients per week) but the load of injury cases was more in NIMHANS (180-200 per week) followed by Bowring & Lady Curzon Hospital (150-160 per week) (Table C1 and C2). In Pune forty four out of 56 doctors, 38 out of 85 nurses and 25 residents were trained. In Bangalore 500 hospital staff was trained in 21 training programmes (Table D1 and D2). Two of the 12 hospitals in Pune showed high level of interest and were proactive, while seven were active initially but gradually lost interest. Three hospitals participated on demand. In Bangalore, it was observed that the level of interest and cooperation from the hospitals was partial as there were no instructions from the Ministry of Health. (Table F1 and F2).

Data quality

Capture rate

The data capture rate could not be obtained from the two centres as information from unreported injuries and cases from smaller medical institutions were unavailable. This was as planned in the study protocol. The hospitals that participated in the study were reported to cater to more than 70% of the population of the region for all health problems. Hence it is assumed more than that 70% of serious and fatal injuries occurring in the Pune and Bangalore cities have been captured by the project staff from these hospitals.

Form Completion rate

Out of the total load of injury casualty forms, Pune centre has reported that only 65% of the injury forms could be completed. The reasons for missing information need to be elucidated.

Variable completion rate

The rate of completeness of individual variables in the form varied. Following is the list of variables with missing data.

Variable	No. of cases with missing data (N=32546)
Age	593
Sex	126
Name of the injured	309
Hospital ID	10,257
Education	8647
How were you injured	358
Place of injury	512
Helmet use among two wheeler	985
Road user category	7923
Type of collision	2218
Status at the time of admission	931
First aid giver	1515
Where first aid given	858
Treatment	5164
Outcome	15562
Mode of transport	8226
Source of referral	2974
Intent	1317

Narrative quality data

The data format had provisions to enter narrative data. Only the Bangalore centre has furnished narrative details. The data received from Pune does not contain narrative data.

External Cause of injury

A total of 32,546 cases were recorded at the two centres during April-September, 2007 of which 28,115 (86.4%) were registered in the hospitals. The cause of injuries was reported in 32188 cases and for the remaining 358 cases the cause was missing.

The reported causes of injury were the following:

Cause of injury	Number (N=32546)
Road Traffic Injury	14125
Fall	3358
Assault	7874
Stab/cut	637
Burns	1198
Poisoning	2525
Drowning	50
Hanging	125
Sports	56
Animal Bite	1190
Fall of object	599
Crush Injury	53
Others	398
Total	32188
Missing cases	358

Road traffic injuries accounted for 44% (14125) of the total cause of injuries. Injuries due to assaults constituted the second largest accounting for one-fourth of the total while falls and poisoning comprised 10% and 8% respectively.

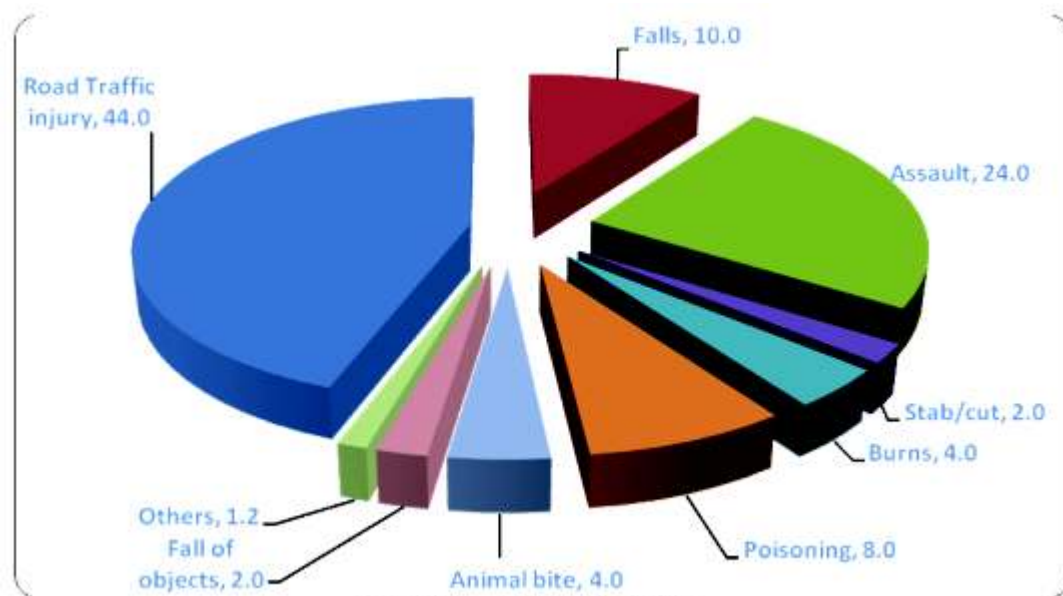


Figure 1. Cause of injuries

Age-Sex distribution

Children and young adults less than 25 years of age comprised almost a third of these injuries. Injuries occurred most frequently in 25-34 years with a broad peak across age groups 15-34 years (Figure 2). In all age groups more males presented with injuries than females.

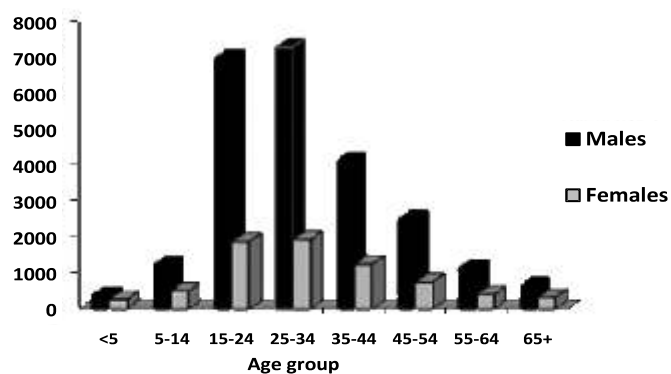


Figure 2. Age-sex distribution of the injured cases

Road Traffic injuries were most frequent in the age group 15-44 years (71.4%). Falls, assaults, stabs, burns and hanging also were reported to be more frequent in this age group. While there

was male preponderance in all other injuries, the proportion of males and females was similar for burns and poisoning. (Figure3)

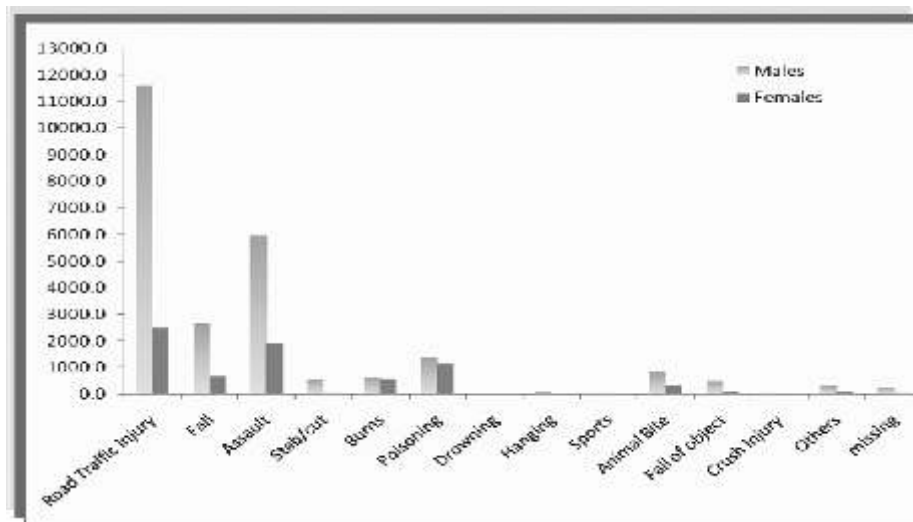


Figure 3. Sex-wise distribution of injury types

Location of the injury

Among injuries other than road traffic injuries, one half occurred at home mainly due to assault (38.5%), poisoning (24.5%), falls (14.8%) and burns (10.9%). One fifth of the injuries that occurred on the roads were due to other reasons viz. assault (62.6%), and falls (20.5%). In workplace 13.9% injuries occurred due to falls and 65% due to assaults and stab/cuts (Figure 4). Not enough cases have been reported on injuries at railways and agricultural fields.

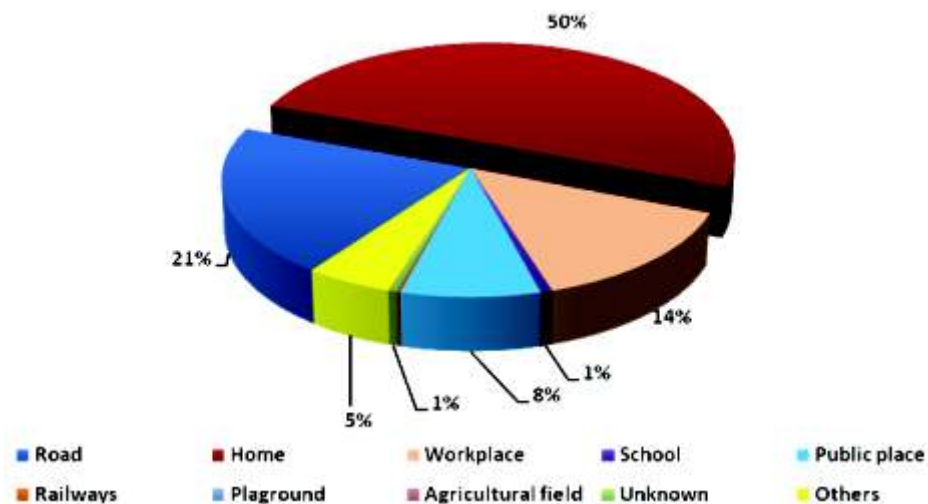


Figure 4. Location of injuries

Activity at the time of injury

Most of the injuries occurred while people were either travelling (32.5%) or walking (17.7%) or working (10.8%). While the road traffic victims were mainly injured when travelling in a vehicle (73%), 19.0% got injured while walking on the road side and the rest while standing or working on the road. Among those who got injured while walking, 46.7% were victims of Road Traffic Injury and 30% were injured due to assaults. Assault was the main cause of injury for those who were standing (68.6%) or sleeping (30%). 15% of the cases did not specify the activity and 4.0% reported doing other activity. Ninety percent of the sports injuries occurred while playing while more than 90% crush injuries occurred while working. Falls predominantly occurred among children playing on the ground. Over 60% of injuries that occurred due to fall of object or stab/cuts while working. More than 70% of the cases injured due to poisoning and hanging did not mention the activity (Figure 5).

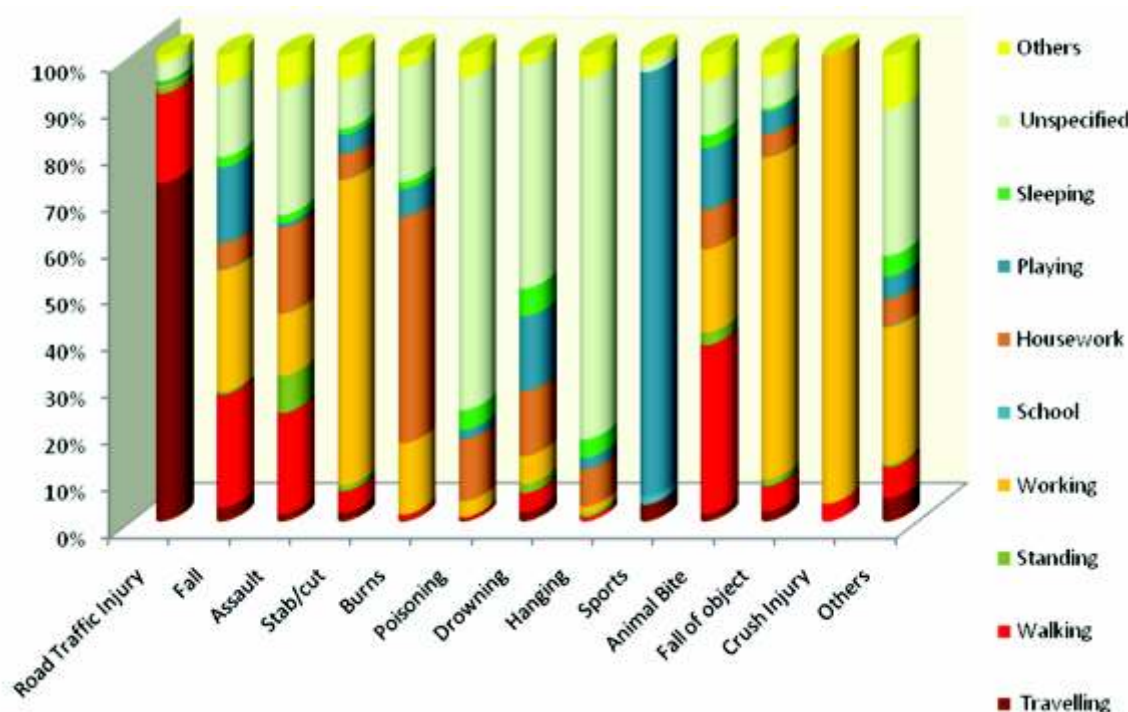


Figure 5. Activities at the time of Injury

Sixty percent of the injuries occurred on city municipal roads and 19% on highways. Over 9% of the road traffic victims were injured while travelling on inner roads and rural roads (Table 5).

Road user type

The data has revealed that two-wheeler riders were the most frequently injured accounting for 30.1% of Road Traffic Victims. Majority of them (66%) belong to the age group 15-34 years while 17 % are in the age group 35-44 years. Among pedestrians who constituted 24% of the total road traffic victims almost all the age groups except children below 5 years are equally vulnerable to road traffic injuries, the maximum being in 25-34 years (18.3%). Pedal cyclists constituted 17.0 percent and two wheeler pillion riders about 10.5% of all road traffic victims (Figure 6, Table15).

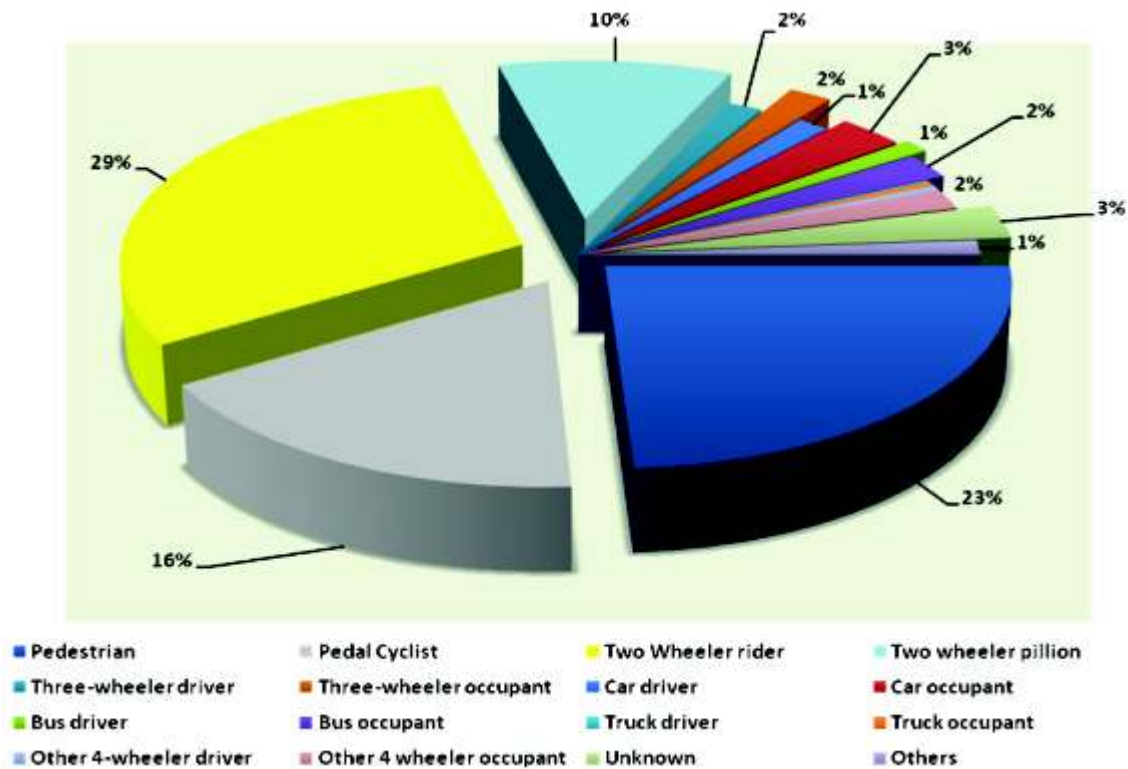


Figure 6. Distribution of road user types among road traffic victims

Type of Collision

Majority of injuries that occurred among two-wheeler riders/pillion riders and pedal cyclists was due to skidding (46%) and falling (40%). However, 11-18% of injuries among these road users got injured due to the vehicle getting hit from the back or from side or even a head-on collision. Three wheeler drivers and occupants got injured due to hit from the back or front or side and

also due to overturning. In fact, 27.3% of the occupants of three wheelers got injured due to overturning. Drivers and occupants of cars and other four wheelers got injured mostly due to head on collision (23-27%) and hitting a fixed object (20%) or getting hit from the back by another vehicle. Passengers of the bus usually got injured by falling from the moving bus. (Table 16).

Risk factors for Road Traffic Injuries

Helmet use among two wheeler riders and severity of injuries

Only 25.2% of the injured two wheeler riders reported wearing helmet at the time of injury, 51% were not wearing helmet and for 24% the information was unknown. In all age-groups the number of non-users was almost double the number of users (Table 18). Injury severity among two wheeler riders ranged from 41% mild injuries, 45% moderate and 14% severe injuries. It was observed that non-users of helmets suffered more serious injuries than the users (Figure 7).

Seat belt use among car drivers and occupants and severity of injuries

Among the injured four wheeler drivers only 9% reported wearing seat belts at the time of injury and 38.5% were not wearing seat belts. This information on the rest 53% was not known. Of the injured 49% had moderate injuries and 33.3% mild injuries. Severe injuries were reported by 18%. Those who did not wear seat belt were more seriously injured as compared to those who wore seat belts (Table 20, Figure 8).

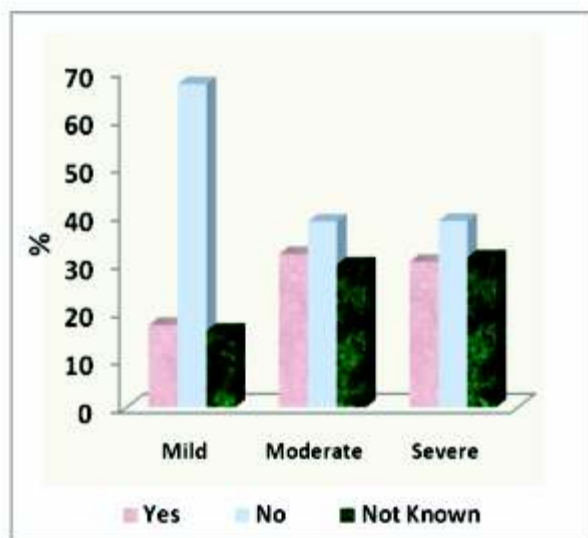


Figure 7 Injury severity and helmet use

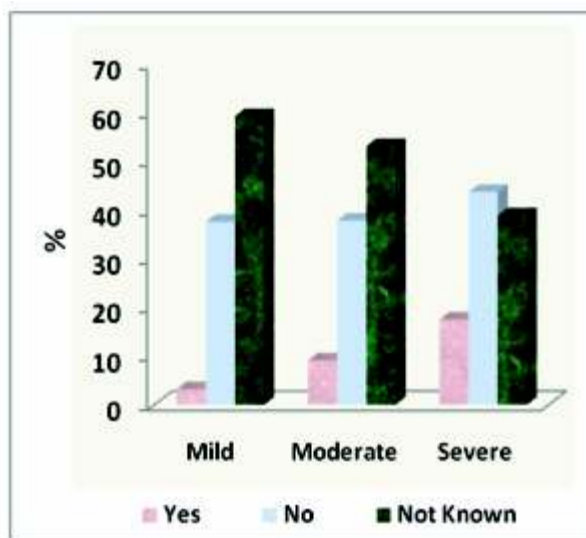


Figure 8 Injury severity and seat belt use

Alcohol use among the road traffic victims

One-half of the cases reported in the study did not consume alcohol and in one-fourth of them the alcohol status was unknown. Only 7% of the injured and 0.9% of the counterpart (those who hit the injured) reported being under the influence of alcohol at the time of the injury.

Severity, nature of injury and body part injured

Among road traffic victims there were more cases of moderate and mild injury than severe injury. Of the 13244 road traffic victims, 41.8% cases had mild injuries, 44.3% moderate and 13.9 % severe injuries (Table 17). The pedestrians, pedal cyclists and two wheeler riders constituted the majority of severely injured cases (70%) as compared to other road users. Car/bus drivers and occupants had moderate injuries (47-53%) while three wheeler occupants and drivers attained mild to moderate injuries more frequently(42-50%). Over 35% of the injured truck drivers reported with moderate to severe injuries. Most injuries resulted in cut and open wound (34%), fractures (23%) and haematoma and wounds (17%). About 11% injuries resulted in abrasion and sprain.

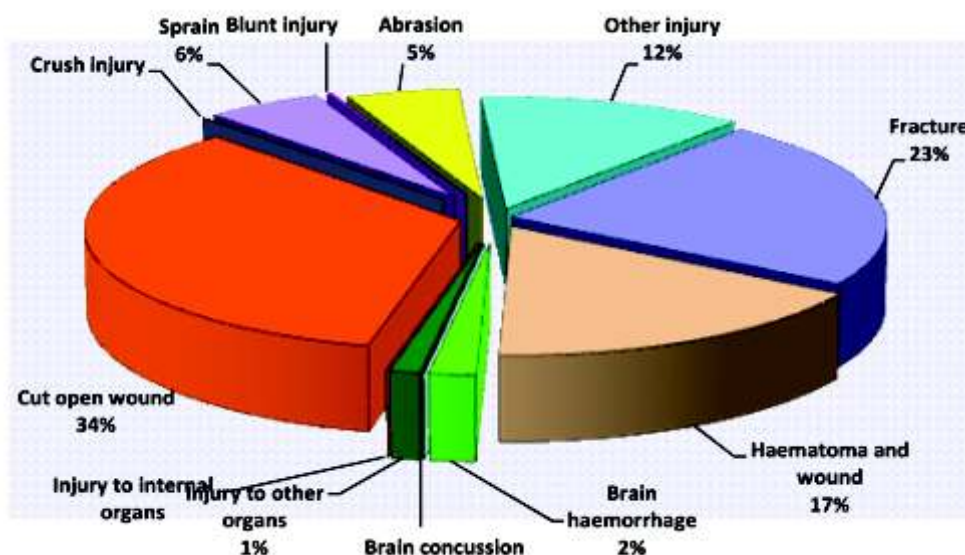


Figure 9. Nature of injuries

Among the road traffic victims 42.1% of the injuries affected the lower limbs (Figure 10). Upper limb injuries were reported by 33.7% victims while head injuries occurred in 40.0% cases. Face

injuries occurred among 27% cases. The upper and lower limbs and head injuries were the most frequent among the two wheeler riders. Among them head and face injuries occurred more among those who were not wearing helmets (61% and 36%) as compared to those who were wearing helmets (16.3% and 16%) (Table 23).

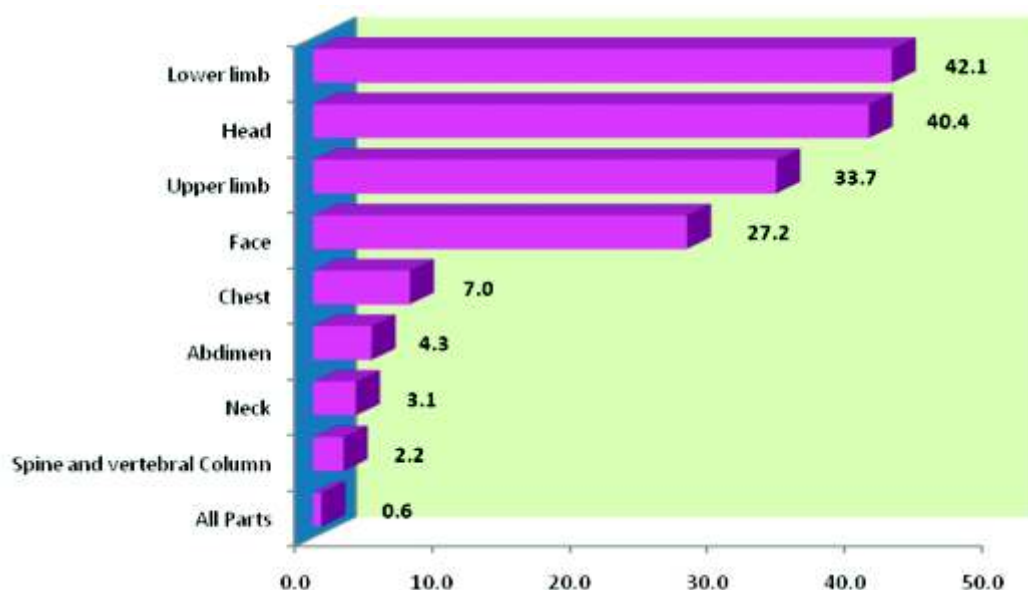


Figure 10. Major body parts injured among road traffic victims

Pre-hospital care and treatment management of road traffic victims

Most of the victims (89%) of road traffic accidents were conscious at the time of admission to the hospital. Only 1% (137) was brought dead and 6.4% were unconscious. Among those who were injured on municipality roads 41% received first aid care. This proportion was less compared to 64% victims on highways and 75% victims on rural roads who received first aid. Most the injured (97%) were taken care at the primary level by the doctors (Table 27). About one half of the injured (48%) reached the hospital on their own while more than one-fifth were referred by government hospitals and 10.3% were referred by private hospitals. (Table 28). Only 19% of the victims were transported by ambulances, 44% on private vehicles or taxis and 28% on auto rickshaws (Figure 11). Police vans were very rarely used (2.3%). Majority of the victims were brought to the hospital by family members (59%) while 25% were shifted to the hospital by some known persons. (Table 33).

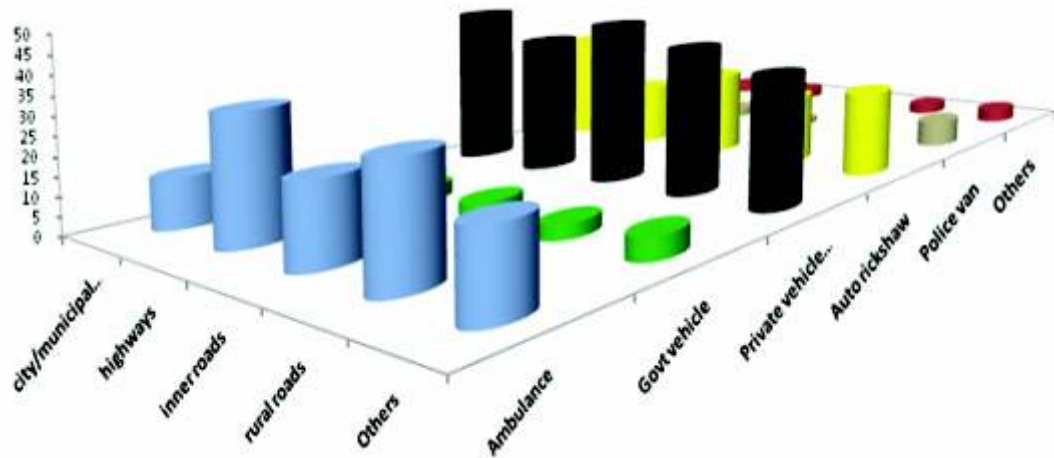


Figure 10. Mode of transportation of the injured victims

Of the victims of road accidents who were transferred to the hospitals 35% were treated and sent home while 46% were admitted for medical and surgical care. One fifth of the injured were treated in the emergency room and referred to another hospital (Table 34). Outcome data was available for only 6004 (42.5%) victims. Of these 4462 (74.5%) recovered and improved, in 19% the condition worsened while 140(2.3%) died. It was observed that the more the severity of injuries worse was the outcome. Among mild injuries more than 90% recovered while among sever injuries only 51% recovered, in 31% the condition worsened 8% died and the rest were shifted to another hospital. (Table 35-36).

Discussions

Road traffic injuries have become a growing burden on the health sector. Enormous resources are spent on acute and long-term care of the injured. However due to lack of good quality data on their geographical distribution and on contributing factors there is still a lot to be done in terms of their prevention and control. One impediment in this effort is the multisectoral nature of this problem. Since Road Traffic Injuries involves persons , vehicles and roads , their prevention also involves cooperation from automobile manufacturers, road engineering, urban planning,

enforcement agencies, insurance and of course health sector. In fact the health sector bears the brunt of all this since the injured has to be treated and taken care of in the hospital. Hence it is important for the health sector to address the issue working in close cooperation with the other agencies. This study is the first step in this direction.

Following a meeting of multiple stakeholders in July 2006, ICMR initiated a pilot study to develop an injury surveillance module at two centres, Pune and Bangalore. Data from 32546 injured cases was obtained during a period of six months. Since it was a pilot study no effort was made to exclude non-serious cases. The coordinating centres at BJMC, Pune and NIMHANS, Bangalore identified, monitored the training of the nodal officers and other staff in the emergency care units of the participating hospitals and police staff. Hospital staff inventory shows that all the hospitals had sufficient manpower to handle this activity. Initially they needed some resources for computer, internet and some trained staff dedicated for this purpose. Also a mechanism for linking data from different departments within the same hospital needs to be built. Once the system is in place then the ongoing data collection can continue on a reasonable budget.

The data has shown that 64% of the injuries that were reported in the hospitals were unintentional injuries, 24% intentional and 8% suicides. The majority of the injuries occurred in 15-44 years which is the most productive years of life as several other studies have shown. Males are predominantly more in number than females. Road Traffic Injuries constituted 44% of the total number of injuries. Assaults were only slightly less (39%). This indicates that injuries due to violence are no less than traffic injuries. As observed in many other studies the most vulnerable road users were pedestrian and two wheeler riders. Helmet and seat belt use was less than 25% while severity of injuries was more in non-users. Enforcement on these two aspects is therefore very very essential. Injuries to upper and lower limbs, head and face were most common. Most of the injured were taken to the hospital in private vehicles and taxis. Ambulance was used only in 19% cases.

The findings from the study has given leads for a national injury surveillance programme that can either be a vertical programme or could be incorporated in the existing health system. This method has proved to be adaptable for use in other hospital settings after sorting out issues for local settings. The major areas that need to be addressed for a sustainable injury surveillance network are:

- Allocate resources for infrastructure

- Recruitment of participating agencies to the network
- Consultation and training of the agency staff during the development and implementation stages
- Regular training and orientation programs
- Quality assurance points awarded for participation
- Recognition of the value of the staff and nodal officer to provide technical assistance,
- Constant support and ongoing encouragement

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Table A1. Casualty Staffing Patterns in the participating hospitals- Bangalore

S. No	Hospital	Type of hosp. (Pvt/ Govt)	Doctors	Interns/ Residents	Nursing Staffs	Nursing students	Medical record officials
1	Bangalore Baptist Hospital	Pvt.teaching	5	4	12	nil	Present
2	Bhagawan Mahaveer jain hospital	Pvt.teaching	10	nil	16	5	Present
3	Bowring & Lady Curzon Hospital	Govt	2	5	2	4	Present
4	D.G. hospital	Private	3	5	7	nil	Present
5	General hospital, Jayanagar	Govt	2	X	16	nil	Present
6	Hosmat hospital	Private	9	2	12	12	Present
7	K .R. hospital	Private	2	4	3	3	Present
8	KIMS Hospital	Pvt.teaching	25	6	30	25	Present
9	M.S.Ramaiah hospital	Pvt.teaching	10	5	22	nil	Present
10	Mallige medical Centre	Private	4	nil	6	nil	Present
11	Mallya hospital	Pvt.teaching	3	X	12	nil	Present
12	Manipal Hospital	Pvt.teaching	10	nil	15	5	Present
13	NIMHANS	Govt teaching	16	6 - 8	15		Present
14	Ravi kirlosker hospital	Private	7	nil	6	nil	Present
15	Sagar Apollo hospital	Private	7	nil	17	nil	Present
16	Sanjay Gandhi accident hospital	Govt	4	1	4	6	Present
17	Sparsha hospital	Private	3	4	10	nil	Present
18	St. Johns medical college	Pvt.teaching	15	3	12	6	Present
19	St. Philomena's hospital	Pvt.teaching	6	nil	10	nil	Present
20	St.Marthas hospital	Pvt.teaching	3	nil	10	4	Present
21	Victoria hospital	Govt teaching	24	15	6	2	Present

Table A2. Casualty Staffing Patterns in the participating hospitals (in 24 Hrs) - Pune

S.No.	Hospital	Type of hosp.	Doctors	Interns /Residents	Nursing Staff	Nursing Students	Medical Researchers
1.	Sassoon Hospital	Govt.	6	On call-1 Res. from each dept. And 4 Int.	9	3	0
2.	YCM Hospital, Pimpri	Govt.	4	On call-1 Res. from each dept. No Int.	14	Nil	0
3.	Lokmanya Hospital, Nigdi	Pvt.	3	12 Int. And 9 Res.	6	6	0
4.	Ruby Hospital	Pvt.	9	15 Int. On call-1 Res. from each dept.	15	0	0
5.	Talegaon MIMER Hospital, Talegaon-Dabhade, Dist: Pune	Pvt.	4	2 Int. On call-1 Res. from each dept	3	3	0
6.	Dinanath Mangeshkar Hospital, Pune	Pvt.	6	2 Int. On call-1 Res. from each dept.	8	2	0
7.	Jehangir Hospital, Pune	Pvt.	5	On call-1 Res. from each dept. No Int.	5	0	0
8.	Inlaks Budhrani Hospital, Pune	Pvt.	5	On call-1 Res. from each dept. No Int.	7	0	0
9.	Sancheti Hospital, Pune	Pvt.	4	5 Res. No Int.	6	0	1
10.	Hardikar Hospital, Pune	Pvt.	4	On call-1 Res. from each dept. No Int.	6	0	0
11.	Poona Hospital, Pune	Pvt.	3	On call-1 Res. from each dept. No Int.	3	3	0
12.	Surya Hospital, Pune	Pvt.	3	No Int. or No Res.	3	0	0

Note: The above staff is the total number in 24 hours in 3 shifts.

Table B1. Data recording system in the participating hospital- Bangalore

S. No	Name of the participating hospital	Type of hospital (Private or Government)	Data recording
			Manual/ electronic /Both
1	Bangalore Baptist Hospital	Pvt.teaching	Manual
2	Bhagawan Mahaveer jain hospital	Pvt.teaching	Manual
3	Bowring & Lady Curzon Hospital	Govt	Manual
4	D.G. hospital	Private	Manual
5	General hospital, Jayanagar	Govt	Manual
6	Hosmat hospital	Private	Manual
7	K .R. hospital	Private	Manual
8	KIMS Hospital	Pvt.teaching	Manual
9	M.S.Ramaiah hospital	Pvt.teaching	Manual
10	Mallige medical Centre	Private	Manual
11	Mallya hospital	Pvt.teaching	Manual
12	Manipal Hospital	Pvt.teaching	Manual
13	NIMHANS	Govt teaching	Manual
14	Ravi kirlosker hospital	Private	Manual
15	Sagar Apollo hospital	Private	Manual
16	Sanjay Gandhi accident hospital	Govt	Manual
17	Sparsha hospital	Private	Manual
18	St. Johns medical college	Pvt.teaching	Manual
19	St. Philomena's hospital	Pvt.teaching	Manual
20	St.Marthas hospital	Pvt.teaching	Manual
21	Victoria hospital	Govt teaching	Manual

Table B2. Data recording system in the participating hospital- Pune

S.No.	Name of the participating hospital	Type of hospital (Private or Government)	Data recording system
			Manual/ Electronic/Both/ None
1.	Sassoon Hospital, Pune	Govt.	Manual
2.	YCM Hospital, Pimpri, Pune	Govt.	Manual
3.	Lokmanya Hospital, Nigdi	Pvt.	Both
4.	Ruby Hospital, Pune	Pvt.	Both
5.	Talegaon MIMER Hospital, Talegaon-Dabhade, Dist: Pune	Pvt.	Manual
6.	Dinanath Mangeshkar Hospital, Pune	Pvt.	Both
7.	Jehangir Hospital, Pune	Pvt.	Manual
8.	Inlaks Budhrani Hospital, Pune	Pvt.	Manual
9.	Sancheti Hospital, Pune	Pvt.	Both
10.	Hardikar Hospital, Pune	Pvt.	Manual
11.	Poona Hospital, Pune	Pvt.	Manual
12.	Surya Hospital, Pune	Pvt.	Manual

Table C1. Casualty load in the participating hospital during study period- Bangalore

Sl. No	Hospital	No. of pts attending Casualty/Week	No. of Injury Patients in casualty /week
1	Bangalore Baptist Hospital	320 to 350	50 to 70
2	Bhagwan Mahavir Jain Hospital	430 - 450	15 to 20
3	Bowring & Lady Curzon Hospital	180 to 200	150 to 160
4	D.G. Hospital	50 – 60	10 – 20
5	District Hospital	250 to 300	50 to 60
6	General Hospital, Jayanagar	130 to 150	40 to 60
7	Hosmat Hospital	100 to 120	40 to 60
8	K .R .Hospital	120 to 140	10 to 15
9	KIMS Hospital	130 to 150	50 to 60
10	M.S. Ramaiah hospital	450 to 470	40 to 50
11	Mallige Medical Centre	300 to 320	15 to 20
12	Mallya Hospital	230 to 250	35 to 50
13	Manipal Hospital	480 to 500	50 to 60
14	NIMHANS	550 to 570	180 to 200
15	Ravi Kirloskar Hospital	130 to 150	15 to 30
16	Sagar Apollo Hospital	280 to 300	40 to 50
17	Sanjay Gandhi Accident Hospital and research centre	30 to 50	30 to 50
18	Sparsh Hospital	70 to 90	40 to 60
19	Sri Siddhartha Medical College	100 to 150	2 to 3
20	St. Johns Medical College	680 to 700	100 to 120
21	St. Marthas Hospital	340 to 360	40 to 50
22	St. Philomena's Hospital	500 to 520	40 to 50
23	Victoria Hospital	750 to 770	250 to 270

Table C2. Casualty load in the participating hospital during study period- Pune

S.No.	Name of the participating hospital	Study Period	Total casualty registrations	Casualty injury registrations	Completed forms	Missing forms
1.	Sassoon Hospital, Pune	11.4.07 to 30.9.07	25,232	9122	8,096	1,026
2.	YCM Hospital, Pimpri, Pune	4.4.07 to 30.9.07	16125	3156	1,360	1,796
3.	Lokmanya Hospital, Nigdi	1.5.07 to 30.9.07	2476	973	519	454
4.	Ruby Hospital, Pune	23.5.07 to 30.9.07	2896	360	149	211
5.	Talegaon MIMER Hospital, Talegaon-Dabhade, Dist:Pune	6.4.07 to 30.9.07	986	468	136	332
6.	Dinanath Mangeshkar Hospital, Pune	23.4.07 to 30.9.07	2738	271	131	140
7.	Jehangir Hospital, Pune	26.6.07 to 30.9.07	1788	239	124	115
8.	Inlaks Budhrani Hospital, Pune	19.5.07 to 30.9.07	2405	441	118	323
9.	Sancheti Hospital, Pune	1.6.07 to 31.8.07	1696	1108	144	964
10.	Hardikar Hospital, Pune	13.5.07 to 30.9.07	712	543	91	452
11.	Poona Hospital, Pune	1.7.07 to 30.9.07	1068	266	73	193
12.	Surya Hospital, Pune	9.5.07 to 30.9.07	N.A.	N.A.	41	N.A.
	Total	4.4.07 to 30.9.07	58,122	16,947 (100.0%)	10,982 (64.8%)	6,006 (35.44%)

Table D1. Result of the hospital training programmes- Bangalore

S.No.	Date	Training Programme	Place of training	No. of Participants
1	3rd March 2007	For Nodal Officers (All partner institutions)	NIMHANS	40
2	5th March 2007	For doctors and staff	Jayanagar General Hospital	20
3	16th March 2007	For doctors and staff	Bowring and Lady Curzon Hospital	60
4	20th March 2007	For doctors and staff (All partner institutions)	NIMHANS	74
5	28th March 2007	for doctors and staff	Siddhartha Medical College, Tumkur	16
6	4th April 2007	Orientation on Injury prevention	Sanjay Gandhi Accident Hospital and Research Centre	48
7	12th April 2007	For writers of various police stations	NIMHANS	26
8	13th April 2007	For Doctors and staff	District Hospital, Tumkur	16
9	24th April 2007	For Nurses	District Hospital, Tumkur	22
10	24th April 2007	For Nurses	District Hospital, Tumkur	18
11	24th April 2007	For Doctors and CMOs	District Hospital, Tumkur	14
12	7th July 2007	For Nurses	NIMHANS	3
13	21st July 2007	For CMOs and staff nurses in M S Ramaiah hospital	M S Ramaiah hospital	20
14	7th august 2007	For staff and students of medicine department in Victoria hospital	Victoria hospital	25
15	16thAugust 2007	For staff and students of Orthopedics, general surgery departments in Victoria hospital	Victoria hospital	70
16	18thaugust 2007	For MOs and staff of CHC and PHC in tumkur	Tumkur	8
17	3rd September 2007	For MOs and staff nurses of DG hospital	D G Hospital	10
18	22nd September 2007	For doctors, nurses, medical record officers in KIMS hospital	KIMS hospital	32
19	10 th October 2007	Review meeting with staff	Victoria hospital	17
20	25 th October 2007	Review meeting in NIMHANS	NIMHANS	22
21	7 th November 2007	Training for 4 hospitals	Sparsh hospital	16

Results are generally OK . The trainings were mixed and not separated by category of personnel. The training was a combination of sensitization, training in filling up of forms and for followup activities. The programmes were generally open ended and unstructured and was carried out depending on the nature of personnel attending the programme.

Table D2. Result of the hospital training programmes- Pune

S.No	Name of the participating hospital	No.of training programmes	Persons trained			Orientation given Yes/No	No. of times
			Doctors	Residents	Nurses		
1.	Sassoon Hospital, Pune	2	1	0	18	Yes	1
2.	YCM Hospital, Pimpri, Pune	1	4	0	9	Yes	2
3.	Lokmanya Hospital, Nigdi	2	3	10	0	Yes	2
4.	Ruby Hospital, Pune	1	20	0	0	Yes	2
5.	Talegaon MIMER Hospital, Talegaon-Dabhade, Dist: Pune	1	9	8	4	Yes	2
6.	Dinanath Mangeshkar Hospital, Pune	1	6	0	3	Yes	2
7.	Jehangir Hospital, Pune	1	5	1	0	Yes	2
8.	Inlaks Budhrani Hospital, Pune	1	3	0	2	Yes	2
9.	Sancheti Hospital, Pune	1	3	0	0	Yes	2
10.	Hardikar Hospital, Pune	1	3	5	1	Yes	2
11.	Poona Hospital, Pune	1	2	1		Yes	2
12.	Surya Hospital, Pune	1	3	0	1	Yes	2

Note: All the above staff were trained once only. However every week the 1project staff gave them feedback about their forms filling and rectifications were carried out.

Table E1. Result of other agencies training programmes - Bangalore

Date	Training Programme	Place of training	No. Of Participants
12 th April 2007	Writers of Traffic Police stations	NIMHANS	26
26 th June 2007	Writers of Traffic Police stations	NIMHANS	37
11 th July 2007	Writers of Law and Order Police stations	NIMHANS	120
11 th September 2007	Writers of Law and Order Police stations	NIMHANS	140
24 th September 2007	Writers of Traffic Police stations	NIMHANS	42
20 th November 2007	Writers of Traffic Police stations	NIMHANS	27
22 nd November 2007	Writers of Law and Order Police stations	NIMHANS	112

3 Review meetings (march 3, 2007 – June 12 2007 – October 3 , 2007) have been held with all stakeholders, nodal officers, and others. In the meeting the progress was reviewed – data was shared and discussed – problems identified and addressed – and future course of work planned

Table E2. Result of other agencies training programmes

S.No.	Participating agency	No. of training programmes	Persons trained			Orientation given Yes/No	No. of times
			ACP	SI			
1.	Police	1	1	2		Yes	1

Results with police are generally better more because of administrative controls within the department. – Bangalore

Bangalore:

The level of interest and cooperation from hospitals is partial and not to the expected levels. Many are not interested as it is not a programme of GOI or MOH. Hence, it is not binding on anyone's part to fill up forms in casualty. This programme will only move if there are administrative instructions for hospitals.

Table F2. Level of interest in the participating agencies-Pune

Name of the participating hospital	Level of interest A.High and proactive/ B.High initially but diminished gradually/ C.Only on demand/ D.Not interested
1. Sassoon Hospital, Pune	A
2. YCM Hospital, Pimpri, Pune	B
3. Lokmanya Hospital, Nigdi	B
4. Ruby Hospital, Pune	B
5. Talegaon MIMER Hospital, Talegaon-Dabhade, Dist: Pune	B
6. Dinanath Mangeshkar Hospital, Pune	B
7. Jehangir Hospital, Pune	B
8. Inlaks Budhrani Hospital, Pune	B
9. Sancheti Hospital, Pune	A
10. Hardikar Hospital, Pune	C
11. Poona Hospital, Pune	C
12. Surya Hospital, Pune	C

Reasons:

1. In hospitals no.3, 10, 11, the form filling work was done by the residents in addition to the CMOs. They had other priorities like their P.G. studies, PG programme, etc
2. In hospital no. 1, the CMOs refused to fill up the form saying they were already overburdened with large number of casualty patients.
3. In hospitals no. 3-12, there were problems with filling of forms during night time.
4. In one of the hospitals that did not participate in the study, the reasons were lack of incentive to the person filling the form. And in another hospital, the managing trustee-the decision-maker, was abroad and was not expected to return within the study period.

5. Generally speaking, the hospital authorities were helpful. However, the casualty staff view this as a burden on them.
6. In hospitals 2-12, the staffs have mainly done the form filling of RTI cases.
7. In hospitals 2-12, there was a change in the casualty staff due to transfers, resignations, completing the Residency course, etc.
8. In hospitals 3-12, usually fewer number of the RTI cases are shown as MLC cases to avoid inconvenience to the patients. In some cases, the RTI are even shown as other types of injuries.
9. Except the MLC, there is no reporting of any kind for the casualties of the hospitals.

Solutions:

1. An appeal letter directly from the ICMR/WHO inviting the hospitals to participate in the study.
2. An appreciation letter directly from the ICMR/WHO to the hospitals which participated in the study so their interest can be sustained and all help and participation can be ensured in future too.
3. Distribution of Certificates of participation to those who undertook filling of forms done by the P.I.
4. Some sort of remuneration to those who undertook filling of forms to be ensured in the study.
5. The nodal persons from the participating hospitals can be shown as Co- investigators to encourage participation.

Bangalore:

We are not linking this with FIRs as practices in each hospital are different. It is mandatory for only deaths and situations where there is need for court, compensation

Table G1. No. of cases registered and with FIRs- Pune

S.No.	Name of the hospital	No. of injured	No. of FIRs done		No. of brought dead	No. died while being treated.	Total Died
			Total	RTI & Injury			
1.	Sassoon Hospital, Pune	9122	22,501	7907	266	22	288
2.	YCM Hospital, Pimpri, Pune	3156	8373	2457	17	5	22
3.	Lokmanya Hospital, Nigdi	973	923	159	5	2	7
4.	Ruby Hospital, Pune	360	173	63	2	1	3
5.	Talegaon MIMER Hospital, Talegaon-Dabhade, Dist:Pune	468	408	123	0	3	3
6.	Dinanath Mangeshkar Hospital, Pune	271	95	6	2	1	3
7.	Jehangir Hospital, Pune	239	141	54	0	0	0
8.	Inlaks Budhrani Hospital, Pune	441	187	108	3	11	14
9.	Sancheti Hospital, Pune	1108	208	22	1	1	2
10.	Hardikar Hospital, Pune	543	94	10	0	0	0
11.	Poona Hospital, Pune	266	162	86	1	1	2
12.	Surya Hospital, Pune	N.A.	152	(RTI=2)	0	0	0

Analysis of All Injury Data

Table 1. Age-sex distribution of the injured

Sex Age group	Male		Female		Total
	N	C %	N	C %	N
<5	386	1.6	257	3.5	643 (2.0)
5 - 14	1225	5.0	502	6.9	1727 (5.5)
15 - 24	6997	28.7	1886	25.8	8883 (28.0)
25 - 34	7297	29.9	1937	26.5	9234 (29.2)
35 - 44	4134	17.0	1253	17.2	5387 (17.0)
45 - 54	2519	10.3	748	10.2	3267 (10.3)
55 - 64	1155	4.7	397	5.4	1552 (4.9)
65+	657	2.7	321	4.4	978 (3.1)
Total (R %)	24370 (76.9)		7301 (23.1)		31671*

*Missing information on 875 cases.

Table 2. Age-wise distribution of injury types

Cause of injury		<5	5 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Total
Road Traffic Injury	N	170	659	3697	3994	2386	1557	817	517	13797 43.9
	C %	26.4	38.5	41.9	43.6	44.6	48.1	53.1	53.4	
	R %	1.2	4.8	26.8	28.9	17.3	11.3	5.9	3.7	
Fall	N	214	441	654	634	506	405	226	220	3300 10.5
	C %	33.2	25.7	7.4	6.9	9.5	12.5	14.7	22.7	
	R %	6.5	13.4	19.8	19.2	15.3	12.3	6.8	6.7	
Assault	N	13	87	2156	2645	1575	786	289	133	7684 24.4
	C %	2.0	5.1	24.5	28.9	29.4	24.3	18.8	13.7	
	R %	0.2	1.1	28.1	34.4	20.5	10.2	3.8	1.7	
Stab/cut	N	3	21	278	163	82	52	9	5	613 2.0
	C %	0.5	1.2	3.2	1.8	1.5	1.6	.6	.5	
	R %	0.5	3.4	45.4	26.6	13.4	8.5	1.5	.8	
Burns	N	87	92	335	399	163	76	24	12	1188 3.8
	C %	13.5	5.4	3.8	4.4	3.0	2.3	1.6	1.2	
	R %	7.3	7.7	28.2	33.6	13.7	6.4	2.0	1.0	
Poisoning	N	63	78	1063	764	296	130	47	18	2459 7.8
	C %	9.8	4.6	12.1	8.3	5.5	4.0	3.1	1.9	
	R %	2.6	3.2	43.2	31.1	12.0	5.3	1.9	.7	
Drowning	N	4	7	10	8	10	8	1		48 0.2
	C %	0.6	0.4	0.1	0.1	0.2	0.2	0.1		
	R %	8.3	14.6	20.8	16.7	20.8	16.7	2.1		

Table 2. Age-wise distribution of injury types(contd)

Cause of injury		<5	5 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Total
Hanging	N		4	37	37	28	11	5	2	124 0.4
	C %		0.2	0.4	0.4	0.5	0.3	0.3	0.2	
	R %		3.2	29.8	29.8	22.6	8.9	4.0	1.6	
Sports	N	1	17	24	8	1	1			52 0.2
	C %	.2	1.0	.3	.1	.0	.0			
	R %	1.9	32.7	46.2	15.4	1.9	1.9			
Animal Bite	N	60	245	238	218	147	119	64	42	1133 3.6
	C %	9.3	14.3	2.7	2.4	2.7	3.7	4.2	4.3	
	R %	5.3	21.6	21.0	19.2	13.0	10.5	5.6	3.7	
Fall of object	N	15	38	202	159	100	47	27	7	595 1.9
	C %	2.3	2.2	2.3	1.7	1.9	1.5	1.8	.7	
	R %	2.5	6.4	33.9	26.7	16.8	7.9	4.5	1.2	
Crush Injury	N		2	17	19	9	4			51 0.2
	C %		0.1	0.2	0.2	0.2	0.1			
	R %		3.9	33.3	37.3	17.6	7.8			
Others	N	14	22	104	112	50	44	29	12	387 1.2
	C %	2.2	1.3	1.2	1.2	.9	1.4	1.9	1.2	
	R %	3.6	5.7	26.9	28.9	12.9	11.4	7.5	3.1	
Total	N	644	1713	8815	9160	5353	3240	1538	968	31431*

Table 3. Distribution of injury types according to sex

Sex Type of injury	Male			Female			Total
	N	R %	C %	N	R %	C %	N
Road Traffic Injury	11607	82.3	47.1	2489	17.7	33.4	14096
Fall	2670	79.7	10.8	680	20.3	9.1	3350
Assault	5961	75.9	24.2	1891	24.1	25.4	7852
Stab/cut	573	90.0	2.3	64	10.0	.9	637
Burns	612	51.3	2.5	582	48.7	7.8	1194
Poisoning	1388	55.0	5.6	1134	45.0	15.2	2522
Drowning	35	70.0	.1	15	30.0	.2	50
Hanging	80	64.0	.3	45	36.0	.6	125
Sports	49	89.1	.2	6	10.9	.1	55
Animal Bite	827	69.8	3.4	357	30.2	4.8	1184
Fall of object	497	83.1	2.0	101	16.9	1.4	598
Crush Injury	51	96.2	.2	2	3.8	.0	53
Others	316	80.0	1.3	79	20.0	1.1	395
Total	24666	76.8	100.0	7445	23.2	100.0	32111*

* Missing information on 435 cases

Table 4. Place of injury and injury type (Other than road traffic injury)

Type of injury Place		Fall	Assault	Stab /cut	Burns	Poisoning	Drowning	Hanging	Sports	Animal Bite	Fall of object	Crush Injury	Other	Total
Road	N	768	2349	37	11	55	3	2	4	386	43	2	52	3712
	C %	23.2	30.1	5.9	.9	2.2	6.4	1.6	7.3	32.7	7.3	3.8	13.6	20.8
	R %	20.7	63.3	1.0	.3	1.5	.1	.1	.1	10.4	1.2	.1	1.4	
Home	N	1332	3474	141	985	2213	13	114	7	478	129	2	135	9023
	C %	40.2	44.6	22.3	82.8	89.9	27.7	92.7	12.7	40.5	21.8	3.8	35.3	50.6
	R %	14.8	38.5	1.6	10.9	24.5	.1	1.3	.1	5.3	1.4	.0	1.5	
Work-place	N	745	520	393	155	48	2	2		130	380	47	103	2525
	C %	22.5	6.7	62.3	13.0	2.0	4.3	1.6		11.0	64.1	88.7	27.0	14.2
	R %	29.5	20.6	15.6	6.1	1.9	.1	.1		5.1	15.0	1.9	4.1	
School	N	68	24	4	5	2			12	7	3		2	127
	C %	2.1	0.3	0.6	0.4	.1			21.8	.6	.5		.5	0.7
	R %	53.5	18.9	3.1	3.9	1.6			9.4	5.5	2.4		1.6	
Public place	N	111	1122	17	25	74	6	5	3	72	16	1	22	1474
	C %	3.3	14.4	2.7	2.1	3.0	12.8	4.1	5.5	6.1	2.7	1.9	5.8	8.3
	R %	7.5	76.1	1.2	1.7	5.0	.4	.3	.2	4.9	1.1	.1	1.5	
Railways	N	19	3		1	1				1	1	1	9	36
	C %	0.6	0.0		0.1	.0				.1	.2	1.9	2.4	0.2
	R %	52.8	8.3		2.8	2.8				2.8	2.8	2.8	25.0	
Others	N	273	300	39	7	66	23		29	107	21		59	924
	C %	8.2	3.8	6.2	.6	2.7	48.9		52.7	9.1	3.5		15.4	5.2
	R %	29.5	32.5	4.2	.8	7.1	2.5		3.1	11.6	2.3		6.4	
Total	N	3317	7793	631	1189	2461	47	123	55	1181	593	53	382	17825

*Missing information on 590 cases

Table 5. Activity at the time of injury and injury type

Type of injury	Travelling		Walking		Standing		Working		School		Housework		Playing		Sleeping		Unspecified		Others		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Road Traffic Injury	10269	97.1	2684	46.7	207	22.3	62	1.8	8	32.0	2	0.1	62	5.7	65	13.7	556	9.6	210	15.9	14125	43.9
Fall	100	0.9	812	14.1	24	2.6	875	25.2	8	32.0	187	6.7	545	50.3	74	15.5	525	9.1	208	15.8	3358	10.4
Assault	127	1.2	1701	29.6	638	68.6	1046	30.2	4	16.0	1461	52.6	64	5.9	140	29.4	2127	36.7	566	43.0	7874	24.5
Stab/cut	12	0.1	29	0.5	8	0.9	418	12.1	1	4.0	34	1.2	27	2.5	8	1.7	67	1.2	33	2.5	637	2.0
Burns	4	0.0	12	0.2	3	0.3	182	5.2			584	21.0	70	6.5	18	3.8	294	5.1	31	2.4	1198	3.7
Poisoning	11	0.1	11	0.2	3	0.3	85	2.5	1	4.0	336	12.1	49	4.5	108	22.7	1801	31.1	120	9.1	2525	7.8
Drowning	1	0.0	2	0.0	1	0.1	3	0.1			7	0.3	8	0.7	3	0.6	24	0.4	1	0.1	50	0.2
Hanging			1	0.0	1	0.1	2	0.1			10	0.4	3	0.3	5	1.1	97	1.7	6	0.5	125	0.4
Sports	2	0.0							1	4.0			51	4.7			1	0.0	1	0.1	56	0.2
Animal Bite	19	0.2	430	7.5	33	3.5	213	6.1			102	3.7	156	14.4	33	6.9	136	2.3	68	5.2	1190	3.7
Fall of object	13	0.1	32	0.6	9	1.0	414	11.9	1	4.0	29	1.0	29	2.7	4	0.8	41	0.7	27	2.1	599	1.9
Crush Injury			2	0.0			51	1.5													53	0.2
Others	20	0.2	26	0.5	3	0.3	117	3.4	1	4.0	23	.8	19	1.8	18	3.8	125	2.2	46	3.5	398	1.2
Total	10578	32.9	5742	17.8	930	2.9	3468	10.8	25	0.1	2775	8.6	1083	3.4	476	1.5	5794	18.0	1317	4.1	32188*	100.0

* Missing information on 358 cases

Table 6. Status at the time of admission and the place of injury

Status Place of injury	Unconscious		Brought dead		Conscious		Semi-conscious		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	
Road	1000	5.8	215	1.2	15432	89.2	562	3.2	85	0.5	17294
Home	387	4.4	123	1.4	7881	89.1	436	4.9	14	0.2	8841
Workplace	87	3.5	23	0.9	2316	92.2	79	3.1	8	0.3	2513
School	6	4.0	2	1.3	138	91.4	5	3.3			151
Public place	50	3.5	9	0.6	1335	92.7	44	3.1	2	0.1	1440
Railways	7	17.1	1	2.4	32	78.0	1	2.4			41
Playground	1	33.3			2	66.7					3
Others	45	4.8	34	3.6	823	87.8	32	3.3	4	0.4	937
Total	1583	5.1	407	1.3	27959	89.6	1160	3.7	113	0.4	31221

* 1325 missing cases

Table 7. Place of injury and first aid giver

First aid giver Place	Health worker			Doctor			Nurse			Police			Public			Self medication			Others			Total
	N	R%	C%	N	R%	C%	N	R%	C%	N	R%	C%	N	R%	C%	N	R%	C%	N	R%	C%	N
Road	81	1.1	74.3	7309	96.1	58.3	47	.6	38.5	9	0.1	37.5	25	0.3	56.8	60	.8	40.3	73	1.0	65.2	7604
Home	10	0.3	9.2	3198	95.5	25.5	45	1.3	36.9	12	0.4	50.0	9	0.3	20.5	63	1.9	42.3	12	0.4	10.7	3349
Workplace	10	0.9	9.2	1095	95.2	8.7	11	1.0	9.0	1	0.1	4.2	5	0.4	11.4	13	1.1	8.7	15	1.3	13.4	1150
School	3	4.3	2.8	60	87.0	0.5	1	1.4	0.8				1	1.4	2.3	1	1.4	0.7	3	4.3	2.7	69
Public place	4	0.7	3.7	518	93.8	4.1	12	2.2	9.8	1	.2	4.2	1	0.2	2.3	11	2.0	7.4	5	0.9	4.5	552
Railways				23	95.8	0.2	1	4.2	0.8													24
Others	1	0.3	0.9	325	95.6	2.6	5	1.5	4.1	1	0.3	4.2	3	0.9	6.8	1	0.3	0.7	4	1.2	3.6	340
Total	109	0.8	100	12528	95.7	100.0	122	0.9	100	24	0.2	100	44	0.3	100.0	149	1.1	100.0	112	0.9	100.0	13088*

*Information missing on 19458 cases

Table 8. Type of injury and place of first aid given to the injured

Type of injury \ Place of firstaid	At injury site		Nearby government hospital		Nearby private hospital		Medical college		Police		Nursing home		General practitioner		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
Road Traffic Injury	216	3.3	3028	46.0	1949	29.6	278	4.2	4	.1	975	14.8	51	.8	82	1.2	6583
Fall	38	2.4	663	41.0	427	26.4	80	4.9			375	23.2	21	1.3	13	.8	1617
Assault	48	2.7	829	47.3	502	28.7	45	2.6	3	.2	251	14.3	35	2.0	39	2.2	1752
Stab/cut	31	12.4	77	30.8	91	36.4	2	.8	1	.4	37	14.8	7	2.8	4	1.6	250
Burns	4	.7	337	55.0	132	21.5	35	5.7			83	13.5	17	2.8	5	.8	613
Poisoning	30	2.7	524	47.3	326	29.4	46	4.2	1	.1	163	14.7	4	.4	13	1.2	1107
Drowning			7	41.2	6	35.3	1	5.9			3	17.6					17
Hanging	2	4.1	23	46.9	13	26.5	1	2.0			10	20.4					49
Sports	2	8.7	10	43.5	5	21.7					4	17.4			2	8.7	23
Animal Bite	140	20.3	269	38.9	173	25.0	15	2.2	1	.1	42	6.1	5	.7	46	6.7	691
Fall of object	15	4.9	115	37.3	80	26.0	12	3.9			74	24.0	10	3.2	2	.6	308
Crush Injury	4	17.4	3	13.0	7	30.4	4	17.4			4	17.4	1	4.3			23
Others	8	4.5	64	36.4	76	43.2	1	.6	1	.6	20	11.4	1	.6	5	2.8	176
Total	538	4.1	5949	45.0	3787	28.7	520	3.9	11	.1	2041	15.5	152	1.2	211	1.6	13209*

*Information missing in 19337 cases

Table 9. Type of injury and mode of transportation of the all injured victims

Type \ Mode	Ambulance			Govt vehicle			Private vehicle or taxi			Auto rickshaw			Police van			Walking			Others			Total
	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N
Road Traffic Injury	1905	19.5	56.9	342	3.5	28.2	4247	43.6	51.4	2679	27.5	33.3	247	2.5	41.8	21	.2	19.8	306	3.1	28.3	9747
Fall	348	15.0	10.4	114	4.9	9.4	642	27.6	7.8	993	42.8	12.3	62	2.7	10.5	12	.5	11.3	151	6.5	14.0	2322
Assault	314	5.2	9.4	452	7.4	37.3	1826	30.0	22.1	2810	46.2	34.9	197	3.2	33.3	42	.7	39.6	445	7.3	41.2	6086
Stab/cut	39	8.4	1.2	20	4.3	1.7	171	36.9	2.1	163	35.1	2.0	6	1.3	1.0	1	.2	.9	64	13.8	5.9	464
Burns	157	26.8	4.7	20	3.4	1.7	205	35.0	2.5	176	30.0	2.2	12	2.0	2.0	2	.3	1.9	14	2.4	1.3	586
Poisoning	298	18.7	8.9	49	3.1	4.0	487	30.5	5.9	700	43.9	8.7	30	1.9	5.1	5	.3	4.7	27	1.7	2.5	1596
Drowning	17	42.5	.5	2	5.0	.2	8	20.0	.1	10	25.0	.1							3	7.5	.3	40
Hanging	28	32.6	.8	5	5.8	.4	20	23.3	.2	26	30.2	.3	5	5.8	.8				2	2.3	.2	86
Sports	9	17.6	.3	5	9.8	.4	9	17.6	.1	23	45.1	.3							5	9.8	.5	51
Animal Bite	86	9.1	2.6	162	17.2	13.4	424	44.9	5.1	221	23.4	2.7	8	.8	1.4	19	2.0	17.9	24	2.5	2.2	944
Fall of object	57	15.0	1.7	23	6.1	1.9	128	33.8	1.6	139	36.7	1.7	8	2.1	1.4	3	.8	2.8	21	5.5	1.9	379
Crush Injury	1	2.9	.0	2	5.7	.2	18	51.4	.2	13	37.1	.2				1	2.9	.9				35
Others	87	28.8	2.6	15	5.0	1.2	72	23.8	.9	93	30.8	1.2	16	5.3	2.7				19	6.3	1.8	302
Total	3346	14.8	100.0	1211	5.3	100.0	8257	36.5	100.0	8046	35.5	100.0	591	2.6	100.0	106	.5	100.0	1081	4.8	100.0	22638

* Information missing in 9908 cases

Table 10. Mode of transportation and status at the time of admission

Mode Status	Ambulance		Govt vehicle		Private vehicle or taxi		Auto rickshaw		Police van		Walking		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
Unconscious	506	41.8	46	3.8	291	24.0	275	22.7	68	5.6	2	0.2	23	1.9	1211 (5.4)
Brought dead	178	46.2	41	10.6	61	15.8	79	20.5	12	3.1			14	3.6	385 (1.7)
Conscious	2441	12.0	1114	5.5	7703	37.9	7430	36.6	478	2.4	103	0.5	1037	5.1	20306 (89.8)
Semi-conscious	180	30.3	7	1.2	153	25.7	216	36.3	36	6.1	1	0.2	2	0.3	595 (2.6)
Others	33	30.6	1	0.9	41	38.0	30	27.8	1	0.9			2	1.9	108 (0.5)
Total	3338	14.8	1209	5.3	8249	36.5	8030	35.5	595	2.6	106	0.5	1078	4.8	22605*

* Information on 9941 cases missing

Table 11. Age and part of the body injured

	Head		chest		Face		abdomen		Neck		UL		LL		all		SpineVert. Column		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
<5	268	41.2	46	7.1	179	27.5	48	7.4	27	4.2	162	24.9	158	24.3	3	0.5	5	0.8	650
5 - 14	587	34.0	85	4.9	397	23.0	88	5.1	39	2.3	517	29.9	621	35.9	12	0.7	25	1.4	1729
15 - 24	2787	31.3	611	6.9	2326	26.2	598	6.7	369	4.1	2971	33.4	2887	32.5	123	1.4	164	1.8	8894
25 - 34	3022	32.7	737	8.0	2565	27.7	583	6.3	381	4.1	3153	34.1	3065	33.1	130	1.4	177	1.9	9248
35 - 44	1854	34.3	461	8.5	1475	27.3	337	6.2	206	3.8	1743	32.3	1932	35.8	75	1.4	98	1.8	5401
45 - 54	1140	34.9	276	8.4	861	26.3	185	5.7	122	3.7	1063	32.5	1201	36.7	34	1.0	66	2.0	3271
55 - 64	572	36.8	144	9.3	368	23.7	73	4.7	54	3.5	527	33.9	538	34.6	15	1.0	50	3.2	1553
65+	390	39.9	72	7.4	224	22.9	35	3.6	30	3.1	290	29.7	406	41.5	9	0.9	21	2.1	978
Total	10620	33.5	2432	7.7	8395	26.5	1947	6.1	1228	3.9	10426	32.9	10808	34.1	401	1.3	606	1.9	31724

* Information missing on 822 cases

Table 12. Age distribution and nature of injury among all cases

		Fracture	Hematoma & wound	Brain hemorrhage	Brain Concussion	Injury to other organs	Injury to internal	Cut open wounds	Crush Injury	Sprain	Blunt	Abrasion	Other injury	Total
<5	N	79	70	7		6		202		26		29	75	650
	R %	12.2	10.8	1.1		0.9		31.1		4		4.5	11.5	
5-14	N	357	222	20		17	1	639	3	91	4	74	245	1729
	R %	20.6	12.8	1.2		1	0.1	37	0.2	5.3	0.2	4.3	14.2	
15 - 24	N	1334	1306	99	2	145	3	3557	7	736	15	298	1257	8894
	R %	15	14.7	1.1	0	1.6	0	40	0.1	8.3	0.2	3.4	14.1	
25 - 34	N	1435	1423	103	1	118	1	3684	9	733	13	379	1499	9248
	R %	15.5	15.4	1.1	0	1.3	0	39.8	0.1	7.9	0.1	4.1	16.2	
35 - 44	N	933	786	67	1	73	1	2252	4	492	8	203	968	5401
	R %	17.3	14.6	1.2	0	1.4	0	41.7	0.1	9.1	0.1	3.8	17.9	
45 - 54	N	591	514	50	1	58		1298	2	230	11	136	538	3271
	R %	18.1	15.7	1.5	0	1.8		39.7	0.1	7	0.3	4.2	16.4	
55 - 64	N	329	265	28		26		551	2	104	2	68	309	1553
	R %	21.2	17.1	1.8		1.7		35.5	0.1	6.7	0.1	4.4	19.9	
65+	N	210	127	19	1	12		365	1	55	1	29	194	978
	R %	21.5	13	1.9	0.1	1.2		37.3	0.1	5.6	0.1	3	19.8	
Total	N	5268	4713	393	6	455	6	12548	28	2467	54	1216	5085	31724*
	R %	16.5	14.9	1.2	0	1.4	0	39.6	0.1	7.8	0.2	3.8	16	100.0

* Information missing on 822 cases

Table 13. Outcome and type of injury

Outcome Type	Recovered and improved			Condition worsened			Dead			Referred to other hospital			Total
	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N
Road Traffic Injury	4462	74.3	38.9	1115	18.6	44.8	140	2.3	32.0	288	4.8	80.0	6005
Fall	1179	72.3	10.3	321	19.7	12.9	111	6.8	25.4	20	1.2	5.6	1631
Assault	4181	94.9	36.4	169	3.8	6.8	16	0.4	3.7	40	0.9	11.1	4406
Stab/cut	337	91.3	2.9	26	7.0	1.0	4	1.1	.9	2	.5	0.6	369
Burns	131	53.3	1.1	106	43.1	4.3	7	2.8	1.6	2	.8	0.6	246
Poisoning	358	43.4	3.1	444	53.8	17.8	22	2.7	5.0	1	0.1	0.3	825
Drowning	11	31.4	0.1	4	11.4	0.2	19	54.3	4.3	1	2.9	0.3	35
Hanging	15	29.4	0.1	8	15.7	0.3	28	54.9	6.4				51
Sports	36	83.7	0.3	5	11.6	0.2	1	2.3	0.2	1	2.3	0.3	43
Animal Bite	483	68.4	4.2	213	30.2	8.6	9	1.3	2.1	1	.1	0.3	706
Fall of object	177	80.5	1.5	30	13.6	1.2	12	5.5	2.7	1	.5	0.3	220
Crush Injury	15	93.8	0.1	1	6.3	0.0							16
Others	91	43.8	.8	46	22.1	1.8	68	32.7	15.6	3	1.4	.8	208
Total	11476	77.7	100.0	2488	16.9	100.0	437	3.0	100.0	360	2.4	100.0	14761

Table 14. Age-distribution and outcome of the injury

	Recovered and improved			Condition worsened			Dead			Referred to other hospital			Total
	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N
<5	199	78.7	1.8	43	17.0	1.8	9	3.6	2.1	2	.8	.6	253
5 - 14	650	82.3	5.8	104	13.2	4.3	14	1.8	3.2	22	2.8	6.2	790
15 - 24	3277	79.2	29.2	663	16.0	27.2	92	2.2	21.0	108	2.6	30.3	4140
25 - 34	3302	79.8	29.4	647	15.6	26.6	114	2.8	26.0	75	1.8	21.1	4138
35 - 44	1954	77.7	17.4	417	16.6	17.1	79	3.1	18.0	66	2.6	18.5	2516
45 - 54	1077	73.1	9.6	292	19.8	12.0	61	4.1	13.9	44	3.0	12.4	1474
55 - 64	454	67.2	4.0	151	22.3	6.2	44	6.5	10.0	27	4.0	7.6	676
65+	319	67.3	2.8	117	24.7	4.8	26	5.5	5.9	12	2.5	3.4	474
Total	11232	77.7	100.0	2434	16.8	100.0	439	3.0	100.0	356	2.5	100.0	14461

* Missing information on 18085 cases

Analysis of Road Traffic Injury Data

Table 15. Age-sex distribution of the injured road users

Sex Age groups	Male		Female		Total
	N	C %	N	C %	N
<5	112	1.0	56	2.3	168 (1.2)
5 - 14	460	4.1	198	8.2	658 (4.8)
15 - 24	3166	27.9	530	21.9	3696 (26.8)
25 - 34	3458	30.4	531	21.9	3989 (28.9)
35 - 44	1942	17.1	437	18.0	2379 (17.3)
45 - 54	1221	10.8	335	13.8	1556 (11.3)
55 - 64	621	5.5	196	8.1	817 (5.9)
65+	377	3.3	140	5.8	517 (3.8)
Total	11357	82.4	2423	17.6	13780

*Missing information on 325 cases

Table 16. Age distribution of the injured road users

Age group		<5	5-15	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Total
Road users	N	92	323	540	592	566	447	323	279	3162
	%	54.1	49.1	14.6	14.8	23.7	28.7	39.5	54.0	22.9
Pedestrian	N	12	98	667	716	346	224	113	57	2233
	%	7.1	14.9	18.0	17.9	14.5	14.4	13.8	11.0	16.2
Pedal cyclist	N		17	1251	1425	685	398	131	35	3942
	%		2.6	33.8	35.7	28.7	25.6	16.0	6.8	28.6
Two wheeler rider	N	33	91	398	382	227	137	64	53	1385
	%	19.4	13.8	10.8	9.6	9.5	8.8	7.8	10.3	10.0
Two-wheeler pillion	N	1		56	76	50	23	3	1	210
	%	.6		1.5	1.9	2.1	1.5	.4	.2	1.5
Three-wheeler driver	N	6	13	78	75	35	27	10	7	251
	%	3.5	2.0	2.1	1.9	1.5	1.7	1.2	1.4	1.8
Three-wheeler occupant	N			41	74	29	25	12	2	183
	%			1.1	1.9	1.2	1.6	1.5	.4	1.3
Car driver	N	6	22	99	111	62	42	32	15	389
	%	3.5	3.3	2.7	2.8	2.6	2.7	3.9	2.9	2.8
Car occupant	N			39	41	36	23	10	1	150
	%			1.1	1.0	1.5	1.5	1.2	.2	1.1
Bus Driver	N	5	13	91	73	56	39	22	7	306
	%	2.9	2.0	2.5	1.8	2.3	2.5	2.7	1.4	2.2
Bus occupant	N			5	5	3	2	1		16
	%			.1	.1	.1	.1	.1		.1
Truck driver	N			24	13	5	7		4	53
	%			.6	.3	.2	.4		.8	.4
Truck occupant	N			13	26	11	6	3	1	60
	%			.4	.7	.5	.4	.4	.2	.4
Other 4-wheeler driver	N	2	17	65	45	54	27	12	14	236
	%	1.2	2.6	1.8	1.1	2.3	1.7	1.5	2.7	1.7
Other 4 wheeler occupant	N	11	52	287	298	186	114	68	37	1053
	%	6.5	7.9	7.8	7.5	7.8	7.3	8.3	7.2	7.6
Unknown	N	2	12	43	42	35	16	13	4	167
	%	1.2	1.8	1.2	1.1	1.5	1.0	1.6	.8	1.2
Others	N									
	%									
Total	N	170	658	3697	3994	2386	1557	817	517	13796*

Table 17. Type of collision met by the injured road victim

		Hit pedestrian	Head on collision	Hit from back	Hit from side	Hit vehicle in front	Overturn	Hit a fixed object	Skid and fall	Run off road	Hit and run	Pedestrian run over	Fall from moving vehicle	Others	Total
Pedestrian	N	2535	13	90	207	8	2		2	5	135	7		15	3019
	%	84.0	0.4	3.0	6.9	0.3	0.1		0.1	0.2	4.5	0.2		0.5	100.0
Pedal cyclist	N	31	200	374	349	125	3	45	785	3	36	45	2	7	2005
	%	1.5	10.0	18.7	17.4	6.2	0.1	2.2	39.2	.1	1.8	2.2	.1	.3	100.0
Two wheeler rider	N	31	410	380	634	84	10	142	1593	20	60		2	67	3433
	%	.9	11.9	11.1	18.5	2.4	0.3	4.1	46.4	.6	1.7		.1	2.0	100.0
Two-wheeler pillion	N	10	119	180	185	30	59	40	480	12	23	6	14	27	1185
	%	.8	10.0	15.2	15.6	2.5	5.0	3.4	40.5	1.0	1.9	0.5	1.2	2.3	100.0
Three-wheeler driver	N	1	30	28	36	3	30	10	27	1	3		7	3	179
	%	.6	16.8	15.6	20.1	1.7	16.8	5.6	15.1	0.6	1.7		3.9	1.7	100.0
Three-wheeler occupant	N		27	17	23	3	70	6	37	4	2		4	6	199
	%		13.6	8.5	11.6	1.5	35.2	3.0	18.6	2.0	1.0		2.0	3.0	100.0
Car driver	N		37	22	23	6	20	30	7	3	3			6	157
	%		23.6	14.0	14.6	3.8	12.7	19.1	4.5	1.9	1.9			3.8	100.0
Car occupant	N		97	53	17	10	59	70	21	8	3	7		8	353
	%		27.5	15.0	4.8	2.8	16.7	19.8	5.9	2.3	.8	2.0		2.3	100.0
Bus Driver	N		30	12	7	18	12	15	14	2		35		1	146
	%		20.5	8.2	4.8	12.3	8.2	10.3	9.6	1.4		24.0		.7	100.0
Bus occupant	N	12	36	22	16	10	23	22	25	8	2	3	39	38	256
	%	4.7	14.1	8.6	6.3	3.9	9.0	8.6	9.8	3.1	.8	1.2	15.2	14.8	100.0
Truck driver	N		4	1		1	3	2	2		1		1		15
	%		26.7	6.7		6.7	20.0	13.3	13.3		6.7		6.7		100.0
Truck occupant	N		6	1	2		18	2	6				11		46
	%		13.0	2.2	4.3		39.1	4.3	13.0				23.9		100.0
Other 4-wheeler driver	N		12	6	3	1	7	6	2	10				2	49
	%		24.5	12.2	6.1	2.0	14.3	12.2	4.1	20.4				4.1	100.0
Other 4 wheeler occupant	N		33	10	11		29	14	36	10	1		6	17	167
	%		19.8	6.0	6.6		17.4	8.4	21.6	6.0	.6		3.6	10.2	100.0
Unknown	N	15	82	51	60	35	72	51	31	6	6	15		17	441
	%	3.4	18.6	11.6	13.6	7.9	16.3	11.6	7.0	1.4	1.4	3.4		3.9	100.0
Others	N	6	6	11	23	2	27	10	13	3	11	7	4	16	139
	%	4.3	4.3	7.9	16.5	1.4	19.4	7.2	9.4	2.2	7.9	5.0	2.9	11.5	100.0
Total	N	2641	1142	1258	1596	336	444	465	3081	95	286	125	90	230	11789
	%	22.4	9.7	10.7	13.5	2.9	3.8	3.9	26.1	0.8	2.4	1.1	0.8	2.0	100.0

*Information missing in 2336 cases

Table 18. Severity of injury among injured road users

Severity Road user	Mild		Moderate		Severe		Total
	N	R %	N	R %	N	R %	
Pedestrian	1297	42.5	1374	45.0	379	12.4	3050
Pedal cyclist	766	38.1	906	45.0	340	16.9	2012
Two wheeler rider	1584	40.6	1756	45.0	564	14.4	3904
Two-wheeler pillion	637	47.1	567	41.9	148	10.9	1352
Three-wheeler driver	101	50.2	85	42.3	15	7.5	201
Three-wheeler occupant	109	44.9	112	46.1	22	9.1	243
Car driver	51	28.7	91	51.1	36	20.2	178
Car occupant	138	35.5	184	47.3	67	17.2	389
Bus Driver	41	29.1	75	53.2	25	17.7	141
Bus occupant	136	45.2	125	41.5	40	13.3	301
Truck driver	4	28.6	5	35.7	5	35.7	14
Truck occupant	22	41.5	17	32.1	14	26.4	53
Other 4-wheeler driver	18	31.6	31	54.4	8	14.0	57
Other 4 wheeler occupant	108	49.3	91	41.6	20	9.1	219
Unknown	465	47.8	368	37.8	140	14.4	973
Others	61	38.9	77	49.0	19	12.1	157
Total	5538	41.8	5864	44.3	1842	13.9	13244

* Information missing in 881 Cases

Table 19. Use of helmet among two wheeler riders in different age groups

Helmet use Age groups	Yes		No		Not known		Total
	N	C %	N	C %	N	C %	
5 - 14	2	0.2	12	0.6	4	0.4	18
15 - 24	326	32.7	636	31.6	294	30.8	1256
25 - 34	386	38.7	712	35.4	334	35.0	1432
35 - 44	147	14.7	372	18.5	168	17.6	687
45 - 54	96	9.6	188	9.3	116	12.2	400
55 - 64	31	3.1	74	3.7	29	3.0	134
65+	10	1.0	17	0.8	8	0.8	35
Total	998	25.2	2011	50.7	953	24.0	3962*

*Missing information on 71 cases

Table 20. Severity of injury among two wheeler riders

Severity Helmet use	Mild		Moderate		Severe		Total
	N	R %	N	R %	N	R %	
Yes	272	27.1	562	55.9	171	17.0	1005
No	1069	54.3	682	34.6	219	11.1	1970
Not known	252	26.5	523	55.0	176	18.5	951
Total	1593	40.6	1767	45.0	566	14.4	3926

*Missing information on 107 cases

Table 21. Use of seat belt among car drivers and car occupants

Seat belt use Age groups	Yes		No		Not known		Total
	N	R %	N	R %	N	R %	N
<5			3	50.0	3	50.0	6
5 - 14	1	4.5	7	31.8	14	63.6	22
15 - 24	8	5.7	53	37.9	79	56.4	140
25 - 34	17	9.2	81	43.8	87	47.0	185
35 - 44	10	11.0	33	36.3	48	52.7	91
45 - 54	8	11.9	21	31.3	38	56.7	67
55 - 64	7	15.9	16	36.4	21	47.7	44
65+			6	35.3	11	64.7	17
Total	51	8.9	220	38.5	301	52.6	572

*Missing information on 19 cases

Table 22. Severity of injury in seat-belt users and non users among car drivers and occupants

Severity Use of seat belt	Mild		Moderate		Severe		Total	
	N	R %	N	R %	N	R %	N	C %
Yes	6	12.2	25	51.0	18	36.7	49	8.6
No	71	32.3	104	47.3	45	20.5	220	38.8
Not known	112	37.6	146	49.0	40	13.4	298	52.6
Total	189	33.3	275	48.5	103	18.2	567	100.0

*Information missing on 24 cases

Table 23. Alcohol consumption reported by the injured victims and their Counterparts

Alcohol User Age-group	Injured			Counterpart			Both			Not applicable			Unknown			No			Total	
	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	R %	C %	N	C %
<5				1	.6	.9				103	63.2	4.8	20	12.3	.7	39	23.9	.6	163	1.3
5 - 14				8	1.3	7.3				335	54.8	15.7	79	12.9	2.8	189	30.9	2.9	611	4.9
15 - 24	222	6.7	24.5	23	.7	20.9	15	.5	28.3	531	16.0	24.8	804	24.2	28.2	1734	52.1	27.0	3329	26.7
25 - 34	325	9.0	35.9	25	.7	22.7	18	.5	34.0	447	12.4	20.9	864	24.0	30.3	1927	53.4	30.0	3606	28.9
35 - 44	193	8.9	21.3	27	1.2	24.5	7	.3	13.2	309	14.2	14.5	492	22.7	17.3	1141	52.6	17.8	2169	17.4
45 - 54	112	8.0	12.4	17	1.2	15.5	5	.4	9.4	218	15.5	10.2	316	22.5	11.1	734	52.4	11.4	1402	11.2
55 - 64	35	4.8	3.9	5	.7	4.5	6	.8	11.3	119	16.3	5.6	166	22.8	5.8	398	54.6	6.2	729	5.8
65+	19	4.0	2.1	4	.8	3.6	2	.4	3.8	75	15.8	3.5	110	23.2	3.9	265	55.8	4.1	475	3.8
Total	906	7.3	100.0	110	0.9	100.0	53	0.4	100.0	2137	17.1	100.0	2851	22.8	100	6427	51.5	100	12484	100.0

*Information missing on 1641 cases

Table 24. Age and part of the body injured

Part of the body Age group	Head		Chest		Face		Abdomen		Neck		Upper limb		Lower limb		All parts		Spine vertebral Column		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
<5	89	52.4	7	4.1	59	34.7	6	3.5	4	2.4	29	17.1	60	35.3		0.0	1	0.6	170
5-14	271	41.1	26	3.9	181	27.5	21	3.2	15	2.3	168	25.5	281	42.6		0.0	13	2.0	659
15 - 24	1461	39.5	203	5.5	1023	27.7	167	4.5	121	3.3	1307	35.4	1548	41.9	24	0.6	74	2.0	3697
25 - 34	1574	39.4	287	7.2	1117	28.0	172	4.3	122	3.1	1424	35.7	1676	42.0	19	0.5	92	2.3	3994
35 - 44	990	41.5	197	8.3	635	26.6	106	4.4	78	3.3	776	32.5	1012	42.4	23	1.0	55	2.3	2386
45 - 54	615	39.5	136	8.7	417	26.8	64	4.1	47	3.0	512	32.9	676	43.4	8	0.5	30	1.9	1557
55 - 64	348	42.6	73	8.9	192	23.5	36	4.4	27	3.3	268	32.8	326	39.9	6	0.7	30	3.7	817
65+	228	44.1	42	8.1	126	24.4	15	2.9	15	2.9	163	31.5	228	44.1	2	0.4	10	1.9	517
Total	5576	40.4	971	7.0	3750	27.2	587	4.3	429	3.1	4647	33.7	5807	42.1	82	0.6	305	2.2	13797

*Information missing on 328 cases

Table 25. Status at the time of admission and the type of road user

Status Road user	Unconscious			Brought dead			Conscious			Semi-conscious			Others			Total
	N	Col %	R %	N	Col %	R %	N	Col %	R %	N	Col %	R %	N	Col %	R %	
Pedestrian	200	22.6	6.4	36	26.3	1.1	2768	22.7	88.0	133	28.1	4.2	7	9.0	0.2	3144
Pedal cyclist	125	14.1	5.7	21	15.3	1.0	1946	15.9	88.8	89	18.8	4.1	11	14.1	0.5	2192
Two wheeler rider	255	28.8	6.4	31	22.6	.8	3548	29.0	88.8	124	26.2	3.1	39	50.0	1.0	3997
Two-wheeler pillion	89	10.1	6.4	10	7.3	.7	1254	10.3	89.6	40	8.4	2.9	7	9.0	0.5	1400
Three-wheeler driver	10	1.1	4.6	3	2.2	1.4	194	1.6	89.8	6	1.3	2.8	3	3.8	1.4	216
Three-wheeler occupant	10	1.1	4.0	1	.7	.4	231	1.9	92.0	9	1.9	3.6				251
Car driver	15	1.7	8.2	1	.7	.5	165	1.4	89.7	2	.4	1.1	1	1.3	0.5	184
Car occupant	19	2.1	4.8	6	4.4	1.5	352	2.9	89.1	17	3.6	4.3	1	1.3	0.3	395
Bus Driver	12	1.4	8.1	1	.7	.7	126	1.0	85.1	8	1.7	5.4	1	1.3	0.7	148
Bus occupant	20	2.3	6.5	3	2.2	1.0	275	2.3	88.7	11	2.3	3.5	1	1.3	0.3	310
Truck driver	1	.1	6.3				14	.1	87.5	1	.2	6.3				16
Truck occupant	7	0.8	13.2				45	.4	84.9	1	.2	1.9				53
Other 4-wheeler driver	5	0.6	8.3	3	2.2	5.0	47	.4	78.3	3	.6	5.0	2	2.6	3.3	60
Other 4 wheeler occupant	19	2.1	8.4	4	2.9	1.8	202	1.7	89.0	2	.4	.9				227
Unknown	91	10.3	8.8	13	9.5	1.3	904	7.4	87.3	23	4.9	2.2	4	5.1	0.4	1035
Others	6	.7	3.7	4	2.9	2.4	148	1.2	90.2	5	1.1	3.0	1	1.3	0.6	164
Total	884	100.0	6.4	137	100.0	1.0	12219	100.0	88.6	474	100.0	3.4	78	100.0	0.6	13792

*Information missing on 333 cases

Table 26. Status at the time of admission and the type of roads where accident occurred

Status Type of roads	Unconscious		Brought dead		Conscious		Semi-conscious		Others		Total
	N	%	N	%	N	%	N	%	N	%	
City/Municipal roads	443	54.9	70	55.6	6932	60.2	251	54.2	41	53.9	7737 (59.6)
Highways	190	23.5	40	31.7	2111	18.3	100	21.6	25	32.9	2466 (19.0)
Inner roads	68	8.4	5	4.0	1123	9.8	63	13.6	7	9.2	1266 (9.8)
Rural roads	79	9.8	4	3.2	1065	9.3	42	9.1	1	1.3	1191 (9.2)
Others	27	3.3	7	5.6	280	2.4	7	1.5	2	2.6	323 (2.5)
Not known					2	.0					2
Total	807	100.0	126	100.0	11513	100.0	463	100.0	76	100.0	12985

*Information missing on 1140 cases

Table 27. Type of road where accident occurred and and first aid given

First aid given Type of roads	Yes			No			Not known			Total
	N	C %	R %	N	C %	R %	N	C %	R %	N
City/Municipal roads	3129	48.6	41.2	4370	71.0	57.5	103	68.2	1.4	7602
Highways	1526	23.7	63.5	855	13.9	35.6	21	13.9	.9	2402
Inner roads	753	11.7	60.9	471	7.6	38.1	12	7.9	1.0	1236
Rural roads	882	13.7	74.6	289	4.7	24.5	11	7.3	.9	1182
Others	145	2.3	45.2	172	2.8	53.6	4	2.6	1.2	321
Not known	2	.0	100.0							2
Total	6437	100.0	50.5	6157	100.0	48.3	151	100.0	1.2	12745

*Information missing on 1380 cases

Table 28. Type of roads and first aid giver to the road traffic victims

First aid giver Type of road	Health worker		Doctor		Nurse		Police		Public		Self medication		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
City/Municipal roads	16	.5	3019	97.2	27	0.9	5	0.2	8	0.3	2	0.1	29	.9	3106
Highways	40	2.6	1441	95.1	7	0.5			2	0.1			25	1.7	1515
Inner roads	4	0.5	725	97.6	4	0.5	2	0.3	2	0.3			6	0.8	743
Rural roads	4	0.5	867	98.7	3	0.3			1	0.1			3	0.3	878
Others	1	0.7	142	98.6									1	0.7	144
Not known			2	100.0											2
Total	65	1.0	6196	97.0	41	0.6	7	0.1	13	0.2	2	0.0	64	1.0	6388

*Information missing on 7737 cases

Table 29. Type of roads where accident occurred and source of referral among road traffic victims

Source Type of road	Directly on their own		General practitioner		Private hospital		Government hospital		Private teaching hospital		District hospital		Nursing home		Primary health centre		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
City/Municipal roads	3990	56.8	220	3.1	687	9.8	1122	16.0	122	1.7	74	1.1	517	7.4	128	1.8	160	2.3	7020
Highways	733	34.1	89	4.1	260	12.1	658	30.6	73	3.4	51	2.4	178	8.3	46	2.1	61	2.8	2149
Inner roads	431	37.9	34	3.0	92	8.1	343	30.1	39	3.4	41	3.6	114	10.0	25	2.2	19	1.7	1138
Rural roads	298	26.0	38	3.3	125	10.9	468	40.9	42	3.7	24	2.1	102	8.9	26	2.3	22	1.9	1145
Others	185	60.1	12	3.9	42	13.6	47	15.3	4	1.3	2	.6	9	2.9	3	1.0	4	1.3	308
Not known											1	50.0			1	50.0			2
Total	5637	47.9	393	3.3	1206	10.3	2638	22.4	280	2.4	193	1.6	920	7.8	229	1.9	266	2.3	11762

*Information missing on 2363 cases

Table 30. Severity of injury and source of referral among road traffic victims

Source \ Severity	Directly on their own		General practitioner		Private hospital		Government hospital		Private teaching hospital		District hospital		Nursing home		Primary health centre		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
Mild	2403	50.4	92	1.9	241	5.1	1056	22.2	141	3.0	114	2.4	495	10.4	109	2.3	115	2.4	4766
Moderate	2599	49.5	184	3.5	673	12.8	1101	21.0	90	1.7	61	1.2	341	6.5	92	1.8	105	2.0	5246
Severe	593	36.2	117	7.1	282	17.2	442	27.0	48	2.9	22	1.3	74	4.5	26	1.6	35	2.1	1639
Total	5595	48.0	393	3.4	1196	10.3	2599	22.3	279	2.4	197	1.7	910	7.8	227	1.9	255	2.2	11651

*Information missing on 2474 cases

Table 31. Type of road and mode of transportation of the road traffic victims

Mode of Transport Type of road	Ambulance		Govt vehicle		Private vehicle or taxi		Auto rickshaw		Police van		Walking		Others		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N	R %	N
City/Municipal roads	784	13.5	179	3.1	2637	45.5	1855	32.0	144	2.5	19	.3	175	3.0	5793
Highways	595	33.3	67	3.8	694	38.9	320	17.9	48	2.7	1	.1	61	3.4	1786
Inner roads	162	21.3	37	4.9	348	45.7	185	24.3	11	1.4			19	2.5	762
Rural roads	218	30.2	29	4.0	297	41.1	146	20.2	10	1.4			23	3.2	723
Others	58	20.9	17	6.1	101	36.3	68	24.5	22	7.9			12	4.3	278
Not known					1	50.0	1	50.0							2
Total	1817	19.4	329	3.5	4078	43.6	2575	27.6	235	2.5	20	.2	290	3.1	9344

*Information missing on 4781 cases

Table 32. Helmet use and body part injured among two wheeler victims

Helmet use	Head		Chest		Face		Abdomen		Neck		Upper limb		Lower limb		All		Spine/ Vertebral Column		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Yes	168	16.3	47	4.6	166	16.1	31	3.0	25	2.4	490	47.6	542	52.7	4	0.4	26	2.5	1029
No	1231	60.7	80	3.9	727	35.9	33	1.6	16	0.8	647	31.9	960	47.4	19	0.9	25	1.2	2027
Not known	397	40.6	76	7.8	302	30.9	40	4.1	25	2.6	400	40.9	447	45.8	6	0.6	18	1.8	977
Total	1796	44.5	203	5.0	1195	29.6	104	2.6	66	1.6	1537	38.1	1949	48.3	29	0.7	69	1.7	4033

Table 33. Age distribution and nature of injury among road traffic victims

Nature of injury Age-group	Fracture	Hematoma & wound	Brain hemorrhage	Brain Concussion	Injury to other organs	Injury to internal	Cut open wounds	Crush Injury	Sprain	Blunt	Abrasion	Other injury	Total
<5	32	31	3		1		59		10		19	16	170
	18.8	18.2	1.8		0.6		34.7		5.9		11.2	9.4	
5 - 14	165	130	7		8		238	2	30	4	56	87	659
	25.0	19.7	1.1		1.2		36.1	0.3	4.6	0.6	8.5	13.2	
15 - 24	907	682	81	2	59	2	1489	1	253	9	204	465	3697
	24.5	18.4	2.2	0.1	1.6	0.1	40.3	0.0	6.8	0.2	5.5	12.6	
25 - 34	1012	729	79	1	49	1	1562	2	255	7	242	562	3994
	25.3	18.3	2.0	0.0	1.2	0.0	39.1	0.1	6.4	0.2	6.1	14.1	
35 - 44	663	446	51	1	25	1	932		163	3	126	342	2386
	27.8	18.7	2.1	0.0	1.0	0.0	39.1		6.8	0.1	5.3	14.3	
45 - 54	429	293	35	1	23		582		69	8	93	203	1557
	27.6	18.8	2.2	0.1	1.5		37.4		4.4	0.5	6.0	13.0	
55 - 64	234	163	22		18		293	2	40		48	143	817
	28.6	20.0	2.7		2.2		35.9	0.2	4.9		5.9	17.5	
65+	132	85	11	1	3		193		20		24	87	517
	25.5	16.4	2.1	0.2	0.6		37.3		3.9		4.6	16.8	
Total	3574	2559	289	6	186	4	5348	7	840	31	812	1905	13797
	25.9	18.4	2.1	0.0	1.3	0.0	38.5	0.0	6.1	0.2	5.9	13.7	

*Information missing on 328 cases

Table 34. Place of occurrence of injuries and source who brought them to hospital

Source who brought Type of road	Family members		Known Person		Police		Not Known		Self		Total
	N	R %	N	R %	N	R %	N	R %	N	R %	N
City/Municipal roads	3438	55.1	1735	27.8	372	6.0	352	5.6	339	5.4	6236
Highways	1112	62.9	352	19.9	72	4.1	178	10.1	53	3.0	1767
Inner roads	595	62.0	254	26.5	21	2.2	57	5.9	32	3.3	959
Rural roads	661	79.3	121	14.5	8	1.0	29	3.5	15	1.8	834
Others	161	54.2	68	22.9	44	14.8	12	4.0	12	4.0	297
Total	5969	59.1	2530	25.1	517	5.1	628	6.2	451	4.5	10095

*Missing information on 4030 cases

Table 35. Type of injury and treatment

Treatment Type of injury	Treated in emergency room and sent home		Treated in emergency room and referred to another hospital		Admitted for medical /surgical care		Others		Total
	N	R %	N	R %	N	R %	N	R %	N
Road Traffic Injury	4206	34.6	2311	19.0	5571	45.9	55	.5	12143
Fall	1321	44.7	626	21.2	997	33.8	10	.3	2954
Assault	5035	74.8	405	6.0	1286	19.1	2	.0	6728
Stab/cut	341	58.7	16	2.8	220	37.9	4	.7	581
Burns	134	16.0	62	7.4	637	76.2	3	.4	836
Poisoning	276	13.7	146	7.2	1575	78.2	17	.8	2014
Drowning	10	40.0	2	8.0	13	52.0			25
Hanging	11	16.7	12	18.2	43	65.2			66
Sports	37	72.5	1	2.0	13	25.5			51
Animal Bite	524	52.9	35	3.5	432	43.6			991
Fall of object	184	36.3	82	16.2	235	46.4	6	1.2	507
Crush Injury	12	26.7	4	8.9	29	64.4			45
Others	101	36.1	23	8.2	156	55.7			280
Missing	12192	44.8	3725	13.7	11207	41.2	97	.4	27221
Total	4206	34.6	2311	19.0	5571	45.9	55	.5	12143

*Missing information on 1982 cases

Table 36: Outcome among road traffic victims

	Recovered and improved			Condition worsened			Dead			Referred to other hospital			Total
	N	Row %	Col %	N	Row %	Col %	N	Row %	Col %	N	Row %	Col %	Count
Pedestrian	837	71.2	18.8	263	22.4	23.6	37	3.1	26.4	38	3.2	13.2	1175
Pedal cyclist	708	86.1	15.9	92	11.2	8.3	17	2.1	12.1	5	.6	1.7	822
Two wheeler rider	1382	73.0	31.0	346	18.3	31.0	40	2.1	28.6	126	6.7	43.9	1894
Two-wheeler pillion	462	73.4	10.4	113	18.0	10.1	13	2.1	9.3	41	6.5	14.3	629
Three-wheeler driver	76	73.8	1.7	20	19.4	1.8	2	1.9	1.4	5	4.9	1.7	103
Three-wheeler occupant	91	74.6	2.0	25	20.5	2.2	2	1.6	1.4	4	3.3	1.4	122
Car driver	71	69.6	1.6	23	22.5	2.1				8	7.8	2.8	102
Car occupant	123	61.2	2.8	59	29.4	5.3	3	1.5	2.1	16	8.0	5.6	201
Bus Driver	47	65.3	1.1	21	29.2	1.9	1	1.4	.7	3	4.2	1.0	72
Bus occupant	109	75.7	2.4	31	21.5	2.8	2	1.4	1.4	2	1.4	.7	144
Truck driver	1	100.0	.0										1
Truck occupant	2	50.0	.0	2	50.0	.2							4
Other 4-wheeler driver	22	55.0	.5	12	30.0	1.1	4	10.0	2.9	2	5.0	.7	40
Other 4 wheeler occupant	61	52.1	1.4	46	39.3	4.1	5	4.3	3.6	5	4.3	1.7	117
Unknown	419	82.2	9.4	47	9.2	4.2	13	2.5	9.3	31	6.1	10.8	510
Others	51	75.0	1.1	15	22.1	1.3	1	1.5	.7	1	1.5	.3	68
Total	4462	74.3	100.0	1115	18.6	100.0	140	2.3	100.0	287	4.8	100.0	6004

Table 37. Severity and outcome among the injured

	Recovered and improved			Condition worsened			Dead			Referred to other hospital			Total
	N	Row %	Col %	N	Row %	Col %	N	Row %	Col %	N	Row %	Col %	N
Mild	2163	90.5	51.1	178	7.5	16.6	7	.3	8.0	41	1.7	15.0	2389
Moderate	1634	67.4	38.6	631	26.0	59.0	14	.6	16.1	147	6.1	53.8	2426
Severe	435	51.4	10.3	261	30.8	24.4	66	7.8	75.9	85	10.0	31.1	847
Total	4232	74.7	100.0	1070	18.9	100.0	87	1.5	100.0	273	4.8	100.0	5662

*missing information on 8463 cases missing

Appendix-A

PUNE INJURY / ROAD TRAFFIC INJURY SURVEILLANCE PROGRAMME

Indian Council of Medical Research - World Health Organization –MOH & FW, Govt. of India, New Delhi

OPD No.

IPD No.

MLC No.

Name of the Hospital: _____

Police Identification Number: _____

Date of registration (DD / MM / YY):

<input type="text"/>	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>	<input type="text"/>
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Time of registration (HH: MM):

Brought by: 1. Family members 2. Known persons 3. Police 4. Not known 5. Self

Date of occurrence of Injury (DD / MM / YY):

<input type="text"/>	<input type="text"/>	/	<input type="text"/>	<input type="text"/>	/	<input type="text"/>	<input type="text"/>
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Time of occurrence of Injury (HH: MM):

Place of injury occurrence: 1. Within Pune/PCMC 2. Outside Pune/PCMC

A. PERSONAL DETAILS OF THE INJURED:

1 Name of the injured: _____

2 Age (in years) of the injured: _____

3 Sex of the injured: 1. Male 2. Female

4 Education:

Illiterate

Middle

Graduate

Primary

Secondary, High-school & PUC

Post graduate & above

5 Occupation:

1. Unemployed

2. Retired

3. Homemaker

4. Student

5. Unskilled laborer

6. Skilled laborer

7. Clerical

8. Business

9. Professional category

10. Others _____

6 Marital status: 1. Married 2. Single 3. Not applicable

7 Place of residence: 1. Urban Pune/PCMC 2. Rural Pune District 3. Specify for other location _____

B. DETAILS OF INJURY:

8 Place of injury:

1. Road

2. Home

3. Workplace

4. School

5. Others, specify _____

6. Unknown

9 Type of Injury:

1. Road traffic injury

2. Fall

3. Assault

4. Stab/cut

5. Burns

6. Poisoning

7. Drowning

8. Hanging

9. Sports

10. Animal bites

11. Fall of object

12. Others, specify _____

10

Activity at the time of injury:

1. Traveling in vehicle

2. Walking

3. Standing on road

4. Working

5. Going/Coming from school

6. Doing home work

7. Playing

8. Others(specify)

9. Unspecified

- 11 **Intent:** 1. Unintentional 2. Self-harm 3. Intentional (assault) ☐
 4. Others, specify _____ 5. Unknown
- 12 Mention the name of **object causing injury:** _____
- 13 **Alcohol consumption by:** 1. Injured 2. Counterpart 3. Both 4. Not applicable 5. Unknown 6. No ☐

C. DETAILS OF THE ROAD TRAFFIC INJURY:

- 14 **Place of occurrence:** 1. City / Municipal roads 2. Highway 3. Inner roads ☐
 4. Rural Roads 5. Others, specify: _____
- 15 **Road User category:**
 1. Pedestrian 2. Pedal cyclist 3. Two wheeler rider
 4. Two wheeler pillion 5. Three wheeler driver 6. Three wheeler occupant
 7. Car driver 8. Car occupant 9. Bus / truck driver
 10. Bus / truck occupant 11. Other 4-wheeler driver 12. Other 4-wheeler occupant
 13. Others, specify _____ (tempo, etc) 14. Unknown
- 16 **Type of collision:**
 1. Hit pedestrian 2. Head on collision 3. Hit from the back 4. Hit from the side ☐
 5. Nose to tail collision 6. Overturn 7. Hit a fixed object 8. Skid & fall
 9. Run off road 10. Hit & run 11. Others, (specify) _____
- 17 **If Two-wheeler rider/pillion, use of helmet:** 1. Yes 2. No 3. Not known ☐
- 18 **If Car driver/occupant, use of seat belt:** 1. Yes 2. No 3. Not known ☐

D. PREHOSPITAL CARE DETAILS:

- 19 **First Aid given before reaching the hospital:** 1. Yes 2. No 3. Don't know ☐
- 20 **Where was First Aid given:**
 1. At injury site 2. Nearby govt. hospital 3. Nearby Pvt. Hospital ☐
 4. Medical college 5. Police 6. Nursing home 7. Others (specify) _____
- 21 **If First Aid given, who gave the first aid:**
 1. Health worker 2. Doctor 3. Nurse ☐
 4. Police 5. Public 6. Others, specify _____
- 22 **Source of referral:**
 1. General practitioner 4. Pvt. teaching hospital 7. Primary health center ☐
 2. Pvt. Hospital (Corporate) 5. District hospital 8. Directly on their own
 3. Govt. hospital 6. Nursing home 9. Others, specify _____
- 23 **Number of hospital/s visited:** ☐
- 24 **Mode of transportation:**
 1. Ambulance 2. Govt. vehicle 3. Private vehicle or taxi ☐

4. Autorikshaw (3-wheeler)

5. Police van

6. Others, specify _____

E. INJURY MANAGEMENT & OUTCOME:

25 Status of the injured at the time of entry:

1. Unconscious

2. Brought dead

3. Conscious

4. Others, specify _____

26 Type of injury:

1. Mild

2. Moderate

3. Severe

27 Part of the body injured:

1. Head

2. Chest

3. Face

4. Abdomen

5. Neck

6. Upper limbs

7. Lower limbs

8. Spine & vert. column

9. All

28 Nature of injury:

1. Fracture

2. Haematomas/wound

3. Brain haemorrhage

4. Sprain

5. Burn (*indicate* %)

6. Injury to other organs

7. Cut or open wound

8. Brain contusion

9. Others

29 Treatment:

1. Treated in casualty and sent home

2. Treated in casualty and referred to another hospital

3. Admitted to hospital for medical / surgical care

30 Outcome (at the end of casualty stay):

1. Recovered & improved

2. Not recovered

3. Referred to: _____

4. Dead

Address of the Injured Person:

.....

Appendix - B

SI No.

BANGALORE INJURY / ROAD TRAFFIC INJURY SURVEILLANCE PROGRAMME

Ministry of Health & Family Welfare - Indian Council of Medical Research - World Health Organization, New Delhi

Name of the Hospital: _____ Police Identification number: _____

Date of registration (DD / MM / YY): / /

Time of registration (HH: MM): :

Brought by: 1. Family members 2. Known persons 3. Police 4. Not known

Date of occurrence of Injury (DD / MM / YY): / /

Time of occurrence of Injury (HH: MM): :

Place of injury occurrence: 1. Within Bangalore 2. Outside Bangalore

A. PERSONAL DETAILS OF THE INJURED

1 Name of the injured: _____

2 Age (in years) of the injured:

3 Sex of the injured: 1. Male 2. Female

4 Education: 7. Illiterate 9. Middle 11. Graduate 8. Primary 10. Secondary, High-school & PUC 12. Post graduate & above

5 Occupation: 1. Unemployed 4. Student 7. Clerical 10. Others 2. Retired 5. Unskilled laborer 8. Business 3. Homemaker 6. Skilled laborer 9. Professional category

6 Marital status: 1. Married 2. Single 3. Not applicable

7 Place of residence: 1. Urban Bangalore 2. Rural Bangalore 3. Specify for other location _____

B. DETAILS OF INJURY

8 Place of injury: 1. Road 2. Home 3. Workplace 4. School 5. Others, specify _____ 6. Unknown

9 How were you injured: 1. Road traffic injury 2. Fall 3. Assault 4. Stab/cut 5. Burns 6. Poisoning 7. Drowning 8. Hanging 9. Sports 10. Animal bites 11. Fall of object 12. Others, specify _____

10 Activity at the time of injury: 1. Traveling in vehicle 2. Walking 3. Standing on road 4. Working 5. Going/Coming from school 6. Doing home work 7. Playing 8. Others, specify _____ 9. Unspecified

11 Intent: 1. Unintentional 2. Self-harm 3. Intentional (assault) 4. Others, specify _____ 5. Unknown

- 12 Mention the name of **object causing injury**: _____
- 13 Alcohol consumption by: 1. Injured 2. Counterpart 3. Both 4. Not applicable 5. Unknown ☐

C. DETAILS OF THE ROAD TRAFFIC INJURY

- 14 Place of occurrence: 1. City / Municipal roads 2. Highway 3. Inner roads 4. Rural Roads ☐
5. Others, If available, mention the name of road, specify: _____

- 15 Road User category:
- | | | | | |
|----------------------|------------------------|--|--------------------------|--------------------------|
| Pedestrian | Three wheeler occupant | Other 4-wheeler driver (<i>maxi cab, tempo, etc</i>) | <input type="checkbox"/> | <input type="checkbox"/> |
| Pedal cyclist | Car driver | Other 4-wheeler occupant | | |
| Two wheeler rider | Car occupant | Others, specify _____ | | |
| Two wheeler pillion | Bus / truck driver | Unknown | | |
| Three wheeler driver | Bus / truck occupant | | | |

- 16 Type of collision:
- | | | | | |
|---|---|--------------------|--------------------------|--------------------------|
| Hit pedestrian | Hit from the side (<i>side angle collision</i>) | Hit a fixed object | J. Hit & run | <input type="checkbox"/> |
| Head on collision | Nose to tail collision | Skid & fall | I. Others, specify _____ | |
| Hit from the back (<i>rear end collision</i>) | Overturn | Run off road | | |

- 17 If Two-wheeler rider /pillion, **use of helmet**: 1. Yes 2. No 3. Not known ☐
- 18 If Car driver/occupant, use of **seat belt**: 1. Yes 2. No 3. Not known ☐

D. PREHOSPITAL CARE DETAILS

- 19 **FIRST AID** given before reaching the hospital: 1. Yes 2. No 3. Don't know ☐

- 20 **Where** was First Aid given:
- | | | | | |
|-----------------------|----------------------|--------------|-----------------------|--------------------------|
| At injury site | Nearby pvt. Hospital | Police | Others, specify _____ | <input type="checkbox"/> |
| Nearby govt. hospital | Medical college | Nursing home | | |

- 21 If Q21 is yes, **who gave** the first aid:
- | | | | | |
|---------------|--------|-----------------------|--|--------------------------|
| Health worker | Nurse | Public | | <input type="checkbox"/> |
| Doctor | Police | Others, specify _____ | | |

- 22 **Source of referral**:
- | | | | |
|---------------------------------------|---------------------------|--------------------------|--------------------------|
| 1. General practitioner | 5. Pvt. teaching hospital | 8. Primary health centre | <input type="checkbox"/> |
| 2. Pvt. Hospital (<i>Corporate</i>) | 6. District hospital | 7. Directly on their own | |
| 3. Govt. hospital | 7. Nursing home | 8. Others, specify _____ | |

- 23 **Number of hospital/s visited**: ☐

- 24 **Mode of transportation**:
- | | | | |
|------------------|----------------------------|--------------------------|--------------------------|
| 1. Ambulance | 3. Private vehicle or taxi | 5. PCR van | <input type="checkbox"/> |
| 2. Govt. vehicle | 4. Autorikshaw (3-wheeler) | 6. Others, specify _____ | |

E. INJURY MANAGEMENT & OUTCOME

25 Status of the injured at the time of entry:

- | | |
|-----------------|--------------------------|
| 1. Unconscious | 3. Conscious |
| 2. Brought dead | 4. Others, specify _____ |

☐

26 Type of injury:

- | | | |
|---------|-------------|-----------|
| 4. Mild | 5. Moderate | 6. Severe |
|---------|-------------|-----------|

☐

27 Part of the body injured (tick the appropriate part of the body):

- | | | | | |
|-------|---------|-------------|----------------------|-----|
| Head | Face | Neck | Lower limbs | All |
| Chest | Abdomen | Upper limbs | Spine & vert. column | |

28 Nature of injury (tick the appropriate nature of injury):

- | | | | | |
|------------------|-------------------|---------------------|-------------------|--------|
| Fracture | Brain haemorrhage | Burn (indicate %) | Cut or open wound | Others |
| Haematomas/wound | Sprain | Injury other organs | Brain contusion | |

29 Treatment:

- | | |
|---|---|
| 1. Treated in emergency room and sent home | 3. Admitted for medical / surgical care |
| 2. Treated in emergency room and referred to another hospital | |

☐

30 Outcome (at the end of casualty stay):

- | | | | |
|-------------------------|------------------|----------------------|---------|
| 1. Recovered & improved | 2. Not recovered | 3. Referred to _____ | 4. Dead |
|-------------------------|------------------|----------------------|---------|

☐

Name and signature of attending physician:

Signature:

Name:

Appendix-C

Instructions for Filling up the Data Collection format

Name of the Hospital: Name of the hospital within the study –as such

Date of registration: Date when the patient is registered in the hospital (dd/mm/yy)

Time of registration: Time when the patient is registered in the hospital (hh:mm, 24 hours)

Information provided by :

1. Family member
2. Known person
3. Police
4. Not Known
5. Self

Date of injury: Date when the patient got injured (dd/mm/yy)

Time of injury : Time when the patient was injured (hh:mm: 24 hours format)

Place of injury :

1. Within Bangalore/Pune
2. Outside Bangalore

Section A: personal details of the injured:

Name of the person is a key variable in this section which helps not just in identifying the person injured but also facilitates for maintenance of the records .Other personal details of the injured like age, sex, education, occupation, marital status and place of residence are major socio-demographic variables will provide for a detailed analysis of the surveillance data and also give critical inputs for planning interventions. For example some type of injuries may be more common amongst particular age groups or amongst certain occupation or may be more amongst either males or females. Analysis of the education status as a cross-variable would help to plan awareness programmes, etc., The exact method of documentation for each of the variables under this section is given below.

1. **Name of the injured:** Enter the full name of the person.
2. **Age:** age of the patient has to be recorded in completed years.
3. **Sex:** 1.Male / 2.Female.
4. **Education:** For purposes of this surveillance programme 6 broad categories of educational attainment is being enquired into. The highest attained qualification needs to be documented.
 1. **Illiterate:** A person who is unable to read but is able to put only his signature.
 2. **Primary:** Education from standard I to V
 3. **Middle:** education from standards V to VII.
 4. **Secondary & High school:** Education from VIII to XII
 5. **Graduate:** Person who has done a bachelor's courses in any field

6. **Post Graduate and above:** Person who has done a master course and above
7. **Not Known:** Information not known/not available
8. **Not applicable:** For children less than 4 years

5. Occupation:

For purposes of the surveillance programme the ICMR recommended 10 major category occupations will be adapted. **Encircle the most appropriate occupation.** The predominant occupation is to be enquired (“working / involved most of the time”). Exercise caution and do not document designations as occupation. The sub-categories / definitions under the broad occupational headings are given below. In case of doubt or confusion, the exact nature of work being done may be recorded in the left had margin. Circle the appropriate response. **Examples are given below for your information.**

1. **Unemployed:** Person who is not involved any type of job
 2. **Retired:** currently not working but was employed earlier in any sector
 3. **Homemaker:** person who is not working outside the home but is predominantly involved in only household work and is not paid for it in any form, eg: house wives. It is essential to note that this category does not include house-maids, or those who have retired from active service.
 4. **Student:** Who is registered full time for any course in any recognized cent 76 does not include those who are pursuing part-time courses. If so then they should be considered
 5. **Unskilled labour:** Includes labourers, agriculture labour, Domestic servants, Casual workers, Peon, Sweeper, Porter, Washer-man, Factory operator, Shoe maker, Potters, Others (security guard, shop helpers, canteen helper, vegetable vendor).
 6. **Skilled labour:** Artisan, clerks, foreman, supervisor, carpenter, tailor, mechanic, electrician, railway guard, painter, modeler, smiths, baker, driver, shop assistant, petty trader, constable, soldier, linesman, points man, barber, others (printer, receptionist, salesman, welder, gardner, cook, mason, postman, plumber, agarbatti worker
 7. **Clerical:** Includes section in charges / Clerical cadres like FDA, SDA, etc
 8. **Business:** Includes petty business, door-to-door vendors apart from other medium to large scale business endeavors.
 9. **Professional:** doctor, engineer, principal, lawyer, military officer, senior executive, business proprietor, writer, scientist, large employer, director, university professor, police officer, others (horse riders).
 10. **Others:** not classified elsewhere.
 11. **Not known:** information not known/available
6. **Marital status:** Marital status of the injured has to be entered as
1. **Married:** currently married includes widows/widowers
 2. **Single:** currently not married includes people more than 18 yrs.
 3. **Not applicable:** Primarily Children

7. **Place of residence:** Place of residence is important to know whether a person is from rural or an urban area and co-relating with place of occurrence of injury helps in not just classifying injuries but also planning appropriate interventions.

For purposes of this study Urban area is within the administrative limits of Corporation . In case when it is not known or there is confusion specify the location.

Section B: Brief details of injury

This section elicits information related to where, how, who, what and risk factor regarding injury. The main objective is to document details about the injury which guides in its proper classification. While place of injury describes the exact location of injury, the nature of injury (Road traffic Injury, fall, burns, assault, etc.,) along with the activity at the time of injury indicates to the probable cause of injury. Alcohol is a known and common risk factor for many types of injuries.

8. **Place of injury:** Place of injury can be classified as either happening on road or in school, home or workplace. This is the exact location where the injury occurred.

1. **Road:**
2. **Home:**
3. **Work place:** Workplace is the general place of work and includes industrial workplace, business establishment, shops, trade area, etc., In case of agricultural injuries, the place of work become fields, farms, etc.,
4. **School:** Injury occurring within premises of an educational institution.
5. Public place
6. Railways
7. Playground
8. Agricultural field: Any of the cultivation land
9. **Unknown:** When the exact location is not known
10. **Others:** Injury occurring at any other locations either in public or private places (swimming pools, shopping centres, parks, within other buildings or within their compound walls, etc.,)

9. Type of Injury:

The nature of injury looks at broad common categories of injury in India and a miscellaneous category. It is the most popular classification of injury.

1. **Road traffic injury:** Injury sustained due to a direct or indirect impact of a vehicle on the road during any activity which includes driving, walking, standing, etc
2. **Fall:** Injury sustained as result of fall from stairs, steps, ladder, tree, bed, etc or from or out of the building or into a hole or other open surfaces. It also includes condition when fall is from same height like due to collision/ push or resulting from a medical condition or due to effect of one or more drugs and also conditions when the person trips over objects and falls
3. **Assault:** It is injury sustained due to use of force (bodily or with the help of an object) by one human being on another.

4. **Stab/cut:** Injury sustained due to impact of either a sharp or blunt object such as knife, scissors, sickle, stick, etc.,
5. **Burns:** Burn injury, suicidal or homicidal, is the result of heat on body tissues.
6. **Poisoning:** this refers to accidental, incidental or intentional consumption of poisonous chemical substances like insecticides (organophosphorus), pesticides, drugs etc. It does not include poisoning by animals, mammals, reptiles or any other living agent including human beings.
7. **Drowning:** Injury occurring from falling into water either accidental or intentional and resulting in compromised respiration.
8. **Hanging:** Injury resulting from constriction of neck structures (pharynx, larynx, veins, etc) by using rope, wires, cloth etc. It is injury essentially from a height.
9. **Sports:** Injury occurring while being involved in sports or other type of leisure activities of any kind, including native sports.
10. **Animal bite:** Injury sustained as result of bite / scratch / lick of living beings like dogs, cows, monkeys, scorpion, snakes, etc, including human beings.
11. **Fall of object:** This refers to injury sustained as a result of fall of object or objects on the individual who may be moving or stationary.
12. **Crush Injury**
13. **Agricultural injury:** Injury sustained while working on the agricultural site while ploughing , cutting, thrashing etc.
14. **Others:** Injuries which cannot be classified as above.

10. Activity at the time of injury:

The activity at the time of injury is the specific activity being undertaken by the individual like traveling in vehicle (two wheelers driver or pillion, occupants of bus, lorry, car, jeep, etc.), walking, standing, working, going or coming from school, doing homework, playing. The information from this question provides inputs to deciding the individual predisposition for occurrence of injury and helps a great deal in planning interventions.

1. **Travelling in vehicle(two wheelers driver or pillion, occupants of bus, lorry, car, jeep etc)**
2. **Walking**
3. **Standing**
4. **Working**
5. **Going or coming from school**
6. **Doing homework**
7. **Playing**
8. **Sleeping**
9. **Unspecified**
10. **Other. specify**

11. **Intent:** The intention behind an injury is important not just from a legal point of view (homicide, criminal, etc,) but it also helps in planning specific interventions. Though most of the injuries are Unintentional (injuries like road traffic accidents, accidental poisoning, fall of object, etc) and a smaller proportion being intentional (assault,

Homicidal poisoning), the interventions for intentional self harm (suicidal hanging, suicidal poisoning) needs different approaches.

1. Unintentional

2. Suicidal

3. Intentional (assault)

4. Unknown

12. Mention the name of the object causing injury: The object which results in injury may be one or many and includes vehicle, poisons, staircase, sticks, rods, knives, brick, stone, metal piece, piece of machinery, etc. including motor vehicles as in case of an RTI.

13. Alcohol consumption: Alcohol use is a known risk factor for occurrence of injuries and has been proved to affect diagnosis, management and outcome.

1. Injured

2. Counterpart

3. Both

4. Not applicable

5. Unknown

6. No

The response of not applicable is generally for children and that of unknown is when the status of alcohol cannot be ascertained.

Section C: Details of road traffic injury

Road traffic injuries constitute a major proportion of injuries and resultant deaths in India (section 2: scale on injury). Keeping this in mind more specific questions (type of road where RTI occurred, who was / were the road users, type of collision and use of personal protective devices like seat belts and helmets) which help to plan better road safety interventions and campaigns are being asked in this section.

14. Place of occurrence: Place of occurrence or type of road where the injury occurred is important to plan proper road safety measures. The different type of roads can be broadly classified as:

1. **City/Municipal roads:** Arterial of main roads within a city or town which carry the bulk of vehicular traffic within the city and connect different parts or localities of the city. They are usually maintained by the local self government
2. **Highways:** Highways are roads which connect one or more cities along its path and are the life lines of living. They may be either national or state highways. Much of the traffic on the highways are large carriers and most of the vehicles travel at much greater speed on the highways.
3. **Inner roads:** Inner city roads are roads within parts or localities of the city and link up with arterial roads within the city. They are generally narrow and neglected with respect to aspects of road safety.
4. **Rural roads:** Rural roads are roads within rural areas or connect rural areas to the highways. Generally being not-pucca roads, there are of variable standards.

5. **Others:** Roads which can be specifically classified in the above categories can be noted here

15. Road user category:

This information is very crucial at targeting specific road user category for preventive purposes.

1. **Pedestrian:** Person who is not a vehicle occupant, who is walking on road, crossing road or walking on footpath.
2. **Pedal cyclist:**
3. **Two wheeler rider:** two wheelers like scooter, moped, bike, etc.
4. **Two wheeler pillion:** person who is not a driver but in the back seat of two-wheeler.
5. **Three wheeler driver:** Three wheelers like auto rickshaw.
6. **Three wheeler occupant:**
7. **Car driver:**
8. **Car occupant:**
9. **Bus/truck driver**
10. **Bus/truck occupant:**
11. **Other 4 wheeler driver:** eg: maxi cab, tempo, etc
12. **Other 4 wheeler occupant:**
13. **Others specify:** vehicles that do not come under above category.
14. **Unknown**
15. **Other specify: vehicle that do not come under above category.**

16. Type of collision: Enter the way collision occurred for the injured person. Given below are some examples.

1. **Hit pedestrian:** accident involving the moving vehicle and pedestrian who is walking on road or on the footpath
2. **Head on collision:** accident involving two or more moving vehicle which are facing each other in opposite direction
3. **Hit from back:** rear end collision
4. **Hit from side:** side angle collision
5. **Nose two tail collision:** accident involving two or more moving vehicle which are moving in the same direction, while one vehicle hits a other vehicle from back side
6. **Overtake:**
7. **Hit a fixed object:** moving vehicle hit a fixed object like electrical pole, standing vehicle, etc.
8. **Skid and fall:**
9. **Run off road:**
10. **Hit and run:**
11. **Others:** type of collision which does not come under the above category

18. If two wheeler rider/pillion, use of helmet:

1. **Yes**
2. **No**
3. **Not known**

19. If car driver or occupant, use of seat belt:

1. **Yes**
2. **No**
3. **Not known**

Section D: Prehospital care aspects

19. First aid given before reaching the hospital:

1. **Yes**
2. **No(skip to question 20)**
3. **Not known**

20. Where was the First aid given:

1. **At injury site**
2. **Near by government hospital:** An established health care agency run by government.
3. **Near by private hospital**
4. **Medical college:** Sassoon General Hospital, Bharati Medical College Hospital, AFMC, etc
5. **Police**
6. **Nursing home:** an institution authorised by the government with facilities for in or out patients with the availability of immediate services run by or a group of private people.
7. **Others:** Specify

21. If Q19 is yes, who gave the first aid

1. **Health worker:**
2. **Doctor:**
3. **Nurse:**
4. **Police:**
5. **Public**
6. **Self medication**
7. **Others:** Specify

22. Sources of referral:

1. **Directly on their own:** Arriving to your hospital after an injury directly on their own without reference from any hospital
2. **General practitioner:** A qualified person in any branch of health trained in any school having a clinic or consultation office with the required minimum qualification.

3. **Private hospital:** Ruby Hall Clinic, Lokmanya Hospital, etc.
4. **Government hospital:** An established health care agency run by government.
8. **Private teaching hospital:** Medical college with hospital facilities, eg: Sassoon General Hospital, Bharati Medical College Hospital, AFMC, etc
5. **District Hospital:**
6. **Nursing home:** an institution authorised by the government with facilities for in or out patients with the availability of immediate services run by or a group of private people.
7. **Primary health centre:** PHC located in rural area.
8. **Directly on their own:** arriving to your hospital after an injury directly on their own without reference from any hospital.
9. **Others:** specify

23. Number of hospital/s visited: This refers to the no. of hospitals visited by the patient before reaching your hospital casualty.

24. Mode of transportation: A person who has sustained Neurotrauma, needs to be transported with at most care. Improper handling during transport can cause further damage. Hence this has to be enquired into and code as given below.

1. **Ambulance:**
2. **Govt. vehicle:**
3. **Private vehicle or taxi:**
4. **Autorikshaw** (3 wheeler)
5. **Police van**
6. **Walking**
7. **Others:** specify

Section E: Injury Management and outcome

25. Status of injured at the time of entry:

1. **Unconscious:** Where patient does not respond to external stimuli but vital signs are present.
2. **Brought dead:** Where patient enters the casualty with no vital signs. Eg: no pulse rate, no heart rate, no respiration, pupils and dilated and fixed.
3. **Conscious:** Where patient responds to oral commands with spontaneous eye opening, well oriented to time, place and person
4. **Semi-conscious :** Drowsy or partially conscious
5. Others: specify

26. Type of injury:

1. **Mild:** patient sustains mild injuries like abrasion, laceration, etc where patient does not require hospital admission, and can be sent home after observation.
2. **Moderate:** patient sustains moderate injuries like fractures, moderate external or suspected internal bleeding, large open wound where there is suspected injury to internal organs and vitals are stable which requires hospital admission and / or stay in casualty for more than 6 hours.

3. **Severe:** patient sustains severe injuries like massive internal or external bleeding; cerebral haemorrhage and vitals are not stable which requires admission and immediate aggressive management.

27. Part of body injured (tick the appropriate boxes)

1. **Head,**
2. **Face,**
3. **Neck,**
4. **Chest,**
5. **Abdomen,**
6. **Upper limbs,**
7. **Lower limbs,**
8. **Spine and Vertebral column,**
9. **All**

28. Nature of injury (tick the appropriate boxes):

1. **Cut or open wound**
2. **Abrasion**
3. **Blunt injury**
4. **Fracture,**
5. **Sprain,**
6. **Cut or open wound,**
7. **Haematoma/wound:** haematoma is extra vascular collection of blood within the body,
8. **Brain contusion,**
9. **Brain haemorrhage:** collection of blood inside the brain,
10. **Crush Injury**
11. **Injury to internal organs,**
12. **Burn** (indicate in %)
13. **Injury to other organs**
14. **Others**

29. Treatment:

1. **Treated in emergency room and sent home:**
2. **Treated in emergency room and referred to another hospital**
3. **Admitted for medical/surgical care**
4. **Others None of the above**

30. Outcome (at the end of casualty):

By knowing what has happened to the patient later on, one can follow up the patient. This is useful in clinical management as well as improving upon the services at specialised and other care centres

1. **Recovered& improved**
2. **Condition worsened**
3. **Dead**
4. **Referred to another hospital**

