

## Demographic Study and Medico-legal Aspect of Fatal Road Traffic Accident in Aurangabad

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**ABSTRACT** The problem of deaths and injuries as a result of road traffic accidents is now acknowledged to be a global public health phenomenon. This study was done to emphasize the importance of behavioral change in population regarding road safety rules rather than just improving the road conditions and to know the commonest fatal injury so that the proper personal protective measures can be applied. All Road Traffic Accident cases brought to mortuary between September 2006 to August 2007 were analyzed and data was collected regarding personal information, road factors, vehicle involved and fatal injuries. 50 % of fatal victims were in age group of 20-40 years, 87 % were males, 74 % married. The places of accidents of fatal road traffic accidents were on good and straight roads for 91 % and 68 % victims respectively. Approximately 50% succumbed to head injuries, and mostly two wheelers were involved (40%). This burden can be simply overcome by enhancement of road safety knowledge among general public so that Road Traffic Accidents (RTA) can be prevented to great extent.

### INTRODUCTION

The problem of deaths and injuries as a result of road accidents is now acknowledged to be a global public health phenomenon. The publications show that in 1990 road accidents as a cause of death or disability were by no means insignificant, lying in ninth place out of a total of over 100 separately identified causes. However by the year 2020, forecasts suggest that as a cause of death, road accidents will move up to sixth place and in terms of years of life lost (YLL) and 'disability- adjusted life years' (DALYs) will be in second and third place respectively (WHR 1999). WHO data shows that in 2002 nearly 1.2 million people worldwide died as a result of road traffic injuries. This represents an average of 3242 persons dying each day around the world from road traffic injuries (Pedan et al.2004) Countries of South- East Asia are passing through significant urbanization, motorization, industrialization but the lack of safety-related policies and programmes result in increased accidents to the intensity that more than a quarter of injury-related deaths in the world occurred in the South-East Asia Region in 2000 (WHO 2002).

India accounts for about 10% of road accident fatalities worldwide. Road accidents contributed 37.9 percent to all kind of unnatural accidental deaths during 2008-09. Out of total RTA, 30% was fatal in nature. Rate of death per 1000 vehicle was 1.4 in 2009. In India alone, the death toll rose to 14 per hour in 2009 as opposed to 13 in the previous year. The total number of deaths every year due to road accidents has now passed the 135,000 mark, according to the latest report of National Crime Records Bureau or NCRB (NCRB 2010).

The most productive age group, those aged between 15 and 44 years, is heavily represented in road traffic injuries resulting in loss of earnings, together with medical bills, funeral costs and legal bills and can have a ruinous effect on a family's finances. As per the economic impact reported in one study, three quarters of all poor households affected by a road death reported a decrease in their living standard while 61% of poor families had to borrow money (Silcock 2003). By year 2020, it is forecasted to be second leading cause of Disability Adjusted Life Years lost for low and middle income countries. Factors responsible for the increase in road traffic accidents include human factor, vehicles and various road factors. This study was done to emphasize the importance of need of behavioral change in population regarding road safety rules rather just improving the road conditions and to know the commonest fatal injury so that the proper personal protective measures can be applied.

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## MATERIAL AND METHOD

This study was conducted from 1<sup>st</sup> September 2006 to 31<sup>st</sup> August 2007 at Government Medical College and Hospital Aurangabad, Maharashtra, India. The study group consisted of victims of Fatal Road Traffic Accidents brought to mortuary, Department of Forensic Medicine, Govt. Medical College and Hospital, Aurangabad, Maharashtra, India in the above mentioned period.

For the purpose of the study, a Road Traffic Accident was defined as accident, which took place on the road between two or more objects, one of which must be any kind of a moving vehicle. Any injury on the road without involvement of a vehicle (for example a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (for example, persons getting injured while washing or loading a vehicle) were excluded from the study.

Personal information regarding victims of the accidents was obtained from their relatives, friends and investigating police officer. Visit to the scene of accident was made to note the type and condition of road.

## RESULTS

In our present study, total vehicular accident fatalities comprised 216 (8.97 %) out of total 2408 medico-legal cases autopsied during the study period. Last half of year had reported 137(63.4%) of cases as the city is a tourist place and weather is pleasant during this time.

The study finding reveals that 56 % were between 21-40 years, followed by 48(22.22%) in age group of 41-60 years. Less than 5 % were above 60 years of age. Male and female ratio was found to be 6.7:1. Married (74%) were more commonly involved than unmarried. Almost half (51.39%) of victims were either illiterate or had just primary level of education. Middle income group (II, III, and IV) constituted 84.22% of total fatal RTA victims. Fatalities due to RTA in rural and urban residents were almost equal as evident in Table 1.

Table 2 shows the relation of road factors with fatal RTA's. Maximum number of deaths were on roads which were in good condition (91.20%). One hundred and forty- seven (68.06%) fatalities occurred on straight roads

**Table 1: Demographic characteristics of fatal RTA victims**

Demographic profile	No. of victims	Percentage	
Age	0 – 20	36	16.67 %
	21 – 40	122	56.48 %
	41 – 60	48	22.22 %
	> 60	10	4.63 %
Sex	Male	188	87.04 %
	Female	28	12.96 %
Marital Status	Married	161	74.54 %
	Unmarried	55	25.46 %
Residence	Rural	106	49.07 %
	Urban	110	50.92 %
Literacy	Illiterate	31	14.35 %
	Below secondary	80	37.04 %
	SSC	39	18.05 %
	Higher sec	25	11.57 %
	Graduate and post graduate	42	18.52 %
Social Status(Prasad's Classification Modified 2006)			
	I	17	7.87 %
	II	55	25.46 %
	III	52	24.07 %
	IV	75	34.72 %
	V	17	7.87 %

followed by 48(22.22%) on curved roads. Head injury was the single largest cause of death and was seen in 107(49.54%) of victims. Multiple injuries were second largest cause of deaths in 77 victims (35.65%) as shown in Table 3.

**Table 2: Various road factors and fatal RTA victims**

Road factors	No. of victims	Percentage	
Road Condition	Bad	14	6.48 %
	Good	197	91.2 %
	Under-constructed	5	2.31 %
Road Type	Straight	147	68.05 %
	Curve	48	22.22 %
	T-junction	10	4.63 %
	U-turn	11	5.09 %

**Table 3: Fatal injuries in RTA victims**

Fatal injuries	Number	Percentage
Head	107	49.54 %
Multiple	77	35.65 %
Abdomino-pelvic	17	7.8 %
Thoracic	4	1.85 %
Others	11	5.09 %

Among the fatal cases in different types of vehicles, 86(39.8%) were on two wheelers followed by 63(29%) in light motor vehicles and 43 (19.9%) in heavy motor vehicles. Out of total 216 victims, 142(65.7 %) were drivers and

rest were the occupants. All of them had valid driving licences. None of them had been found using the helmet or seat belts at time of accident. Alcohol was found to be consumed by 26 (18.3%) of victims who were driving the vehicles (Table 4).

**Table 4: Various vehicles involved in fatal RTA's**

<i>Vehicle</i>	<i>Number</i>	<i>Percentage</i>
Two wheeler	86	39.81 %
Heavy motor vehicle	43	19.91 %
Light motor vehicle	63	29.17 %
Three wheeler	13	6.02 %
Human and animal powered	11	5.09 %

## DISCUSSION

Significant urbanisation, motorization and industrialisation in the past two decades has increased the injuries on roads due to lack of safety related policies and program. The health sector in the South- East Asia region bears the maximum brunt in terms of provision of acute health care and short term and long term rehabilitation services. Limited information is available in health research and development on motor vehicle safety; contributing to growing seriousness of problem. The present study was carried out to emphasize the usage of safety protective measures and focus on target group to reduce the RTA fatalities. The most common age group affected in the study was between 21-40 years (56.48%) and is consistent with the studies available from India and other countries (Sharma et al. 2001; Jha and Agrawal 2004; Kumar et al. 2008). The age group 20-40 years is the most active phase of life, during which there is tendency to take a risk. As they are economically productive, there is serious financial loss to the community. This is the high risk group, where preventive strategies need to be targeted. The lower proportion of victims above 60 years could be due to general less mobility of this group. Not surprisingly our study shows the overwhelming majority of the deceased were males (87.04%). This is due to greater male exposure on urban streets and low representation of women in India's work force. Similar higher incidence of traffic accidents among males has been found by many other researchers (Sharma et al. 2001; Jha and Agrawal 2004; Kumar et al. 2008) but our study shows the marked predominance of males, may be due to

fact that the victims of fatal RTA were mostly drivers who are usually males. Rural and urban had almost equal share of fatal RTAs due to urbanization and industrialization. On the socio-educational front, majority of them had lower level of education and belonged to middle socio-economic classes and this is similar to results of other studies (Joly et al. 1991; Jha and Agrawal 2004). This can be explained by fact that this group always travels in two wheelers (40% fatalities) for their work which is improperly maintained and have a little knowledge of road safety rules. Light Motor Vehicles (LMV) (29%) and Heavy Motor Vehicles (HMV - 20%) were next commonly involved in fatal RTA's. Similar observations were reported by other (Ghosh 1992; Jha et al. 2003) from India. Rough driving, over speeding and heavy loaded vehicle offering poor control may be the possible reason for RTA's. According to C.I.R.T. (Central Institute of Road Transport), its study in 1994 statistically shows that over 80% truck drivers are under- matriculate, 88% learned driving on their own, only 8% are equipped for trailers and containers. In the present study, 18% of drivers were found to have consumed alcohol which is higher than other studies (Ghosh 1992; Jha et al. 2003). The difference may be due to methodology of this study where only the fatal RTA's were taken into consideration unlike the above mentioned studies. This shows there is gross negligence to comply with traffic rules on both sides, public and government. This situation can be improved by educating public through the mass media and initiating road safety training campaign in schools and colleges.

Maximum fatalities were seen on straight (68%) and good (91%) roads. Another study (Mohan 2009) also reported that the fatality rate per volume is more than three times higher on the four-lane section than on two-lane sections. Probable cause may be the speed and recklessness of driver on straight and good roads which lead to loss of control and increase in accidents. 22.22 % of fatalities occurred on the curved one lane road, due to tendency of taking risk by overtaking on such roads. On the bad, under-constructed road though the frequency of RTA's are more but they are not usually fatal in nature.

According to present study, head injury was the single largest cause of death and was seen in 107(49.5%) of victims. Again head injury was also one of the injuries in many victims with

multiple injuries. It is in concordance with various other studies (Montazeri 2004; Kumar et al. 2008) showing head injury to be common cause of death in fatal road accidents. On questioning the investigating officer, it was found that none of the two wheeler's and four wheeler's victims were using either helmet or safety belts respectively. No LMV's had the safety air bags. The common mode of sustaining fatalities was by falling down in case of two wheelers and collision of head on steering wheel or dashboard in four wheelers. These fatalities could have been easily prevented by simplified measure like enhancement of road safety knowledge among general public.

### CONCLUSION

Finally to conclude, head injury being the most common cause of death, males were more prone, with the most vulnerable age group being 20-40 years with low socio-educational background. Maximum deaths occurred on straight and good roads, the most commonly involved vehicles were two-wheelers followed by HMV's and LMV's. Alcohol intoxication was found in 18% drivers and none of the victims were using safety devices.

### RECOMMENDATIONS

It is therefore recommended that the Government should equip law enforcement agents involved in regulating and monitoring road users to ensure and enforce safe driving. Along with good road networks in the state and country, citizens should change their attitudes positively, stop reckless driving, obey traffic rules, and use of protective devices like helmet for two wheelers and safety seat belts in four wheelers. Driver's license should be issued only to qualified persons. Health facilities should be modernized and fully equipped with good neuro-surgical care and drugs with adequate man-

power. A nationwide computerized trauma centre should be established for surveillance and management of victims

### REFERENCES

- CIRT Study 1994. *Road Goods Transport industry in India – A Study of its Structure and Organization*. Pune: CIRT (Central Institute of Road Transport).
- Ghosh PK 1992. Epidemiological study of the victims of vehicular accidents in Delhi. *Journal of Indian Medical Association*, 90 (12): 309–312.
- Jha N, Srinivasa DK, Roy G, Jagdish S 2003. Injury pattern among road traffic accident cases: A study from South India. *Indian Journal of Community Medicine*, 28(2): 85–90.
- Jha N, Agrawal CS 2004. Epidemiological study of road traffic accident cases: A study from Eastern Nepal. *Regional Health Forum, WHO South-East Asia Region*, 8(1): 15-22.
- Joly MF, Foggin MP, Less BI 1991. Geographical and socio-ecological variations of traffic accidents among children. *Social Sciences and Medicine*, 33(7): 765-769.
- Kumar Arvind, Lalwani Sanjeev, Agrawal Deepak, Rautji Ravi, Dogra TD 2008. Fatal road traffic accidents and their relationship with head injuries: An epidemiological survey of five years. *Indian Journal of Neurotrauma (IJNT)*, 5(2): 63-67.
- Mohan Dinesh 2009. Road accidents in India. *IATSS Research*, 33(1): 75 -79.
- Montazeri A 2004. Road-traffic-related mortality in Iran: A descriptive study. *Public Health*, 118: 110-113.
- NCRB 2010. *Transportation /India Has the Highest Number of Road Accidents in the World*. New Delhi: National Crime Records Bureau (NCRB), Ministry of Home Affairs, Govt. of India.
- Peden Margie, Scurfield Richard, Sleet David, Mohan Dinesh, Hyder Adnan A, Jarawan Eva, Mathers Colin 2004. *World Report on Road Traffic Injury Prevention*. Geneva: World Health Organization.
- Sharma BR, Harish D, Sharma V, Vij K 2001. Road Traffic accidents – a demographic and topographic analysis. *Med Sci Law*, 41: 266-74.
- Silcock Babbie Ross 2003. *Report on Project R7780: Transport Research Laboratory Guidelines for Estimating the Cost of Road Crashes in Developing Countries*. London: Department for International Development.
- World Health Report 1999. *Making a Difference*. Geneva: WHO.
- World Health Organization 2002. *Strategic Plan For Injury Prevention and Control in South-East Asia*. Regional Office for South-East Asia, New Delhi: WHO.