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Road Traffic Accidents in India: Issues and Challenges

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Abstract

The main aim of this paper is to analyze the road accidents in India at national, state, and metropolitan city level. Analysis shows that the distribution of road accidental deaths and injuries in India varies according to age, gender, month and time. Age group 30-59 years is the most vulnerable population group, though males face higher level of fatalities and injuries than their female counterparts. Moreover, road accidents are relatively higher in extreme weather and during working hours. Analysis of road accident scenario at state and city level shows that there is a huge variation in fatality risk across states and cities. Fatality risk in 16 out of 35 states and union territories is higher than the all India average. Although, burden of road accidents in India is marginally lower in its metropolitan cities, almost 50% of the cities face higher fatality risk than their moffusil counterparts. In general, while in many developed and developing countries including China, road safety situation is generally improving, India faces a worsening situation. Without increased efforts and new initiatives, the total number of road traffic deaths in India is likely to cross the mark of 250,000 by the year 2025. There is thus an urgent need to recognize the worsening situation in road deaths and injuries and to take appropriate action.

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Keywords: Road safety; public health; fatality rate; fatality risk; India.

1. Introduction

Fatalities and injuries resulting from road traffic accidents are a major and growing public health problem in India. Every week nearly 2,650 people get killed and 9,000 get injured due to traffic accidents. In 2013, latest year for which data is available, 137,423 people died and 469,900 people got injured due to road accidents in India. Traffic accidents

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have now earned India a dubious distinction; with nearly 140,000 deaths annually, the country has overtaken China to top the world in road fatalities. India is the only country in the world which faces more than 15 fatalities and 53 injuries every hour as a consequence of road crashes. While in many developed and developing countries including China, the situation is generally improving, India faces a worsening situation. If the trend continues, the total number of road traffic deaths in India would increase by 100% between 2013 and 2027. Without increased efforts and new initiatives, the total number of road traffic deaths in India is likely to cross the mark of 250,000 by 2025.

The main aim of this study is to analyze the road traffic accidents in India at national, state, and metropolitan city level. Focus would be to identify the major road safety issues and discuss countermeasures that would have potential to address the specific road safety problems. The primary source of data for the study is *Accidental Deaths & Suicides in India, 1970 to 2013* published by the National Crime Records Bureau, Ministry of Home Affairs, Government of India, New Delhi.

The analysis shows that during the last ten years, road accidental fatalities in India have increased at the rate of 5% per year while the population of the country has increased only at the rate of 1.4% per year. Due to this, fatality risk, road accidental deaths per 100,000 people, has increased from 7.9 in 2003 to 11.2 in 2013. Fatality risk in India is not only quadruple than that in some of the developed countries such as United Kingdom and Sweden but also still increasing rapidly. It is also found that the distribution of road accidental deaths and injuries varies according to age, gender, month and time. Among people of all age groups, people of economically active age group of 30-59 years is the most vulnerable. However, if we compare gender-wise fatalities and accidents, we found that the males accounted for 85.2% of all fatalities and 82.1% of all injuries in 2013.

Moreover, road accidents are relatively higher in May-June and December-January which shows that extreme weather influences the occurrence of road accidents. Accidents remain relatively constant and high during 9 AM - 9 PM and variable but low during mid-night and early hours of the day. However, this does not imply that daytime driving is more risky than nighttime driving. The study also tries to find out cause-wise distribution of road accidents. There are several factors responsible for accidents but drivers' fault is found to be the most important one; drivers' fault accounted for 78% of total accidents in 2013.

Analysis of road traffic accidents across states and union territories reveals that, during the year 2013, three states and union territories, Tamil Nadu (22.8), Haryana (17.2), and Andhra Pradesh (16.9), faced 50% higher fatality risk than all India average (11.2). It is found that the burden of road traffic accidents in India is relatively low in its metropolitan cities (million plus cities), though fatality risk varies from 3.0 fatalities per 100,000 people in Kolkata to 25.5 fatalities per 100,000 people in Jaipur. From 2003 to 2013, fatality risk in 6 out of 21 selected metropolitan cities increased at higher rate than that in the country. Ahmedabad faced the highest increase in fatality risk (0.6 to 4.2) followed by Varanasi (9.5 to 17.9), Patna (9.2 to 17.4), Chennai (8.8 to 14.3), Jaipur (15.9 to 25.5), and Vishakhapatnam (15.5 to 22.0).

The study is organized into six sections. Section 2 presents the analysis of road accident scenario at national level. This section analyses the road accidental deaths and injuries in detail along with causes of the same. Section 3 presents a comparison of road accidental problems across states and union territories. Section 4 deals with the road accidental problems faced by the metropolitan cities. Section 5 discusses the way forward to overcome these problems. Conclusion of the study is presented in the last section.

2. Analysis of road accident scenario at national level

2.1. *Road accidental deaths and injuries in India*

There has been an alarming increase in accidental deaths on Indian roads over the years. Road accidental fatalities have increased more than 9 times, from 14,500 in 1970 to 137,400 in 2013. In comparison to 2003, fatalities and injuries in 2013 are higher by 53,000 and 87,000, respectively (see, Table 1). From 2003 to 2013, fatalities have increased at a rate of 5% per year while the population of the country has increased only at the rate of 1.4% per year. Consequently, fatality risk, road accidental deaths per 100,000 people, has increased from 7.9 in 2003 to 11.2 in 2013. Despite low level of motorization, India faces very high level of fatality risk in comparison to developed countries (see, Table 2). Fatality risk in India is quadruple than that in the United Kingdom and Sweden, and almost twice than that in the Japan and Germany. Although fatality rate, road accidental deaths per 10,000 vehicles, has decreased over the years from 87.5 in 1970 to 8.6 in 2013, it is still quite high in comparison to developed countries. Fatality rate in many developed countries is less than 1 fatality per 10,000 vehicles (see, Table 2).

Table 1. Road Accident Statistics of India: 1970-2013

Year	No. of road accidents (in thousand)	No. of road accidental injuries (in thousand)	No. of road accidental deaths (in thousand)	Accident risk (no. of accidents per 100,000 people)	Accident severity index (no. of fatalities per 100 accidents)	Fatality risk (no. of fatalities per 100,000 people)	Fatality rate (no. of fatalities per 10,000 vehicles)
1970	114.1	70.1	14.5	21.6	12.7	2.7	87.5
1980	153.2	109.1	24.6	23.1	16.1	3.7	54.4
1990	282.6	244.1	54.1	34.4	19.1	6.6	28.2
2000	308.3	340.2	80.1	30.8	26.0	8.0	16.6
2003	336.4	382.9	84.4	31.5	25.1	7.9	12.6
2010	430.6	470.6	133.9	36.3	31.1	11.3	10.5
2013	443.0	469.9	137.4	36.1	31.0	11.2	8.6

Table 2. Comparison of International Fatality Rates

Country	Motorization rate (no. of vehicles per 1,000 people)	Fatality rate (no. of fatalities per 10,000 vehicles	Fatality risk (no. of fatalities per 100,000 people)
India (2013)	130	8.6	11.2
Germany (2012)	657	0.67	4.4
Japan (2012)	651	0.63	4.1
New Zealand (2012)	733	0.95	6.9
Sweden (2012)	599	0.50	3.0
United Kingdom (2012)	559	0.51	2.8
United States of America (2012)	846	1.26	10.7

Sources: (1) Comparison of International Fatality Rates, Monash Injury Research Institute, Monash University, Australia (available at www.monash.edu.au/miri/research/reports/papers/fatals.html) (2) Motor vehicles (per 1,000 people), World Bank Data, The World Bank (available at http://data.worldbank.org/indicator/IS.VEH.NVEH.P3).

2.2. *Age- and sex-wise distribution of road accidental deaths and injuries*

Table 3 presents fatality distribution by age. This table clearly shows that the most productive age group, 30-44 years, is the most prone to road accident fatality in India. Age group 30-44 years comprises only 20% of Indian population but faces almost 35% of total road accident fatality. During the last ten years from 2003 to 2013, the number of fatalities faced by this age group has also increased substantially from 29,156 (34.5% of total fatality) to 47,838 (34.8% of total fatality). The middle age group 45-59 years is also very prone to road accident fatality. This age group comprises only 12% of the total population but faces almost 21% of total fatality. Therefore, age group 30-59 years, the economically active age group, is the most vulnerable population group in India. More than half of the road accident fatalities are faced by this group of population which accounts for less than one third of the total population. This could be because people in this age group are in their prime working years, and thus are more likely to be present on the roads. The proportion of fatalities in the age groups 15-29 years and 60 years and above is similar to their respective representation in the total population.

Table 4 presents sex wise distribution of road accidental deaths and injuries in India for the year 2003 and 2013. This table shows that the males accounted for 85.2% of all fatalities and 81.1% of all injuries in 2013. During the last ten years, number of fatalities faced by males has increased by 64.6%, from 71,128 in 2003 to 117,055 in 2013. This is significantly higher than the increase in fatalities faced by females; number of fatalities faced by females has increased by 53.1%, from 13,302 in 2003 to 20,368 in 2013. However, trend in injuries is just opposite to that in fatalities. During the last ten years, number of injuries faced by males has increased by 21.8%, from 313,055 in 2003 to 381,228 in 2013. This is relatively lower than the increase in injuries faced by females; number of injuries faced by females has increased by 26.9%, from 69,843 in 2003 to 88,654 in 2013.

Table 3. Age Wise Distribution of Road Accidental Deaths in India

Age group	No. of fatalities (2003)	Percentage share (2003)	No. of fatalities (2013)	Percentage share (2013)
Up to 14 years	6534	7.7	7305	5.3
15-29 years	25223	29.9	42453	30.9
30-44 years	29156	34.5	47838	34.8
45-59 years	16674	19.7	28263	20.6
60 years and above	6843	8.1	11564	8.4
Total	84430	100	137423	100

Table 4. Sex Wise Distribution of Road Accidental Deaths and Injuries in India

Gender	Fatalities					Injuries				
	2003	Share of total fatality in 2003 (%)	2013	Share of total fatality in 2013 (%)	%age change in fatality (2003/ 2013)	2003	Share of total injury in 2003 (%)	2013	Share of total injury in 2013 (%)	%age change in injury (2003/ 2013)
Male	71128	84.2	117055	85.2	64.6	313055	81.8	381228	81.1	21.8
Female	13302	15.8	20368	14.8	53.1	69843	18.2	88654	18.9	26.9
Total	84430	100	137423	100	62.8	382898	100	469882	100	22.7

2.3. *Month- and time-wise distribution of road accidents*

Figure 1 presents month-wise distribution of road accidents in India. Although monthly variation in road accidents is not substantial, road accidents are relatively higher in May-June and December-January. This shows that extreme weather influences the occurrence of road accidents. Since temperature is fairly high in May-June in India, it might have had its impact on road accidents. High temperatures have both psychological and physiological effect on drivers. Emotions rise with the temperature, people are more irritable to others, they get tired, lose their concentration, and their reaction time gets slower (Bijleveld and Churchill, 2009). This may be the reason why number of road accidents is relatively higher in summer particularly in May. Although occurrence of road accidents in December-January is not as high as in May-June, in general, it is higher than that in other months. This may be because certain part of the country particularly North India faces poor visibility on the roads in the months of December and January due to foggy weather condition. In foggy weather, people generally drive somewhat slower, but simultaneously keep a shorter following distance to the vehicle in front of them. In combination with the decreased field of vision, this increases the risk of crashes (Bijleveld and Churchill, 2009).

Figure 2 shows time-wise distribution of road accidents in India. This figure clearly reveals that there is substantial variation in road accidents during different times of the day. Accidents remain relatively constant and high during 9 AM to 9 PM and variable but low during mid-night and early hours of the day. However, this does not imply that daytime driving is more risky than nighttime driving. If we estimate accident risk per vehicle-km or passenger-km during day as well as nighttime, we may find that driving during nighttime is riskier than daytime. Unavailability of data restricts us to estimate the accident risk during daytime vis-à-vis nighttime.

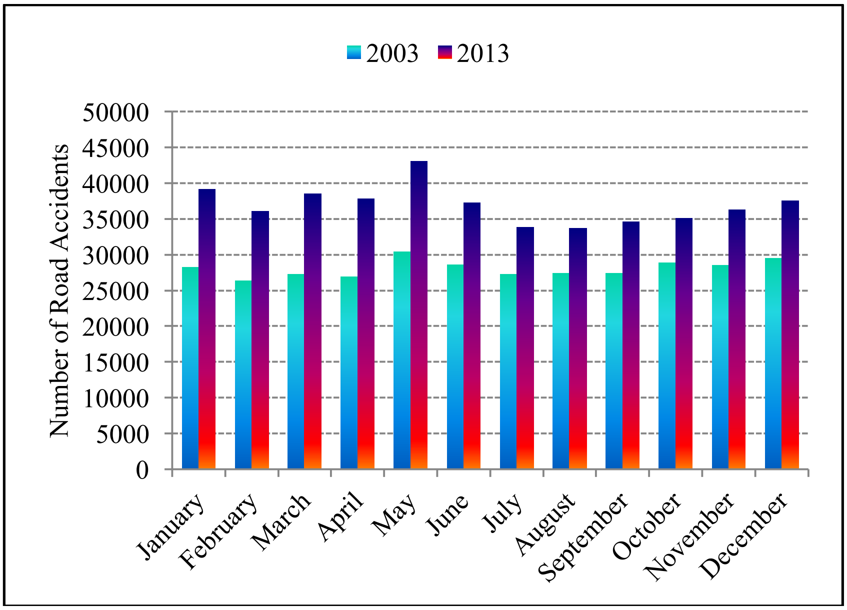

Figure 1. Number of Road Accidents by Month of Occurrence in 2003 and 2013

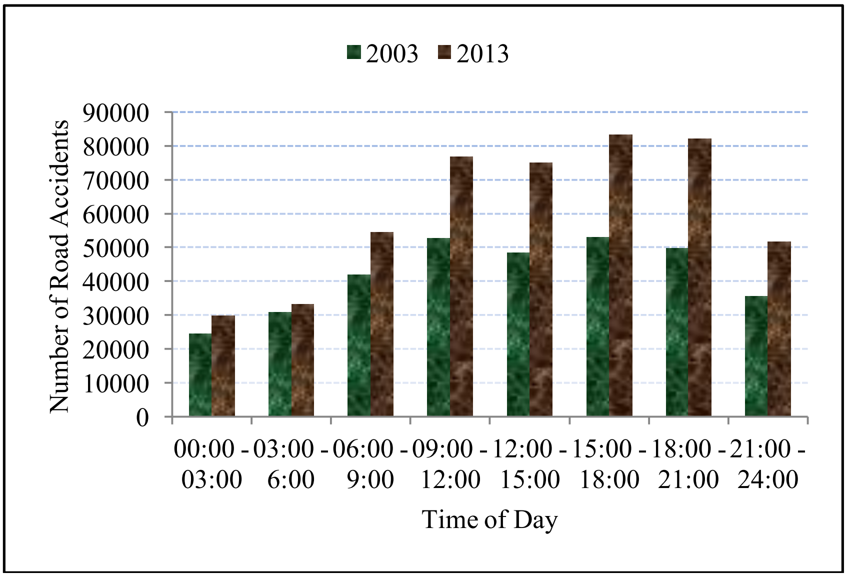

Figure 2. Number of Road Accidents by Time of Occurrence in 2003 and 2013

2.4. *Causes of road accidents*

Figure 3 presents cause-wise distribution of road accidents in India in 2013. It clearly shows that drivers' fault is the single most important factor responsible for accidents. Drivers' fault accounted for 78% of total accidents, 76.5% of total injuries and 73.7% of total fatalities in 2013. Within the category of drivers' fault, accidents caused due to exceeding lawful speed accounted for a high share of 55.6%. As a share of total accidents and deaths due to drivers' fault, intake of alcohol and drugs accounted for 5.3% and 6.4%, respectively. As a share of total road accidents and deaths, overloading / overcrowding of vehicles accounted for 19.6% and 22.8%, respectively.

The fault of cyclists and pedestrians appears to be marginal; they account only 1.2% and 2.2% of total accidents, respectively. The accidents caused due to defects in motor vehicle condition and road condition is also negligible in comparison to drivers' fault. They accounted only 1.8% and 0.8% of total road accidents, respectively.

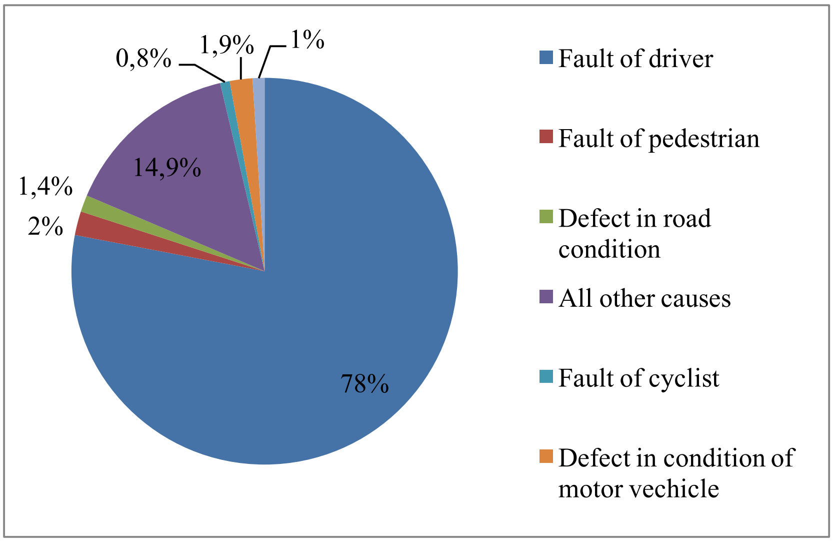

Figure 3. Causes of Road Accidents in 2013

3. Analysis of road accident scenario at state level

Figure 4 presents fatality risk, number of fatalities per 100,000 people, across Indian states and union territories for the year 2003 and 2013. There is a huge variation in fatality risk across states and union territories, ranging from 0 fatality per 100,000 people in Lakshadweep to 22.8 fatalities per 100,000 people in Tamil Nadu in 2013. During the same year, three states, Tamil Nadu (22.8), Haryana (17.2), and Andhra Pradesh (16.9), faced 50% higher fatality risk than all India average (11.2). In 2013, fatality risk in 16 out of 35 states and union territories was higher than the all India average. From 2003 to 2013, fatality risk in 11 states and union territories increased at higher rate than that in the whole country. During the same period, Jharkhand faced the highest increase in fatality risk (1.6 to 8.1) followed by Punjab (6.2 to 16.2), A & N Island (3.2 to 7.5), Bihar (2.5 to 5.0), Assam (4.1 to 7.8), Madhya Pradesh (7.1 to 12.0), Uttar Pradesh (4.6 to 7.5), Orissa (6.1 to 9.8), Tamil Nadu (14.6 to 22.8), Sikkim (7.1 to 10.8), and Chhattisgarh (9.4 to 13.9). However, there are nine states and union territories which experienced decrease in fatality risk from 2003 to 2013. Out of these nine states and union territories, Lakshadweep (1.7 to 0.0), Nagaland (3.1 to 1.5), Chandigarh (14.0 to 7.6), Delhi (12.9 to 9.3), and Punducherry (18.6 to 14.9) experienced sharp decline in their fatality risk.

Figure 5 presents fatality rate, number of fatalities per 10,000 vehicles, across Indian states and union territories for the year 2003 and 2013. There is a huge variation in fatality rate across states and union territories, ranging from 0 fatality per 10,000 vehicles in Lakshadweep to 16.0 fatalities per 10,000 vehicles in Bihar in 2013. During the same year, five states, Bihar (16.0), Sikkim (15.8), West Bengal (15.1), Himachal Pradesh (14.3), and Assam (13.5) faced 50% higher fatality rate than all India average (8.6). In 2013, fatality rate in 16 out of 35 states and union territories was higher than the all India average. From 2003 to 2013, fatality rate has decreased in most of the states and union territories; in fact, 24 out of 35 states and union territories experienced higher decline in their fatality rate than that in the whole country. Fatality rate in 8 states and union territories declined by more than 50%. However, two states, Jharkhand (4.1 to 8.4) and Punjab (4.7 to 7.3), and one union territory, A & N Island (4.3 to 5.2), faced increase in their fatality rate.

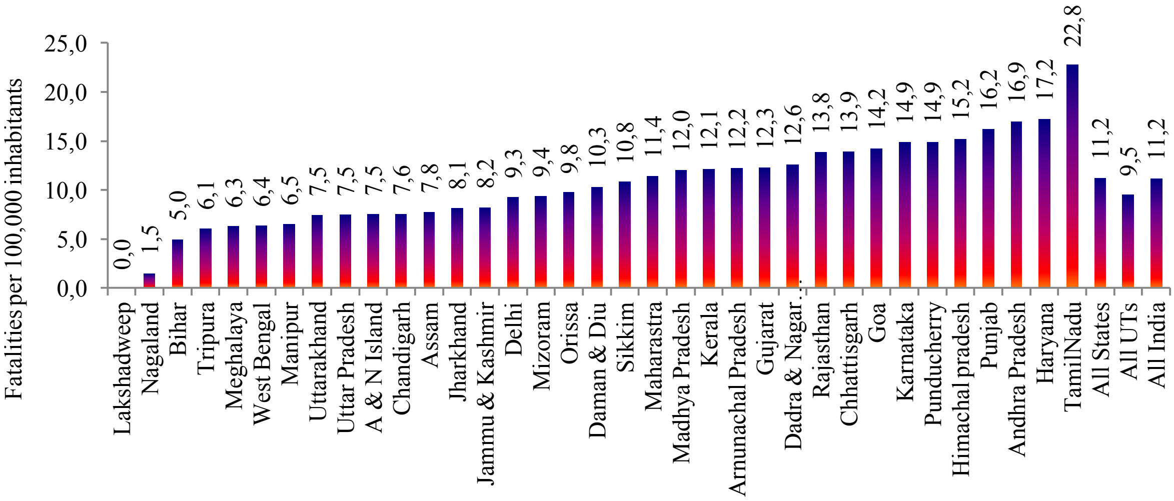

Figure 4a. Road Accident Fatality Risk in Indian States and Union Territories in 2013

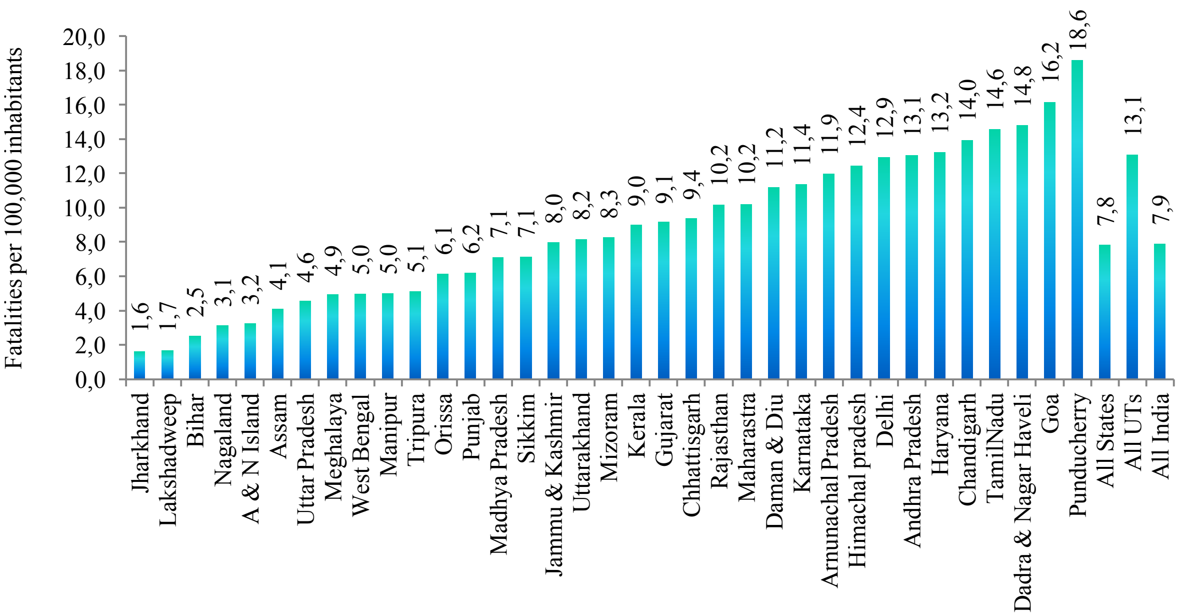

Figure 4b. Road Accident Fatality Risk in Indian States and Union Territories in 2003

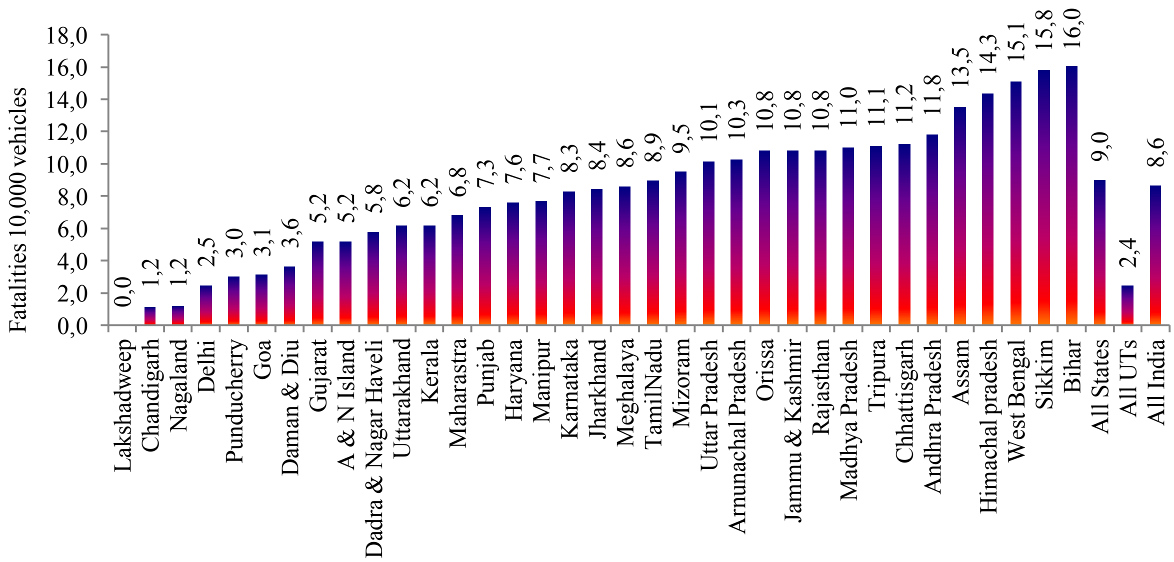

Figure 5a. Road Accident Fatality Rate in Indian States and Union Territories in 2013

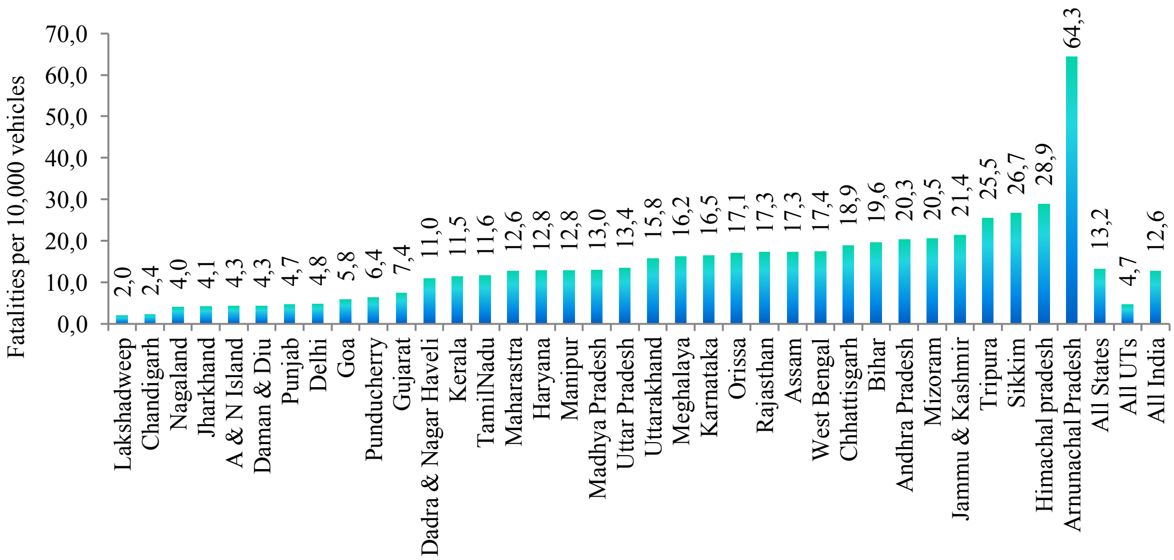

Figure 5b. Road Accident Fatality Rate in Indian States and Union Territories in 2003

4. Analysis of road accident scenario at city level

The burden of road traffic accidents in India is marginally lower in its metropolitan cities (million plus cities). On an average, fatality risk in metropolitan cities is 9.9 fatalities per 100,000 people, which is slightly lower than all India average of 11.2 fatalities per 100,000 people. However, there is a huge variation in fatality risk across cities of India, ranging from 3.0 fatalities per 100,000 people for Kolkata to 25.5 fatalities per 100,000 people for Jaipur in 2013 (see, Figure 6). During the same year, Jaipur (25.5), Kanpur (22.3), Vishakhapatnam (22.0), Varanasi (17.9), Lucknow (17.7), and Patna (17.4) faced more than 50% higher fatality risk than the metropolitan city average (9.9). From 2003 to 2013, fatality risk in 6 out of 21 selected metropolitan cities increased at higher rate than that in the country.

Ahmedabad faced the highest increase in fatality risk (0.6 to 4.2) followed by Varanasi (9.5 to 17.9), Patna (9.2 to 17.4), Chennai (8.8 to 14.3), Jaipur (15.9 to 25.5), and Vishakhapatnam (15.5 to 22.0). However, there are eight cities which experienced decrease in fatality risk from 2003 to 2013; out of these, Bangaluru experienced the highest decrease from 15.5 to 8.8 fatalities per 100,000 people whereas Kolkata experienced the lowest decrease (3.3 to 3.0). Due to fall in fatality risk in eight cities, fatality risk in metropolitan cities in India increased only by 5% in a span of a decade from 9.4 fatalities per 100,000 people in 2003 to 9.9 fatalities per 100,000 people in 2013.

Figure 7 presents fatality rate across Indian metropolitan cities for the year 2003 and 2013. In 2013, fatality rate varied from 1.5 fatalities per 10,000 vehicles for Hyderabad to 8.5 fatalities per 10,000 vehicles for Kolkata. However, fatality rate in none of the sample cities is higher than all India average (8.6 fatalities per 10,000 vehicles). From 2003 to 2013, fatality rate has declined in fifteen out of twenty one sample cities. Seven cities, Indore, Bangaluru, Hyderabad, Bhopal, Pune, Kanpur, and Mumbai, experienced more than 50% decrease in their fatality rate in a span of a decade. That's why, fatality rate in Indian metropolitan cities decreased by 42% from 5.1 fatalities per 10,000 vehicles in 2003 to 3.0 fatalities per 10,000 in 2013. The decline is in line with the expectation since as motorization increases fatality rate decreases (Singh, 2012).

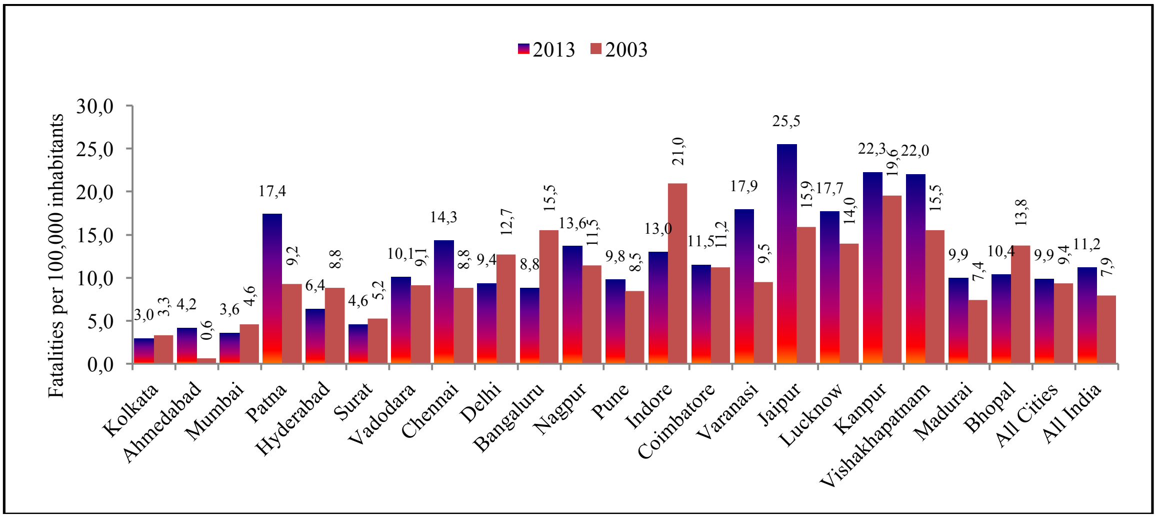

Figure 6. Road Accident Fatality Risk in Selected Indian Metropolitan Cities in 2003 and 2013

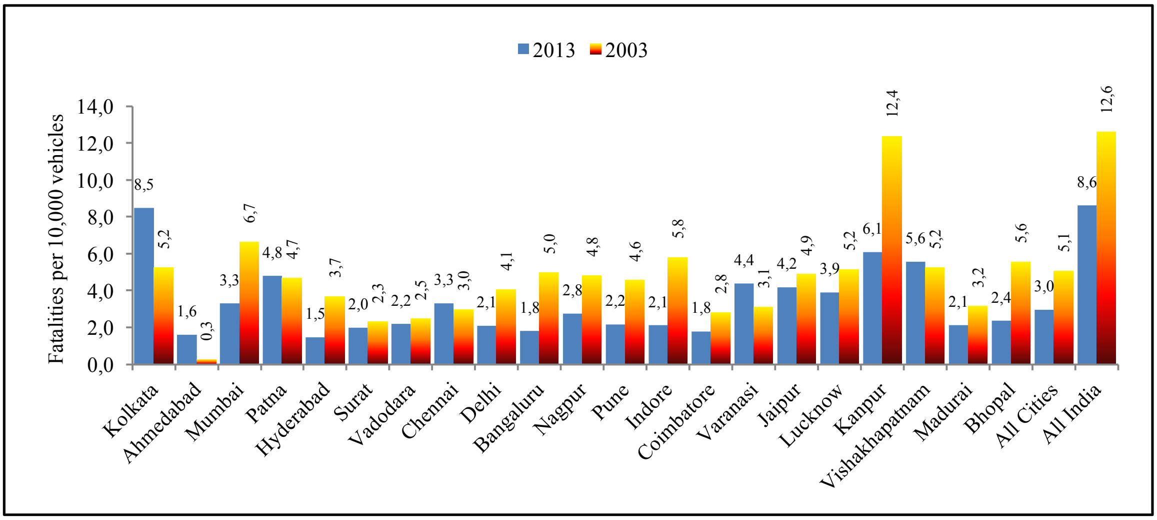

Figure 7. Road Accident Fatality Rate in Selected Indian Metropolitan Cities in 1999 and 2009

5. The way forward

Road traffic fatalities and injuries are, to a great extent, preventable, since the risk of incurring injury in an accident is largely predictable and many countermeasures, proven to be effective, exist. The most effective way to reduce fatalities and injuries would be through an integrated approach involving close collaboration of many sectors. Progress is being made in many parts of the world where multisectoral strategic plans are leading to incremental reductions in the number of road accidental fatalities and injuries (Evans, 2003). Such strategies focus on four key factors that contribute to the risk of occurrence of a road accident – exposure, behavioral factors, road environment, and vehicle factors.

Perhaps the least used of all road safety intervention strategies are those that aim to reduce exposure to risk. Risk in road traffic arises out of a need to travel – to have access to work or for education or leisure pursuits. Therefore, there is a need to promote not only regional economies in such a way that reduces the need for long-distance travel but also self sufficient compact townships which would reduce the need for short-distance travel within the cities.

The problem of road accidents in India also gets aggravated due to mixed nature of road traffic on its roads – with pedestrians, bicycles, mopeds, scooters, motorcycles, auto-rickshaws, taxis, vans, cars, trucks, and buses sharing the same road space. In other words, the same road network is used by different categories of motorized and non-motorized vehicles, of varying width and speed. To reduce the exposure to risk, there is a need not only to segregate fast moving from slow moving vehicles and heavy from light vehicles but also enforce speed limit on fast moving vehicles.

Road accidents and related injuries and fatalities are highly dependent on the speed of motor vehicles. Empirical evidences suggest that an average increase in speed of 1 Km/h is associated with a 3% higher risk of a crash involving an injury (Finch et al., 1994; Taylor et al., 2000). For car occupants in a crash with an impact of 80 Km/h, the likelihood of death is 20 times what it would have been at an impact speed of 32 Km/h (Margie et al., 2004). Pedestrians have a 90% chance of surviving car crashes at 30 Km/h or below, but less than a 50% chance of surviving impacts at 45 Km/h or above (Ashton and Mackay, 1983). While in many developed countries, there is increasing use of in-built mechanisms in trucks and buses to restrict speeds above a certain limit, such devices are rarely used in India, if installed, are disabled by the operators. Commercial bus and truck operations, particularly privately owned ones, are often based on timetables that put pressure on drivers to speed. In many places in India, private bus operators link the wages of drivers with the ticket receipts and number of trips, which encourages high speeds. Although various states and union territories and city authorities in India have imposed speed limits on motor vehicles, enforcement of the same is almost non-existent. The time has come to strictly enforce the implementation of speed limits both on highways and city roads. In mix traffic environment, restriction on vehicle speed would also help in reducing casualties to pedestrians, cyclists, and other vulnerable road users.

Behavior of road users, the way people drive, cycle, or walk on the road, are the most common source of road injuries and fatalities. Factors such as age and experience of driver, alcohol and drug use, fatigue, acute psychological stress, and enforcement of traffic laws are the key determinants of accident and fatality risk. In general, inexperienced drivers are relatively high risk road users, and in newly motorized societies the risk gets increased due to relatively high proportion of new drivers in the driving population. In countries like India where this growth is accompanied by inadequate driver training and testing facilities, the risk gets further increased.

As discussed before, road accidents and related fatalities are highly dependent on the speed of motor vehicles. Drivers' speed choice is influenced not only by the legal speed limit but also by age and experience of driver, alcohol and drug use, psychological condition, road layout, traffic density, road surface condition, and the level of enforcement of speed limits. There is still a lack of acceptance among drivers that their choice of speed may increase accident risk not only for themselves but also for other road users. To reduce accident risk, there is a need to focus on changing the drivers' perception of speed risk.

The level of enforcement of traffic law and the severity of penalties for infringement also influence the behavior of road users. Low levels of enforcement often negate the efforts made to improve road safety through legislation. Simply legislating is rarely effective without enforcement, education, and publicity campaigns to raise public awareness of the purpose of the legislation. When used in support of legislation and law enforcement, education, publicity, and information can create shared social norms for road safety. However, when used in isolation, education, information, and publicity do not generally deliver tangible and sustained reductions in accidental deaths and injuries (O'Neill et al., 2002; Zaza et al., 2001). Therefore, a systems approach to road injury prevention, that is, using the legislation and law enforcement with the support of education, information, and publicity campaigns, needs to be adopted by the government to influence the behavior of road users and consequently to reduce the rate of road accidents and related fatalities and injuries.

Most of the traffic accidents are caused by human errors. In 2013, drivers' fault accounted for 78% of total accidents, 76.5% of total injuries, and 73.7% of total fatalities in India. For this reason, road safety initiatives traditionally focus on 'fixing' the driver in order to prevent accidents. There is no doubt that the approaches involving road-safety education and enforcement such as wear your *seat belts*, always wear *helmet* while driving, say no to *drunken driving*, and general adherence to *traffic rules* are essential in curtailing traffic accidents, however, it is equally important to realize that people will always make mistakes. Therefore, there is a need to focus on mediating the outcome of accidents by designing safer vehicles and safer roads. It is indeed possible to protect the road user in the event of an accident by designing vehicles and roads to work together to ensure crash energies do not overwhelm the human. For vulnerable road users such as pedestrians, bicyclists, motorcyclists, and those using informal public transport, road design must ensure that they are not exposed to high speed traffic (Singh, 2009). Therefore, roads should be designed in such a way so that it is not only self-explaining but also forgiving.

6. Conclusion

The analysis shows that the distribution of road accidental deaths and injuries in India varies according to age, gender, month and time. It is found that the economically active age group is the most vulnerable population group. In general, males face higher fatality and accident risk than their female counterparts. Moreover, road accidents are relatively higher in May-June and December-January which shows that extreme weather influences the occurrence of road accidents. Accidents are relatively constant and high during 9 AM to 9 PM and variable but low during mid-night and early hours of the day. There are several factors responsible for accidents but drivers' fault is the most important factor; drivers' fault accounted for 78% of total accidents, 76.5% of total injuries and 73.7% of total fatalities in 2013.

The study also analysed road accident scenario across Indian states and cities. It is found that during the year 2013, three states, Tamil Nadu (22.8), Haryana (17.2), and Andhra Pradesh (16.9), faced 50% higher fatality risk than all India average (11.2). It is also found that the burden of road traffic accidents in India is marginally lower in its metropolitan cities. However, there is a huge variation in fatality risk across cities of India, ranging from 3.0 fatalities per 100,000 people for Kolkata to 25.5 fatalities per 100,000 people for Jaipur.

Despite the growing burden of road traffic fatalities and injuries, road safety has received insufficient attention at the central, state, and local government levels. The main reason for this is that the problem of road traffic accidents does not belong to any specific agency, either at central or state or local government levels. The responsibility of dealing with the various aspects of problems including road worthiness test for vehicles, the design of road networks and roads, urban planning, the introduction and enforcement of road safety legislations, and post-crash medical care is divided among many different agencies, sectors, and groups. There has usually been no leader to ensure that they coordinate their efforts and address the problem holistically. This situation needs to change so that responsibility is clearly assigned, specific roles are allocated to specific agencies, and duplication is avoided.

Many countries, particularly from developed world, have experienced sharp reduction in road traffic accidents and fatalities over the past couple of decades by adopting a systems approach to road safety that emphasizes environment, vehicle, and road user interventions, rather than only focusing on direct approaches aimed at changing the behavior of road users. Although solutions for road safety problems in India may differ from those countries that have very high rate of motorization, some basic principles would remain the same. These include, for example, good road design and traffic management, improved vehicle standards, speed control, the use of seat belts and helmets, and the enforcement of alcohol limits (Margie et al., 2004). Current efforts to address the problems of road safety are minimal in comparison to what should be done. While there are many interventions that can save lives, political will and commitment at central, state, and local government levels are essential and without them little can be achieved. Road users in India deserve better and safer road travel.

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