

Comparative Study of Road Accidents of Haryana

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ABSTRACT

Transportation is vital for overall development of country but in India it is very critical problem because every year with increase in population, traffic volume also increase on road. Unfortunately, inadequate attention to safety several people loss of live, wealth and health. Here, a survey is performed based on past road accidents. After collection of data from sources, various indices like Accident severity index (It is defined as the number of persons killed per 100 accidents (MORTH, 2012), Total number of accidents in each year, Total number of male, female and children involved in these road accidents, Peak hour time of accident (at an interval of two hours) and different proportion of pedestrians and vehicle victims type of vehicle involved in road accident, have been studied. The weighted accident severity index of these years is also calculated and is given to each accident on the basis of scale 1 to 5 on the basis of type of accident. Based on the study, main reasons for this large number of accidents are lack of traffic signals, parking areas, markings and geometric designs of road. To overcome these reasons, some suggestions are provided with conclusion to reduce the number of accidents and save the lives of human over the selected street.

Keywords: Accident Severity Index; Peak Hour time of Accident; Total Number of Accident per Year; Involvement of different types of vehicle; Weighted Accident Severity Index

1. INTRODUCTION

Road traffic accidents and their causalities on human being has been the major scourge in both developed and developing societies in the latter half of the twentieth century (Dhamaniya, 2015, Baguley, 2008). Traffic accidents are one of the major social problems adversely affecting the welfare and prosperity of developing countries. Urban Transport facilities in most of the Indian cities are inadequate and deteriorating over the years. The development of public transport system has not kept pace with the traffic demand both in terms of quality and quantity. As a result, the use of undesirable modes such as personalized transport, mainly two-wheelers and intermediate public transport, mainly three-wheelers, is growing at rapid speed. Roads and footpaths today are heavily encroached by parked vehicles, hawkers, and roadside business forcing pedestrians to walk on the road (Singh, 2014). As per data registered by the World Health organization, nearly 12 lakhs people are known to die each year in road accidents globally out of which more than 83,000 people are killed in India while roughly 5 times of this number (about 4 lakhs) are seriously injured in India (Desai, 2014). The total cost of losses due to road accidents are in the range of ₹ 400- 500 crores a day. The estimated cost includes compensation, asset loss, time and energy spent on police, hospital and court cases etc. (WHO, 2000). On the basis of number of road accident per lakh population, Haryana was ranked 14th among all state and union territories in 2012 (MORTH, 2015). A study has been taken up on a selected stretch of SH-6, the Saharanpur-Kurukshetra road, between Pipli to 3rd Gate of Kurukshetra University in Haryana to find out accident severity index, weighted accident severity index, accident prone areas, peak hour time of accident, total number of accident per year and involvement of different type of vehicles and pedestrians.

Developing countries are much more affected from traffic accidents than developed countries. As per current reports, most of the developing countries are facing the problem of lack of road safety. Accident fatalities rate in developing countries like India is high in comparison to the developed countries. Most of the roads in India are witnessing the phenomenon of escalating growth of vehicular traffic due to large scale socio-economic activities.

The growing road sector demand, the large and diverse road network across the country, both rural and urban, and the fast growth of vehicle ownership fueled by economic growth has implications for road safety outcomes. Although the statistics generate a sense of optimism in view of the fact that vehicle-kilometer of road travel is increasing with expansion of the network of higher category of roads, which allow travel at higher speed, these surely hide the glaring problem of road safety, and we cannot afford rest on our laurels. The number of road fatalities in 2015 still hovered around 14 lakh, making India's road safety record indeed dismal.

Accidents are still thought of by some persons as “acts of God” or the result of luck or chance. Accidents are not as uncontrollable as the weather, nor do they defy Systematic study. Study of accidents based on "macro" scale includes the tabulation of number and rates unrelated to true risk, which is meaningless to the general public, including drivers and passengers. In addition, micro analysis is still a manual, individualized activity, and has not been systematized or applied to any great degree to automated data-processing procedures. Thus, when accidents are seen as true incidents, which results from a combination of circumstances or a chain of related events, they lend themselves to engineering study and systematic analysis. Despite causing loss of human life and property, together with the associated trauma and suffering, road accidents are often not placed under the category of disasters. The magnitude of the problem is often not realized, and these are looked upon as stray incidences. This leads to lack of organized support for efforts to mitigate road accidents, and tolls keeps mounting with increase in road length and vehicular traffic.

Topic of Study and Its Importance

The dissertation entitled "A Comparative Study of Road Safety of Haryana Roads" deal, with analyzing the accident safety scenario on Haryana roads as compared to the Indian scenario and finding out the causes which are major contributor to the accidents in the state of Haryana Road safety is one of the main concerns and challenges that the government and the transportation engineers face today. Road accidents in India are increasing at an alarming rate for the last many years leading to loss of valuable lives, damage to property and many social and economic adverse effects. The main reasons for road accidents are found to be drivers' fault, bad roads, unfit vehicles and others. Among the measures that are useful in reducing the accidents are 3Es that is Engineering, Enforcement and Education. The 4th E that is, Emergency Care also plays a major role in reducing the fatalities due to road accidents.

National Highways and State Highways are the main roads of the country / a state having good contribution in the economic development of the country / state The total length of NHs is less than 2% whereas they carry more than 40% of total traffic on the roads indicating that NHs are highly congested. The length of SHs is about 4% in the total road network of the country and they are also highly congested. It is estimated that both NHs and SHs account for about 60% of total road accident fatalities in the country. Hence, the accident safety analysis of National Highways, State Highways as well the other roads of a State is very Important to know the status of its road safety record and planning suitable safety measures for the same.

LITERATURE REVIEW

Global status report on road safety (2014) compiled data from 178 countries The report shows that developed nations have been able to significantly reduce the number of accident deaths in the past decade. This has, been achieved by proactive measures from the government and strict enforcement of the laws. In any country, where the government is bystander to the problem no improvement has been possible.

The report shows that although basic laws for road safety exist in India, their enforcement is extremely week. Enforcement for wearing seat belts for passengers of cars scored 2 out of 10 In India, the number of road accidents fatalities has been growing at nearly 8% per year and shows no sign to fall. The result suggests that, in India, road safety laws need to be made more comprehensive while enforcement should be strengthened.

India occupies 86% rank in healthcare spending among the nations with the government spending just 7% of GDP on healthcare. Hence it is important that government has to take measures to increase the safety on Indian roads. Unfortunately, India has the worst record of road safety.

In India, nearly 120000 people die and around 1300000 sustain injuries every year in Road Traffic Accidents. Road accidents registered a sharp 6% rise in 2010 to 2014. However, road safety experts say the real numbers could be higher since many of those accidents are not reported. As per the statistics, there is one death on Indian road every sixth minute and this is supposed to increase to one death every three minute by 2020 if same conditions prevail. Even this may be an understatement, as according to Report on Traffic Accidents (2014), out of the estimated 1.4 million serious road accidents occurring annually in India, hardly 0.4 million are recorded. Many road traffic deaths in rural area arc not reported.

Road Accident Studies and Surveys Done In India

MORTH Report (2010-2015) has shown that, small states in India had doubtful record as far as the rate of accident-deaths per thousand vehicles was concerned. It was highest in Arunachal Pradesh at 5.7%, followed by 3.6% for Sikkim. Similarly, rate of accidents was highest in Nagaland at 92.1% followed by 89.7% for Mizoram against national average of 28.4%. As compared to all India level, the total road accidents in seven metropolitan cities namely Ahmedabad, Bangalore, Mumbai, Kolkata, Delhi, Hyderabad and Chennai were about 21.5%, in 1977 which marginally came down by 5% to 16.9% in 2001. The fatalities and injuries during this period exhibit a declining trend. This decline in most of the selected cities reflects not only the expansion of road network but also the extent of safety measures taken by city authorities.

India accounts for about 10% of road accidents fatalities worldwide. Although India accounts for only 1 % of the registered motor vehicles, it accounts for 9% of accident deaths. The Report on Traffic Accidents (2014) by Road Traffic Education Institute in India has shown that speeding, mixing driving with drinking, less use of helmets and seat belts while driving and child restraints is the main contributing factors of road accident fatalities. In 2013, road accidents were top 9th cause of death.

A report on Accidental Deaths and Suicides in India published by National Crime Records Bureau statistics show that 11 people die in our country every hour due to accidents and road accidents had the maximum (37%) share of unnatural causes or death in the country. The average cost of accidents is around 12.5 billion dollars. This does not include the economic burden of permanent disability of people who survive major accidents every year. 85% of the victims of these fatalities are men in age group of 20-50 years. Majority of those people are bread earners for their families.

Road traffic accident fatalities and serious injuries place huge strain on economic and social fabric of the family and the society at large. The family loses the source of income in addition to their loved ones. Searching for a new source of income is a challenging task and is filled with uncertainties. The larger ramification of this includes children dropping out of school for employment and elderly being forced to work. Physical disability also hugely impacts the society. For instance, spinal cord injury permanently disables the patient resulting in him/her being confined to wheel chair for rest of their life. The plight of the family is similar to, if not worse, than those of the fatally injured.

On the basis of all the statistics mentioned above and some awful influences of road accidents many researchers came forward and dedicated their work to area of road accidents and traffic survey and gave their inputs to safety analysis project by analyzing road accident statistics and recommending remedies for improvement.

Review of Various Research Papers

S K Singh and Ashish Mishra (2014) conducted a case study on 'Road Accident analysis of Patna City' made a conclusion that congestion and encroachment are the main reasons behind road accidents in the city.

R. K. Singh and S K Suman (2013) proposed a study on Accident Analysis and Prediction model on National Highway-77 aiming at finding monthly and annual variation in accident rate, effect of traffic volume on accident rate and to develop model using AADT and road condition. Using their equation, conclusion was made that number of accidents increase with AADT and decrease with improvement in road condition.

P. Pramada Valli (2014) developed road accident models for large metropolitan cities of India. The major conclusion from the study was made that to minimize the accidents, major policies must be transformed to reduce growth of personalized vehicles and encourage the people to use public transport.

METHODOLOGY OF STUDY

The study aims at studying the level of road safety on Haryana roads as compared to the road safety scenario in India. With this objective in view, accident data for past few years for various countries as well as for India and also for some selected states of India including Haryana are collected from different sources. After analysis of the data, condition of road safety of Haryana roads is established and specific causes of accidents are found out. The methodology adopted for the present study is diagrammatically represented in the figure 1.

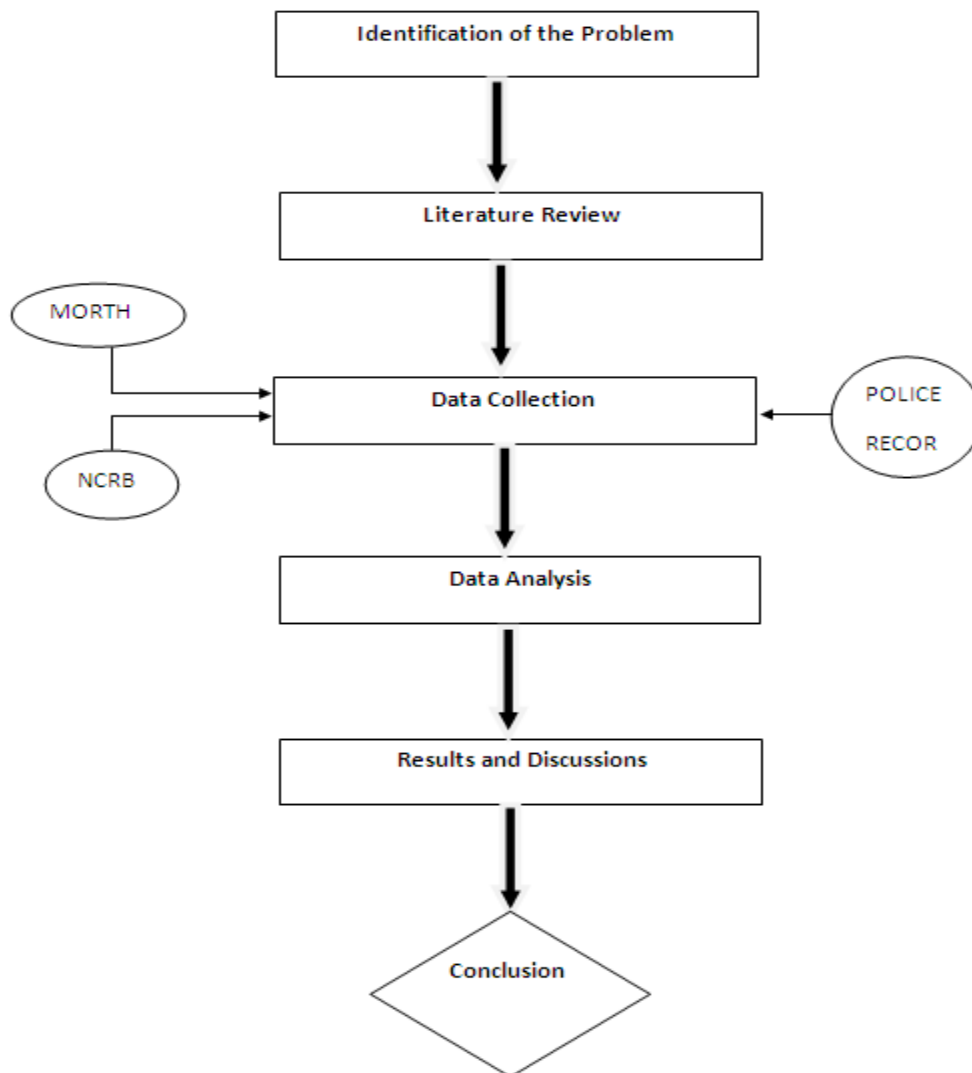


Fig. 1 Flowchart for Methodology of the Study

Identification of Problem

Due to heterogeneous traffic condition in Haryana ranging from pedestrians, animal drawn vehicles, rickshaws, hand carts to motorized vehicles such as motor cycles, three wheelers, motor cars, motor cars, buses, trucks the percentage of accidents is increasing at alarming rate year by year. The haphazard pattern of roads, absence of proper traffic controlling devices and lack of driving discipline in people is the main reason of increasing trend of accidents in the state.

The study has been taken up in view of increasing road accidents and very high number of road accident fatalities in the country as well as in the state of Haryana. The objective of the study is to know the status of road safety in Haryana and bring out any specific causes of road accidents in the state.

Data Collection and Tabulation

The accident data for different countries all over the world and same data is collected for India and they are tabulated in order to compare the status of road safety in India as compared to global scenario. On the similar terms, accident data was collected for various state in India including Haryana. The road accident data includes the information like number of accidents for individual year, number of fatalities, population of the area, total road length in the area number of person injured, and number of registered vehicles etc. The international accident data is obtained from various sites and from

Ministry of Road Transport and Highways. The data for the states in India is obtained from records from National Crime Records Bureau and from police records.

Data Analysis and Discussion

After the data compilation is completed the further analysis of the data according to the different characteristic of the accidents is done. The data gathered is then sorted out and put into respective tables for comparison. Various graphs are plotted to see the variation in accident rates over the years and to observe the trend. Modeling of results by multiple linear regression analysis is carried out for prediction of accidents and fatalities both for Haryana and India.

RESULTS AND DISCUSSION

The analysis of road accident data for the safety analysis can be done based on various features. The analysis and discussion is done in following table and graphs.

International Comparison of Accidental Data

The comparison is made between the countries with highest number for the categories i.e. number of person killed per 1 lakh population and number of person injured per 1 lakh population.

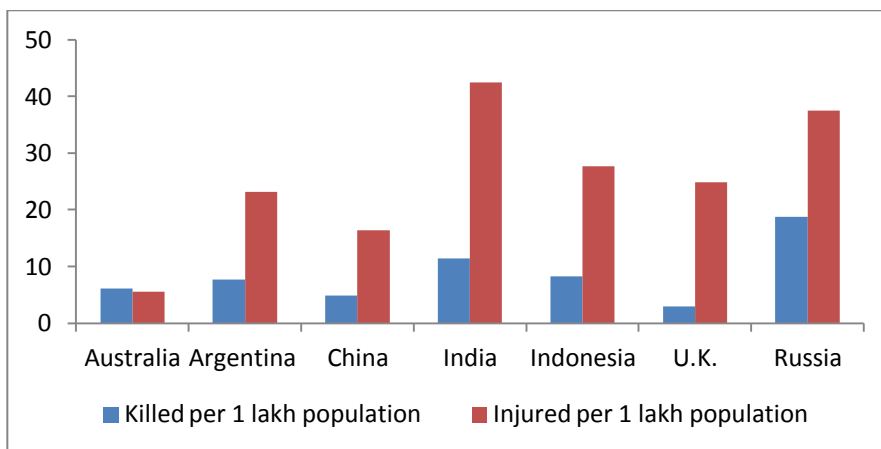


Fig 2. Comparison of Accident data for different countries

From above bar chart, it can be seen that India ranks second highest for Accident fatality rate (number of person killed per lakh population) and grabs first position for number of injuries per lakh of population.

Comparing Accident Data for India and China

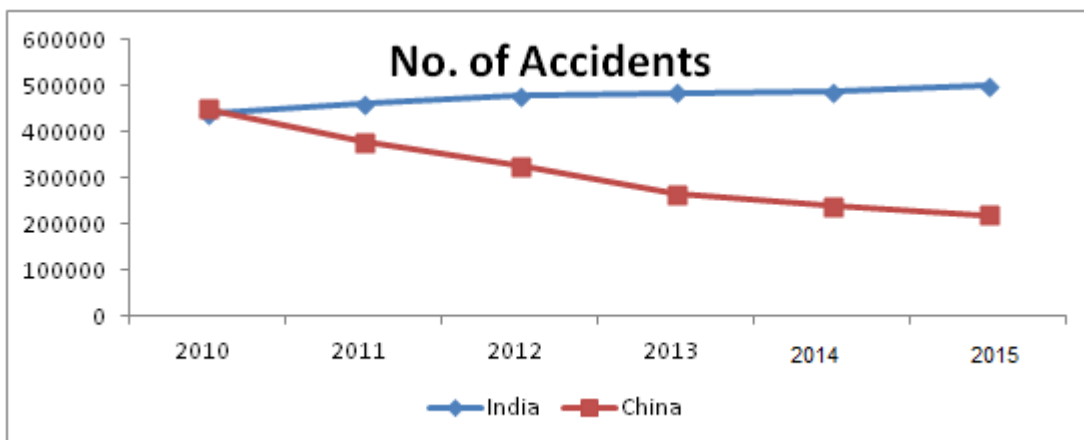


Fig 3: Comparison between India and China (2010-2015) (No. of accident)

It can be seen from above graph that over the years, China has managed to control and reduce the number of accidents significantly whereas in India it continues to increase every year and shows no signs of reduction. This indicates lack of commitment of the Indian government towards the serious issue of road accidents.

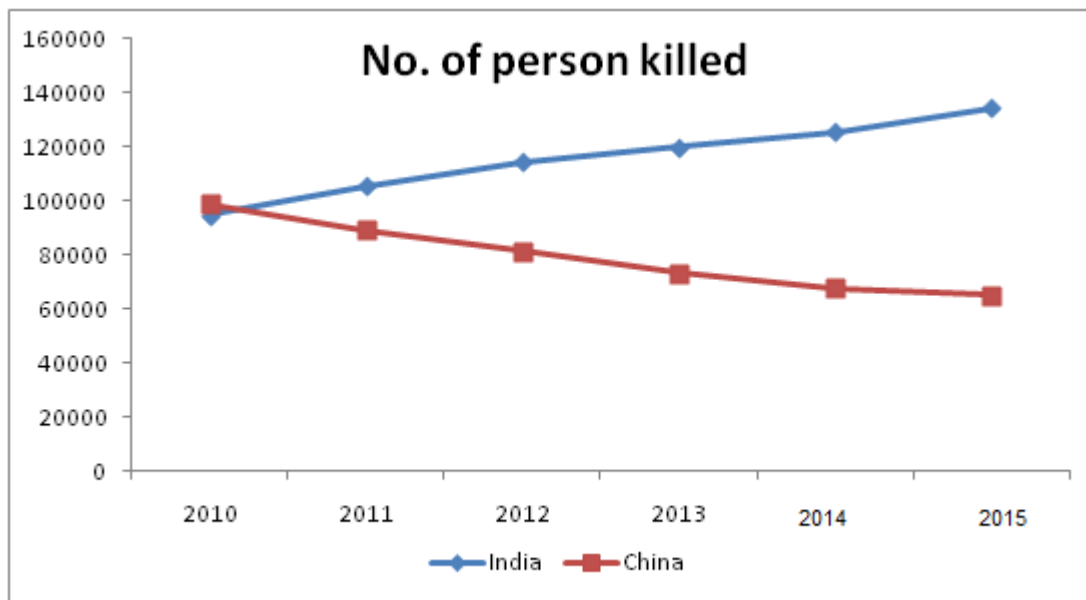


Fig 4: Comparison between India and China (2010-2015) (No. of person killed)

From above plot, it can be clearly seen that number of person killed in India is increasing every year whereas it is decreasing for China. The positive slope of India graph is indicative of harsh and unsafe condition of transport on Indian roads.

CONCLUSIONS

Road accident scenario in the country is a matter of great concern. The study 'A Comparative Study of Road Safety of Haryana Roads' presented in the dissertation has been conducted to carry out accident safety analysis for the roads in Haryana versus some other states and the country as a whole. Accident data for past few years is collected mainly from Ministry of Road Transport and Highways, National Crime Records Bureau and from Haryana Police Records. The data was analyzed to determine the level of safety on Haryana roads. The following main conclusions are drawn from the study:

- India ranks second highest in the world for Accident Fatality Rate (number of person killed per lakh population, India 11.43, Russia 18.72, UK 2.97) and grabs first position for Accident Injury Rate (number of injuries per lakh of population, India 42.46, Russia 37.52, UK 2481). Number of road accidents in India in 2015 was more than two times the number of road accidents in China. Number of persons killed in China in road accidents in 2015 was less than half the total number of persons killed in India in the same year.
- Haryana has 3.75% of India's motorized registered vehicles and it contributes 3.2% of the total road accident fatalities and 2.05% of total road accidents in the country.
- The Accident Severity Index (number of persons killed per 100 accidents) for Haryana is much higher than ASI of India. In a given year, ASI of Haryana is found to be more than 50% higher than ASI of India. It increased from 41.1 in 2010 to 43.1 in 2015 for Haryana whereas for India it increased from 24.73 in 2010 to 28.1 in 2015.

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