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Review Study on Road Accidents - Causes and Remedial Measure

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Abstract: The main problem in the study of traffic accident is to determine how the accident took place and how to prove such a course of the accident road safety is a multi- sectoral and multi-dimensional subject. It includes orderly development and management of roads, provision of safer vehicles, and a comprehensive response to accidents. Road accident is a major problem for our future generation. In India with the expansion in road network, motorization and urbanization in the country the number of accident have surged. In different cities such as Delhi, Ahmadabad, Hyderabad, Chennai, Bangalore, and Kolkata for predicting road accidents using population and vehicular population. In this study an attempt has been made to develop Road Accidents Models for Sampla city (IN HARYANA) for a selected draw out of NH10.this is main highway but there are many issue what I see on the road. And I want to do work on this area.in this area there are a huge problem to cross the road when there are no red light system.on the highway there are no sign board .i want to work that there is a systematic arrangement for crossing the road. Such as underpass,or bridge . The main point to study the road accident to protect our generation.

Keywords: Literature review, Road Accidents, Past Trends, Current and Future Scenario

I. INTRODUCTION

The effects of injuries and fatalities due to road traffic accidents (RTAs) have a tremendous impact on socio-economic development of a country. RTAs causing an estimated 1.2 million deaths and 50 million injuries per year (World Health Organization, 2004) are one of the most threatening issues to a government. The major states that contribute to the development of country in various aspects, encounters serious threat of RTAs. The major aim of this work is to collect the empirical details and various important statistics related to the road accident severity and the measures to reduce RTAs. Safety can be improved by successfully correlating frequency of accident occurrence and severity of the causative variables. RTAs can be reduced through proper education and promotional involvement that encourage the use of safety equipments. Not much is known about the effects of safety education programmes and driver education programmes. This work gives a wide analysis of causes and frequency of accidents occurring in leading cities of the world.

II. LITERATURE REVIEW

Many researchers have attempted to find the variables most highly associated with crashes.

- 1) Studied the guess of the number of crashes versus the crash rate using Poisson failure. This type of failure was used to model both the crash and crash rate. Small data sets for several intersections were used for this study. Several ways of modeling highway safety were investigated, including different representations of traffic introduction and intersection effects as independent variables.
- 2) Suggested that the Poisson distribution allows for the relationship between exposure and crashes to be more accurately modeled as different to the linear relationship unsaid in crash rate prediction. However, this study was only focused on intersections thus being site particular.
- 3) Developed motor vehicle crash rates by crash any crashes. type and roadway class in eight states: California, Illinois, Maine, Michigan, Minnesota, North Carolina, Utah and Washington. The accident data were extracted from the Highway Safety Information System (HSIS). The most important variables for calculating the crash rates were the urban or rural code, the functional roadway class, number of lanes and divided versus undivided roads. The results of this study showed that the most common accident type in most states was the rear end/same direction sideswipe, with angle and turning accidents as second. In terms of crash rates produced, these were lower on freeways than any other roadway class. The study showed significant variation in the crash rates, even within common roadway classes. This was justified by the differences in reporting procedures, the nature of the highway system, driving populations and other factors that varied from state –to state. Severity, light and surface conditions and collision types were also considered, yielding very similar results for all eight states. Zegeer et al. concluded that the results from their study were considered reasonable with the crash rates to be used as a baseline in order to better understand crash trends. Knowing this kind of information can be used to improve safety for passengers and drivers by and upgrading existing highways and changing the design of new highways. In another study,

- 4) Developed accident rates using the Highway Safety Information System database in order to use them for the development of the so-called Interactive Highway Safety Design Model (IHSDM). An accident prediction model was developed to produce average accident rates for different highway accident types. The objective of the study was to determine if the HSIS data could be used to develop the accident prediction model. Two states referred to as state A and B from the HSIS, were selected for the analysis. Three years of accident data were used and only accidents that occurred on interstates, state routes and U.S. routes were considered. The results of the study showed that data from a database such as the HSIS could be used to develop the accident prediction model for different roadway types. Mohamed shah and Kohls suggested that the development of average accident rates require judicious manipulation of the data and sound engineering judgement
- 5) Developed accident rates and examined their relationship with volume-to-capacity ratios. Data from Interstate I-94 in Detroit, Michigan were used to examine this relationship. Particular emphasis was given on the development of models to explain the differences between accident rates during weekends and weekdays, rear end accidents and fixed-object collisions and property damage only accidents versus accidents involving injury and fatality.
- 6) Concluded that the accident rates were highest in the very low hourly volume-to-capacity (v/c) range and decreased rapidly when the v/c ratio increased. Then the rates gradually increased as the v/c ratio continued to increase. This very important as in the following chapters it will be shown that this is consistent with the results obtained in this thesis. The final outcome of this study was that the correlation between accident rates and the volume-to-capacity values followed a general U-shaped pattern. Regarding the property damage only accident rates, these had a general U-shaped relationship with v/c values. On the contrary the rates that involved injury and fatality.
- 7) In this study the impact of traffic law enforcement on fatalities in Botswana was assessed using multiple regression analysis using secondary data and interview data obtained from law enforcers. The study concluded that licensed drivers in the age group 30 to 45 years have the lowest rate of fatalities.
- 8) Road Traffic Accident Situation in Khulna city, Bangladesh was reported by [8] Two year data pertaining to road accidents were gathered from different police stations located in the city. During the report period, 157 road accidents occurred and 25% of the victims were in the age group of 30 to 39 years, 33% of pedestrians lost their life and 34% of them got injured.
- 9) Forecasted that by the year 2020, road accidents would move up to third place in the table of major causes of death and disability.
- 10) Had performed a monthly analysis of road traffic accident with data from secondary source in selected local Government Grease of Laos state, Nigeria. This study suggested preventive & corrective safety measures towards reducing road traffic accidents. In Nigeria, over the past thirty years disturbing road traffic accident situation has been witnessed. The chance of a person getting killed in Nigeria when compared with that in Britain is 47 times higher. Road Accident and safety study in Bangladesh has been analyzed by
- 11) The north-eastern division of Bangladesh named Sylhet, witnesses with rapid 28180 Muthusamy A P growth of road vehicle and development in economic tourism, at the same time; it experiences severe road traffic accidents. A better understanding and consciousness of the accident causes can prevent and minimize the severity of road accidents.
- 12) Studied the contribution of fatigue for occurrence of accident without a reliable fatigue detector and concluded that 3% of single vehicle accidents reported to the police were fatigue related. A driver causing an accident after being awake for more than 24 consecutive hours can be convicted, sentenced to up to 10 years and fined.
- 13) Investigated the relationship existing between traffic safety and vehicle choice. This was done through quantification of the effects of the arms race on vehicle demand, producer performance, and traffic safety. The accident externality of a light truck amounts to \$2444 during vehicle lifetime and that 12% of new light trucks sold in 2006 and 204 traffic fatalities could have been attributed to the arms race, the design mismatch between light trucks and passenger cars being the reason. Brake failure and its effect on road traffic accident in Kumasi Metropolis, Ghana had been discussed by Seth
- 14) The research design used for this study was survey which relied on questionnaire to generate data for analysis and discussion. 40% of the vehicle users agreed that brake failure is cause by low or shortage of brake fluid and 33% of the respondents said it was due to brake overheating. The major contributing factor of the road accidents is the motor vehicle that plying on the roads, gross indiscipline on our roads, over loading and fatigue driving.

A. Traffic Accidents in India

There are urban and local areas many accident increase to see the education or not follow up the rules .the local public not follow the rules and this is the big reason for accident. The development of public transport system has not kept action with traffic demand both in terms of excellence and amount Today here is big problem for creation .

Today road traffic accidents are major problem .these are causes of death and many people are hospitlazed .in india the awareness is more than other countries.

Table 1.1 Road Accident data of India (2017-2020)

Year	Number of Accidents	Deaths	Population in Lakh	Rate of Accident per Lakh Population	Accident strictness
2018	486492	147913	12080	40.21	22.9
2019	325643	150012	12250	40.87	27.9
2020	496521	103210	12420	32.20	28.8

Taking road accident as a serious issue, in past, India signed the Brasilia declaration and committed to reducing road accidents and fatalities by half. So far, the fall in road accidents has not been substantial. In 2017, road accidents in India decreased by merely 3.27% with 4,64,910 road crashes as against 4,80,652 in 2016. losses resulting from these accidents saw a even smaller drop -- just 1.9%. As many as 147,913 persons died in road crashes in 2017 against 1,50,785 in 2016. This not so hopeful data is further marred by road dead figures of the first quarter of 2018 which show a 1.68% rise over the corresponding previous quartering 2019 it was increase 1.8%.but due to covid-19 accident percentage fall in 2020.

B. Traffic Accidents in Haryana

The accident take place in Haryana more than other state .due to negligence of people accident percentage is more .they do not follow up the rule and regulation .the traffic police is very upset to see their negligence .the local public cross the road after red light this is the main the reason of accident. Haryana traffic police want to aware the public about the rules so the department start the rule fair. so that public will be aware.. The two wheeler vehicle are create more accident they do not follow the rule. study also indicated that the maximum number of accidents takes die .due to fog the speed limit not reduced by the vehicle. which is the main reason the winter season is heavy for accident. the number of road accidents in Haryana went down by 13.82 per cent in 2020 as compared to the number of such .

The road accident take place on the crossing for example:sampla –beri mod,polytechnic college sampla,,there are no crossing way and the students are face the problem.

With 9,431 road accidents in 2020, the average number of accidents reported daily came down to 26 as compared to about 30 cases of mishaps were reported everyday in 2019. The number of people who died also dropped by 10.87 per cent while injuries to persons also saw a dip of 18.19 per cent. However the lockdown enforced to contain the spread of Covid-19 also contributed to a significant dip in accidents. Sharing the official data, he said that the number of road mishaps in 2020 came down to 9,431 from 10,944 in 2019, showing a fall of 1,513 cases. In terms of fatalities in road accidents, 4,507 people died last year compared to 5,057 in the same period in 2019, a drop of 550 cases.

The DGP said incidents of injuries to people also saw a decline of 1,703 cases. In total, 7,659 cases of injuries priority to saving to persons were reported in 2020 as compared to 9,362 in 2019. Giving highest the lives of people, he said that police have provided 84 ambulances, 40 big cranes and 22 small/medium cranes in all districts for immediate first aid to the accident victims and removal of such vehicles. In addition, 45 Traffic Assistance Booths have also been set up every 10- km along National Highways to provide help to the accident victims.

Table 1.2 Road Accident data of Haryana (2017-2020)

Year	Number of Accidents	Vehicles Involved	Persons killed	Persons injured
2018	11320	9362	4617	10,342
2019	10944	8976	4507	9362
2020	9431	6543	550	7659

C. Traffic Accidents on Sampla to Rohtak road

In our Haryana rohtak is famous district.and the population of Rohtak district is 1058683 as per 2020.the approach road of this city is very tense. The nh10 highway crossing to sampla to delhi, sampla to rohtak is not safe. On this highway every year accident average is raise. On any crossing no sign board, no under passing. which are the reason of accident took place. Every year the percentage is raise.

Table 1.3 presents the accident data of Rohtak city from 2017-2020. City has noticed 25% increase in the number of motor vehicle registered and 19% increase in the population from 2017 to 2020.

Table 1.3 Road Accident Data of sampla City

Year	Population	Vehicles	Fatalities	Injuries	Total Accidents
2018	103242	1023	15	46	45
2019	112365	1125	23	55	32
2020	104325	6547	29	57	23

Most of the roads accident in sampla city have gone heavily parked vehicles, street hawkers and roadside businesses. Public transport system of city is not that much effective, which has given tremendous increase in intermediate public transport (IPT) modes and personalized vehicles. The width of road and in the other words single lane roads are the reason for accidents.because the overcrossing on the single lane road a big fault for road accident. Most of the roads are narrow and their geometrics and surface condition are not good. sign board and safety rules are not available.on the sampla road there are no geometry figure are follow up on any side.

III. REASONS BEHIND ACCIDENTS

Various reasons of accidents are listed as follows:

- 1) *Drivers:* the main reason for accident is driver careless .driver use the mobile ,communication with other when he drive .extra speed.
- 2) *Pedestrians:* Violating regulations, carelessness in using the carriageway meant for vehicular traffic.
- 3) *Passengers:* Alighting from or getting in to moving vehicles.
- 4) *Vehicle Defects:* any defect of vehicle is the reason for accident
- 5) *Road Condition:* the condition of road is very poor. The material is used by engineer is very poor. which is the reason for accident.
- 6) *Road Design:* designing of road and geometrical shape is not proper..
- 7) *Weather:* weather conditions like fog, snow, dust, smoke or heavy rainfall, which restricts the visibility on the road.

IV. CONCLUSION

The results of various field works done on the road traffic accident in various countries have been reported in this paper. This literature study helps the researchers to have a nut shell view about the effect of RTAs and the safety measures to be followed to avoid RTAs. The empirical details and various important statistics related to the road accident severity and the measures to reduce RTAs discussed in various studies were presented. Multifaceted review of various literatures has shown that accidents occurrences are the effect of multiple human, vehicle and environmental elements often interacting in a complicated manner to generate the initiation of the event. The causes of road traffic accidents are not just human error or driver negligence. There is need to view road traffic accident as an issue that needs urgent attention aimed at reducing the health, social and economic impacts.

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