A Comprehensive Review on Road Traffic Fatal Accidents in India

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Abstract— Road traffic (RT) security is a major issue for government transport authorities& citizens. Road accidents (RAs) are unclear & accidents are unpredictable & their survey needs issues that affect them. RAs source problems are greater at an alarming rate. Adjusting traffic accidents on roads is a critical challenge. Towards provide benign driving recommendations, clear & suspicious consider of RT information is dangerous. The main of this paper is to consider RAs in India at the national, urban & state city levels. Exploration of RA situation at city & state level displays that there is a vast difference in fatalness threat across states & cities. The probability of fatality is greater than the average in India for ten people outside union territory and 35 Member States. While in these metropolitan cities RAs are slightly lower in India, almost 50 percent of the cities are facing greater fatality risks than their fossil counterparts. There is so an urgent want to identify a failing situation in injuries & road deaths& towards proceeds suitable action.

Keywords—Road Traffic, Safe Driving, Data Mining Techniques, Literature Review

I. INTRODUCTION

In the new life, accidents happen on a daily basis. Every day we hear accident's news, either through the Internet or television. Several people die on spot at the time of the accident, others can be seriously injured. Seeing an accident, one may understand its terror. There are several causes of RAs, some of which increase no. of vehicles, careless driving & violate traffic instructions. RAs cause many types of damage, which can occur in human form, due to infrastructure and governmental &additional administrative damage.

It is even more painful if traffic accidents (TAs) are really a minor accident or a big accident. TAs have an impact on the community. Those injured in TA want to cope with ache & distress, pay reduction, curative expenses, vehicle repair costs increases & coverage premium rate. There are many people around us who are going by this pain & leading a pathetic life. There is not much we can do as an audience, & sometimes we will get into it. RA injuries can be a major problem for humanity in terms of targets, puts & physical damage [1]. So we want to attempt to gain insight into issues that affect the accident severity. In maximum studies, Studies attempted to understand the severity of RA injuries, then the relationship among risk factors & severity of accident injuries has not yet been fully elucidated.

When it comes to traffic safety, factors related by heavy-duty trucks can be addressed by highway engineers, policy architects, & community due to its size, driving & vehicle load. Outside trucks have special driving characteristics like long vehicle length, short stopping distance &heavyweight, which can affect the severity of accidents.

In overview, accident records & previous studies have shown that lorry accidents can reason serious car injuries & fatal accidents [2]. Trucks are large into the size and sometimes roads are not built giving towards them. A collision comprising truck is always more deadly & more probable than some other vehicle. In terms of high severity, RAs including trucks come first. But, relative effects of maximum risk issues, for example, road conditions that can result in serious injury or death, have not been accurately estimated.

Developing effective countermeasures affecting or affecting the likelihood of a road accident requires a deeper understanding and understanding of problem involved, & physical issues that reduce or exacerbate effects of frequent injuries on the road, primarily includes those who use the road to travel. Security researchers have used many techniques &processes to date [3]. These methodological solutions have provided new insights, & basic features & components of data contain crash details, often attributed to methodological disruptions, which are largely unknown & without notice. The purpose of this study is to highlight shortcomings in RA severity records and methodology methods with emphasis on strong & weak features of various methods via additional improvement in this area.

II. LITERATURE REVIEWS

The cost of traffic injuries and deaths has extensive social effects. In modern years, Studies have placed a big emphasis on defining issues that considerably affect the severity of driver injuries in TAs.

Tibebe et al. [4] number of Ethiopian civilian casualties focuses on the contribution of some issues associated with

the road. Modeling combines road-related issues by driver data to better expectations & identifies interactions among several attributes.

Jianfeng et al. [5] AHP is introduced to examine the status of risks such as road, driver, vehicle condition, &environmental issues. The main features of the accident are overload or not, driving experience, weather & road conditions.

Evgenikos, et al. [6] attentive on revelation information connected towards mobility of these vehicles (passenger-km travel vehicle fleet and veh-km), Fatigue driving is one of the major issues in long-distance lorry driving associated accidents Also, The macroscopic analysis contained in this paper influences the road safety of HGVs and buses/coaches and highlights the causes of their fatalities.

Goel [7] Note speed/driver faults (87 to 88%). Trucks / canters / buses are maximum risk (42%), occurred through car & jeep (35%), 2-wheeler (13%), others (10%). Buses are caused by 6% of accidents. Enforcement procedures must be taken into account as maximum accidents ensue on a road truck/canter/ bus. Further accidents (61%) occur during the day than at night (39%). It can be due to the reduced number of cars & 2-wheelers vehicles at night.

Batrakova et al. [8] Synthesis of traffic environment and driver interaction theory by road safety do not take solitary technical abilities of the car into account, then also psychological & physical characteristics of driver's pregnancy in the road environment. Maximum driver reliability and maintaining set speed is an effective tool in the design phase to improve traffic safety.

Helen, et al. [9] Focusing on NB (Naive Bayes) algorithm is a great way to classify short & concise snippets of text, also is an easy, practical and simply applicable method. This study suggests that filtering using a 2 NB model towards select manual review has fruitfully produced a biased evaluation of the frequency of injury causation/ events that have shown this easy method to be effective, Then other exhibitions can improve overall performance.

Taylor, et al. [10] A significant point has been shown that additional steps can be occupied to optimize the model of the prediction model, for example increasing sample size, & general noise towards increase performance of the NBs method Excluding conditions model.

Wong et al. [11] Comparisons of methodological methods were used to identify factors causing risk severity. By adopting Taiwan single-auto-accident data set, results indicate the grouping of adverse issues before a single factor. In addition, threats associated with low or high support laws show unique characteristics.

Chong, et al. [12] Important Factors Affecting Severity of Injury Most studies related to the mining of data routinely differ based on socio-economic circumstances& infrastructure of specified locations.

Ali et al. [13] Crash data from Iranian traffic police information & technology records from 2006 to 2008 find the most significant issues that affect the severity of the injury. Results suggest that seat belt is the most significant issue related to the traffic risk accidents.

Brijesh et al. [14] From January 2004 to May 2008, a car accident data was extracted from Beijing's road traffic accident data. Results suggest that single-vehicle accidents cause vehicle type, light conditions, driving experience, and severity of accidents when wearing seat belts.

Ting, et al. [15] Focusing on decisions, the knowledge base is the best classifier beside many general classifiers, for example, decision tree (DT), support of vector machines (SVMs), neural networks (NNs) in terms of accuracy & computational proficiency. Also increase the time utilized to train & normalize model, as shown in the test section.

III.   FEATURES OF INJURY SEVERITY RECORDS

Critical injury or death, non-fatal injury, minor injury & property damage are usually denoted through injury severity record. In addition, previous studies have condemned characteristics, data properties, and procedural issues that are disapprovingly studied to improvement & appropriate statistical procedures to study the specific nature of these data sets. [16] This paper deals with the synopsis of the features.

Certain procedural concerns that are generally encountered are:

A.   A sampling of crash data prepared for under-reported crashes

Statistical models have been developed supposing that sample records are designated on the random source to population, & individuals with equal probability are involved in these accidents [18]. Instead, in prior studies, crash records typically take those accidents into account, resulting in the destruction of property or property exceeding a certain amount, requiring a degree of damage to the vehicle. Beyond a certain standard.

Like concerns these injuries are apprehensive, in addition to sampling random data from the population, accident incidence database may be accurately definite as a percentage of injury severity in a police-reported sample of outcome- Is called based sampling. The rate of the severity of the injury is different from all further injuries in an accident [20]. A fact known here is that sampling results based on such results in partial parameters may produce nominal effects.

B.   Ordinal nature

An example shows specific nature of severity of injury measurement, where severity increases & can be fatal

without further injury, & minor injury, then apparent injury, may continue to destabilize injury until eventually death. Knowing the gradual nature of severity information is studied very useful while selecting an important technique [17].

C. Issues with static parameters

Most former studies have related models of injury severity based on models with unchanged issues, & usually control for the effect that descriptive variables have on personal injury observations. Accidental populations still have a level of invisible diversity that includes individuals like a difference of these issues [15].

D. Omitted variable results in bias solution

One of the main problems is the absence of significant variables whereby the severity of certain perceptions of injury lead to security determinations is expressed in the most frequent reports of research related to the crash boundary because of the amount of data available to us from crash records.

E. Limited sample size

Sample size supports in determining suitable method for modeling, & due to lack of available crash data, smaller samples contribute towards more basic & simpler models, which is why sample size is a key factor in determining optimal modeling framework important feature. Hence larger sample size provides us a better view & determines better output to progress.

F. Endogeneity

While expressive variables are hypothetically skewed with the impact of the severity of an accident, this inference may cause issues. Why our prospects are directly hampered The definition of an airbag in the model can be clarified [18]. Its accessibility still fails in maximum crashes on low-profile cars. It chaos between drivers, it should be addressed by the vehicle maker. If the airbag is exaggerated with the estimated variable that captures certain additional factors, not just proficiency of airbag.

Over the years, Fatal incidents on the Indian roads have risen alarmingly. RAs increased 9-times by 14,500 in 1970 to 137,400 in 2013. Number of deaths & injuries in 2013 was 53,000 & 87,000 respectively, associated to 2003 (see Table 1). By 2003 to 2013, the death rate increased by 5% per year, when the country's population improved by only 1.4%. Consequently, the number of road deaths per 100,000 people improved by 7.9 in 2003 to 11.2 in 2013. Notwithstanding the low rates of motorization, India still has a higher mortality rate than developed countries.

Table 1. Road Accident Statistics of India 1970-013

Year	Number of accidents by road (in thousand)	Number of road accidental injuries (in thousand)	Number of road accidental deaths (in thousand)	Accident risk (number of accidents per 100,000 people)	Accident severity index (number of fatalities per 100 accidents)	Fatality risk (number of fatalities per 100,000 people)	Fatality rate (number 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	24.5	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	26.1	8.0	16.6
2013	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

The death rate in India is four times higher than in the United Kingdom & Sweden, double that of Germany & Japan. The death rate per 10,000 vehicles & road accident deaths decreased by 87.5 to 8.6 in 2013 in 1970 but is still higher than in developed countries. Death rates are less than one in several developed countries per 10,000 vehicles (Table 2).

Table 2. Comparison of international fatality rate

Country	Motorization rate (number of vehicles per 1,000 people)	Fatality rate (number of fatalities per 10,000 vehicles)	Fatality risk (number of fatalities per 100,000 people)
India (2013)	130	8.6	11.2
Germany (2012)	657	0.67	4.4
Japan	651	0.63	4.1
New Zealand (2012)	733	0.95	6.9
Sweden	533	0.50	3.0
U.K. (2-12)	559	0.51	2.8
USA (2012)	846	1.26	10.7

IV. CONCLUSION

In this paper, we surveyed the impact that various road & traffic accidents have on human life & society. Survey highlights no. of approaches utilized to reduce threats in several countries & cities. The analysis shows that in India prevalence of road accidents and injuries varies by gender, age, month and time. Economically active age group was found to be a very vulnerable population set. In common, Men face higher mortality and risk factors than females.

Notwithstanding the increasing burden of RT accidents & injuries, road security has not expected much attention at

central, local &state government levels. This is mainly due to the fact that the problem of RT accidents does not come by the level of some particular agency, central or local or state government. Responsible for managing various aspects of issues comprising road eligibility to vehicles, road network design & road design, urban planning, road safety legislation, implementation, & crash-post medical care between some agencies, regions & groups. There is generally no leader to confirm that they combine their efforts & solve problems comprehensively. This situation wants towards change, therefore responsibility is obviously definite, precise roles are allotted to particular agencies, and duplication is eliminated.

Although significant progress has been made in modeling injury severity over these years, major methodology & data-based deficiencies remain to be addressed. Crash severity studies should be of great importance to future researchers in addressing these risks, as RA injuries affect everyone, regardless of where they are in the world.

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