ANALYSIS OF ACCIDENT DATA IN INDIAN HIGHWAYS

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Abstract: *This paper attempts to analyse the road accidents in India and collect the year wise data. The study focuses on today's accident rates and fetches the number of persons died or injured. Even though persons are having awareness of the road accidents, the number is increasing day by day. Road accidents are one of the major causes of death worldwide as per Global safety report more than 1.5 million people are killed in road accidents every year throughout the world. The probability of occurrence of accident depends on numerous factors like roadway condition, geometrics of road, vehicle, pavement condition and weather condition, etc. each factor contributes its own share towards occurrence of accidents and there can be many more factors which are situation specific. To ascertain the effect of various parameters an accident occurrence, data of road accidents of an Indian national highway was collected.*

Keywords: Nature of Accidents, Causes of Accident, Road Safety, Traffic Management, Driving Safety.

1 INTRODUCTION

A Road Traffic Accident (RTA) can be defined as, 'An event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed, where at least one moving vehicle is involved. In the present scenario everyone has noticing newspapers, magazines, news in channels and also watching directly and nearly shown that more than half of the people have affected road accidents, died and injured on the road. In the road accident not only having on vehicle riding people but also effect on pedestrians. In today's world road and transport has become an integral part of growth and development of a nation. Everybody is a road user in one or other shape. The present transport system has minimized the distance but it has on the other hand increased the life risk. Every road crashed result in loss of lakh of lives and serious to injuries to corers of people. India has a total of about 2 million kilometers of roads out of which 960,000 km are surfaced road and about 1 million km of roads in India are of poor quality. Rural areas have unsurfaced roads and urban areas have high severity of congestion. In India there are over 100000 deaths occur on roads due to accidents. The death include young and old people, people walking, people driving, people traveling in buses, cars, trucks, two wheelers and three wheelers. It also consider people on bicycles and people not traveling at all but simply passing the time of the day by the side of the road. Given that the population is increasing every day and the number of vehicles are coming on to the roads is increasing fast the future looks very miserable unless something is done. Accidents cannot be totally restricted but through scientific analysis and proper engineering measures their frequency and severity can be decreased. Therefore, traffic engineer has to identify systematic accident studies to explore the causes of accidents and to take preventive measures in terms of design and control. It is needed to analyze every individual accident and to keep zone wise accident records. These are some of the major problem face on any Indian roads. This is very serious situation and requires proper attention with the use of some statistical methods. In today's world where the number of road commuters is increasing drastically, demanding more and safer roads to have accident free roads. A lot of initiative are being taken up by the government to tackle this issue but needs a little more research attention. This study is an effort to make roads safer for road user.

2. LITERATURE REVIEW

Many researchers have studied and research related to accident study and road safety improvements for a particular place or select stretch in a different manner. Some of the reviews are carried out in this paper related to accident data analysis.

[1] Conducted accident analysis and identification of black spot its objective was analysis of road traffic accident data and identify black spot. In this study accident analysis was carried out for five years (2010-2014). The result shows 509 accidents occurred in the year 2010-2014. Identified the black spot based on maximum number of accident rate on the study area. And finally they concluded the following estimations from accident analysis:

- Estimates maximum number of accident occurs due to head collision there was no facility median on center of lane.
- Two wheelers (20.62%) and four wheelers (27.5%) involve the highest share of percentage in total road traffic accident.
- Highest number of accident occurred in month of March and April.
- Majority of accidents have been occurred in summer season (42.63%)

[2] Carried out analysis of road accident its aim was to analyze the traffic accidents occurring in a selected stretch by statistical method which is facing strain as diminished level of administration and increment in numerous quantities of accidents because of vast number of road user clients, specially four wheelers. It achieves exploratory inspection of the mishaps information and suggests remedial measures for reduction in accidents on stretch. Accident data was collected from various police stations along the study area stretch. The collected data are analyzed according to the following Parameters: yearly variation of accident, classified according month, according day ,according collision type, according accident spot, according to vehicle type, according to time, according vehicle maneuver , according drivers error , according drivers age, according weather and according alcohol/drugs. Have finalizes their work by proposed safety measures.

[3] Studied related with identification of black spot and its objective was to gather accident data on Islampur and Ashta road for last five year, to identify the black spots on Islampur Ashta road, to transfer out the surveys on black spots area and to give remedial measures for reduction in accidents on selected road.

[4] Studied identification of black spot in Ahmedabad city and its objective was to carry out study of existing condition and to identify the black spots in the study area. Accident data carried out from the Sola-high court police station last five years from the 2008 to 2012. Inventory survey was carried out five different locations. The road width, footpath, Median and Service lane are also measured at those locations. The summary of Inventories of five locations on the study area, Spot speed survey is carried out between Thaltej cross road to Umiya Campus. Pedestrian survey carried out between Thaltej cross road to Umiya campus evening peak hour at Five locations. Among these, Thaltej circle is having highest number of Pedestrian Volume 1325 / hour, Classified volume count survey carried out between Thaltej cross road to Umiya campus in morning and evening peak hour and identified black spot based on the accidents recorded, Speed observed, Deficiency of the Geometry and Pedestrian volume.

3. OBJECTIVE

Various objective of this research work is:

a. To analyse the total number of road accidents in India during the period from 2010 to 2016.
b. To perform a micro level analysis of traffic accident.
c. To develop accident prediction model for road accidents by using statistical analysis.
d. To propose integrated permanent solution using traffic sign, make awareness in a society and change a geometry and pavement of the road**.**

4. RESEARCH DESIGN AND METHODOLOGY

This study gives an idea about road accidents in Indian highways. Methodology for the research work is mainly divided into three parts:-

- Analysis based on location – analysis for identifying stretch points with higher number of accidents.
- Analysis based on time – analysis for identifying the hours having highest number of accidents occurring on stretch.
- Regression analysis – for obtaining prediction equation by using parameters available in accidental data.

5. COLLECTION OF DATA AND ANALYSIS

Analysis based on accident location on right as well as left lane where highest no. of accidents occur. The time at which highest accident occur also predict. Using prediction equation and proper parameters, prediction for classification of accident that can occur determined. For prediction purpose, random 60 values from available accident data is chosen for input variables and prediction is made using equation. Predicted values from regression equation were compared with available accident data.

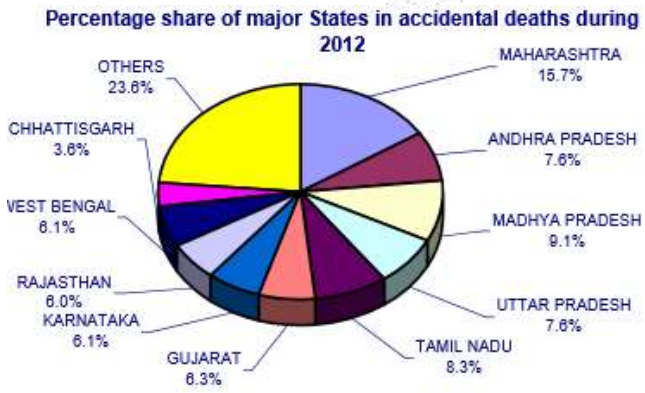

Fig. 1 showing percentage share of major states in accidental deaths during 2012

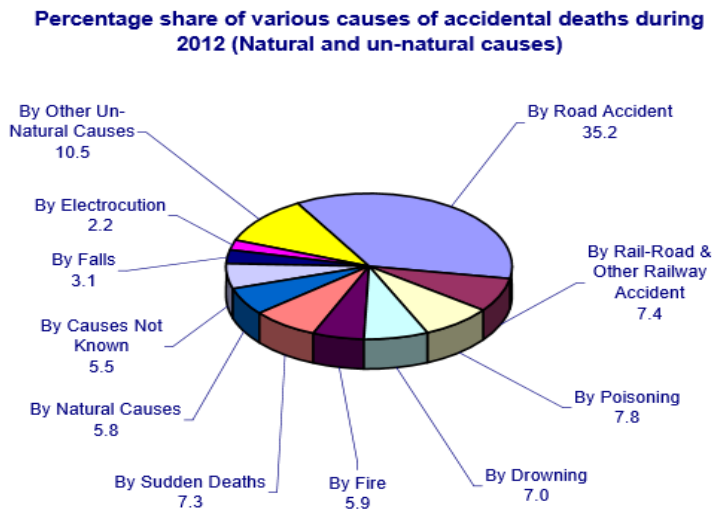

Fig. 2 showing percentage share of major states in accidental deaths during 2012 (Natural and un-natural causes)

Table 1: Incidence of Accidental Deaths by Natural and Un-Natural Causes in India

Year	Natural causes (A)	Un- Natural causes			Total (A+B)	Share of Road Accidents in Total Incidences
		Other un-natural	Road accident	Total un-natural		
2001	36651	154106	80262	234368	271019	29.61 (%)
2011	23690	230360	136834	367194	390884	35.01 (%)

Source: National Crime Record Bureau, Govt. of India

Current traffic safety conditions in India are extremely serious. According to N**ation**al Crime Record Bureau total incidences of accidental deaths due to natural and un-natural causes increased 1.4 times, while no. of deaths due to road accidents increased 1.7 times from 2001 to 2011. The share of road accidental deaths has increased from 29.61% in 2001 to 35.01% in 2011 (Table 1).

Table 2: State / UT wise rate of accidental death in comparison to all India (Rate)

More Accident Prone			Less Accident Prone		
Sl. No.	State / UTs	Rate (more than 32.6)	Sl. No.	State / UTs	Rate (more than 32.6)
1	Puducherry	80.1	1	A and N Islands	32.2
2	Chhattisgarh	58.2	2	Arunachal Pradesh	32.2
3	Goa	58.1	3	Mizoram	32.1
4	Maharashtra	54.1	4	Kerala	31.7
5	Madhya Pradesh	48.8	5	West Bengal	26.8
6	Tamil Nadu	48.2	6	Sikkim	26.0
7	Himachal Pradesh	46.9	7	Uttarakhand	24.7
8	Daman and Diu	46.7	8	Chandigarh	22.3
9	Haryana	46.2	9	Jharkhand	20.2
10	Delhi (UT)	43.6	10	Jammu and Kashmir	19.9

Table 3: No. of cases of road accidents and no. of deaths due to road accidents in 2012 in all states and UTs in India

Sl. No.	States / UT	No. of cases of road accidents	No. of deaths due to road accidents in 2012
States:			
1	Andhra Pradesh	39344	14966
2	Arunachal Pradesh	204	136
3	Assam	6535	2291
4	Bihar	10320	5056
5	Chhattisgarh	13511	3167
6	Goa	4288	302
7	Gujarat	27267	7855
8	Haryana	9971	4598
9	Himachal Pradesh	2899	1109
10	Jammu and Kashmir	6637	1426
11	Jharkhand	4625	2512
12	Karnataka	44448	9448
13	Kerala	36174	4286
14	Madhya Pradesh	29173	8506
15	Maharashtra	45247	13936
16	Manipur	771	158
17	Meghalaya	355	213
18	Mizoram	110	77
19	Nagaland	42	56
20	Odisha	9285	3701
21	Punjab	6328	4795
22	Rajasthan	22969	9528
23	Sikkim	123	44
24	Tamil Nadu	67757	161775
25	Tripura	888	272
26	Uttar Pradesh	24478	15109
27	Uttarakhand	1455	827
28	West Bengal	15608	6222
	Total (States):	430812	136771
Union Territories			
29	A and N Islands	236	25
30	Chandigarh	412	114
31	D and N Haveli	85	53
32	Daman and Diu	50	29
33	Delhi (UT)	6937	1866
34	Lakshadweep	0	0
35	Puducherry	1510	233
	Total (UTs)	9230	2320
	Total (All India)	440042	139091

6. CONCLUSION AND SUGGESTIONS

Severity of accident can be reduced by applying prediction model with proper input of parameters. The likelihood of accidents on the highway can be reduced. Lighting provisions must be improved for 18:00-20:59 hours on the highway. Other conclusions are:

a. Road management is a main source for economic responsibility, irresponsible road activities leads to the building of rush situation, accident and loss of economic goods.
b. Moreover, the traffic safety management should confirm the directions of the road safety developments in future.
c. Use of 3-Dimensional speed breaker should be taken into account.
d. Shoulders across the Highway should be in Level.
e. Subways should be constructed at every Chowk for safer travel of pedestrians.
f. General Awareness about Road Safety and control.
g. Speed Limit of vehicles should be followed and monitored by Authorities.
h. Traffic Rules should be strictly followed and action should be taken by Authorities if someone violets the Rules.

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