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Exploration of Road Accidents Severity and Inquiry of Reason for Road Accidents in National Highways in Tamil Nadu

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Abstract: ***Recent day's government of India is more particular about the Road transportation development as it leads to the economic development of the nation. With the improvement of road, the risk of road accidents, injuries and fatalities has also outstretched to the extreme extent. Road accident severity has been recorded to 31.8% in 2017 in India. Among this more than 30% of the accidents are befalling in National Highways. Among the total Indian roads, 1.8% is National Highways which carry about 40% of the Indian traffic. Huge volume of traffics on national highways and the attitude of the driver towards driving on National Highways are the important reason for National Highways road accidents. The researchers in the recent study are going to analyse about the severity of road accidents in National and in state level by calculating the number of deaths to every 100 road accidents. The researchers are also going to analyse the reasons for National highways road accidents from people's perspective.***

Key words: ***Road accidents, accident severity, National Highways and reason for road accidents***

I. INTRODUCTION

After Globalization Indian Government started to give importance to Infrastructural development. Among the various forms of Infrastructure, transportation development was given the first priority. Surrounded by number of various other transportations, Road transport is considered more important as it is very much important for the development of the nation as well as for the people and good for its easy mobility with in the nation. However, National Highways development has exposed the people to uncertainty called road accidents, fatalities and injuries. High rate of economic growth with motorization and urbanization has lead India to high Revelation of confrontational traffic environment. As a result, the occurrences of road accidents, fatalities and injuries rate are remaining inadmissibly high in the India.

At present in India, National highways road traffic accident related deaths and injuries are one of the foremost important causes of loss of life and infirmities in the economy.

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According to the 2016 Health data, the 8th leading causes of death is Road traffic accidents in India and it is also the principal cause of loss of health in the midst of young adults of age group of 15-45 years.

1.1 Network of Road in India

Indian Road Network is considered as one of the largest road network of the world with about 56 lakh km in March 2016. The country's road network can be named as Rural and village roads, Districts roads, State Highways and National Highways. After Globalisation, there has been dependable expansion in road network across the country, as the government is involved in the development of fresh roads and up gradation of the prevailing roads in India. At an annual growth rate of 3.7%, the road network of India has increased during the last decade. Among many of the developed countries, India's road density is highest with a density of 1.7 km/sq.km of area. And surfaced or paved road is 62.5 % among the total road length. According to 2016 data, 1.8 % constitute of national Highways in the country. The remaining Indian road network is divided as 3.2% of State Highways, 10% of the road networks are District Roads, 70% are Rural Roads, 9% are Urban Roads and nearly 6% are Project Roads.

II. REVIEW OF LITERATURE

Pawan Deshpande (2014) made his study on Road accidents and defined "road accidents are human tragedy". According to them these accidents leads to very high suffering to the people and there is a financial cost to the family as sudden loss of people and loss of potential income to the family occurs. Even though when government is taking lots of steps to safeguard the people on National Highways, the data exposes an unacceptable situation prevailing here in National Highways. According to the study the numbers interprets that for every one minute there records an accident, and for every four minute these is an accidental death. The researcher has analysed the road accidents in India and provided the extent to which the road accidents occurred and explained the various dimensions of road accident in India, which further helps the government to create awareness. The study also helps in forming the guidelines and assist in formation of road safety rules and helps in decision making on road safety.

Neelima Chakrabarty, Arun Lakshman, Kamini Gupta, Ankit Bhatnagar (2013), had an opinion that during the last decade, India have been exhibiting rapid increase in human population which led to heavy usage of vehicles which further led to increase in road accidents.

Incorrect driving behavior of the people is considered as the most important causes of highway accidents in India as compared to faulty geometric plan of pavement in national highways or machine-driven defects in vehicles that they drive. It can also be a result of circumstances such as lack of lane discipline among the drivers, disrespect shown by the road users to traffic laws, frequent traffic damages, increase in crashes due to self-centred driving mind of the people.

Krishnan. S, Geetha. K, Rabiya Basri, analysed that the road accident in India is increasing despite the fact that lots of jurisdictive amendments implemented by the government, awareness programmes created by the officials and enforcements of traffic rules in India. According to the researcher the behaviour of the Road user's is the prime reason in 70% to 90% of road accidents cases in India. The researchers also tried to study about the Government and authorities of Tamil Nadu's action on road accidents and its impact on the road accidents. According to the study, during 2017 the Government of Tamil Nadu were able to bring down the accidents because they implemented certain policies like wearing helmets is compulsory in Tamil Nadu and Government's announced severe actions against the rule defaulter.

According to **Jain. S. S, Singh P. K, and parida. M (2011),** the "formal procedure for evaluating accident potential and safety performance of new and existing roads is Road Safety Audit (RSA)". 'Road safety Audit' is most cost effective and practical method to analyse and get better road safety in India. There are lots of potential proofs that RSA saves lives. Thus according to the researcher RSA is the ideal tool for improving road safety in India. National Highway (NH) - 58 was used by the researchers to evaluate Road Safety Audit and with the results the researcher tried to identify the deficiencies and plan action to benefit the people. Trucks parked on national highway reduce the actual breadth of roadway and make the traffic menaces. Missing road should be properly checked and access and service lanes are required to be immediate developed.

Singh. A. P, Agarwal P. K, Sharma A (2011) in their study on "Speed Thrills but Kills" had observed that even after knowing the fact that "speed thrills but kills", people don't slow down. The fatal game of "hunted and hunter" is played by the people every day on the Indian Roads and specially on national highways, were the giant vehicles play the role of hunter and others on road being hunted. These crashes are not just leading to considerable suffering but economy of the nation is also disturbed because of it. There is wastage of 300 billion Indian rupees every year representing more than 3% of India's GDP on road accidents and its related issues. The study concentrated on some of the very important and burning sensations like - "road accidents, their movements, factors responsible for such road accidents, adverse effects of road accidents on the economy, prevention and control and some recent approaches to improve the safety on roads".

Dinesh Mohan, Omes Tsimhoni, Michael Sivak, Michael J Flannagan, (2009), as a team designed a report by analysing the Indian traffic safety situation. And they identify counter measures to substantially reduce the harmful effect caused by crashes. The challenges and opportunities of traffic safety in India were focused on this report. The researcher made a comprehensive study on the Indian present road traffic safety situation and found that death rates are recorded greater than before both on highways as well as urban areas. They want to implement new policy to bring down the number of fatalities in India. The following are the areas identified to reduce fatalities rate in India: "(1) pedestrians and other non-motorists in urban areas, (2) pedestrians, other non-motorists, and slow vehicles on highways, (3) motorcycles and small cars in urban areas, (4) over-involvement of trucks and buses, (5) night time driving, and (6) wrong-way drivers on divided highways".

According **Sanjay K. Singh (2005)** Cities play a very important place in stimulating prosperity and economic growth. The physical, Social and institutional structure determines the development of the cities. With this perspective, the development urban transportation is dominant. The researcher overviews the urban transportation issues in India. The study primarily focused on implementing of a better policy rather than on studying urban transportation. Initially the vehicular growth trends along with the transport availability in Indian cities were studied. Further a discussion on the nature of urban transport like congestion on road, pollution due to vehicles, and road accidents on highways were analysed. Based on the study they proposed some policy measures to expand urban transportation in India. They also insisted the government to frame policy which reduces the personalized modes of travelling and boost public transport system. They recommended a demand and supply side management to be implemented by public transportation.

III. OBJECTIVES OF THE STUDY

1. To analyse the road accident severity in India and in Tamil Nadu.
2. To investigate the reason for road accidents in National highways in Tamil Nadu.

IV. RESEARCH METHODOLOGY

1.2 Collection of data

The researchers used both the primary data as well as the secondary data for the present study. For collecting the primary data the structured questionnaire were formed and the information was collected from the Road users from NH45 (National Highways 45) in Tamil Nadu. The secondary data were collected from "Government of India Ministry of Road Transport & Highways Transport Research Wing New Delhi" for data at National level and from SCRB Chennai (State Crime Record Bureau) for data at Tamil Nadu level. The secondary data were used for collecting the literature review for the study. This study followed empirical research. Convenience random sampling method was used to collect the primary data for the study.

1.3 Selection of sample

The road users are the population of the present study and there in no definite way to select the sample thus convenience random sampling method was used to collect the data.

From an infinite population, 400 samples were collected for the study.

1.4 Research Instrument

The questionnaire was divided into 2 sections. The first section denotes demographical profile of the respondent which includes gender, category of work and frequency of road usage by the respondent. The second section of the questionnaire covers the reason for road accidents in National Highways. The respondents were asked to rank the reason for road accidents according to their own perspective.

V. ROAD ACCIDENT IN INDIA

Table 1: Road accident statistics in India

Year	Accidents in India		% of fatal accidents in total accidents	Persons		% of persons killed per 100 accidents
	Over-all	Fatal Accidents		Killed	Injured	
2005	4,39,255	83,491	19.0	94,968	465282	21.6
2006	4,60,920	93,917	20.4	105,749	496,481	22.9
2007	4,79,216	1,01,161	21.1	114,444	513,340	23.9
2008	4,84,704	1,06,591	22.0	119,860	523,193	24.7
2009	4,86,384	1,10,993	22.8	125,660	515,458	25.8
2010	4,99,628	1,19,558	23.9	134,513	527,512	26.9
2011	4,97,686	1,21,618	24.4	1,42,485	5,11,394	28.6
2012	4,90,383	1,23,093	25.1	1,38,258	5,09,667	28.2
2013	4,86,476	1,22,589	25.2	1,37,572	4,94,893	28.3
2014	4,89,400	1,25,828	25.7	1,39,671	4,93,474	28.5
2015	5,01,423	1,31,726	26.3	1,46,133	5,00,279	29.1
2016	4,80,652	1,36,071	28.3	1,50,785	4,94,624	31.4
2017	4,64,910	1,34,796	28.9	1,47,913	4,70,975	31.8

Source: "Government of India Ministry of Road Transport & Highways Transport Research Wing New Delhi"

Fig 1: Trend of accident severity in National level

Inference Table 1 represents the number of road accidents occurred in national level. During the study period the share of fatal accidents to the total is in increasing trend. In 2005 the fatal accident covers the 19% of the total road accidents, which increased to 29% in 2017. But the overall road accident during 2017 shows a declining trend compared to the previous year.

VI. ROAD ACCIDENT IN TAMIL NADU

Table 2: Road accident statistics in Tamil Nadu

Year	Accidents in India		% of fatal accidents in total accidents	Persons		% of persons killed per 100 accidents
	Over-all	Fatal Accidents		Killed	Injured	
2005	53878	8844(16.4)	16.4	9760	61967	18.1
2006	55145	10055(18.2)	18.2	11009	64341	19.9
2007	59140	11034(18.6)	18.6	12036	71099	20.4
2008	60409	11813(19.6)	19.6	12784	70251	21.2
2009	60794	12727(20.9)	20.9	13746	70504	22.6
2010	64996	14241(21.9)	21.9	15409	75445	23.7
2011	65873	14359(21.8)	21.8	15422	74245	23.4
2012	67757	15072(22.2)	22.2	16175	78348	23.9
2013	66238	14504(21.9)	21.9	15563	75681	23.5
2014	67250	14165(21.1)	21.1	15190	77725	22.6

2015	67250	14524(21.6)	21.6	15642	79401	23.3
2016	71431	16092(22.5)	22.5	17218	82163	24.1
2017	65562	15061(22.9)	22.9	16157	74572	24.6

Source: SCRB Chennai

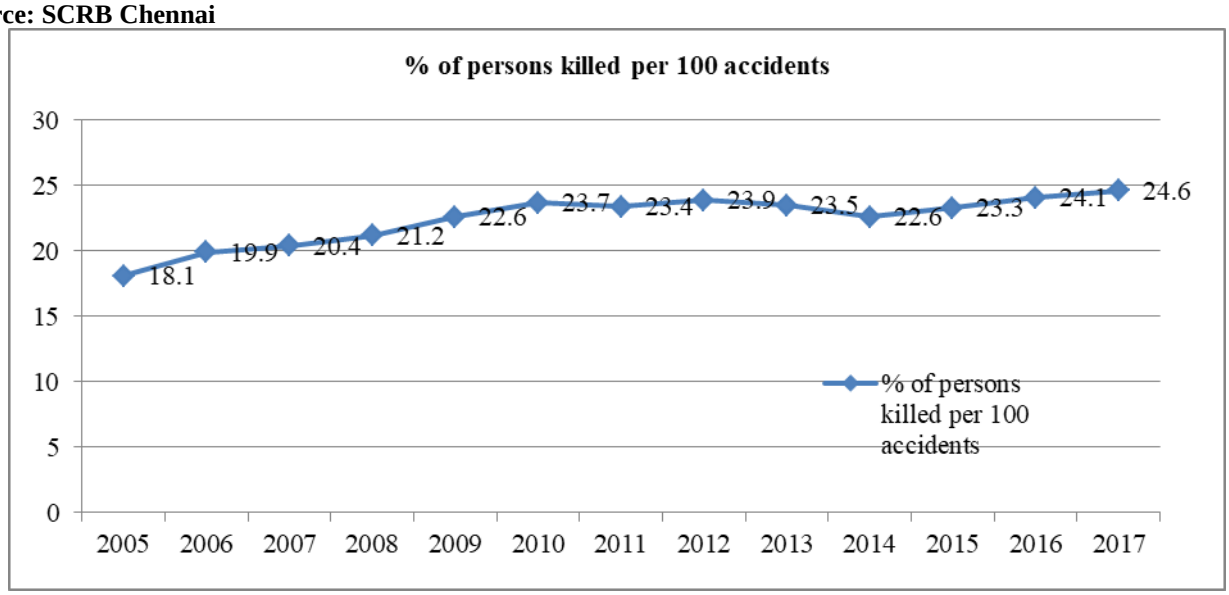

Fig 2: Trend of accident severity in Tamil Nadu

Inference Table 2 represents the number of road accidents occurred in the state of Tamil Nadu. During the study period the share of fatal accidents to the total is in increasing trend. In 2005 the fatal accident covers the 16.4 of the total road accidents, which increased to 22.9% in 2017. But the overall road accident during 2017 shows a declining trend compared to the previous year. This decline is seen even in national level because the government lots of initiative to reduce the road accidents.

VII. DATA ANALYSIS

Frequency Distribution

TABLE 3: Gender of the respondents

Gender of the respondents	Male	Female	Total
No. of Respondents	370	30	400
Percentage	93	7	100

Source: Computed from Primary data

Inference: Table 3 explains the gender of the respondents'. 93% of the respondents are male and rest of the 7 % are female. Normally the road users are male only thus the result will be accurate.

TABLE 4: Category of Respondents

Category of respondents	Driver	Staff	Travellers	Total
No. of Respondents	310	46	44	400
Percentage	77	12	11	100

Source: Computed Primary data

Inference: Table 4 explains the category of respondents. Majority of 77% of the respondents are drivers (Drivers, owners and owner come drivers) and rest of the 23% of them are staff and passengers. As 77% of them are drivers, the study will be more accurate.

VIII. GARRETT'S RANKING TECHNIQUE

To analyse the opinion of the road users about the reasons for road accidents in national highways Garrett's ranking was used. The people were asked to rank the reason according to their own observation and it's been analysed by using the formula given below:

$$\text{Percent Position} = \frac{R_{ij} - 0.5}{n_j} * 100$$

R_{ij} = Rank given by j^{th} individual for the i^{th} factor, and

N_j = Number of factors ranked by the j^{th} individual.

Thus, the per cent position of each rank is obtained, which is converted into scores using Garret Rank Table. After that, the scores of individual respondents for each factor were added and then divided by total number of respondents who had responded to the questionnaire. The mean score was then ranked in descending order.

Table 5: Respondents Opinion on Reasons for Accidents in National highways 45

Sl.No	Reason for Accidents in National Highways	Total Scores	Percentage	Rank
1	Congestion on the roads and high volume of traffic	18537	61.79	II
2.	Behavior of other drivers like rash driving, poor overtaking and not indicating properly	21121	75.08	I
3.	Air/ noise pollution from vehicles	9652	43.07	VI
4.	Beaming headlights of other vehicles	6572	42.19	VII
5.	Animals crossing the roads like cows, dogs and monkeys.	13494	45.33	IV
6.	Pedestrians crossing the road where not allowed	10122	44.98	V
7.	Bad roads (potholes, rutting, rough roads)	15599	52.00	III

Source: Computed from Primary data

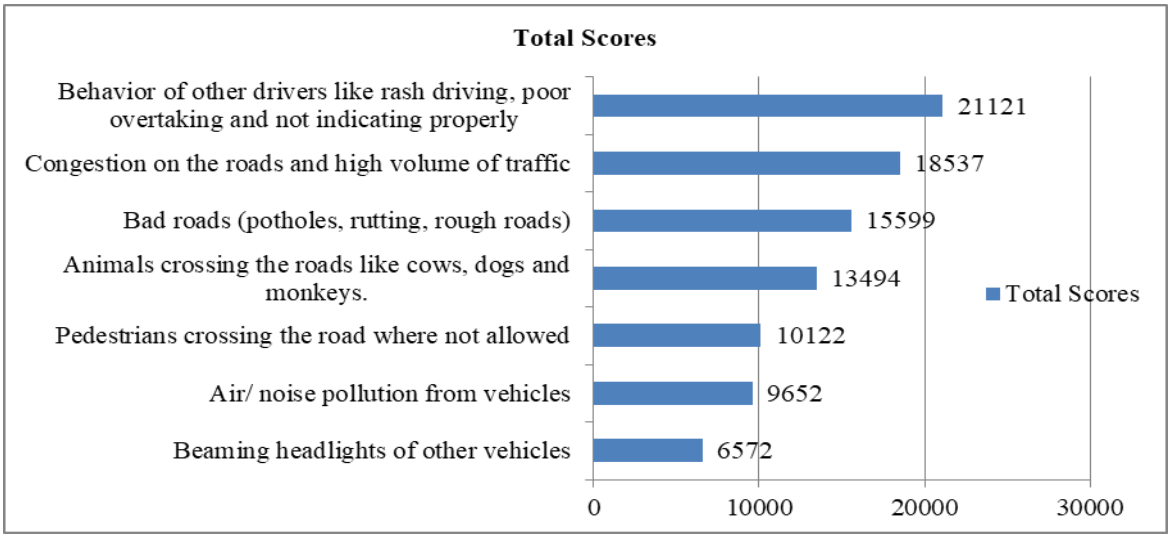

Fig 3: shows the respondents opinion on reason for road accidents in National Highways 45

The Table 5 shows the factors which were assigned the ranks. The first rank was given to the "Behavior of other drivers (rash driving/ poor overtaking/ not indicating properly)" with a total score of 21121; second rank was given to "Congestion on the roads/ high volume of traffic" with a total score of 18537; third rank to "Bad roads (potholes, rutting, rough roads)"with a total score of 15599; forth rank to "Animals crossing the roads (cows, dogs, monkeys)" with a total score of 13494; fifth rank to "Pedestrians crossing the road where not allowed" with a total score of 10122; sixth rank to "Air/ noise pollution from vehicles" with a total score of 9652 and seventh rank to "Beaming headlights of other vehicles" with a total score of 6572.

IX. CONCLUSION

The severities of road accidents are very well sensed in recent times in India. The development accomplishment of the government which is equipped for the development of the nation is now turning out to be more subdued. 31.8% persons were killed per 100 accidents in India during 2017. The main reason being the behavior of the drivers on these National Highways – rash driving has the road is very smooth, poor overtaking habits of the drivers and mainly not indicating properly their turns and moves on National Highways. And then other reasons for accidents in National highways are congestion on the roads or high volume of traffic, bad roads, pedestrians crossing the roads, animals crossing the roads and noise pollution form the vehicles. The study found that the major and important reason for road accident is being the drivers. The Indian drivers are not having a proper knowledge on how to drive in National highways and this leads to accidents. They are not having awareness on dos and don'ts connected to it. Thus the government has to take steps to train the Indian drivers on National Highways to reduce the accident accruing there. And same ways educate the common people about the usage of National Highways.

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