AN ANALYTICAL STUDY ON SEVERITY OF ROAD ACCIDENTS IN INDIA

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Abstract

Road accidents, injuries and fatalities due to road accidents are very common in case of India and it is a very big and ever growing problem for Indian public health system. The present study has been conducted to find out the status of road accidents in India. It is based on secondary data collected from the reports published by the Ministry of Road Transport and Highways. The collected data has been complied into tables and analysed with the help of descriptive statistics such as mean and compound annual growth rate.It has been found in the result the study that the number of road accidents in India are increasing with a slow rate which is good but the matter of concern is the severity of the accidents which is evidenced by the higher compound annual growth rate of persons killed in the road accidents.Further, It has also been observed in the study that even after a negative growth in total number of road accidents, the serious accidents (Fatal and Grievous Injury Accidents) have been found increasing at higher rate in comparison to the increase in total number of accidents.The major reason of road accidents in India during the period 2018 and 2019 is over-speeding followed by the other reasons like the technical fault in the vehicle, rash driving, road condition etc. It may be suggested here that there should be formulation of strong regulations regarding speed limit. Obviously the implementation of the regulations should also be insured. Further, proper training and awareness programmes regarding road safety must be introduced and implemented in order to improve the road safety status of the country.

Keyword: Road Accidents, Compound Annual Growth Rate, Mean

ISBN: 978-81-955611-9-3

Introduction

Road accidents, injuries and fatalities due to road accidents are very common in case of India and it is a very big and ever growing problem for Indian public health system. Every week nearly 2,650 people get killed and 9,000 get injured due to traffic accidents. In 2013, the latest year for which data is available, 137,423 people died and 469,900 people got injured due to road accidents in India. Traffic accidents have now earned India a dubious distinction; with nearly 140,000 deaths annually, the country has overtaken China to top the world in road fatalities. India is the only country in the world which faces more than 15 fatalities and 53 injuries every hour as a consequence of road crashes. While in many developed and developing countries including China, the situation is generally improving, yet India faces a worsening situation. If the trend continues, the total number of road traffic deaths in India would increase by 100% between 2013 and 2027. Without additional efforts and new initiatives, the total number of road traffic deaths in India is likely to cross the mark of 250,000 by 2025 (Singh, 2020). The World Bank recently released a new report that makes some fascinating notes about India. For starters, the report noted that even though India is home to just 1 per cent of the world's vehicles, we still hold for 11 per cent of the global road accident deaths. This is the highest in the world, by the way. It depicts an indeed more grim number 53 road accidents happen in India every hour, killing one person every 4 minutes (Time Drive Desk, 2021).The main aim of the present study is to analyse the trend of road accidents, injuries and fatalities in India. Further, the types of various accidents and reasons of road accidents have been analysed in the present study.

Objectives of the Study

The following are the main aims of the present study:

1. To study the trend of Road Accidents, Person Injured and Killed in India.
2. To find out the significant causes of road accidents in India.
3. To provide suggestions for the improvement in the road safety issue of India.

ISBN: 978-81-955611-9-3

Review of Literature

Zavareh et.al. (2009) conducted a study to explore various barriers in the way of prevention of road traffic injuries in Iran and attempted to provide appropriate suggestions for the prevention of road traffic injuries. The study was based on primary data collected from 38 semi-structured interviews of various persons relating to the field of road traffic injuries such as police officers; public health professionals; experts from the road administrators etc. The collected information was analysed using grounded theory method. In the outcomes of the study, human factors, transportation system, and organizational coordination were found as the barriers in the way of prevention of road traffic accidents. It was suggested to make efforts for changing human behaviour with the help of public education campaigns and more strict law enforcement. **Singh (2017)** analysed the road accidents in India considering national, state and metropolitan city level. Road accidental deaths and injuries were found varying according to age, sex, month and the specific hours of the day. As per age group, the much vulnerable part of the population for road accidents was observed to be the persons under age group of 30 years to 59 years. The study puts some light on the road safety situation in India and worldwide. In the results, it was depicted that the situation of road safety in India is not up to mark in comparison to the rest of the world. It was suggested that for taking corrective actions, efforts should be made to recognize the actual situation of road safety in India.**Alcarazet. al. (2020)** made an attempt to find a procedure for assessing and identifying risks that promote accidents by road users considering the view of improving safety through the implementation and technical employment of operative strategies inBajaCalifornia, Mexico, in the Centinela–La Rumorosa highway.The findings of the study were taking about the ability of procedure provided by this research in contributing towards the determination of high risk areas that promote accidents and in generation of a risk reduction plan to support future decision-making that guarantees better performance for road users. It was suggested that the analysis of road safety must be a permanent process for those who operate, design, and build the road system.**Cheng et. al. (2021)** made efforts to analyse the current development trends of roadside safety in China by conducting a review study. The main

ISBN: 978-81-955611-9-3

concentration of the study was on the three aspects including the frequency of roadside accidents, the severity of roadside accidents, and the practice of roadside safety design. In the results, small-radius curves, heavy traffic, objects adjacent to the lane(such as poles and trees), narrow lanes, and narrow shoulders were found to be thefirst five significant risk factors that cause frequent roadside accidents. Driver age ≤25 or ≥65, alcohol, speeding, failure to use seat belts, and heavy trucks were observed to be the first five significant risk factors that cause fatal roadsideaccidents.It was suggested that for roadside safety design, roadside clear zonesand safety slopes should be precisely quantified based on a cost-benefit analysis in future studies.

On the basis of the above review of literature, it may be said that researchers are conducting impressive research in the field of road safety worldwide. The present will provide some support to the existing stock of research in the field of road safety as this study is concentrated to India which is making it a specific and more focused study.

Research Methodology

As far as the nature of the study is concerned, the present study is descriptive cum analytical in nature. It is based on secondary data collected from the reports published by the Ministry of Road Transport and Highways. The collected data has been complied into tables and analysed with the help of descriptive statistics such as mean and compound annual growth rate. The study period for the present research consists of 19 year (2001 to 2019) for road accidents and consequences in India, 5 year (2015-2019) for types of accidents in India and 2 year (2018-2019) for various reasons of road accidents in India.

Discussion

Following is the discussion part of the present study:

Table 1: Road Accidents and Consequences in India (2001-2019)

Year	Total Number of Road Accidents (in numbers)	% Change	Total Number of Persons Killed (in numbers)	% Change	Total Number of Persons Injured (in numbers)	% Change
2001	**4,05,637**		**80,888**		**4,05,216**	

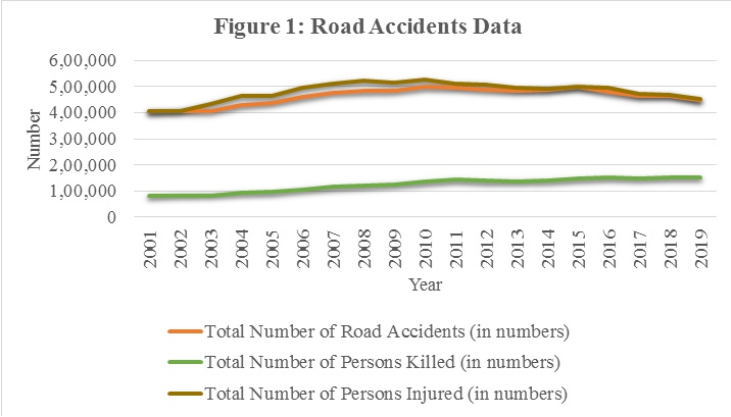
ISBN: 978-81-955611-9-3

2002	4,07,497	0.46	84,674	4.68	4,08.711	0.86
2003	4,06,726	-0.19	85,998	1.56	4,35.122	6.46
2004	4,29,910	5.70	92,618	7.70	4,64.521	**6.76**
2005	4,39,255	2.17	94,968	2.54	4,65,282	0.16
2006	4,60,920	**4.93**	1,05,749	**11.35**	4,96,481	6.71
2007	4,79,216	3.97	1,14,444	8.22	5,13.340	3.40
2008	4,84,704	1.15	1,19,860	4.73	5,23.193	1.92
2009	4,86,384	0.35	1,25,660	4.84	5,15,458	-1.48
2010	4,99,628	2.72	1,34,513	7.05	**5,27,512**	2.34
2011	4,97,686	-0.39	1,42,485	5.93	5,11,394	-3.06
2012	4,90,383	-1.47	1,38,258	**-2.97**	5,09.667	-0.34
2013	4,86,476	-0.80	1,37,572	-0.50	4,94.893	-2.90
2014	4,89,400	0.60	1,39,671	1.53	4,93.474	-0.29
2015	**5,01,423**	2.46	1,46,133	4.63	5,00,279	1.38
2016	4,80,652	**-4.14**	1,50,785	3.18	4,94.624	-1.13
2017	4,64,910	-3.28	1,47,913	-1.90	4,70,975	**-4.78**
2018	4,67,044	0.46	**1,51,417**	2.37	4,69.418	-0.33
2019	4,49,002	-3.86	1,51,113	-0.20	4,51,361	-3.85
Mean	**4,64,571**		**1,23,406**		**4,81,627**	
CAGR		**0.54%**		**3.34%**		**0.57%**

Source: Ministry of Road Transport and Highways

ISBN: 978-81-955611-9-3

Figure 1: Road Accidents, Person Killed and Person Injured (2001-2019)



The above Table 1 and Figure 1 shows the data regarding the total number of persons killed and injured in relation to the total the number of accidents in India considering a period starting from the year 2001 to the year 2019. As per the data regarding total number of accidents, the highest number of road accidents have happened in the year 2015 (5,01,423) and the lowest number of accidents have been found in the year 2001 (4,05,637). When the growth rate of road accidents year by year was analysed, it has been observed that in the majority number of years the road accidents have been found in increasing trend. The highest growth rate in road accidents in India has been found in the year 2006 and the lowest growth rate has been found in the year 2016. Average number of road accidents in India during 2001-2019 has been found as 4,64,571 with a compound annual growth rate of 0.54%. The number of persons killed in road accidents has also been found in increasing trend during the study period except year 2012, 2017 and 2019. The highest number of person killed in road accident was in the year 2018 and lowest number was in the year 2001. The average number of persons killed in the road accidents in India has been depicted as 1,23,406 with a compound annual growth rate of 3.34%. It is a quite high rate in comparison to the compound annual growth rate of number of road accidents in India during the study period. It shows that the number of road accidents are increasing with a slow rate which is good but the matter of concern is the severity of the accidents which is evidenced by the higher compound annual growth rate of persons killed in the road accidents. The persons injured in road accidents in

ISBN: 978-81-955611-9-3

India during 2001-2019 have been found in a mixed trend. The highest number of persons injured in the road accidents in India has been found in the year 2010 and the lowest number has been found in the year 2001. The average number of person injured in road accidents has been found as 4,81,627 with a compound annual growth rate of 0.57%.

Table 2: Types of Road Accidents in India (2015-2019)

Type of road Accidents	Parameter	2015	2016	2017	2018	2019	Mean	CAGR
Fatal accident	Number	1,31,726	1,36,071	1,34,796	1,37,726	1,37,689	**1,35,602**	
	% age Change	4.7	3.3	-0.9	2.2	-0.03		**0.89%**
	share in total	**26.3**	**28.3**	**29**	**29.5**	**30.7**		
Grievous injury accidents	Number	1,19,668	1,20,848	1,20,971	1,25,311	1,26,759	**1,22,711**	
	% age Change	3.6	1	0.1	3.6	1.2		**1.16%**
	share in total	**23.9**	**25.1**	**26**	**26.8**	**28.2**		
Minor injury accidents	Number	1,92,634	1,87,642	1,74,400	1,69,920	1,57,215	**1,76,362**	
	% age Change	0.2	-2.6	-7.1	-2.6	-7.5		**-3.98%**
	share in total	**38.4**	**39**	**37.5**	**36.4**	**35**		
Non-injury accidents	Number	57,395	36,091	34,743	34,087	27,339	**37,931**	
	% age Change	2.8	-37.1	-3.7	-1.9	-19.8		**-13.79%**
	share in total	**11.4**	**7.5**	**7.5**	**7.3**	**6.1**		
Total	Number	**5,01,423**	**4,80,652**	**4,64,910**	**4,67,044**	**4,49,002**	**4,72,606**	
	% age Change	**2.5**	**-4.1**	**-3.3**	**0.5**	**-3.9**		**-2.18%**

Source: Ministry of Road Transport and Highways

ISBN: 978-81-955611-9-3

Figure 2: Accident Type wise Data (2015-2019)

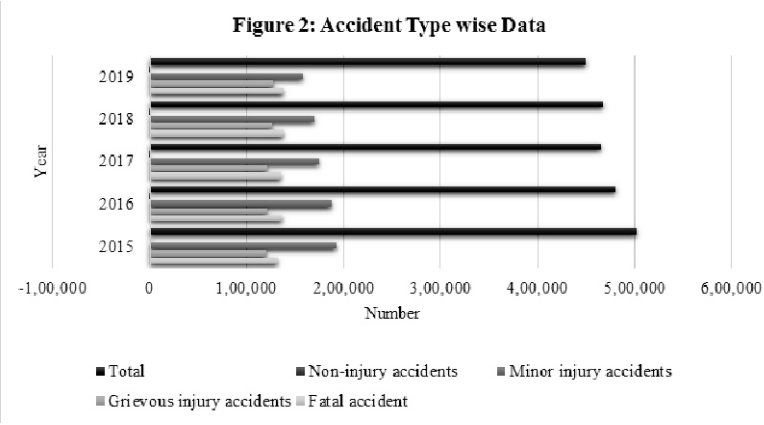


Table 2 and Figure 2 represents the data regarding road accidents in India specifically on the basis of type of road accident considering the period of five years (2015-2019). As per the information from the above table and figure, it can be interpreted that out of a total of 4,72,606 accidents, 2,58,313 (54.66%) accidents are fatal accidents or serious injury accidents which is a scary number. During the period (2015-2019), the total number of accidents was increased at a compound annual growth rate of -2.18%. Simultaneously, thefatal accidents and accidents creating serious injuries were increasing with a positive CAGR and it is highest amongst the group of various types of accidents. It is noticeable here that even there is a negative growth in total number of road accidents but the serious accidents (Fatal and Grievous Injury Accidents) are increasing at higher rate in comparison to the increase in total number of accidents.

Table 3: Reasons of Road Accident in India (2018-2019)

Traffic rules violation	Number of accidents	... Killed	Persons injured	Number of accidents	Persons Killed	Persons injured
		2018			**2019**	
Over-speeding	3,10,612	97,588	3,16,421	3,19,028	1,01,723	3,26,850
% share of total	**66.5**	**64.4**	**67.4**	**71.1**	**67.3**	**72.4**

ISBN: 978-81-955611-9-3

Drunken driving/consumption of alcohol & drugs	12,018	4,188	9,944	12,256	5,325	10,564
% share of total	**2.6**	**2.8**	**2.1**	**2.7**	**3.5**	**2.3**
Driving on wrong side/ Lane indiscipline	24,781	8,764	24,100	24,431	9,201	24,628
% share oftotal	**5.3**	**5.8**	**5.1**	**5.4**	**6.1**	**5.5**
Jumping red light	4,441	1,545	4,126	4,443	1,797	4,006
% share of total	**1**	**1**	**0.9**	**1**	**1.2**	**0.9**
Use of mobile phone	9,039	3,707	7,878	10,522	4,945	8,144
% share of total	**1.9**	**2.4**	**1.7**	**2.3**	**3.3**	**1.8**
Others	1,06,150	35,625	1,06,949	78,322	28,122	77,169
% share of total	**22.7**	**23.5**	**22.8**	**17.4**	**18.6**	**17.1**
Total	**4,67,041**	**1,51,417**	**4,69,418**	**4,49,002**	**1,51,113**	**4,51,331**

Source: Ministry of Road Transport and Highways

The above table, Table 3 shows information regarding the reasons of road accidents in India during 2018 and 2019. As per the results from the above table, it can be seen clearly that the major reason of road accidents in India during the period 2018 and 2019 is over-speeding followed by the other reasons like the technical fault in the vehicle, rash driving, road condition etc. It may be suggested here that there should be formulation of strong regulations regarding speed limit. Obviously the implementation of the regulations should also be insured. Further, proper training and awareness programmes regarding road safety must be introduced and implemented in order to improve the road safety status of the country.

Conclusion

Road accidents, injuries and fatalities due to road accidents with the increase in their number are intensifying problems for Indian public health system. It is found in the study that the number of road accidents in India are increasing with a slow pace which is soothing but the severity of the situation is

ISBN: 978-81-955611-9-3

apparent by the higher compound annual growth rate of persons killed in the road accidents.Further, It has also been observed in the study that even after a negative growth in total number of road accidents, the serious accidents (Fatal and Grievous Injury Accidents) have been found increasing at higher rate in comparison to the increase in total number of accidents.The major reason of road accidents in India during the period 2018 and 2019 is over-speeding followed by the other reasons like the technical fault in the vehicle, rash driving, road condition etc. It may be suggested here that there should be formulation of strong regulations regarding road (riding/driving/parking) ethics. Implementation of these regulations should also be insured and kept on record. Further, enhancing the number of proper training and awareness programmes regarding road safety may prove fruitful to improve the road safety status of the country.

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ISBN: 978-81-955611-9-3