

Study of Road Accidents Statistics of Uttarakhand along with Detailed Analysis of Roorkee: Identification of Risk Factors and Preventions

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Abstract— Road Traffic Accident is a very serious problem in every country of the world. In Second Global High Level Conference on Road Safety which held in Brasilia of Brazil in 2015, as per the Brasilia declaration, India have to halves the deaths and injuries along with accidents by 2020 but India is lacking in this target because India has diversity in its topography so we can't consider same factors for whole nation. We can't control this problem as a whole so we have to start from a small level. To control this problem, risk factors of each and every area should be identified. This paper is a small effort to identify the risk factors of accidents in Roorkee Urban Region which is located in Uttarakhand so that the remedial measures can be proposed to avoid accidents in this area. Also an attempt has been made through a small survey to know the background of road users in Roorkee. This paper also represents year wise analysis of accidents, number of persons killed, and number of injuries in Uttarakhand of last ten years from 2009-2018.

Keywords: Road Traffic Accidents, Fatal, Statistics, Commercial Freight Vehicles, Accident Severity

I. INTRODUCTION

India ranks high when it comes to road traffic accidents. India is a country which has middle economy level and it is needed to boost up. To boost economy, statistics of these accidents should be reduced. Global Status Report on Road Safety 2018, presented by World Health Organization (WHO), shows that 1.35 million people are losing their life on world's road due to road traffic crashes i.e. 3700 peoples in a day. In these road traffic crashes, India is on the top and it's share is 11% in the world. Though Motor Vehicle Act 1988 has been strictly enforced with Amendments on September 1, 2019 but even after that there is no significant drop in these cases. These rules are being followed in big cities by imposing large penalties but in small cities there is no special concern about these rules because of negligence of the system and lack of awareness among road users. Attitude of peoples about these traffic rules are not appreciable because peoples don't follow these rules for their safety but they follow just to avoid penalty.

Roorkee is a city which comes under Roorkee Urban Region. As per the reports of Census Organization of India, population of Roorkee city is 1,18,200 in 2011 and now estimated population of Roorkee city is 2,55,155.8 which is estimated by India Population 2019 and this growing factor of population also leading to traffic congestion because number vehicles are also increasing. Increasing in the number of vehicles and poor traffic management are becoming the cause of accidents in Roorkee. For reducing the number of accidents, we have to analyze the driver's behavior and previous accident records of Roorkee so that suggestions can be proposed.

II. DATA COLLECTION

For identifying risk factors of accidents, data is collected from Government records, reports presented by various ministries and departments, newspapers and through conducting an online survey.

A. Comparative Analysis of Uttarakhand for the Years 2009-2018

As statistics present that Udham Singh Nagar faced the highest number of road accidents in 2018 i.e. 356 followed by Haridwar and Dehradun and the highest number of deaths due to road traffic crashes also recorded in Udham Singh Nagar i.e. 206 followed by Dehradun and Haridwar.

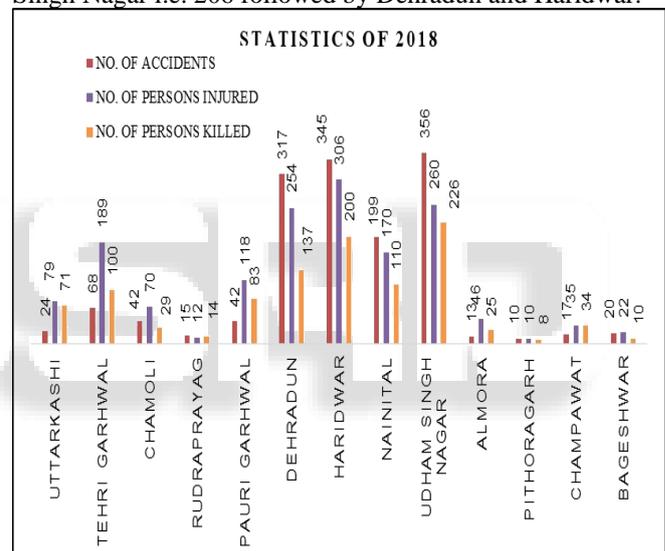


Fig. 1: District Wise Presentation of Statistics of 2018

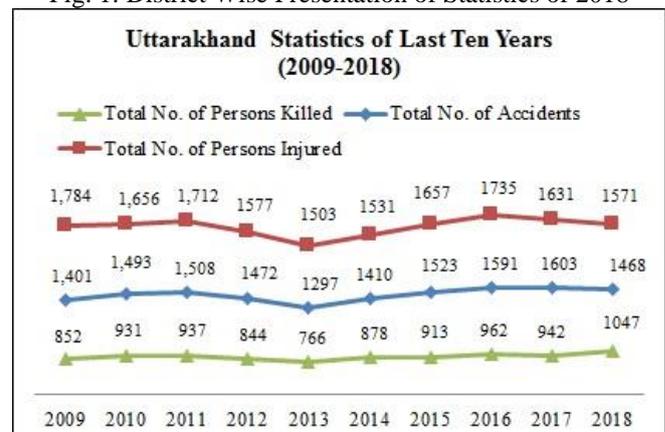


Fig. 2: Road Traffic Accident Statistics of Uttarakhand for Last Ten Years from 2009 to 2018

As per the statistics of last ten years from 2009 to 2011, number of accidents was increasing but after that there is also a drop in this data and lowest number of accidents recorded in 2013 i.e. 1297. After 2013, this

statistics are increasing every year. In 2018, number of accidents recorded in Uttarakhand is 1468 while this figure was 1603 in 2017, it shows decrement of 8.4%, on the other hand, number of persons killed increased by 11.1%, this figure was 942 in 2017 but it is recorded 1047 in 2018.

Year	No. of Fatal Accidents (%)	Accident Severity
2009	676 (48.25)	60.8
2010	740 (49.56)	62.4
2011	726 (48.14)	62.1
2012	686 (46.60)	57.3
2013	642(49.50)	59.05
2014	713(50.56)	62.26
2015	765(50.22)	59.94
2016	801(50.34)	60.46
2017	727(45.35)	58.08
2018	797(54.29)	71.3

Table 1: Percentage of Fatal Accidents and Accident Severity from 2009 to 2018

As it can be seen in the table, maximum number of fatal accidents was recorded in 2016 but its percentage was high in 2018. Accident Severity is the number of persons killed per 100 accidents. It is also fluctuating every year but it was recorded highest in 2018 and lowest in 2012 i.e. 71.3 and 57.3 respectively.

B. Analysis of Accident's Record of Roorkee, 2019

Record of Accidents in Roorkee was collected from various sources. With the help of these records, an attempt has been made to identify the risk factors of accidents with respect to vehicles involved, causes of accidents, etc.

An analysis of total 257 road accidents of 2019, carried out that took place in Roorkee city and its nearby area which comes under 20 kms. According to this record, number of deaths due to road traffic crashes is 113, number of persons injured is 426 in which 149 peoples were severely injured. In 257 accidents, there are only 30 accidents in which no loss of lives took place. Other than of these accidents, there were more than 22 accidents which happened during Kanwar Yatra in the month of July due to poor traffic management. In these accidents, more than 140 peoples injured and there is no sufficient record for persons killed during Kanwar Yatra.

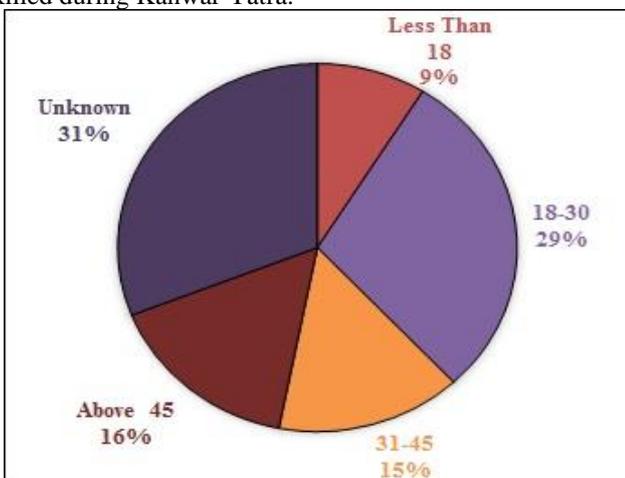


Fig. 3: Percentage of Persons Killed according to Age Profile

According to Age Profile of persons killed, 29% are from the most productive age group of 18-30 and 15 % having age between 31-45. Percentage of persons killed, having age less than 18 and more than 45 is 9% and 16% respectively. Percentage of persons killed of unknown age is about 31%.

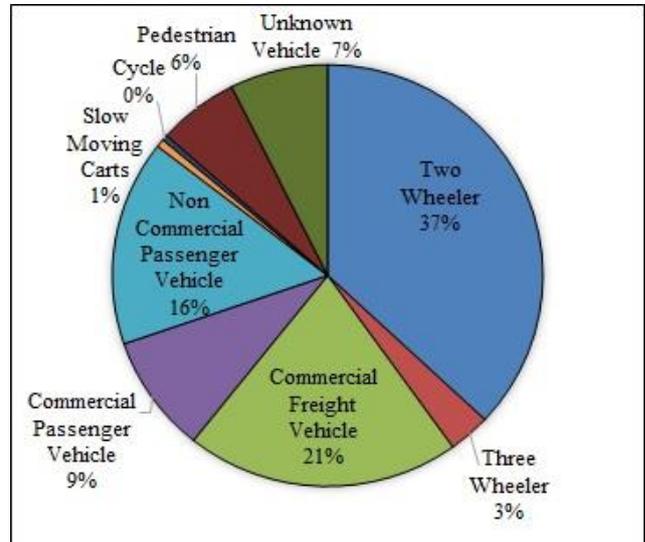


Fig. 4: Percentage of Vehicles and Pedestrian Involved in Accidents

Two wheeler which involved in accidents has the highest percentage among all the vehicles i.e. 37% and followed by commercial freight vehicles i.e. 21%. Percentage of involved Commercial passenger and noncommercial passenger vehicles are 9% and 16% respectively. Percentage of Pedestrian involved is 6%.

When it comes to causes of accidents, Driver's fault was the main reason for 90% accidents in Roorkee and accident due to road conditions is 5%. All other causes such as environmental factors, mechanical issue of vehicle come under 5%.

C. Analysis of Background of Road Users Through A Survey

A small survey conducted on road users in which 47 respondents belong to Roorkee. In this 35 peoples are driver or learner driver and 17 peoples are cyclist or pedestrian.

In these 35 peoples, only 66% peoples have Driving License and Other 44% peoples are driving on roads without Driving License and in these 66%, 30% peoples got their license through agent.

Taking consideration of age group, 11.5% are having age less than 18, 77% and 11.5% are from 18-30 and 31-45 age group respectively.

In these 35 peoples, 63% peoples drive two wheeler, 6% peoples drive car and 31% peoples drive both vehicles and only 23% peoples are trained by qualified instructor.

III. RESULTS

A. Results from The Road Accident Statistics of Uttarakhand

Statistics present that, in road traffic accidents, Uttarakhand has fluctuating records which vary year to year, it doesn't

show a continue pattern of increment or decrement. In 2018, there was decrement in road accidents as compared to 2017. It has to be seen that what changes come after the MV Act enforced from September 1, 2019.

B. Results from the Accident Record Analysis of Roorkee, 2019

- 1) It can be clearly seen from the analysis, two wheelers have the highest percentage and the reason are as follows:
 - Overspeeding, driving without helmet, rash driving, and sometimes passengers are more than two and upto five on two wheeler and this all happen because of poor enforcement of laws.
- 2) At the second number, commercial freight vehicles are becoming the reason for accidents. Due to overloading, these vehicles can't control their speed so that they become uncontrolled and sometimes flip due to misbalance or collide with other vehicles. During night, commercial freight and commercial passenger vehicles go from the middle of the main market which is not allowed for these vehicles.
- 3) Reason of ninety percent accidents is driver's fault i.e. rash driving in streets, drunken driving, overtaking of another vehicle. With driver's fault, there may be some other reasons but awareness of driver can control the other factors.
- 4) In Kanwar Yatra, accidents can be controlled by strictly enforcing the traffic rules.
- 5) Other main reasons for accidents in Roorkee are:
 - Expansion of highway without proper sign boards.
 - At every intersection, there are traffic signals which are not working.
 - Lack of Sign Boards and Street lights.
 - Lack of reflectors on poles and speed breakers.
 - Lack of safety walls and guard rails due to which vehicle falls into river.
- 6) Major reason for death is lack of treatment in GOLDEN HOUR. To avoid these type of consequences, Government policies should be promoted in Roorkee.

IV. RESULTS FROM SURVEY

This survey shows that there is loophole in the system. People are getting driving license without giving test which becomes a major cause of accident. Peoples prefer to learn drive from a family member rather than a qualified instructor which becomes the cause of lack of awareness. It can be clearly seen that peoples are not following the rules properly and somewhere it shows the failure of traffic police.



Fig. 5: Not Working Traffic Signal at Ramnagar



Fig. 6: Encroachment on Road



Fig. 7: Construction Material in the Middle of Road



Fig. 8: Damaged Road



Fig. 9: Expansion of NH 72 without Proper Sign Boards

V. CONCLUSION

Uttarakhand's land covers 86.07% of hilly region and 13.93% of plains. In hilly region, its narrow roads becoming the reason for accidents but in plains, road users are becoming the reason for their accidents. In Uttarakhand, total identified Black Spots are 715, there should be proper sign boards. In Roorkee, urbanization and industrialization are the reasons for traffic congestion. For reducing the traffic congestion, public transportation system should be more healthier.

Road traffic accident is a failure of Driver-Vehicle-Road-Traffic Law system. For reducing the accidents, we have to work on '3E Formula' i.e. Education, Engineering and Enforcement of laws.

Education- Peoples are unable to identify road signs due to lack of awareness so Road Safety Education is important for every road user. Various booklets are available at Uttarakhand Traffic Police website related to traffic rules and road safety. These types of booklets should be a compulsory subject of school curriculum like Environmental Studies.

Engineering- Road conditions of Roorkee are not so good due to faulty design of roads and for improving the road conditions, there should not be any compromise with road design.

Enforcing of Laws- Traffic rules and laws should be enforced and followed strictly.

REFERENCES

- [1] Global Status Report on Road Safety 2018, Presented by World Health Organization in 2018.
- [2] Population of Roorkee given by Census Organization of India, 2011 Available at: <https://www.census2011.co.in/census/city/27-roorkee.html>
- [3] Estimated Population of Roorkee given by India Population 2019, Available at: <https://indiapopulation2019.com/population-of-roorkee-2019.html>
- [4] District wise Road Accident Data of Uttarakhand in 2018, Available at: <https://uttarakhandpolice.uk.gov.in/pages/display/325-road-accident-data>

- [5] Road Accident Data of Uttarakhand State, Available at: <https://transport.uk.gov.in/pages/view/70/76-road-accident-data-in-uttarakhand-state>
- [6] Road Safety Questionnaire used for Data Collection, Available at: https://docs.google.com/forms/d/e/1FAIpQLSd32SLEt84sX6s4NhwXcqBLd-KM08Y1eYrlXkWoVITKE4wiHA/viewform?usp=sf_link
- [7] Various Booklets related to Traffic Rules and Road Safety, Available at: <http://uttarakhandtraffic.com/>