



ROAD ACCIDENT ANALYSIS IN RAJASTHAN

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Abstract: The main aim of this paper is to analyse the road accidents in Rajasthan state at divisional level. Analysis shows the distribution of road accidental deaths and injuries in Rajasthan. Moreover, road accidents are relatively higher in extreme weather and during working hours. Analysis of road accident scenario at division and districts level shows that there is a huge variation in fatality risk across. Fatality risk in 1 divisional out of 7 is higher than the all Rajasthan average. This paper present reviews on the road accident analysis in Rajasthan. In order to applaud the scale of the accident tragedy in the state, it is common exercise to relate the number of road accidents (deaths and injuries) in districts and division of Rajasthan.

I. INTRODUCTION

Road traffic accident is now representing the eighth leading cause of death globally. In every 24 seconds a person died due to the road accident. Due to the road accidents nearly 3700 people died every day this is according to World Health organization. By road accident, nearly 1.35 million people die every year and up to 50 million are injured in the world. And the fact is, every one of those deaths and injuries can be preventable. There is the highest overall number of road deaths in India.

Due to increasing motor vehicle registrations and population, traffic volume leads to an increase in fatalities per capita. In India, the motor vehicle population is growing with the economic and population growth. Because of the expansion in motorization the road network facing the problem of road accidents. According to the different types of studies already have been done to linking road traffic fatalities with vehicle ownership, regional population and economic growth.

This paper presents the use of data of road accidents to evaluate the effectiveness of countermeasures and to compare the safety of different districts of Rajasthan state in different periods of time. During this period risk factors in different districts have been compared. It is observed that few works have been carried out on statistical analysis of accidents on National Highways. Various indices to measure fatalities also have been applied on National Highways of the state. Secondary data of population, registered vehicles and road accidents have been obtained from various international organization, government departments of India & government departments of Rajasthan.

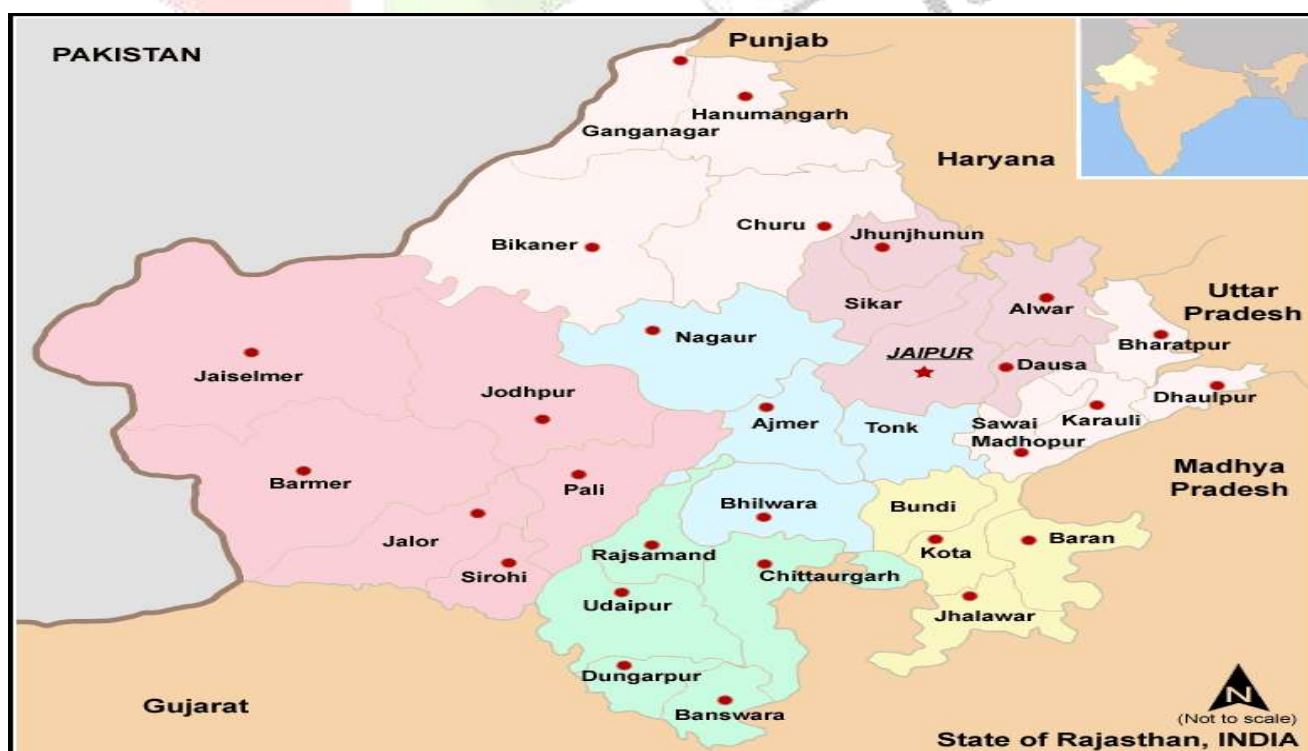


figure: Rajasthan map

II. RESEARCH ANALYSIS

Aim: - To find out accident data or analysis (death & injuries) in Rajasthan

Table1 showing comparison in no. of road accidents, no. of deaths and no. of injuries in Rajasthan from year 2011 to year 2018

Year	No. Of Road Accidents	Percentage increment Over Last Year	No. Of Deaths in Road Accidents	Percentage increment Over Last Year	No. Of Injuries in Road Accidents	Percentage increment over Last Year
2011	23245	-4.35	9232	0.75	28666	-7.63
2012	22969	-1.19	9528	3.21	28135	-1.85
2013	23592	2.71	9724	2.06	27424	-2.53
2014	24628	4.39	10289	5.81	27453	0.11
2015	24072	-2.26	10510	2.15	26153	-4.74
2016	23066	-4.18	10465	-0.43	24103	-7.84
2017	22112	-4.13	10444	-0.002	22071	-8.4
2018	21741	-1.68	10320	-1.19	21545	-2.38

Source-Government of Rajasthan (Transport Department)

Table2 Showing different types of vehicles involved in Road accidents in Rajasthan

Type of vehicles	2011	2012	2013	2014	2015	2016	2017	2018
Bus	1,979	1,857	1,874	1,820	1,586	1,490	1534	1304
Truck	4,625	4,571	4,557	4,511	4,317	3,805	3608	3460
Car/Jeep	6,588	6,484	6,587	6,888	7,329	7,389	7206	7272
Two-Wheeler	4,891	4,968	5,249	5,955	5,865	5,736	5456	5406
Other Vehicles	5,162	5,089	5,325	5,454	4,975	4,646	4308	4299
Total	23,245	22,969	23,592	24,628	24,072	23,066	22112	21741

Source-Government of Rajasthan (Transport Department)

Table3 showing comparison in no. of road accidents and cause of accident in Rajasthan from year 2011 to year 2018

Cause of Accident	2011	2012	2013	2014	2015	2016	2017	2018
Fault of driver	22,576	21,939	22,120	23,637	23,018	22,009	19393	19414
Fault of passengers	5	16	3	4	0	10	25	33
Bad road conditions	282	209	203	170	75	30	298	178
Bad weather	14	30	76	23	22	0	102	156
Mech. Def. in Vehicles	16	28	72	74	94	72	71	112
Cattle & Cattle cart	0	4	14	31	43	42	85	185
Others	352	743	1107	689	820	903	2138	1663
Total	23,245	22969	23,592	24,628	24,072	23,066	22112	21741

Source-Government of Rajasthan (Transport Department)

Table showing the cause of accidents and no. of accidents involved with that cause.

- This data shows the mindset and undisciplined manner of road users in Rajasthan as well as in India.
- This data shows that maximum accidents take place due to fault of vehicle's driver or road user. And these phenomena clearly show that why we lost many persons in road accidents

Road Accidents at National Highways in Rajasthan:

- In Rajasthan 6020 no. of accidents take place on National Highways in only 2018 and about 3458 no. of persons died in these road accidents.
- If we talk about 2017 than the data specify another clear vision than 6284 no. of persons lost their life in 3764 no. of road accidents on National Highways in Rajasthan.
- Let's talk about 2016 than 6576 no. of road accidents take place and 3734 persons lost their life in these road accidents.
- Accidents at National Highways are more dangerous because the speed of vehicles is very high on National Highways.
- Table shows the no. of road accidents and no. of persons killed in those accidents at NH from year 2011 to 2018.

Table4 showing no. of road accidents at national highways and no. of persons died in those accidents from year 2011 to year 2018

Source-Government of Rajasthan (Transport Department)

Year	No. of Road Accidents at NH in Rajasthan	No. of person Died in Road Accidents at NH in Rajasthan
2011	7273	3493
2012	6916	3537
2013	6704	3403
2014	6991	3598
2015	6821	3709
2016	6576	3737
2017	6284	3764
2018	6020	3458

Comparison in No. Of Road Accident in Divisions:

- This Comparison shows that Jaipur division have highest no. of road accidents in Rajasthan from last three years.
- But it also shows that in 2017 road accidents in Jaipur division decreases 5.5% as compare to 2016.
- It also shows that Bikaner division have least no. of road accidents in Rajasthan.
- Only Three divisions Udaipur, Bikaner & Kota have increased in no. of road accidents from 2017 to 2018.

Table 6 comparison between no. of road accidents in divisions of Rajasthan

Division	No. of Road Accident in 2011	No. of Road Accident in 2012	No. of Road Accident in 2013	No. of Road Accident in 2014	No. of Road Accident in 2015	No. of Road Accident in 2016	No. of Road Accident in 2017	No. of Road Accident in 2018
Jaipur	7648	7471	7767	8,061	8,061	7,809	7,373	6880
Jodhpur	3063	3082	3038	3,189	3,189	2,984	3,002	2890
Ajmer	3377	3207	3344	3,434	3,434	3,324	3,184	3012
Udaipur	3315	3408	3504	3,520	3,520	3,449	3,332	3441
Bikaner	1722	1609	1759	1,551	1,551	1,514	1344	1408
Kota	2549	2651	2601	2,667	2,667	2,427	2,220	2221
Bharatpur	1571	1541	1479	1,652	1,652	1,560	1,657	1569

Source - Rajasthan transport department

Comparison in No. Of Deaths in Road Accident in Divisions:

- This Comparison shows that Jaipur division have highest no. of deaths in road accidents in Rajasthan from last three years.
- But it also shows that in 2017 no. of deaths in road accidents in Jaipur division decreases 2.5% as compare to 2016.
- Jodhpur, Ajmer & Udaipur divisions have medium no. of deaths in road accident in last three years.
- It also shows that Kota & Bharatpur division have least no. of deaths in road accidents in Rajasthan.
- But it also shows that Bharatpur have increased 12.5% in no. of deaths in road accidents from 2016 to 2017.

Table 7 comparison between no. of deaths inroad accidents in divisions of Rajasthan

Division	No. of Deaths in Road Accident in 2011	No. of Deaths in Road Accident in 2012	No. of Deaths in Road Accident in 2013	No. of Deaths in Road Accident in 2014	No. of Deaths in Road Accident in 2015	No. of Deaths in Road Accident in 2016	No. of Deaths in Road Accident in 2017	No. of Deaths in Road Accident in 2018
Jaipur	2766	2558	2872	2721	3,226	3,038	2,950	2727
Jodhpur	1547	1685	1669	1754	1,816	1,763	1,823	1695
Ajmer	1394	1464	1484	1608	1,555	1,722	1,678	1602
Udaipur	1259	1316	1396	1419	1,472	1,525	1,507	1664
Bikaner	971	1008	1021	1047	964	936	893	957
Kota	640	661	646	752	770	709	724	721
Bharatpur	655	676	636	677	709	772	869	780

Source-Government of Rajasthan (Transport Department)

III. CONCLUSION

The event analysis obtained from crash investigation and reconstruction can be applied to determine the possible contributory factors in the fatal road crash. These contributory factors are generalized according to the available information of the system components. The event tree analysis mainly deals with what were the events and factors that came to the drivers' attention and decision making to influence their behavior during driving in the pre-crash stage. The factors found based on the event analysis can be concluded as follows:

a) Human Factor

Cognitive behavior particularly judgment and decision-making based on analytical aspects of reaction were found to be important particularly in this case. This behavior was highly dependent on the inaccurate risk assessment. Both drivers had other causes which influenced them to take the risk.

Sensorimotor behavior includes experiences related to sensory and motor channels. This is another aspect of human behavior, which highly contributes to crashes. This effect was found to be important in this case where evasive action (i.e. braking action) was perceived later than required. In this case, the pick-up driver could not react in an appropriate time to avoid collision when there was a mistake in passing maneuver happened by the bus.

b) Road and Environment Factor

It was found to have a potential effect on road crashes. The visibility, geometry, lane markings, surface condition, and street light facilities have a potential influence on the drivers to perceive and react in a dynamic driving condition. The interaction of road and environment is quite complex with driving behavior and performance. In this case, absence of street lights, unclear lane marking was found to increase the risk of crash and its severity.

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