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Research Article

Analysis of Road Traffic Accident Rates in Kerala from 2011 to 2020

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Abstract:

This research aims to model and analyze road traffic accident rates in Kerala over the ten seven years, from 2011 to 2020. We conducted this research in order to draw attention to the severe issue of the ever-increasing tendency of road accidents in Kerala, despite the fact that the government has adopted numerous rules and regulations. During the study period, the researcher conducted personal interviews with a number of vehicle drivers and pedestrians, and included their perspectives and feelings in the conclusion section. Accidents and fatalities are on the rise, maybe as a result of rapid growth in motorization without appropriate improvements in road safety techniques. The researcher employed Trend analysis to conduct this research and evaluate the results. This article uses Time Series Models such as Auto-Regressive Integrated Moving Average (ARIMA) and Exponential Smoothing, as well as the software package SPSS, to anticipate annual traffic accident rates in Kerala.

Keywords: Traffic accidents, safety Measures, Accident rates.

1. Introduction

Numerous Indian states are experiencing challenges with street traffic, such as slow moving traffic, increasing mishap rates in recent years, and so on. Because of the growing population, the situation is becoming increasingly dire. In India, along with population growth, several variables, such as improving fiscal situation, have resulted in an increase in the number of vehicles. As a result, there is an increase in the frequency of street incidents and the resulting fatalities, which is becoming a growing social and economic burden. Victims are responsible for both actual and intangible costs. It is critical to address this problem right now. According to India's road accident statistics, more than a third of the victims are aged twenty-five to forty. As a result, our country is losing a group of energetic individuals who can contribute to the country's growth and prosperity. The situation in Kerala, on the other hand, is far worse. As a result, the subject of how to lessen the number and severity of disasters is still open. Approaching safety and collision concerns from the ground up is a powerful strategy. We must continue to look for and work toward a lasting cure. Those short-term techniques will produce results at first, but they will be ineffective in the long run. So, in order to deal with the problem, a thorough examination of the situation is required, as well as the development and implementation of effective and long-term solutions. However, due to a variety of other circumstances, the numbers finally increased once more. Our goal is to highlight the seriousness of the situation and to propose ideas or plans for a better future. In Kerala, the ongoing pattern is also

manifesting itself in the form of street mishaps. This paper is geared toward examining the patterns, examples, and magnitude of streetcar crashes in Kerala.

2. Statement of the problem

Despite the fact that mindfulness battles on street wellbeing are yielding results, the state had a higher number of road accidents in 2016 compared to the previous year, as evidenced by police data. While 39,420 lives were lost on the streets a year ago, compared to 4,287 in 2016, the number of people injured in street mishaps also increased to 39,420 from 38,470 in 2017 to 2021. In traffic accidents from 2011 to 2021, a total of 1, 91,573 persons suffered severe injuries. Because of the formulation and execution of street security improvement programmes in the investigation zone, it might be considered as adding to the comprehensive and formative methodology.

3. Objectives of the Research

1. From 2011 through 2020, the total number of traffic accidents, the number of people injured in Kerala is studied.
2. To investigate the number of traffic accidents in Kerala related to the types of roads from 2011 to 2020.
3. To study the types of vehicles involved in the Accident in Kerala during the year from 2011 to 2020.
4. To study the Causes of Accident in Kerala during the year from 2011 to 2020.

4. Research Methodology and Statistical Design

This study shows a decade of 2011-20 road accidents in Kerala among all districts of the state and analysis extended up to different types of roads and types of vehicles. It spells out the large scale level investigation and utilizing auxiliary wellsprings of information in the investigation region. Employing this study inspected the systematic approach of covering a table, Mean, Standard Deviation. For analyzing (1) to (5) we have used the secondary data provided in the government website. For the years 2029 and 2020, the accident rates are dipping due to the COVID-19 restrictions and Lockdown imposed by the State Government.

5. Result Analysis

5.1 Table (1)

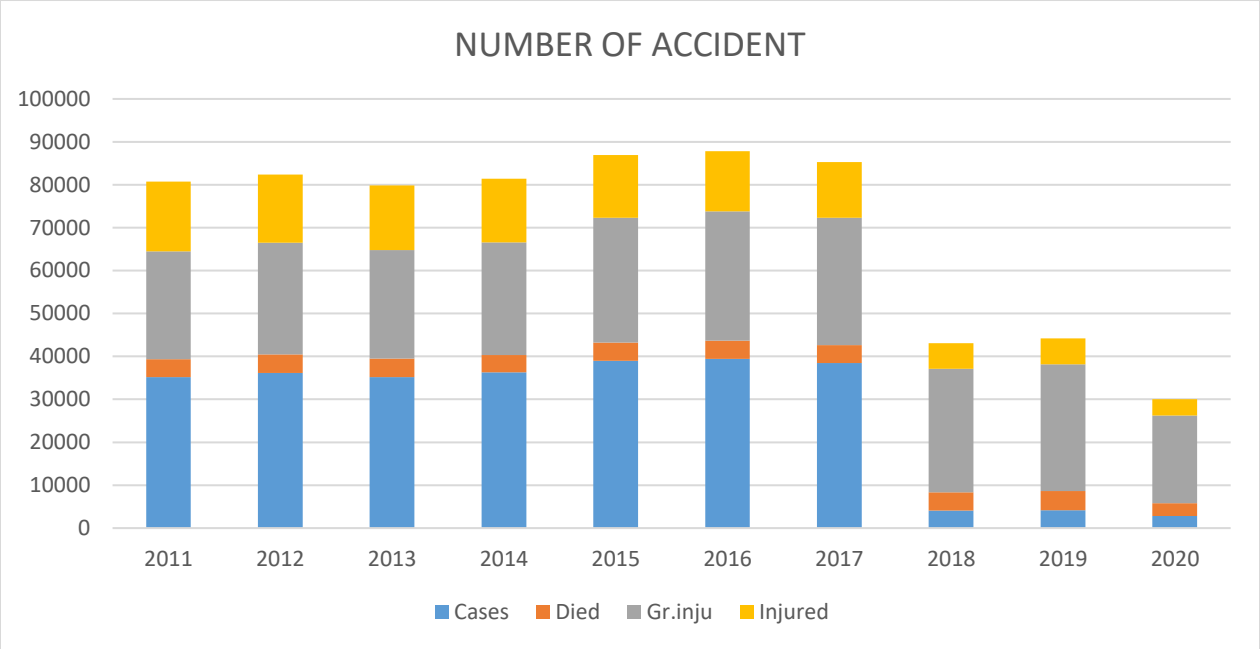
Total number of road accidents, the persons injured, the persons Died in Kerala during the period from 2011 to 2020

			NUMBER OF ACCIDENT		
S.No	**Year**	**Cases**	**Died**	**Gr.inju**	**Injured**
1	2011	35216	4145	25110	16269
2	2012	36174	4286	26034	15881
3	2013	35215	4258	25281	15065
4	2014	36282	4049	26219	14877
5	2015	39014	4196	29096	14639
6	2016	39420	4287	30100	14008

7	2017	38470	4131	29733	12938
8	2018	4069	4303	28714	5971
9	2019	4183	4440	29569	6043
10	2020	2823	2979	20393	3819
Sub Total		270866	41074	270249	119510
Average		27086.6	4107.4	27024.9	11951
Std.Dev		16215.08	411.2629	3031.803	4732.553

Figure (1)

Total number of road accidents, the persons injured, the persons Died in Kerala during the period from 2011 to 2020



5.2 Table (2)

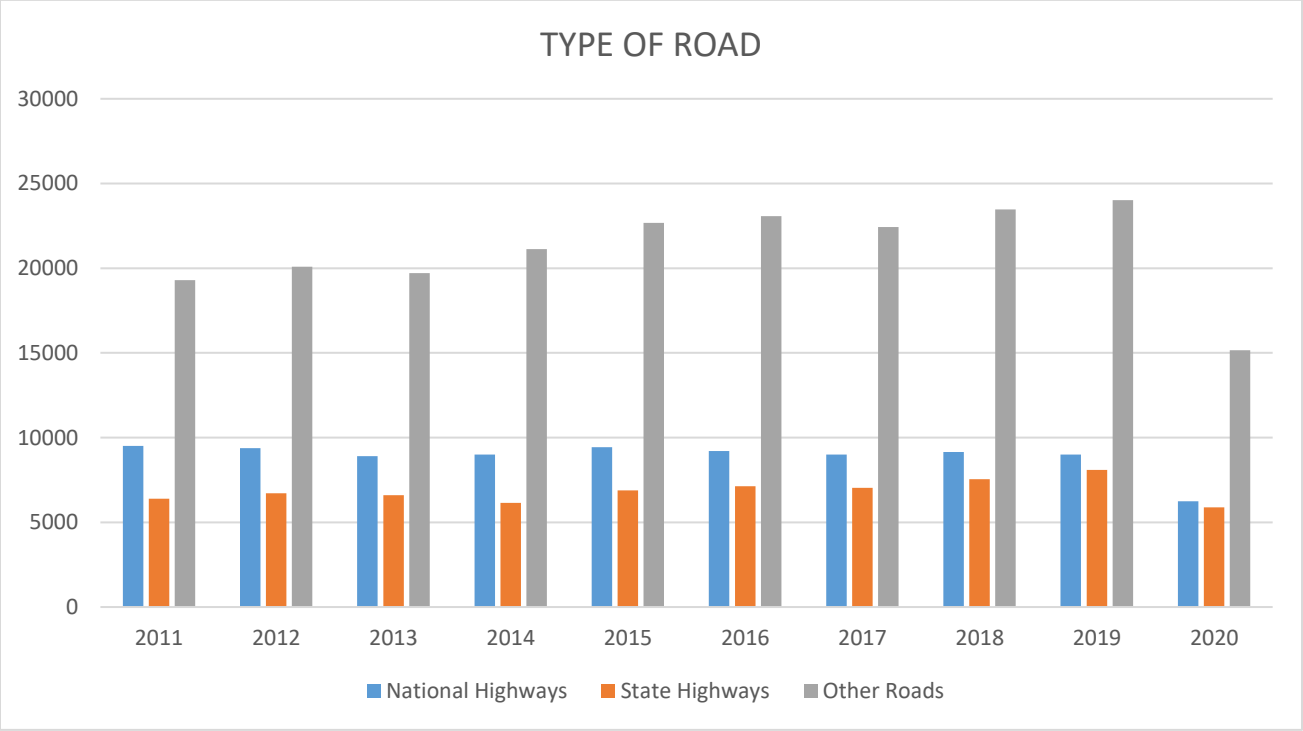
Number of road accidents in National highways, State highways and other roads during the year from 2011 to 2020

TYPE OF ROAD				
S.No	**Year**	**National Highways**	**State Highways**	**Other Roads**
1	2011	9519	6401	19296
2	2012	9375	6718	20081
3	2013	8911	6593	19711
4	2014	9006	6140	21136
5	2015	9442	6888	22684
6	2016	9209	7135	23076
7	2017	8993	7043	22434

8	2018	9161	7552	23468
9	2019	9001	8097	24013
10	2020	6247	5876	15167
Sub Total		88864	68443	211066
Average		8886.4	6844.3	21106.6
Std.Dev		950.6090679	658.7240275	2660.610381

Figure (2)

Number of road accidents in National highways, State highways and other roads during the year from 2011 to 2020



5.3 Table (3)

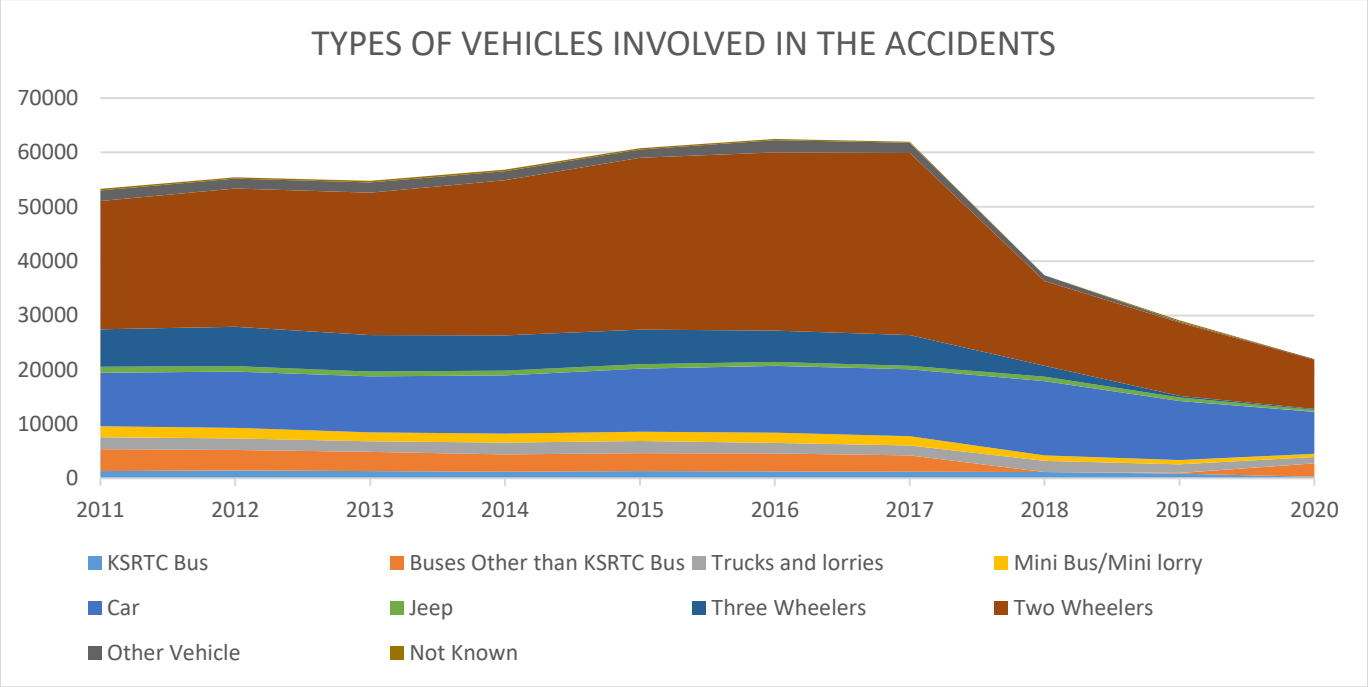
Number of road accidents regard to KSRTC Bus, cars, buses, heavy vehicles and others during the year from 2011 to 2020

TYPES OF VEHICLES INVOLVED IN THE ACCIDENTS											
S.No	**Year**	**KSRTC Bus**	**Buses Other than KSRTC**	**Trucks and lorries**	**Mini Bus/Mini lorry**	**Car**	**Jeep**	**Three Wheelers**	**Two Wheelers**	**Other Vehicle**	**Not Known**
1	2011	1368	4003	2194	1997	9871	1096	6920	23637	1908	313
2	2012	1435	3819	2072	1967	10365	1019	7222	25445	1841	252

3	2013	1332	3523	1967	1624	10344	883	6711	26236	1861	270
4	2014	1200	3208	2174	1632	10731	897	6477	28546	1702	249
5	2015	1321	3293	2275	1673	11641	800	6381	31614	1577	210
6	2016	1270	3292	1956	1892	12294	730	5761	32812	2249	229
7	2017	1252	2971	1840	1725	12295	618	5651	33534	1918	165
8	2018	1170	0	2077	1009	13665	818	2002	15600	1070	0
9	2019	862	151	1569	788	10886	607	322	13491	163	247
10	2020	296	2450	1192	596	7729	370	145	9046	117	0
Sub Total		11506	26710	19316	14903	109821	7838	47592	239961	14406	1935
Average		1150.6	2671	1931.6	1490.3	10982.1	783.8	4759.2	23996.1	1440.6	193.5
Std.Dev		338.4728	1433.814	329.1596	505.131	1624.615	213.3718	2798.922	8557.181	748.7321	108.8967

Figure (3)

Number of road accidents regard to KSRTC Bus, cars, buses, heavy vehicles and others during the year from 2011 to 2020



5.4 Table (4)

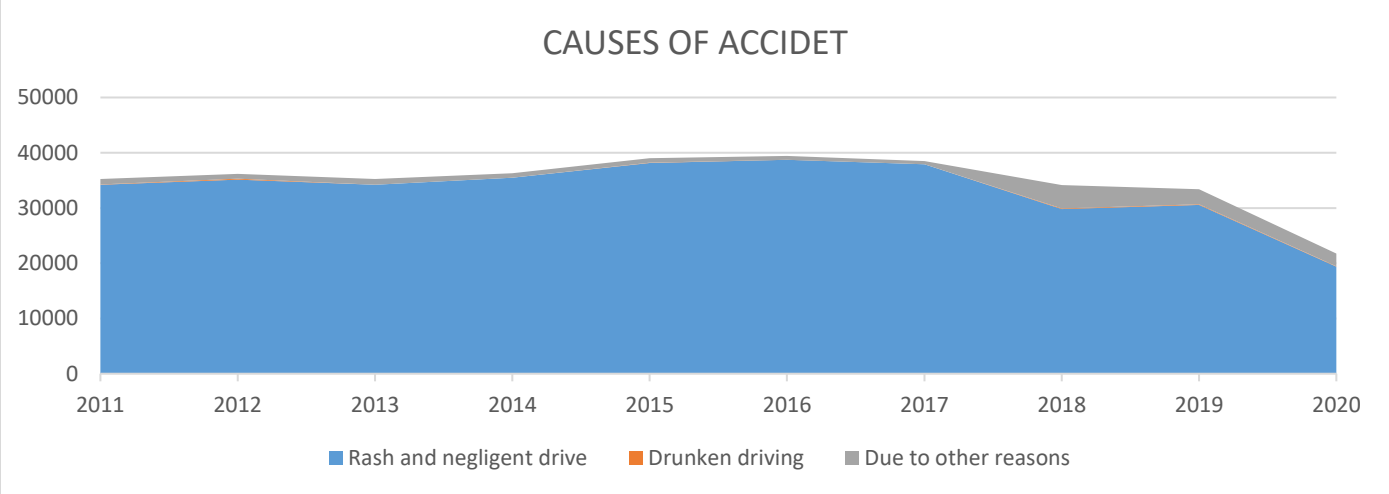
Causes of Accident during the year from 2011 to 2020

CAUSES OF ACCIDET				
S.No	**Year**	**Rash and negligent drive**	**Drunken driving**	**Due to other reasons**
1	2011	34186	101	929
2	2012	35128	168	878

3	2013	34198	28	989
4	2014	35447	20	815
5	2015	38159	27	828
6	2016	38723	16	681
7	2017	37894	23	553
8	2018	29775	157	4191
9	2019	30554	110	2729
10	2020	19364	76	2310
Sub Total		333428	726	14903
Average		33342.8	72.6	1490.3
Std.Dev		5752.546852	58.63294485	1195.803129

Figure (4)

Causes of Accident during the year from 2011 to 2020



5.4 Table (5)

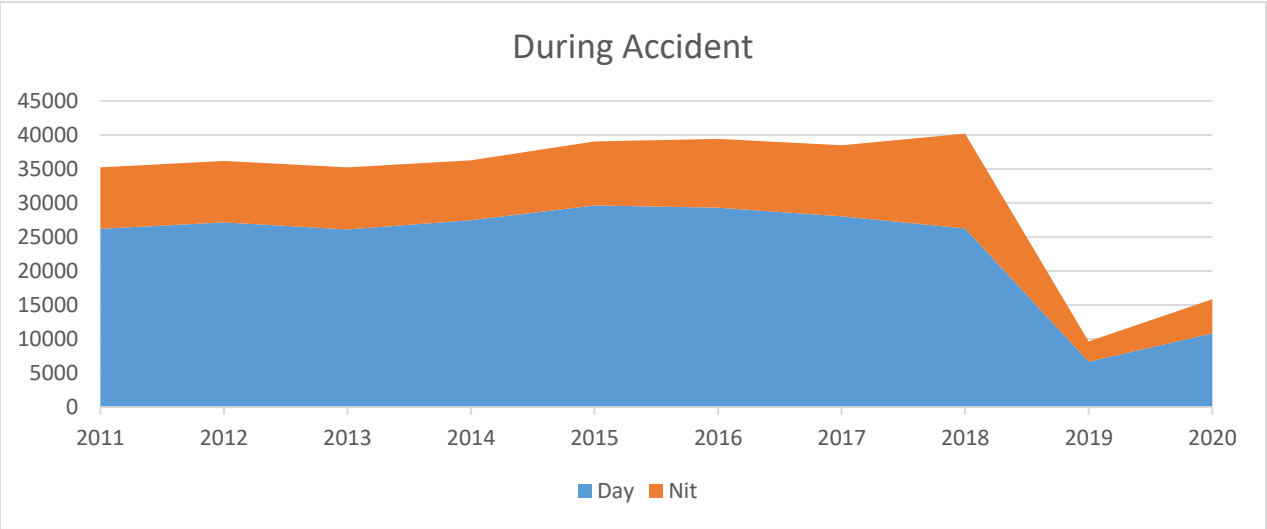
Time during Accident in the year from 2011 to 2020

DURING			
S.No	**Year**	**Day**	**Nit**
1	2011	26202	9014
2	2012	27145	9029
3	2013	26104	9111
4	2014	27477	8805
5	2015	29624	9390
6	2016	29322	10098
7	2017	28014	10456
8	2018	26263	13918
9	2019	6676	2987
10	2020	10812	5036

Sub Total	237639	87844
Average	23763.9	8784.4
Std.Dev	8068.66	2964.988

Figure (5)

Time during Accident in the year from 2011 to 2020



6. Conclusions

The following conclusions can be drawn from the foregoing findings:

- The figures for the number of accidents and fatalities are consistently increasing. This may be due to rapid expansion in motorization without adequate improvement in road safety.
- Accident rates are very low in National highway compared to other roads.
- Motorcycles/Scooters account for a large proportion of road traffic accidents. Driving without helmets causes serious injuries while traffic crashes.
- For the years 2029 and 2020, the accident rates are dipping due to the COVID-19 restrictions and Lockdown imposed by the State Government.

7. Suggestions

1. Follow advisory speed limits.
2. Be vigilant to identify and choose low-risk modes of transportation.
3. Give preference to pedestrians and children while crossing the road.
4. Ensure the use of helmets while travelling in scooters.
5. Ensure the use of seat belts in cars.
6. Realize road safety is a basic right and be aware of what is our duty to avoid crashes in road.

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