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Research Article

The Social and Economic Impacts of Increasing Road Accidents in Kerala

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ABSTRACT

The state of Kerala, known for its advanced social indicators, faces a growing challenge due to the increase in road accidents. This research explores the social and economic impacts of road accidents in Kerala, highlighting the trends, contributing factors, and the broader implications on the state's economy and society. The study uses a mixed-method approach, analyzing secondary data from government reports and surveys. The findings indicate a substantial social burden, including loss of life, injuries, and psychological trauma, alongside economic impacts such as healthcare costs, productivity loss, and strain on public resources. Recommendations for policy interventions are proposed to mitigate these impacts.

Keywords: Road Accident Severity, Golden Hour, Drunk Driving, Accident Density, Accident Rate.

Introduction

Road accidents are one of the leading causes of death, injury, and disability worldwide, including in both developed and developing countries. With a broad estimate, every minute, two people are killed and 95 people are severely injured or permanently disabled in traffic accidents worldwide. Traffic accident-related deaths and injuries result in not only substantial economic losses but also serious physical and mental suffering.

Developing countries are significantly more affected by traffic than developed countries. According to World Health Organization (WHO) data, more than 90% of road traffic fatalities occur in low- and middle-income nations. Asia and Africa have the greatest incidence of road traffic injuries and deaths. Even in high-income countries, those with lower socioeconomic status are more likely to be involved in traffic accidents. People aged 15 to 44 years account for 48% of global road traffic fatalities. Furthermore, the handicap load in this age group accounts for 60% of all traffic accidents. The costs and implications of these losses are substantial. Three-quarters of all impoverished families who lost a relative to a traffic fatality reported a drop in their level of living, and 61% reported having to borrow money to cover expenditures after their loss. According to the World Bank, road traffic injuries cost developing nations between 1% and 2% of their GDP, or twice the total amount of development aid they receive globally (WHO – Global Status Report on Road Safety 2018).

In India, around 150,000 people die every year in road accidents. According to the National Crime Records Bureau in every minute, the country is facing a serious road accident, and every four minutes a person dies in a road accident. Two-wheelers account for 25% of total road accident deaths in India. On an average of 1214 road crashes occur every day in India. 20 children under the age of 14 die every day due to road crashes in the country. 377 people die every day, equivalent to a jumbo jet crashing every day. Tamil Nadu is the state with a maximum number of road crash injuries while Uttar Pradesh is the state with a maximum number of death.

More than 16,000 people have lost their lives on the roads of Kerala over the past four years. On an average of 42000 people are injured every year on Kerala roads. In Kerala, road accidents have touched an all-time high during the last six years. Alarmingly, people - mainly between the age group of 15 and 45 - are the majority of the victims of road accidents in Kerala. Of this 80% are teens, Speeding and violations of rules by two-wheeler riders and car drivers are the major reasons for road accidents.

Objectives of the Study

1. To analyze the trend of road accidents in Kerala over the past decade.
2. To assess the social impact of road accidents, including loss of life, injuries, and psychological effects.
3. To evaluate the economic consequences, focusing on healthcare costs, productivity losses, and infrastructure damages.
4. To propose recommendations for improving road safety and reducing the socio-economic burden.

Methodology

This article adopts a descriptive and analytical approach. Secondary data sources include government publications, reports from the Ministry of Road Transport and Highways (MORTH), Kerala Police, and health department figures. A literature review was undertaken to establish the theoretical backdrop for road accidents and their socioeconomic consequences. Statistical analysis was utilized to identify trends and determine the magnitude of economic losses.

Review of Literature

There is extensive literature in the area of fatalities related to traffic. We first present the research articles from Western Countries and then discuss those from India, as the vehicle types and traffic conditions are significantly different in both contexts.

From 1994 to 2005, David Clarke examined a sample of 1,185 fatal accidents in ten UK police jurisdictions. They demonstrated that excessive speeding and drunk driving, in which the drivers' blood alcohol content was higher than allowed, were the main causes of collisions. He discovered that most accidents involving young drivers occur when they lose control on bends or curves, usually at night in rural locations and/or while they are driving for "leisure." These collisions demonstrate significant degrees of irresponsibility, speeding, and alcohol use.

Using panel data from 1963-99 for 88 countries, Kopits and Cropper investigate how economic growth affects the death rate from traffic fatalities, as well as the number of deaths per motor vehicle and the motorization rate (vehicles/population). The correlation between the motor vehicle fatality rate and per capita income initially rises before peaking and then falling. This is due to the fact that the number of motor cars is growing faster than the number of motor vehicle fatalities at low-income levels. The opposite happens at higher income levels. The number of road deaths worldwide is expected to increase by almost 66% over the next 20 years, according to projections of future traffic fatalities. This figure, however, represents varying rates of change across the globe: a roughly 28% decrease in deaths in high-income nations compared to an over 92% increase in China and a 147% increase in India.

In the Indian context, Mohan and Bawa (1985) attempted to understand fatal crash patterns in Delhi in the 1980s. The results of the study indicated that fatality patterns in Delhi were different from those in highly industrialized countries. Pedestrians, two-wheeler riders, and bus commuters comprised 80 percent of the fatalities while motor-vehicle occupants comprised a small minority. The authors proposed some short-term and long-term safety countermeasures for Delhi which were significantly different from those in more industrialized high-income countries.

Sood. S, Department of Surgery, University College of Medical Sciences, Delhi, India (1988) studied the different factors influencing the fatality of injury among two-wheeler motor accidents. One key observation was that the helmet users had a much lower incidence and severity of head injury than the riders who did not use helmets. Among 1,231 two-wheeler accidents, 77 percent of the victims were in the age group of 18–44 years, and the accident rate among males (83 percent) was higher than those among females (17 percent). They further concluded that the highest number of accidents occurred at a certain time of the day (6 p.m.–10 p.m.).

Road Accidents in India and the World – An Overview

Every year, more than 1.25 million people worldwide are killed as a result of road traffic accidents. Between 20 and 50 million more people sustain nonfatal injuries, with many becoming disabled as a result of their injuries. Individuals, families, and nations as a whole suffer significant economic losses as a result of road traffic injuries. These losses include the cost of treatment as well as lost productivity for individuals who are dead or crippled as a result of their injuries, as well as family members who must take time from work or school to care for them. Road traffic accidents cost most countries 3% of their GDP.

Road accidents are caused by a combination of factors, including the length of the road network, vehicle population, human population, and adherence to/enforcement of road safety standards, among others. Road accidents involve injuries, fatalities, disability, and hospitalization, resulting in significant socioeconomic consequences across the country.

Analysis of Data – Road Accidents in Kerala from 2010 To 2017

In 2017, there were 38470 road crashes, which resulted in 4131 deaths and left 42671 people injured. Kerala is the state with the fifth highest number of road crash cases in India. The total number of injured per lakh population is also high at 123.5.

Table No. 1 Road Accident Statistics of Kerala from 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Crashes	35082	35216	36174	35215	36282	39014	39420	38470
Injured	41473	41379	41915	40346	41096	43735	44108	42671
Fatalities	3950	4145	4286	4258	4049	4196	4287	4131
Share of Total Fatalities	3	2.9	3.1	3.1	2.9	2.9	2.8	2.8
Share in total Road Crashes	7.1	6.9	7.3	7.2	7.4	7.8	8.2	8.1
Total person injured/ Lakh population	114	115.9	116.8	115.2	116.6	123.3	123.6	123.2

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

In 2016, Kerala was the Indian state with the highest number of grievous injury crashes at 27263, which implies that 22.5% of the total grievous injury crashes in India occurred in Kerala alone. Consequently, it was also the state with the highest number of grievously injured persons in India (30,100). It was also the state with the highest number of road crashes in rainy weather (6902). The percentage share of Kerala in total road crashes is 8.2% and in total road crash fatalities is 2.8%. Since 2013, Kerala has consistently been the state with the highest number of injured per lakh population. The severity of road crashes in Kerala (Road Accident Severity = Person killed/100 accidents) has increased marginally since 2015.

Table No. 2 Road Crash Severity Statistics of Kerala

	2013	**2014**	**2015**	**2016**	**2017**
Road Crash Severity	12.1	11.2	10.8	10.9	11.2

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

Out of the total of 38470 occurrences of road crashes in 2017, 16036 occurred on National and State Highways, resulting in 2146 deaths out of a total of 4131 deaths in Kerala.

Table No. 3 Road wise Statistics of Accidents in Kerala 2017

	Cases	**Injured**	**Fatalities**
National Highways	**8993**	**9990**	**1309**
State Highways	**7043**	**7913**	**837**
Total	**16036**	**17903**	**2146**

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

In 2016, Kerala was the state with the second-highest number of bus crashes in India (5519). Mode of transport-wise number or road crash deaths in Kerala:

Table No. 4 Road Accidents in Kerala 2016

Mode of Transport	**Road Crashes**	**Fatalities**
Motor Cycle/Scooter	**13164**	**1280**
Moped-Scooty	**54**	**13**
Bus	**5519**	**852**
Motor Car	**5981**	**741**
Taxi	**1856**	**182**
Truck/Lorry	**2509**	**454**
Tempo	**2370**	**268**

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

Table No. 5 Cause-wise distribution of road crashes in Kerala 2016

Causes of Road Crash	Crashes	Injured	Fatalities
Rash driving	34062	38823	3300
Drunk driving	133	120	7
Asleep/Fatigued	61	43	27
Using Mobile phone	1	1	0
Overtaking	2175	1391	162

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

Table No. 6 Road Crash Statistics Different Cities in Kerala

	Kannur	Kochi	Kollam	Kozhikode	Malappuram	Thrissur	Thiruvananthapuram
Fatal Crashes	47	161	194	138	376	116	177
Total Crashes	504	2573	1677	1542	2738	1357	2453
Total Persons Injured	660	2595	1688	1681	3264	1585	2994
Total Persons Killed	52	169	207	145	402	128	180
Accident Severity	10.3	6.6	12.3	9.4	14.7	7.3	9.4

Source: Data Published by the Official Web portal of Kerala Police: keralapolice.gov.in

Factors Contributing to the Increase in Road Accidents in Kerala

Kerala, known for its lush landscapes and vibrant culture, faces a disturbing rise in road accidents. Several critical factors contribute to this alarming trend. The majority of accidents happened during peak hours, that is between 12 and 18 hours and most victims were between 25 and 40 years of age. The most common cause of the accident was rash driving and increased traffic congestion. The majority of accidents occurred in the blind curves. The rapid increase in vehicle population, driven by rising incomes and urbanization, leads to congestion on already crowded roads. This surge in vehicles exacerbates the potential for collisions as drivers navigate through tighter spaces. Inadequate road infrastructure presents significant challenges. Many roads lack proper signage, traffic lights, and pedestrian crossings, creating confusion and increasing the likelihood of accidents. Poor maintenance of roads, characterized by potholes and uneven surfaces, further heightens the risk for motorists (Beevi N, Manju L, Jose R, Bindu SA, Haran JC, 2015).

Driver behaviour plays a crucial role. High instances of reckless driving, such as overspeeding and frequent use of mobile devices while driving, can lead to grave consequences. The cultural acceptance of violation of traffic rules, coupled with a lack of stringent enforcement, exacerbates the issue. Environmental conditions, such as heavy monsoons, can impair visibility and road conditions, leading to an uptick in accidents. Addressing these factors through improved infrastructure, stricter traffic regulations, and heightened public awareness about road safety is essential for curbing accidents in Kerala (Manu,Thangamani & Amirsha 2018).

Social Impacts of Road Accidents

Increased traffic accidents in Kerala have serious social consequences, particularly for the younger generation. From 2010 to 2018, there were 186, 375 documented accidents, resulting in 19, 468 fatalities, with people aged 18 to 45 accounting for around 60.5% of deaths. This tendency not only causes deaths, but it also puts a burden on healthcare resources and has an economic impact on families. This increase in accidents is due to increased vehicle density and traffic offenses, emphasizing the importance of improved road safety measures and public awareness efforts. The significant social consequences of traffic accidents can be stated as follows.

Road accidents are a leading cause of death among young adults in Kerala. According to the Kerala Health Department, road accidents cause more fatalities than communicable diseases. The loss of life affects not just the immediate family but also the community, causing emotional and psychological distress. Non-fatal accidents often result in severe injuries, leading to disabilities. These injuries place a heavy burden on families, requiring long-term care and rehabilitation. Additionally, victims and their families often experience psychological trauma, including depression and post-traumatic stress disorder (PTSD). The death or disability of a family member, especially if they are the primary earner, can have devastating effects. It can push families into financial instability and poverty, impacting children's education and the overall well-being of the household (Wim Wijnem, 2013) .

Economic Impacts of Road Accidents

The economic implications of road accidents in Kerala are significant, affecting both direct and indirect aspects of the economy. The cost of emergency medical services, surgeries, and rehabilitation for accident victims imposes a substantial burden on the healthcare system. Public hospitals, which often provide care to accident victims, experience strain on resources and personnel. Accidents frequently involve individuals in the productive age group (18-45 years). The loss of skilled labour and the inability of injured individuals to return to work contribute to a decline in productivity. According to a study by the National Transportation Planning and Research Centre (NATPAC), road accidents result in a loss of approximately 2% of the state's GDP annually.

The government incurs substantial costs in road accident management, including emergency response services, road repairs, and legal proceedings. This diverts public funds from other critical areas such as education and infrastructure development. Insurance claims related to road accidents have been rising, leading to increased premiums for vehicle owners. Legal disputes and compensations also add to the economic burden, affecting both the public and private sectors (Maen Ghadi, 2018).

Findings of The Study

One person is killed every two hours in Kerala, and every hour there are 5 crashes that occurs in Kerala. This study reveals that more than 10 persons are killed per 100 accidents in Kerala. An analysis of the 33,088 road accidents has shown that rash driving accounted for 32,055 accidents, drunk driving 182, and other reasons for 851. The major causes of the high rate of road accidents from 6 pm to 8 pm are rash driving and disobeying traffic rules. Driving without a helmet and nonbearing of seat belt are the major causes of teenage death and young people's deaths in accident

An analysis of the vehicles involved revealed that 19,648 were bikes or scooters, 9,270 were motorcars, 4,117 auto rickshaws, 2,559 private stage carriers, 2,300 lorries, and 940 Kerala State Road Transport Corporation buses. As many as 368 mini-buses and 670 jeeps were involved in the accidents. In Kerala, 86% of road accidents are due to the fault of the driver. This shows that if we obey traffic rules, drive at moderate speed, and follow all the safety directions from the motor vehicle department, we can avoid almost 86% of accidents in Kerala.

About 1500 people die every year in Kerala due to two-wheeler road accidents. Out of this, 60 % of victims are in the age group of 18 to 40 years. Wearing a motorcycle helmet correctly can reduce the risk of death by almost 40% and the risk of severe injury by over 70%. Wearing a seatbelt reduces the risk of a fatality among front-seat passengers by 40–50% and of rear-seat passengers by between 25–75%. Overspeeding, rash driving or dangerous driving is a significant cause of accidents in Kerala. An increase in speed is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash. Narrow roads and frequent traffic jams in Kerala compel drivers to violate traffic rules. The only solution for this vicious circle is to construct adequate quality roads for the growing needs of the people.

From the above analysis, we can identify the main causes of road accidents in Kerala:

- Not knowing or not adopting correct driving habits.
- Increasing number of New generation vehicles, especially Two wheelers.
- Aggressive driving behavior of Heavy vehicle drivers especially Private Buses & Tipper Lorries.
- Drivers sleeping while driving especially of Heavy vehicles & light motor vehicles after midnight due to fatigue and other reasons.
- Over speeding.
- Bad condition of Roads and absence of different lanes.
- Driver /Rider's ignorance of Road conditions, Road signs, and Environmental factors.
- Driver /Rider's ignorance or violation of Traffic Rules.
- Drunken Driving/Driving without a seat belt.
- Driving without a Helmet.

Recommendations

Road deaths and injuries in Kerala are preventable. A wide range of effective road safety interventions exist and a scientific system approach to road safety is essential to tackle the problem. This approach should address the traffic system as a whole and look into interactions between vehicles, road users, and road infrastructure to identify solutions. The accident level in Kerala can be effectively curbed by strictly enforcing the following steps.

1. Widens the existing road in accordance with the increase in vehicle density. Convert single lane to two lanes and Two lanes roads to four lanes.
2. Vehicles should have seat belts and other safety provisions like air bags.

3. Road should be well maintained with frequent of relaying of road surfaces and marking of road safety and signs.
4. Provide proper footpaths for pedestrians and pedestrian crossing at intersections.
5. Provide separate lanes for slow –moving and fast moving vehicles.
6. Issuing driving license should be based on the minimum proficiency acquired by the learners from designated driving schools.
7 Rules for compulsory wearing of helmets by two wheelers and seat belts by four wheelers must be maintained.
8 Enforce traffic rules by the concerned authority strictly.
9 Preventing haphazard parking of vehicles on busy roads and intersection to ensure free flow of traffic.
10 The importance of the "Golden Hour" in giving adequate treatment to the accident victim in saving the injured should be highlighted to both health personnel and the community.

Conclusion

33 million people, 11 million motor vehicles, narrow roads and reckless driving are the basic characteristics of Kerala's road transportation. In a state witnessing 10% annual growth in vehicles, it should take a "zero tolerance" policy toward the most common transgressions—dangerous and reckless driving; disregard for traffic rules etc. But strict implementation of traffic rules and stringent punishments alone will not solve the persisting crisis. Change in the mind set of riders and drivers and road users realizing their responsibilities alone will bring about a change. The ultimate goal is to reduce the number of accidents and fatalities. The measures to decrease the accident rates are generally divided into four groups engineering, enforcement, education, and Emergency care. More concentration should be given to implement the above road safety measures. Accident-prone stretches of different roads may be assessed by finding the Block spots in which accidents occurred frequently by the zonal officers. The mere celebration of the annual Road Safety Week during January does not serve any purpose.

The increasing rate of road accidents in Kerala poses a serious social and economic challenge. The human cost, in terms of lives lost and injuries sustained, is compounded by the economic burden on families and the state. Addressing this issue requires a comprehensive approach, involving infrastructure development, enhanced law enforcement, public awareness, and improved healthcare services. By implementing these measures, Kerala can work towards reducing the incidence of road accidents and alleviating their socio-economic impact.

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