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Impact of Road Accidents on Society and Economy in Himachal Pradesh: A Case Study of Shimla District

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Abstract: **Speedy population growth and increasing economic activities have resulted in tremendous growth in motor vehicles over the past few years in India. The public transportation system in Himachal Pradesh consists of city buses, but these do not play along all routes. Thus, the existing public transport system is not adequate and people prefer to use private mode of transportation. The growing number of private motor vehicles is one of the primary factors responsible for road accidents in Himachal Pradesh. In India, motor vehicles are growing at a faster rate than economic and population growth. Road traffic injuries are the sixth biggest cause of death in India, resulting in a greater proportion of hospitalization, disabilities and socio-economic losses among the young and middle aged. From a humanitarian perspective, there is an urgent need to reduce road deaths and injuries in developing countries like India. At the same time, a strong case should be made to reduce road-crash deaths on economic grounds alone, as accidents consume massive financial resources that countries cannot afford to lose. This study examines the impact of road accident on victims of road accidents in Himachal Pradesh.**

Index Terms **– Road Accidents, Socio-Economic, Transportation, Injuries, Victims.**

I. INTRODUCTION

Road traffic accidents contribute major part in non-communicable disease burden in India. The survivors of non-fatal road traffic accident suffer huge loss in the form of disability, loss of job, loss of daily wages. The change in attitude of family members towards victims after road accidents like negligence, blaming them for their condition and if a person is handicapped then it has additive effect on worsening his/her present and future significantly. A road accident in which death of the patient has not occurred." Road accidents are human tragedies which involve high human suffering. They impose a huge socio-economic cost in terms of untimely deaths, injuries and loss of potential income. The negative impact of road traffic accident is felt not only on individuals, their health and welfare but also on the economy.

Road traffic injuries are the eighth leading cause of death globally. In its study highlighting the larger share of Low- and Middle-Income Countries in road accident fatalities, the World Bank underscores a distinct co-relation between socio-economic status and road use patterns in low- and middle-income countries such as India. The report states that daily wage workers and those employed as casual labourers in informal activities are more prone to be defined as vulnerable as compared to workers engaged in regular activities. It is often the poor, especially male road-users of working age that constitute the vulnerable road users (VRU) in India where VRUs share road space with other less vulnerable users with their income level having a direct bearing on the mode of transportation used and resultant risk faced by them on that account. Numerous factors can be attributed to be the causative factors of road accidents and can be broadly classified into road environment factors, human factors and vehicular factors.

II. Accidents on Account of Road Environment Factors

The various road features such as straight stretches, curved roads, location of culverts, bridges, potholes etc also cause accidents. Straight road stretches, which allow for movement of vehicles at high speeds, have accounted for the highest number of accidents (64-66%) in 2018 and 2019. Categories such as curved roads, culverts, potholes and ongoing works have shown an increase in 2019 vis-à-vis the figures obtaining in 2018. Road junctions, by virtue of being traffic merging points, are theoretically prone to more accidents. However, an analysis of the data from 2019 reveals that various types of road junctions accounted for only 28% of road

accidents with 72% falling in the others category. Within the road junction categories, T junctions account for the largest share in road accidents, deaths and injuries. As regards traffic control, the largest number of accidents (92,654), deaths (28,727) and injuries (87,489) have taken place at uncontrolled crossing places in the year 2019.

III. Traffic Accident Statistics

There were 6,551 road accidents in Himachal Pradesh in three years. Of these, 1,425 accidents took place under 10 police stations, which is 21.75 per cent of the total accidents. This has been revealed in the analysis of three-year traffic accidents for the years 2020, 2021 and 2022 by the Traffic Tourist and Railway Department. DGP Sanjay Kundu said that in the police headquarters, high officials continuously brainstorm and analyze the statistics of traffic accidents.In these, 193, Nalagarh 173, Kullu 154, Amb 141, Baddi 139, Paonta Sahib 135, Balh 131, Noorpur 125, Sadar Bilaspur 125 and Theog 114 road accidents took place under police station Sadar Una.Of the total deaths in the state, 20.69 per cent took place under these police stations. The number of deaths is 562. Under Sadar Una 99, Nalagarh 83, Baddi 83 Amb 53, Kullu 53, Nurpur 50, Theog 44, Balh 40, Paonta Sahib 36 and Sadar Bilaspur 21 deaths. The total number of people injured in accidents under these 10 police stations was 1,947, which is the analysis of total accidents in the state.

IV. Ongoing Construction Works

Ongoing road and other construction work on or astride the road result in availability of restricted space to the road user. Improper road markings, lack of traffic control etc at such sites further complicates the safety environment around these construction sites.

V. Speed Breakers

Presence or absence of speed breakers are amongst a major cause of road accidents. Incorrect location, poor construction and possibility to avoid the speed breaker result in a large number of accidents.

VI. Weather Conditions

Weather impacts not just the road surface condition but also the visibility of the road user thereby increasing chances of road accidents. Heavy rain, dense fog and hail storms reduce visibility and make the road surface slippery thus posing serious risks to the road users.

VII. Poor Lighting

Lack of lighting on roads is a major cause for accidents. Dim lighting, particularly during night and in adverse weather conditions, impinges on visibility and increases the chances of road accidents.

VIII. Lack of Adequate Road Signs

Correctly placed road signs are necessary to provide road users with advance warnings about road conditions, ongoing works, Traffic Lights Police Controlled Stop Sign Flashing Signal Uncontrolled No of Accidents No of Deaths No of Injuries Road features such as turns and sharp bends etc. Absence of such road signs results in the road users being unaware of the requirement of reducing speed or taking additional care in driving.

IX. Accidents on Account of Human Factors

Violation of Traffic Rules: - Over speeding remains the major cause of road accidents in the country with almost 71% (3,19,028) accidents in 2019 occurring due to high speeds and resulting in the death of 1,01,723 (67.3% of total deaths) persons while causing injuries to another 3,26,850 (72.4% of total injuries) individuals. Lane indiscipline was the next major human factor accounting for 5.4% (27,431) of road accidents, 6.1% (9,201) of total deaths and 5.5% (24,628) of total injuries. Balance violations like drunk driving, jumping of traffic signal and use of mobile phones together accounted for 6% of total accidents and 8% of total deaths although these factors have shown an increase in 2019 from the corresponding figures of 2018 highlighting the need for stricter enforcement measures. Traffic accidents, deaths and injuries on account of other causes such as road environment, vehicular condition etc accounted for 17-18% of the total figures with the figures for 2019 showing a substantial reduction as compared to those caused by human factors.

Invalid Driving License: - Vehicles driven by untrained and unqualified drivers are a serious traffic hazard and can cause accidents, death and injuries. Though the problem is basically an enforcement issue, it must also be addressed with better facilities and opportunities for training/skilling and evaluation/ testing. While the number of accidents by owners with valid/ learner's license has shown a decline, the corresponding figure for individuals without a license has shown an increase from 8% in 2018 to 9.9% in 2019 despite a decrease from 2017 (10.4%).

No Use of Safety Devices: - Helmets and Seat Belts. While safety devices such as helmets and seat belts do not cause accidents by themselves, they are instrumental in reducing the number of fatal and grievous injuries. 29.82% (44,666) of the total road accident-related fatalities in 2019 were on account of the driver/ passenger not wearing safety helmets and indicates a callous attitude amongst the population as well as inadequate enforcement measures.

Triple Riding: - This is a major factor accounting for the large number of two-wheeler accidents. Besides being illegal, triple riding amounts to contributory negligence as it renders the vehicle unstable and more accident prone.

Distracted Driving: - A distracted driver is a motorist who diverts his or her attention from the road, usually to talk on a cell phone, talk to the passengers, send a text message or eat food or even applying makeup. Distracted driving is especially dangerous because, unlike cases of drunk driving which usually occur at night, automobile accidents caused by distracted drivers can occur at any time of the day. Teens and young adults tend to engage in cell phone tasks much more frequently, in riskier situations than adults and therefore are more likely to indulge in distracted driving.

Overcrowding of Passenger Vehicles: - Overloaded luggage and passengers beyond the mandated capacity of the vehicle are also reasons that lead to road accidents and cause fatalities and injuries. Such overloading/ overcrowding disturbs the centre of gravity of the vehicle and causes accidents due to loss of balance. Hindrance to the driver's view of the rear is also a result of overloaded passenger vehicles.

X. Accidents on Account of Vehicular Factors

Accidents in Over-Age Vehicles: - Old vehicles are relatively more prone to breakdown and malfunction and therefore require greater care and maintenance on the part of the owner. A study of the data for 2019 reveals that vehicle in the 10–15-year age range accounted for 12.5% of total accidents and 12.6% of total deaths while those above 15 years of age were involved in 11% accidents and 12.3% deaths.

Overloading: - Overloaded vehicles, those with improperly secured loads and vehicles with loads protruding beyond their body structure pose a serious hazard to themselves as well as other road users. Overloaded trucks can be the cause of accidents on account of various effects of the excess load which include bursting of tyres due to excess weight, wearing out of brakes due to excessive friction, road collapse due to extra weight, overturning/ roll-over of the vehicle due to shifting of the centre of gravity and increase/ decrease of speed/ momentum while going downhill/ uphill due to the excessive load. 7.9% of the total accidents, 9.5% of deaths and 8.2% of injuries in 2019 were attributable to overloaded vehicles.

XI. Himachal Pradesh Records Maximum Numbers of Road Accidents with Average of 3 Deaths per day According to Report

In the wake of road accidents in Himachal Pradesh, it has come to light how unsafe is the traffic movement in this hill state. Amongst three hill states in north, including Uttarakhand, Jammu and Kashmir, Himachal Pradesh recorded highest incidence of road accidents with an average of three deaths per day according to official data. According to survey conducted by traffic, tourist and railways (TTR) wing of the state quoted that around 5,503 lives were lost in over 13, 740 road accidents in the past five years. Himachal Pradesh stands at 22nd spot in the annual Road accidents report published by the ministry of road transport and highways. Annually, around 3,000 people lose their lives in road mishaps in Himachal Pradesh, while 105 were killed in around 200 accidents reported in the state per month.

XII. Probable causes of unsafe traffic

- Citizens defying traffic rules drives under influence of intoxicating substances
- Uneven construction of roads and their poor maintenance
- Poor pedestrian infrastructure
- Adverse weather conditions also contribute in the number of accidents as it often leads to landslides
- Lack of provision of crash barriers, parapets on outer curves
- Overloaded vehicles.

In addition to these, poor maintenance of the roads is a major contributor in roads accidents. Often due to inclement weather conditions sudden landslides occur disrupting road journeys. Due to a smaller number of bus routes plying on roads, sometimes buses far exceed the number of passengers leading to dangerous journeys. Narrow and damaged the roads in Himachal Pradesh

have remained unsafe for traffic movement. What makes them more dangerous for vehicular movement is absence of crash barriers, shooting stones, gravel on surface, overloaded and over speeding vehicles.

Road safety has been a major issue in Himachal Pradesh. In the last 10 years, over 11,000 people have died in more than 29,000 road accidents, while over 50,000 have been injured. On an average, 3000 accidents happen every year, where over 1,100 people killed and 5,000 are injured. In the 2019 road accident in Banjar at Kullu District of Himachal, overloading of the 42-seater bus was found to be the cause. While 44 passengers had died in the accident, many others were injured. These accidents will never stop until the condition of roads is improved. More buses need to ply on rural roads to check overloading. A 40-seater bus carries more than 70 passengers. The bus operators are not to be blamed, as passengers forcibly board the buses as they know there is no other bus soon a respondents said.

XIII. Review of Literature

Bora, Vishrut Landge and Dalai (2018), This study makes use of a system dynamics approach, which provides a comprehensive understanding of the problem for Indian cities. Data were collected and collated with major inputs from the Traffic Department of the city for all road accidents from 2010 to 2015. The study found that the costs recorded for RTAs amounted to INR 935.5 million in 2015, which was 0.09% of the city's GDP. In addition, major cost components were evaluated by varying the severity level. **Prakashrao Rathod & Rujuta S Hadaye (2020),** stated that road traffic accidents contribute major part in non-communicable disease burden in India. The survivors of non-fatal road traffic accident suffer huge loss in the form of disability, loss of job, loss of daily wages. The change in attitude of family members towards victims after RTA like negligence, blaming them for their condition and if a person is handicapped then it has additive effect on worsening his/her present and future significantly. Aim and objective: To study social and economic impact of non-fatal Road traffic accidents on patients. This study found that non-fatal road traffic accidents have a major impact on social, psychological and economic life of patient in terms of attitude of family members, change of job pattern and psychiatric disorders.

XIV. Methodology

Road accidents resulting in personal injury are an increasing cost of society. This study is based on 150 accident victims who were victims of road accidents. This study examines survivors' residual disablement and involvement with rehabilitation services. Data on a representative sample of 120 people are surveyed in more detailed to analyse the impact of accidents on their socio-economic life. Respondents identified throughout the hospital and police records to yield a detailed interview of them.

XV. Results & Discussion

Himachal Pradesh in a hilly state in a lap of Himalayas. When it comes to accidents or emergency treatment, the first one hour after the accident is known as the golden hour and how the patient is treated or handled in that hour has the maximum effect on the victim's health. In this study respondents stated that the village local people respond first to rescue when accidents occurred. Police and local administration reached the spot of accident after two or three-hours suspension. There is not sufficient ambulance facility when any mishappening occurred. The following table provide an information about road accident victims.

Table .1
Distribution of non-fatal road traffic accident victims by their age groups

Sr. No.	Site of injuries	No. of cases	Percentage
1.	18-25	38	31.66
2.	26-35	59	49.16
3.	36-45 & above	23	19.16
	Total	**120**	**100**

It was found in the study that the most age group of 26-35 were involved in road traffic accidents and followed by the age group of 18-25 years. This may be due to fact that persons of 21-40 years of age group had more active life and were involved in outdoor activities most of the time.

Table .2
Distribution of non-fatal road traffic accident victims with reference to site of injuries

Sr. No.	Site of injuries	No. of cases	Percentage
4.	Head, Neck and face	40	33.33
5.	Extremities	29	24.16
6.	Multiple Injuries	51	42.5
	Total	**120**	**100**

In present study it was found that most common site of injuries were multiple injuries 51 (42.2%) and next common site for head, neck and face area accounting for 40 (33.33%) and extremities found 29 (24.16%) respectively. The reasons were that, in case of two wheelers wheel strikes a lower limb, in case of four wheelers bumper strikes lower limb, limbs also injured due to the reflex action of victim at the time of accident. Head, neck and face region involved due to non-usage of safety devices at the time of accident. Moreover, Shimla district is totally hilly area and roads in this region are made on the rocks and hills, and in case of road accident occurrence victims get multiple injuries.

Table .3
Distribution of non-fatal road traffic accidents victims by occurrence of fractures

Sr. No.	Occurrence of fractures	No. of cases	Percentage
1.	Single side fractures	32	26.66
2.	Two side fractures	43	35.83
3.	Multiple fractures	45	37.5
	Total	**120**	**100**

In present study it was found that most fractured of road traffic accidents were multiple fractures 45 (37.5%) and two side fractures which account 43 (35.83%). As above mentioned in table 1.3 that Shimla district is hilly district and road accident arisen very hazardously which caused major harms to victims.

Table .4
Distribution of non-fatal road traffic accident victims by duration of hospital stay

Sr. No.	Duration of hospital stay	No. of cases	Percentage
1.	10 Days	54	45
2.	11-20 Days	40	33.33
3.	30 Days	26	21.66
	Total	**120**	**100**

In present study about 120 road accident victims were hospitalized, out of which 45 per cent were admitted for 10 days, 33.33 per cent were hospitalized for 11-20 days and only 21.66 per cent were admitted for 30 days and more. Those who were admitted for longer duration required major surgical treatment, prolonged immobilization.

Table .5
Distribution of non-fatal road traffic accident victims on economic aid from government

Sr. No.	Duration of hospital stay	No. of cases	Percentage
1.	Satisfied	29	24.16
2.	Not satisfied	60	50
3.	Satisfied to some extent	31	25.83
	Total	**120**	**100**

It was found in the present study that 50 per cent of respondents were not satisfied with the economic aid provided by the administration in token of instant relief. While 24.16 per cent were satisfied and about 25.83 per cent were satisfied to some extent. The reason was that the instant relief provided by the government to the road traffic accident victims is very small amount and rest of the expenditure have to be spent by the victims to their treatment.

According to the Himachal police's examination of fatalities, 23% of accidents were caused by head-on collisions, 22% by vehicles straying off the road, and 19% by pedestrian strikes. According to data from the previous five years given by the state traffic police agency, Himachal Pradesh had a worse road safety record than the national average (31.54%), both in terms of population and number of cars. (Image used purely as a representation). In terms of both population and the number of vehicles,

Himachal Pradesh had a worse road safety record than the national average (31.54%), according to data from the previous five years given by the state traffic police department. The average number of traffic accidents per lakh people in the country is 29.3%. In addition, the state had a higher rate of unintentional deaths per lakh of people (13.77% vs. 10.93%) than the national average. India had a rate of accidents per 10,000 vehicles of 15.1%, while HP had a record of 17.37%. According to the data, Himachal had 6.93% more unintentional deaths per 10,000 vehicles than the national average of 5.08%.

According to data research between September 2017 and 2022, there were 15,648 accidents in Himachal Pradesh, resulting in 6,273 fatalities and 25,729 injuries. With 2,617 accidents, Kangra district had the most in the previous five years, accounting for 847 fatalities and 4,199 injuries. With 2,555 accidents, 1,169 fatalities, and 4,387 injuries, the Shimla district has the second-highest accident rate in the state. Una had the most fatalities among the police jurisdictions, with 193 persons dying in traffic accidents, followed by Nalagarh with 173 fatalities. Theog and Una police stations, with 247 and 243 injuries from traffic accidents, respectively, have the highest registration rates. According to the data, almost 32% of incidents in Himachal were caused by four-wheelers, while 30% involved two-wheelers. Analysis of police data revealed that almost 80% of accidents were reported from rural areas. According to the report, nighttime incidents involving pedestrians predominately happen because of low visibility.

XVI. Recommendations

1. Those with accidents typically need to have their socioeconomic status upgraded.
2. It's important to have strong community backing and institutional care for accident victims on the margins.
3. It is important to provide proper traffic instruction on the use of seat belts and helmets.
4. The creation of an All-India Road Crash Registry is urgently needed.

XVII. Integrating research into clinical practise

1. It is necessary to strengthen the correct education systems for issuing driver's licences depending on educational level;
2. To cope with stress from their families and jobs, riders from the marginal section need psychological care. It will enable them to handle any circumstance;
3. There needs to be more space for their kids to play sports and the roads where most of the margin's dwell need to be renovated.
4. Hospitals should provide care and counselling for accident victims and their families.

XVIII. Conclusion

It has been shown that lower socioeconomic groups experience a higher rate of fatal injuries or deaths as a result of increased d egrees of deprivation. Identity crisis brought on by a low socioeconomic profile makes people, especially adults, poor, marginalis ed, vulnerable, and excluded, and they drive recklessly. For highrisk groups, preventive measures and behavioral adjustment are required. Road accidents should be taken into account by policymakers as a socioeconomic problem. In this regard, by concentrating on improving the three components of the human development index, particularly education, efforts can be made to decrease road fatalities over time. Road accidents have become a leading cause for fatalities and injuries globally with India. The huge loss of life and attendant economic losses are highly avoidable and require urgent measures to be adopted for effective mitigation.

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