Empowering Road Safety Analysis: State-wise Accident Data Visualization with Power BI

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Abstract. The main intention of this paper is to research and analyzes accident data in India at national, country, and metropolitan town degree from 2017 to 2021, specifically looking at trends, key effects and regional differences. Road accidents have been a major problem in India for many years. Research shows that road injuries remain a significant public health problem with economic and social impacts. The number of accidents remains high in states like Tamil-Nadu, Maharashtra and Uttar-Pradesh. The article analyses data from a wide range of sources, including government reports to provide insights into the scope of the problem, geographical differences, important risk factors, and viable prevention techniques. One of the major causes of road accidents in India is reckless driving. Furthermore, the increasing number of vehicles on the road has also impacted the rate of road accidents. According to the Ministry of Road Transport and Highways, the number of registered motor vehicles in India has increased from 24.8 crore in 2017 to 28.9 crore in 2020, a staggering 16.5% increase. This increase in vehicles has led to congested roads, making it difficult for drivers to navigate safely.

Keywords: Road accidents, India, fatalities, injuries, road safety, Analysis.

1 Introduction

Deaths and injuries due to road accidents are a major and growing public health problem in India. Almost 2,650 people are killed and 9,000 injured each week as a result of traffic accidents [2]. The main aim of this study is to analyze the road traffic accidents in India at national, state, and metropolitan city level. Focus would be to identify the major road safety issues and discuss countermeasures that would have potential to address the specific road safety problems.

First, understanding accident trends and causes is essential for developing effective prevention strategies. This analysis provides a foundation for identifying key risk factors and high-risk areas.

Second, the period from 2017 to 2021 includes significant events such as the Motor Vehicles (Amendment) Act, 2019, and the COVID-19 pandemic, both of which impacted road traffic and accident patterns. Analyzing this data helps assess the effectiveness of new regulations and the impact of changes in road use [3].

Third, road accidents have substantial social and economic implications, resulting in loss of life, injuries, and disabilities. By studying accident data [4] , we can better understand these impacts and advocate for policies to mitigate them. This research aims to provide a comprehensive analysis of road accident trends in India from 2017 to 2021, identify key contributing factors, and offer recommendations for improving road safety, contributing to ongoing efforts to make Indian roads safer for all users. A period marked by policy changes and evolving road use patterns. Studying this data is crucial for several reasons.

With the ever-increasing number of vehicles on roads in India, road accidents have become a major concern in recent years. According to the World Health Organization, India has the dubious distinction of having the highest number of road accident fatalities in the world, accounting for about 11% of global road accident deaths. In this paper, we will analyze the road accident data in India from 2017 to 2020 and discuss the major causes, trends, and efforts taken by the government to address this issue.

According to the World Health Organization (WHO), India has the highest number of road accident fatalities in the world. In 2019 alone, approximately 1.5 lakh people lost their lives in road accidents in India [5]. This alarming statistic paints a grim picture of the state of road safety in the country. According to a study conducted by road safety organization Save LIFE Foundation, nearly 80% of road accidents are caused by human error, mainly due to over speeding, drunk driving, and overtaking [6]. These reckless driving behaviors are fueled by a lack of enforcement of traffic laws and a general disregard for road safety rules.

2 Literature Review:

Previous research on road safety analysis

Road safety analysis has been extensively studied to understand the causes of traffic accidents and mitigate their consequences. Elvik and Vaa (2004) in "The Handbook of Road Safety Measures" provide a comprehensive review of various road safety measures and their effectiveness, emphasizing the need for evidence-based policy making to reduce crashes.

The World Health Organization's (2018) Global Status Report on Road Safety identifies key risk factors such as excessive speed, drink driving and failure to use seat belts and

helmets. This report highlights the importance of integrated road safety strategies, including engineering, law enforcement and education.

Yannis, Papadimitriou and Folla (2016) in the "Journal of Safety Research" reveal a correlation between economic changes and road traffic fatalities. They note that economic downturns often lead to increased accident rates, highlighting the need for targeted interventions during such periods.

State-wise Accident Data Analysis
Nationwide analysis of traffic accident data provides valuable insights into regional variations in accident rates. India's Ministry of Road Transport and Highways (MoRTH) provides annual statistics that show significant differences in accident rates between states. For example, the MoRTH report "Road Accidents in India 2020" highlights that rural areas often have higher death rates due to factors such as poor road infrastructure and delayed medical assistance.

In the United States, the National Highway Traffic Safety Administration (NHTSA) provides nationwide crash statistics through "Traffic Safety Facts" reports. These reports help identify high-crash states and analyze root causes such as traffic volume and road conditions.

The role of data visualization in road safety research
Data visualization improves the analysis of road safety data by making complex datasets accessible. Tools like Power BI allow researchers to create interactive dashboards that reveal trends and patterns in traffic accidents. For example, heat maps can highlight accident hotspots, and time series graphs can show trends over time.

Thomas (2021) in “Data Analysis with Microsoft Power BI” highlights the effectiveness of visual analytics in making data understandable even for non-experts. In road safety research, visualizations help policymakers and the public to more effectively understand and act on findings.

Geographic Information Systems (GIS) further improve the ability to visualize spatial data, provide insight into regional accident patterns, and assist in targeted road safety measures. The integration of GIS with tools such as Power BI offers a comprehensive view of the spatial distribution of accidents.

In summary, the literature review highlights the importance of prior research in understanding road safety, the value of analyzing crash data by condition, and the role of data visualization in improving road safety research. These findings are essential for the development of effective strategies and interventions.

3 Data Collection:

3.1 Methodology and data collection

Data sources and data collection techniques:
For this research work, the primary data source used is data.gov.in, a comprehensive repository of datasets provided by the Government of India. This platform offers a wide range of data sets related to different industries including road safety, which are crucial for conducting detailed analysis of traffic accidents in different states.

1. Data set selection:
The data has been carefully selected from the road safety category on data.gov.in. Key datasets include traffic accident records reported by various government agencies. The selection criteria focused on datasets that provide comprehensive and consistent information such as accident reports, locations, times and causes of accidents.

2. Data Extraction:
Data extraction involved downloading data sets in accessible formats such as CSV (Comma-Separated Values) or Excel that are compatible with Power BI for visualization and analysis. For accurate analysis, it was essential to ensure that the data was up-to-date and up-to-date.

3. Data cleaning and Process:
Prior to analysis, datasets underwent a thorough cleaning process to ensure data quality. This included:
- **Deduplication:** Identification and removal of duplicate records to avoid biased results.
- **Handling missing values**: Dealing with missing or incomplete data using imputation methods or exclusion depending on the extent and nature of the missing data.
- **Standardization of formats:** Ensuring consistency of data formats, geographic identifiers and categorical variables.

4. Data integration:
Datasets from various sources within the platform have been integrated into a comprehensive dataset. This integration involved matching and merging data based on common identifiers such as state codes and accident IDs.

5. Data verification:
Cross-references were made with other available sources or historical data to verify the accuracy and reliability of the data. This step helps in identifying any anomalies or inconsistencies in the data set.

6. Data transformation:
Cleaned and integrated data was converted into a format suitable for analysis in Power BI. This included:

- **Creating calculated columns:** For additional information such as accident severity or time of day.
- **Data Aggregation:** Summarize data by state, month or year to facilitate comparative analysis.
- **Geocoding:** Convert location data to geographic coordinates for spatial analysis.

Overview of accident data by state:
A dataset from data.gov.in provides detailed information on road accidents in various states of India. Each entry typically contains:

- **Date and Time of Accident:** Necessary for temporal analysis.
- **Accident location:** Detailed location information, including state, district and coordinates.
- **Accident Type:** Categories such as collisions, rollovers or pedestrian accidents.
- **Severity of the accident:** Classification according to the severity of injury or death.
- **Weather conditions:** Information about the weather conditions at the time of the accident, if available.

Using this comprehensive data set, the analysis aims to identify patterns and trends in road safety in different states, thereby contributing to valuable insights for policy making and improving road safety.

Summary:
The methodology for data collection and preparation included acquisition, cleaning, integration and validation of traffic accident data from data.gov.in. This robust process ensures that the data used in the analysis is accurate, reliable and ready for effective visualization and interpretation with Power BI.

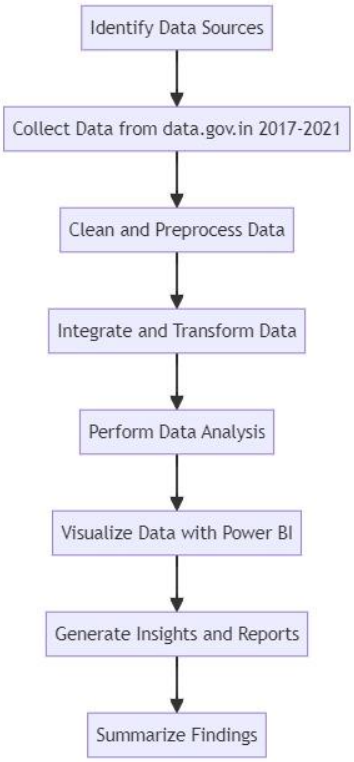

Chart 1: Data collection Process:

Data Details	2017	2018	2019	2020	2021
State-wise Data	✓	✓	✓	✓	✓
Rural/Urban Data	✗	✗	✗	✓	✗
Death	✗	✗	✗	✓	✓
Injury	✗	✗	✗	✓	✓
Reason of Accident	✗	✗	✗	✓	✗
Male/Female	✗	✗	✗	✗	✓
Vehicle-wise	✗	✗	✗	✗	✓
Nature of Road	✗	✗	✗	✗	✓
Weather	✗	✗	✗	✗	✓

Table 1: Information about data:

4 Road Accident Data Analysis:

Figure 1 presents analysis of road accident data from 2017 to 2021 reveals some startling statistics. According to MRTH [1], there were 4,64,910 road accidents in 2017, which resulted in 1,47,913 deaths and 4,70,975 injuries. In 2018, the number of accidents decreased marginally to 4,67,044, but fatalities saw a slight increase, with 1,51,417 deaths and 4,69,418 injuries. The number of accidents further reduced in 2019 to 4,37,396, resulting in 1,51,417 deaths and 4,69,418 injuries. However, the COVID-19 pandemic had a significant impact on the number of accidents in 2020, with a decrease of 26.6% compared to 2019. The total number of accidents in 2020 was 3,57,826, which led to 1,34,395 deaths and 4,39,262 injuries. However, revised data indicates that the total number of accidents in 2020 was 3,66,138, with 1,20,806 fatal accidents and 1,31,714 persons killed. In 2021, the number of road accidents increased to 4,12,432. This year saw 1,42,163 fatal accidents and 1,53,972 persons killed [1].

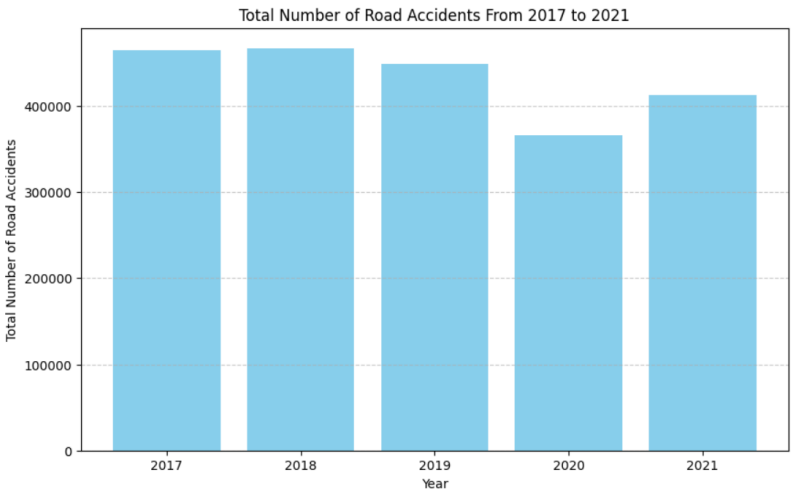

Fig. 1. Total number of Road accident in India Year-wise

4.1 State-wise Road Accident Analysis:

4.1.1 General Trends in Road Accidents:

2017–2019: Figure 7 presents the number of road accidents gradual decline from 4,64,910 in 2017 to 4,37,396 in 2019. Despite the reduction in the total number of

accidents, the number of fatal accidents remained high, with 1,51,417 deaths in 2018. 2019.

2020: Figure 7 presents the year of the pandemic saw a significant drop in accidents to 3,66,138, a 26.6% reduction compared to 2019. Fatal accidents and fatalities also decreased, reflecting reduced vehicle movement during exclusion.

2021: Figure 7 presents as restrictions eased, road accidents rose again to 4,12,432, with fatalities rising to 1,42,163 and fatalities reaching 1,53,972, suggesting a return to Pre-pandemic levels of road activity.

4.1.2 States with High Accident Rates:

Uttar Pradesh: Figure 2 reveals Consistently the highest number of accidents, peaking at 22,655 in 2019, followed by a decline during the pandemic and rising again in 2021.

Tamil Nadu: Figure 2 present Significant fluctuations with a significant decrease in accidents from 2017 to 2020 and a sharp increase in 2021.

Maharashtra and Karnataka: Figure 2 reveals Both states showed stable trends with a significant decline in 2020 and an increase in 2021.

4.1.3 States with Moderate Accident Rates:

Rajasthan and Madhya Pradesh: Figure 7 present Stable trends with a dip in 2020, but 2021 showed a return to or surpassing pre-pandemic levels.

Andhra Pradesh and Gujarat: Figure 7 present Similar trends with a decrease in 2020 and an increase in 2021.

4.1.4 States with Low Accident Rates:

Delhi, Kerala and Punjab: Figure 3 reveals There was a significant decline in accidents in 2020, with a slight increase in 2021.

Smaller States and Union Territories: Figure 2 present Minimal accident rate with slight fluctuations. States like Lakshadweep, Ladakh and Daman and Diu reported very low numbers.

4.1.5 Impact of COVID-19 on Road Accidents:

Figure 1 shows That The pandemic has significantly affected accidents, as evidenced by a sharp decline in 2020. This can be attributed to reduced traffic, lockdown measures and restricted interstate travel.

In Figure 1 The increase in accidents in 2021 suggests a return to normal and possibly an increase in traffic volume, which may have contributed to the increase in accidents and fatalities.

4.1.6 Deaths and Injuries from Road Accidents:

Figure 4 & Figure 5 Shows that Uttar Pradesh, Maharashtra, Madhya Pradesh & Tamil Nadu has a greater number of Injuries and deaths or Figure 5 shows that Uttarakhand, Jammu & Kashmir, Panjab, Odisha has a smaller number of deaths & Injuries. While the total number of accidents decreased during the pandemic, the fatality rate remained relatively high, suggesting that despite fewer accidents, the severity of these accidents may not have decreased significantly.

4.1.7 States with Highest and Lowest Deaths and Injuries:

Statistical Highlights: Figure 4 In 2021, Indian roads witnessed tragic statistics: Uttar Pradesh peaked with 19,037 deaths and 15,982 injuries, Maharashtra followed with 12,018 deaths and 17,165 injuries, Madhya Pradesh recorded 11,667 deaths and a staggering 41,758 injuries.

Statistical lowest: Table 2 In 2021, the states with the fewest deaths and injuries reveal surprising findings: Goa stands out with only 224 deaths and 875 injuries, followed by Jammu and Kashmir (731 deaths, 5,924 injuries), Uttarakhand (692 deaths, 862 injuries), Punjab (3,916 deaths, 2,881 injuries) and Odisha (4,738 deaths, 8,822 injuries).

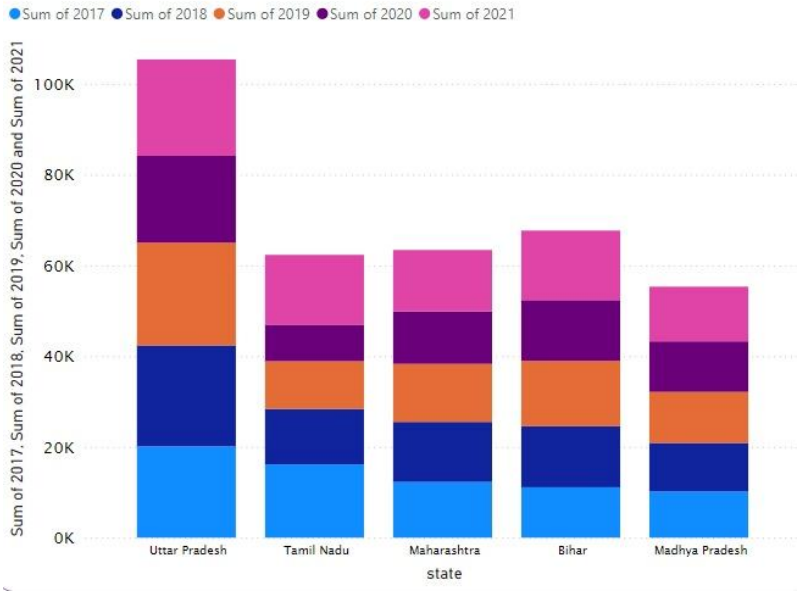

Fig. 2. Year Wise Total Number of Road Accident in India of top 5 state

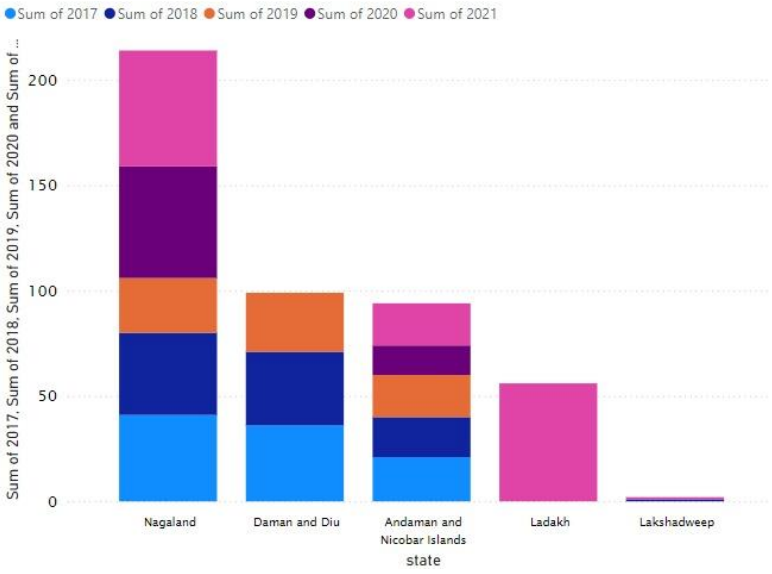

Fig. 3. Year Wise Total Number of Road Accident in India of bottom 5 state

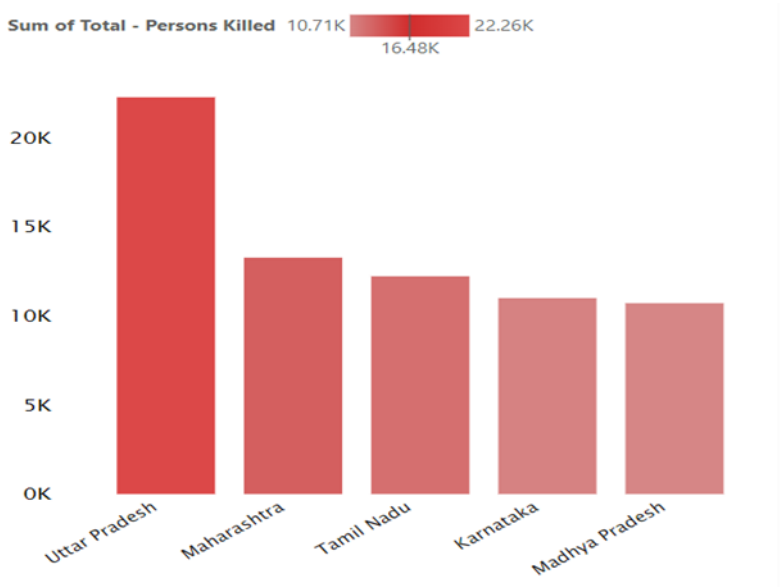

Fig. 4. Total number of deaths in top 5 state in 2021

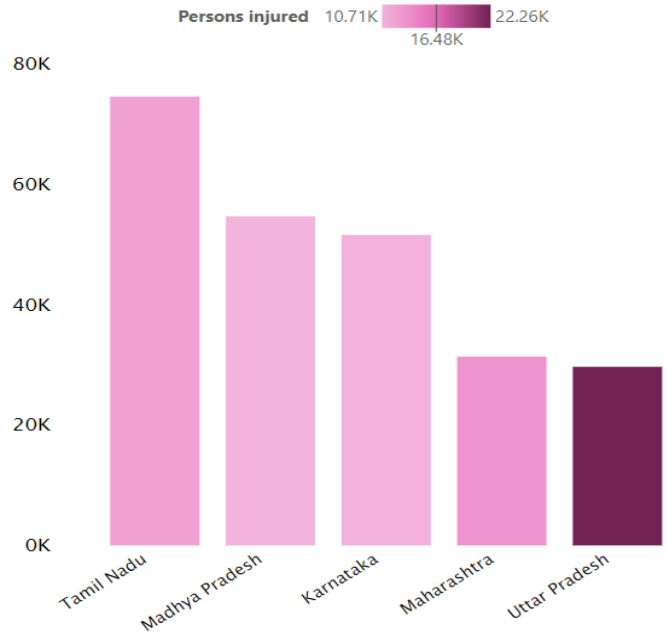

Fig. 5. Total number of injuries in top 5 state in 2021

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S. No.	States/UTs	2017	2018	2019	2020	2021	Total
1	Andhra Pradesh	25,727	24,475	21,992	19,509	21,556	113,259
2	Arunachal Pradesh	241	277	237	134	283	1,172
3	Assam	7,170	8,248	8,350	6,595	7,411	37,774
4	Bihar	8,855	9,600	10,007	8,639	9,553	46,654
5	Chhattisgarh	13,563	13,864	13,899	11,656	12,375	65,357
6	Goa	3,917	3,709	3,440	2,375	2,849	16,290
7	Gujarat	19,081	18,769	17,046	13,398	15,186	83,480
8	Haryana	11,258	11,238	10,944	9,431	9,933	52,804
9	Himachal Pradesh	3,114	3,110	2,873	2,239	2,404	13,740
10	Jharkhand	5,198	5,394	5,217	4,405	4,728	24,942
11	Karnataka	42,542	41,707	40,658	34,178	34,647	193,732
12	Kerala	38,470	40,181	41,111	27,877	33,296	180,935
13	Madhya Pradesh	53,399	51,397	50,669	45,266	48,877	249,608
14	Maharashtra	35,853	35,717	32,925	24,971	29,477	158,943
15	Manipur	578	601	672	432	366	2,649
16	Meghalaya	675	399	482	214	245	2,015
17	Mizoram	68	53	62	53	69	305
18	Nagaland	531	430	358	500	746	2,565
19	Odisha	10,855	11,262	11,064	9,817	10,983	53,981
20	Punjab	6,273	6,428	6,348	5,203	5,871	30,123
21	Rajasthan	22,112	21,743	23,480	19,114	20,951	107,400
22	Sikkim	196	180	162	138	155	831
23	Tamil Nadu	65,562	63,920	57,228	45,484	55,682	287,876
24	Telangana	22,484	22,230	21,570	19,172	21,315	106,771
25	Tripura	503	552	655	1,603	1,468	4,781
26	Uttarakhand	1,603	1,468	1,352	1,405	1,352	7,180
27	Uttar Pradesh	38,783	42,568	42,572	34,243	37,729	195,895
28	West Bengal	11,631	12,705	10,158	9,180	11,937	55,611
29	Andaman & Nicobar Islands	189	254	230	141	115	929
30	Chandigarh	342	316	305	159	208	1,330
31	Dadra & Nagar Haveli	67	80	68	100	140	455

32	Daman & Diu	79	76	69	68	82	374
33	Delhi	6,673	6,515	5,610	4,178	4,720	27,696
34	Jammu & Kashmir	5,624	5,978	5,796	4,860	5,452	27,710
35	Ladakh	0	NA	NA	NA	236	236
36	Lakshadweep	1	3	1	1	4	10
37	Puducherry	1,693	1,597	1,392	969	1,049	6,700
	Total (All India)	**4,64,910**	**4,67,044**	**4,49,002**	**3,66,138**	**4,12,432**	**2,159,526**

Table 2. Total number of road accident in India form 2017-2021

5 Detailed Analysis for 2020 and 2021

5.1 Observations:

2020: Marked a tremendous decline in road accidents throughout all states due to the COVID-19 pandemic and lockdown measures.

2021: noticed a rebound in street injuries as regulations have been lifted and traffic volumes accelerated.

5.2 State-wise Analysis:

Top state with the greatest number of road accident:

Tamil Nadu: In Tamil Nadu, the total number of road accidents in 2020 was 45,484, which increased to 55,682 in 2021. Tamil Nadu saw a 20.5% reduction in accidents in 2020 due to pandemic restrictions, followed by a 22.4% increase in 2021 as conditions normalized**.**

Madhya Pradesh: Madhya Pradesh saw 45,266 road accidents in 2020, rising to 48,877 in 2021. The state saw a 10.7% decline in accidents in 2020, followed by an 8% increase in 2021, reflecting a recovery phase.

Uttar Pradesh: Uttar Pradesh had 34,243 road accidents in 2020, increasing to 37,729 in 2021. The state saw a 19.5% decline in accidents in 2020, with a 10.2% increase in 2021, suggesting a rebound.

Karnataka: In Karnataka, the total number of road accidents was 34,178 in 2020 and 34,647 in 2021. The state saw a 15.9% decline in accidents in 2020, followed by a slight increase of 1.4% in 2021, indicating a gradual recovery.

Maharashtra: Maharashtra recorded 24,971 road accidents in 2020, increasing to 29,477 in 2021. The state saw a 24.2% reduction in accidents in 2020, followed by an 18% increase in 2021, indicating a significant rebound.

Kerala: Kerala had 27,877 road accidents in 2020, increasing to 33,296 in 2021. The state saw a 32.2% decline in accidents in 2020, with a 19.5% increase in 2021 as traffic levels returned to normal.

Gujarat: There were 13,398 road accidents in Gujarat in 2020 and this number increased to 15,186 in 2021. The state saw a 13.3% increase in accidents from 2020 to 2021.

Rajasthan: Rajasthan recorded 19,114 road accidents in 2020, rising to 20,951 in 2021. The state saw a 9.6% increase in accidents over the period.

Andhra Pradesh: Andhra Pradesh saw 19,509 road accidents in 2020, increasing to 21,556 in 2021. The state saw a 10.5% increase in accidents between 2020 and 2021.

West Bengal: West Bengal had 9,180 road accidents in 2020, which increased to 11,937 in 2021. The state saw a substantial increase of 30.1% in accidents between the two years.

Visual Summary:

States/UTs	2020	2021	Percentage Change
Tamil Nadu	45,484	55,682	+22.4%
Madhya Pradesh	45,266	48,877	+8.0%
Uttar Pradesh	34,243	37,729	+10.2%
Karnataka	34,178	34,647	+1.4%
Maharashtra	24,971	29,477	+18.0%
Kerala	27,877	33,296	+19.5%
Gujarat	13,398	15,186	+13.3%
Rajasthan	19,114	20,951	+9.6%
Andhra Pradesh	19,509	21,556	+10.5%
West Bengal	9,180	11,937	+30.1%

Table 3: Top state with the greatest number of road accident in 2020 & 2021 with Percentage Change

Top State with a smaller number of road accident:

Sikkim: In Sikkim, the total number of road accidents in 2020 was 162, which increased to 196 in 2021. Sikkim saw a 21.0% increase in accidents from 2020 to 2021.

Lakshadweep: Lakshadweep had 1 road accident in 2020, which rose to 4 in 2021. This reflects a 300.0% increase, but the numbers remain very low.

Daman & Diu: In Daman & Diu, there were 33 road accidents in 2020, and this increased to 59 in 2021. The state experienced a 78.8% increase in accidents over the period.

Andaman & Nicobar Islands: The Andaman & Nicobar Islands had 141 road accidents in 2020, which decreased to 115 in 2021. This reflects an 18.4% decrease in accidents.

Chandigarh: Chandigarh saw 159 road accidents in 2020, which increased to 208 in 2021. The state experienced a 30.7% rise in accidents from 2020 to 2021.

Visual Summary:

States/UTs	2020	2021	Percentage Change
Sikkim	162	196	+21.0%
Lakshadweep	1	4	+300.0%
Daman & Diu	33	59	+78.8%
Andaman & Nicobar Islands	141	115	-18.4%
Chandigarh	159	208	+30.7%

Table 4: Top state with the smaller number of road accident in 2020 & 2021 with Percentage Change

Insights:

strong recuperation: States like Tamil Nadu and Kerala noticed strong rebounds, indicating a go back to pre-pandemic site visitors' stages.

slow increase: States like Karnataka had greater gradual increases, suggesting various prices of healing.

Lowest accidents: Ladakh, Lakshadweep, and Mizoram had the bottom accidents, with Ladakh and Lakshadweep showing minimal boom. Arunachal Pradesh had the best percent growth within the lowest accident states, reflecting vast restoration.

6 Contributing Factors:

- **Over Speeding:** Speeding is one of the most common and significant causes of road accidents. The risk of severe accidents increases with higher speeds due to reduced reaction times and increased stopping distances. Møller and Haustein [7] highlight that social factor, such as the influence of peers and the desire to fit in with a group, can drive young drivers to exceed speed limits. This behavior significantly elevates the risk of accidents and fatalities on the road.

- **Careless Driving:** Careless driving, including reckless maneuvers and disregard for traffic rules, is a major contributor to road accidents. This factor encompasses behaviors such as ignoring speed limits, failing to signal lane changes, and not adhering to road signs. According to Møller and Haustein [7], the influence of peer behavior on driving habits can exacerbate careless driving, particularly among young drivers. Peer pressure and social norms can encourage risky behaviors, further increasing accident rates.

- **Drunken driving**: Drunken driving /consumption of alcohol & drugs, jumping of red light and use of mobile phones taken together accounted for 9.5 percent of total accidents and 9.8 per cent of total deaths. The others category which would include reasons like road environment, vehicular condition, etc. accounted for almost 18.8 percent of the accidents, 20.5 percent of accident-related deaths and 17.9 percent of injuries.

- **Bad Weather Conditions:** Adverse weather conditions, such as rain, fog, and snow, contribute to a higher incidence of road accidents. Poor visibility and slippery roads can impair driving ability and increase the likelihood of accidents. Drivers often struggle to maintain control of their vehicles under such conditions, leading to increased risk. Studies have shown that weather-related accidents can spike during extreme weather events, underscoring the need for cautious driving during adverse conditions.

- **Driving Under the Influence (DUI):** Driving under the influence of alcohol or drugs is a significant factor in road accidents. Impaired judgment, reduced coordination, and slower reaction times associated with intoxication lead to a higher risk of accidents. Møller and Haustein [7] note that peer influence can also play a role in this behavior, particularly among young drivers who may feel pressured to drink and drive in social settings.

- **Inadequate Vehicle Maintenance:** Poor vehicle maintenance can lead to accidents due to malfunctions such as brake failure, tire blowouts, or engine problems. Regular maintenance is crucial for ensuring vehicle safety and reliability. Neglecting vehicle upkeep can result in unexpected breakdowns or failures, increasing the risk of accidents on the road.

- **Distracted Driving:** Distractions, including the use of mobile phones, in-car entertainment systems, and other non-driving activities, are significant contributors to road accidents. Distracted driving impairs a driver's ability to focus on the road, increasing the likelihood of accidents. Research indicates that distractions can be as dangerous as speeding or drunk driving, as they significantly reduce reaction times and awareness

- **Poor Infrastructure and Maintenance**: Many Indian roads lack proper infrastructure and maintenance, such as potholes, poor lighting, inadequate signage, and lack of safety measures like barriers. These factors increase the risk of accidents, especially during the monsoon season.

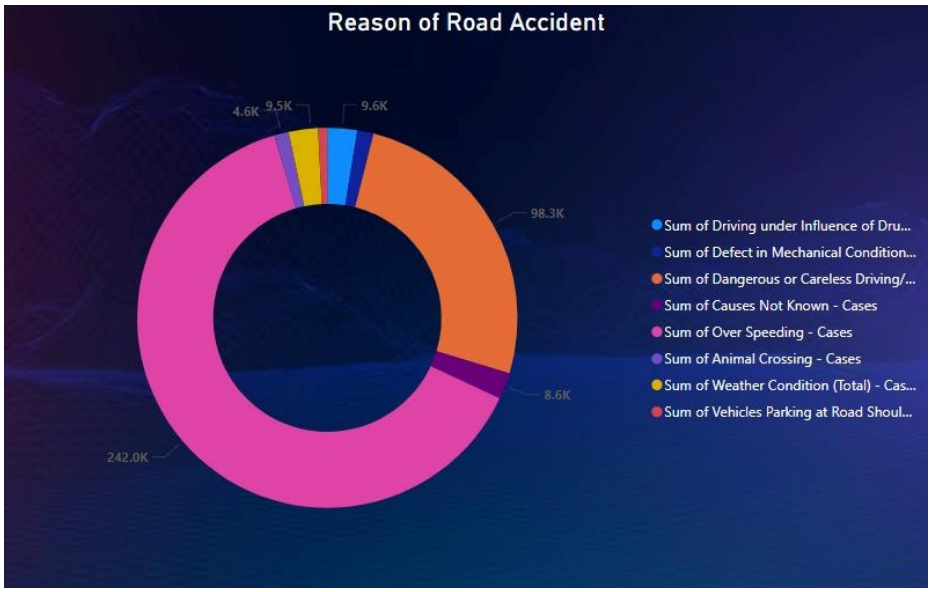

Fig 6: Contributing Factors

7 Conclusion:

The data and analysis clearly indicate that there is an urgent need for stricter enforcement of traffic regulations and improvement in road infrastructure to reduce the number of road accidents in India. It is essential to address the root causes of accidents, such as human error, poor road conditions, vehicle maintenance, and overloading. The government's initiatives to improve road safety, along with the active participation of citizens, can help achieve the target of reducing road accidents and fatalities significantly. It is also crucial to foster a culture of responsible driving among citizens to make the Indian roads safer.

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[5] According to the World Health Organization (2018), road traffic injuries are the leading cause of death for children and young adults aged 5-29 years
[6] According to a study conducted by road safety organization Save LIFE Foundation.
[7] Møller and Haustein (2019) investigated the influence of peer behaviour on speeding among young male drivers, highlighting significant social factors in road safety