Nigerian Traffic Crashes Analysis Report

Introduction

This report delves into the analysis of traffic crashes in Nigeria, utilizing the "Nigerian Traffic Crashes" dataset from Kaggle. The dataset covers crash incidents across various states and quarters, and the goal of this analysis is to explore trends, identify high-risk areas, and understand the contributing factors that lead to crashes. The results will provide valuable insights into traffic safety, offering recommendations to reduce crash occurrences and fatalities.

Methodology

The dataset used for this analysis was sourced from Kaggle. It includes information on total crashes, crashes involving speeding, alcohol or drug influence, poor weather conditions, and fatigue across multiple states in Nigeria from 2020 to 2024. Since the data was already cleaned, no additional data cleaning processes were applied. Python libraries such as pandas, matplotlib, and seaborn were used for the data analysis and visualization. The analysis focused on identifying trends, correlations, and key risk factors contributing to crashes across different states and quarters.

Question 1: What is the trend of total crashes over the quarters across different states?

Insight:

The total number of crashes shows some fluctuation over time, with notable spikes in specific quarters. In Q4 2022, crashes peaked at 3,617, whereas Q3 2023 saw a significant decrease, recording 2,187 crashes. Seasonal trends may play a role in these variations, with certain quarters experiencing higher traffic flow or hazardous conditions, potentially contributing to higher crash rates.

Recommendation:

The government should monitor quarters with higher crash frequencies to implement preventive measures, such as traffic campaigns during peak periods and enhanced road safety enforcement.

Question 2: Which state has the highest number of crashes in each quarter?

Insight:

The Federal Capital Territory (FCT) consistently recorded the highest number of crashes across most quarters, suggesting that it is a high-risk area for road accidents. Ogun also appeared prominently, though less frequently.

Recommendation:

Focus road safety interventions in the FCT by increasing traffic enforcement, promoting public awareness campaigns, and improving road infrastructure. These interventions should also be extended to Ogun due to its recurrent appearance in the list of high-risk states.

Question 3: What is the correlation between the number of injured and the number of killed in crashes across different states?

Insight:

The correlation between injuries and fatalities is 0.87, indicating a strong positive relationship. This suggests that crashes with more injuries also tend to result in more fatalities.

Recommendation:

To reduce both injuries and fatalities, immediate medical response systems should be enhanced, particularly in high-accident areas. Educational campaigns focusing on the use of seatbelts and other protective measures may also help reduce fatalities.

Question 4: How do different factors (Speed Violation, Alcohol/Drug Influence, Poor Weather, Fatigue) contribute to the total number of crashes in each state?

Insight:

Speed violations were the most prevalent contributing factor to crashes, especially in states like Ekiti (68.6%) and Jigawa (73.1%). Fatigue and poor weather also played significant roles in several states, while alcohol or drug influence was less prominent in comparison.

Recommendation:

Stricter enforcement of speed limits, particularly in high-speed violation areas, is crucial. Additionally, promoting rest areas for fatigued drivers and improving driver education on the dangers of impaired driving can mitigate the effects of fatigue and alcohol/drug influence.

Question 5: Which state has the highest percentage of crashes involving speed violations in each quarter?

Insight:

Bayelsa stands out with extremely high speed violation percentages, particularly in Q4 2020 (10,000%) and Q3 2023 (2,400%). Other states like Zamfara and Sokoto also had substantial speed violation percentages.

Recommendation:

Given the high percentage of speed-related crashes, states like Bayelsa and Zamfara require targeted interventions. Speed monitoring systems such as radar enforcement should be installed, especially in high-risk areas, and public campaigns about the dangers of speeding should be implemented.

Question 6: What is the distribution of crashes with fatalities compared to those without, and how does this vary by state and quarter?

Insight:

Each state had at least one crash with a fatality across the quarters, with some states like Zamfara consistently showing fatal crashes in every quarter.

Recommendation:

Improve the availability of emergency medical services and response times in states with frequent fatalities. Additionally, increasing road safety infrastructure, such as guardrails and better lighting, may help reduce the number of fatal crashes.

Question 7: How does poor weather (PWR) impact the total number of crashes and injuries in each state?

Insight:

Poor weather contributed significantly to crashes in some states. For example, Lagos (0.56%) and Niger (3.35%) saw higher percentages of crashes during poor weather, leading to increased injury rates.

Recommendation:

Improve weather-related warning systems and enforce strict road safety measures during adverse weather conditions. Public campaigns should also encourage drivers to avoid unnecessary travel during poor weather and to adhere to safe driving practices.

Question 8: Which quarter has the highest number of crashes involving driving under the influence (DAD), and how does it vary by state?

Insight:

The highest number of DUI-related crashes occurred in Q1 2024, with 10 incidents. The Federal Capital Territory (FCT) and Lagos also showed higher DUI-related crashes.

Recommendation:

To address DUI-related crashes, stricter laws and penalties for DUI offenses should be enforced. Increased police presence and random sobriety checkpoints during high-risk periods may deter drivers from driving under the influence.

Question 9: How does fatigue (FTQ) correlate with the number of vehicles involved in crashes across different states?

Insight:

Fatigue-related crashes have a high correlation (0.98) with the total number of vehicles involved in crashes. This suggests that fatigue often leads to multi-vehicle collisions.

Recommendation:

Rest stops should be strategically placed along highways and high-traffic routes to provide drivers with opportunities to rest. Additionally, fatigue detection systems, such as roadside checks for drowsy drivers, should be implemented.

Question 10: What are the top contributing factors to crashes (Other Factors) across different states, and how do they compare to other known factors?

Insight:

In states like Bayelsa and Abia, "Other Factors" such as reckless driving and road conditions were significant contributors to crashes. Speed violations (SPV) still remained one of the top contributors across most states.

Recommendation:

Road safety campaigns should not only focus on speeding and DUI but also highlight other factors like reckless driving and unsafe road conditions. Governments should invest in road maintenance and driver education to mitigate these contributing factors.

Conclusion

The analysis of Nigerian traffic crashes revealed significant trends and risk factors contributing to road accidents. Speed violations, fatigue, and poor weather were prominent factors, with states like the FCT and Bayelsa experiencing the highest number of crashes. Implementing targeted safety measures, improving road infrastructure, and increasing driver awareness can significantly reduce the frequency and severity of crashes.

By using these insights, policymakers, traffic enforcement agencies, and stakeholders can develop data-driven strategies to enhance road safety and protect lives across Nigeria.