

Data Analytics Graduate Capstone – WGU C772

Problem Statement

Most drivers on the roadway are unaware of factors that may cause their vehicle to rollover during an accident. This study aims to resolve that. The problem question is: what factors affect vehicles to rollover during an accident? I believe that terrain and speed statistically significantly affect rollover accidents.

Data Analysis Process

National accident data was collected from the National Highway Traffic Safety Administration (NHTSA) website for 2020. Python was used to read, clean, analyze, and present the dataset. The raw dataset has 201 columns and 54,272 rows. 'ROLLOVERNAME' was identified as the target variable. After a thorough cleansing effort, we were left with 13 variables and 30,779 records. Univariate and bivariate analyses were conducted as initial investigative steps. A logistic regression analysis was then conducted to reduce the number of variables and pinpoint only those variables that most heavily affected rollovers.

Findings & Limitations

Findings show that exceeding the speed limit, driving on a dirt road, and driving an SUV/MPV/CUV or sedan increase the chances of a vehicle rolling over during an accident. SUV/MPV/CUVs are 2x more likely than sedans to rollover. Furthermore, driving on a straight road reduces rollover incidents the most. Limitations of the study were that 20,000+ records contained "Unknown" or "Not Reported" values. This caused us to remove these values to not muddy-up the dataset.

Proposed Actions

We identify this as a 3-fold effort. The first part is to (1) educate drivers at the point of purchasing their vehicle that SUV/MPV/CUVs are 2x more likely to rollover during an accident in comparison to sedans. The next part is (2) display signs in areas identified as dirt roads to educate drivers that one of the dangers of driving on dirt roads is rolling over. And lastly, (3) during the DMV license examination, educate drivers that driving more than the speed limit, specifically on curvy roads, can lead to rollover accidents.

Benefit of this study

In 2020, 18% of accidents were rollover accidents in the U.S. and this study aims to shed light on the factors that increase the chances of drivers being in a rollover accident. Adhering to all the proposed actions would benefit the safety and lives of drivers so that we can reduce that percentage of national rollover accidents significantly.