Is our Obsession with SUVs Secretly Killing us?

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**Introduction**

The problem with pedestrian deaths has always been in existence. Even before there were cars, there were issues with horses killing by passers in the street. However, this issue became more apparent as cars became widely available to the general population in the early 20th century. More than 6,000 pedestrians in the U.S. alone, died from collisions with vehicles in 2019 (GHSA, 2020). However, it is important to note that things have gotten better since the 1970s. “Pedestrian deaths were 17 percent lower in 2019 than in 1975” (iihs.org, 2021). Although, this trend cannot be seen when looking at more recent years. There was a 46% increase in pedestrian deaths from 2010 to 2019 (GHSA, 2020). Increasing an average of 15% year over year. Paul Marks noted an important finding from a study done by Devon E.Lefler and Hampton C.Gabler, “Someone struck by a large sports utility vehicle is more than twice as likely to die as someone hit by a saloon car travelling at the same speed” (Paul Marks, 2004). This study looked at pedestrians hit by motor vehicles and their survival rate. Clay Gabler, a lead researcher in this study, stated that “In the US, pedestrians are the forgotten crash victims,” due to the fact that so few studies like the one mentioned above look into pedestrian deaths and causes them. We have an exorbitant amount of studies looking into car crash victims, but not the victims outside the cars. While this study alone helps show that light trucks and SUVs are more likely to kill it’s victims over smaller passenger cars (supporting our hypothesis), this study was published in 2004. Meaning that this was a concern of Gabler’s far before we saw the significant increase in pedestrian deaths in 2010 to 2019. So the question still remains, is the increase in pedestrian deaths since 2010 due to the increased number of SUVs on the road, or something else entirely?

**Outcome of EDA**

Our analysis looked at how several variables were related to pedestrian deaths. We choose to include variables that we believed had the most impact based on prior research (i.e. the research done on SUVs) and public assumptions (i.e. the rise in cell phone use causes distracted driving leading to rising pedestrian deaths). Our hypothesis was that the increasing number of SUVs and light tucks on the road are the major contributors to the increased number of pedestrian deaths.

The analysis showed that rising pedestrian deaths in the USA are happening. The analysis also showed that these deaths are highly correlated to both the rise in SUV sales and cell phone subscriptions. But which has a stronger effect? After running both a simple and multiple linear regression model, we found that the number of SUV sales had a greater impact on the changes in pedestrian deaths.

**What was missed during the analysis?**

This analysis was focused on the effect of SUV sales and pedestrian deaths. However, while conducting the analysis, I noticed some interesting trends in the difference in deaths between states with and without hand held device bans. Based on the combined histogram comparing states with and without hand held device bans, there appears to be a decrease in the number of deaths in states with this ban. However, since hand held device bans were not the focus of this analysis, we did not investigate it any further. I think further investigation of this trend should have been included in this analysis.

**Were there any variables you felt could have helped in the analysis?**

This analysis was not simple one to address. We did the best to select variable that we believe had the greatest impact on pedestrian deaths. However, not all the variables we wanted were readily available. One variable that I think could have helped this analysis would have been to include the cause of the death (cause of car hitting pedestrian). Did the person die due to the type of car they were hit by (more SUVs) or was there more individuals dying from drunk or distracted drivers? As we saw, the number of cell phone subscriptions are highly correlated to the rise in deaths. However, are these trends related? I think it would have helped to have data on the number of individuals who past due to negligent, drunk, or distracted driving to help dig further.

**Were there any assumptions made you felt were incorrect?**

We made the assumption that the rise in SUV sales were correlated to the rise in pedestrian deaths. After our EDA, this assumption was proved to be correct. However, we also assumed that the deceased in passenger car sales also impacted the rise in deaths. After running our regression analysis, it turned out that the decrease in passenger car sales did not have of much of an effect as expected (larger p-value). Due to this, we excluded passenger cars from the regression model.

**What challenges did you face, what did you not fully understand?**

There were several challenges in the data collection for this EDA. Much of the data we would have liked to see/use was not readily available. We would have liked to use one clean data set with every variable broken down by year, month, week, and state. However, we could not get to this level of detail for the number of cars and SUV sales. This led to us needing to use two datasets. One with 511 observations and one with 10. I would have liked to run this analysis with this level of detail for all variables as well as include more as mentioned in the section above. While we did find some interesting patterns in this analysis, I think there is much more that needs to be done. I look forward to continuing this analysis to help identify the true cause of deaths that can easily be avoided.

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