

## **Group - 9**

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### **Analysis of Traffic Accident Casualties (2005-2014)**

From 2005 to 2014, the overall trend in traffic accidents showed a positive decline in injuries, with car drivers and pedestrians being the primary beneficiaries of this reduction. The annual statistics, however, displayed some fluctuations. For instance, years like 2007 and 2012 witnessed minor increases in injuries, whereas years like 2010 and 2014 saw notable decreases. These variations might be linked to several factors, including changes in traffic regulations, shifts in economic conditions affecting driving behaviors, advancements in vehicle safety technology, or enhancements in emergency medical services.

In terms of specific casualty groups, car occupants, who previously faced the highest risk, observed a significant drop in injury numbers throughout the decade. This trend suggests improvements in vehicle safety features or a shift towards more responsible driving practices. Despite the overall decrease, pedestrians remained a substantial part of the injury statistics, indicating ongoing concerns regarding pedestrian safety and the need for targeted preventive measures.

The analysis of these statistics year by year helps in understanding the dynamics of road safety and the impact of various external factors. By delving into these details, policymakers and stakeholders can identify critical areas needing attention, enabling the formulation of more effective strategies to further diminish traffic-related injuries and make roads safer for everyone.

### **Road Traffic Casualties and Severity Analysis**

The accident frequency chart indicates that certain months have a higher accident rate than others. One month stands out because there are much more serious accidents than usual. There are more little mishaps than major ones. It appears that little collisions occur frequently, which implies that there is some risk involved whenever we drive. However, such noticeable increases in occasionally catastrophic incidents indicate that we must identify the cause and work toward prevention. Although there aren't many fatal accidents, the frequency of them seems to increase slightly when there are significant ones.

There is severity in the accidents in the month of September. There is a huge severity of accidents from August to September and then there is a gradual decrease from September to October. There are always slight accidents with a small rate of increase as we move forward. Through the data visualization we observe different stages and difficulties like even though deadly accidents aren't as common, they show that sometimes our systems can get better to provide better road safety and avoid accidents.

### **Analysis of Pedestrian vs Driver Collisions**

An analysis was conducted on pedestrian collisions using a dataset spanning from 2005 to 2014, segmented into quarters to highlight seasonal variations. Similarly, the data was

disaggregated by gender. Concurrently, vehicle collisions were also analyzed to discern any correlations between drivers and pedestrians.

The overarching trend revealed a decline in collisions, which is a positive indicator. Across all severity types, males were found to be involved in more collisions than females. Notably, there was a consistent decrease in pedestrian collisions during Q2 and Q3 annually, with Q1 and Q4 maintaining higher figures. This pattern suggests that pedestrians are more susceptible to injury during winter compared to summer. Conversely, driver collisions did not exhibit such seasonal trends, nor did the incidence of collisions decrease throughout the year.

### **Analysis of collision on different road type**

Further examination was conducted on collision occurrences across different road types. The majority of collisions were observed on single carriageway roads, with approximately 20% occurring on dual carriageways. Incidents on other road types, such as slip roads, one-way streets, and roundabouts, were relatively low in frequency.

The data reveals a concerning trend: single carriageways lead with the highest number of accidents at an alarming 3,392,707, suggesting a critical review of their design and traffic management is necessary. In stark contrast, one-way streets report the lowest, with 53,869 accidents, indicating a potential model for safer road structures. Through sophisticated data visualization techniques, these figures can be transformed into insightful graphics, enabling policymakers and the public to comprehend the magnitude of road safety issues. Such visual reports are instrumental in driving home the message that while all road types present risks, the variance in accident rates is significant and warrants a differentiated approach to road safety interventions. This analysis not only underscores the urgency of addressing safety on single carriageways but also showcases the effectiveness of one-way streets in minimizing accidents, serving as a pivotal tool for strategic planning and resource allocation in road safety initiatives.

#### **Age Distribution:**

- Drivers involved in car accidents range from 11 to 100 years old.
- The majority of accidents involve drivers aged 18 to 30, with significant representation extending up to age 50. Beyond age 50, there is a decrease in accident involvement, followed by a notable increase among the elderly population (ages 60 and above).
- The age group with the highest casualty count is 18, closely followed by ages 19 and 20. Casualties decrease gradually with age, yet there is a noteworthy resurgence among the elderly, particularly those above 60.

#### **Sex Distribution:**

- The dataset comprises casualties of three sexes: male, female, and other.
- Males are consistently more prevalent in car accidents compared to females and individuals of other sexes.
- However, when examining casualties as a proportion of each sex's population, females exhibit a slightly higher casualty rate than males, particularly in younger age groups.
- While the "other" category constitutes a smaller portion of the dataset, their involvement in accidents, particularly among younger age groups, is noteworthy.

#### **Casualty Trends:**

- There is a general trend of decreasing casualties with increasing age, with a slight uptick observed in older age groups.

- Males consistently exhibit higher casualty numbers across all age groups compared to females and individuals of other sexes.
- The age group with the highest number of casualties is 18 for both males and females, closely followed by ages 19 and 20. Similarly, individuals of other sexes also experience peak casualty numbers within the same age range.

The age distribution among drivers involved in car accidents spans from 11 to 100 years old, with a notable concentration observed among individuals aged 18 to 30, extending significantly up to age 50. Beyond this threshold, there is a decline in accident involvement, followed by a noteworthy increase among the elderly population aged 60 and above. Among these age groups, casualties are highest among 18-year-olds, closely followed by ages 19 and 20, with casualties gradually decreasing with age, yet showing a resurgence among those above 60.

In terms of sex distribution, the dataset encompasses casualties of three sexes: male, female, and other, with males consistently comprising a higher proportion of car accidents compared to females and individuals of other sexes. However, when considering casualties as a proportion of each sex's population, females exhibit a slightly higher casualty rate than males, particularly within younger age groups. Although the "other" category constitutes a smaller portion of the dataset, their involvement in accidents, particularly among younger age groups, remains noteworthy.

Regarding casualty trends, there is a general pattern of decreasing casualties with increasing age, albeit with a slight uptick observed in older age groups. Across all age groups, males consistently exhibit higher casualty numbers compared to females and individuals of other sexes. The age group with the highest number of casualties remains 18 for both males and females, closely followed by ages 19 and 20. Similarly, individuals of other sexes also experience peak casualty numbers within the same age range.