

Background

Since 1986, The Centre for Injury Prevention within Sunnybrook Health Sciences Centre’s Tory Trauma Unit has played a critical role in preventing injuries at a both a provincial and national scale, through a variety of community programs, initiatives, and collaborations. Specifically, the Centre has established many injury prevention programs, such as Stop the Bleed and P.A.R.T.Y, all of which have prevented many traumatic injuries and injury-related deaths among high-risk populations, through unique approaches and services.

Main Project

My role was to create a trauma data report, which showcased the trend analysis for major injury types treated by the Tory Trauma Unit from 2016 to 2020. For each injury type, I conducted two separate analysis, including an overall trend analysis and a more specific marginalization data analysis. The overall trend analysis examined the relationship between key variables and each injury type, to determine whether certain underlying factors increased the risk for injury (ex. blood alcohol content). Whereas, the marginalization data analysis investigated whether social and health inequities impacted injury rates by connecting patient postal codes with provincial data sets to identify high-risk regions.

Objectives

- 1) Present trends and patterns based on the trauma data from 2016 to 2020 to facilitate a reduction in the number of injuries by informing future injury prevention methods.
- 2) Determine how the social determinants of health play a role in increasing the risk for injury by analyzing the association and correlation between key variables and each injury type.
- 3) Establish marginalization rates for each injury type to determine whether health inequities and social disparities exist and further the risk for specific injury mechanisms.

Methods

My first task was to conduct the overall trend analysis on four key injury types: fall, motor vehicle collision, penetrating, and self-harm injuries. Specifically, I measured key variables associated with each injury type, including the patient age, sex, injury place, intent, injury severity score, living/dead, work-related, and blood alcohol content. Trends were reported over five-year periods.

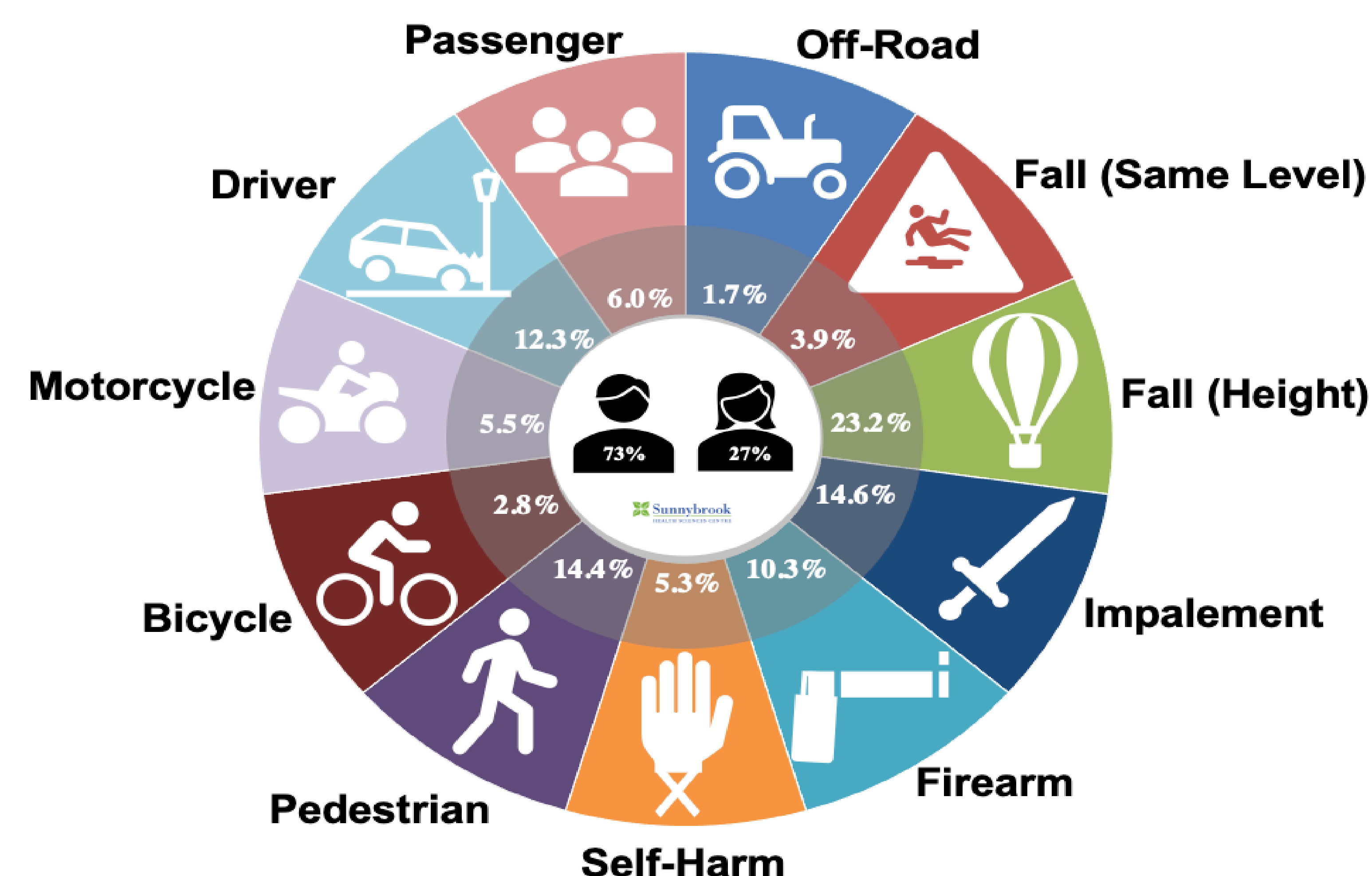


Figure 1. Trauma Wheel showcasing major mechanisms of injury

My second task was to complete the marginalization analysis for the 11 injury subtypes, represented in the trauma wheel. Six-digit postal codes (PC) of patients were obtained for each injury subtype, which I then merged with the Postal Code Conversion File. This was used to provide correspondence between the PC and standard geographic areas by identifying unique Dissemination Area Codes for each patient. Next, these codes were connected with Ontario-Marginalization Index 2016 to provide information on the marginalization rate of each patient. A marginalization Summary Score was obtained using the following equation:

$$\text{Summary Score} = (\text{instability quintile} + \text{deprivation quintile} + \text{dependency quintile} + \text{ethnic concentration quintile}) / 4$$

The summary score values were assigned to one of five quintiles. Quintiles 1 and 2 represent **lower** levels of marginalization; quintiles 4 and 5 represent **higher** levels of marginalization; quintile 3 represents **moderate** levels of marginalization

Findings

- Majority of motor vehicle collision and fall injuries occurred among patients from **lower** to **moderate** levels of marginalization, as 73% and 75% of cases were reported in quintiles 2 and 3.
- Majority of penetrating injuries occurred among patients from **moderate** to **higher** levels of marginalization, as 78% of cases were reported in quintiles 3 and 4.
- The number of self-harm injuries were **evenly distributed** between the lower and higher quintiles of 2 and 4, indicating that populations of lower and higher levels of marginalization are impacted equally.

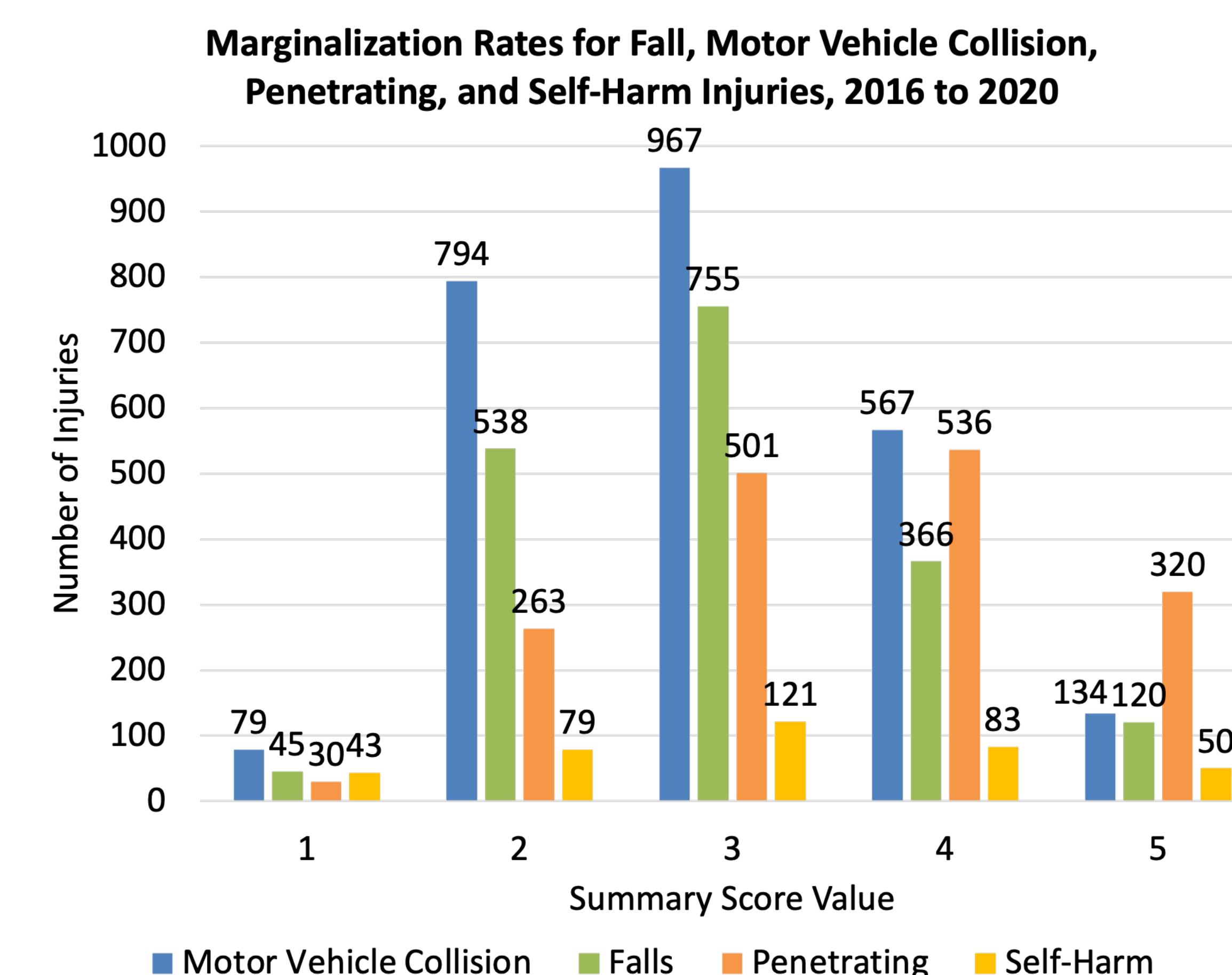


Figure 2. Number of Motor Vehicle Collision, Fall, Penetrating and Self-Harm Injuries Per Summary Score

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