Week6

Ding Ding

October 12, 2016

Title: Mortality in a fatality car accident is associated with different positions in the crash

Introduction

Nation's highways in motor vehicle traffice crashes result in 35,092 lives lost, 45,495 of injured victims, and bllions of dollars in property damage[1]. For all those injuried in crashes, four variables play key role for surviving through the accidents are location of the person in the crash, alcohol,restriction use and extrication. Location in the crash includes pedestrian,pedalcyclist, driver and occupant in different position in the vehicle. Alcohol is tested with Breathalyzer "BAC". Extrication is if equipment or other force was used to remove this person from the vehicle.

Understanding the relationship between chance of survival fatality crash to variables like location in the crash can help us to characterize the fatal cases and try to improve the survival rate. Here we performed an analysis to determine if there was a significant association between survival rate and the key variable mentioned above. Using exploratory analysis and logistic regression method we show that there is a significant relationship between survial rate and the location of the victim in the crash, alcohol positive and extrication,even after adjusting for important confounders such as age, eject and cross-section.

Methods

Data Collection

For our analysis we used the open data set that contains detailed, anonymized information about each of these tragic incidents of 2015. Data is downloaded from NHTSA's Fatality Analysis Reporting System (FARS) on September 9, 2016.

Exploratory Analysis

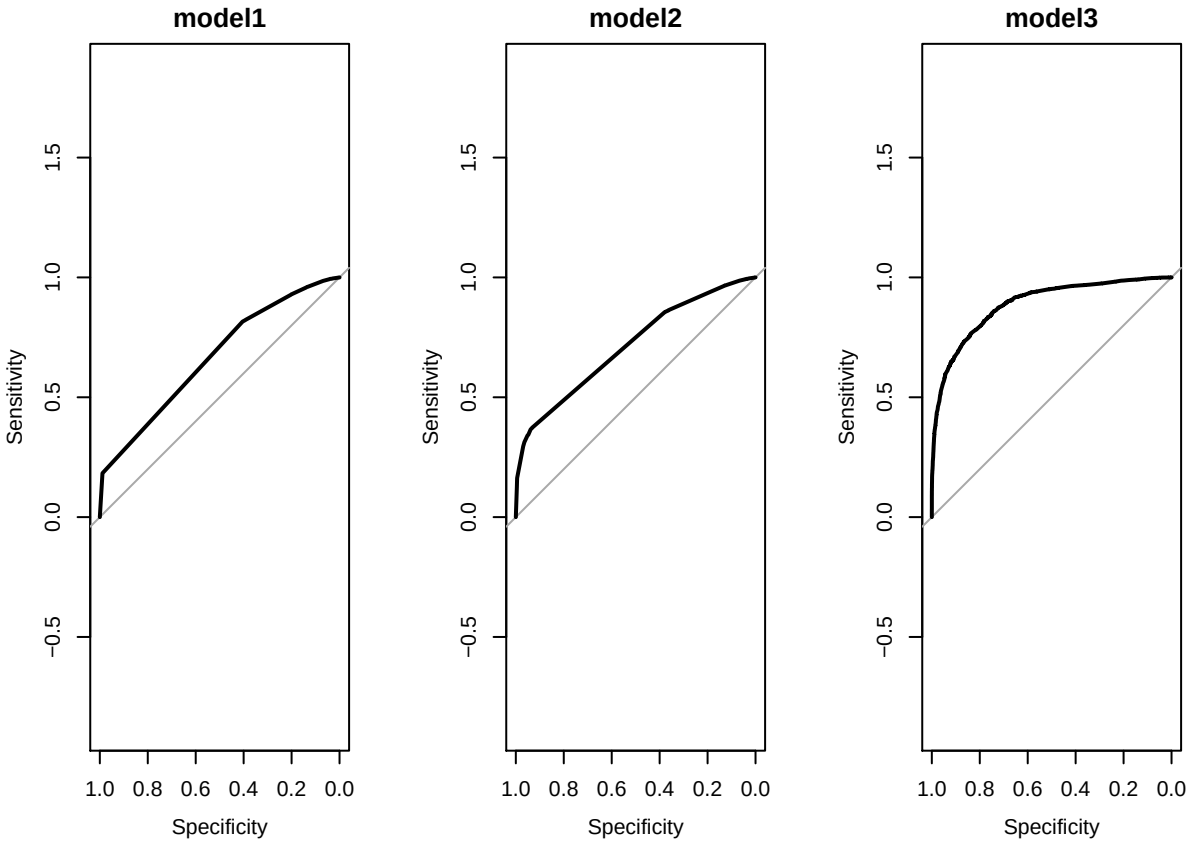
Exploraloty analysis was performed by examining plots and tables of the recorded data. We identified all the injuried people in fatal crash are categoried into fatal and survivor, which is binary outcome for analysis. Exploratory analysis was used to (1) verify the quality of the data, (2)identify response, key varibles and potential confounders,and (3) determine the variables and regression model for the analysis.

Statistical Modeling

To analysis the chance to survive through crash and variables like location in the crash, we performed a logistic regression model. Model selection was performed on the basis of our exploratory analysis, the type of response and prior knowledge of the relationship between the variables and the chance to survive. Models are estimated with cross validation, ROC and AUC.

Reproducibility

Results



Conclusions