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10/25/22

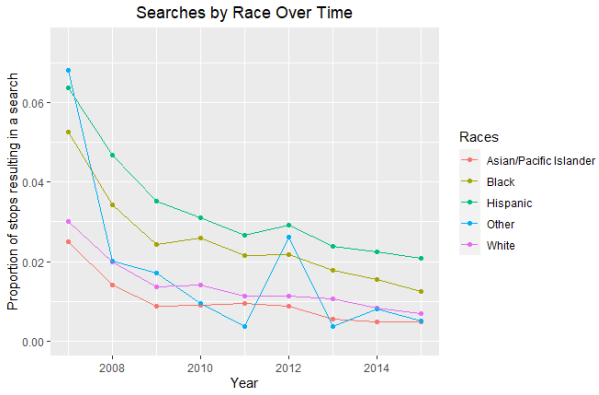
Policing Memo

The question I seek to explore is: Are vehicular searches performed by the Massachusetts State Police conducted at different rates for drivers of different races?

The data I used to explore this question is from the Stanford Open Policing Project. The data is for stops conducted by the Massachusetts State Police from January 2007 – December 2015. An initial check of the data revealed that there were 3,416,238 stops present in the dataset, with 24 attributes across those stops. However, 8 of those attributes had NA values in more than 1% of the observations; given the robustness of the other attributes I decided to drop these columns from further analysis. Additionally, while every observation had an exact date attached to it, I knew that I wanted to conduct my analysis across each year, as an exact date would be too specific. Thus, I generated a new column in the dataset that is the year of the observation.

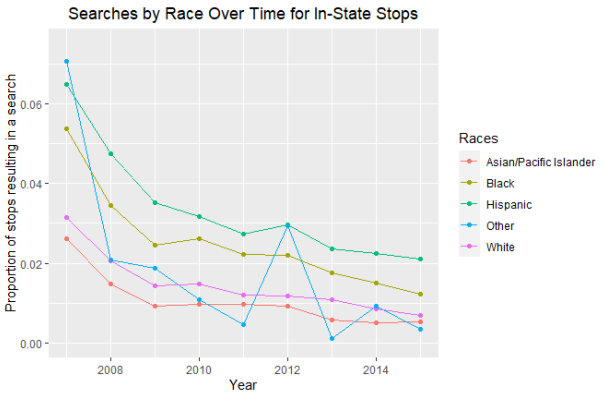
I began my analysis by looking at how many stops were conducted per race. This led me to realize that some races were NA, and others were listed as Unknown. Neither of these values would be useful in analysis, so I dropped all observations containing those values for race. This left me with 3,397,557 observations for the bulk of my analysis.

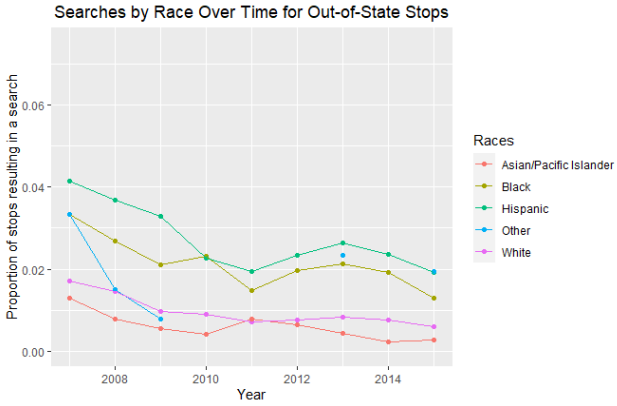
The main part of my analysis focused on the proportion of stops that resulted in searches of the vehicle. I calculated these rates for each race, and plotted the values.



The general trend is a decrease in search rates from 2007 to 2015, across all races. The one exception is for “other” races, which had a large increase in searches in 2012.

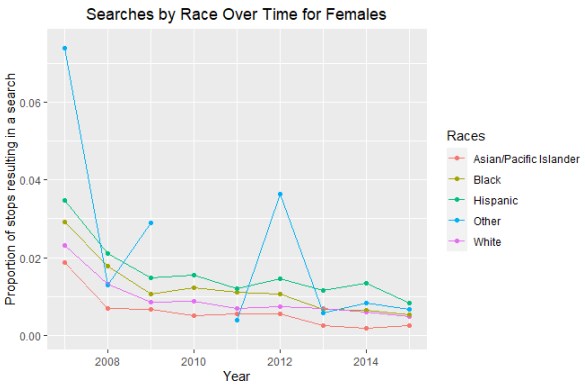
I wanted to see if there was a variation in this trend between vehicles that have an in-state (Massachusetts) license plate versus out-of-state plates. I split up the data on this factor, and plotted the results.

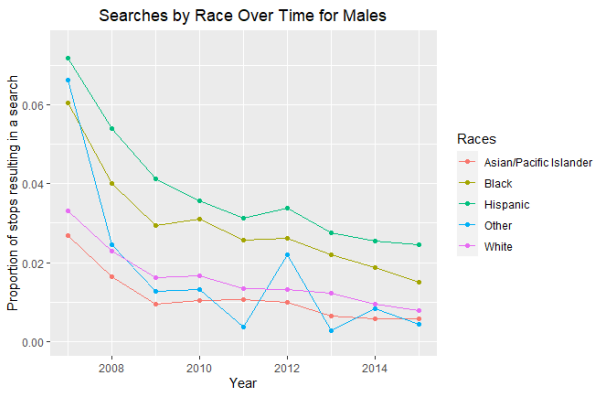




Searches appear to be higher in the earlier years for in-state plates, but drop down to 2% of stops or lower for all races by 2015. This follows the general trend for all stops.

Finally, I split the data on gender to see if there was any difference across races for female versus male drivers. I plotted the result rates on the same scale as before.





Overall, male drivers appear to have higher rates of searches conducted during their stops than female drivers. While there are numerous factors that determine whether an officer decides to conduct a search of the vehicle during a traffic stop, it's notable that perhaps these reasons are more likely to be prevalent in male drivers than in female drivers.

For all five of the search rate plots, we can also see that Black drivers and Hispanic drivers tend to have higher rates of searches conducted of their vehicles than drivers of other races. Again, there are a number of aspects an officer likely has to take into account before deciding to conduct a search, so it may not be the case that a driver's race is the main reason that an officer decides to search. However, a further extension of this analysis could test to determine whether a driver's race is indeed a significant predictor of whether or not a search gets conducted.