

Evaluation of Recidivism Algorithm

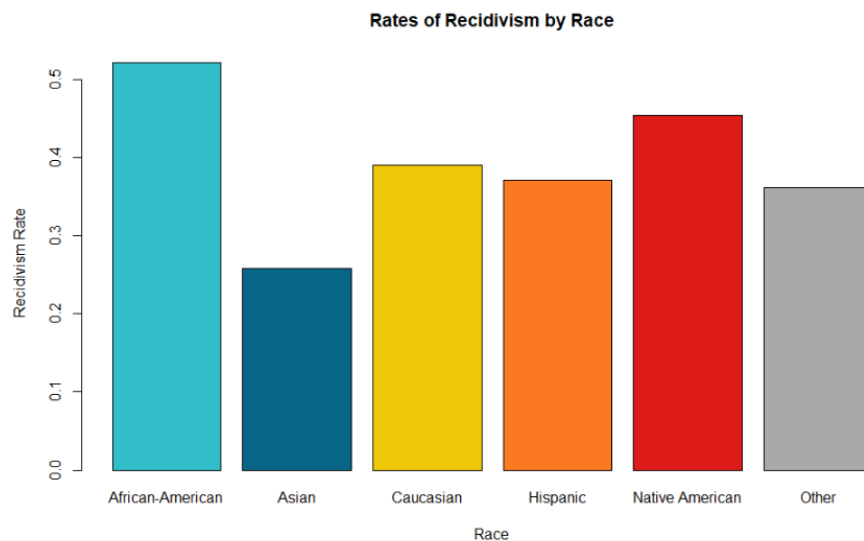
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Broward County, Florida recently implemented an algorithm to predict convict recidivism to inform decision-making during the appeals process. Using a provided set of their data to test, the algorithm was evaluated to determine (1) how accurate the model is, (2) how biased the model is, and (3) the effectiveness of implementing the model in Philadelphia.

Context

According to a sampling of Broward County inmates, there is a disproportionate rate of recidivism of African-Americans convicts, compared to all other races.



Of those sampled, 52% of African-American convicts recidivated compared to a 45% recidivism rate for convicts of all races, and a 39% recidivism rate for Caucasian convicts. These figures are in line with the racial makeup of the incarcerated sample population. 51% of the sample is African-American and only 34% of the sample is Caucasian. African-Americans makeup a disproportionate rate of convicts, and recidivated convicts. Any algorithm should be tested rigorously to ensure it is not contributing to this problem and rather, increases the rate at which released convicts are able to reintegrate into society, without recidivating.

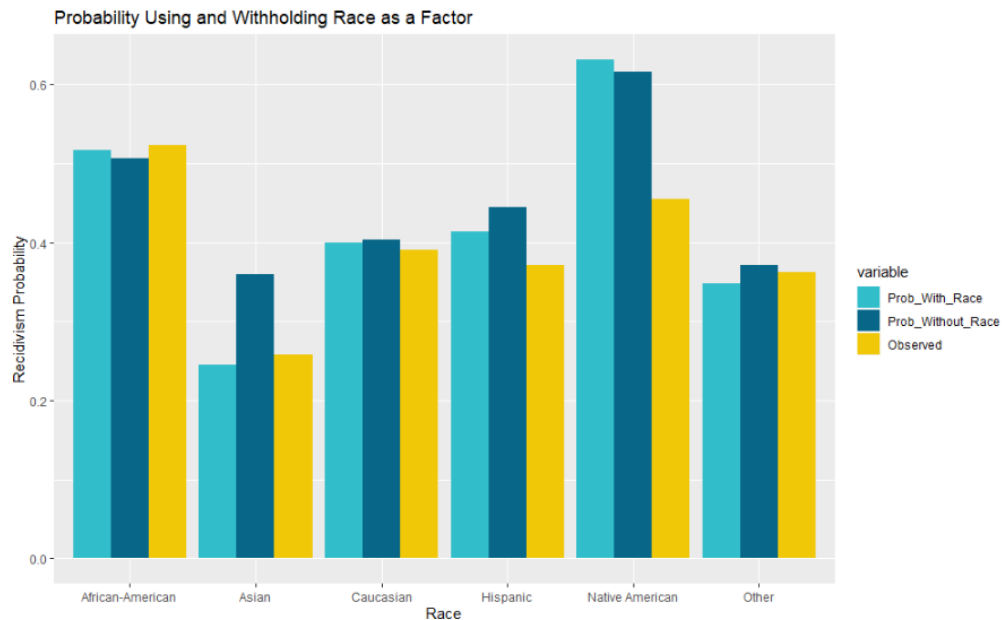
Evaluation

Including race data in the model is helpful for holding the model accountable for bias. By blindly predicting recidivism, there is no way to assess how proportionately the risk of recidivism is being calculated. When there is a concern about a variable, such as race, skewing the results of a predictive model, the model should be tested with and without the variable and have the results compared. This method allows for assessment of how much of an influence such a variable has on the prediction. If the influence is too large, this can be accounted for and adjusted to produce a more accurate and less biased model.

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According to the models, the model that factored in a convict's race was more accurate at predicting recidivism rates for African-American, Asian, and Caucasian convicts. The models are only as good as the data used to train them and the relatively small sample size of Native American, and Hispanic convicts made their models less accurate. Both models, using and withholding race, overpredicted recidivism rates for Hispanic and Native American convicts. This can be explained by a small data set or other factors unique to these populations that are better predictors of recidivism. A more mature model, tailored to a local population like Philadelphia's, may be able to account for these nuances.

The observed recidivism rate for all convicts was 39%. The model that included race as a factor predicted an overall 42% recidivism rate. The model that withheld race as a factor predicted an overall 45% recidivism rate. Both models slightly overpredict recidivism, but the model with the race as a factor was more accurate compared to observed recidivism.

Recommendation

This model could be a valuable component in a larger toolbox of information used to determine a convict's rehabilitation. The model that included race as a factor, overall, predicted recidivism with a 7% error. This figure should be compared to the error rate of the existing decision-making framework. Models like these have the opportunity to provide a worthwhile prediction that can help balance the overall decision-making process. As the data shows recidivism and incarceration are disproportionately high among the African-American convict population, the model that factored in race was able to predict recidivism within this group with an error of 1%.

The best way to improve this model is to apply it to future cases and study its accuracy. The more data available, the more accurate the model can become. If implemented, the model should be routinely assessed with the most recent data and determine the rates at which the model accurately predicted recidivism and non-recidivism. At a point where the model is predicting recidivism in-accurately, this is contributing to the number of convicts that the model is persuading should remain in prison even though they likely would reintegrate as productive members of society and not recidivate. Additionally, the system should not be over-reliant on this or any one prediction model. This should be used in conjunction with a case-by-case analysis and a variety of other indicators specific to each individual. Use of this model will prove successful if it is able to reduce the recidivism rate of released convicts, thereby increasing the value of rehabilitation.