PREDICTING CANCER DEATHS

GUN CONTROL: WHAT NEEDS TO CHANGE

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SOCIOTECHNICAL SYNTHESIS

Technology has the ability to cause a lot of harm, but if used properly, it can bring about some really useful improvements to society. Starting with medical improvements, the technical research topic attempts to accurately predict the rate of cancer deaths in Virginia based on demographic statistics for a given region in order to isolate the factors that increase one's risk and hopefully prevent unnecessary deaths. With the development of a machine learning regression model, the technical topic identifies certain characteristics that put an individual at a higher chance of death from lung cancer with the goal of preventing some of these mortalities. The science, technology and society (STS) topic utilizes a societal construction framework in order to understand the social ramifications of firearms as well as the various populations that are affected by gun control in order to prevent more mass shootings. The loosely related research topics cover the development of regression models for predicting cancer along with the societal implications of gun control on relevant social groups with the goal of decreasing the number of deaths within these two issues.

The technical research topic describes the creation of multiple regression models to improve the accuracy of prediction of lung cancer related deaths with the use of machine learning algorithms. The current allocation of resources provides only a small portion of funding into predicting cancer. The designed prediction model uses a linear regression with a gradient descent optimization method to predict the rate of cancer given an input of various demographic characteristics. It was programmed using Python and utilizes multiple standard libraries such as Sklearn and Pandas data frames.

Multiple other regression models were developed with the purpose of comparison in order to find the most accurate regression framework. While the linear regression model is able to predict the rate of cancer on test data with a relatively low root mean squared error compared to the other approaches, it is not accurate enough to rely on for allocating funding. More time would be necessary to properly determine the weight of each input parameter in order to make it accurate enough to base actual cancer research on.

The original reason for wanting to research the social implications of gun control and the factors that increase one's likelihood of death due to cancer was to figure out how to prevent large numbers of deaths in America. However, the STS research then became an analysis of the social groups involved in gun control and how each impacts the development of new regulations pertaining to firearms with the ultimate goal of finding a solution that appeases both sides while decreasing the current rate of mass shootings in America. Bijker and Pinch's Social Construction of Technology theory was utilized in order to understand the differing opinions of various social groups and how they impact gun control legislation. The framework was created by analyzing other research studies, mass shooting statistics, and opinion pieces in order to understand the rationale behind the arguments of each party.

Overall, this research was able to develop a few potential solutions including reducing the amount of media attention a mass shooting gets as well as a safety course that would be required in order to purchase a firearm. Neither of these solutions will completely eradicate the problem, but they still provide potential ways that could reduce

it. The research gave a deeper comprehension of the groups that affect gun control and will hopefully lead to more investigations into find a permanent solution.

People are dying far too frequently from causes that could be preventable such as mass shootings and cancer. However, there needs to be a lot more research into determining what factors are holding society back from discovering a permanent solution if one is to be found. Technology has many potential, beneficial uses but depending on the society it is developed in, it can lead to great harm.

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