Assessing the Efficacy of COVID-19 Policies Using Machine Learning

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To limit the spread of COVID-19, government policies are necessary. Current research focuses primarily on documenting proposed policies rather than assessing the efficacy of said proposals. Thus, the goal of this research is to analyze COVID-19 policies using machine learning methods. Specifically, our aims are to one, develop an accurate machine learning model to predict the effectiveness of COVID-19 policies, and two, to use that model to find the most effective COVID-19 policies. Data from the CoronaNet Research Project and Our World in Data was used to provide a list of over 50,000 government policies in 195 countries as well as the corresponding COVID-19 data. A random forest regression algorithm achieved an R2 value of 0.88 on training data and 0.63 on test data. These high values affirmed the strength of our model. Using the feature importances attribute of our model, we identified the top 15 most important policy features, and these results were affirmed by a feature selection algorithm. Our model is novel because it conducts a holistic analysis of COVID-19 policies, meaning it can used by policymakers to compare the effectiveness of a wide range of policies. Additionally, unlike others, our model can predict the impact of proposed policies. Based on our findings, we recommend governments increase policy adherence through methods such as publicizing information concerning the pandemic. We also recommend the prioritization of policies that restrict external borders and regulate businesses. Policies should target all residents and be mandated through consequences like jail time and fines.

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