

Effects of Government Policy and Socioeconomic Factors on Covid-19 Mortality Rates Worldwide

In a comparison of 170 countries with at least one COVID-19 death, the most significant impact on COVID-19 mortality rates was stringency of government policy ($q=3.4e-127$), where stringency was determined by the Oxford Government Response Tracker (3) as a single measure of magnitude and thoroughness of various government actions. When examining effects in intervals of 2-4 weeks, government policy at any given time significantly affected COVID-19 mortality rates most after 4 weeks. Socioeconomic factors within a country, such as rates of extreme poverty and percentage of population over 65 years of age also significantly determined COVID-19 mortality rates ($q=5.7e-4$, $4.0e-4$). Other health factors such as rate of diabetes and total hospitals per capita also affected COVID-19 mortality rates, but insignificantly ($q=0.37$, 0.91). In terms of government response, containment and public information campaigns dropped the COVID-19 mortality rates twice as much as economic support policies.

The figure to the right demonstrates the government response indices and COVID-19 deaths over time. The first 6 plots moving rowwise, then columnwise depict the 6 countries with the highest cumulative COVID-19 cases as of July 27, 2020 (1). Countries such as Brazil and India demonstrate increase in daily COVID-19 deaths despite maintaining government policy stringency. Countries such as Canada and New Zealand demonstrate declining deaths under sustained government policy. Taiwan has the lowest stringency index, yet maintains no deaths.

Statistical tests performed using mixed models from python statsmodels package. Datasets obtained from (1), (2), (3). Analysis adapted from (4).

References:

- (1) European Centre For Disease Prevention And Control (2020) 'Sonraí faoi choróinvíreas COVID-19'. Publications Office. doi: 10.2906/101099100099/1. Retrieved from: <https://data.europa.eu/euodp/en/data/dataset/covid-19-coronavirus-data>
- (2) Max Roser, Hannah Ritchie, Esteban Ortiz-Ospina and Joe Hasell (2020) - "Coronavirus Pandemic (COVID-19)". Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/coronavirus>'
- (3) Thomas Hale, Sam Webster, Anna Petherick, Toby Phillips, and Beatriz Kira. (2020). Oxford COVID-19 Government Response Tracker. Blavatnik School of Government. Retrieved from: <https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker>
- (4) Jinjarak, Yothin, et al. Accounting for Global COVID-19 Diffusion Patterns, January-April 2020. No. w27185. National Bureau of Economic Research, 2020.

