

Supplementary Materials for  
**Epidemic outcomes following government responses to COVID-19: Insights  
from nearly 100,000 models**

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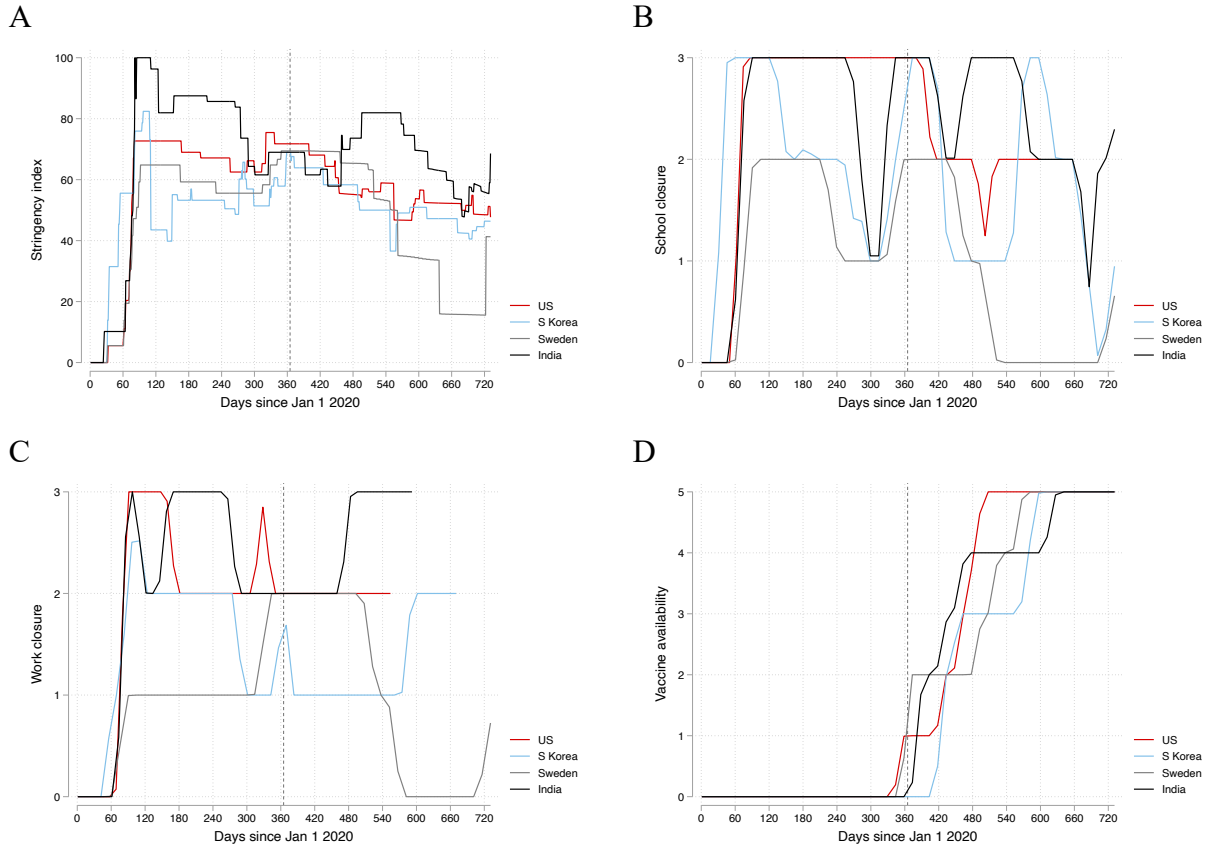
**The PDF file includes:**

Fig. S1  
Table S1  
Legend for data file S1  
References

**Other Supplementary Material for this manuscript includes the following:**

Data file S1

**Supplementary Figure S1:** Trends in 4 government responses in the US, South Korea, Sweden, and India, January 1, 2020 to December 31, 2021.



A comparison of government response trends as noted in the Oxford Covid-19 Government Response Tracker (OxCGRT). The definitions of each level of government response and the calculations of the Stringency index are available in the OxCGRT github.

**Supplementary Materials Table S1:** A collection of articles in the scientific literature providing an evaluation of government policy effectiveness on Covid-19. This represents the first 15 articles we could find that directly evaluated government policies. The quoted material represents claims from either the Abstract or Discussion section of the articles. All 15 make strong claims either in the direction of effectiveness or futility of government policies.

<u>Study/Citation</u>	<u>Design</u>	<u>Period</u>	<u>Geography</u>	<u>Outcomes</u>	<u>Conclusion</u>	<u>Citations (as of 1/14/23)</u>
Flaxman et al, Nature 2020 Aug;584(7820):257-261(9)	Modeling	2-5/2020	11 European countries	Transmission	"Our results show that major non-pharmaceutical interventions—and lockdowns in particular—have had a large effect on reducing transmission."	3736
Hsiang et al, Nature 2020 584, 262–267(15)	Observational	2-4/2020	Regions in China, South Korea, Italy, Iran, France, US	Transmission / case growth rate	"We estimate that across these 6 countries, interventions prevented or delayed on the order of 61 million confirmed cases, corresponding to averting approximately 495 million total infections."	1571
Herby et al, medRxiv 2023.08.30.23294845(11)	Observational (meta-analysis)	1-9/2020	US, Europe (countries/continental); Italy	Mortality	"... lockdown policies are ill-founded and should be rejected as a pandemic policy instrument"	165
Krishnamachari et al, Am J Infect Control. 2021 Aug; 49(8): 1036–1042(43)	Observational	2020-2021	United States	Cases	"The benefits of mask mandates are apparent, especially when mandates were issued within a month."	35
Dreher et al, Am J Med Sci 2021;361:575-84 (44)	Observational	1-5/2020	United States	Transmission, deaths	"States with stay-at-home orders in place at the time of their 500th case were associated with lower average Rt the following week compared to states without them (p<0.001) and significantly less likely to have an Rt>1 (OR 0.07, 95% CI 0.01–0.37, p = 0.004)...Stay-at-home orders had the largest effect of any policy analyzed"	57
Hale et al, medRxiv	Observational	1-5/2020	170 countries in Europe, Asia,	Mortality	"...speed and degree of government responses do indeed have a statistically robust and substantively	45

2020.07.04.20145334(22)			Americas and Africa		significant relationship with deaths related to COVID-19"	
Tobias, Sci Total Environ 2020;725:138539(45)	Observational	2-4/2020	Spain and Italy	Mortality	"Lockdown, including restricted social contact and keeping open only those businesses essential to the country's supply chains, has had a beneficial effect in both countries."	324
Vlachos et al. Proc Natl Acad Sci. 2021 Mar 2;118(9)(46)	Observational	3-4/2020	Sweden	Cases	"The results for parents indicate that keeping lower-secondary schools open had minor consequences for the overall transmission of SARS-CoV-2 in society."	133
Gibson. New Zealand Economic Papers, 56:1, 17-28, 2020(47)	Observational	3-5/2020	US	Mortality	"Lockdowns are ineffective at reducing Covid-19 deaths. Variation amongst counties in the United States, where over one-fifth had no lockdown, shows no impact from lockdowns. Specifically, one cannot reject the hypothesis of zero difference in deaths between lockdown and non-lockdown counties, even after three months. Thus, there is no evidence to suggest that lockdowns saved lives"	47
Siedner et al, PLoS Medicine. 17.8 (2020): e1003244. August 11, 2020(48)	Observational before-after	up to 5/26/2020	US	Case and mortality growth rate	"Statewide social distancing measures were associated with a decrease in the COVID-19 case growth rate that was statistically significant. Statewide social distancing measures were also associated with a decrease in the COVID-19-attributed mortality growth rate beginning 7 days after implementation, although this decrease was no longer statistically significant by 10 days."	158
Liu et al, BMC Public Health 21, 965 (2021)(49)	Observational	Up to 5/31/2020	US	Reproduction number	"This retrospective assessment of NPIs on Rt has shown that NPIs played critical roles on epidemic control in the US in the past several months. The quantitative results could guide individualized decision making for future adjustment of NPIs in the US and other countries for COVID-19 and other similar infectious diseases."	36
Alfano et al. Appl Health Econ Health Policy	Observational panel data	Up to 5/10/2020	202 countries	Cases and reproduction number	"Results suggest that lockdown is effective in reducing the R0, i.e. the number of people infected by each infected person, and that, unlike what has been	495

2020;18:509-17(50)					suggested in previous analyses, its efficacy continues to hold 20 days after the introduction of the policy"	
Thayer et al, Health Policy Plan. 2021 Jun 3;36(5):620-629(51)	Observational interrupted time series	Up to 8/31/2020	India	Cases	"The increasing rate of incident case reports in India was attenuated after the lockdown policy was implemented compared to before, and this reduction was maintained after the restrictions were eased, suggesting that the policy helped to 'flatten the curve' and buy additional time for pandemic preparedness, response and recovery"	58
Guzzetta et al, Emerg Infect Dis. 2021 Jan;27(1):267-270(52)	Observational	Up to May 3, 2020	Italy	Cases and reproduction number	"Our results suggest that the national lockdown put in place as of March 11 to limit the spread of SARS-CoV-2 in Italy brought Rt below 1 in most regions and provinces within 2 weeks. Although Rt had been declining steeply even before the national lockdown in regions with intense interventions, we estimated that the epidemic was brought under control only after the implementation of the lockdown"	80
Liu et al, BMC Med. 2021 Feb 5;19(1):40(53)	Observational panel	Up to June 2020	130 countries	Transmission, cases	"The effectiveness of school closure and internal movement restrictions appears robust across different model specifications, with some evidence that other NPIs may also be effective under particular conditions. This provides empirical evidence for the potential effectiveness of many, although not all, actions policy-makers are taking to respond to the COVID-19 pandemic."	328

**Supplementary Data S1:** This folder contains the code for all analyses and figures. The code is written in Stata 17. The code is executed by running the *master\_file*. The *master\_file* takes the original data files from OxCGRT, the Johns Hopkins Covid-19 dashboard, Covid-19 cases, infections, and deaths from the Institute for Health Metrics and Evaluation (IHME), and excess all-cause mortality from the *New York Times*, the *Financial Times*, the *Economist*, and the World Mortality Dataset from a folder titled *data*, and returns the results in a folder titled *results*.

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