MIT Sloan School of Management

MIT Sloan School Working Paper 6185-20

The COVID Report Card

Megan Czasonis
Mark Kritzman
Baykan Pamir
David Turkington

Ocotober 19, 2020

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Megan Czasonis
mczasonis@statestreet.com

Mark Kritzman
kritzman@mit.edu

Baykan Pamir
bpamir@statestreet.com

David Turkington
dturkington@statestreet.com

THIS VERSION: OCTOBER 16, 2020

Abstract

The authors model COVID infections and COVID deaths, both reported and implied, for the 50 U.S. states as well as the District of Columbia, and separately for a sample of 33 countries, as a function of pre-existing circumstances that citizens have no ability to control over the short term. These models give predictions of expected COVID outcomes. They then compare their model's predicted results with actual experience. They interpret the differences between actual experiences and the predictions across the jurisdictions as the COVID outcomes attributable to the behavior of citizens.

THE COVID REPORT CARD

We model COVID infections and deaths, both reported and implied, across the 50 U.S. states and the District of Columbia, as well as for a sample of 33 countries, based on pre-existing circumstances that, in the short term, are beyond the control of citizens. The set of variables we use to model COVID outcomes are all statistically significant in predicting cross-sectional variation in infection rates and reported and implied death rates for our U.S. analysis. Three out of four of our explanatory variables are statistically significant for our country analysis. The single variable that is not statistically significant still exhibits the relationship we expect, with the correct sign for its regression coefficient. We then compare actual COVID outcomes with our models' predictions. We interpret the models' predictions as the handicap for each jurisdiction and the spreads between actual outcomes and the predictions as grades for the behavior of citizens. We leave it to the reader to speculate why certain jurisdictions performed better or worse than others.

We proceed by first describing our data and methodology for our U.S. analysis. We then report our model's coefficients and t-statistics. Next, we report our results for each state and the District of Columbia. We then describe the data for our country analysis and present the results of this analysis. We conclude with a summary.

U.S. Data

Our U.S. sample comprises weekly[1] observations of COVID infections, reported deaths, and implied deaths as dependent variables, and education, age, governor's political affiliation, and population density as independent variables. Our data covers the period from May 23, 2020 to September 12, 2020. Below we describe this data in detail.

Dependent variables

We analyze three types of COVID outcomes: new cases, reported deaths, and implied deaths.

New cases: We define new cases for each state and the District of Columbia as the number of new cases per one million people less the average of new cases per one million people across all states and the District of Columbia, measured weekly. Thus, the new cases we report for a given jurisdiction would be negative if it were less than the average across all jurisdictions. We use the level of new cases because the percentage change in new cases fails to reflect the pre-existing number of cases. We determine our standardized measure of new cases from the total cases that are shown on the New York Times's publicly available database, which relies on sources such as public releases from individual states, the Federal Center for Disease Control and Prevention, and Johns Hopkins University.

Reported deaths: We define reported deaths as the number of new deaths per one million people less the average of new deaths per one million people across all states and the District of Columbia, measured weekly. We obtain data on total deaths attributed to COVID from the New York Times's publicly available database.

Implied deaths: We include implied deaths because some states have under reported COVID deaths and because no state can account for all COVID related deaths, especially given the lack of testing capabilities. Moreover, many deaths resulted indirectly from COVID because people chose not to schedule medical appointments or certain types of treatment for fear of contracting COVID at medical facilities.

We measure implied deaths in each state as the total deaths in excess of the expected deaths. We obtain the total and expected deaths from the National Center for Health Statistics (NCHS) website. The implied deaths are calculated as the number of deaths for all causes for a given week in 2020 compared to the average number across the same week in 2017–2019. We standardize implied deaths as we did new cases and reported deaths.

Independent variables

We use four independent variables to model COVID outcomes: education level, median age, political affiliation of governor, and population density.

Education level: We measure education level as the percentage of the population with a bachelor's degree or higher, as reported by the U.S. Census Bureau's American Community Survey (as of 2018). This variable is highly correlated with median income, which we argue also serves as a proxy for access to better quality healthcare. We therefore expect a negative coefficient for education level.

Median age: We obtain the median age for each state from the U.S. Census Bureau's American Community Survey (as of 2018). We expect that because older people face greater health risks from COVID, they exercise more caution than younger people. We also expect that on average, older people may have fewer social interactions than younger people and that older people act less impulsively than younger people in general. We, therefore, expect median age to have a negative coefficient. This logic applies to the COVID deaths per million people despite the fact that older people are more likely to die from COVID, because a lower rate of transmission in states with older populations likely outweighs a slightly higher case fatality rate.

Political affiliation of governor: We obtain the most recent governor political affiliations from the National Governors' Association. We define this variable as a dummy variable in which we assign a one for a Democratic governor and a zero for a Republican governor.[2] This variable is 53% correlated with state electoral preferences in the 2016 presidential election. Because Republican governors have been less willing than Democratic governors to impose restrictions on businesses and gatherings or to encourage responsible behavior as recommended by healthcare experts, we expect this variable to have a negative coefficient.

Population density: We measure population density as the natural logarithm of the ratio of a state's population to land area in square miles. We use 2019 population estimates from the U.S. Census Bureau and 2010 state area measurements, also from the U.S. Census Bureau. We consider population density as a proxy for the fraction of the population that lives in an urban environment. We expect this variable to have a positive coefficient because denser populations implies more interpersonal contact and therefore more opportunity for COVID transmission.

U.S. Methodology

We performed cross-sectional linear regressions on pooled weekly data across all states and the District of Columbia from the Saturday of the Memorial Day holiday (May 23, 2020) through September 12, 2020. We chose to begin our analysis with the Memorial Day holiday because prior to this date the guidance from healthcare experts was mixed. For example, at the beginning of the pandemic in the U.S., healthcare experts did not advise people to wear facemasks, because they underestimated the threat posed by COVID and because facemasks were not widely available. By Memorial Day, there was a consensus among healthcare experts that people should wear facemasks in public, perform social distancing, avoid large crowds, especially indoors, and wash their hands frequently. Moreover, the early experiences with COVID were more randomly determined than behaviorally determined. Therefore, Memorial Day weekend posed the first major test of the population's willingness to abide by uniform expert advice at a time when COVID was pervasive throughout the country.

U.S. Results

Exhibit 1 presents the outcome from our model of new cases. It reveals that all the variables are statistically significant, and the signs of the coefficients align with our expectations. The predictions from this model are 56% correlated with actual COVID new case outcomes. All of the t-statistics we report in this paper use standard errors that are adjusted to account for correlated errors that result from partially-redundant observations in the pooled cross-section of data.[3]

Exhibit 1: U.S. Regression Results for New COVID Cases (per million people)

	Education Level	Median Age	Democrat Governor	Population Density
Coefficient	-4760	-94	-179	134
t-statistic	-4.3	-5.9	-2.5	9.2
+ 1 standard deviation effect	-1,843	-3,831	-179	134

This model indicates that states with Democratic governors should expect 179 fewer cases per one million people each week, based on the overall level of infections that occurred during this sample. Or put more starkly, a state with a Democratic governor and a population of 20 million people should expect 3,600 fewer cases per week than an equally populated state with a Republican governor, holding constant other factors. Likewise, the model also suggests that states with one percent more people with a bachelor's degree or higher should experience 952 fewer cases per week (-4760 / 100 * 20 = -952).

We also include the impact of a one standard deviation increase in the independent variables. We present these results in standard deviation units because the variables are measured in different units. For example, this information reveals that a jurisdiction with a one standard deviation higher median age should expect 3,831 fewer cases per one million people than the average across the U.S.

Exhibit 2 compares the expected number of new cases based on our regression model, which we refer to as handicap, with the actual number of new cases for each state and the District of Columbia. These numbers are shown relative to the national average. For example, Vermont was expected to have significantly fewer cases than the national average, population adjusted, based on pre-existing circumstance beyond the control of the citizens. And it performed slightly better than expected because there were fewer new cases relative to the national average than predicted by the model. Maine was also expected to have fewer new cases than the national average, but its citizens slightly underperformed because new cases in Maine were not as far below the national average as expected.

Exhibit 3 shows the spreads between realizations of new cases and expectations (the differences between blue and gray bars in Exhibit 2). These results are effectively a report card for the behavior of the citizens, because they account for the handicap the citizens faced from pre-existing circumstances that were beyond their control. Not surprisingly given the guidance from the state capital, even after controlling for the party affiliation of the governor, Floridians behaved in a manner that caused higher infection rates than any state or the District of Columbia, and by a considerable margin. By contrast, states such as New York and Massachusetts experienced fewer new cases than expected based on their pre-existing circumstances.

Exhibit 2: U.S. Actual New Cases (per million, relative to average) versus Model Predictions

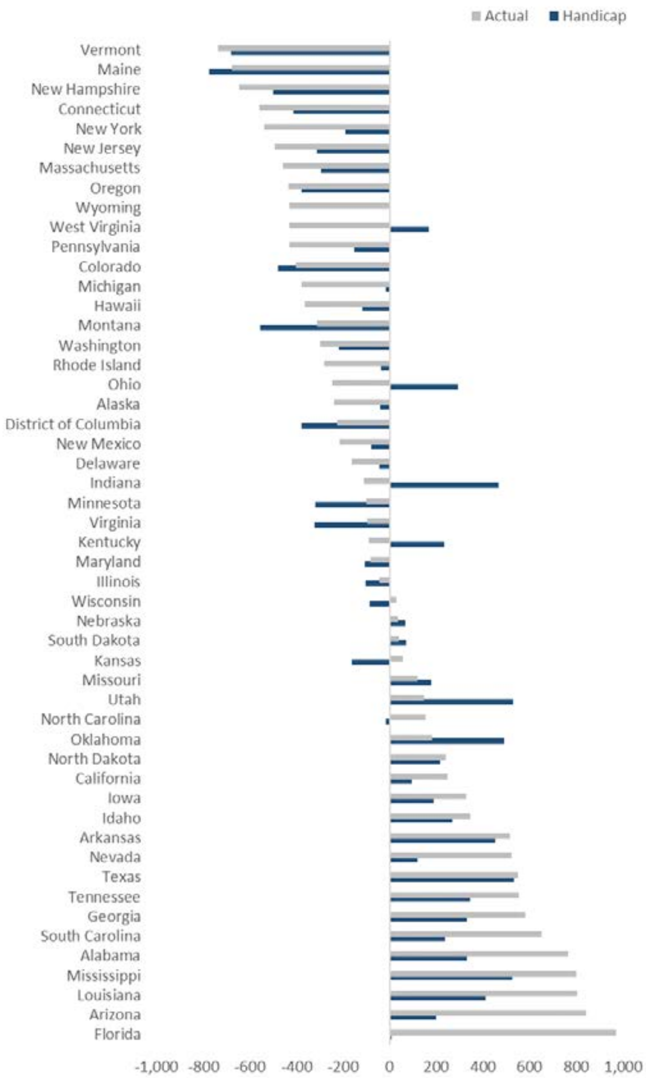
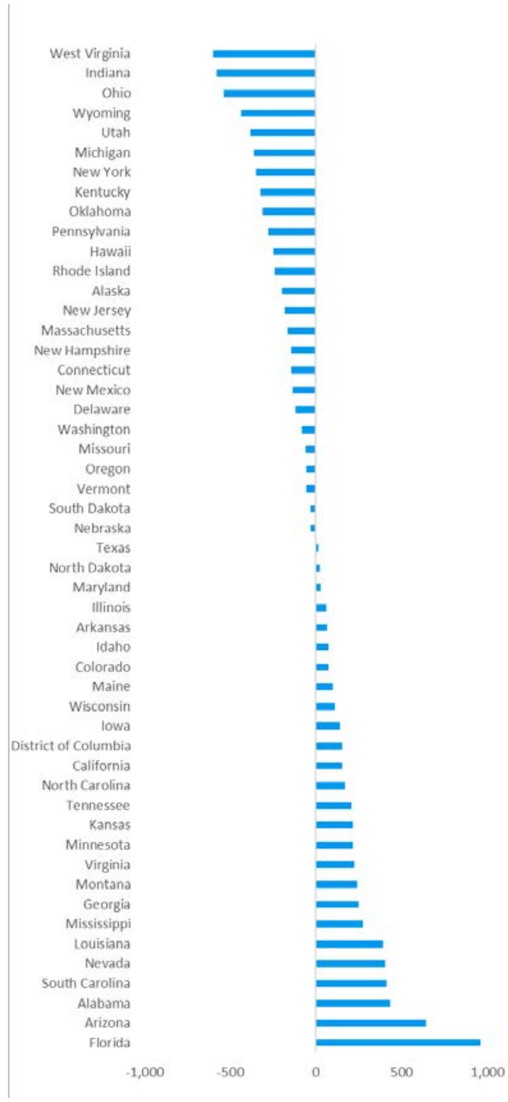


Exhibit 3: U.S. COVID Report Card for Total Cases (Actual – Handicap)



We next provide the same information for reported deaths as well as implied deaths, which also captures unreported deaths and deaths that occurred as a second order effect of COVID. In both cases, all the explanatory variables are statistically significant and have the expected sign.

Exhibit 4: U.S. Regression Results for COVID Deaths

Reported Deaths (per million people)

	Education Level	Median Age	Democrat Governor	Population Density
Coefficient	-61.5	-0.6	-3.7	4.8
t-statistic	-2.4	-1.9	-2.2	16.6
+ 1 standard deviation effect	-24	-26	-4	5

Implied Deaths (per million people)

	Education Level	Median Age	Democrat Governor	Population Density
Coefficient	-94.2	-1.3	-4.2	5.3
t-statistic	-2.7	-4.2	-2.1	5.6
+ 1 standard deviation effect	-36	-55	-4	5

As with our analysis of new cases, our explanatory variables explain a significant portion of COVID deaths across states. The predictions for reported deaths and implied deaths from these models are 42% and 33% correlated, respectively, with the actual outcomes across states. These regression results suggest that a state with 20 million people and a Democratic governor should expect 80 fewer reported deaths per week than a state with a Republican governor (-4 * 20 = -80). And a state with 20 million people with a one percent higher fraction of the population having a college or higher degree should expect 12 fewer reported deaths each week (-61.5 / 100 * 20 = -12.3).

Exhibit 5 compares the expected number of reported deaths, based on our regression model, with the actual number of reported deaths for each state and the District of Columbia.

Again, these numbers are shown relative to the national average. Exhibit 6 shows the spreads between realizations of reported deaths and expectations. Exhibits 7 and 8 present the same results for implied deaths.

Interestingly, Texas ranks as the 4th best performing state when the death metric is reported deaths, but when we consider unreported deaths and second order COVID related deaths, Texas falls to the 7th worst performing state. It could be that Texans were especially fearful of healthcare facilities and avoided important checkups or medical procedures, or it could be that the authorities underreported COVID deaths. We leave it to the reader to decide the basis of this enormous disparity between reported and implied deaths in Texas.

Exhibit 5: U.S. Reported Deaths (per million, relative to average) versus Model Predictions

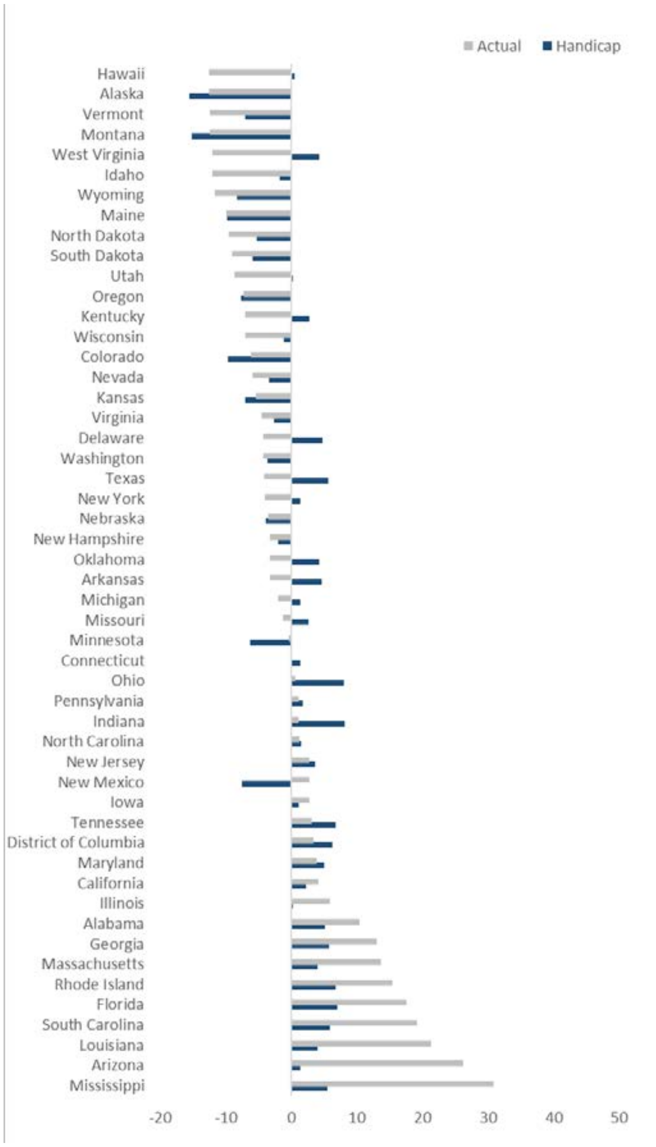


Exhibit 6: U.S. COVID Report Card for Reported Deaths (Actual – Handicap)

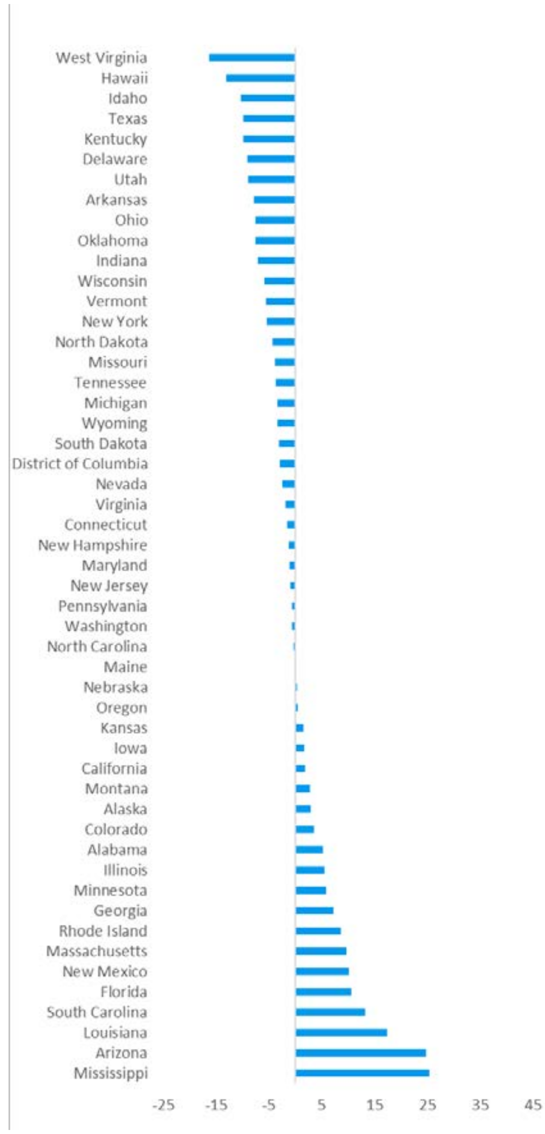


Exhibit 7: U.S. Implied Deaths (per million, relative to average) versus Model Predictions

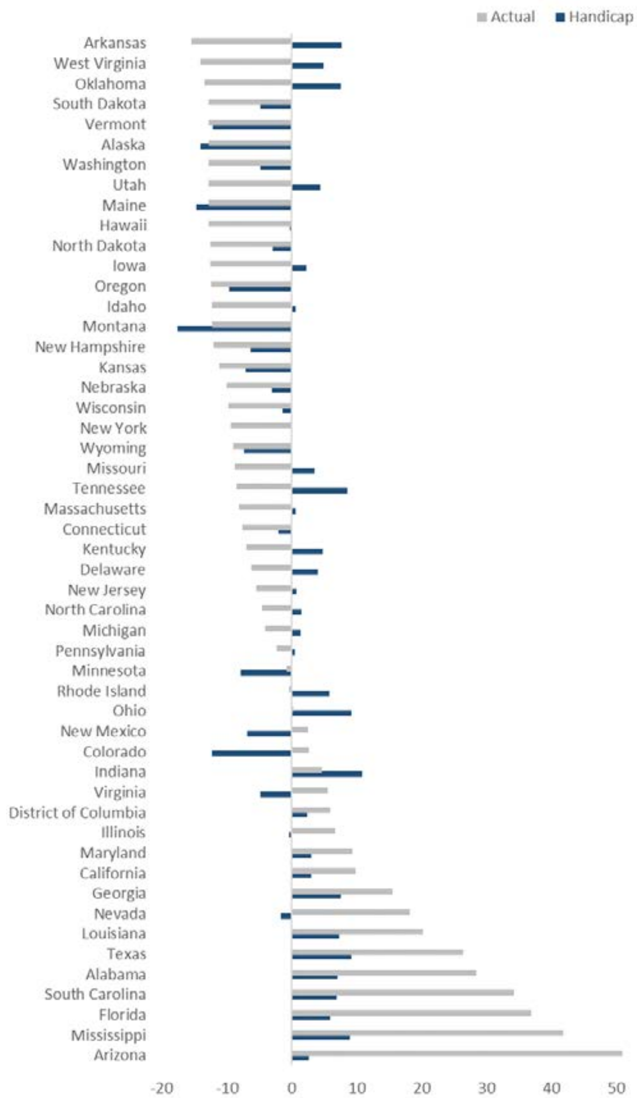
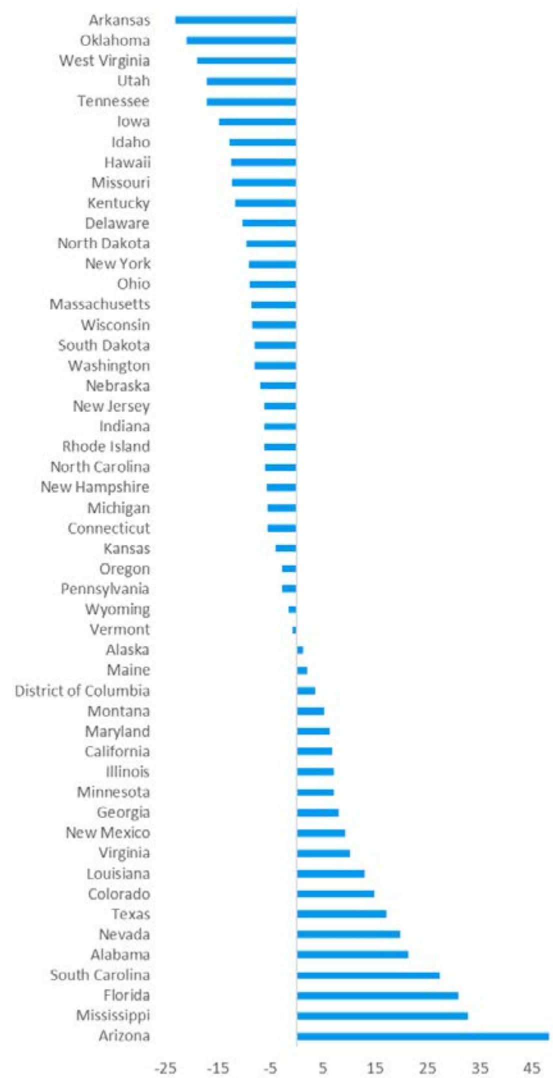


Exhibit 8: U.S. COVID Report Card for Implied Deaths (Actual – Handicap)



We now turn our attention to global outcomes.

Global Data

Our global sample covers 33 countries for which we were able to obtain data covering our variables of interest: Argentina, Australia, Austria, Belgium, Brazil, Canada, Colombia, Costa Rica, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovenia, South Africa, Sweden, Switzerland, United Kingdom, and the United States. As we did in our U.S. analysis, we observe our data at weekly intervals for the period from May 23, 2020 to September 12, 2020.

Dependent variables

We analyze two types of COVID outcomes: new cases and reported deaths.

<u>New cases</u>: We define new cases for each country as the number of new cases per one million people less the average of new cases per one million people across all countries. We obtain our data from the ourworldindata.org database which combines sources such as the European Centre for Disease Prevention and Control (ECDC), the World Health Organization (WHO), and Johns Hopkins University.

<u>Reported deaths</u>: We define reported deaths as the number of new deaths per one million people less the average of new deaths per one million people across all countries, and we also obtain this data from ourworldindata.org.

Independent variables

We use four independent variables to model COVID outcomes: education level, median age, political affiliation of the government, and population density.

Education level: We measure education level as the percentage of the population with a tertiary education reported by OECD (as of 2019).

Median age: We obtain the median age for each country from the Central Intelligence Agency's World Factbook archives.

Political affiliation of government: We categorize the political affiliation of the ruling party as left-wing (which includes the center-left) or right-wing (which includes the center-right).

Population density: We measure population density as the natural logarithm of the ratio of a country's population to land area in square miles, which we obtain from the World Bank.

Global Methodology

We performed the same weekly cross-sectional linear regressions on pooled data across all countries as we did for our U.S. analysis for the same period beginning May 23, 2020 through September 12, 2020. We present our results in the same manner.

Global Results

Our results show that education level, median age, and the political affiliation of the government are all statistically significant in explaining COVID new cases and reported deaths. Population density is not significant, though its coefficient has the expected sign. The predictions for new cases and deaths from these models are 62% and 69% correlated, respectively, with actual reported COVID outcomes.

Our analysis shows that countries with left-wing governments should have had 97 fewer cases every week per million people. A country with more than 50 million people, for example, should have experienced 4,850 fewer cases per week due to this effect (-97 * 50 = -4,850).

Our analysis also shows that Brazil had the most new cases compared to the average of all countries and performed worse than what would be expected based on their invariant conditions, according to our model. New Zealand and Latvia, by contrast, had fewer cases than expected given their invariant conditions.

The United States had the most new cases of all countries relative to its handicap compared to the rest of our universe. When we focus on the 10 countries with the highest GDPs per capita,[4] as a proxy for the most developed countries among our sample of 33 countries, we observe that all countries in this group performed better than expected apart from the United States and Sweden. However, the United States performed meaningfully worse than Sweden in terms of unexpected new cases (2.7 times worse per week).

Interestingly, if Florida were a country,[5] it would have had 1,500 unexpected new cases per million people, by far the largest among the 33 countries relative to its handicap. Next in line would be the United States, which is already an outlier with 627 unexpected cases per million people.

Our analysis paints a similar picture when we consider COVID deaths. All else equal, the experience of these 33 countries reveals that a country with 50 million people should experience 125 fewer deaths every week if they have a left-wing government instead of a right-wing government (-2.5 * 50 = -125).

Among the ten most developed countries, only the United States and Sweden performed worse than expected, and the U.S. experienced 1.4 times as many COVID deaths per million people as did Sweden, after accounting for invariant conditions.

By a significant margin, Floridians would have ranked worst in excess deaths as well, performing 1.7 times worse than Brazil, and 2.1 times worse than the United States overall.

These observations can be seen in Exhibits 9 through 13.

Exhibit 9: Global Regression Results

New COVID Cases (per million people)

	Education Level	Median Age	Left-wing Governance	Population Density
Coefficient	-387	-40	-97	18
t-statistic	-4.2	-4.7	-10.7	0.6
+ 1 standard deviation effect	-185	-1,834	-97	112

Reported Deaths (per million people)

	Education Level	Median Age	Left-wing Governance	Population Density
Coefficient	-15.8	-1.2	-2.5	0.4
t-statistic	-6.5	-7.3	-4.8	0.8
+ 1 standard deviation effect	-8	-56	-3	3

Exhibit 10: Global New Cases (per million people, relative to average) versus Model Predictions

Exhibit 11: Global COVID Report Card for New Cases (Actual – Handicap)

Exhibit 12: Global Reported Deaths (per million people, relative to average) versus Model Predictions

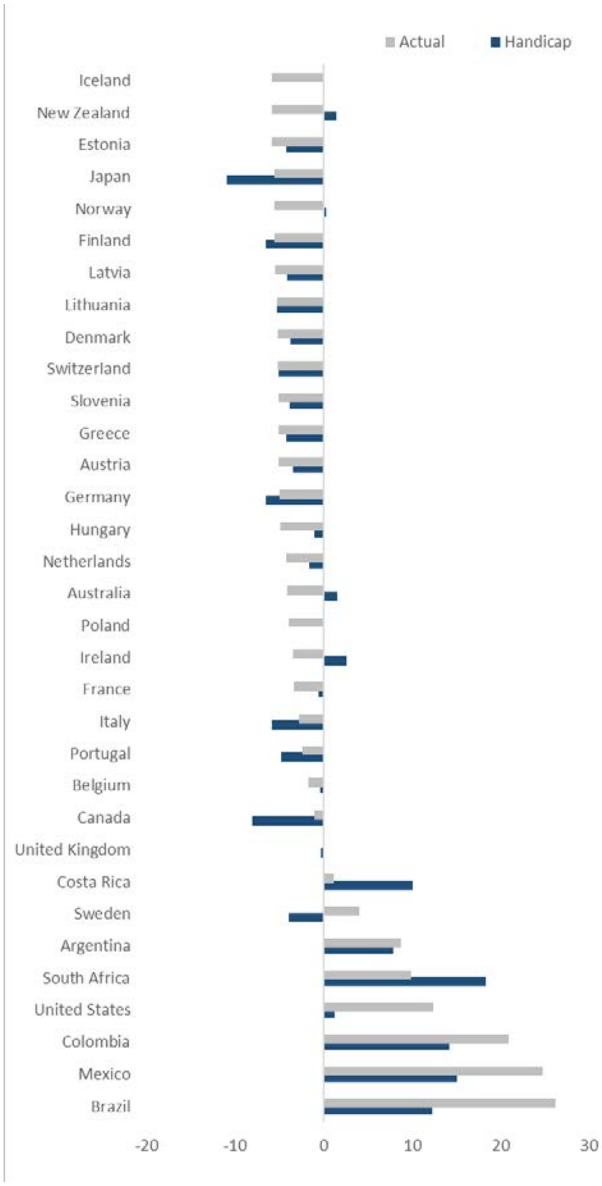


Exhibit 13: Global COVID Report Card for Reported Deaths (Actual – Handicap)

Summary

We modeled variation in COVID outcomes across states and the District of Columbia within the U.S. and across countries globally, as a function of pre-existing circumstances that were beyond the short-term control of citizens. Our choice of explanatory variables – education, age, politics, and density – did an excellent job of explaining differences in COVID outcomes across these jurisdictions. We then compared actual COVID experience with the predictions from our models as a measure of how well or poorly citizens in various jurisdictions behaved given conditions they could not control. Effectively, we measured the effect of discretionary behavior.

Within the U.S., Florida stands out as having much worse COVID outcomes than it should have experienced owing to the discretionary behavior of its citizens.

Globally, the discretionary behavior of U.S. citizens had a more damaging effect on new COVID cases than the discretionary behavior of citizens in any other country in our sample. And only discretionary behavior in Brazil produced a worse result than the U.S. in contributing to COVID deaths.

In light of the outcomes we document, it is hard to interpret the U.S. response to the COVID crisis as anything other than an epic failure of governance.

Appendix A: U.S. Data

State	Education Level	Median Age	Political Affiliation of the Governor	Population Density (log space)
Alabama	26%	39.2	Republican	4.6
Alaska	30%	34.6	Republican	0.2
Arizona	30%	37.9	Republican	4.2
Arkansas	23%	38.3	Republican	4.1
California	34%	36.8	Democrat	5.5
Colorado	42%	36.9	Democrat	4.0
Connecticut	40%	41	Democrat	6.6
Delaware	31%	40.7	Democrat	6.2
District of Columbia	60%	34	Democrat	9.4
Florida	30%	42.2	Republican	6.0
Georgia	32%	36.9	Republican	5.2
Hawaii	34%	39.2	Democrat	5.4
Idaho	28%	36.6	Republican	3.1
Illinois	35%	38.3	Democrat	5.4
Indiana	27%	37.9	Republican	5.2
Iowa	29%	38.2	Republican	4.0
Kansas	34%	36.9	Democrat	3.6
Kentucky	25%	38.9	Democrat	4.7
Louisiana	24%	37.2	Democrat	4.7
Maine	32%	44.9	Democrat	3.8
Maryland	41%	38.8	Republican	6.4
Massachusetts	45%	39.4	Republican	6.8
Michigan	30%	39.8	Democrat	5.2
Minnesota	37%	38.1	Democrat	4.3
Mississippi	23%	37.7	Republican	4.1
Missouri	30%	38.7	Republican	4.5
Montana	32%	39.9	Democrat	2.0
Nebraska	32%	36.6	Republican	3.2
Nevada	25%	38.1	Democrat	3.3
New Hampshire	37%	43	Republican	5.0
New Jersey	41%	40	Democrat	7.1
New Mexico	28%	38.1	Democrat	2.8
New York	37%	39	Democrat	6.0
North Carolina	32%	38.9	Democrat	5.4
North Dakota	30%	35.2	Republican	2.4
Ohio	29%	39.4	Republican	5.7
Oklahoma	26%	36.7	Republican	4.1
Oregon	34%	39.4	Democrat	3.8
Pennsylvania	32%	40.8	Democrat	5.7
Rhode Island	34%	40.1	Democrat	6.9
South Carolina	28%	39.6	Republican	5.1
South Dakota	29%	37.1	Republican	2.5
Tennessee	28%	38.8	Republican	5.1
Texas	30%	34.8	Republican	4.7
Utah	35%	31	Republican	3.7
Vermont	39%	42.8	Republican	4.2
Virginia	39%	38.4	Democrat	5.4
Washington	37%	37.7	Democrat	4.7
West Virginia	21%	42.7	Republican	4.3
Wisconsin	30%	39.6	Democrat	4.7
Wyoming	27%	38	Republican	1.8

Appendix B: Global Data

Country	Education Level	Median Age	Political Affiliation of the Government	Population Density (log space)
Argentina	36%	32.4	Left-wing	3.7
Australia	47%	37.5	Right-wing	2.1
Austria	34%	44.5	Right-wing	5.6
Belgium	41%	41.6	Right-wing	6.9
Brazil	18%	33.2	Right-wing	4.2
Canada	59%	41.8	Left-wing	2.4
Colombia	24%	31.2	Right-wing	4.8
Costa Rica	25%	32.6	Left-wing	5.5
Denmark	40%	42.0	Left-wing	5.9
Estonia	41%	43.7	Right-wing	4.4
Finland	46%	42.8	Left-wing	3.9
France	38%	41.7	Right-wing	5.8
Germany	30%	47.8	Right-wing	6.4
Greece	32%	45.3	Right-wing	5.4
Hungary	26%	43.6	Right-wing	5.6
Iceland	45%	37.1	Left-wing	2.2
Ireland	47%	37.8	Right-wing	5.2
Italy	20%	46.5	Left-wing	6.3
Japan	53%	48.6	Right-wing	6.8
Latvia	36%	44.4	Right-wing	4.4
Lithuania	43%	44.5	Right-wing	4.8
Mexico	18%	29.3	Left-wing	5.1
Netherlands	40%	42.8	Right-wing	7.2
New Zealand	39%	37.2	Left-wing	3.9
Norway	44%	39.5	Right-wing	3.6
Poland	32%	41.9	Right-wing	5.8
Portugal	26%	44.6	Left-wing	5.7
Slovenia	33%	44.9	Right-wing	5.6
South Africa	7%	28.0	Left-wing	4.8
Sweden	44%	41.1	Left-wing	4.2
Switzerland	44%	42.7	Left-wing	6.3
United Kingdom	47%	40.6	Right-wing	6.6
United States	48%	38.5	Right-wing	4.5

Appendix B (continued)

Country	System of Governance	Head of State
Argentina	Presidential	President – Alberto Fernández
Australia	Parliamentary	Queen – Elizabeth II
Austria	Parliamentary	President – Alexander Van der Bellen
Belgium	Parliamentary	King – Philippe
Brazil	Presidential	President – Jair Bolsonaro
Canada	Parliamentary	Queen – Elizabeth II
Colombia	Presidential	President – Iván Duque
Costa Rica	Presidential	President – Carlos Alvarado Quesada
Denmark	Parliamentary	Queen – Margrethe II
Estonia	Parliamentary	President – Kersti Kaljulaid
Finland	Parliamentary	President – Sauli Niinistö
France	Semi-presidential	President – Emmanuel Macron
Germany	Parliamentary	President – Frank-Walter Steinmeier
Greece	Parliamentary	President – Katerina Sakellaropoulou
Hungary	Parliamentary	President – János Áder
Iceland	Parliamentary	President – Guðni Th. Jóhannesson
Ireland	Parliamentary	President – Michael D. Higgins
Italy	Parliamentary	President – Sergio Mattarella
Japan	Parliamentary	Emperor – Naruhito
Latvia	Parliamentary	President – Egils Levits
Lithuania	Semi-presidential	President – Gitanas Nausėda
Mexico	Presidential	President – Andrés Manuel López Obrador
Netherlands	Parliamentary	King – Willem-Alexander
New Zealand	Parliamentary	Queen – Elizabeth II
Norway	Parliamentary	King – Harald V
Poland	Semi-presidential	President – Andrzej Duda
Portugal	Parliamentary	President – Marcelo Rebelo de Sousa
Slovenia	Parliamentary	President – Borut Pahor
South Africa	Parliamentary	President – Cyril Ramaphosa
Sweden	Parliamentary	King – Carl XVI Gustaf
Switzerland	Parliamentary	President – Simonetta Sommaruga
United Kingdom	Parliamentary	Queen – Elizabeth II
United States	Presidential	President – Donald Trump

Appendix B (continued)

Country	Head of Government	Leading Political Party	Political Affiliation of the Government
Argentina	*See head of state*	Justicialist Party	Left-wing
Australia	Prime Minister – Scott Morrison	Liberal Party of Australia	Right-wing
Austria	Federal Chancellor – Sebastian Kurz	Austrian People's Party	Right-wing
Belgium	Prime Minister – Sophie Wilmès	Reformist Movement	Right-wing
Brazil	*See head of state*	Alliance for Brazil	Right-wing
Canada	Prime Minister – Justin Trudeau	Liberal Party of Canada	Left-wing
Colombia	*See head of state*	Democratic Center	Right-wing
Costa Rica	*See head of state*	Citizens' Action Party	Left-wing
Denmark	Prime Minister – Mette Frederiksen	Social Democrats	Left-wing
Estonia	Prime Minister – Jüri Ratas	Estonian Centre Party	Right-wing
Finland	Prime Minister – Sanna Marin	Social Democratic Party of Finland	Left-wing
France	Prime Minister – Jean Castex	"La République En Marche!" (LREM)	Right-wing
Germany	Federal Chancellor – Angela Merkel	Christian Democratic Union of Germany	Right-wing
Greece	Prime Minister – Kyriakos Mitsotakis	New Democracy	Right-wing
Hungary	Prime Minister – Viktor Orbán	Fidesz	Right-wing
Iceland	Prime Minister – Katrín Jakobsdóttir	Left-Green Movement	Left-wing
Ireland	Prime Minister – Micheál Martin	Fianna Fáil	Right-wing
Italy	Prime Minister – Giuseppe Conte	*Independent*	Left-wing
Japan	Prime Minister – Yoshihide Suga	Liberal Democratic Party	Right-wing
Latvia	Prime Minister – Krišjānis Kariņš	New Unity	Right-wing
Lithuania	Prime Minister – Saulius Skvernelis	Lithuanian Farmers and Greens Union	Right-wing
Mexico	*See head of state*	National Regeneration Movement	Left-wing
Netherlands	Prime Minister – Mark Rutte	People's Party for Freedom and Democracy	Right-wing
New Zealand	Prime Minister – Jacinda Ardern	New Zealand Labour Party	Left-wing
Norway	Prime Minister – Erna Solberg	Conservative Party of Norway	Right-wing
Poland	Prime Minister – Mateusz Morawiecki	Law and Justice	Right-wing
Portugal	Prime Minister – António Costa	Socialist Party	Left-wing
Slovenia	Prime Minister – Janez Janša	Slovenian Democratic Party	Right-wing
South Africa	*See head of state*	African National Congress (ANC)	Left-wing
Sweden	Prime Minister – Stefan Löfven	Swedish Social Democratic Party	Left-wing
Switzerland	Federal Council	Social Democratic Party of Switzerland	Left-wing
United Kingdom	Prime Minister – Boris Johnson	Conservative Party	Right-wing
United States	*See head of state*	Republican	Right-wing

Notes

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[1] Weekly observations are taken on Saturdays.

[2] The District of Columbia does not have a governor, but we use the political affiliation of the mayor who performs a similar function to a governor in this instance.

[3] Conventional estimates of standard errors for regression coefficients assume that errors are uncorrelated. This may not hold in practice, especially for a pooled cross-sectional sample. For example, if two states have nearly identical trends in COVID cases, their observations are partly redundant and their regression residuals will be correlated. We use the observed correlation of regression residuals for every pair of states in our sample to adjust the standard errors accordingly.

[4] From highest GDP per capita to lowest, the top ten countries are as follows: Switzerland, Ireland, Norway, Iceland, United States, Denmark, Australia, Netherlands, Sweden, and Austria.

[5] We predict Florida's performance using our country-level regression betas from Exhibit 9 and the invariant conditions of Florida from Appendix A.