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Confidence in public institutions is critical in containing the COVID-19 pandemic

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ABSTRACT

This paper investigates the relative importance of confidence in public institutions in explaining cross-country differences in the severity of the COVID-19 pandemic. We extend the related literature by employing regression and machine learning methods to identify the most critical predictors of deaths attributed to the pandemic. We find that a one standard deviation increase (e.g., the actual difference between the US and Finland) in confidence is associated with 350.9 (95% CI -531.922 - -169.831, p=0.000) fewer predicted deaths per million inhabitants. Confidence in public institutions is one of the most important predictors of deaths attributed to COVID-19, compared to country-level measures of individual health risks, the health system, demographics, economic and political development, and social capital. Our results suggest that effective policy implementation requires citizens to cooperate with their governments, and willingness to cooperate relies on confidence in public institutions.

JEL codes: I18, P16

Keywords: COVID-19, death rate, confidence in institutions, machine learning

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A közintézményekbe vetett bizalom kulcsfontosságú a COVID-19 járvány megfékezéséhez

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ÖSSZEFOGLALÓ

Kutatásunkban megvizsgáljuk, hogy a közintézményekbe vetett bizalom milyen mértékben magyarázza a COVID-19 járvány súlyosságának országok közi eltérését. Cikkünk a meglévő irodalmat azáltal bővíti, hogy regressziós és gépi tanulási módszerek alkalmazásával azonosítja, mely tényezők jelzik előre legerősebben a járvánnyal összefüggése hozható halálozások számát. Eredményeink alapján a közintézményekbe vetett bizalom egy szórásegységnyi növekedése (pl. mintha az Egyesült államok bizalmi szintje megemelkedne a Finnországban mért bizalom szintjére) 350,9-del alacsonyabb egymillió főre eső halálozást prediktál, és ez az eredmény 1%-on szignifikáns. A gépi tanulási módszerek eredményei alapján a közintézményekbe vetett bizalom az egyik legfontosabb előrejelzője a COVID halálozásnak egyéb tényezőkkel összevetve, mint pl. a különféle egészségügyi kockázatok országszintű mérőszámai, az egészségügyi rendszer jellemzői, a demográfiai helyzet, gazdasági és politikai fejlettség vagy a társadalmi tőke. Az eredményeink azt jelzik, hogy a járványellenes beavatkozások hatékony implementációja nagyban múlik az egyének együttműködési hajlandóságán, amely viszont nagyrészben attól függ, hogy az emberek milyen mértékben bíznak meg a közintézményekben.

JEL: I18, P16

Kulcsszavak: COVID-19, halálozási ráta, közintézményekbe vetett bizalom, gépi tanulás

Confidence in public institutions is critical in containing the COVID-19 pandemic*

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Abstract

This paper investigates the relative importance of confidence in public institutions in explaining cross-country differences in the severity of the COVID-19 pandemic. We extend the related literature by employing regression and machine learning methods to identify the most critical predictors of deaths attributed to the pandemic. We find that a one standard deviation increase (e.g., the actual difference between the US and Finland) in confidence is associated with 350.9 (95% CI -531.922 - -169.831, p=0.000) fewer predicted deaths per million inhabitants. Confidence in public institutions is one of the most important predictors of deaths attributed to COVID-19, compared to country-level measures of individual health risks, the health system, demographics, economic and political development, and social capital. Our results suggest that effective policy implementation requires citizens to cooperate with their governments, and willingness to cooperate relies on confidence in public institutions.

Introduction

There is substantial heterogeneity in COVID-19 prevalence and deaths across countries [1]. Several potential mechanisms have already been revealed behind this phenomenon, such as the prevalence of comorbidities, the demographic composition of countries [1], their political systems [2], the role of culture in terms of following rules[3], the stringency of social distancing measures[4], mass testing[5], social capital and confidence in public institutions[6], government effectiveness[7] and the geographical mobility of people[8].

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The literature aiming to identify the most critical factors that influence the number of cases and deaths attributed to COVID-19 is interdisciplinary. The medical literature comprises a significant part of these studies, one strand of which focuses on particular health risk factors such as chronic kidney disease[9]. Another strand aims to investigate several individual risk factors to identify the most important ones, such as having severe asthma, diabetes, higher age, being a male, or deprivation[10,11]. These studies use individual-level data from single countries and do not account for cross-country differences in socioeconomic factors.

The bulk of the socioeconomic line of the COVID-related literature takes a broader perspective and executes cross-country analyses. The results of these papers are difficult to compare, given that there is limited overlap between the investigated explanatory variables (see the summary of this literature in Table A 5[1]). Nevertheless, from a policy perspective, it is vital to learn more about the relative predictive power of factors like democracy, confidence in public institutions, and healthcare resources. Improving the most critical socioeconomic factors in the mid-term is key to fight pandemics that are expected to occur more often in the future[12].

At the beginning of pandemics, the number of cases grows exponentially[13]; thus, the timing and stringency of policy measures are crucial [8]. However, it also matters how people might obey these unprecedented rules, especially those that cannot be enforced effectively. For example, the enforcement of shop closures is straightforward. In contrast, it is not easy to compel citizens to report being sick to the authorities or comply with social distancing rules at home. One facet of this mechanism is national culture regarding how tightly or loosely people follow rules in general. Gelfand et al.[3] show that countries with looser cultures have had significantly more COVID-19 cases and deaths attributed to the pandemic than countries with tighter cultures. Moreover, it is also essential whether people believe that the situation is indeed difficult, and the introduced measures make sense. Thus, they must have confidence in their national authorities to be willing to comply.

Using individual data, previous literature has proven that confidence in public institutions may help contain the COVID-19 pandemic through various channels. First, higher confidence in public institutions increases compliance with health regulations, such as social distancing or quarantining[14,15]. The existing theory also supports the validity of this channel[16]. Second, the perception of COVID-19 risk is significantly associated with confidence in the government along with confidence in science, prosocial values, and personal experience with

[1] Complementary tables, figures and detailed regression results are presented in the Appendices A and B.

the virus[17]. Higher risk perception is likely associated with higher compliance with restrictions related to COVID-19.

In terms of the current pandemic, Elgar, Stefaniak, and Wohl[6] and Helliwell et al.[18] look at the relationship between confidence in public institutions and COVID-19 deaths using country-level data. Elgar, Stefaniak, and Wohl[6] concentrate on the first wave of the pandemic and estimate time-series models to look at the evolution of mortality rates in 84 countries during a 30-day period after recording the tenth COVID-19 death. They find a small but negative association between mortality rates and confidence in public institutions. Helliwell et al. [18] estimate cross-country regressions to predict COVID-19 death rates in 2020, controlling for only a few covariates at a time, including confidence in public institutions. They find that countries with higher confidence experienced fewer deaths attributed to COVID-19. While both previous articles found a significant association, it is not clear whether the estimated relationship between COVID-deaths and confidence in public institutions is specific to the early onset of the pandemic and whether it would survive after controlling for a larger set of covariates and rigorous robustness checks.

Building on these precedents, this paper investigates the relationship between the severity of the COVID-19 pandemic and confidence in public institutions (the government, parliament, the press, the political parties, the courts, and the police), conditional on a rich set of country-level characteristics including economic and political development measures, demographics, health, social distancing policy, mobility, and social capital. We make three contributions to the literature. First, while the previous socioeconomic literature used divergent sets of potentially important explanatory variables for similar exercises (Table A 5), we cover all types of these factors. Second, to the best of our knowledge, ours is the first paper to gather these country-level socioeconomic factors and look at their relative predictive power. We use regression and machine learning methods to examine the relative predictive power of confidence in public institutions in explaining the severity of the pandemic, captured by the number of deaths attributed to Covid-19 per million people. We exploit data on 75 countries and follow the number of deaths attributed to COVID-19 until 21 March 2021. This date is an ideal point in time, as mass vaccination was still at an early stage in all countries in the sample. Thus, we measure death outcomes before the effects of mass vaccination might have phased in. Our third contribution is that while Elgar, Stefaniak, and Wohl[6] conclude that further investigation is needed to uncover the mechanisms behind the significant statistical relationship

between confidence and COVID-19 deaths, we take a step further and look into its potential drivers.

We find that confidence in public institutions is key in explaining cross-country heterogeneity in the severity of the pandemic. In our main regression specification, one standard deviation higher confidence is associated with a 56.3 percent (or in raw numbers, 350.9 (95% CI -531.922 - -169.831, p=0.000)) lower number of deaths per million population. This relationship is significant at the 1% level and robust to an extensive series of robustness checks, including restricting the sample to democracies and OECD countries, using alternative outcome variables (number of cases, fatality rate, and excess deaths compared to the previous five years), earlier observation periods, different estimation methods and applying a variable selection model to identify the empirically most efficient set of control variables. Machine learning methods, random forest regressions, and a least absolute shrinkage and selection operator (lasso), suggest that confidence in public institutions is among the most important predictors of the number of deaths attributed to COVID-19.

Looking at the potential channels, we find no evidence that in countries with higher confidence in public institutions people would reduce their mobility more than in countries with lower confidence. However, we find that the role of confidence is two times as large in countries conducting comprehensive contact tracing as in countries not using this method. This result suggests that in countries where confidence in public institutions is higher, people are more willing to comply with rules that would require them to become visible to the authorities, for example, by supplying their personal data for contact tracing. The rest of the paper proceeds as follows. Section 2 presents the data, and Section 3 describes our empirical methods. Results are shown in Section 4, while Section 5 concludes with a discussion.

Data

We measure country-level confidence in public institutions before the pandemic using the joint World Value Survey (WVS) and European Value Survey (EVS) 2017-2021 dataset[19]. The interviews were conducted in 2017-2020 (see the end of fieldwork by country in Table A 2). Note that in five countries out of the 75 that we use, fieldwork ended in March-Aug 2020, after the onset of COVID-19. Thus, we provide a robustness check where we exclude these countries in Table B 5.

First, we estimate the survey-weighted country-level averages of individual answers to the following question (and multiply them by -1): *I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence* (coded as 1), *quite a lot of confidence* (coded as 2), *not very much confidence* (coded as 3), *or none at all* (coded as 4). We use six items: *The government. The press. The police. The political parties. Parliament. The courts.* Then, we conduct Principal Component Analysis (PCA) on the six country-level aggregates and use the first predicted score (share of explained variation: 0.75; Chronbach's alpha: 0.93) as an index of *confidence in public institutions*. (The correlation matrix of these measures is presented in Table A 3).

We replicate our main results on the individual items of confidence in Table B 4. We provide two robustness checks regarding these data. First, individual-level non-response varies between 0% and 9.3% across countries (Table A 4). Thus, in Table B 7, we control for the share of non-response (missing values) in a country in addition to our standard control variables. Second, there seem to be some non-democratic countries in the data where confidence in institutions is surprisingly high (Figure 1). To mitigate the effect of these outliers, we replicate our main results in Table B 5 by restricting the sample to democracies (i.e., excluding countries from the sample that are categorized as "not free" by Freedom House[20]) and to OECD countries.

We retrieved the data on the number of COVID-19 induced deaths from the online resource https://ourworldindata.org/. They collect COVID-19 data from the COVID-19 Data Repository by the Center for Systems Science and Engineering at Johns Hopkins University. We look at the total number of confirmed deaths per one million inhabitants for all countries until 21 March 2021. Following Gelfand et al.[3], we take logs and use the log number of deaths as our primary outcome variable. We replicate our main results using several alternative outcome measures: the raw number of deaths per one million inhabitants, the log number of cases, the log fatality rate (the ratio of deaths to cases), excess deaths in 2020, and the log of excess deaths in 2020, the mean positivity rate of tests and the log number of tests in Table B 3 and five alternative observation periods ending between 21 October 2020 and 21 March 2021 in Table B 7. Furthermore, we control for the *method of how countries register deaths as attributed to COVID-19* in Table B 6.

Following the literature, in the main analysis and the robustness checks we control for a rich set of country-level characteristics, all measured before the onset of COVID-19 (see more details in Table A 1): economic and social development (GDP per capita, life expectancy, Gini index); political development (government efficiency (WGI) and democracy score (FH),

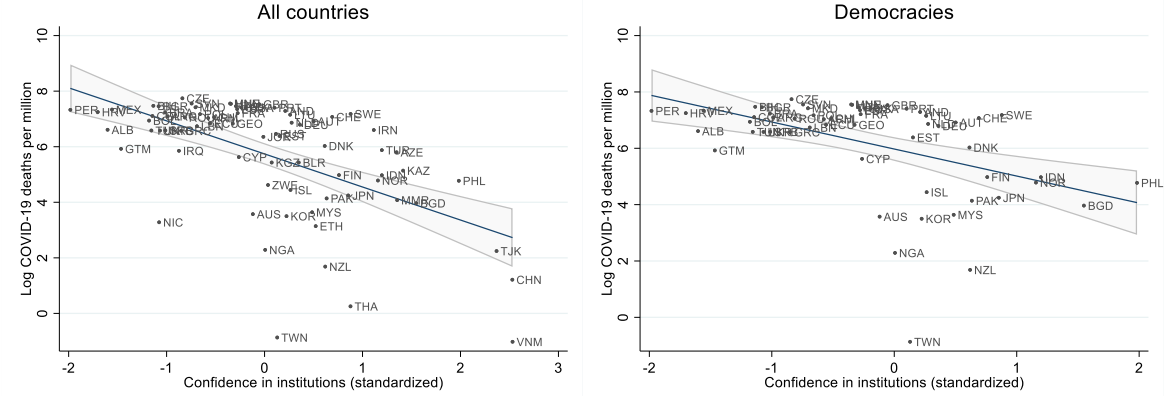
summarized into an index using PCA), the lack of corruption index by Transparency International, demography (share of those above age 65, mortality rates before the pandemic, share of migrants as a % of the population); health (summary index using PCA, from the following health measures: BMI and share of deaths by risk factors[21], including alcohol and smoking, air pollution, dietary risk and known comorbidities (high blood pressure, obesity, diabetes mellitus, chronic kidney diseases, air pollution)); the resources of the health system (health expenditures per capita, number of hospital beds per thousand people, number of medical doctors per thousand people; again, summarized into a PCA index); presence of the epidemic (number of days since the first reported death in the country); population, population density; five-year survival rate of breast cancer; average years of education; trust in people (via PCA from joint EVS/WVS 2020 data); tightness-looseness cultural measure[3].

We also use two contemporaneous measures. *Mobility* is the average change in Google mobility trends data (number of visitors) in retail, pharmacies, transit stations, and workplaces. More negative values indicate larger percentage drops in mobility until 16 March 2021, relative to median mobility between 3 January 2020 and 6 February 2020. *Stringency is* a composite index based on nine response indicators, including school closures, workplace closures, testing policy, and travel bans from the Oxford COVID-19 Government Response Tracker [22]. We use the highest value for each country by 21 March 2021 in our main specifications and provide alternative models using the mean (Table B 5).

Note that our setup does not allow us to look at the causal effects of reduced mobility or social distancing measures. These two contemporaneous measures are likely affected by the severity of the pandemic in a country, and thus they are considered *bad controls* [23]. We use them to show that even if we control for them, there is still a meaningful statistical relationship between the lack of confidence in institutions and the deaths attributed to COVID-19. Furthermore, we also use two index elements of stringency measures separately in Table B 9: *restrictions on personal gatherings of small groups* and *comprehensive contact tracing*.

The descriptive statistics of all variables are reported in Table A 4. Figure 1 shows the raw association between the log number of deaths per million population and confidence in public institutions. The statistical relationship between deaths and confidence in institutions is significantly negative.

Figure 1: Log total deaths attributed to COVID-19 and confidence in institutions



Number of countries: 75 and 58. The confidence in institutions measure is standardized to mean 0 and SD 1. The subsample of democracies: countries categorized as "Not free" by Freedom House are excluded from the baseline sample [20]. The list of countries is shown in Table A 1.

Empirical methods

We start by estimating linear regressions to investigate the statistical relationship between the log number of deaths attributed to COVID-19 per million people and confidence in institutions. In Model 1, we do not include any additional control variables and have 75 countries. In Model 2 to 7, we add the above-mentioned control variables sequentially to the model. In our preferred specification, Model 7, we have 55 countries. We provide robustness checks where we also control for variables that would further reduce our sample size. As we only have 55 countries in our preferred specification, we re-estimate all models using Full Information Maximum Likelihood (FIML) estimation. FIML infers available information from the total sample of 75 countries, even if some variables are missing for some countries. Throughout the analysis, we assume that conditional on all other variables we have, country-level variables are missing at random.

Once we have established a robust statistical relationship between confidence in institutions and the number of deaths attributed to COVID-19, we investigate the relative importance of this measure in predicting the outcome. We use two machine learning algorithms for this purpose: lasso and random forest regression.

The lasso procedure determines the empirically optimal set of control variables, applying a regularization on the coefficient estimates. Holding out a subset of the sample, we estimate the model on the training sample and test the model's predictive power on the held-out part. We use 100-fold cross-validation (we repeat the sampling and model estimation 100 times). The procedure selects the optimal subset of explanatory variables that produce a model

with the lowest mean squared prediction error in predicting the outcome variables in the held-out subsamples [24]. As a result of this process, we find the most efficient set of control variables and re-estimate our main results controlling for these variables only. Furthermore, we also interpret the lasso coefficients as indicators of relative predictive importance.

As both the OLS regression and the lasso procedure assumes a linear relationship between the number of deaths and the explanatory variables, we also employ a random forest regression to model any potential nonlinearities and interaction terms. In particular, we are interested in the relative predictive importance of the control variables in predicting the number of deaths (Figure B 1). The relative importance of predictors is determined by the Increase in Mean Squared Errors (MSE) measure, which captures the increase in MSE should predictors be replaced by their own randomly permuted values [25]. The code for the data manipulation and the analysis is available on Github.

Last, we provide two further robustness checks. We look at how the estimated coefficient in the main model using our 55-country sample compares to the distribution of the same coefficients estimated on 35-country simulated random samples to show that country choice is not leading our results. Then, we estimate quantile regressions to investigate whether the association between confidence and COVID-deaths changes along the distribution of log number of deaths.

Results

The log number of deaths attributed to COVID-19 is significantly lower in countries where confidence in public institutions is higher (Table 1 and Table B 1). This relationship prevails even after sequentially adding the following control variables to the model: number of days since first death, population, population density, GDP per capita, Gini, index of democracy and government effectiveness, mortality rate before the pandemic; share of those above age 65, life expectancy, the share of migrants, trust in others, resources of the health system, index of health risks, stringency of COVID-19 measures, decrease in mobility. In our preferred specification, Model 7, we find that one standard deviation higher confidence in public institutions is associated with 56.3 percent (raw coefficient: -0.828, 95% CI -1.169 - -0.486, p=0.000) fewer deaths per a million population.

Alternatively, considering number of deaths per a million population as the dependent variable (Table B 3 in Appendix B), we find that one standard deviation higher confidence in

public institutions is associated with 350.9 fewer deaths (95% CI -531.922 - -169.831, p=0.000) per million. To put this into perspective, for instance, if people in the US (confidence in public institutions= -0.19) had about one standard deviation higher confidence in public institutions, such as people in Finland (confidence in public institutions= 0.76), our model would predict about 116 thousand fewer deaths attributed to COVID-19.

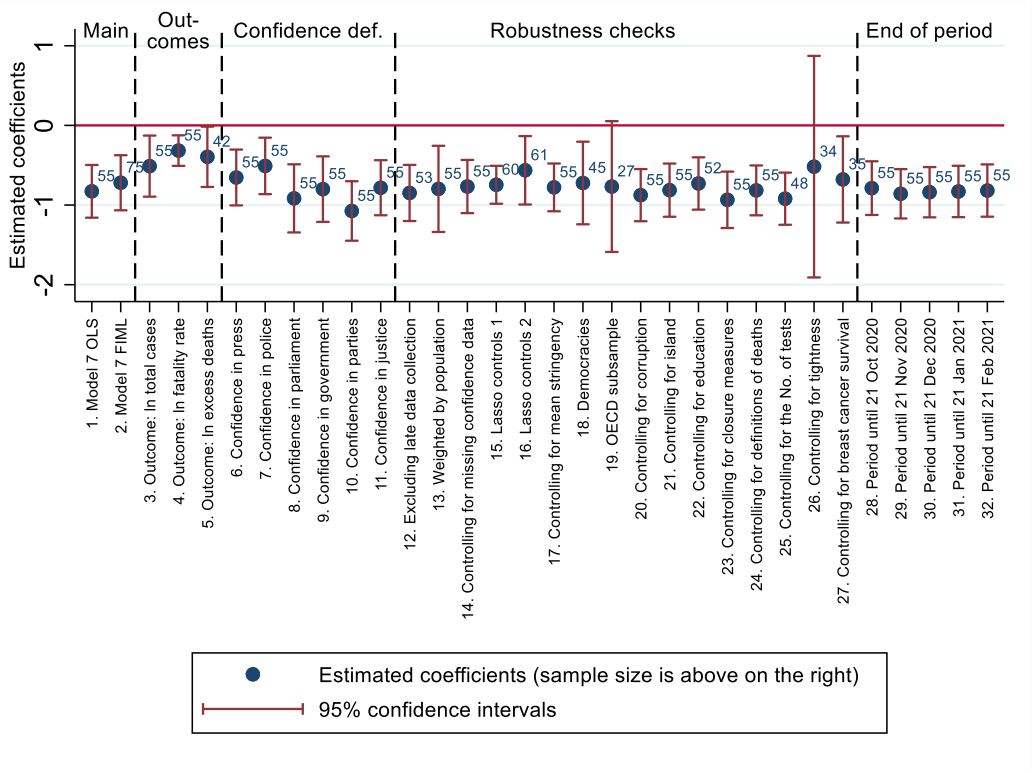
In line with the medical strand of the literature, the index of health risks, which summarizes how large the contribution of specific risk factors to death rates before the pandemic was (such as obesity, high blood sugar, high blood pressure, etc.), shows a positive correlation with the number of deaths attributed to COVID-19, although this relationship is weak. As countries facing a higher disease burden must spend more on healthcare, the index capturing the available resources (but not the quality) of the health system also shows a weak positive correlation with the number of deaths. As in Gelfand et al.[3] and Sorci, Faivre, and Morand[26], the stringency of the social distancing measures is positively correlated with the number of deaths (beta=0.032, 95% CI 0.005 - 0.058, p=0.021), probably because countries hit harder by COVID-19 established more rigorous restrictions. Similarly, a decrease in mobility is associated with more deaths as people respond to the severity of the pandemic, although this relationship is small and insignificant.

Table 1: Log total deaths attributed to COVID-19 and confidence in institutions (Model 7 of Table B 1)

	Estimated coefficients	95% confidence intervals	Robust p-values
Confidence in institutions, standardized	-0.828	[-1.169 - -0.486]	(0.000)
Days since first death	0.014	[-0.003 - 0.031]	(0.100)
Log population	-0.124	[-0.431 - 0.183]	(0.419)
Log population density	0.180	[-0.213 - 0.573]	(0.361)
Log GDP per capita	0.510	[-0.787 - 1.806]	(0.431)
Gini	-0.006	[-0.052 - 0.041]	(0.803)
Index of democracy and government effectiveness	0.240	[-0.664 - 1.145]	(0.593)
Log mortality rate before the pandemic	-1.427	[-4.689 - 1.836]	(0.382)
Share of those above age 65	0.034	[-0.243 - 0.311]	(0.806)
Life expectancy	-0.168	[-0.416 - 0.080]	(0.178)
Share of migrants	-0.044	[-0.114 - 0.026]	(0.214)
Trust in others	0.049	[-0.462 - 0.561]	(0.847)
Resources of the health system	0.712	[-0.034 - 1.457]	(0.061)
Index of health risks	0.211	[-0.059 - 0.482]	(0.122)
Stringency of COVID-19 measures	0.032	[0.005 - 0.058]	(0.021)
Decrease in mobility	-0.029	[-0.081 - 0.022]	(0.257)
Constant	19.575	[-25.830 - 64.979]	(0.388)
Observations	55		
R-squared	0.769		

There are several ways to measure how severe the pandemic is in a country, and they all have their advantages and disadvantages. We have chosen the number of deaths attributed to COVID-19 per one million people as our primary outcome variable because this measure could be the least prone to underreporting. While the number of cases in a country relies heavily on their testing protocols, those who become very sick (and thus unfortunately die) usually get tested (or diagnosed). The protocols attributing deaths to COVID-19, however, also differ country by country[27]. Despite these potential problems, we find similarly strong associations if we replicate Model 7 using the following alternative outcome variables: raw number of total deaths per million people (beta= -350.876, 95% CI -531.922 - -169.831, p=0.000), log number of cases per million people (beta=-0.511, 95% CI -0.907 - -0.115, p=0.013), log fatality rate (beta=-0.316, 95% CI -0.514 - -0.118, p=0.003), excess deaths in 2020 compared to the average of 2015-2019 (beta=-4.711, 95% CI -10.043 - 0.620, p=0.081) and the log of excess deaths (beta=-0.395, 95% CI -0.792 - 0.003, p=0.052) (Table B 3). Looking at the share of positive tests as an outcome again reveals a negative relationship (beta=-0.051, 95% CI -0.075 - -0.027, p=0.000) while we find no association with the log number of tests (beta=0.034, 95% CI -0.269 - 0.336, p=0.822). Furthermore, our results stay very similar if we use the log number of deaths as an outcome variable and control for the different protocols of countries in attributing deaths to COVID-19 (beta=-0.934, 95% CI -1.301 - -0.568, p=0.000; Table B 6).

Figure 2: Robustness checks



Looking at confidence in specific institutions instead of the summary measure reveals that they all matter (Table B 4). In terms of the magnitude of the coefficients, the one on confidence in political parties is the highest (beta=-1.074, 95% CI -1.460 - -0.688, p=0.000), followed by parliament (beta=-0.916, 95% CI -1.358 - -0.475, p=0.000) and the government (beta=-0.800, 95% CI -1.225 - -0.375, p=0.000).

These results also prevail if we estimate Model 1-7 by FIML instead of OLS to keep the sample size at 75. Table B 2 shows that the estimated coefficient on confidence in institutions decreases from -1.190 (95% CI -1.564 - -0.816, p=0.000) to -0.720 (95% CI -1.066 - -0.374, p=0.000) between Model 1 and 7. The point estimate of Model 7 indicates that a one standard deviation increase of confidence is associated with a 51.3% decrease in the number of deaths, conditional on our set of country-level characteristics.

Both the lasso and the random forest algorithms find that lack of confidence in institutions is one of the most important predictors of the number of deaths attributed to COVID-19. When the regressors of the main specification are included in the models (Lasso1 in Table B 5 and Figure B 1), confidence in public institutions has the highest relative predictive importance compared to all control variables. As the lasso and random forest procedures can handle relatively large number of explanatory variables compared to the number of observations, we repeat the same procedures using the items of the PCA scores for health risks,

resources and political systems as covariates (Lasso2 in Table B 5 and Figure B 2. In these models, confidence in public institutions is the most important (lasso) or the second most important factor after BMI (random forest) to predict the outcome.

Robustness checks

In Table B 5 and in Figure 2 we support our results with further robustness checks: we weight by population, control for the share of non-response in the confidence measures, re-estimate the main model controlling for only covariates found to be important by the lasso procedure (confidence in institutions, number of days since the first death, the index of democracy and government effectiveness, resources of the health system, index of health risks, stringency of COVID-19 measures, decrease in mobility), restrict the sample to democracies and OECD countries, and exclude two countries where the data collection on confidence was not completed by 1 March 2020; all resulting in statistically equivalent estimates as before.

In Table B 6, we show that controlling for further potentially important variables does not change our baseline estimates in a statistical sense. These additional control variables, if all added in one model, would radically decrease sample size, thus, we add them one by one on top of our main specification. Adding the tightness measure[3] does not make the magnitude of our estimated coefficient on lack of confidence in institutions statistically significantly different (-0.518 [40.4%], 95% CI -2.022 - 0.986, p=0.476) from our baseline estimate (beta= -0.828, 95% CI -1.169 - -0.486, p=0.000) (two-tail t-test p-value: 0.6046). In addition, we obtain similar estimates to our main specifications if we control for a measure of corruption, the number of COVID-19 tests, the five-year survival rate of breast cancer, the average years of education, whether the country is an island, and use the mean of stringency measures in a country instead of the maximum that we used in our main model.

In our models, the number of observations is between 27 and 75, and our main result is estimated on a sample of 55 countries. These are fairly small samples, and it might matter which countries fall into them. Figure B 3 compares our main estimate in Model 7 to the distribution of estimates on 35-country random samples. It shows that our main 55-country estimate is almost precisely in the middle of this distribution, suggesting that our results are reasonably robust to leaving out various subsamples of countries from the estimations.

Lastly, we test whether the confidence in institutions measure captures the effect of unmeasured factors related to the quality of the health system, the health behaviour of the individuals or the quality of the public services (Table B 8). First, we test whether confidence in institutions captures either the quality of the health system that is not captured by other

measures in the models (i.e., number of beds/doctors, health expenditures), or how quickly people would go to see a doctor in case of health problems. We proxy these possibilities with the 5-year survival rate of breast cancer as this is an illness that can be cured successfully if caught early and appropriate care is given. Using this measure as an outcome variable, we find no significant association between confidence in public institutions and cancer survival.

Second, we test whether confidence in public institutions captures the quality of public services overall. Namely, we want to examine whether the measure of confidence reflects how well in people's perceptions institutions solve problems in general, while appreciating that this would not have been captured (directly) by any of the measures used up until this point. To test this hypothesis, we re-estimate the model having the share of the prison population on the left-hand side to proxy how well public institutions can solve social problems (and prevent criminal activity). Again, we find no significant statistical association between confidence in public institutions and prison population. We also look at whether there is an association between the decrease in people's mobility and the lack of confidence in public institutions. We find no significant relationship.

Channels

As noted in the Introduction, there are two channels between confidence in public institutions and COVID-19 related deaths already verified by the literature, namely higher compliance with restrictions and stronger risk perception. We make attempts to understand better the nature of the relationship between confidence in institutions and COVID-19 related deaths.

We test the restriction compliance hypothesis, and examine whether data sharing and cooperation in contact tracing can be a possible channel. As a test for these two channels, we investigate whether confidence in public institutions matters more in countries that employ particular measures in Table B 9. We examine two sub-measures of the stringency index: one captures whether countries had more restrictions on small private gatherings that are hard to force if people don't cooperate, and the other captures countries that applied comprehensive contact tracing that requires people to provide their own personal data as well as the data of others they had contacts with. We find that the association between confidence in public institutions and deaths attributed to COVID-19 does not differ across countries employing more or fewer restrictions on personal gatherings. On the other hand, in terms of contact tracing, we find heterogeneity: lack of confidence in public institutions has a higher correlation with deaths

in countries that relied more on contact tracing. This result points to cooperation in contact tracing as a potential channel between confidence in public institutions and deaths attributed to COVID-19. Theoretically, this result could also imply that confidence matters more in countries where the pandemic was less severe (i.e., it is probably difficult to trace contacts when there is a considerable number of cases). We test this by estimating quantile regressions in Table B 10. While the estimated coefficient is somewhat larger at the 20th percentile of log deaths than at the 80th percentile, they do not differ in a statistical sense. Thus, the association we find between confidence and deaths exists along the whole distribution of deaths.

Discussion

This article investigates the relative predictive importance of confidence in public institutions in explaining cross-country differences in the severity of the COVID-19 pandemic. We look at the statistical association between the number of deaths attributed to COVID-19 and confidence in public institutions while we control for the potentially important factors covered so far by the related socioeconomic literature. We find that the number of deaths is significantly higher in countries with less confidence in public institutions, and this relationship is robust to an extensive series of robustness checks.

Our results are in line with Elgar, Stefaniak, and Wohl[6] and Helliwell et al.[18] in finding that countries with less confidence in public institutions suffered more losses due to COVID-19. We showed that this relationship is not attenuated by including additional socioeconomic measures that these papers did not take into account, and we also provided a series of rigorous robustness checks. Furthermore, all of our methods point to the conclusion that compared to country-level measures of individual health risks, the health system, demographics, economic and political development, and social capital, confidence in public institutions is one of the most crucial predictors of deaths attributed to COVID-19.

We find that the role of confidence in public institutions is more pronounced in COVID-19 than in other health or social problems. We do not find a significant statistical relationship between confidence and either the survival rate of breast cancer or the share of the prison population. Thus, confidence in public institutions is not a proxy of people's knowledge about the quality and problem-solving ability of these institutions (that could theoretically predict well how effective institutions would be in containing COVID-19). Similarly, we do not find

evidence that confidence in public institutions would work through either mobility or compliance to restrictions on small- and medium-size private gatherings.

Looking at the potential mechanisms behind these results, we find suggestive evidence that confidence in public institutions has a role in how effective contact tracing would work in a country, i.e., how willing people might be to expose their personal data, social networks and become visible to the authorities.

Our results imply that, as a complementary factor of restriction measures in pandemics, it is crucial to enhance the cooperativeness of citizens with the authorities and, as a result, increase implementation effectiveness. This is especially important in the case of those measures that cannot be enforced legally (i.e., providing personal data for contact tracing). As pandemics are expected to occur more often in the future, it is vital to enhance confidence in public institutions to build capacities to contain such crises.

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Appendix A

Table A 1: Variables

Variable	Definition	Type	Source
Outcome variables			
Total number of deaths attributed to COVID-19	Total number of deaths attributed to COVID-19 by 21 March 2021 per one million inhabitants, raw or log-transformed as indicated. As robustness checks, we also use the log number of deaths by 21 October 2020, 21 November 2020, 21 December 2020, 21 January 2021 and 21 February 2021.	Continuous	COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University; retrieved from Our World in Data
Log total number of COVID-19 cases	Total number of confirmed COVID-19 cases by 21 March 2021 per one million inhabitants, log-transformed.	Continuous	
Log fatality rate	Total number of deaths/ Total number of cases, log-transformed.	Continuous	
Excess deaths	The average of monthly or weekly p-scores, i.e., the ratios of the number of deaths in 2020 over the average of the same period in 2015-2019. All causes of deaths in all ages.	Continuous	Human Mortality Database (https://www.mortality.org/), retrieved from Our World in Data
Main variable of interest			
Confidence in institutions (composite measure of six institutions)	PCA score of the survey-weighted country-level averages of individual answers to the following question (answers coded 1,2,3,4, respectively and multiplied by -1 so higher values indicate higher confidence): *"I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?"* The government. The press. The police. The political parties. Parliament. The courts. We also use the indexes standardized to mean 0 and SD 1.	Continuous	EVS/WVS (2021): Joint EVS/WVS 2017-2021 Dataset (Joint EVS/WVS). GESIS Data Archive, Cologne. ZA7505 Data file Version 1.1.0, https://doi.org/10.4232/1.13670
Control variables			

Variable	Definition	Type	Source
Log population	Population in 2020, log-transformed	Continuous	United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects 2019 Revision; retrieved from Our World in Data
Log population density	Number of people divided by land area, measured in square kilometres, most recent year available, log-transformed.	Continuous	World Bank World Development Indicators, sourced from Food and Agriculture Organization and World Bank estimates; retrieved from Our World in Data
Share of migrants in the population	International migrant stock, % of population, 2015	Continuous	World Bank, https://data.worldbank.org/indicator/SM.POP.TOTL.ZS?view=chart
Time since the 1st death attributed to COVID-19	Number of days since the 1st death attributed to COVID-19 up until 21 March 2021.	Continuous	COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University; retrieved from Our World in Data
Log GDP per capita	Gross domestic product at purchasing power parity (constant 2011 international dollars), most recent year available, log-transformed.	Continuous	World Bank World Development Indicators, source from World Bank, International Comparison Program database retrieved from Our World in Data
Life expectancy	Life expectancy at birth in 2019	Continuous	James C. Riley, Clio Infra, United Nations Population Division, retrieved from Our World in Data
Gini index	Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.	Continuous	World Bank (2016), retrieved from Our World in Data
Government efficiency	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	Continuous	World Governance Indicators, World Bank https://info.worldbank.org/governance/wgi/Home/Documents
Freedom House (FH) Total Democracy Score	The sum of the FH Political Rights Index and the FH Civil Rights Index. Measures political (electoral processes, political pluralism, and the functioning of government) and civil (freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights).	Continuous	Freedom House, 2020. Freedom in the World 2020, www.freedomhouse.org/countries/freedom-world/scores.

Variable	Definition	Type	Source
Index of health risks	PCA score of the following variables:	Continuous	Global Burden of Disease study, 2019[21], retrieved from Our World in Data
Smoking	Share of deaths attributed to smoking. Smoking is defined as current daily or occasional use of any smoked tobacco product.		
Alcohol use	Share of deaths attributed to alcohol use. Age-corrected risk based on the share of drinkers (individuals consuming at least one alcoholic beverage in the past year) and average grams of pure alcohol consumed per day.		
Low physical activity	Low physical activity was measured in total metabolic equivalent (MET) minutes and was defined as average weekly physical activity (at work, home, transport related, and recreational) of less than 3000–4500 MET min per week.		
High blood pressure	High systolic blood pressure: We estimated brachial SBP in mm Hg. We used a TMREL of SBP ranging from 110 to 115 mm Hg.		
High blood glucose	High fasting plasma glucose is defined as serum fasting plasma glucose greater than 4.8–5.4 mmol/L.		
High LDL cholesterol	We estimated blood concentration of LDL in units of mmol/L. We used a TMREL with a uniform distribution between 0.7 and 1.3 mmol/L.		
Kidney dysfunction	Kidney dysfunction is defined as estimated glomerular filtration rate (eGFR) less than 60 mL/min per 1·73 m^2or albumin-to-creatinine ratio (ACR) greater than or equal to 30 mg/g. The TMREL is ACR less than 30 mg/g and eGFR greater than or equal to 60 mL/min per 1·73 m^2.		
BMI	Body mass index		
Share of those above 65	Share of the population that is 65 years and older, most recent year available	Continuous	World Bank World Development Indicators based on age/sex distributions of United Nations World Population Prospects 2017 Revision, retrieved from Our World in Data
Total mortality rate	Mortality in all age groups per a million inhabitants in 2017	Continuous	Global Burden of Disease study, 2019, retrieved from Our World in Data
Number of hospital beds per thousand people	Hospital beds per 1,000 people, most recent year available since 2010	Continuous	OECD, Eurostat, World Bank, national government records and other sources, retrieved from Our World in Data
Health expenditure per capita	Current health expenditure per capita, PPP (current international $)	Continuous	World Bank WDI (2018), retrieved from Our World in Data
Number of medical doctors per thousand people	Includes generalists, specialist medical practitioners and medical doctors not further defined.	Continuous	WHO, World Health Data Platform, https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/medical-doctors

Variable	Definition	Type	Source
Trust in others	PCA index of answers to the following questions, multiplied by -1: "*I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?"* Your family. Your neighbourhood. People you know personally. People you meet for the first time. People of another religion. People of another nationality.	Continuous	EVS/WVS (2021): Joint EVS/WVS 2017-2021 Dataset (Joint EVS/WVS). GESIS Data Archive, Cologne. ZA7505 Data file Version 1.1.0, https://doi.org/10.4232/1.13670
Contemporaneous measures			
Stringency index	A composite measure based on nine response indicators including school closures, workplace closures, testing policy and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region. We used the highest value for each country by 21 March 2021 in our main models and also provide a robustness check with the mean.	Continuous	Thomas Hale, Noam Angrist, Rafael Goldszmidt , Beatriz Kira , Anna Petherick, Toby Phillips, Samuel Webster, Emily Cameron-Blake, Laura Hallas, Saptarshi Majumdar, and Helen Tatlow. (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." Nature Human Behaviour. https://doi.org/10.1038/s41562-021-01079-8.
Stringency sub-index: Restrictions on personal gathering	Restrictions on gatherings of 0-10 and 11-100 people.	Continuous or binary	
Stringency sub-index: Comprehensive contact tracing	Comprehensive contact tracing; done for all identified cases.	Continuous or binary	
Mobility	The average of the change in mobility trends data (number of visitors) in retail, pharmacies, transit stations and workplaces. (Residential areas and parks are left out purposefully.) More negative values indicate larger percentage drops in mobility until 16 March 2021, relative to median mobility between 3 January 2020 and 6 February 2020. We use the mean drop for each country.	Continuous	Google mobility trends data https://www.google.com/covid19/mobility/
Definition of deaths attributed to COVID-19	0: such information is not available for a country 1: WHO definition: clinically confirmed or probable COVID-19 cases, not dependent on the availability of a laboratory test. 2: Definition is reliant primarily on a positive laboratory test. 3: Both occur.	Categorical	COVID-19 Health System Response Monitor https://analysis.covid19healthsystem.org/index.php/2020/06/04/how-comparable-is-covid-19-mortality-across-countries/
Further control and outcome variables			

Variable	Definition	Type	Source
Lack of corruption	The Corruption Perceptions Index (CPI) captures perceptions by business people and country experts of the level of corruption in the public sector. Higher values indicate less corruption.	Continuous	Transparency International https://www.transparency.org/en/cpi/2020/index/nzl#
Log number of COVID-19 tests	Total tests for COVID-19 per 1,000 people by 21 March 2021, log-transformed.	Continuous	COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, retrieved from Our World in Data
Mean positivity rate	Average share of positive COVID-19 tests by 21 March 2021.	Continuous	COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, retrieved from Our World in Data
Breast cancer survival rate	Data is based on the percentage of those diagnosed with cancer who survive at least five years after the date of diagnosis.	Continuous	Allemani et al. (2018)
Prison population	Total prison population per 100,000 of the national population.	Continuous	World Prison Brief (WPB) https://www.prisonstudies.org/highest-to-lowest/prison_population_rate?field_region_taxonomy_tid=All
Tightness-looseness of culture	A measure of tightness-looseness of culture in terms of following rules/social norms in general.	Continuous	Gelfand et al. (2011)
Years of education	Average years of education	Continuous	Barro Lee Education Dataset (2010)

Table A 2: List of countries and the data collection period of confidence in public institutions

Country	ISO code	End of field-work	Share of interviews conducted after 1 March 2021	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Democ-racy sub-sample	OECD sub-sample
Albania	ALB	201807	0%	1	1	1	1	1	1	0	1	0
Andorra	AND	201809	0%	1	0	0	0	0	0	0	1	0
Argentina	ARG	201707	0%	1	1	1	1	1	1	1	1	0
Armenia	ARM	201804	0%	1	1	1	1	1	0	0	1	0
Australia	AUS	201808	0%	1	1	1	1	1	1	1	1	1
Austria	AUT	201805	0%	1	1	1	1	1	1	1	1	1
Azerbaijan	AZE	201812	0%	1	1	1	1	1	1	0	0	0
Bangladesh	BGD	201812	0%	1	1	1	1	1	1	1	1	0
Belarus	BLR	201803	0%	1	1	1	1	1	1	1	0	0
Bolivia	BOL	201703	0%	1	1	1	1	1	1	1	1	0
Bosnia and Herzegovina	BIH	201906	0%	1	1	1	1	1	1	1	1	0
Brazil	BRA	201806	0%	1	1	1	1	1	1	1	1	0
Bulgaria	BGR	201801	0%	1	1	1	1	1	1	1	1	0
Chile	CHL	201802	0%	1	1	1	1	1	1	1	1	1
China	CHN	201810	0%	1	1	1	1	1	1	0	0	0
Colombia	COL	201812	0%	1	1	1	1	1	1	1	1	0
Croatia	HRV	201802	0%	1	1	1	1	1	1	1	1	0
Cyprus	CYP	201905	0%	1	1	1	1	1	1	0	1	0
Czechia	CZE	201712	0%	1	1	1	1	1	1	1	1	1
Denmark	DNK	201801	0%	1	1	1	1	1	1	1	1	1
Ecuador	ECU	201805	0%	1	1	1	1	1	1	1	1	0
Estonia	EST	201807	0%	1	1	1	1	1	1	1	1	1
Ethiopia	ETH	202003	46%	1	1	1	1	1	1	0	0	0
Finland	FIN	201806	0%	1	1	1	1	1	1	1	1	1
France	FRA	201808	0%	1	1	1	1	1	1	1	1	1
Georgia	GEO	201803	0%	1	1	1	1	1	1	1	1	0
Germany	DEU	201805	0%	1	1	1	1	1	1	1	1	1
Greece	GRC	201710	0%	1	1	1	1	1	1	1	1	1
Guatemala	GTM	201910	0%	1	1	1	1	1	1	1	1	0
Hungary	HUN	201808	0%	1	1	1	1	1	1	1	1	1

Iceland	ISL	201803	0%	1	1	1	1	1	1	0	1	0
Indonesia	IDN	201808	0%	1	1	1	1	1	1	1	1	0
Iran	IRN	202004	100%	1	1	1	1	1	1	0	0	0
Iraq	IRQ	201806	0%	1	0	0	0	0	0	0	0	0
Italy	ITA	201901	0%	1	1	1	1	1	1	1	1	1
Japan	JPN	201909	0%	1	1	1	1	1	1	1	1	1
Jordan	JOR	201806	0%	1	0	0	0	0	0	0	0	0
Kazakhstan	KAZ	201811	0%	1	1	1	1	1	1	1	0	0
Kyrgyzstan	KGZ	202001	0%	1	1	1	1	1	1	1	0	0
Lebanon	LBN	201806	0%	1	0	0	0	0	0	0	1	0
Lithuania	LTU	201802	0%	1	1	1	1	1	1	1	1	1
Malaysia	MYS	201805	0%	1	1	1	1	1	1	1	1	0
Mexico	MEX	201805	0%	1	1	1	1	1	1	1	1	1
Montenegro	MNE	201912	0%	1	1	1	1	1	0	0	1	0
Myanmar	MMR	202003	2%	1	0	0	0	0	0	0	0	0
Netherlands	NLD	201739	0%	1	1	1	1	1	1	1	1	1
New Zealand	NZL	202002	0%	1	0	0	0	0	0	0	1	0
Nicaragua	NIC	202001	0%	1	1	1	1	1	1	1	0	0
Nigeria	NGA	201801	0%	1	1	1	1	0	0	0	1	0
North Macedonia	MKD	201903	0%	1	1	1	1	1	0	0	1	0
Norway	NOR	201812	0%	1	1	1	1	1	1	1	1	1
Pakistan	PAK	201812	0%	1	1	1	1	1	1	1	1	0
Peru	PER	201809	0%	1	1	1	1	1	1	1	1	0
Philippines	PHL	201912	0%	1	1	1	1	1	1	1	1	0
Poland	POL	201802	0%	1	1	1	1	1	1	1	1	1
Portugal	PRT	202003	0%	1	1	1	1	1	1	1	1	1
Romania	ROU	201805	0%	1	1	1	1	1	1	1	1	0
Russia	RUS	201712	0%	1	1	1	1	1	1	1	0	0
Serbia	SRB	201769	0%	1	1	1	1	1	1	1	1	0
Slovakia	SVK	201712	0%	1	1	1	1	1	1	1	1	1
Slovenia	SVN	201712	0%	1	1	1	1	1	1	1	1	1
South Korea	KOR	201801	0%	1	0	0	0	0	0	0	1	0
Spain	ESP	201801	0%	1	1	1	1	1	1	1	1	1
Sweden	SWE	201806	0%	1	1	1	1	1	1	1	1	1

Switzerland	CHE	201801	0%	1	1	1	1	1	1	1	1	1
Taiwan	TWN	201906	0%	1	0	0	0	0	0	0	1	0
Tajikistan	TJK	202002	0%	1	1	1	1	1	1	1	0	0
Thailand	THA	201802	0%	1	1	1	1	1	1	1	0	0
Tunisia	TUN	201905	0%	1	1	1	1	1	1	0	1	0
Turkey	TUR	201805	0%	1	1	1	1	1	1	1	0	1
Ukraine	UKR	202008	100%	1	1	1	1	1	1	1	1	0
United Kingdom	GBR	201807	0%	1	1	1	1	1	1	1	1	1
United States	USA	201705	0%	1	1	1	1	1	1	1	1	1
Vietnam	VNM	202001	0%	1	1	1	1	1	1	1	0	0
Zimbabwe	ZWE	202003	91%	1	1	1	1	1	1	1	0	0
Total number of countries				75	67	67	67	66	63	55	58	27

Table A 3: The correlation matrix of confidence measures

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Confidence in institutions (PCA)	1.000						
(2) Confidence in the press	0.825	1.000					
(3) Confidence in the police	0.644	0.304	1.000				
(4) Confidence in parliament	0.950	0.736	0.511	1.000			
(5) Confidence in the government	0.936	0.781	0.451	0.915	1.000		
(6) Confidence in the parties	0.933	0.774	0.433	0.946	0.902	1.000	
(7) Confidence in justice	0.878	0.625	0.798	0.753	0.732	0.704	1.000

Table A 4: Descriptive statistics

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln total deaths per million	75	5.741	2.046	-1.022	7.742
Total deaths per million	75	793.56	660.006	.36	2303.394
Ln total cases per million	75	9.748	1.893	3.274	11.912
Ln fatality rate	75	-4.007	.612	-5.726	-2.406
Excess deaths in 2020	54	14.634	13.43	-.508	63.11
Log excess deaths	52	2.31	1.075	-1.417	4.145
Mean positive test rate	66	.097	.08	.001	.406
Confidence in institutions	75	0	1	-1.983	2.531
Confidence in press	75	0	1	-1.825	2.41
Confidence in police	75	0	1	-2.21	2.363
Confidence in parliament	75	0	1	-1.939	2.499
Confidence in government	75	0	1	-1.598	2.483
Confidence in parties	75	0	1	-1.59	3.326
Confidence in justice	75	0	1	-2.401	1.808
Days since first death	75	369.427	21.848	233	424
Log population	75	16.688	1.716	11.255	21.087
Log population density	74	4.338	1.119	1.164	7.143
Log GDP per capita	73	9.755	.837	7.456	11.079
Gini	67	35.566	7.431	24.09	53.5
Index of democracy and government	74	0	1.327	-2.514	2.042
Log mortality rate before the pandemic	75	8.953	.386	7.9	9.808
Share of those above age 65	73	12.736	6.32	2.751	27.049
Life expectancy	75	76.873	5.343	54.69	84.63
Share of migrants	74	8.484	10.383	.071	59.714

Trust in others	75	-.061	.794	-1.842	1.796
Resources of the health system	72	0	1.317	-2.34	2.333
Index of health risks	75	0	2.174	-6.191	4.295
Stringency of COVID-19 measures	72	82.8	15.475	24.07	100
Decrease in mobility	63	-19.11	7.848	-39.694	-5.484
Survival rate of breast cancer	43	79.572	8.198	43.1	90.6
Prison population per 100,000	73	160.795	103.362	32	639
Definition of deaths: no info	75	.68	.47	0	1
Clinical diagnosis-based definition	75	.133	.342	0	1
Test-based definition of deaths	75	.147	.356	0	1
Clinical and test-based definition	75	.04	.197	0	1
Years of schooling	65	9.866	2.093	4.57	13.18
Closing measures, max	72	13.141	2.676	3	15
Closing measures, mean	72	9.31	2.595	.78	13.435
Closing measures, SD	72	3.07	.994	.493	5.096
Stringency of COVID-19 measures	72	82.8	15.475	24.07	100
Mean stringency of COVID-19 measures	72	61.83	13.52	13.612	83.918
Restrictions on personal gatherings	72	.636	.224	0	.953
Restrictions on personal gatherings, binary	75	.587	.496	0	1
Comprehensive contact tracing	72	.494	.344	0	1
Comprehensive contact tracing, binary	75	.533	.502	0	1
Data on confidence missing	75	.028	.024	0	.093
Log deaths by 2020-10-21	75	4.442	1.795	-1.224	6.935
Log deaths by 2020-11-21	75	4.879	1.874	-1.224	6.983
Log deaths by 2020-12-21	75	5.221	1.969	-1.224	7.043
Log deaths by 2021-01-21	75	5.473	2.002	-1.224	7.365
Log deaths by 2021-02-21	75	5.641	2.021	-1.022	7.505
Log number of tests per thousand people	65	5.451	1.497	2.041	8.258
TI lack of corruption score	73	48.973	19.616	20	87

Table A 5: Cross-country studies published in peer-reviewed journals: data coverage and results

Paper	Journal	Number of countries	End of the observation period	Outcome	Confidence in public institutions[1]	Economy[2]	Inequality[3]	Demography[4]	Govt efficiency[5]	Culture of following the rules[6]	Democracy[7]	Stringency of policy measures[8]	Healthcare resources[9]	Health risk[10]	Social capital[11]	COVID duration[12]	Mobility[13]	Results
Gelfand et al. [3]	Lancet	57	16 Oct 2020	log no. of deaths and cases		x	x	x	x	x	x	x						Nations with high levels of cultural looseness have 4.99 times the number of cases and 8.71 times the number of deaths.
Sorci, Faivre, and Morand [1]	Nature Scientific Reports	143 /72	11 June 2020	fatality rate: deaths/ cases		x		x			x	x	x	x		x		Comorbidity and socioeconomic factors are important drivers of COVID-19 case fatality rate.
Karabulut et al. (2021)	Economics Letters	99	15 Dec 2020	log infection rate, log case fatality rate		x	x	x			x		x					The infection rates of the disease are higher for more democratic countries, the case fatality rates are lower.
Elgar, Stefaniak, and Wohl [6]	Social Science & Medicine	84	3 Oct 2020	deaths	x	x	x	x							x			COVID-19 mortality positively related to income inequality, trust and group affiliations and negatively related to social capital from civic engagement and confidence in public institutions.
Liang et al. [7]	Nature Scientific Reports	169	13 June 2020	Covid-19 mortality rate		x		x	x			x	x	x				COVID-19 mortality rate negatively associated with Covid testing, government effectiveness, and number of hospital beds, and positively associated with proportion of population aged 65 or older and transport infrastructure quality.
The present article		75	21 March 2021	log no. of deaths (robustness: raw no. of deaths / 1M log	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

				no. of cases, log fatality rate)														

(1) Confidence in public institutions (2) GDP per capita, sectoral controls, quality of transport infrastructure; (3) GINI; (4)total population, population density, share of pop. older than 65/70; (5) WGI scores; (6) tightness, collectivism, power distance; (7) authoritarianism, democracy; (8) time to lockdowns, stringency, testing; (9) health expenditures, number of doctors, number of hospital beds; (10) disability adjusted years, share of total disease burden: cardiovascular diseases, cancers, chronic respiratory diseases, chronic kidney diseases, lower respiratory infections, diabetes mellitus, obesity, air pollution; (11) trust in people; (12) time since first case, time since first death; (13) Google trends mobility data

Appendix B: Robustness checks

Table B 1: Log total deaths attributed to COVID-19 and confidence in institutions: Model 1 – Model 7

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
Confidence in institutions, standardized	-1.190	-1.099	-1.058	-1.071	-1.083	-0.923	-0.828
	[-1.573 - -0.807]	[-1.424 - -0.774]	[-1.445 - -0.670]	[-1.468 - -0.673]	[-1.399 - -0.768]	[-1.244 - -0.602]	[-1.169 - -0.486]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Days since first death		0.015	0.017	0.016	0.016	0.012	0.014
		[-0.004 - 0.034]	[-0.005 - 0.038]	[-0.005 - 0.038]	[0.002 - 0.030]	[-0.003 - 0.026]	[-0.003 - 0.031]
		(0.126)	(0.125)	(0.131)	(0.027)	(0.107)	(0.100)
Log population		-0.159	-0.116	-0.115	-0.123	-0.157	-0.124
		[-0.405 - 0.088]	[-0.378 - 0.146]	[-0.379 - 0.149]	[-0.383 - 0.137]	[-0.403 - 0.090]	[-0.431 - 0.183]
		(0.203)	(0.378)	(0.386)	(0.347)	(0.208)	(0.419)
Log population density		0.148	0.116	0.119	0.309	0.234	0.180
		[-0.259 - 0.556]	[-0.291 - 0.523]	[-0.291 - 0.529]	[-0.036 - 0.654]	[-0.083 - 0.550]	[-0.213 - 0.573]
		(0.469)	(0.570)	(0.563)	(0.078)	(0.144)	(0.361)
Log GDP per capita		0.748	0.612	0.608	0.517	0.715	0.510
		[0.094 - 1.403]	[-0.416 - 1.640]	[-0.419 - 1.634]	[-0.656 - 1.690]	[-0.373 - 1.802]	[-0.787 - 1.806]
		(0.026)	(0.238)	(0.240)	(0.381)	(0.193)	(0.431)
Gini		-0.015	-0.012	-0.010	0.004	0.004	-0.006
		[-0.060 - 0.030]	[-0.062 - 0.038]	[-0.061 - 0.040]	[-0.042 - 0.050]	[-0.039 - 0.047]	[-0.052 - 0.041]
		(0.517)	(0.625)	(0.686)	(0.869)	(0.856)	(0.803)
Index of democracy and government effectiveness		-0.063	0.167	0.147	0.407	0.149	0.240
		[-0.586 - 0.460]	[-0.496 - 0.830]	[-0.577 - 0.871]	[-0.336 - 1.151]	[-0.583 - 0.881]	[-0.664 - 1.145]
		(0.810)	(0.615)	(0.685)	(0.277)	(0.684)	(0.593)
Log mortality rate before the pandemic			2.203	2.212	-0.358	-2.946	-1.427
			[-0.687 - 5.093]	[-0.676 - 5.101]	[-4.515 - 3.798]	[-5.744 - -0.148]	[-4.689 - 1.836]
			(0.132)	(0.131)	(0.863)	(0.039)	(0.382)
Share of those above age 65			-0.159	-0.161	-0.077	0.122	0.034
			[-0.400 - 0.081]	[-0.401 - 0.078]	[-0.388 - 0.235]	[-0.103 - 0.348]	[-0.243 - 0.311]
			(0.189)	(0.183)	(0.623)	(0.281)	(0.806)
Life expectancy			0.088	0.090	-0.141	-0.257	-0.168
			[-0.144 - 0.319]	[-0.144 - 0.324]	[-0.384 - 0.102]	[-0.456 - -0.057]	[-0.416 - 0.080]
			(0.452)	(0.445)	(0.249)	(0.013)	(0.178)
Share of migrants			-0.018	-0.019	-0.028	-0.041	-0.044
			[-0.091 - 0.055]	[-0.097 - 0.058]	[-0.094 - 0.038]	[-0.102 - 0.019]	[-0.114 - 0.026]
			(0.624)	(0.615)	(0.398)	(0.177)	(0.214)
Trust in others				0.067	0.125	0.135	0.049
				[-0.489 - 0.623]	[-0.398 - 0.648]	[-0.326 - 0.596]	[-0.462 - 0.561]

				(0.810)	(0.633)	(0.558)	(0.847)
Resources of the health system					0.619	0.782	0.712
					[0.009 - 1.229]	[0.131 - 1.432]	[-0.034 - 1.457]
					(0.047)	(0.020)	(0.061)
Index of health risks					0.195	0.234	0.211
					[-0.094 - 0.485]	[0.014 - 0.454]	[-0.059 - 0.482]
					(0.182)	(0.038)	(0.122)
Stringency of COVID-19 measures						0.042	0.032
						[0.016 - 0.069]	[0.005 - 0.058]
						(0.002)	(0.021)
Decrease in mobility							-0.029
							[-0.081 - 0.022]
							(0.257)
Constant	5.741	-4.356	-28.620	-28.901	10.920	37.451	19.575
	[5.355 - 6.126]	[-13.741 - 5.029]	[-65.062 - 7.821]	[-65.553 - 7.750]	[-40.719 - 62.559]	[1.620 - 73.282]	[-25.830 - 64.979]
	(0.000)	(0.357)	(0.121)	(0.120)	(0.673)	(0.041)	(0.388)
Observations	75	67	67	67	66	63	55
R-squared	0.338	0.591	0.617	0.617	0.697	0.764	0.769

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 2: Log total deaths attributed to COVID-19 and confidence in institutions: Full Information Maximum Likelihood Estimates (FIML)

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
Confidence in institutions, standardized	-1.190	-1.182	-1.192	-1.182	-1.026	-0.787	-0.720
	[-1.564 - -0.816]	[-1.530 - -0.833]	[-1.556 - -0.828]	[-1.523 - -0.841]	[-1.356 - -0.696]	[-1.129 - -0.445]	[-1.066 - -0.374]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Days since first death		0.006	0.009	0.009	0.011	0.010	0.007
		[-0.022 - 0.034]	[-0.017 - 0.034]	[-0.017 - 0.035]	[-0.007 - 0.030]	[-0.007 - 0.027]	[-0.009 - 0.024]
		(0.687)	(0.502)	(0.498)	(0.234)	(0.247)	(0.386)
Log population		-0.115	-0.094	-0.100	-0.067	-0.174	-0.090
		[-0.365 - 0.134]	[-0.369 - 0.182]	[-0.374 - 0.174]	[-0.364 - 0.229]	[-0.440 - 0.093]	[-0.354 - 0.174]
		(0.365)	(0.505)	(0.473)	(0.656)	(0.201)	(0.505)
Log population density		0.161	0.175	0.181	0.287	0.196	0.173
		[-0.301 - 0.622]	[-0.312 - 0.662]	[-0.299 - 0.660]	[-0.171 - 0.744]	[-0.203 - 0.595]	[-0.134 - 0.480]
		(0.495)	(0.481)	(0.460)	(0.219)	(0.336)	(0.269)
Log GDP per capita		0.874	0.817	0.801	-0.050	0.030	0.302
		[0.068 - 1.680]	[-0.275 - 1.909]	[-0.302 - 1.904]	[-1.106 - 1.005]	[-0.895 - 0.955]	[-0.666 - 1.270]
		(0.034)	(0.142)	(0.155)	(0.926)	(0.950)	(0.541)
Gini		-0.022	-0.019	-0.016	0.004	0.014	0.000

		[-0.083 - 0.039]	[-0.089 - 0.050]	[-0.086 - 0.053]	[-0.066 - 0.073]	[-0.047 - 0.075]	[-0.055 - 0.056]
		(0.481)	(0.585)	(0.648)	(0.918)	(0.654)	(0.995)
Index of democracy and government effectiveness		-0.140	-0.056	-0.059	0.465	0.189	-0.086
		[-0.701 - 0.421]	[-0.783 - 0.671]	[-0.816 - 0.698]	[-0.287 - 1.216]	[-0.487 - 0.866]	[-0.792 - 0.621]
		(0.624)	(0.880)	(0.879)	(0.225)	(0.583)	(0.812)
Log mortality rate before the pandemic			1.872	1.923	-0.359	-1.884	-1.929
			[-0.965 - 4.709]	[-0.957 - 4.804]	[-3.642 - 2.923]	[-3.989 - 0.222]	[-3.850 - -0.007]
			(0.196)	(0.191)	(0.830)	(0.080)	(0.049)
Share of those above age 65			-0.126	-0.127	-0.073	0.081	0.131
			[-0.395 - 0.144]	[-0.402 - 0.147]	[-0.369 - 0.224]	[-0.123 - 0.284]	[-0.049 - 0.310]
			(0.360)	(0.363)	(0.632)	(0.439)	(0.154)
Life expectancy			0.033	0.036	-0.092	-0.141	-0.181
			[-0.233 - 0.299]	[-0.237 - 0.309]	[-0.318 - 0.135]	[-0.319 - 0.036]	[-0.358 - -0.004]
			(0.810)	(0.795)	(0.428)	(0.119)	(0.045)
Share of migrants			0.010	0.012	-0.006	-0.020	-0.022
			[-0.044 - 0.064]	[-0.039 - 0.062]	[-0.056 - 0.045]	[-0.066 - 0.027]	[-0.059 - 0.015]
			(0.718)	(0.655)	(0.829)	(0.411)	(0.240)
Trust in others				-0.008	0.043	0.010	0.155
				[-0.511 - 0.496]	[-0.459 - 0.544]	[-0.478 - 0.498]	[-0.259 - 0.570]
				(0.976)	(0.868)	(0.969)	(0.463)
Resources of the health system					0.661	0.773	0.720
					[-0.136 - 1.458]	[0.076 - 1.471]	[0.127 - 1.313]
					(0.104)	(0.030)	(0.017)
Index of health risks					0.338	0.319	0.318
					[0.072 - 0.603]	[0.115 - 0.522]	[0.126 - 0.510]
					(0.013)	(0.002)	(0.001)
Stringency of COVID-19 measures						0.047	0.033
						[0.015 - 0.079]	[0.005 - 0.061]
						(0.004)	(0.021)
Decrease in mobility							-0.082
							[-0.133 - -0.031]
							(0.002)
Constant	5.741	-2.932	-21.735	-22.370	13.084	26.164	26.207
	[5.364 - 6.117]	[-12.902 - 7.038]	[-59.876 - 16.406]	[-61.246 - 16.506]	[-31.660 - 57.829]	[-2.653 - 54.980]	[-1.670 - 54.084]
	(0.000)	(0.564)	(0.264)	(0.259)	(0.567)	(0.075)	(0.065)
Observations	75	75	75	75	75	75	75

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 3: COVID-19 and confidence in institutions: Alternative outcomes (Model 7)

	(1) Log total no. of deaths per million	(2) Total no. of deaths per million	(3) Log no. of total cases	(4) Log fatality rate	(5) No. of excess deaths in 2020	(6) Log no. of excess deaths in 2020	(7) Mean positive test rate	(8) Log no. of tests
Confidence in institutions, standardized	-0.828	-350.876	-0.511	-0.316	-4.711	-0.395	-0.051	0.034
	[-1.169 - -0.486]	[-531.922 - -169.831]	[-0.907 - -0.115]	[-0.514 - -0.118]	[-10.043 - 0.620]	[-0.792 - 0.003]	[-0.075 - -0.027]	[-0.269 - 0.336]
	(0.000)	(0.000)	(0.013)	(0.003)	(0.081)	(0.052)	(0.000)	(0.822)
Days since first death	0.014	-6.180	0.017	-0.003	-0.096	-0.021	0.000	-0.001
	[-0.003 - 0.031]	[-10.725 - -1.635]	[-0.002 - 0.037]	[-0.011 - 0.005]	[-0.401 - 0.209]	[-0.060 - 0.019]	[-0.000 - 0.001]	[-0.011 - 0.009]
	(0.100)	(0.009)	(0.080)	(0.449)	(0.523)	(0.291)	(0.608)	(0.898)
Log population	-0.124	19.916	-0.243	0.119	0.809	0.063	0.008	-0.213
	[-0.431 - 0.183]	[-136.510 - 176.343]	[-0.527 - 0.041]	[-0.041 - 0.279]	[-2.320 - 3.937]	[-0.234 - 0.360]	[-0.008 - 0.024]	[-0.412 - -0.014]
	(0.419)	(0.798)	(0.091)	(0.141)	(0.600)	(0.667)	(0.304)	(0.037)
Log population density	0.180	107.746	0.181	-0.001	0.284	0.272	0.001	-0.024
	[-0.213 - 0.573]	[-61.670 - 277.162]	[-0.219 - 0.581]	[-0.157 - 0.154]	[-3.358 - 3.925]	[-0.277 - 0.821]	[-0.024 - 0.026]	[-0.287 - 0.238]
	(0.361)	(0.206)	(0.365)	(0.985)	(0.874)	(0.317)	(0.938)	(0.850)
Log GDP per capita	0.510	341.123	0.780	-0.270	9.288	0.806	-0.073	1.023
	[-0.787 - 1.806]	[-132.941 - 815.187]	[-0.351 - 1.911]	[-0.899 - 0.359]	[0.296 - 18.280]	[-0.112 - 1.724]	[-0.136 - -0.011]	[0.229 - 1.818]
	(0.431)	(0.153)	(0.171)	(0.391)	(0.043)	(0.083)	(0.023)	(0.013)
Gini	-0.006	-1.508	-0.009	0.003	-0.145	0.004	-0.001	-0.015
	[-0.052 - 0.041]	[-26.707 - 23.691]	[-0.052 - 0.034]	[-0.026 - 0.032]	[-0.701 - 0.411]	[-0.052 - 0.060]	[-0.005 - 0.003]	[-0.062 - 0.031]
	(0.803)	(0.904)	(0.673)	(0.822)	(0.596)	(0.886)	(0.579)	(0.509)
Index of democracy and government effectiveness	0.240	-53.542	0.077	0.164	-1.235	-0.446	0.032	-0.174
	[-0.664 - 1.145]	[-314.326 - 207.243]	[-0.655 - 0.808]	[-0.221 - 0.549]	[-6.237 - 3.766]	[-0.969 - 0.076]	[-0.001 - 0.066]	[-0.564 - 0.215]
	(0.593)	(0.680)	(0.833)	(0.395)	(0.616)	(0.090)	(0.057)	(0.368)
Log mortality rate before the pandemic	-1.427	-934.373	-0.130	-1.297	-34.456	-1.840	-0.134	-0.799
	[-4.689 - 1.836]	[-2,308.887 - 440.141]	[-3.279 - 3.020]	[-2.791 - 0.198]	[-65.414 - -3.498]	[-4.127 - 0.447]	[-0.339 - 0.071]	[-3.036 - 1.439]
	(0.382)	(0.177)	(0.934)	(0.087)	(0.031)	(0.110)	(0.193)	(0.472)
Share of those above age 65	0.034	81.748	-0.072	0.105	1.347	0.091	-0.003	0.057
	[-0.243 - 0.311]	[-39.923 - 203.418]	[-0.352 - 0.209]	[-0.016 - 0.226]	[-1.527 - 4.220]	[-0.137 - 0.319]	[-0.021 - 0.016]	[-0.122 - 0.236]
	(0.806)	(0.182)	(0.609)	(0.087)	(0.344)	(0.420)	(0.772)	(0.522)

Life expectancy	-0.168	-65.499	-0.073	-0.095	-1.430	-0.093	0.000	-0.092
	[-0.416 - 0.080]	[-173.699 - 42.702]	[-0.321 - 0.175]	[-0.214 - 0.024]	[-4.914 - 2.054]	[-0.341 - 0.154]	[-0.016 - 0.017]	[-0.244 - 0.059]
	(0.178)	(0.228)	(0.554)	(0.114)	(0.407)	(0.444)	(0.959)	(0.223)
Share of migrants	-0.044	-15.154	-0.046	0.002	0.101	-0.018	-0.003	-0.001
	[-0.114 - 0.026]	[-46.910 - 16.601]	[-0.118 - 0.027]	[-0.028 - 0.032]	[-0.390 - 0.593]	[-0.078 - 0.041]	[-0.007 - 0.002]	[-0.060 - 0.057]
	(0.214)	(0.340)	(0.208)	(0.909)	(0.675)	(0.534)	(0.235)	(0.970)
Trust in others	0.049	66.039	0.177	-0.128	-7.744	-0.195	-0.005	0.340
	[-0.462 - 0.561]	[-221.224 - 353.302]	[-0.227 - 0.582]	[-0.377 - 0.120]	[-17.234 - 1.745]	[-0.791 - 0.400]	[-0.043 - 0.033]	[-0.111 - 0.791]
	(0.847)	(0.644)	(0.380)	(0.303)	(0.105)	(0.505)	(0.791)	(0.134)
Resources of the health system	0.712	118.575	0.585	0.126	-0.965	0.157	0.022	0.334
	[-0.034 - 1.457]	[-88.289 - 325.440]	[-0.014 - 1.185]	[-0.198 - 0.451]	[-4.958 - 3.029]	[-0.277 - 0.591]	[-0.012 - 0.055]	[-0.099 - 0.766]
	(0.061)	(0.253)	(0.055)	(0.435)	(0.624)	(0.464)	(0.198)	(0.126)
Index of health risks	0.211	50.357	0.200	0.011	1.725	0.054	0.018	0.119
	[-0.059 - 0.482]	[-58.522 - 159.236]	[-0.034 - 0.433]	[-0.124 - 0.147]	[-2.513 - 5.962]	[-0.271 - 0.379]	[0.004 - 0.032]	[-0.079 - 0.316]
	(0.122)	(0.355)	(0.092)	(0.865)	(0.410)	(0.735)	(0.014)	(0.230)
Stringency of COVID-19 measures	0.032	11.977	0.023	0.009	-0.099	-0.000	-0.000	0.015
	[0.005 - 0.058]	[2.984 - 20.970]	[-0.002 - 0.047]	[-0.001 - 0.019]	[-0.327 - 0.128]	[-0.018 - 0.017]	[-0.002 - 0.001]	[-0.003 - 0.034]
	(0.021)	(0.010)	(0.065)	(0.083)	(0.378)	(0.972)	(0.596)	(0.102)
Decrease in mobility	-0.029	-13.471	-0.029	-0.000	-0.505	-0.043	-0.000	-0.040
	[-0.081 - 0.022]	[-38.204 - 11.261]	[-0.085 - 0.027]	[-0.024 - 0.023]	[-1.020 - 0.010]	[-0.090 - 0.003]	[-0.004 - 0.003]	[-0.075 - -0.006]
	(0.257)	(0.277)	(0.305)	(0.966)	(0.054)	(0.067)	(0.799)	(0.023)
								[. - .]
								(.)
Constant	19.575	10,237.976	5.134	14.441	349.321	21.533	1.914	11.462
	[-25.830 - 64.979]	[-7,796.045 - 28,271.996]	[-35.811 - 46.080]	[-6.555 - 35.436]	[-93.908 - 792.550]	[-13.142 - 56.209]	[-0.861 - 4.689]	[-17.334 - 40.258]
	(0.388)	(0.258)	(0.801)	(0.172)	(0.117)	(0.213)	(0.170)	(0.423)
Observations	55	55	55	55	43	42	50	48
R-squared	0.769	0.664	0.759	0.523	0.732	0.636	0.693	0.826

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 4: Log total deaths attributed to COVID-19 and confidence in specific institutions (Model 7)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Confidence in institutions	-0.828 [-1.169 - -0.486] (0.000)						
Confidence in press		-0.654 [-1.016 - -0.292] (0.001)					
Confidence in police			-0.509 [-0.875 - -0.143] (0.008)				
Confidence in parliament				-0.916 [-1.358 - -0.475] (0.000)			
Confidence in government					-0.800 [-1.225 - -0.375] (0.000)		
Confidence in parties						-1.074 [-1.460 - -0.688] (0.000)	
Confidence in justice							-0.783 [-1.140 - -0.426] (0.000)
Days since first death	0.014 [-0.003 - 0.031] (0.100)	0.018 [-0.000 - 0.036] (0.055)	0.019 [-0.001 - 0.038] (0.066)	0.013 [-0.006 - 0.032] (0.166)	0.015 [-0.004 - 0.034] (0.108)	0.006 [-0.009 - 0.022] (0.391)	0.020 [0.001 - 0.039] (0.041)
Log population	-0.124 [-0.431 - 0.183] (0.419)	-0.110 [-0.413 - 0.194] (0.470)	-0.199 [-0.526 - 0.129] (0.226)	-0.157 [-0.464 - 0.150] (0.306)	-0.144 [-0.469 - 0.181] (0.376)	-0.064 [-0.345 - 0.218] (0.650)	-0.148 [-0.470 - 0.173] (0.356)
Log population density	0.180 [-0.213 - 0.573] (0.361)	0.083 [-0.345 - 0.510] (0.697)	0.084 [-0.288 - 0.456] (0.650)	0.202 [-0.216 - 0.621] (0.333)	0.188 [-0.230 - 0.606] (0.367)	0.201 [-0.194 - 0.596] (0.310)	0.187 [-0.188 - 0.561] (0.320)
Log GDP per capita	0.510 [-0.787 - 1.806] (0.431)	0.349 [-0.981 - 1.679] (0.598)	0.364 [-1.026 - 1.755] (0.599)	0.549 [-0.791 - 1.889] (0.412)	0.476 [-0.885 - 1.838] (0.483)	0.655 [-0.558 - 1.869] (0.281)	0.526 [-0.751 - 1.803] (0.410)
Gini	-0.006 [-0.052 - 0.041] (0.803)	-0.011 [-0.065 - 0.043] (0.676)	0.021 [-0.035 - 0.078] (0.456)	-0.007 [-0.054 - 0.040] (0.761)	0.003 [-0.046 - 0.052] (0.906)	-0.009 [-0.052 - 0.034] (0.674)	0.008 [-0.041 - 0.056] (0.748)
Index of democracy and government effectiveness	0.240 [-0.664 - 1.145] (0.593)	0.367 [-0.518 - 1.251] (0.406)	0.256 [-0.758 - 1.269] (0.612)	0.070 [-0.811 - 0.951] (0.873)	0.245 [-0.700 - 1.191] (0.603)	0.032 [-0.774 - 0.838] (0.936)	0.344 [-0.608 - 1.296] (0.468)

Log mortality rate before the pandemic	-1.427	-1.178	-1.815	-1.594	-1.754	-2.119	-0.827
	[-4.689 - 1.836]	[-4.923 - 2.566]	[-5.385 - 1.755]	[-4.596 - 1.408]	[-4.889 - 1.381]	[-4.872 - 0.634]	[-4.256 - 2.601]
	(0.382)	(0.528)	(0.310)	(0.289)	(0.265)	(0.127)	(0.628)
Share of those above age 65	0.034	0.037	0.129	0.041	0.054	0.082	-0.005
	[-0.243 - 0.311]	[-0.285 - 0.360]	[-0.162 - 0.421]	[-0.217 - 0.299]	[-0.216 - 0.324]	[-0.143 - 0.307]	[-0.304 - 0.294]
	(0.806)	(0.815)	(0.374)	(0.749)	(0.687)	(0.467)	(0.972)
Life expectancy	-0.168	-0.148	-0.154	-0.175	-0.214	-0.220	-0.126
	[-0.416 - 0.080]	[-0.440 - 0.143]	[-0.436 - 0.127]	[-0.417 - 0.066]	[-0.455 - 0.027]	[-0.432 - -0.007]	[-0.392 - 0.141]
	(0.178)	(0.308)	(0.274)	(0.150)	(0.080)	(0.043)	(0.346)
Share of migrants	-0.044	-0.069	-0.043	-0.036	-0.035	-0.036	-0.045
	[-0.114 - 0.026]	[-0.147 - 0.009]	[-0.116 - 0.030]	[-0.107 - 0.034]	[-0.111 - 0.041]	[-0.101 - 0.030]	[-0.114 - 0.024]
	(0.214)	(0.082)	(0.242)	(0.301)	(0.358)	(0.279)	(0.194)
Trust in others	0.049	-0.265	-0.046	0.207	-0.011	0.230	0.000
	[-0.462 - 0.561]	[-0.789 - 0.259]	[-0.667 - 0.576]	[-0.339 - 0.752]	[-0.568 - 0.547]	[-0.242 - 0.702]	[-0.563 - 0.563]
	(0.847)	(0.312)	(0.882)	(0.448)	(0.969)	(0.330)	(1.000)
Resources of the health system	0.712	0.672	0.666	0.744	0.698	0.694	0.713
	[-0.034 - 1.457]	[-0.062 - 1.406]	[-0.139 - 1.472]	[-0.026 - 1.514]	[-0.074 - 1.470]	[-0.011 - 1.399]	[-0.038 - 1.465]
	(0.061)	(0.072)	(0.102)	(0.058)	(0.075)	(0.054)	(0.062)
Index of health risks	0.211	0.220	0.290	0.203	0.264	0.250	0.168
	[-0.059 - 0.482]	[-0.023 - 0.462]	[-0.059 - 0.639]	[-0.066 - 0.471]	[-0.019 - 0.548]	[0.009 - 0.490]	[-0.122 - 0.459]
	(0.122)	(0.075)	(0.100)	(0.135)	(0.067)	(0.042)	(0.248)
Stringency of COVID-19 measures	0.032	0.035	0.040	0.033	0.032	0.032	0.030
	[0.005 - 0.058]	[0.006 - 0.064]	[0.010 - 0.070]	[0.007 - 0.058]	[0.004 - 0.060]	[0.009 - 0.055]	[0.002 - 0.058]
	(0.021)	(0.019)	(0.011)	(0.014)	(0.026)	(0.009)	(0.034)
Decrease in mobility	-0.029	-0.039	-0.034	-0.036	-0.034	-0.042	-0.008
	[-0.081 - 0.022]	[-0.099 - 0.021]	[-0.098 - 0.029]	[-0.089 - 0.018]	[-0.088 - 0.020]	[-0.084 - 0.001]	[-0.070 - 0.054]
	(0.257)	(0.200)	(0.282)	(0.182)	(0.209)	(0.054)	(0.789)
Constant	19.575	16.187	20.508	21.822	25.520	29.312	9.686
	[-25.830 - 64.979]	[-35.161 - 67.535]	[-30.808 - 71.825]	[-21.895 - 65.539]	[-19.542 - 70.582]	[-10.059 - 68.683]	[-37.512 - 56.883]
	(0.388)	(0.527)	(0.424)	(0.319)	(0.259)	(0.140)	(0.680)
Observations	55	55	55	55	55	55	55
R-squared	0.769	0.754	0.710	0.759	0.749	0.798	0.754

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 5: Log total deaths attributed to COVID-19 and confidence in institutions: further robustness checks

	(1)	(2)	(3)	(4)		(5)		(6)	(7)	(8)
				Lasso1*		Lasso2*				
	Subsample of countries where data collection on confidence ended by 1 March 2020	Model 7 in Table 1, weighted by population	Model 7 in Table 1, controlling for non-response in confidence	Lasso coeffs	OLS esti-mates	Lasso coeffs	OLS estimates	Mean stringency instead of max	Democracy subsample	OECD subsample
Confidence in institutions, standardized	-0.848 [-1.213 - -0.484] (0.000)	-0.797 [-1.356 - -0.239] (0.006)	-0.768 [-1.113 - -0.422] (0.000)	-0.739	-0.768 [-1.062 - -0.474] (0.000)	-0.600	-0.564 [-1.005 - -0.122] (0.014)	-0.778 [-1.087 - -0.468] (0.000)	-0.723 [-1.265 - -0.181] (0.011)	-0.768 [-1.701 - 0.165] (0.097)
Days since first death	0.013 [-0.004 - 0.031] (0.123)	0.021 [0.004 - 0.037] (0.014)	0.015 [-0.002 - 0.032] (0.081)	0.286	0.017 [0.002 - 0.031] (0.029)	0.265	0.013 [-0.000 - 0.026] (0.053)	0.016 [0.001 - 0.030] (0.035)	-0.015 [-0.047 - 0.017] (0.343)	0.036 [-0.105 - 0.176] (0.584)
Log population	0.022 [-0.405 - 0.449] (0.916)	0.111 [-0.356 - 0.577] (0.634)	-0.094 [-0.401 - 0.212] (0.537)					-0.251 [-0.565 - 0.063] (0.114)	0.085 [-0.236 - 0.407] (0.592)	-0.161 [-0.647 - 0.325] (0.478)
Log population density	0.158 [-0.264 - 0.580] (0.453)	-0.037 [-0.598 - 0.525] (0.896)	0.146 [-0.276 - 0.567] (0.489)			0.133	0.114 [-0.170 - 0.398] (0.423)	0.212 [-0.149 - 0.574] (0.242)	0.265 [-0.165 - 0.696] (0.217)	0.481 [-0.131 - 1.093] (0.111)
Log GDP per capita	0.184 [-1.476 - 1.843] (0.824)	-0.336 [-2.331 - 1.658] (0.735)	0.555 [-0.630 - 1.739] (0.349)					0.518 [-0.711 - 1.747] (0.399)	0.391 [-1.548 - 2.330] (0.683)	1.279 [-5.787 - 8.345] (0.695)
Gini	-0.021 [-0.078 - 0.035] (0.451)	-0.016 [-0.101 - 0.069] (0.698)	-0.017 [-0.074 - 0.039] (0.539)					-0.010 [-0.057 - 0.037] (0.670)	0.026 [-0.037 - 0.089] (0.404)	0.059 [-0.087 - 0.204] (0.389)
Index of democracy and government effectiveness	0.382 [-0.620 - 1.384] (0.444)	0.859 [-0.451 - 2.169] (0.192)	0.157 [-0.537 - 0.852] (0.649)	0.163	-0.010 [-0.453 - 0.432] (0.963)			0.159 [-0.699 - 1.017] (0.710)	0.187 [-1.112 - 1.486] (0.770)	-0.200 [-1.963 - 1.563] (0.806)
Log mortality rate before the pandemic	-1.711 [-5.264 - 1.842] (0.335)	-0.931 [-7.030 - 5.168] (0.759)	-0.900 [-4.356 - 2.556] (0.601)					-2.051 [-4.990 - 0.888] (0.166)	-1.622 [-4.389 - 1.145] (0.240)	2.307 [-4.731 - 9.344] (0.482)
Share of those above	0.052	-0.127	0.055					0.118	0.160	-0.148

age 65	[-0.233 - 0.337]	[-0.555 - 0.300]	[-0.257 - 0.366]				[-0.146 - 0.383]	[-0.074 - 0.394]	[-0.819 - 0.524]
	(0.713)	(0.550)	(0.725)				(0.370)	(0.171)	(0.635)
Life expectancy	-0.139	0.008	-0.175			-0.155	-0.020	-0.207	-0.106	0.147
	[-0.408 - 0.129]	[-0.330 - 0.346]	[-0.438 - 0.089]				[-0.127 - 0.086]	[-0.442 - 0.027]	[-0.311 - 0.098]	[-0.544 - 0.838]
	(0.300)	(0.963)	(0.187)				(0.701)	(0.081)	(0.296)	(0.646)
Share of migrants	-0.036	-0.107	-0.046			-0.177	-0.047	-0.037	-0.027	-0.028
	[-0.114 - 0.042]	[-0.239 - 0.025]	[-0.124 - 0.031]				[-0.100 - 0.006]	[-0.105 - 0.031]	[-0.107 - 0.053]	[-0.135 - 0.080]
	(0.356)	(0.110)	(0.233)				(0.080)	(0.273)	(0.493)	(0.580)
Trust in others	0.032	0.180	-0.089					-0.008	0.211	0.609
	[-0.460 - 0.524]	[-0.591 - 0.950]	[-0.612 - 0.434]					[-0.489 - 0.473]	[-0.347 - 0.769]	[-0.473 - 1.691]
	(0.896)	(0.640)	(0.731)					(0.973)	(0.445)	(0.238)
Resources of the health system	0.628	0.844	0.680	0.474	0.455			0.593	0.152	0.061
	[-0.080 - 1.336]	[-0.277 - 1.965]	[0.044 - 1.315]		[0.044 - 0.865]			[-0.094 - 1.279]	[-0.465 - 0.768]	[-0.900 - 1.021]
	(0.080)	(0.136)	(0.037)		(0.031)			(0.089)	(0.618)	(0.891)
Index of health risks	0.353	0.425	0.196	0.332	0.238			0.282	0.202	0.639
	[-0.066 - 0.773]	[-0.122 - 0.972]	[-0.047 - 0.438]		[0.077 - 0.399]			[0.008 - 0.556]	[-0.094 - 0.497]	[-0.527 - 1.804]
	(0.096)	(0.124)	(0.110)		(0.005)			(0.044)	(0.173)	(0.250)
Stringency of COVID-19 measures	0.030	0.047	0.027	0.314	0.018	0.131	0.004		0.029	-0.028
	[0.003 - 0.058]	[-0.004 - 0.098]	[-0.002 - 0.056]		[-0.005 - 0.042]		[-0.018 - 0.026]		[-0.035 - 0.092]	[-0.158 - 0.102]
	(0.031)	(0.072)	(0.068)		(0.119)		(0.701)		(0.359)	(0.636)
Decrease in mobility	-0.038	0.010	-0.027	-0.237	-0.062	-0.378	-0.080	-0.018	-0.028	-0.105
	[-0.092 - 0.016]	[-0.060 - 0.080]	[-0.081 - 0.027]		[-0.106 - - 0.018]		[-0.122 - - 0.038]	[-0.065 - 0.028]	[-0.090 - 0.033]	[-0.243 - 0.034]
	(0.162)	(0.782)	(0.325)		(0.007)		(0.000)	(0.429)	(0.350)	(0.123)
Data on confidence missing			-17.510 [-46.725 - 11.706] (0.232)							
Current health expenditure per capita, PPP (current international $)						0.441	0.001 [0.000 - 0.001] (0.002)			
number of doctors per thousand						0.236	0.207 [0.001 - 0.413] (0.049)			

BMI					0.056	-0.134 [-0.504 - 0.235] (0.467)		
Obesity[21]					0.544	0.266 [0.080 - 0.453] (0.006)		
High blood sugar[21]					0.099	0.050 [-0.038 - 0.138] (0.257)		
Impaired kidney function[21]					-0.314	-0.279 [-0.479 - -0.078] (0.008)		
Low physical activity[21]					0.254	0.142 [-0.276 - 0.560] (0.497)		
Government effectiveness, WGI					-0.274	-0.850 [-1.775 - 0.076] (0.071)		
FH_score					0.416	0.011 [-0.018 - 0.040] (0.441)		
Mean stringency of COVID-19 measures							0.054 [0.026 - 0.082] (0.000)	
Constant	21.205 [-26.506 - 68.917] (0.373)	6.811 [-74.025 - 87.647] (0.865)	15.298 [-29.366 - 59.963] (0.492)	-3.051 [-7.997 - 1.895] (0.221)	-0.574 [-11.783 - 10.635] (0.918)	28.054 [-15.568 - 71.677] (0.201)	22.128 [-11.105 - 55.360] (0.183)	-51.221 [-171.538 - 69.097] (0.365)
Observations	53	55	55	60	61	55	45	27
R-squared	0.776	0.850	0.789	0.671	0.807	0.798	0.664	0.787

Robust p-values in parentheses, 95% confidence intervals in brackets.
[#] The lasso models are estimated with cvlasso in Stata. Number of folds: 100.

Table B 6: Log total deaths attributed to COVID-19 and confidence in institutions: further control variables

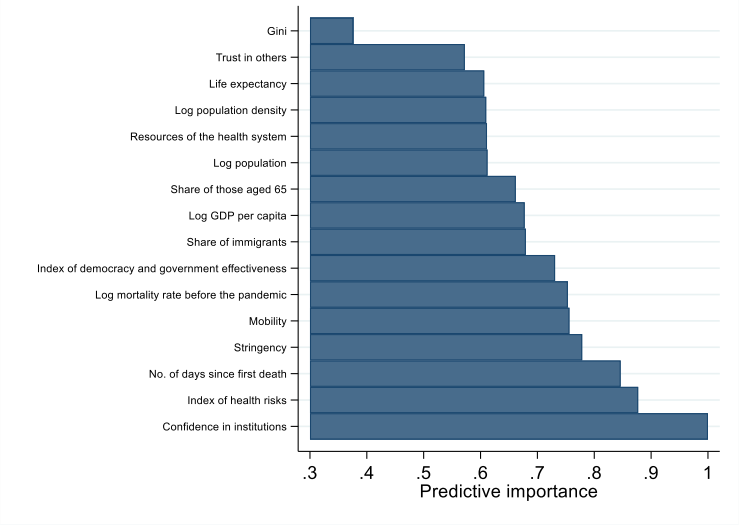
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Control variables added to Model 7 in Table 1							
	Corruption	Island	Years of education	Closure measures	Definition of deaths	No. of tests	Tightness	Breast cancer survival rate
Confidence in institutions, standardized	-0.876	-0.813	-0.729	-0.934	-0.816	-0.920	-0.518	-0.678
	[-1.214 - -0.537]	[-1.158 - -0.468]	[-1.069 - -0.389]	[-1.301 - -0.568]	[-1.140 - -0.491]	[-1.261 - -0.579]	[-2.022 - 0.986]	[-1.261 - -0.096]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.476)	(0.025)
Days since first death	0.015	0.015	0.011	0.013	0.015	0.015	0.017	-0.018
	[-0.001 - 0.031]	[-0.003 - 0.033]	[-0.008 - 0.031]	[-0.003 - 0.028]	[-0.004 - 0.033]	[0.002 - 0.027]	[-0.010 - 0.044]	[-0.087 - 0.050]
	(0.071)	(0.099)	(0.235)	(0.105)	(0.119)	(0.022)	(0.211)	(0.576)
Log population	-0.104	-0.047	-0.095	-0.177	-0.118	-0.101	0.069	0.027
	[-0.401 - 0.194]	[-0.368 - 0.275]	[-0.422 - 0.233]	[-0.459 - 0.106]	[-0.439 - 0.202]	[-0.450 - 0.249]	[-0.754 - 0.892]	[-0.531 - 0.586]
	(0.485)	(0.769)	(0.562)	(0.213)	(0.458)	(0.561)	(0.861)	(0.919)
Log population density	0.182	0.122	0.188	0.133	0.158	0.310	-0.031	0.469
	[-0.223 - 0.587]	[-0.247 - 0.491]	[-0.236 - 0.612]	[-0.218 - 0.484]	[-0.265 - 0.580]	[-0.064 - 0.684]	[-0.717 - 0.655]	[-0.068 - 1.007]
	(0.368)	(0.508)	(0.374)	(0.446)	(0.454)	(0.100)	(0.926)	(0.083)
Log GDP per capita	0.514	0.345	0.218	0.750	0.468	-0.275	0.333	-0.670
	[-0.811 - 1.839]	[-0.928 - 1.619]	[-1.194 - 1.630]	[-0.356 - 1.855]	[-0.931 - 1.867]	[-2.213 - 1.663]	[-1.880 - 2.546]	[-4.507 - 3.168]
	(0.437)	(0.586)	(0.756)	(0.177)	(0.501)	(0.774)	(0.754)	(0.717)
Gini	-0.005	-0.011	0.009	-0.018	-0.012	0.011	0.011	0.035
	[-0.054 - 0.043]	[-0.057 - 0.035]	[-0.044 - 0.062]	[-0.067 - 0.031]	[-0.060 - 0.036]	[-0.049 - 0.071]	[-0.097 - 0.120]	[-0.042 - 0.112]
	(0.819)	(0.638)	(0.733)	(0.458)	(0.616)	(0.712)	(0.826)	(0.355)
Index of democracy and government effectiveness	-0.026	0.302	0.608	0.065	0.273	0.369	0.944	0.320
	[-1.132 - 1.079]	[-0.617 - 1.221]	[-0.517 - 1.733]	[-0.688 - 0.817]	[-0.781 - 1.326]	[-0.558 - 1.297]	[-0.617 - 2.505]	[-1.000 - 1.640]
	(0.962)	(0.509)	(0.280)	(0.862)	(0.603)	(0.423)	(0.218)	(0.616)
Log mortality rate before the pandemic	-1.469	-1.400	-3.010	-1.781	-0.766	-2.419	-2.884	1.707
	[-4.665 - 1.727]	[-4.701 - 1.902]	[-6.278 - 0.258]	[-4.770 - 1.208]	[-4.921 - 3.388]	[-6.425 - 1.588]	[-10.185 - 4.417]	[-6.356 - 9.771]
	(0.358)	(0.396)	(0.070)	(0.235)	(0.710)	(0.227)	(0.415)	(0.661)
Share of those above age 65	0.043	0.054	0.146	0.129	-0.022	0.053	0.142	-0.162
	[-0.231 - 0.318]	[-0.223 - 0.330]	[-0.111 - 0.403]	[-0.159 - 0.416]	[-0.338 - 0.294]	[-0.216 - 0.322]	[-0.381 - 0.665]	[-0.886 - 0.563]
	(0.752)	(0.696)	(0.257)	(0.370)	(0.887)	(0.692)	(0.573)	(0.644)
Life expectancy	-0.170	-0.157	-0.265	-0.210	-0.130	-0.175	-0.153	0.059
	[-0.419 - 0.080]	[-0.400 - 0.086]	[-0.525 - -0.004]	[-0.447 - 0.028]	[-0.431 - 0.171]	[-0.421 - 0.072]	[-0.746 - 0.440]	[-0.738 - 0.857]
	(0.176)	(0.198)	(0.047)	(0.082)	(0.385)	(0.158)	(0.592)	(0.877)
Share of migrants	-0.047	-0.034	-0.039	-0.031	-0.052	-0.049	-0.127	-0.028

	[-0.118 - 0.023]	[-0.097 - 0.028]	[-0.112 - 0.033]	[-0.100 - 0.038]	[-0.132 - 0.029]	[-0.126 - 0.029]	[-0.275 - 0.021]	[-0.114 - 0.058]
	(0.184)	(0.276)	(0.277)	(0.367)	(0.201)	(0.209)	(0.087)	(0.503)
Trust in others	-0.025	-0.006	-0.035	0.037	-0.056	-0.140	0.161	0.270
	[-0.590 - 0.540]	[-0.494 - 0.482]	[-0.598 - 0.527]	[-0.477 - 0.551]	[-0.686 - 0.573]	[-0.646 - 0.365]	[-1.385 - 1.708]	[-0.706 - 1.246]
	(0.930)	(0.979)	(0.899)	(0.886)	(0.858)	(0.575)	(0.828)	(0.567)
Resources of the health system	0.665	0.674	0.715	0.517	0.725	0.824	0.492	0.542
	[-0.077 - 1.406]	[-0.081 - 1.430]	[-0.098 - 1.528]	[-0.107 - 1.140]	[-0.086 - 1.536]	[-0.102 - 1.749]	[-0.692 - 1.676]	[-0.513 - 1.596]
	(0.078)	(0.079)	(0.083)	(0.102)	(0.078)	(0.079)	(0.391)	(0.294)
Index of health risks	0.232	0.191	0.305	0.199	0.198	0.269	0.566	0.663
	[-0.056 - 0.520]	[-0.098 - 0.480]	[-0.010 - 0.621]	[-0.038 - 0.436]	[-0.121 - 0.517]	[-0.068 - 0.605]	[-0.259 - 1.390]	[-0.024 - 1.351]
	(0.111)	(0.189)	(0.057)	(0.097)	(0.217)	(0.113)	(0.165)	(0.058)
Stringency of COVID-19 measures	0.035	0.028	0.051	-0.025	0.029	0.027	0.102	-0.005
	[0.007 - 0.063]	[-0.001 - 0.056]	[0.020 - 0.081]	[-0.081 - 0.030]	[0.004 - 0.054]	[-0.000 - 0.054]	[-0.021 - 0.225]	[-0.096 - 0.085]
	(0.015)	(0.055)	(0.002)	(0.361)	(0.022)	(0.054)	(0.097)	(0.903)
Decrease in mobility	-0.028	-0.033	-0.018	-0.050	-0.030	-0.002	0.005	-0.084
	[-0.080 - 0.023]	[-0.088 - 0.021]	[-0.076 - 0.040]	[-0.100 - 0.000]	[-0.086 - 0.026]	[-0.055 - 0.050]	[-0.136 - 0.146]	[-0.197 - 0.029]
	(0.273)	(0.219)	(0.531)	(0.052)	(0.286)	(0.928)	(0.945)	(0.135)
TI lack of corruption score	0.022							
	[-0.034 - 0.078]							
	(0.434)							
Island		-1.129						
		[-2.903 - 0.645]						
		(0.205)						
Years of schooling			0.006					
			[-0.221 - 0.234]					
			(0.955)					
Closing measures, max				0.106				
				[-0.414 - 0.626]				
				(0.682)				
Closing measures, mean				0.342				
				[-0.158 - 0.842]				
				(0.174)				
Closing measures, sd				-0.335				
				[-0.874 - 0.204]				
				(0.216)				
Clinical diagnosis-based definition of deaths					0.285			
					[-0.615 - 1.185]			

					(0.525)			
Test-based definition of deaths					0.372			
					[-1.026 - 1.770]			
					(0.592)			
Clinical and test-based definition of deaths					-0.409			
					[-1.770 - 0.952]			
					(0.546)			
Log no. of tests per thousand people						0.436		
						[-0.029 - 0.901]		
						(0.065)		
Tightness of culture in following rules							0.318	
							[-3.762 - 4.398]	
							(0.871)	
Survival rate of breast cancer								0.163
								[0.041 - 0.285]
								(0.012)
Constant	17.966	18.968	41.061	25.209	12.082	33.315	23.065	-15.748
	[-25.819 - 61.751]	[-26.933 - 64.868]	[-7.522 - 89.645]	[-17.614 - 68.032]	[-45.443 - 69.607]	[-24.976 - 91.605]	[-75.771 - 121.901]	[-120.262 - 88.766]
	(0.411)	(0.408)	(0.095)	(0.240)	(0.672)	(0.252)	(0.628)	(0.754)
Observations	55	55	52	55	55	48	34	35
R-squared	0.772	0.783	0.790	0.835	0.777	0.805	0.795	0.805

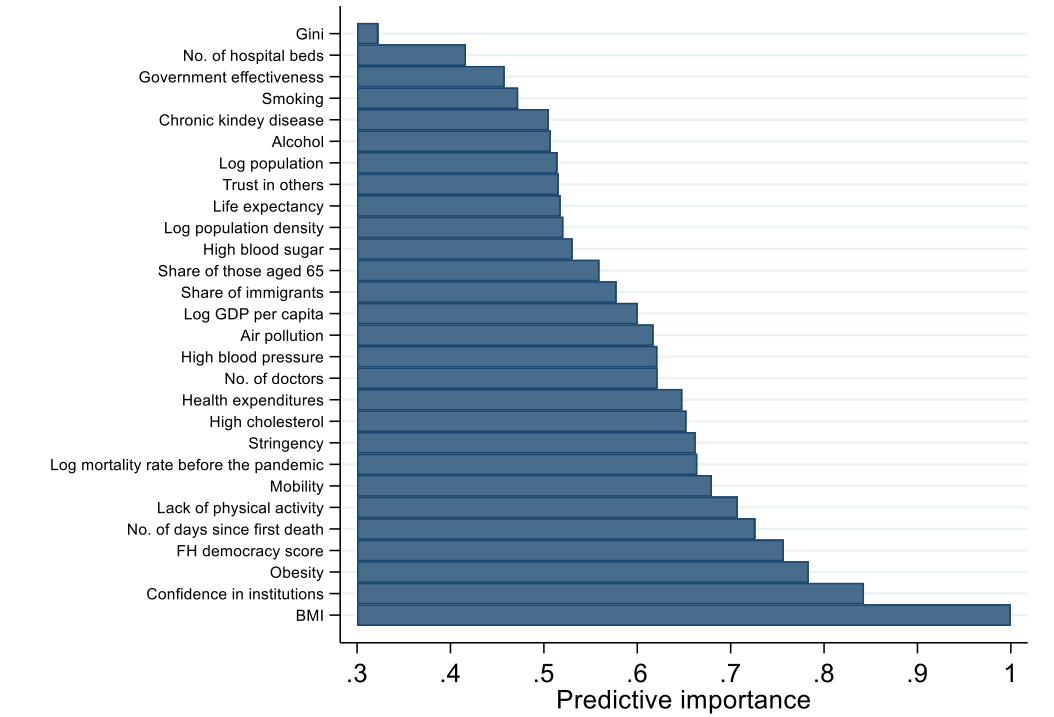
Robust p-values in parentheses, 95% confidence intervals in brackets.

Figure B 1: Random forest relative importance using the same explanatory variables as in Model 7 in Table 1



No. of trees: 10,000. The importance values are scaled proportional to the largest value in the set. Retrieved by the rforest plugin in Stata [31]. No. of countries: 55. Same control variables and sample as Model 7 in Table 1. Predictive importance is based on the Increase in Mean Squared Errors (MSE) measure, which captures the increase in MSE should predictors be replaced by their own randomly permuted values [25].

Figure B 2: Random forest relative importance using the items of PCA measures as explanatory variables



No. of trees: 10,000. The importance values are scaled proportional to the largest value in the set. Retrieved by the rforest plugin in Stata [31]. No. of countries: 55. Same control variables and sample as Model 7 in Table 1. Predictive importance is based on the Increase in Mean Squared Errors (MSE) measure, which captures the increase in MSE should predictors be replaced by their own randomly permuted values [25].

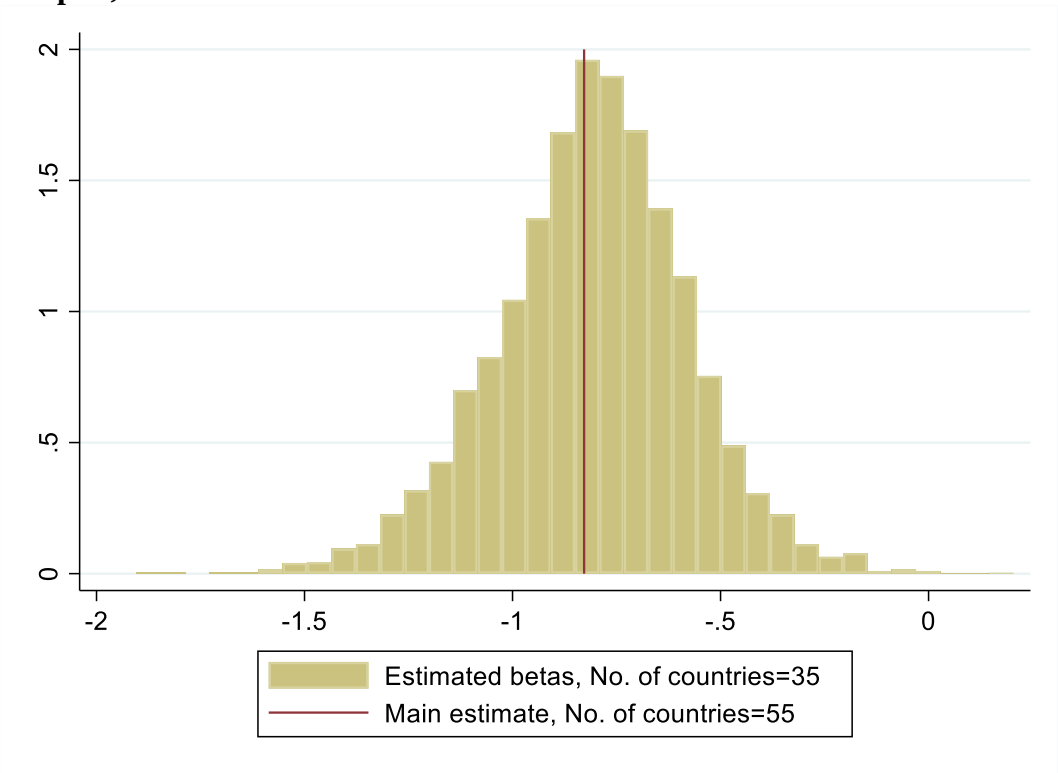
Table B 7: Log total deaths attributed to COVID-19 and confidence in institutions: alternative observation periods

	(1)	(2)	(3)	(4)	(5)	(6)
	Model 7 in Table 1 with log total deaths measured at the end of alternative observation periods					
	21 Oct 2020	21 Nov 2020	21 Dec 2020	21 Jan 2021	21 Feb 2021	21 March 2021 (Model 7 in Table 1)
Confidence in institutions, standardized	-0.788	-0.859	-0.839	-0.829	-0.818	-0.754
	[-1.136 - -0.440]	[-1.179 - -0.539]	[-1.165 - -0.513]	[-1.162 - -0.496]	[-1.157 - -0.479]	[-1.084 - -0.425]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Days since first death	0.016	0.014	0.014	0.014	0.014	-0.018
	[-0.001 - 0.033]	[-0.002 - 0.030]	[-0.002 - 0.030]	[-0.003 - 0.030]	[-0.003 - 0.031]	[-0.043 - 0.008]
	(0.063)	(0.080)	(0.080)	(0.094)	(0.106)	(0.165)
Log population	0.238	0.077	-0.039	-0.109	-0.121	0.060
	[-0.090 - 0.567]	[-0.239 - 0.393]	[-0.357 - 0.279]	[-0.419 - 0.200]	[-0.428 - 0.185]	[-0.257 - 0.376]
	(0.150)	(0.626)	(0.805)	(0.480)	(0.427)	(0.704)
Log population density	-0.223	-0.030	0.086	0.148	0.172	0.229
	[-0.678 - 0.232]	[-0.453 - 0.393]	[-0.327 - 0.499]	[-0.254 - 0.550]	[-0.220 - 0.564]	[-0.146 - 0.604]
	(0.327)	(0.887)	(0.677)	(0.462)	(0.380)	(0.224)
Log GDP per capita	-0.256	-0.003	0.123	0.339	0.470	0.467
	[-1.740 - 1.229]	[-1.337 - 1.332]	[-1.224 - 1.471]	[-0.991 - 1.669]	[-0.829 - 1.770]	[-0.782 - 1.716]
	(0.729)	(0.997)	(0.854)	(0.609)	(0.468)	(0.454)
Gini	-0.022	-0.024	-0.015	-0.008	-0.005	0.010
	[-0.087 - 0.044]	[-0.076 - 0.029]	[-0.065 - 0.036]	[-0.056 - 0.040]	[-0.052 - 0.041]	[-0.042 - 0.061]
	(0.506)	(0.369)	(0.563)	(0.727)	(0.811)	(0.702)
Index of democracy and government effectiveness	-0.082	0.042	0.122	0.181	0.211	0.227
	[-1.002 - 0.838]	[-0.818 - 0.903]	[-0.760 - 1.004]	[-0.716 - 1.078]	[-0.691 - 1.113]	[-0.655 - 1.109]
	(0.858)	(0.921)	(0.781)	(0.685)	(0.639)	(0.605)
Log mortality rate before the pandemic	-1.398	-1.539	-1.462	-1.491	-1.462	-1.211
	[-4.355 - 1.560]	[-4.717 - 1.638]	[-4.602 - 1.678]	[-4.655 - 1.673]	[-4.668 - 1.745]	[-4.176 - 1.753]
	(0.345)	(0.333)	(0.352)	(0.346)	(0.362)	(0.413)
Share of those above age 65	-0.018	-0.014	0.000	0.022	0.034	0.077
	[-0.300 - 0.264]	[-0.297 - 0.268]	[-0.274 - 0.275]	[-0.249 - 0.292]	[-0.239 - 0.306]	[-0.169 - 0.323]
	(0.899)	(0.918)	(0.998)	(0.872)	(0.804)	(0.531)
Life expectancy	0.020	-0.030	-0.062	-0.132	-0.163	-0.145
	[-0.244 - 0.283]	[-0.287 - 0.227]	[-0.309 - 0.184]	[-0.373 - 0.109]	[-0.407 - 0.080]	[-0.373 - 0.084]
	(0.879)	(0.814)	(0.611)	(0.274)	(0.183)	(0.207)
Share of migrants	-0.035	-0.044	-0.041	-0.040	-0.041	-0.030
	[-0.120 - 0.049]	[-0.121 - 0.034]	[-0.116 - 0.034]	[-0.111 - 0.031]	[-0.110 - 0.029]	[-0.096 - 0.036]
	(0.400)	(0.261)	(0.275)	(0.258)	(0.243)	(0.358)
Trust in others	0.427	0.268	0.129	0.098	0.068	0.148
	[-0.227 - 1.081]	[-0.318 - 0.853]	[-0.425 - 0.683]	[-0.435 - 0.632]	[-0.449 - 0.584]	[-0.357 - 0.653]
	(0.194)	(0.361)	(0.640)	(0.711)	(0.792)	(0.557)

Resources of the health system	0.641	0.722	0.750	0.759	0.732	0.558
	[-0.146 - 1.427]	[-0.007 - 1.450]	[0.014 - 1.486]	[0.018 - 1.500]	[-0.010 - 1.473]	[-0.190 - 1.305]
	(0.107)	(0.052)	(0.046)	(0.045)	(0.053)	(0.139)
Index of health risks	0.123	0.200	0.245	0.212	0.198	0.185
	[-0.148 - 0.394]	[-0.053 - 0.453]	[-0.017 - 0.506]	[-0.054 - 0.477]	[-0.070 - 0.467]	[-0.071 - 0.441]
	(0.365)	(0.118)	(0.066)	(0.114)	(0.143)	(0.153)
Stringency of COVID-19 measures	0.016	0.027	0.033	0.033	0.032	0.032
	[-0.011 - 0.044]	[0.000 - 0.053]	[0.007 - 0.059]	[0.008 - 0.059]	[0.006 - 0.058]	[0.007 - 0.057]
	(0.241)	(0.047)	(0.013)	(0.013)	(0.018)	(0.014)
Decrease in mobility	-0.054	-0.044	-0.033	-0.029	-0.032	-0.037
	[-0.109 - -0.000]	[-0.096 - 0.008]	[-0.084 - 0.018]	[-0.080 - 0.021]	[-0.083 - 0.019]	[-0.082 - 0.008]
	(0.050)	(0.093)	(0.198)	(0.252)	(0.214)	(0.107)
Constant	8.010	13.055	14.531	18.860	19.816	23.488
	[-37.101 - 53.121]	[-32.818 - 58.927]	[-30.159 - 59.221]	[-25.207 - 62.926]	[-24.785 - 64.417]	[-18.855 - 65.832]
	(0.721)	(0.568)	(0.514)	(0.392)	(0.374)	(0.268)
Observations	55	55	55	55	55	54
R-squared	0.632	0.709	0.745	0.758	0.765	0.715

Robust p-values in parentheses, 95% confidence intervals in brackets.

Figure B 3: Log total deaths attributed to COVID-19 and confidence in institutions: estimated coefficients of confidence in public institutions using 35-country random samples, Model 7



Number of random samples: 5,000.

Table B 8: Relationship between confidence in public institutions and other health and social outcomes

	(1) Outcome: Five-year survival rate of breast cancer	(2) Outcome: Prison population per 100,000	(3) Outcome: Decrease in mobility
Confidence in institutions, standardized	0.380	-13.780	1.752
	[-1.994 - 2.754]	[-42.601 - 15.042]	[-1.188 - 4.692]
	(0.744)	(0.342)	(0.236)
Days since first death	-0.033	-0.438	-0.086
	[-0.280 - 0.214]	[-1.239 - 0.363]	[-0.195 - 0.024]
	(0.786)	(0.278)	(0.121)
Log population	0.997	19.052	1.660
	[-0.929 - 2.923]	[-6.962 - 45.066]	[-0.172 - 3.491]
	(0.296)	(0.148)	(0.074)
Log population density	-0.686	-11.247	-1.008
	[-2.218 - 0.846]	[-26.478 - 3.984]	[-2.923 - 0.907]
	(0.365)	(0.144)	(0.294)
Log GDP per capita	-2.280	66.567	1.607
	[-17.122 - 12.563]	[-10.820 - 143.954]	[-4.469 - 7.683]
	(0.754)	(0.090)	(0.596)
Gini	-0.133	4.992	-0.161
	[-0.583 - 0.316]	[1.132 - 8.852]	[-0.495 - 0.173]
	(0.546)	(0.012)	(0.337)
Index of democracy and government effectiveness	1.352	-31.393	-3.406
	[-3.266 - 5.970]	[-92.529 - 29.743]	[-6.558 - -0.254]
	(0.551)	(0.307)	(0.035)
Log mortality rate before the pandemic	16.023	-99.472	-15.579
	[-12.006 - 44.053]	[-268.580 - 69.636]	[-33.803 - 2.644]

	(0.250)	(0.243)	(0.092)
Share of those above age 65	-1.315	4.509	2.252
	[-3.419 - 0.790]	[-9.547 - 18.565]	[0.731 - 3.773]
	(0.210)	(0.522)	(0.005)
Life expectancy	1.919	-8.881	-1.437
	[-0.397 - 4.235]	[-23.007 - 5.245]	[-2.926 - 0.052]
	(0.100)	(0.213)	(0.058)
Share of migrants	0.088	0.816	0.226
	[-0.225 - 0.401]	[-2.788 - 4.420]	[-0.113 - 0.565]
	(0.566)	(0.651)	(0.186)
Trust in others	-1.384	9.977	1.260
	[-4.465 - 1.698]	[-24.292 - 44.245]	[-2.331 - 4.852]
	(0.363)	(0.561)	(0.482)
Resources of the health system	1.570	3.048	-1.814
	[-2.280 - 5.421]	[-51.203 - 57.299]	[-4.156 - 0.529]
	(0.408)	(0.911)	(0.126)
Index of health risks	-1.324	17.276	0.883
	[-3.564 - 0.916]	[-1.117 - 35.669]	[-0.662 - 2.429]
	(0.234)	(0.065)	(0.255)
Constant	-172.241	737.127	197.764
	[-521.698 - 177.215]	[-1,661.798 - 3,136.052]	[-51.133 - 446.660]
	(0.319)	(0.540)	(0.116)
Observations	39	65	56
R-squared	0.634	0.438	0.499

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 9: Log total deaths attributed to COVID-19 and confidence in institutions: sub-measures of stringency

	(1)	(2)	(3)	(4)	(5)	(6)
	Outcome: log number of total deaths per million people					
	Model 7 in Table 1, controlling for …					
	Restrictions on personal gatherings			Comprehensive contact tracing		
Confidence in institutions, standardized	-0.702	-0.599	-0.852	-0.932	-0.629	-0.622
	[-1.032 - -0.373]	[-1.804 - 0.605]	[-1.550 - -0.155]	[-1.316 - -0.547]	[-1.184 - -0.075]	[-1.097 - -0.148]
	(0.000)	(0.320)	(0.018)	(0.000)	(0.027)	(0.012)
Restrictions on personal gatherings (continuous)	3.255	3.301				
	[1.310 - 5.200]	[1.306 - 5.296]				
	(0.002)	(0.002)				
Interaction of restrictions on personal gatherings (continuous) and confidence in public institutions		-0.170				
		[-1.907 - 1.567]				
		(0.844)				
Restrictions on personal gatherings, binary = 1			0.928			
			[0.040 - 1.815]			
			(0.041)			
Interaction of restrictions on personal gatherings (binary) and confidence in public institutions			0.048			
Interaction of restrictions on personal gatherings (binary) and confidence in public institutions			[-0.814 - 0.911]			
			(0.910)			
Comprehensive contact tracing				-1.168	-1.283	
				[-2.257 - -0.080]	[-2.348 - -0.218]	
				(0.036)	(0.020)	
Interaction of comprehensive contact tracing (continuous) and confidence in public institutions					-0.663	
					[-1.364 - 0.039]	
					(0.064)	
Comprehensive contact tracing, binary = 1						-0.735
						[-1.380 - -0.090]
						(0.027)
Interaction of comprehensive contact tracing (binary) and confidence in public institutions						-0.537

						[-1.034 - -0.041]
						(0.035)
Days since first death	0.019	0.019	0.015	0.012	0.010	0.010
	[0.003 - 0.035]	[0.003 - 0.034]	[-0.004 - 0.033]	[-0.004 - 0.027]	[-0.004 - 0.024]	[-0.004 - 0.024]
	(0.020)	(0.020)	(0.116)	(0.146)	(0.172)	(0.144)
Log population	-0.179	-0.175	-0.128	0.011	-0.007	-0.033
	[-0.430 - 0.071]	[-0.435 - 0.084]	[-0.409 - 0.154]	[-0.274 - 0.296]	[-0.283 - 0.269]	[-0.290 - 0.224]
	(0.155)	(0.179)	(0.365)	(0.937)	(0.961)	(0.794)
Log population density	0.214	0.221	0.179	0.200	0.261	0.273
	[-0.121 - 0.548]	[-0.131 - 0.573]	[-0.183 - 0.541]	[-0.166 - 0.566]	[-0.099 - 0.622]	[-0.099 - 0.644]
	(0.204)	(0.211)	(0.323)	(0.275)	(0.150)	(0.146)
Log GDP per capita	0.785	0.780	0.710	0.520	0.774	0.681
	[-0.243 - 1.813]	[-0.253 - 1.813]	[-0.466 - 1.886]	[-0.728 - 1.767]	[-0.490 - 2.037]	[-0.563 - 1.924]
	(0.130)	(0.135)	(0.229)	(0.404)	(0.222)	(0.275)
Gini	-0.000	-0.000	-0.014	-0.012	0.002	0.009
	[-0.041 - 0.040]	[-0.041 - 0.041]	[-0.059 - 0.032]	[-0.060 - 0.037]	[-0.047 - 0.050]	[-0.033 - 0.052]
	(0.981)	(0.997)	(0.544)	(0.627)	(0.942)	(0.663)
Index of democracy and government effectiveness	0.023	0.038	0.246	0.397	0.279	0.279
	[-0.670 - 0.716]	[-0.643 - 0.718]	[-0.498 - 0.991]	[-0.466 - 1.259]	[-0.587 - 1.144]	[-0.512 - 1.069]
	(0.947)	(0.911)	(0.507)	(0.358)	(0.518)	(0.480)
Log mortality rate before the pandemic	-2.212	-2.334	-1.285	0.947	0.765	0.516
	[-6.010 - 1.587]	[-6.137 - 1.469]	[-5.940 - 3.369]	[-3.131 - 5.024]	[-3.140 - 4.670]	[-3.432 - 4.463]
	(0.246)	(0.222)	(0.579)	(0.641)	(0.694)	(0.793)
Share of those above age 65	0.168	0.176	0.092	-0.141	-0.127	-0.094
	[-0.172 - 0.507]	[-0.174 - 0.527]	[-0.279 - 0.463]	[-0.474 - 0.193]	[-0.445 - 0.192]	[-0.407 - 0.218]
	(0.324)	(0.314)	(0.618)	(0.399)	(0.426)	(0.545)
Life expectancy	-0.239	-0.248	-0.215	-0.080	-0.101	-0.111
	[-0.520 - 0.043]	[-0.536 - 0.040]	[-0.512 - 0.083]	[-0.335 - 0.175]	[-0.356 - 0.155]	[-0.371 - 0.148]
	(0.094)	(0.089)	(0.152)	(0.528)	(0.429)	(0.392)
Share of migrants	-0.055	-0.053	-0.045	-0.026	-0.019	-0.026
	[-0.120 - 0.009]	[-0.125 - 0.018]	[-0.118 - 0.027]	[-0.090 - 0.039]	[-0.082 - 0.044]	[-0.091 - 0.040]
	(0.090)	(0.136)	(0.214)	(0.429)	(0.542)	(0.427)
Trust in others	-0.062	-0.051	-0.045	0.074	0.138	0.151
	[-0.467 - 0.343]	[-0.475 - 0.373]	[-0.515 - 0.424]	[-0.416 - 0.563]	[-0.378 - 0.655]	[-0.377 - 0.679]
	(0.760)	(0.808)	(0.846)	(0.762)	(0.591)	(0.565)
Resources of the health system	0.469	0.458	0.399	0.668	0.620	0.600
	[-0.125 - 1.064]	[-0.184 - 1.099]	[-0.236 - 1.034]	[-0.007 - 1.343]	[-0.059 - 1.299]	[-0.040 - 1.240]
	(0.118)	(0.157)	(0.211)	(0.052)	(0.072)	(0.065)
Index of health risks	0.308	0.320	0.283	0.222	0.244	0.219
	[0.028 - 0.587]	[0.021 - 0.618]	[-0.063 - 0.629]	[-0.101 - 0.544]	[-0.066 - 0.554]	[-0.074 - 0.512]
	(0.032)	(0.037)	(0.107)	(0.172)	(0.120)	(0.139)
Decrease in mobility	-0.033	-0.032	-0.052	-0.069	-0.076	-0.065

	[-0.085 - 0.018]	[-0.084 - 0.020]	[-0.108 - 0.004]	[-0.127 - -0.011]	[-0.133 - -0.020]	[-0.117 - -0.013]
	(0.194)	(0.216)	(0.069)	(0.020)	(0.010)	(0.016)
Constant	26.983	28.749	21.017	-5.258	-4.586	-1.012
	[-23.569 - 77.535]	[-21.168 - 78.665]	[-37.907 - 79.941]	[-56.116 - 45.601]	[-54.316 - 45.145]	[-51.077 - 49.052]
	(0.287)	(0.251)	(0.475)	(0.835)	(0.853)	(0.968)
Observations	55	55	56	55	55	56
R-squared	0.813	0.813	0.768	0.770	0.781	0.784

Robust p-values in parentheses, 95% confidence intervals in brackets.

Table B 10: Log total deaths attributed to COVID-19 and confidence in institutions: quantile regressions (Model 7 in Table 1)

	(1) 20st percentile	(2) 40st percentile	(3) 60st percentile	(4) 80st percentile
Lack of confidence in institutions, standardized	0.935	0.791	0.749	0.726
	[-0.320 - 2.190]	[0.198 - 1.384]	[0.433 - 1.065]	[0.198 - 1.253]
	(0.140)	(0.010)	(0.000)	(0.008)
Days since first death	0.007	0.014	0.023	0.004
	[-0.153 - 0.167]	[-0.009 - 0.037]	[-0.006 - 0.052]	[-0.025 - 0.032]
	(0.933)	(0.215)	(0.122)	(0.784)
Log population	-0.255	-0.295	-0.219	-0.111
	[-1.346 - 0.836]	[-0.672 - 0.083]	[-0.701 - 0.263]	[-0.398 - 0.176]
	(0.639)	(0.123)	(0.363)	(0.438)
Log population density	0.215	0.226	0.248	-0.062
	[-0.695 - 1.125]	[-0.186 - 0.638]	[-0.248 - 0.745]	[-0.484 - 0.360]
	(0.635)	(0.274)	(0.317)	(0.768)
Log GDP per capita	1.162	1.041	0.957	0.560
	[-0.983 - 3.308]	[-0.139 - 2.220]	[-1.561 - 3.476]	[-1.832 - 2.952]
	(0.280)	(0.082)	(0.446)	(0.638)
Gini	-0.015	-0.016	0.010	0.017
	[-0.160 - 0.129]	[-0.071 - 0.039]	[-0.066 - 0.085]	[-0.087 - 0.120]
	(0.830)	(0.565)	(0.797)	(0.746)
Index of democracy and government effectiveness	-0.158	0.066	-0.022	0.119
	[-1.782 - 1.465]	[-0.842 - 0.974]	[-0.900 - 0.855]	[-1.157 - 1.395]
	(0.845)	(0.884)	(0.959)	(0.851)
Log mortality rate before the pandemic	-3.224	-2.004	0.080	0.471
	[-8.841 - 2.392]	[-6.223 - 2.215]	[-3.735 - 3.894]	[-8.803 - 9.744]
	(0.252)	(0.342)	(0.967)	(0.919)
Share of those above age 65	0.204	0.078	-0.087	-0.044
	[-0.367 - 0.776]	[-0.261 - 0.416]	[-0.329 - 0.156]	[-0.719 - 0.631]
	(0.474)	(0.646)	(0.474)	(0.895)
Life expectancy	-0.382	-0.278	-0.038	0.077
	[-0.712 - -0.051]	[-0.608 - 0.052]	[-0.335 - 0.259]	[-0.350 - 0.505]
	(0.025)	(0.096)	(0.796)	(0.716)
Share of migrants	-0.041	-0.021	-0.014	-0.011
	[-0.187 - 0.104]	[-0.094 - 0.052]	[-0.091 - 0.063]	[-0.074 - 0.052]
	(0.570)	(0.569)	(0.711)	(0.728)
Trust in others	-0.153	-0.231	0.050	0.247
	[-1.365 - 1.059]	[-0.775 - 0.313]	[-0.503 - 0.603]	[-0.526 - 1.019]
	(0.800)	(0.395)	(0.856)	(0.522)
Resources of the health system	0.905	0.805	0.273	-0.070
	[0.132 - 1.677]	[0.054 - 1.556]	[-0.420 - 0.965]	[-0.655 - 0.515]
	(0.023)	(0.036)	(0.430)	(0.809)
Index of health risks	0.108	0.091	0.131	0.031
	[-0.728 - 0.944]	[-0.444 - 0.626]	[-0.418 - 0.679]	[-0.380 - 0.442]
	(0.795)	(0.733)	(0.632)	(0.880)
Stringency of COVID-19 measures	0.046	0.027	0.020	0.011
	[-0.002 - 0.094]	[-0.011 - 0.065]	[-0.003 - 0.044]	[-0.064 - 0.086]
	(0.061)	(0.156)	(0.091)	(0.766)
Decrease in mobility	-0.046	-0.044	-0.012	-0.005
	[-0.165 - 0.074]	[-0.100 - 0.012]	[-0.061 - 0.037]	[-0.102 - 0.091]
	(0.443)	(0.121)	(0.623)	(0.909)
Constant	46.515	30.174	-7.526	-9.195
	[-32.070 - 125.100]	[-16.250 - 76.598]	[-59.119 - 44.068]	[-117.099 - 98.709]
	(0.238)	(0.196)	(0.769)	(0.864)
Observations	55	55	55	55

Robust p-values in parentheses, 95% confidence intervals in brackets.