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COVID-19 and the state

Rachel M. Gisselquist[1] and Andrea Vaccaro[2]

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Abstract: We expect effective state institutions to matter in a country's ability to respond to crises. Yet notably in the first year of the COVID-19 pandemic, what has stood out in simple global snapshots is that wealthier countries with stronger institutions have had the highest numbers of cases and fatalities on average, while many poorer countries with weaker institutions have been praised for more effective pandemic responses. What explains this seeming puzzle? We re-consider these relationships in the cross-country data, drawing on measures of the state, COVID's health impact, and pandemic policy response. In brief, our analysis suggests that, when appropriate additional factors are taken into account, the expected relationship between state effectiveness and pandemic health outcomes does in fact pertain. Our findings also offer insight into how different dimensions of the state influence policy and outcomes, as well as how countries compare in terms of institutional effectiveness.

Key words: COVID-19, pandemic, state, state capacity, state effectiveness, state legitimacy, state authority

JEL classification: I15, I18, H12, O57

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[1] UNU-WIDER, corresponding author: rachel@wider.unu.edu; [2] Department of Social Sciences and Economics, Sapienza University of Rome

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Information and requests: publications@wider.unu.edu

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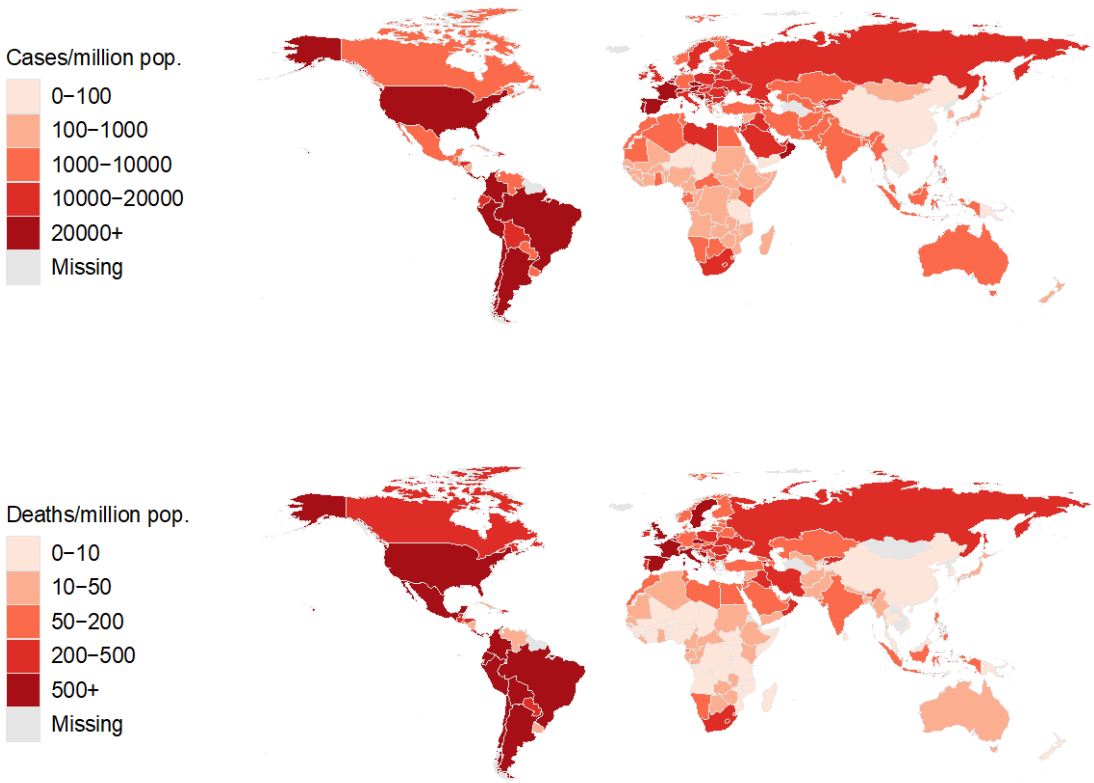
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

At the time of writing, COVID-19 has claimed over 2 million lives and infected over 100 million people.[1] At a relatively early stage of the pandemic, it was clear that no state was completely prepared to deal with a shock of such magnitude. Notably, it was wealthier countries that suffered the highest rates of infection and deaths on average in 2020, while many poorer countries were praised for their more effective pandemic response. Indeed, countries widely considered to have the best 'global health security' reported the highest numbers of COVID-related fatalities (Milanovic 2021). The maps in Figure 1 illustrate this global variation.

Figure 1: COVID-19 direct health impact in the world



Note: as of 15 November 2020.

Source: authors' construction.

A pandemic is precisely the sort of crisis in which we expect effective state institutions—including robust state health systems—to matter. According to Francis Fukuyama (2020), one of the main factors behind successful pandemic response has been 'a competent state apparatus' or, more simply, state effectiveness. In a similar vein, Ang (2020) highlights that the capacity of the state to implement solutions has driven successful pandemic responses. Yet, in the first year of the COVID-19 pandemic, what stands out in simple global snapshots is that it was in wealthier

[1] Source: https://coronavirus.jhu.edu/map.html (accessed 28 January 2021).

countries with stronger institutions that the numbers of cases and fatalities were highest, on average. What explains this seeming puzzle?

In this paper, we consider these relationships in cross-country data, drawing on a diverse set of measures of the state, figures on COVID's health impact, and key measures of pandemic policy response. Our analysis suggests in brief that while 'more effective' states had poorer health outcomes on average than 'less effective' states, various factors which similarly vary, such as the age structure of the population, help to explain this puzzling relationship. Indeed, when such factors are controlled for, our analysis points to an (expected) inverse relationship between state effectiveness and pandemic health outcomes on average (i.e. higher state effectiveness, lower health impact).

Digging deeper into core dimensions of the state, we find notably the strongest relationships between 'state capacity' and COVID-19 cases, deaths, and lethality, as well as between measures of 'state authority' and lethality. By contrast, our analysis does not find evidence for a clear relationship between measures of 'state legitimacy' and health outcomes. In our view, this is not surprising because the expected linkages between state legitimacy and health outcomes are less direct.

We further explore relationships between measures of the state and selected pandemic response policies, a key channel through which the state may influence pandemic outcomes. Interestingly, we observe no clear relationship between measures of state capacity and state authority with either of our core policy indicators (i.e. the stringency of containment and health policies, and the generosity of economic support policies). However, greater state legitimacy is associated both with less severe health and containment policy measures, and with more generous economic support policies. We consider some explanations for these results and point to key areas for further research.

Clearly, care should be taken in interpreting these results given significant data constraints and the fact that the pandemic remains ongoing, with 'outcomes' continuing to evolve over time. Nevertheless, our analysis provides a useful first look into these relationships, with emphasis on 'outcomes' in the pandemic's first calendar year, which can be built upon in subsequent work.

This paper contributes to a fast-growing body of research on COVID-19. A key finding of this work is that the pandemic has both reflected and exacerbated existing inequalities (see Sen 2020). Our analysis, combined with findings from other research, suggests that this is also true in terms of cross-country inequalities in state effectiveness. Not only have countries with less effective states—all else being equal—been more affected by COVID-19, but also COVID-19 has increased demands on states and on less effective states in particular: recent work suggests that the pandemic will approximately double the expected number of people suffering from hunger by the end of 2021 (Bleich and Fleischhacker 2020), and that even if developing countries have enacted a number of social protection measures to tackle the crisis (Gentilini et al. 2020), poverty will increase dramatically in these countries (Sumner et al. 2020). Research points further to a worrying impact on democracy and inequality (Lührmann and Rooney 2020), trust in society (Brück et al. 2020), and violent conflict (Polo 2020).

In addition, this paper speaks to the large body of literature on the state, long a core area of inquiry in political science. In particular, it offers new global consideration of how state effectiveness relates to crisis response.

The paper proceeds as follows. Section 2 reviews the literature on the state and its role in responding to crises and outlines our expectations. Section 3 discusses our research strategy and

Section 4 describes the data and operationalization. We present our analysis and discuss our findings in Section 5 and, in Section 6, we reflect on how our results might inform future research, in particular the selection of country case studies.

2 The state and its role in responding to crises

Following Weber, states are understood here as 'compulsory associations claiming control over territories and the people within them' (Skocpol 1985: 7). A state is more than the government; '[i]t is the continuous administrative, legal, bureaucratic and coercive systems that attempt not only to structure relations *between* civil society and public authority in a polity but also to structure many crucial relationships *within* civil society' (Stepan 1978: xii). Mann (1984) highlights two dimensions of state power in this sense: first the 'despotic' power of state elites over civil society, and second the 'infrastructural' power of the state 'to penetrate and centrally coordinate the activities of civil society through its own infrastructure' (p. 114). As Skocpol (1985) asserts, states are not simply reflective of civil societies, but also autonomous actors to varying degrees; moreover, they can be compared in their capacity to realize their goals.

In more recent literature, especially work that makes cross-country comparisons of states, three core dimensions of the state are often distinguished: authority, capacity, and legitimacy (Bratton and Chang 2006; Carbone and Memoli 2015; Carment and Yiagadeesen 2019; Grävingholt et al. 2015; Tikuisis et al. 2015; Ziaja et al. 2019). As Ziaja et al. (2019) explain, *authority* refers to the ability of the state to provide order and security within its territorial boundaries, *capacity* to its ability to provide basic public services, and *legitimacy* to its ability to acquire the consent of its population to govern. In this sense, capacity and to a lesser extent authority are closely related to what is sometimes called state effectiveness.

The literature suggests that more effective states support various positive socioeconomic outcomes, including economic growth (Dincecco and Katz 2016; Evans and Rauch 1999), economic performance (Hanson 2014), better provision of public goods (Asadullah et al. 2020; D'Arcy and Nistotskaya 2017), and better public health outcomes (Cingolani et al. 2015; Hanson 2015; Holmberg and Rothstein 2011). A well-functioning state apparatus is also expected to play a key role in mitigating the adverse effects of exogenous shocks such as natural disasters (Kahn 2005; Keefer et al. 2011; Persson and Povitkina 2017).

Overall, then, we expect measures of the state—and especially measures of state capacity—to be associated with 'better' COVID-19 outcomes and responses. We expect 'high-capacity' states to be better prepared to respond to crises than 'low-capacity' states, for instance by having adequate pandemic response plans and preventive infrastructure. In well-functioning administrative apparatuses, which are essential to the provision of public services (Bäck and Hadenius 2008), public officials are chosen according to their merit and are likely to be more competent and thus to make better decisions in response to crises such as a pandemic. Corrupt public officials in the health sector, by contrast, have been linked to more deaths and illnesses (Holmberg and Rothstein 2011) and, unsurprisingly, corruption may undermine the effectiveness of national COVID-19 responses (UNDP 2020a).

We expect state authority also to be related to better pandemic outcomes, as states with higher authority on average should be more effective than those with low authority at enforcing COVID-related restrictions such as quarantine and stay-at-home requirements. Coercion is the most basic instrument of power (Lindvall and Teorell 2016) and without an ability to punish free-riders, the state cannot credibly enforce its policies (D'Arcy and Nistotskaya 2017).

Our expectations with respect to the relationship between state legitimacy and pandemic outcomes are less clear. State legitimacy would seem to impact pandemic outcomes primarily through its influence on the state's ability to enforce rules and provide services (i.e. via state authority and capacity): states with high legitimacy may rely more on voluntary compliance of the population with the rules (Levi 1988) than on assertive enforcement. Individuals in states perceived as legitimate are also likely to have higher social trust (Newton and Norris 2000), which might facilitate voluntary compliance with rules and support for public activities.

In short, the literature on the state suggests that there should be a positive relationship between state effectiveness and pandemic outcomes across countries, all else being equal. Results from the fast-growing body of research on COVID-19, though mixed, offer some empirical support for these expectations. Emerging findings suggest that higher state effectiveness is related to a reduction in COVID-19 mortality (Liang et al. 2020; Serikbayeva et al. 2020), but effective states have also been slower than dysfunctional states to close schools (Cronert 2020) and implement other containment policies (Sebhatu et al. 2020), even if they have been more successful in reducing geographic mobility (Frey et al. 2020). According to Ferraresi et al. (2020), countries with high stability and absence of violence adopted more stringent containment measures, at least at the very beginning of the pandemic, and Enriquez et al. (2020) argue that low state capacity has played a key role in Latin America's poor pandemic response. In general, as case studies on Hong Kong (Hartley and Jarvis 2020), Italy (Capano 2020), and Singapore (Woo 2020) have highlighted, some aspects of state effectiveness might be more closely related to COVID-19 outcomes than others.

In our analysis, we build directly upon this work in several ways. First, we draw upon frameworks and empirical findings to inform our models, including in the selection of control variables. Second, we extend from this work to drill deeper into the nuances of the state, using a broader variety of measures. Adopting this more fine-grained approach to distinguish among different dimensions of the state may offer new leverage on why and how policies and outcomes relating to the COVID-19 pandemic have differed across countries. For instance, why did an effective state like Taiwan not implement strict stay-at-home restrictions or lockdowns at all, yet manage to keep numbers of cases and mortality low, while New Zealand managed to curb the contagion with policy of strict lockdowns (Summers et al. 2020)?

3 Research strategy

Conducting research on an ongoing event presents unique challenges. One key challenge, as the pandemic continues and proceeds through second and third waves, is that our analysis of health outcomes does not reflect 'final' pandemic outcomes, but rather 'intermediate' outcomes. Our current analysis reflects cumulative cases, deaths, and lethality as of 15 November 2020. Significant shifts have already happened since. In particular, since December 2020, we have seen the mass roll-out of vaccinations in some (mainly high-income) countries. That said, November 2020 seems to us a useful point at which to consider variation across countries before the vaccination era. At this point, national governments had some eight months after a global pandemic was declared to respond, and they did so in diverse ways and with diverse capacity.

Another key challenge relates to data. For instance, we focus in this analysis on COVID-19's impact in terms of cases and deaths, but ideally we would consider also broader socioeconomic outcomes. It is undeniable that 'the COVID-19 pandemic is far more than a health crisis' (UNDP 2020b: 3) and that due to the crisis the world is facing a 'steep and unprecedented decline in human development' (UNDP 2020c: 3). Estimates suggest more than 100 million people have already lost their employment (ILO 2021) and that more than half a billion people could be driven into poverty in the near future (Sumner et al. 2020). Nevertheless, at the time of writing, country-level estimates and short-term projections of these outcomes, especially for developing countries, are insufficient to include in our analysis. Long-term country-level forecasts seem at best unreliable given that the socioeconomic consequences of the pandemic are conditional on the future spread of the virus, its direct impact on public and individual health, and government reactions to the crisis. Health outcomes and government responses, in particular, are among the most direct effects of COVID-19 that can be observed. Hence, to narrow the scope of our study and to rely on some of the most frequently used indicators of COVID-19, we focus on cases and deaths. It is also worth noting that these direct effects of the pandemic are more than likely to be reflected in its socioeconomic outcomes, since there is no trade-off between containing the virus and preserving the economy (McKee and Stuckler 2020). As the data improve, our analysis might be reconsidered against a broader range of outcomes and measures.

Our quantitative analysis proceeds as follows: First, we explore the nexus between state effectiveness and COVID-19 health impact through three core dimensions of the state: authority, capacity, and legitimacy. After a descriptive analysis of the relationship between the selected measures of the state and COVID-19 health outcomes, we proceed to a descriptive analysis of the relationship between government responses to the pandemic and each of our dimensions of state effectiveness. In this part, the main focus is on the strength of containment policies and economic relief measures. The timeliness of more specific policies is also analysed.

4 Data and operationalization

After the descriptive analysis, we conduct a battery of cross-section multiple regression models to obtain a more comprehensive picture of the relationship between the state and COVID-19. These regressions allow us to examine the linkage between different dimensions of the state and health outcomes, in terms of cases, deaths, and lethality, and between different dimensions of the state and pandemic responses, in terms of containment policies and economic relief measures, other factors that could affect COVID-19 being equal. These other factors, along with the chosen data, are presented more comprehensively in the next section.

4.1 Measures of the state

Research illustrates the diversity of cross-national measures of the state (Gisselquist 2014; Vaccaro 2020; Ziaja 2012) as well as a significant disconnect in some instances between conceptualization and measurement (Fukuyama 2013; Gisselquist 2012). It is important to consider as a first step whether our chosen measures have at least high face validity.

Our primary measures of the state are taken from the German Development Institute's (DIE) dataset on the state (Ziaja et al. 2019), which provides three indices that capture the conceptualized dimensions of the state: *authority*, *capacity*, and *legitimacy*. The first index quantifies the ability of the state to exercise a monopoly on violence within its territory, the second index quantifies 'the state's ability to carry out policies', and the third index quantifies domestic approval of state rule (Ziaja et al. 2019: 305–06). All three indices have values from 0 (low) to 1 (high).

While being high in face validity, these indices have the limitation of being available only until 2015. Even if the state is generally a slowly changing entity, levels of authority, capacity, and legitimacy might have changed substantially in some countries during the last five years. To address this, we also use three sub-indicators of the Fragile States Index (FSI) (Fund for Peace 2019) as a robustness check throughout the regression analysis. These selected sub-indicators are *security apparatus*, *public services*, and *state legitimacy*.

Security apparatus refers to aspects of the state related to the use of force and internal security, which are closely related to our conceptualization of state authority. *Public services* captures the state's ability to provide some of the most essential public services, such as health care, education, and infrastructure, and is thus closely related to our definition of state capacity. *State legitimacy* measures the population's level of confidence in government and related aspects such as political violence and transparency, and thus seems to express well our understanding of state legitimacy. The set of indicators collected from FSI refers to 2019 and provides the most up-to-date view of states in the world. The original FSI indicators run from 0 (high) to 10 (low) but are inverted and rescaled in our study to range from 0 (low) to 1 (high).

4.2 Measures of pandemic health outcomes

To measure the health outcomes of the pandemic, we use three indicators that have been frequently employed in the literature: *confirmed COVID-19 cases* (i.e. infections), *confirmed COVID-19 deaths*, and *case fatality rate* (CFR; also called mortality rate and referred to in this paper as lethality). Confirmed COVID-19 cases and confirmed COVID-19 deaths measure respectively the total number of cases and deaths linked to COVID-19 as of 15 November 2020. Throughout the analysis we use population-adjusted rates of cases and deaths to account for between-country differences in population. CFR is measured as the ratio between total confirmed deaths and total confirmed cases as of 15 November 2020. The indicators are published by the European Centre for Disease Prevention and Control (2020) and were retrieved via Our World in Data (2020).

Needless to say, these estimates should be viewed with extreme caution. We can be relatively sure that official numbers of confirmed cases underestimate the true numbers of infection 'due to incomplete testing and imperfect test sensitivity' (Wu et al. 2020: 2). The number of confirmed deaths should be a more accurate metric of the disease because we can confidently assume that fewer deaths go unreported than cases. Nevertheless, the number of confirmed deaths is likely to be an underestimate as well. Testing also affects the number of reported deaths and the very definition of a COVID-19 death varies from one country to another (Beaney et al. 2020).

To overcome the possible inaccuracies in the number of cases and deaths, we use CFR as an additional measure of COVID-19 health outcomes. Unfortunately, since CFR is measured as the ratio between deaths and cases, if estimates of deaths and cases are underreported, it is unlikely that CFR will provide a perfect picture of the situation, either. CFR can be both upwards and downwards biased. It underestimates the true lethality of COVID-19 if there is a delay between the reporting of cases and the reporting of deaths, but it overestimates the true lethality if cases are unreported (Sorci et al. 2020: 3).[2] Evidence suggests that, overall, CFR is likely to overestimate the true lethality of COVID-19 (Fauci et al. 2020).

Despite these problems, these three measures are commonly used in studies on COVID-19 in the absence of better ones. For instance, the number of confirmed cases has been used as a measure of COVID-19 health outcomes in Ferraresi et al. (2020), Polo (2020), and Qiu et al. (2020); the number of confirmed deaths is used as a measure of COVID-19 health outcomes in Cheibub et al. (2020), Sebhatu et al. (2020), and Vadlamannati et al. (2020); and CFR has been used as a

[2] See also Lipsitch et al. (2015) for a comprehensive discussion of potential biases in estimating CFR during outbreaks.

measure of COVID-19 health outcomes in Liang et al. (2020), Serikbayeva et al. (2020), and Sorci et al. (2020).

While some degree of measurement imprecision cannot be avoided, our use of all three indicators at least provides offers some additional robustness in comparison with the use of just one indicator, as has been the case in some studies. It has been argued that indicators of excess mortality would be a better solution for cross-national comparisons (Beaney et al. 2020). Unfortunately, excess mortality data are not available for most developing countries. Hence, if we want to include developing countries in our analysis—which is important for the full consideration of variation in state effectiveness—relying on excess mortality data is not a promising strategy at this time.

4.3 Measures of policy response

Two separate indices of government response to the pandemic are collected from the Oxford COVID-19 Government Response Tracker (OxCGRT) dataset (Hale et al. 2020). The Containment and Health Index (CHI) synthesizes indicators related to the stringency of restrictions, closures, and other policy measures that aim to contain the spread of the virus, as well as of health measures such as testing, contact tracing, and wearing facial coverings on the other. The Economic Support Index (ESI), in contrast, synthesizes two indicators related to economic responses to the pandemic, in terms of income support to the population and debt or contract relief for households. The former can be seen as an aggregate index of the strength of containment policies, whereas the latter can be seen as an aggregate index of public economic assistance. Both measures run from 0 (low) to 100 (high), and country-level daily data are averaged across days (since the first official case for each country).

As with measures of COVID-19 health outcomes, it is important to stress that there are some caveats related to government response data. In particular, the OxCGRT data are based on de facto policy responses but do not provide information on the actual enforcement of the responses or their appropriateness (Hale et al. 2020). The degree of compliance with containment and health measures might also change from one country to another, and in some countries less stringent measures could actually increase compliance (Haug et al. 2020). To our knowledge, suitable cross-national indicators on the enforcement, appropriateness, and observance of national pandemic response measures do not exist for now.

4.4 Other variables

We also include in our specifications several plausible determinants of COVID-19 health impact and government response. First, we control for *GDP per capita*. In general, we expect wealthier countries to have more means to address crises. Notably in this pandemic, however, we have seen that the number of cases and deaths increases as the level of national income increases (Table E1 in Appendix E).

Wealth is also related to testing; wealthier countries seem to be able to test more individuals than poorer countries. Testing affects the number of COVID-19 cases and deaths reported (Beaney et al. 2020), simply because conducting more tests should reveal more cases and deaths. For these reasons, we control for the population-adjusted *testing rate*.

Additionally, we control for the *age structure* of population because older individuals are particularly vulnerable to the virus (e.g. Yanez et al. 2020) and for *population density* because infectious diseases, in general, spread more rapidly in densely populated areas (Tarwater and Martin 2001).

Finally, we include *regional dummies* in some of the specifications to account for overall differences across macro-regions and the spatial dependence of the virus's spread (Solivetti 2020). These dummies are coded in accordance with the World Bank's classification of macro-regions. Data sources (Table B1) and summary statistics (Table B2) are presented in Appendix B.

We also tested the robustness of our results to other possibly relevant factors such as the coverage of welfare programmes (Rasmussen and Knutsen 2019) and the spatial–temporal dynamics of COVID-19. To take into account the spatial–temporal spread of COVID-19, five 'alternative' regional dummies were created. These dummies were coded to 1 for the five most severely affected countries (in terms of cases per million people) and their land border countries at the end of February (dummy 1), March (dummy 2), April (dummy 3), May (dummy 4), and June (dummy 5). The remaining countries were coded to 0. These robustness tests do not alter our main conclusions.[3]

The set of chosen controls is inspired by other relevant studies on the topic. For instance, in analysing the 'effect' of government effectiveness on COVID-19 health outcomes Serikbayeva et al. (2020) control for democracy, testing policy, stay-at-home requirements, the share of elders, the number of medical doctors, and the number of hospital beds. Liang et al. (2020), investigating factors associated with COVID-19 health outcomes, find that tests, state capacity, elderly population, hospital beds, and the quality of transport infrastructure are significantly related to COVID-19 health outcomes. Sorci et al. (2020) predict COVID-19 CFR with measures of GDP per capita, population size, health expenditure, number of hospital beds, share of elders, political regime, the stringency of government responses, and testing.

5 Analysis and discussion

5.1 Health outcomes

As Milanovic (2021) notably finds using simple correlations, the Johns Hopkins 'global health security' index[4] has an inverse relationship with COVID-related fatalities: those considered most health secure had the most deaths. Our descriptive analysis of COVID health impact points to some similarly surprising relationships. In particular, consideration of COVID-19 cases and deaths, and measures of the state, shows an inverse relationship: case and death rates are highest on average in more effective states. The CFR, however, behaves generally as theory would predict, with lower values in more effective states on average; in other words, while more effective states have recorded more cases and deaths, the disease has been more lethal on average in less effective states. Similarly, the number of conducted tests is positively related to our core measures of the state: countries with more authoritative, more capable, and more legitimate states have conducted more tests than their less effective counterparts (as we would have expected).

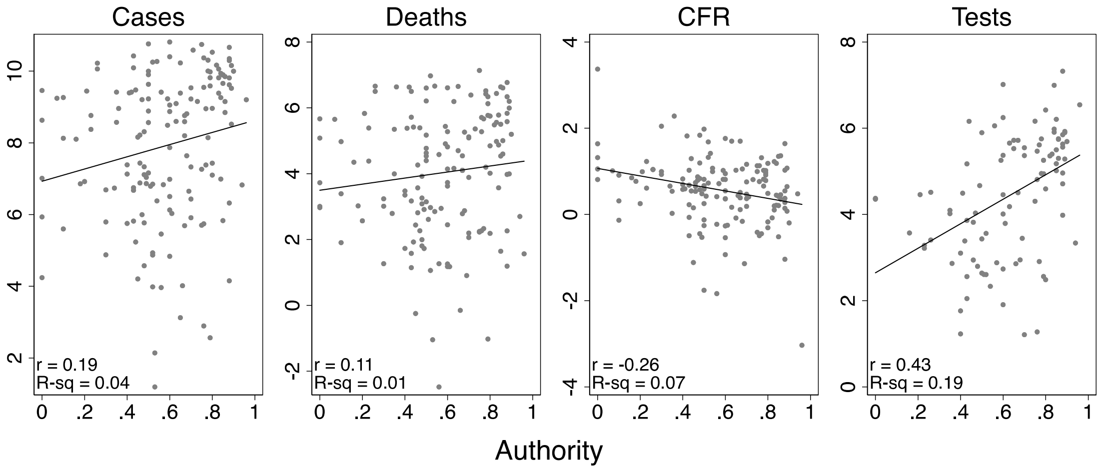
Differences among the three dimensions of the state are also worth noting. The positive associations between authority and COVID-19 cases ($r = 0.19$) and deaths ($r = 0.11$), and the negative association between authority and CFR ($r = -0.26$) are at best weak (Figure 2). The positive relationship between authority and testing ($r = 0.43$) is somewhat stronger, since state authority, alone, explains 19 per cent of the cross-national variation in testing. The bivariate relationships between state capacity and COVID-19 cases ($r = 0.60$), deaths ($r = 0.53$), and testing

[3] The results of these robustness tests are reported in the Supplementary Material, which is available upon request.

[4] https://www.ghsindex.org/

(r = 0.79) are positive and stronger (Figure 3). As before, the relationship between capacity and CFR is weakly negative (r = –0.17). The strength of the relationship between state legitimacy and COVID-19 (Figure 4) seems to lie somewhere in between the two previously analysed ones. Legitimacy is relatively weakly correlated to COVID-19 cases (r = 0.30), deaths (r = 0.28), and testing (r = 0.35), but there is no significant bivariate relationship between legitimacy and CFR.

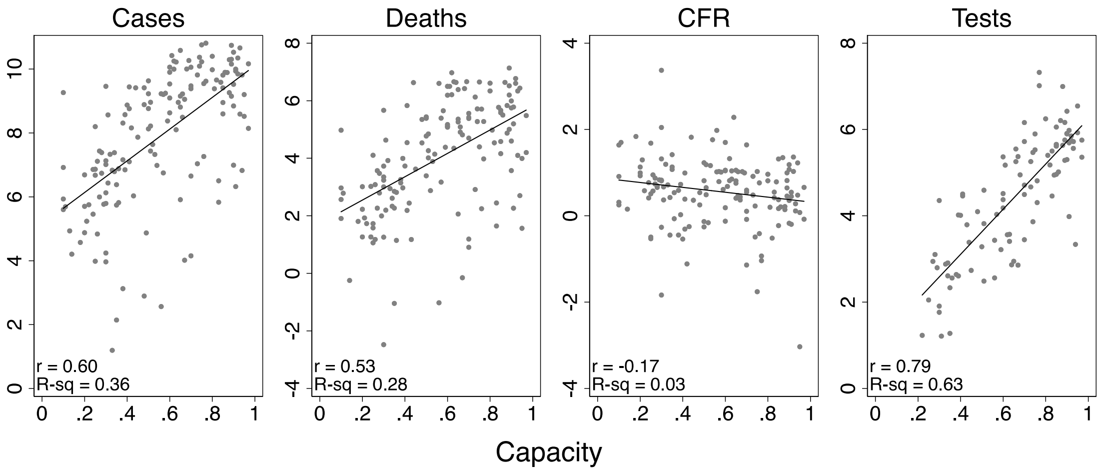
Figure 2: Scatter plots of state authority and COVID-19 cases, deaths, CFR, and tests



Note: as of 15 November 2020. Measure of state authority from DIE. Y-axis title on the top. Cases = Ln(Total cases/million pop.); Deaths = Ln(Total deaths/million pop.); CFR = Ln(Case fatality rate); Tests = Ln(Total tests/1,000 pop.).

Source: authors' construction.

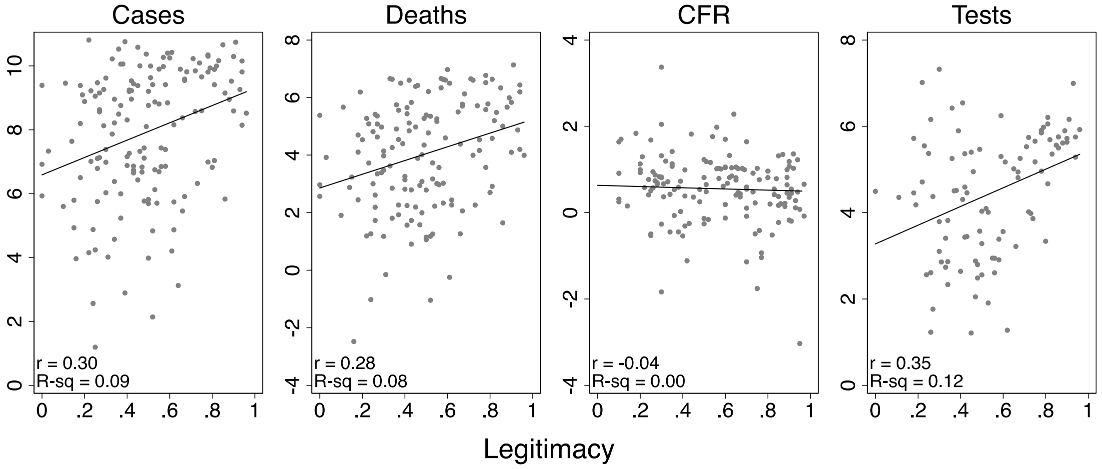
Figure 3: Scatter plots of state capacity and COVID-19 cases, deaths, CFR, and tests



Note: as of 15 November 2020. Measure of state capacity from DIE. Y-axis title on the top. Cases = Ln(Total cases/million pop.); Deaths = Ln(Total deaths/million pop.); CFR = Ln(Case fatality rate); Tests = Ln(Total tests/1,000 pop.).

Source: authors' construction.

Figure 4: Scatter plots of state legitimacy and COVID-19 cases, deaths, CFR, and tests

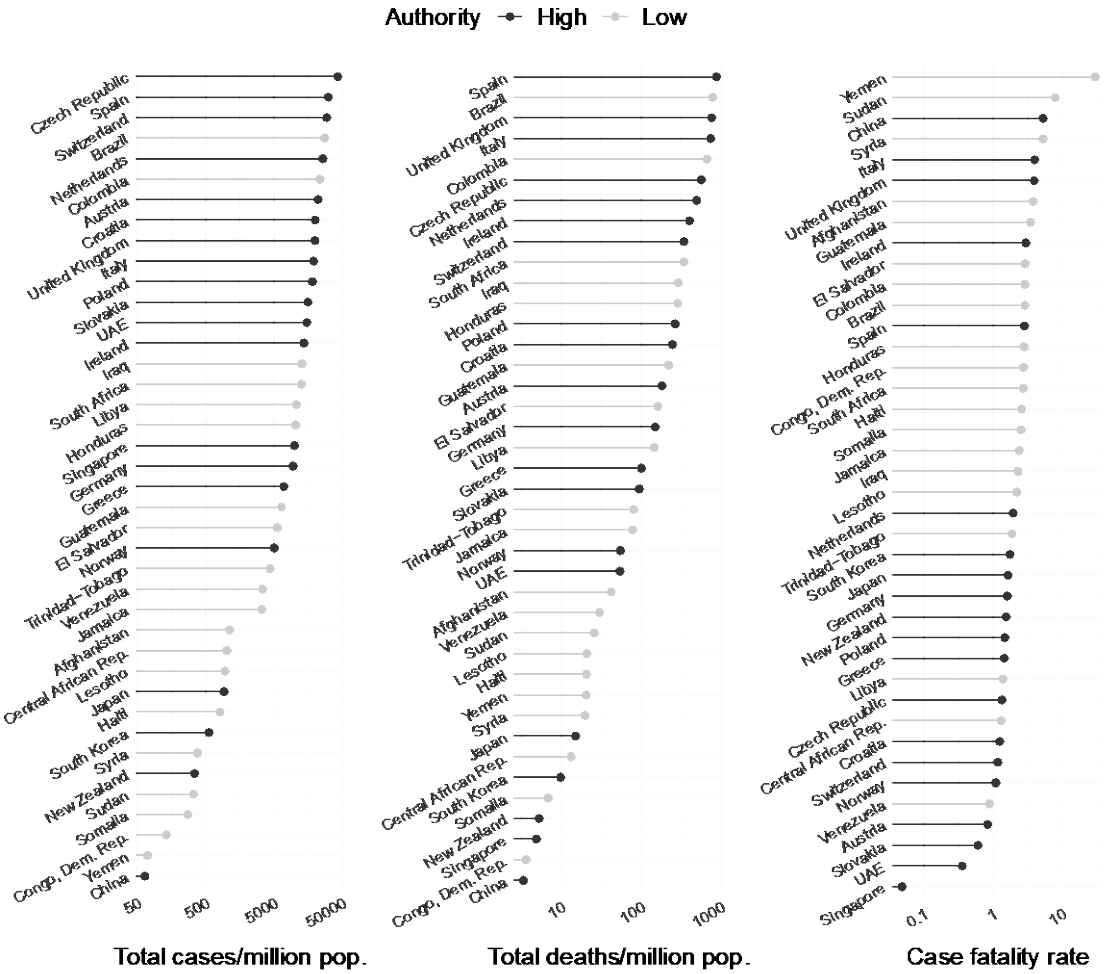


Note: as of 15 November 2020. Measure of state legitimacy from DIE. Y-axis title on the top. Cases = Ln(Total cases/million pop.); Deaths = Ln(Total deaths/million pop.); CFR = Ln(Case fatality rate); Tests = Ln(Total tests/1,000 pop.).

Source: authors' construction.

Differences in these dimensions of the state at the country level are also interesting. In general, as suggested by the bivariate correlations, high-authority countries have had higher rates of COVID-19 cases and deaths than their low-authority counterparts, but there are exceptions (Figure 5). Low-authority countries like Brazil and Colombia have been hit as hard as the most severely affected high-authority countries, while high-authority countries such as China, New Zealand, and South Korea have been less affected than most low-authority countries. In terms of the CFR, the virus has been generally less lethal in high-authority countries than low-authority countries, with some exceptions. In particular, countries with high state authority ratings, such as China, Italy, and the United Kingdom, have a high CFR.

Figure 5: State authority and health impact of COVID-19 in top/bottom countries

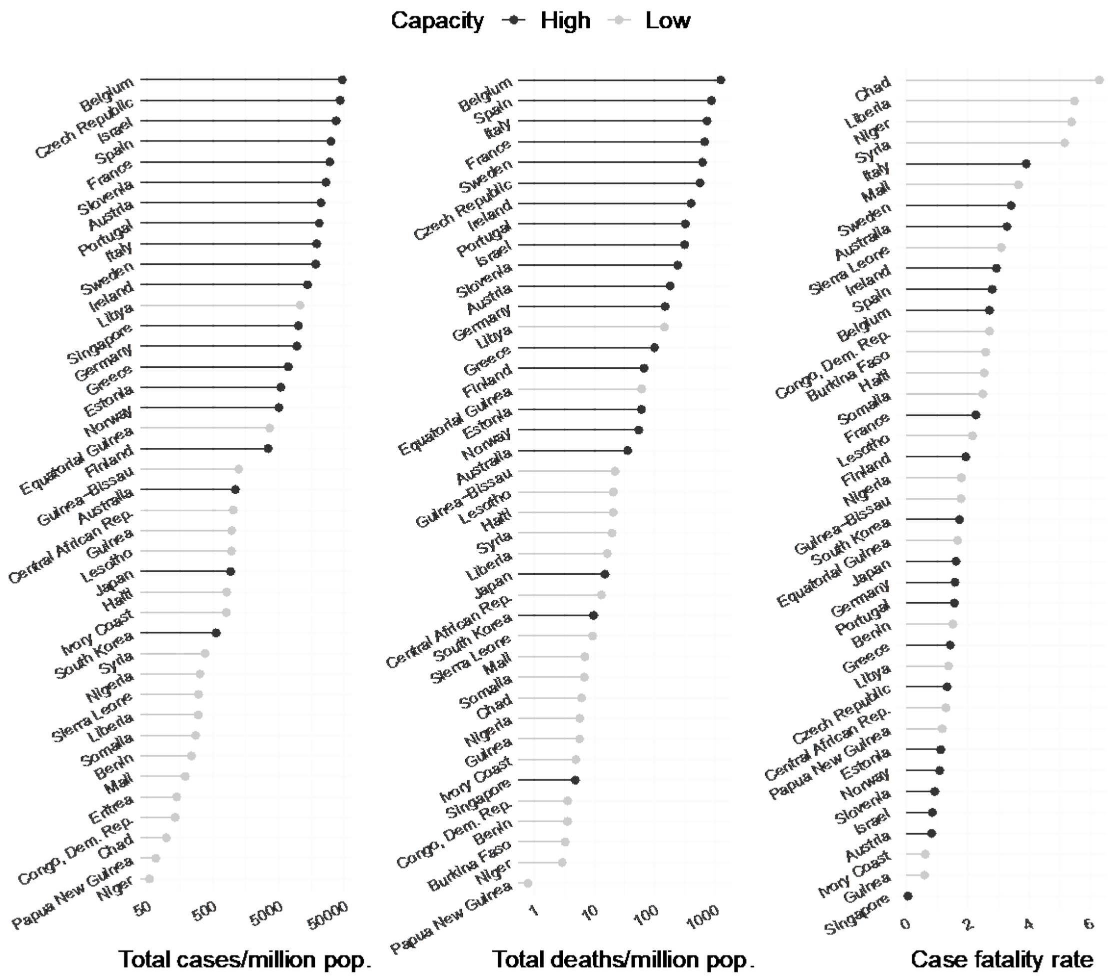


Note: as of 15 November 2020. Measure of state authority from DIE.

Source: authors' construction.

The relationship between state capacity and COVID-19 health outcomes seems to be more clear-cut (Figure 6). In terms of the number of cases and deaths, there are no low-capacity countries that have been hit as hard as the hardest hit high-capacity countries. The most affected low-capacity country, Libya, had more or less the same rate of cases and deaths as Germany and Greece, which are countries that have been praised for their pandemic responses. Singapore can be considered a 'positive' exception in terms of deaths but not cases, while South Korea and Japan have registered exceptionally few cases and deaths. The relationship between CFR and state capacity is also less clear. Generally, COVID-19 lethality is more equally distributed among the two groups of countries, but only low-capacity countries have an unusually high CFR.

Figure 6: State capacity and health impact of COVID-19 in top/bottom countries

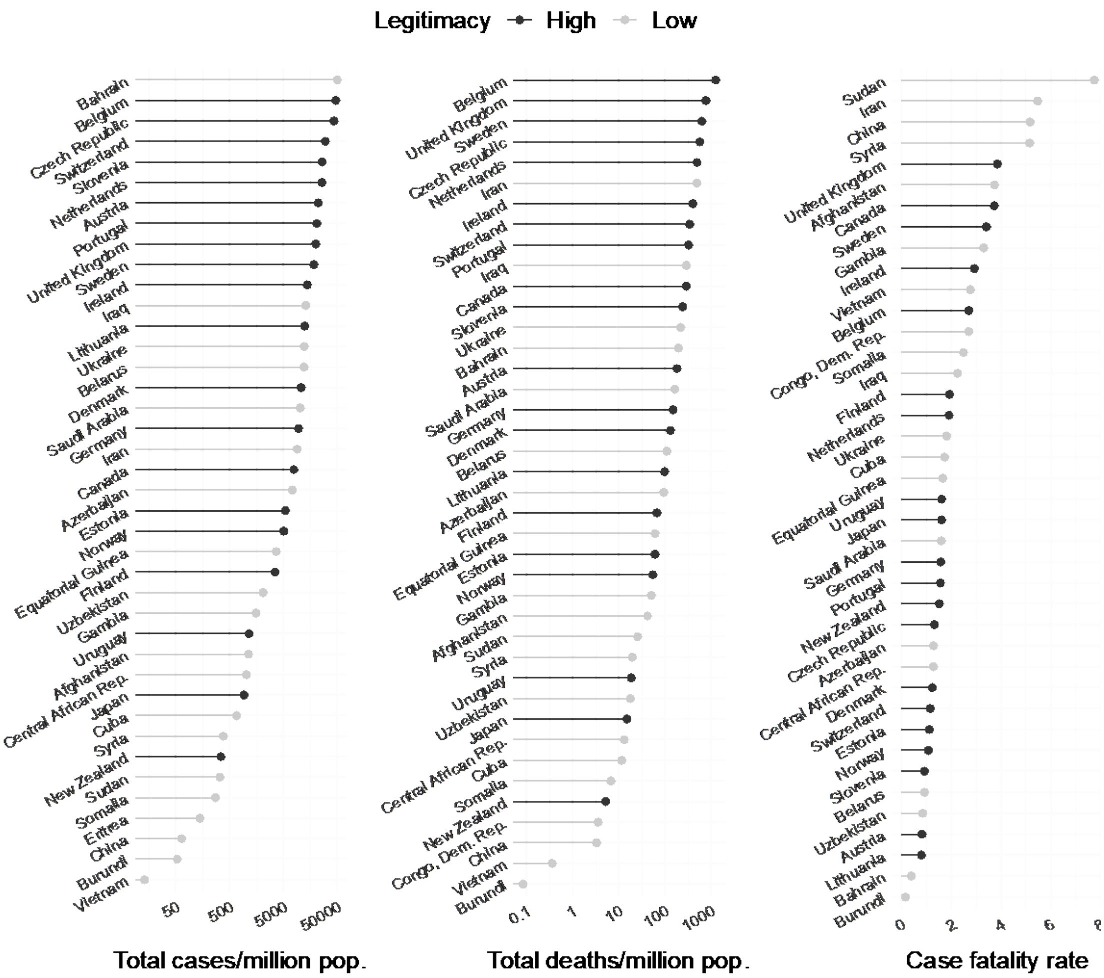


Note: as of 15 November 2020. Measure of state capacity from DIE.

Source: authors' construction.

There are exceptions also in the relationships between state legitimacy and COVID-19 cases and deaths (Figure 7). As to cases, nearly all the hardest hit countries are high-legitimacy countries, but Bahrain has the worst record in the world. As to deaths, the general trend is similar, although low-legitimacy Iran's records are not praiseworthy. Low-legitimacy countries such as Burundi, Viet Nam, and China, in contrast, are among the least severely affected countries in the world, in terms of both cases and deaths. There are some 'well performing' high-legitimacy countries (New Zealand, Japan, and Uruguay) as well, but low-legitimacy countries have overall been less severely affected by the virus, in terms of cases and deaths. As before, CFR is extremely high only in low-legitimacy countries (Sudan, Iran, China, Syria), but otherwise countries are fairly evenly distributed across the 'spectrum'.

Figure 7: State legitimacy health impact of COVID-19 in top/bottom countries



Note: as of 15 November 2020. Measure of state legitimacy from DIE.

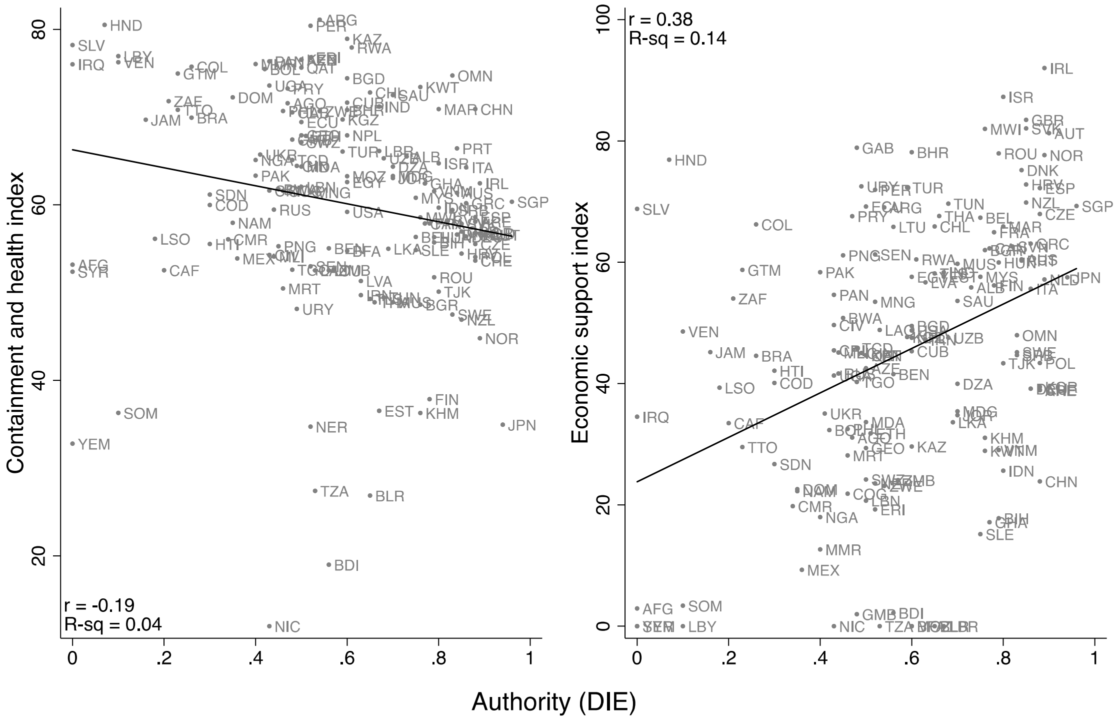
Source: authors' construction.

These puzzling relationships show not only that there are extreme differences in COVID-19 health outcomes across countries, but also that these outcomes may vary with different dimensions of the state. To make sense of these results and to understand more comprehensively the relationship between state effectiveness and COVID-19, it is crucial to take into account other factors that play a role in determining the health outcomes of the pandemic.

5.2 Government response policies

In this section, we explore some of these factors by examining the relationship between state effectiveness and national measures that governments have taken to contain the pandemic, its health effects, and its economic burden. Figures 8–10 present scatter plots between our three dimensions of the state and the strength of government responses to the pandemic.

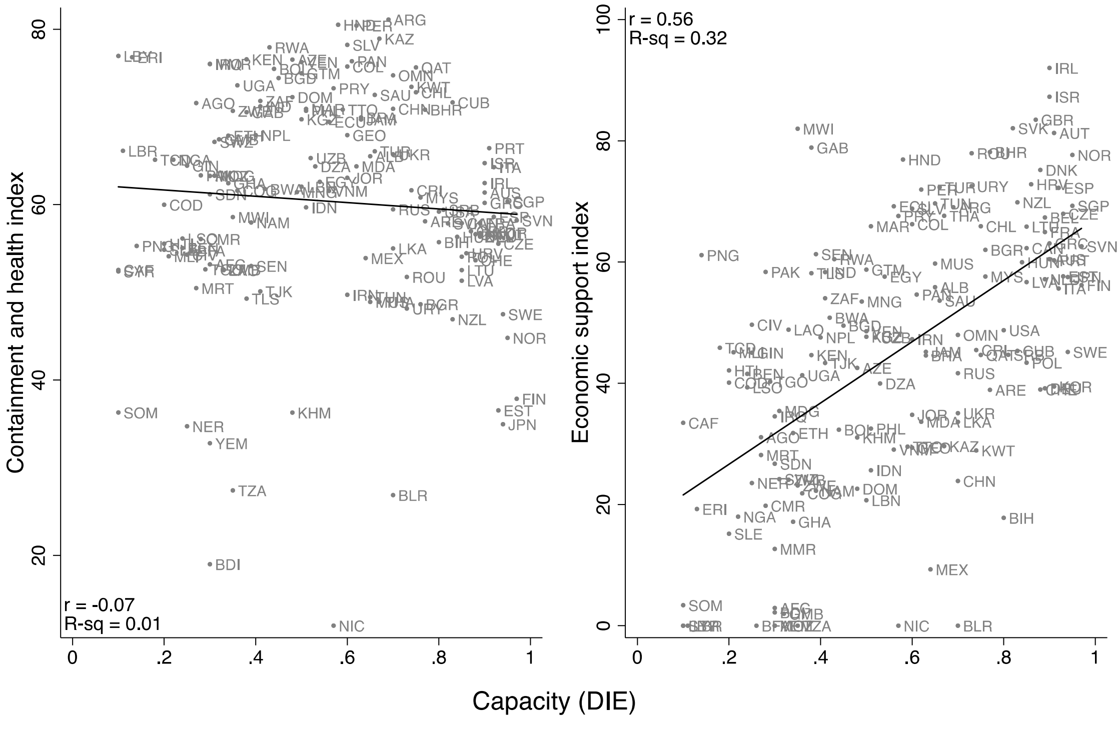
Figure 8: State authority and strength of government responses



Note: as of 15 November 2020. Measure of state authority from DIE.

Source: authors' construction.

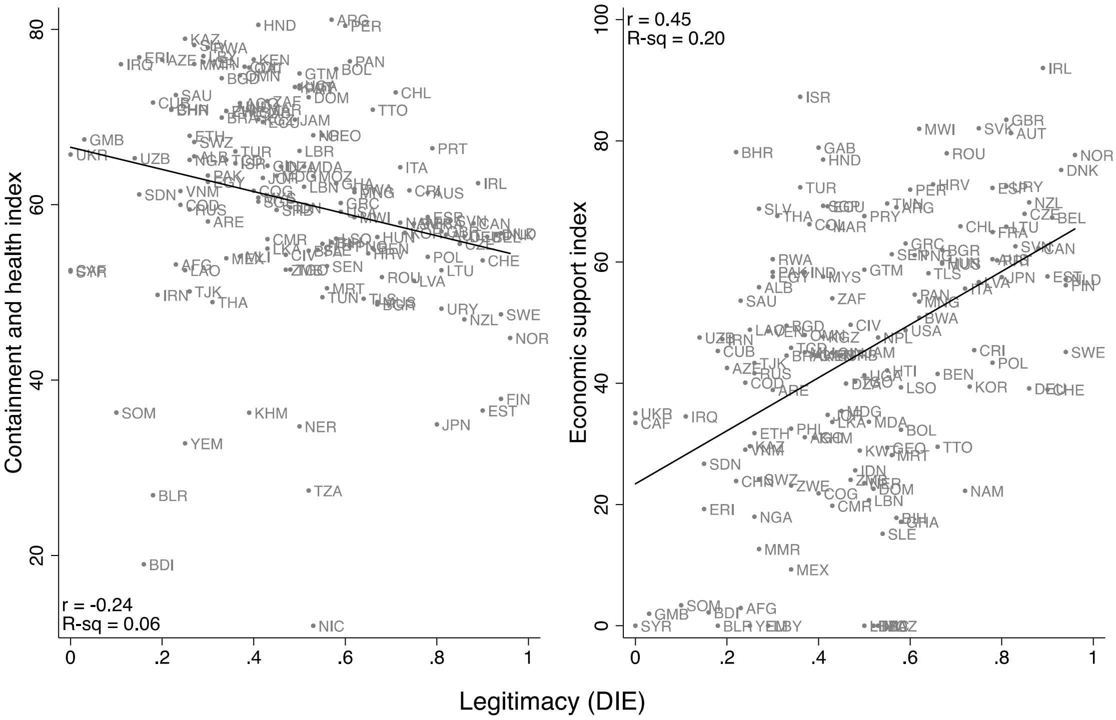
Figure 9: State capacity and strength of government responses



Note: as of 15 November 2020. Measure of state capacity from DIE.

Source: authors' construction.

Figure 10: State legitimacy and strength of government responses



Note: as of 15 November 2020. Measure of state legitimacy from DIE.

Source: authors' construction.

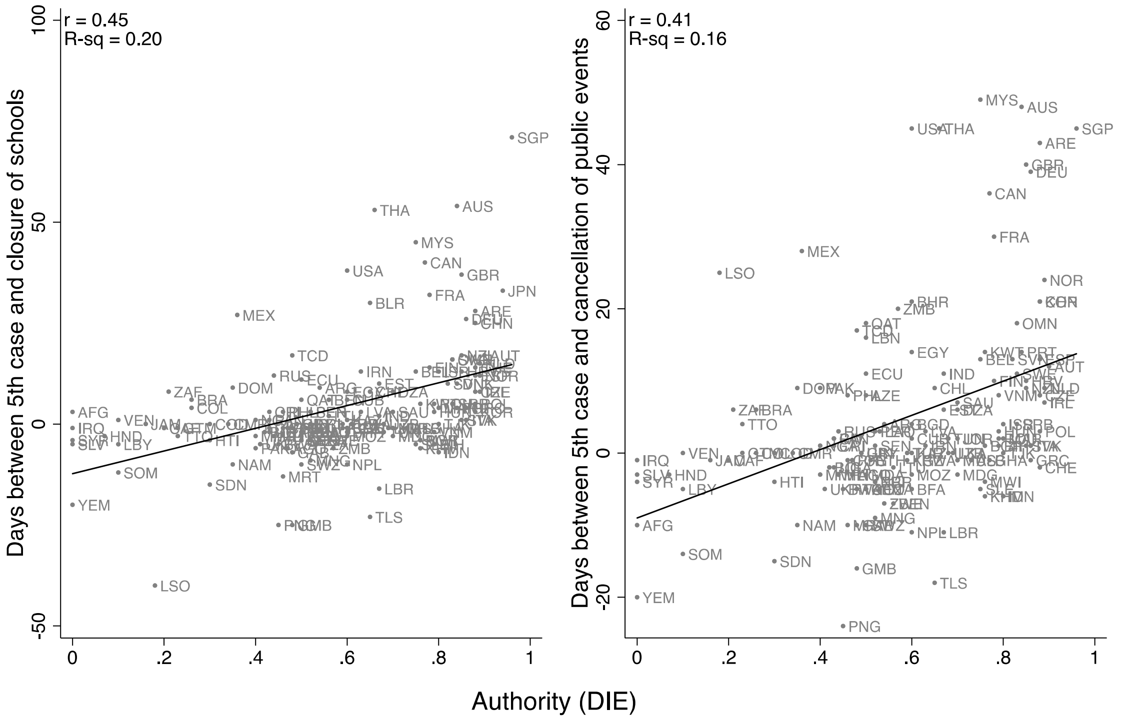
Surprisingly, the relationship between effective state institutions and the stringency of containment policies is negative, suggesting that when other factors are not taken into consideration, more authoritative, capable, and legitimate countries are related to less stringent containment policies. The finding is consistent for each of our three dimensions of the state, albeit very weak for capacity (r = –0.07) and relatively weak for authority (r = –0.19) and legitimacy (r = –0.24).

In contrast, the association between state effectiveness and the supply of economic support policies is positive, showing that more authoritative, capable, and legitimate countries have enacted more supportive economic responses to the pandemic, at least when other factors are not taken into account. Economic relief policies are most strongly related to state capacity (r = 0.56) but also moderately related to state legitimacy (r = 0.45) and state authority (r = 0.38).

To further explore the unexpectedly inverse relationship between effective states and the stringency of national containment and health measures, we analyse the linkage between state effectiveness and the timing of these containment and health measures. If more effective states have really enacted less stringent COVID-19 restrictions, we would expect them to have been less timely in their responses, as well. In fact, this is precisely what we find (Figures 11–13), where the relationship between the different dimensions of state effectiveness and the timeliness of adopting two specific but virtually universal containment policies—closure of schools and cancellation of public events—is illustrated.

As shown in Figure 11, there is a moderately strong positive relationship between state authority and both the timing of school closures (r = 0.45) and the cancellation of public events (r = 0.41), suggesting that in general high-authority countries waited substantially longer than low-authority countries to close schools and cancel public events. While some of the lowest-authority countries in the world such as Yemen, El Salvador, and Somalia closed schools several days before the fifth confirmed case of COVID-19, governments of high-authority countries such as Singapore, Japan, and Australia waited over a month after the fifth confirmed case before closing schools. Most high-authority countries waited many days, if not weeks, after the fifth COVID-19 case to cancel public events, as well, but in many low-authority countries public events were cancelled before the fifth case of COVID-19.

Figure 11: State authority and timeliness of government responses

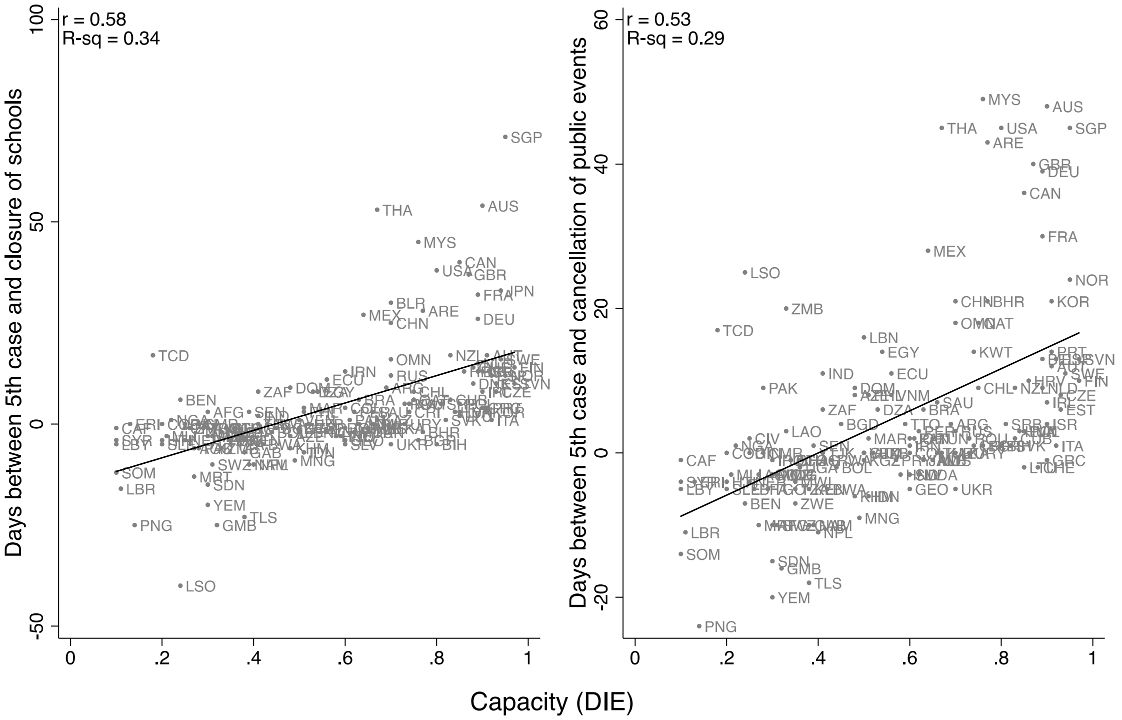


Note: as of 15 November 2020. Measure of state authority from DIE.

Source: authors' construction.

The relationship between state capacity and the timeliness of the two selected containment policies (Figure 12) is even stronger (r = 0.58 for school closure; r = 0.53 for cancelling public events) than for state authority. Singapore waited over two months to close its schools and in many other high-capacity countries governments ordered schools to close weeks after the fifth case. Low-capacity countries, instead, provided a quicker response to the pandemic. Most countries with a state capacity score below 0.40 closed schools before the fifth confirmed case of COVID-19, Chad (17 days) being the only 'less rapid' exception (it closed schools more than a week after the fifth case). Low-capacity states, like their low-authority counterparts, were quick to respond to the pandemic in terms of the cancellation of public events and closure of schools. Papua New Guinea, one of the least capable countries in the world, cancelled all public events and closed its schools more than three weeks before its fifth confirmed case.

Figure 12: State capacity and timeliness of government responses

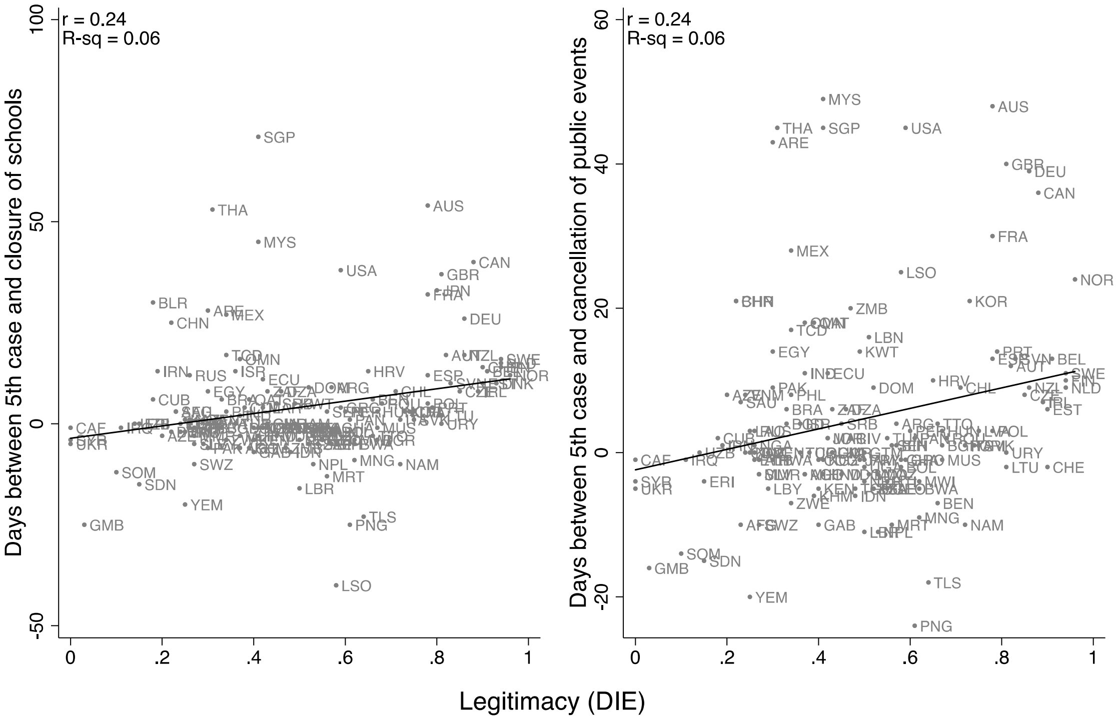


Note: as of 15 November 2020. Measure of state capacity from DIE.

Source: authors' construction.

The timing of containment policies seems to be less associated with state legitimacy (Figure 13) than to the other two dimensions of the state, as indicated by the lower correlation coefficients (r = 0.24 for both school closures and cancellation of public events). Many high-legitimacy countries waited a few weeks before closing schools (e.g., Germany: 26 days; Japan: 33 days; United Kingdom: 37 days), but so did some low-legitimacy countries (e.g., China: 25 days; UAE: 28 days; Belarus: 30 days). Similarly, public events were cancelled preventively, before the fifth case, in both low-legitimacy countries such as Iraq and Syria and high-legitimacy countries such as Switzerland and Lithuania. Nevertheless, other low-legitimacy countries waited many days (e.g., Cuba, Afghanistan) or even weeks (e.g., Belarus, China) before cancelling public events, and so did many high-legitimacy countries. At intermediate levels of legitimacy, we find the highest variation in the timeliness of cancellation of public events between countries. Just to give an example, the United States and Papua New Guinea have almost the same score in state legitimacy (0.59 and 0.61, respectively) but the former cancelled public events 45 days *after* its fifth case, the latter 24 days *before* its fifth case.

Figure 13: State legitimacy and timeliness of government responses



Note: as of 15 November 2020. Measure of state legitimacy from DIE.

Source: authors' construction.

Our descriptive analysis of both the average level of strictness of national containment and health policies and the timeliness of the national COVID-19 response in terms of school closures and cancellation of public events yields surprising results. Overall, our findings suggest that less effective states not only responded to the pandemic with more stringent containment policies but also enacted these policies more quickly than effective states. This would seem to be precisely the opposite of what theory predicts. What might be happening?

First, as some media reports have suggested, it is possible that countries with weaker state institutions, fearing their vulnerability to the pandemic, 'played it safe', while countries with stronger institutions were more confident in their ability to manage the health impact of the pandemic and tried to limit and/or postpone restrictions on economic and social life because of the possible adverse effects. Second, it may be that the spatial–temporal dynamics of the spread of the virus were simply unfavourable to many effective states, which were reluctant to implement strict containment and health policies at the very beginning of the pandemic. Once the virus started to spread in the less effective states of the Global South, countries were more prepared and could faster emulate the government responses implemented in the Global North. Third, it could be that more effective states, which tend to be more democratic as well, were less likely and quick to adopt the most stringent measures to preserve the individual rights of their citizens.

To sum up, it seems that, on average, less effective states adopted more stringent policies to curb the pandemic than more effective states and this in turn may have contributed to their better observed health outcomes. But to what extent does this hold true when we also take into account other factors—beyond state effectiveness—that influence COVID health outcomes?

5.3 Multivariate regression analysis

To analyse more thoroughly the state–pandemic nexus we use ordinary least squares (OLS) to estimate the following equation:

$$y_i = \alpha + \beta_1 state_i + \beta_2 x_i + \varepsilon_i, \quad (1)$$

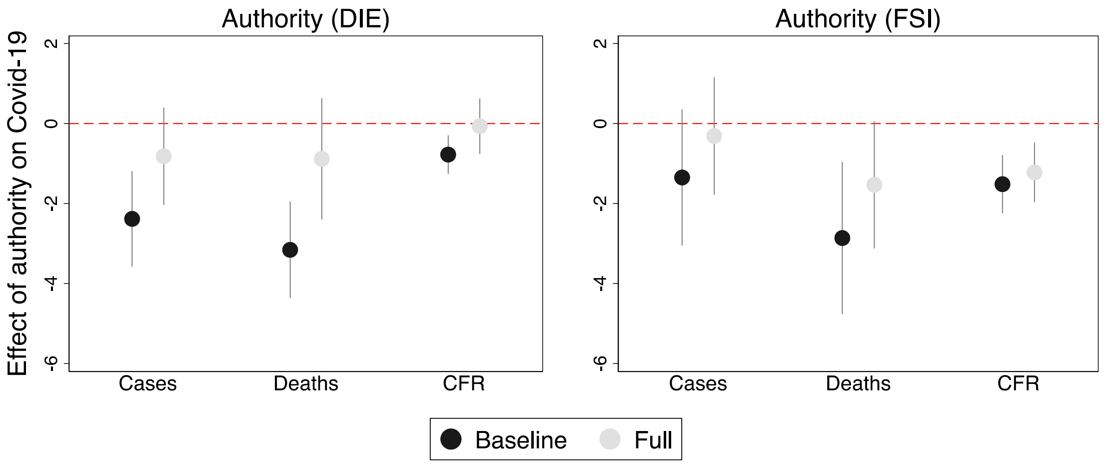
where y is one of our measures of COVID-19 health outcomes or pandemic policy responses, i stands for country, a is the intercept, *state* is one of our measures of the state, x is a vector of control variables, and ε is the error term. The coefficient of main interest is β_1.

We start the regression analysis by assessing the relationship between our measures of state effectiveness and COVID-19 health outcomes. In the baseline models, we control for economic wealth, testing, population density, and age structure of a population. In the full models, we also control for macro-regional differences. Only coefficient plots are reported in the text, but more comprehensive regression results can be found in Appendix A. In coefficient plots the dots represent the point estimates of a given predictor and the spikes represent its 90 per cent confidence intervals.

Overall, the regression estimates of the relationships between different dimensions of the state and COVID-19 health outcomes show that, when we control for the main factors that have been thought to affect the spread of the virus, the relationship becomes either inverse or non-significant, depending on the dimension of the state.

We find relatively weak evidence of an inverse relationship between state authority and COVID-19 health outcomes (Figure 14).

Figure 14: Relationship between state authority and COVID-19 cases, deaths, and CFR



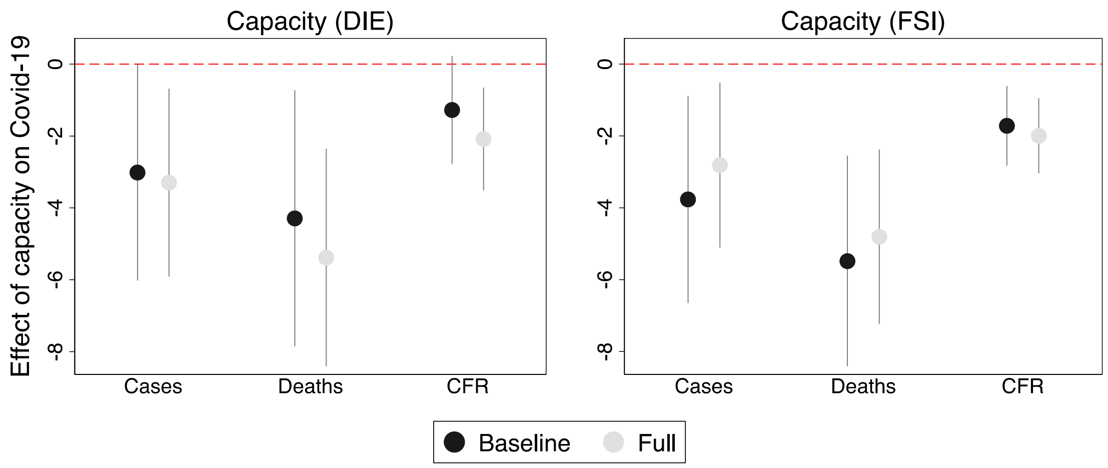
Note: see Tables A1 and A2 (Appendix A) for a more comprehensive summary of the regression results.

Source: authors' construction.

The plot on the left panel, where state authority is measured with DIE indicators, shows that authority has a negative and significant relationship with cases, deaths, and CFR in baseline models, but in the full models, once macro-regional differences are controlled for, the relationship becomes non-significant at conventional levels. On the contrary, the plot on the right panel, where state authority is measured with the FSI indicators, shows that authority has a strong negative relationship with COVID-19 CFR in both specifications. The effect of authority on deaths is negative and significant at the highest level in the baseline model but loses its statistical significance once the macro-regional dummies are included. There seems to be no statistically significant relationship between authority and COVID-19 cases when authority is measured with FSI indicators.

The clearest relationships, as expected, are between state capacity and COVID-19 health outcomes (Figure 15). Regardless of the chosen measure of capacity, once economic wealth, demographic factors, and macro-regional differences are controlled for, state capacity is inversely related to all our three indicators of COVID-19 health outcomes. The finding is statistically significant at conventional levels. In general, compared with the previous battery of models where COVID-19 was predicted with authority, there is higher uncertainty in predicting COVID-19 outcomes with capacity, as shown by the long spikes, especially for cases and deaths. There seems to be no statistically significant relationship, on the other hand, between state legitimacy and COVID-19 health outcomes (Figure 16). The finding is robust to both measures of legitimacy and our three indicators of COVID-19 health outcomes.

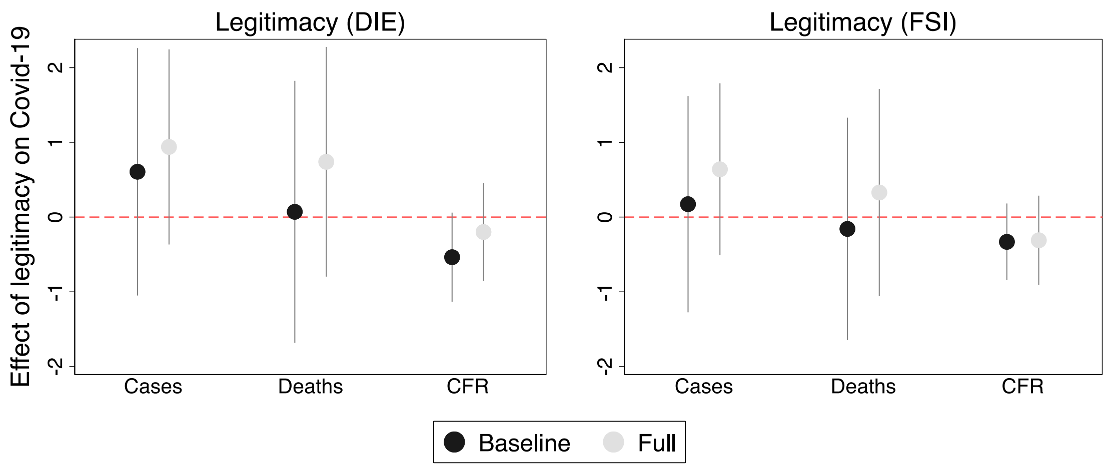
Figure 15: Relationship between state capacity and COVID-19 cases, deaths, and CFR



Note: see Tables A3 and A4 for a more comprehensive summary of the regression results.

Source: authors' construction.

Figure 16: Relationship between state legitimacy and COVID-19 cases, deaths, and CFR



Note: see Table A5 and A6 for a more comprehensive summary of the regression results.

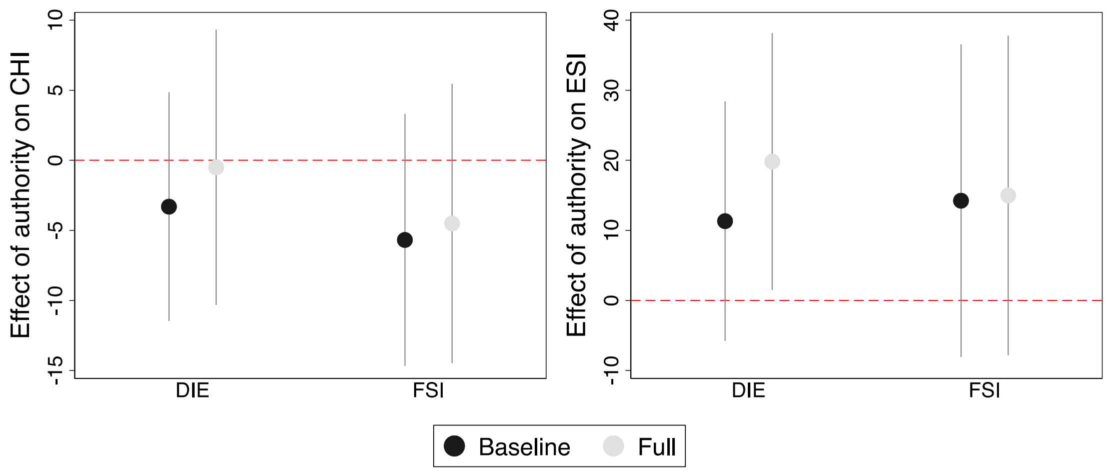
Source: authors' construction.

Overall, these results suggest that once we control for some of the main factors that are commonly thought to affect COVID-19 health outcomes, the state plays an important role in reducing the adverse impact of the ongoing pandemic. Nevertheless, not all the dimensions of the state seem to be equally important in curbing the pandemic. In particular, the results of our regressions suggest that state capacity, and to a lesser extent state authority, play a key role in reducing the number of COVID-19 cases, deaths, and CFR. We find no evidence, however, of a significant relationship between state legitimacy and any of the COVID-19 health outcomes.

Next, we analyse the relationship between our key measures of state effectiveness and national responses to the pandemic. In particular, we assess the relationship between the state and containment and health policies, and the state and economic support policies. As before, we perform a battery of regressions with measures of the state from both DIE and FSI. In the baseline models, we control for economic wealth, population density, age structure of population, and total confirmed deaths from COVID-19. In the full models we also control for macroregional differences.

Figure 17 shows the average effect of authority on the stringency of COVID-19-related national containment and health policies (left panel) and on the generosity of economic support policies (right panel) in countries around the world. As to the relationship between state authority and containment and health policies, two specifications are tested separately for each of our indicators of authority, but the estimated results are stable across models: there seems to be no significant relationship between state authority and the intensity of containment and health policies. Conversely, we find contrasting evidence on the relationship between state authority and economic support. When authority is measured with DIE indicators, the relationship is positive and non-significant in the baseline model but becomes significant in the full model. When authority is measured with FSI indicators, on the other hand, there is no statistically significant relationship in either of the models.

Figure 17: Relationship between state authority and CHI policies and ESI policies

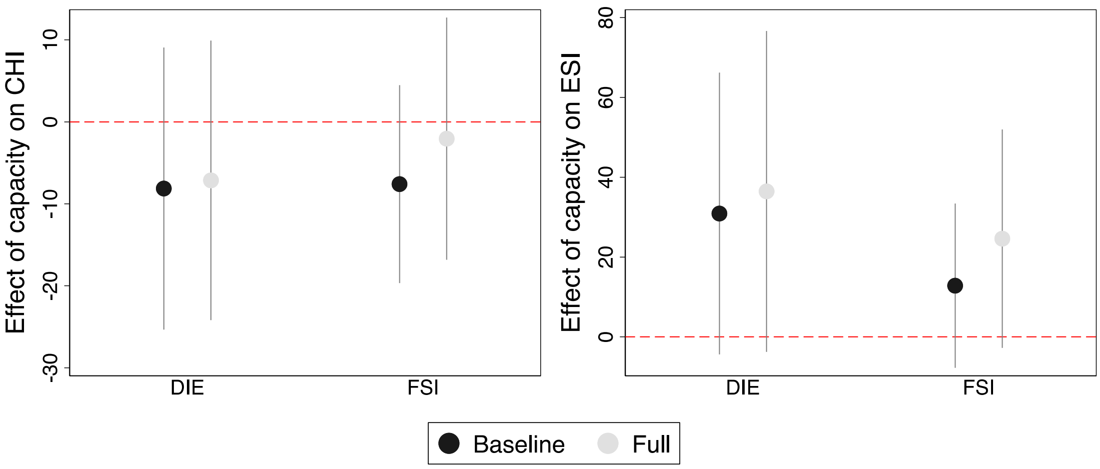


Note: see Tables A7 and A8 for a more comprehensive summary of the regression results.

Source: authors' construction.

We find no evidence of a statistically significant relationship between state capacity and the stringency of containment policies (Figure 18, left panel) or state capacity and the generosity of economic support policies (Figure 18, right panel). The association between capacity and containment policies is not clearly different from zero. The association between capacity and economic support policies seems to be positive and relatively strong on average, but still not different from zero, given the suspiciously large confidence intervals. Our findings suggest that variation in state capacity does not predict the severity of containment and health policies nor the generosity of economic support measures.

Figure 18: Relationship between state capacity and CHI policies and ESI policies



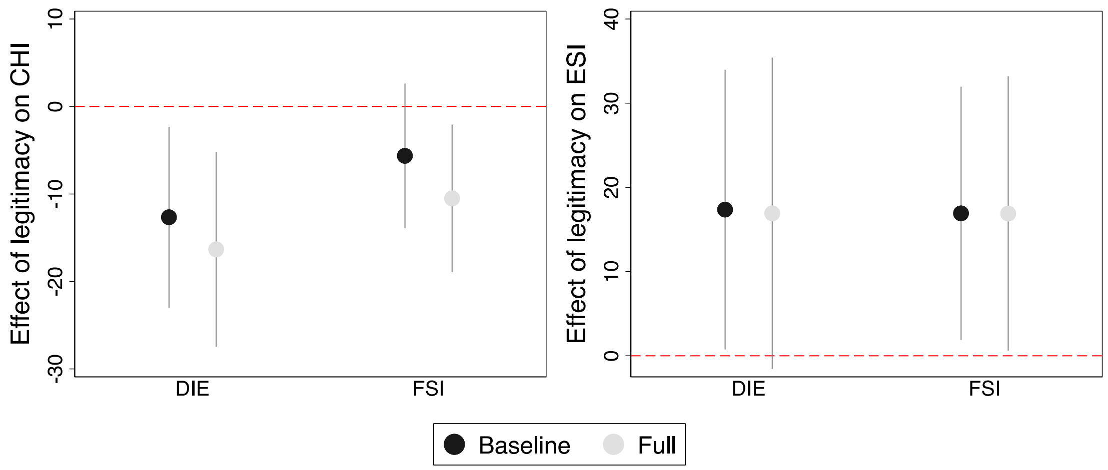
Note: see Tables A9 and A10 for a more comprehensive summary of the regression results.

Source: authors' construction.

Legitimacy, on the other hand, is inversely related to the stringency of containment and health measures (Figure 19, left panel). The finding is statistically significant at conventional levels in the full models regardless of the chosen measure of legitimacy. More legitimate countries seem to have less severe containment and health policies. The relationship between state legitimacy and the generosity of economic support policies (Figure 19, right panel) is positive across models but statistically significant only in the baseline models with both measures of legitimacy. When macro-regional differences are controlled for, the 'effect' loses its statistical significance when legitimacy is measured with the indicator from DIE but not when it is measured with the indicator from FSI. More legitimate countries seem to provide their citizens with more economic relief than their less legitimate counterparts.

Even if we do not find a robust and consistent linkage between the state and the stringency of containment policies or the generosity of economic support policies, we know that effective states should be more capable of implementing intended policy responses by definition. Hence, in practice, we would not be surprised to see more stringent containment and health policies and more generous economic support policies being implemented in countries with effective state apparatuses than in countries with dysfunctional institutions. Since the available indicators of government responses to COVID-19 do not, however, capture the actual enforcement of these policies, but only their adoption, we cannot assess the relationship between the state and the 'true' enforcement of COVID-19 responses for the time being. We strongly suspect that this is one of the reasons for our mainly inconclusive results on the relationship between state effectiveness and government responses.

Figure 19: Relationship between state legitimacy and CHI policies and ESI policies



Note: see Tables A11 and A12 for a more comprehensive summary of the regression results.

Source: authors' construction.

6 Conclusions

This study has provided new analysis of the relationship between state effectiveness and COVID-19 health outcomes. Theory and common sense would suggest that more effective state institutions should help countries to better respond to crises such as the pandemic—the very definition of an effective state implies such a linkage—but instead, as we have seen, more effective states have actually had poorer outcomes on average than less effective states. Cross-country regression analysis provides some insight into why this is the case: these surprising correlations seem to be due largely to other factors related to state effectiveness. Countries with more effective states also tend have older populations and more testing, to be richer, and to be located in regions that were more affected by the first wave of the pandemic. Once these factors are taken into account, our analysis suggests a relationship between state effectiveness and pandemic outcomes that more broadly conforms to our expectations. In particular, state capacity is inversely related to COVID-19 cases, deaths, and lethality. Relationships with state authority are weaker but in the expected direction (inversely related to lethality). State legitimacy is not related to any of the chosen indicators of COVID-19 health outcomes, but in our view this is less surprising given that we expect its impact to be less direct.

Interestingly, in terms of national pandemic responses, however, state authority and capacity are not directly related to either the stringency of containment and health policies or to the generosity of economic support policies in our regressions. State legitimacy, in contrast, seems to matter more for government responses: more legitimate states are associated with less severe health and containment policy measures, as well as with more generous economic support policies.

Our study is one of the first attempts to systematically examine the cross-country relationship between state effectiveness and COVID-19 outcomes. Interpreting cross-country regressions is always challenging and major data constraints present extra challenges on this topic. While care should be taken in interpreting our results, our analysis is an important first step towards a better understanding of the relationship between the state, its underlying dimensions, and COVID-19 impact. We expect future analysis to deepen as better cross-country data become available.

While we take a quantitative and cross-national approach to this topic in this paper, we also see the importance of in-depth country case studies in teasing out underlying relationships. In our view, a useful way to select case studies for such analysis would be to build our results to consider, for instance, countries that seem to be 'typical' and 'outliers' in terms of the relationship between COVID outcomes and measures of the state (see Lieberman 2005). Residual plots of our 'full' specifications (Figures C1–C15 in Appendix C) show that there are several countries that are well predicted by our models across the regressions (i.e. the residual is small). Nevertheless, there are also many observations with large residuals that are not well predicted by our models. Understanding what these 'outliers' have in common could reveal some additional factors that are related to COVID-19 but were not included in the models.

In general, we find that when COVID-19 impact is measured with cases or deaths, South Africa, Philippines, and Indonesia are among the countries with the largest positive residuals and Viet Nam, Cuba, and Uruguay are among those with the largest negative residuals. The former countries have been more affected by the virus than our models predict, whereas the latter have been less affected. When we use CFR as the outcome variable, Iran, Mexico, and China are among the countries with the largest positive residuals and Qatar, Sri Lanka, and Ivory Coast are among the countries the largest negative residuals. Overall, Switzerland, Ethiopia, and Guatemala are the most 'typical' countries of our models; their standardized residual stays within the range of –0.5 and 0.5 across all models.

As to the models predicting the severity of health and containment policies, we find that Cuba, Rwanda, and Uganda have particularly large positive residuals and Nicaragua, Belarus, and Mexico have particularly large negative residuals. Examples of 'typical' countries are Australia, Burkina Faso, and Jordan. As to the models predicting the generosity of economic support policies, we find that Malawi, Gabon, and Honduras are among the countries with particularly large positive residuals and, as before, Belarus, Nicaragua, and Mexico are among the countries with particularly large negative residuals. Examples of 'typical' countries in models predicting economic support policies are France, Niger, and Azerbaijan.

Nearly identical conclusions can be drawn from the partial regression plots of our 'full' specifications (Figures D1–D15 in Appendix D). These plots illustrate the relationship between a given outcome variable and a given measure of state effectiveness, taking into account the impact of the other covariates that were included in the models. Besides showing visually the relationship between COVID-19 and state effectiveness, as residual plots, partial regression plots are useful for identifying countries that conform to the general trend and countries that do not fit the general trend. Obviously, the further away a given observation is from the fit line, the less it fits the general trend, and vice versa.

In our data, there seems to be no obvious factor that distinguishes the 'outliers' identified above from more typical countries. Nevertheless, we expect that focused country case studies will reveal additional information difficult to distinguish at the cross-country level. We are developing such an analysis in continuing work on this topic.

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Appendix A

Table A1: State authority (DIE) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		**Ln(Deaths/mil. pop.)**		**Ln(Case fatality rate)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Authority (DIE)	-2.382***	-0.818	-3.157***	-0.881	-0.774***	-0.064
	(0.719)	(0.732)	(0.728)	(0.913)	(0.292)	(0.417)
Ln(GDP/capita)	0.172	0.318*	0.245	0.237	0.073	-0.081
	(0.155)	(0.165)	(0.191)	(0.199)	(0.108)	(0.113)
Population density	-0.0001	0.0003***	-0.0005***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00003)	(0.00005)
Population, 65+	0.004	-0.045	0.036	-0.035	0.032*	0.010
	(0.020)	(0.040)	(0.026)	(0.043)	(0.017)	(0.020)
Ln(Tests/1,000 pop.)	0.774***	0.194	0.576***	0.025	-0.197***	-0.169*
	(0.141)	(0.155)	(0.179)	(0.183)	(0.072)	(0.092)
East Asia-Pacific		-3.192***		-3.224***		-0.032
		(0.541)		(0.565)		(0.296)
S. America-Caribbean		-0.506		-0.246		0.260
		(0.629)		(0.701)		(0.239)
Middle East-N. Africa		-0.379		-0.691		-0.313
		(0.570)		(0.606)		(0.295)
North America		-0.330		0.366		0.696***
		(0.476)		(0.394)		(0.213)
South Asia		-1.198		-2.013**		-0.815*
		(0.733)		(0.953)		(0.447)
Sub-Saharan Africa		-2.180***		-2.856***		-0.677*
		(0.802)		(0.918)		(0.341)
R^2	0.49	0.71	0.42	0.64	0.38	0.48
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A2: State authority (FSI) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		**Ln(Deaths/mil. pop.)**		**Ln(Case fatality rate)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Authority (FSI)	-1.346	-0.311	-2.860**	-1.530	-1.514***	-1.219***
	(1.024)	(0.884)	(1.145)	(0.958)	(0.440)	(0.449)
Ln(GDP/capita)	0.228	0.318	0.387*	0.331	0.159*	0.013
	(0.182)	(0.192)	(0.215)	(0.220)	(0.094)	(0.102)
Population density	-0.0001*	0.0003***	-0.001***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00004)	(0.00004)
Population, 65+	-0.013	-0.052	0.026	-0.026	0.039**	0.026
	(0.023)	(0.041)	(0.028)	(0.044)	(0.016)	(0.020)
Ln(Tests/1,000 pop.)	0.760***	0.203	0.576***	0.076	-0.184**	-0.127
	(0.148)	(0.163)	(0.182)	(0.185)	(0.071)	(0.090)
East Asia-Pacific		-3.254***		-3.230***		0.024
		(0.560)		(0.566)		(0.288)
S. America-Caribbean		-0.313		-0.032		0.281
		(0.608)		(0.672)		(0.206)
Middle East-N. Africa		-0.429		-0.728		-0.299
		(0.577)		(0.598)		(0.273)
North America		-0.264		0.396		0.660***
		(0.507)		(0.381)		(0.218)
South Asia		-1.231		-1.983**		-0.752*
		(0.747)		(0.974)		(0.449)
Sub-Saharan Africa		-2.157**		-2.578***		-0.421
		(0.876)		(0.961)		(0.333)
R^2	0.44	0.71	0.38	0.65	0.43	0.53
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors’ construction.

Table A3: State capacity (DIE) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		Ln(Deaths/mil. pop.)		Ln(Case fatality rate)	
	(1)	(2)	(3)	(4)	(5)	(6)
Capacity (DIE)	-3.015*	-3.297**	-4.291**	-5.382***	-1.276	-2.085**
	(1.809)	(1.573)	(2.144)	(1.823)	(0.905)	(0.861)
Ln(GDP/capita)	0.349*	0.473**	0.500**	0.503**	0.151	0.031
	(0.194)	(0.199)	(0.233)	(0.228)	(0.114)	(0.107)
Population density	-0.0001*	0.0003***	-0.001***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00003)	(0.00005)
Population, 65+	0.012	-0.006	0.052	0.035	0.039*	0.041
	(0.030)	(0.042)	(0.040)	(0.044)	(0.023)	(0.025)
Ln(Tests/1,000 pop.)	0.818***	0.280*	0.643***	0.166	-0.175**	-0.114
	(0.177)	(0.155)	(0.224)	(0.191)	(0.084)	(0.102)
East Asia-Pacific		-3.153***		-3.118***		0.036
		(0.544)		(0.548)		(0.298)
S. America-Caribbean		-0.253		0.060		0.314
		(0.572)		(0.629)		(0.221)
Middle East-N. Africa		-0.263		-0.473		-0.209
		(0.560)		(0.580)		(0.296)
North America		-0.423		0.172		0.594**
		(0.464)		(0.354)		(0.229)
South Asia		-1.324**		-2.191***		-0.866**
		(0.649)		(0.766)		(0.385)
Sub-Saharan Africa		-2.352***		-3.114***		-0.762**
		(0.752)		(0.820)		(0.329)
R^2	0.44	0.73	0.35	0.68	0.36	0.51
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A4: State capacity (FSI) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		**Ln(Deaths/mil. pop.)**		**Ln(Case fatality rate)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Authority (FSI)	-3.766**	-2.812**	-5.484***	-4.807***	-1.718**	-1.996***
	(1.736)	(1.382)	(1.765)	(1.463)	(0.667)	(0.631)
Ln(GDP/capita)	0.524**	0.539**	0.762***	0.631***	0.238**	0.092
	(0.229)	(0.214)	(0.262)	(0.231)	(0.114)	(0.102)
Population density	-0.0001*	0.0003***	-0.001***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00003)	(0.00004)
Population, 65+	0.002	-0.033	0.038	-0.008	0.036**	0.025
	(0.024)	(0.038)	(0.028)	(0.038)	(0.018)	(0.020)
Ln(Tests/1,000 pop.)	0.888***	0.284*	0.748***	0.180	-0.140*	-0.104
	(0.178)	(0.167)	(0.204)	(0.187)	(0.078)	(0.095)
East Asia-Pacific		-3.157***		-3.115***		0.042
		(0.565)		(0.538)		(0.272)
S. America-Caribbean		-0.480		-0.322		0.158
		(0.585)		(0.624)		(0.201)
Middle East-N. Africa		-0.315		-0.548		-0.233
		(0.554)		(0.594)		(0.303)
North America		-0.108		0.696*		0.804***
		(0.478)		(0.355)		(0.220)
South Asia		-1.359**		-2.255***		-0.897**
		(0.677)		(0.800)		(0.384)
Sub-Saharan Africa		-2.453***		-3.296***		-0.843***
		(0.754)		(0.802)		(0.318)
R^2	0.47	0.73	0.40	0.69	0.39	0.54
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A5: State legitimacy (DIE) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		**Ln(Deaths/mil. pop.)**		**Ln(Case fatality rate)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Authority (DIE)	0.607	0.939	0.071	0.740	-0.536	-0.199
	(0.996)	(0.785)	(1.055)	(0.925)	(0.359)	(0.394)
Ln(GDP/capita)	0.095	0.176	0.202	0.118	0.107	-0.058
	(0.185)	(0.176)	(0.236)	(0.221)	(0.120)	(0.126)
Population density	-0.0001**	0.0003***	-0.001***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00003)	(0.0001)
Population, 65+	-0.038	-0.071	-0.008	-0.059	0.030*	0.012
	(0.027)	(0.044)	(0.032)	(0.048)	(0.018)	(0.021)
Ln(Tests/1,000 pop.)	0.767***	0.219	0.532**	0.044	-0.235***	-0.175*
	(0.170)	(0.149)	(0.220)	(0.179)	(0.082)	(0.093)
East Asia-Pacific		-3.237***		-3.282***		-0.045
		(0.542)		(0.554)		(0.291)
S. America-Caribbean		-0.369		-0.083		0.287
		(0.599)		(0.682)		(0.227)
Middle East-N. Africa		-0.363		-0.695		-0.332
		(0.562)		(0.584)		(0.287)
North America		-0.221		0.474		0.695***
		(0.592)		(0.469)		(0.219)
South Asia		-1.416*		-2.199**		-0.783*
		(0.753)		(1.004)		(0.467)
Sub-Saharan Africa		-2.502***		-3.123***		-0.621*
		(0.927)		(1.086)		(0.370)
R^2	0.43	0.72	0.32	0.64	0.36	0.49
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors’ construction.

Table A6: State legitimacy (FSI) and COVID-19 health outcomes

	Dependent variable:					
	Ln(Cases/mil. pop.)		**Ln(Deaths/mil. pop.)**		**Ln(Case fatality rate)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Authority (FSI)	0.174	0.640	-0.157	0.330	-0.331	-0.310
	(0.871)	(0.692)	(0.896)	(0.835)	(0.309)	(0.360)
Ln(GDP/capita)	0.126	0.213	0.224	0.169	0.097	-0.044
	(0.181)	(0.170)	(0.231)	(0.213)	(0.120)	(0.119)
Population density	-0.0001***	0.0003***	-0.001***	-0.0001	-0.0004***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00003)	(0.00005)
Population, 65+	-0.032	-0.069	-0.004	-0.054	0.027	0.015
	(0.026)	(0.045)	(0.032)	(0.050)	(0.017)	(0.022)
Ln(Tests/1,000 pop.)	0.745***	0.187	0.522**	0.021	-0.222***	-0.166*
	(0.165)	(0.154)	(0.213)	(0.183)	(0.079)	(0.093)
East Asia-Pacific		-3.338***		-3.343***		-0.005
		(0.571)		(0.587)		(0.304)
S. America-Caribbean		-0.455		-0.112		0.343
		(0.648)		(0.745)		(0.249)
Middle East-N. Africa		-0.429		-0.748		-0.319
		(0.572)		(0.606)		(0.295)
North America		-0.335		0.406		0.741***
		(0.561)		(0.447)		(0.225)
South Asia		-1.450*		-2.171**		-0.721
		(0.780)		(1.045)		(0.498)
Sub-Saharan Africa		-2.470***		-3.030***		-0.560
		(0.932)		(1.095)		(0.381)
R^2	0.43	0.71	0.32	0.64	0.35	0.49
N	96	96	96	96	96	96

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors’ construction.

Table A7: State authority and containment and health policies

	Dependent variable: Containment and health index (CHI)			
	(1)	**(2)**	**(3)**	**(4)**
Authority (DIE)	-3.306	-0.500		
	(4.932)	(5.933)		
Authority (FSI)			-5.684	-4.506
			(5.431)	(6.017)
Ln(GDP/capita)	1.291*	1.544	1.637*	2.000*
	(0.745)	(0.953)	(0.852)	(1.151)
Population density	0.001**	0.001	0.001***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	-0.997***	-1.193***	-0.981***	-1.158***
	(0.172)	(0.264)	(0.167)	(0.261)
Deaths	3.118***	4.013***	3.109***	3.937***
	(0.645)	(0.947)	(0.627)	(0.930)
East Asia-Pacific		8.745**		8.368*
		(4.340)		(4.252)
S. America-Caribbean		2.724		2.614
		(4.350)		(3.765)
Middle East-N. Africa		-4.529		-4.891
		(4.119)		(4.139)
North America		-3.635		-3.770
		(2.536)		(2.546)
South Asia		5.346		5.097
		(4.465)		(4.467)
Sub-Saharan Africa		1.796		2.024
		(4.171)		(4.212)
R^2	0.31	0.31	0.34	0.37
N	139	139	126	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A8: State authority and economic support policies

	Dependent variable: Economic support index (ESI)			
	(1)	**(2)**	**(3)**	**(4)**
Authority (DIE)	11.315	19.829*		
	(10.325)	(11.078)		
Authority (FSI)			14.237	14.980
			(13.477)	(13.773)
Ln(GDP/capita)	4.570**	5.460***	3.850*	4.708*
	(1.847)	(2.090)	(2.317)	(2.679)
Population density	0.002*	0.002	0.002*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	0.297	0.205	0.301	0.292
	(0.326)	(0.439)	(0.334)	(0.471)
Deaths	1.599	1.198	1.514	1.146
	(1.083)	(1.366)	(1.098)	(1.368)
East Asia-Pacific		-2.385		-0.989
		(6.710)		(6.841)
S. America-Caribbean		9.549		5.193
		(6.292)		(5.786)
Middle East-N. Africa		-2.196		-1.383
		(7.630)		(8.370)
North America		-6.127		-7.452
		(5.660)		(6.295)
South Asia		8.796		8.451
		(8.017)		(8.650)
Sub-Saharan Africa		2.867		1.452
		(7.052)		(7.206)
R^2	0.30	0.33	0.30	0.31
N	139	139	139	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A9: State capacity and containment and health policies

	Dependent variable: Containment and health index (CHI)			
	(1)	**(2)**	**(3)**	**(4)**
Capacity (DIE)	-8.129	-7.136		
	(10.386)	(10.296)		
Capacity (FSI)			-7.591	-2.057
			(7.288)	(8.919)
Ln(GDP/capita)	1.811	2.072	2.046*	1.740
	(1.265)	(1.301)	(1.202)	(1.303)
Population density	0.002**	0.001	0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	-0.915***	-1.092***	-0.959***	-1.183***
	(0.211)	(0.292)	(0.162)	(0.263)
Deaths	3.271***	3.961***	3.239***	3.997***
	(0.653)	(0.917)	(0.640)	(0.946)
East Asia-Pacific		8.358**		8.543**
		(4.181)		(4.301)
S. America-Caribbean		2.809		2.595
		(3.755)		(4.012)
Middle East-N. Africa		-4.486		-4.559
		(4.122)		(4.111)
North America		-3.985		-3.506
		(2.657)		(2.457)
South Asia		5.084		5.093
		(4.481)		(4.518)
Sub-Saharan Africa		0.989		1.408
		(4.112)		(4.449)
R^2	0.31	0.37	0.32	0.37
N	139	139	139	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A10: State capacity and economic support policies

	Dependent variable: Economic support index (ESI)			
	(1)	**(2)**	**(3)**	**(4)**
Capacity (DIE)	30.904	36.459		
	(21.321)	(24.278)		
Capacity (FSI)			12.832	24.606
			(12.433)	(16.521)
Ln(GDP/capita)	2.529	3.488	3.573	3.697
	(2.786)	(2.966)	(2.538)	(2.892)
Population density	0.002	0.002	0.002*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	-0.034	-0.118	0.317	0.240
	(0.432)	(0.526)	(0.312)	(0.448)
Deaths	1.061	1.173	1.190	1.157
	(1.071)	(1.451)	(1.043)	(1.382)
East Asia-Pacific		-0.272		0.142
		(6.781)		(6.608)
S. America-Caribbean		4.625		7.488
		(5.827)		(6.260)
Middle East-N. Africa		-2.786		-2.134
		(7.828)		(8.239)
North America		-6.027		-9.026
		(6.331)		(6.407)
South Asia		9.017		10.929
		(9.685)		(9.053)
Sub-Saharan Africa		6.363		7.012
		(8.402)		(8.482)
R^2	0.31	0.33	0.30	0.32
N	139	139	139	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A11: State legitimacy and containment and health policies

	Dependent variable: Containment and health index (CHI)			
	(1)	**(2)**	**(3)**	**(4)**
Legitimacy (DIE)	-12.660**	-16.329**		
	(6.245)	(6.730)		
Legitimacy (FSI)			-5.641	-10.505**
			(4.987)	(5.095)
Ln(GDP/capita)	1.687**	2.674***	1.521*	2.542**
	(0.819)	(1.003)	(0.814)	(1.003)
Population density	0.001	0.0001	0.001**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	-0.844***	-0.905***	-0.945***	-0.966***
	(0.202)	(0.269)	(0.192)	(0.264)
Deaths	3.055***	3.959***	3.156***	4.038***
	(0.627)	(0.904)	(0.631)	(0.911)
East Asia-Pacific		8.744**		9.707**
		(4.142)		(4.069)
S. America-Caribbean		4.067		4.474
		(3.258)		(3.684)
Middle East-N. Africa		-5.096		-4.599
		(3.948)		(4.017)
North America		-3.440		-2.009
		(3.607)		(2.883)
South Asia		7.033		7.736*
		(4.518)		(4.453)
Sub-Saharan Africa		5.200		4.768
		(4.208)		(3.982)
R^2	0.34	0.41	0.32	0.39
N	139	139	139	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Table A12: State legitimacy and economic support policies

	Dependent variable: Economic support index (ESI)			
	(1)	**(2)**	**(3)**	**(4)**
Legitimacy (DIE)	17.370*	16.927		
	(10.034)	(11.161)		
Legitimacy (FSI)			16.922*	16.904*
			(9.084)	(9.850)
Ln(GDP/capita)	4.359**	5.100**	3.946**	4.653**
	(1.751)	(2.244)	(1.841)	(2.308)
Population density	0.003**	0.003**	0.003**	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Population, 65+	0.187	0.125	0.159	0.055
	(0.344)	(0.468)	(0.344)	(0.475)
Deaths	1.444	0.931	1.435	0.839
	(1.021)	(1.285)	(1.034)	(1.314)
East Asia-Pacific		-2.233		-3.785
		(6.612)		(6.698)
S. America-Caribbean		3.137		1.787
		(5.707)		(5.677)
Middle East-N. Africa		-2.024		-2.492
		(8.357)		(8.183)
North America		-8.215		-10.601*
		(5.111)		(5.655)
South Asia		5.797		3.719
		(8.881)		(8.757)
Sub-Saharan Africa		-1.363		-2.606
		(7.319)		(7.113)
R^2	0.31	0.32	0.31	0.32
N	139	139	139	139

Note: robust standard errors in parentheses; * p<0.10, ** p<0.05, ***p<0.01. Constant coefficient measured but not reported. Reference macro-region category: Europe and Central Asia.

Source: authors' construction.

Appendix B

Table B1: Data sources for cross-section regressions

Variable	Source	Year
State authority (DIE)	Ziaja et al. (2019)	2015
State capacity (DIE)	Ziaja et al. (2019)	2015
State legitimacy (DIE)	Ziaja et al. (2019)	2015
State authority (FSI)	Fund for Peace (2019)	2019
State capacity (FSI)	Fund for Peace (2019)	2019
State legitimacy (FSI)	Fund for Peace (2019)	2019
Total cases/million pop.	European Centre for Disease Prevention and Control (2020)	2020
Total deaths/million pop.	European Centre for Disease Prevention and Control (2020)	2020
Case fatality rate	Own calculation (based on total cases and deaths)	2020
Total tests/1,000 pop.	Our World in Data (2020)	2020
Economic support index	Oxford COVID-19 Government Response Tracker (Hale et al. 2020)	2020
Containment and health index	Oxford COVID-19 Government Response Tracker (Hale et al. 2020)	2020
GDP/capita	World Development Indicators, World Bank (2020)	2018
Population density	World Development Indicators, World Bank (2020)	2018
Population, 65+	World Development Indicators, World Bank (2020)	2019

Source: authors' construction.

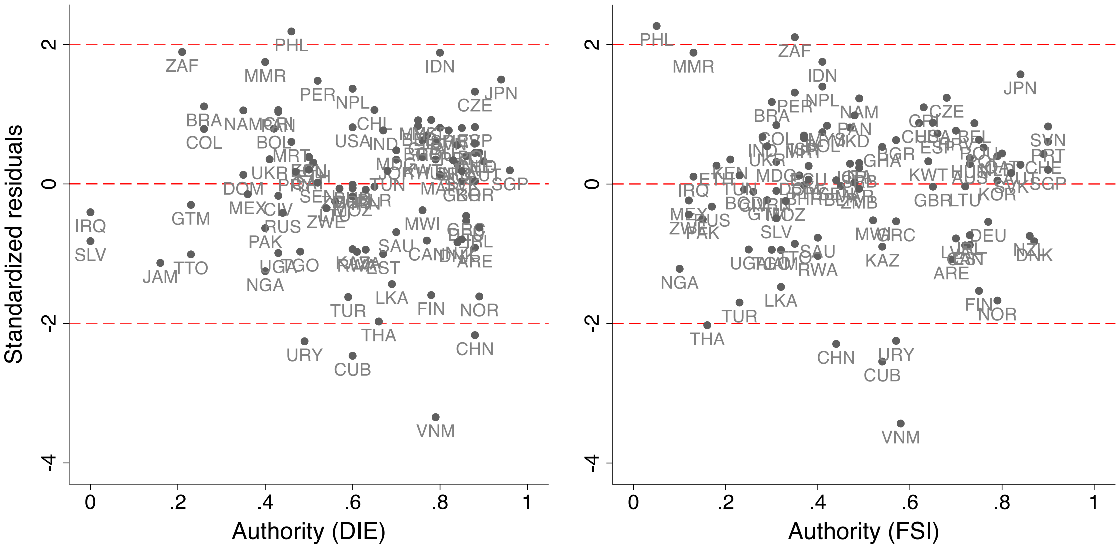
Table B2: Summary statistics

Variable	Obs.	Mean	SD	Min.	Max.
State authority (DIE)	152	0.5781579	0.2295675	0.00	0.96
State capacity (DIE)	152	0.5571053	0.249005	0.10	0.97
State legitimacy (DIE)	152	0.4852632	0.2302517	0.00	0.96
State authority (FSI)	153	0.4330719	0.2313612	0.00	0.90
State capacity (FSI)	153	0.4733987	0.276001	0.00	0.93
State legitimacy (FSI)	153	0.4733987	0.276001	0.00	0.93
Ln(Total cases/million pop.)	154	7.878855	2.101135	1.193619	10.81322
Ln(Total deaths/million pop.)	149	3.990609	1.968729	-2.476938	7.135649
Ln(Case fatality rate)	149	0.5667412	0.7902514	-3.032822	3.370818
Ln(Total tests/1,000 pop.)	97	4.409969	1.457746	1.211346	7.322867
Economic support index	149	44.84435	22.45657	0.00	92.01923
Containment and health index	149	60.44193	12.29828	11.99394	81.10757
Ln(GDP/capita)	151	8.554211	1.49177	5.350832	11.43086
Population density	151	189.6984	673.1169	2.040609	7952.998
Population, 65+	153	8.995798	6.685942	1.156549	28.00205

Source: authors' construction.

Appendix C

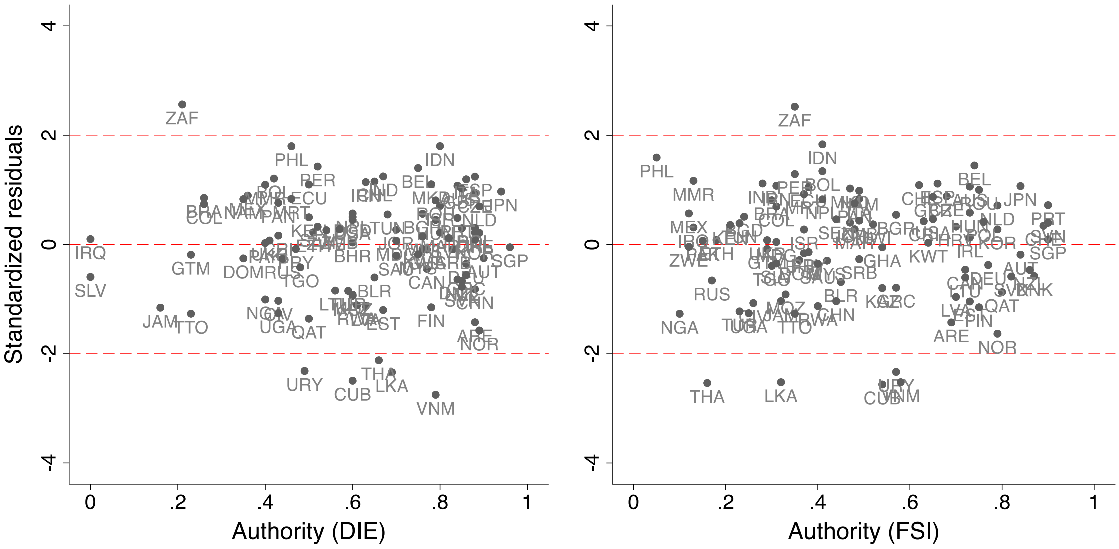
Figure C1: Standardized residuals and state authority



Note: residuals from model 2 in Table A1 on the left. Residuals from model 2 in Table A2 on the right. Dependent variable is Ln(Cases/million pop.).

Source: authors' construction.

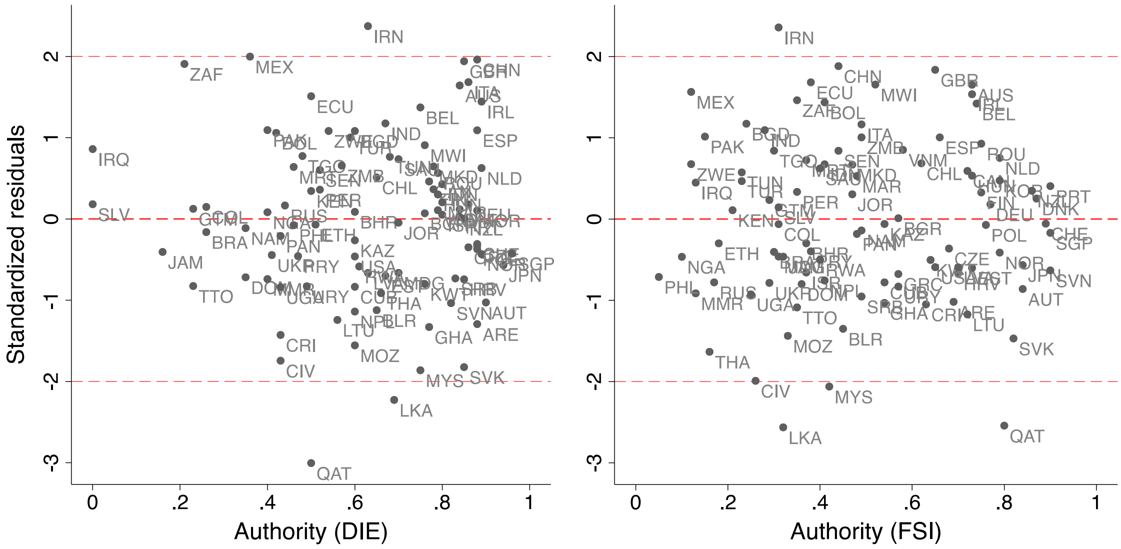
Figure C2: Standardized residuals and state authority



Note: residuals from model 4 in Table A1 on the left. Residuals from model 4 in Table A2 on the right. Dependent variable is Ln(Deaths/million pop.).

Source: authors' construction.

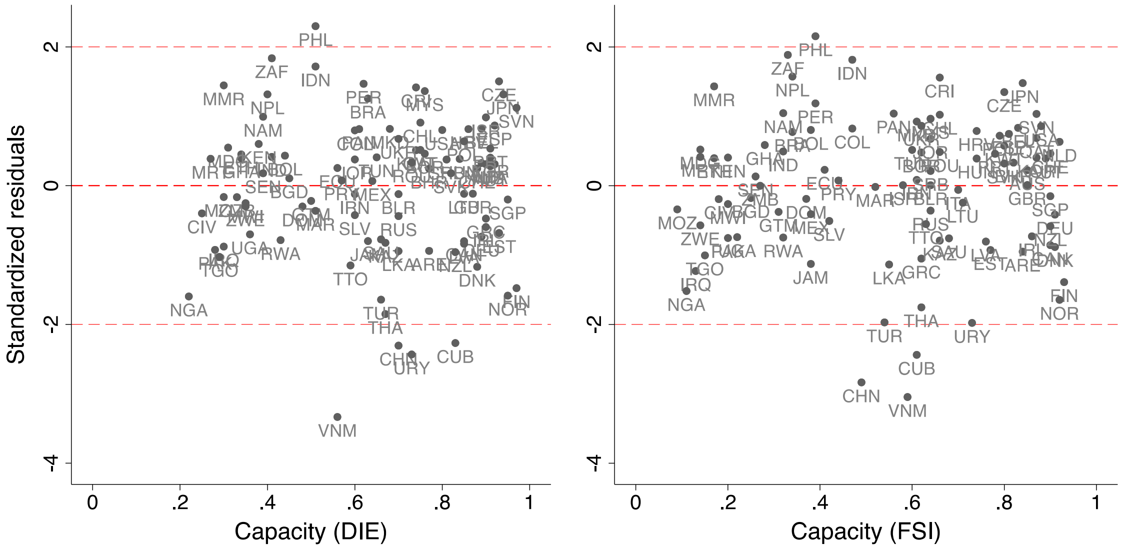
Figure C3: Standardized residuals and state authority



Note: residuals from model 6 in Table A1 on the left. Residuals from model 6 in Table A2 on the right. Dependent variable is Ln(Case fatality rate).

Source: authors' construction.

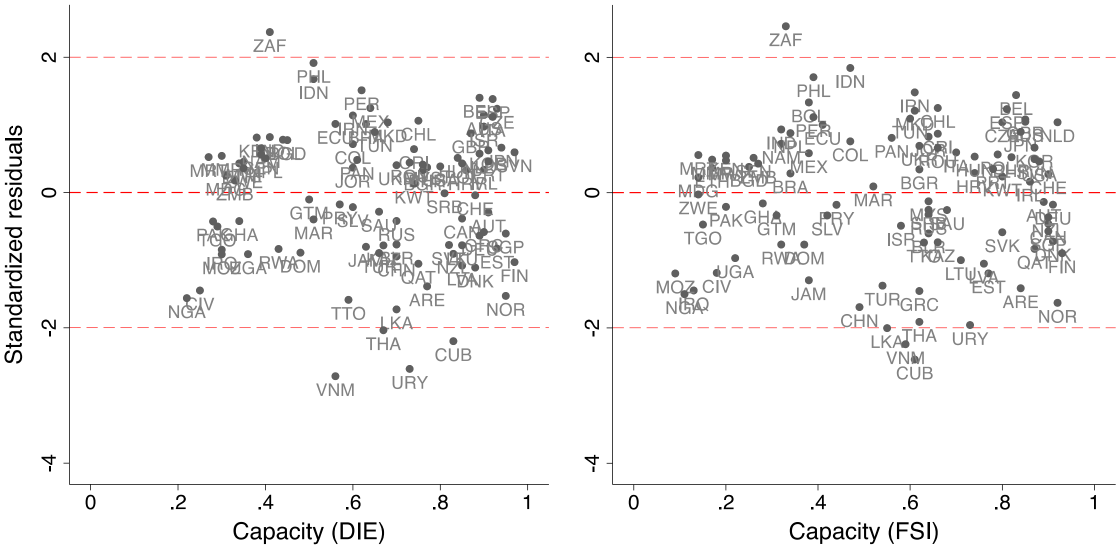
Figure C4: Standardized residuals and state capacity



Note: residuals from model 2 in Table A3 on the left. Residuals from model 2 in Table A4 on the right. Dependent variable is Ln(Cases/million pop.).

Source: authors' construction.

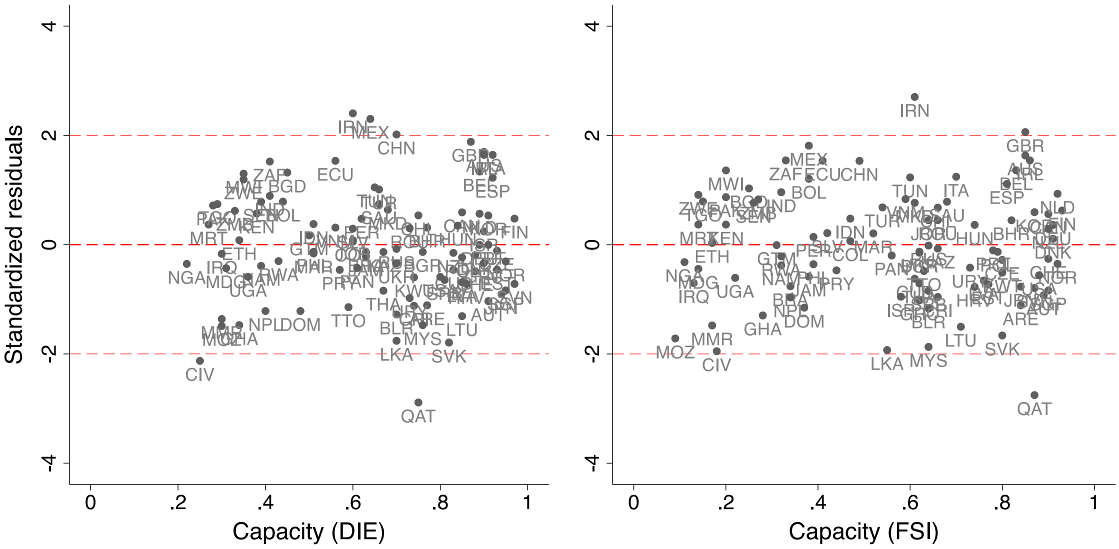
Figure C5: Standardized residuals and state capacity



Note: residuals from model 4 in Table A3 on the left. Residuals from model 4 in Table A4 on the right. Dependent variable is Ln(Deaths/million pop.).

Source: authors' construction.

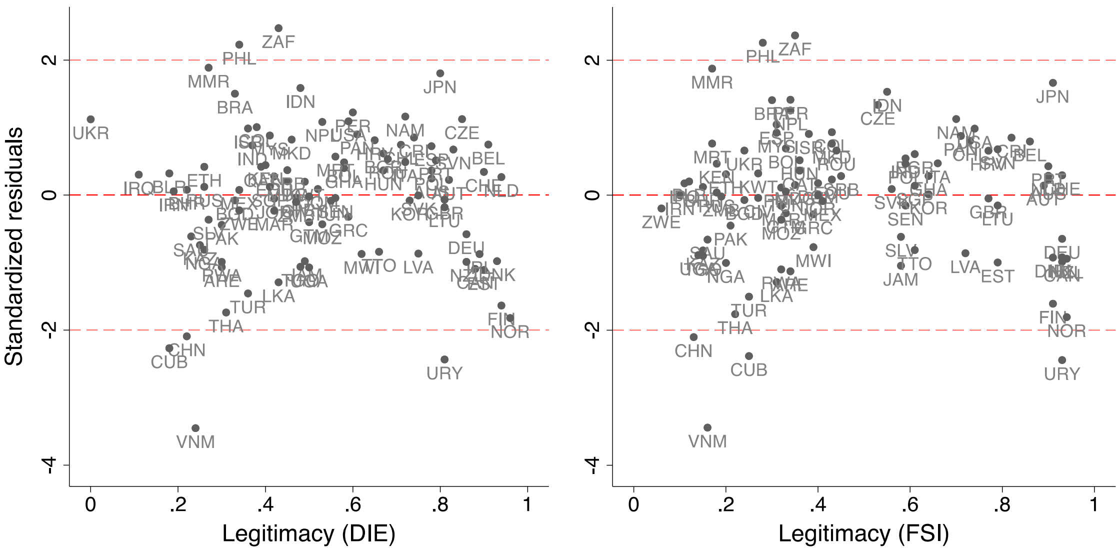
Figure C6: Standardized residuals and state capacity



Note: residuals from model 6 in Table A3 on the left. Residuals from model 6 in Table A4 on the right. Dependent variable is Ln(Case fatality rate).

Source: authors' construction.

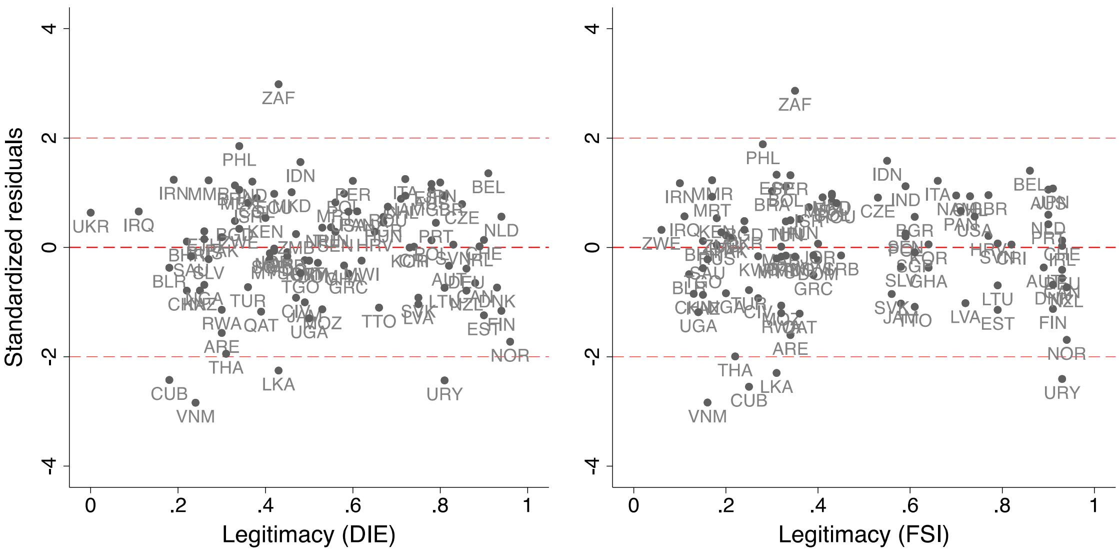
Figure C7: Standardized residuals and state legitimacy



Note: residuals from model 2 in Table A5 on the left. Residuals from model 2 in Table A6 on the right. Dependent variable is Ln(Cases/million pop.).

Source: authors' construction.

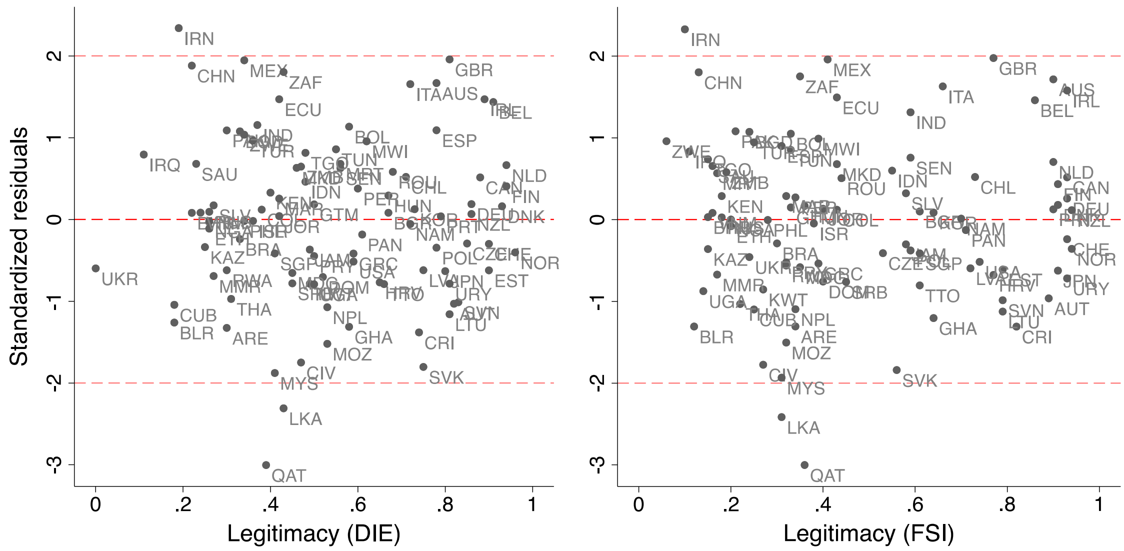
Figure C8: Standardized residuals and state legitimacy



Note: residuals from model 4 in Table A5 on the left. Residuals from model 4 in Table A6 on the right. Dependent variable is Ln(Deaths/million pop.).

Source: authors' construction.

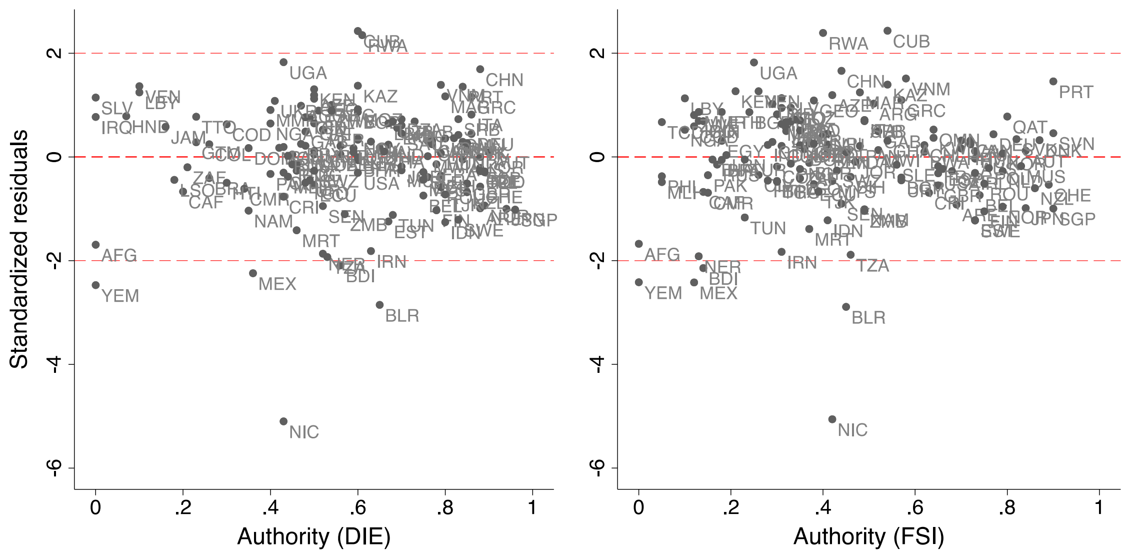
Figure C9: Standardized residuals and state legitimacy



Note: residuals from model 6 in Table A5 on the left. Residuals from model 6 in Table A6 on the right. Dependent variable is Ln(Case fatality rate).

Source: authors' construction.

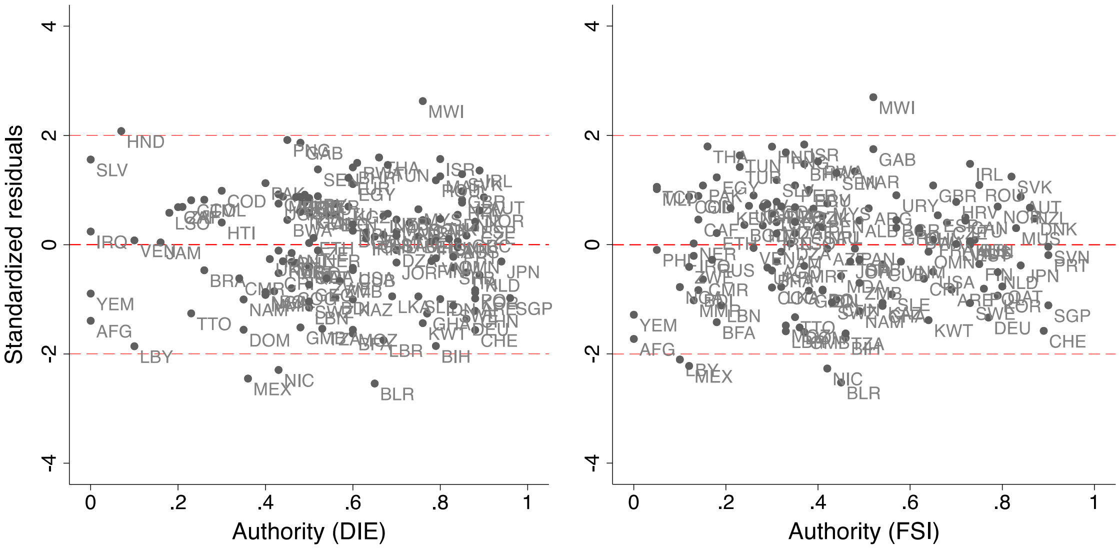
Figure C10: Standardized residuals and state authority



Note: residuals from model 2 in Table A7 on the left. Residuals from model 4 in Table A7 on the right. Dependent variable is CHI.

Source: authors' construction.

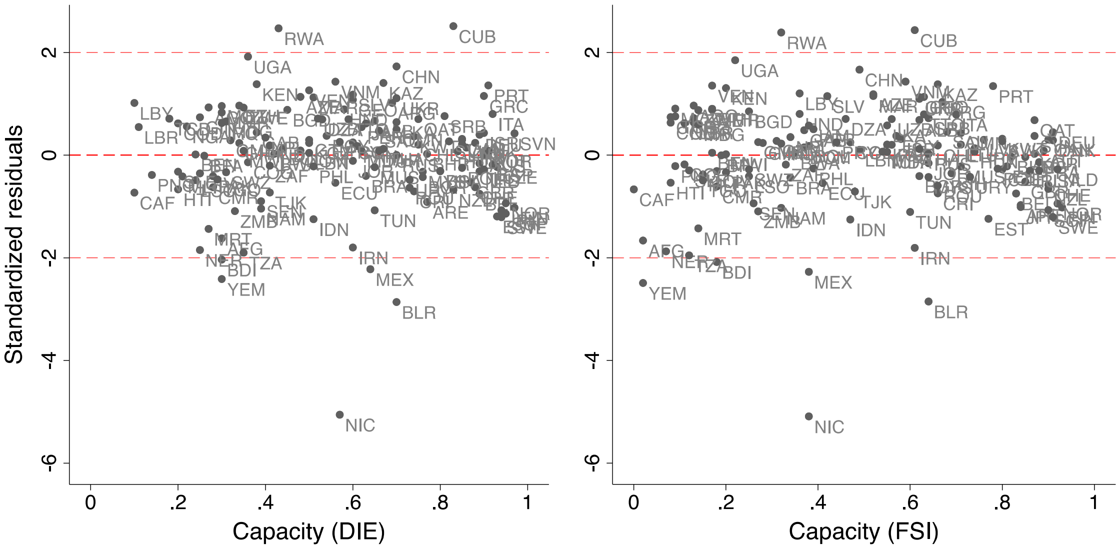
Figure C11: Standardized residuals and state authority



Note: residuals from model 2 in Table A8 on the left. Residuals from model 4 in Table A8 on the right. Dependent variable is ESI.

Source: authors' construction.

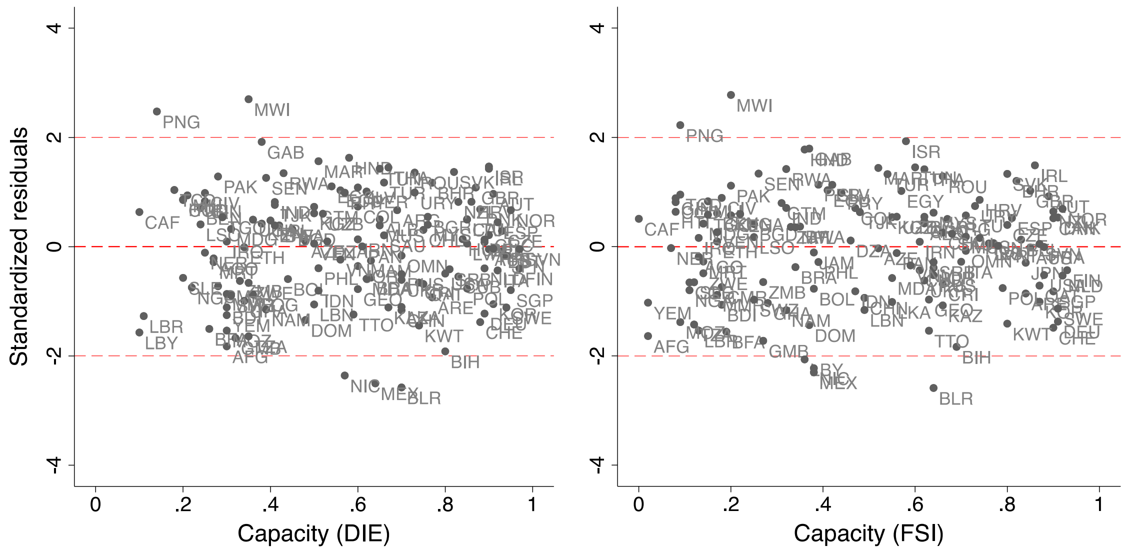
Figure C12: Standardized residuals and state capacity



Note: residuals from model 2 in Table A9 on the left. Residuals from model 4 in Table A9 on the right. Dependent variable is CHI.

Source: authors' construction.

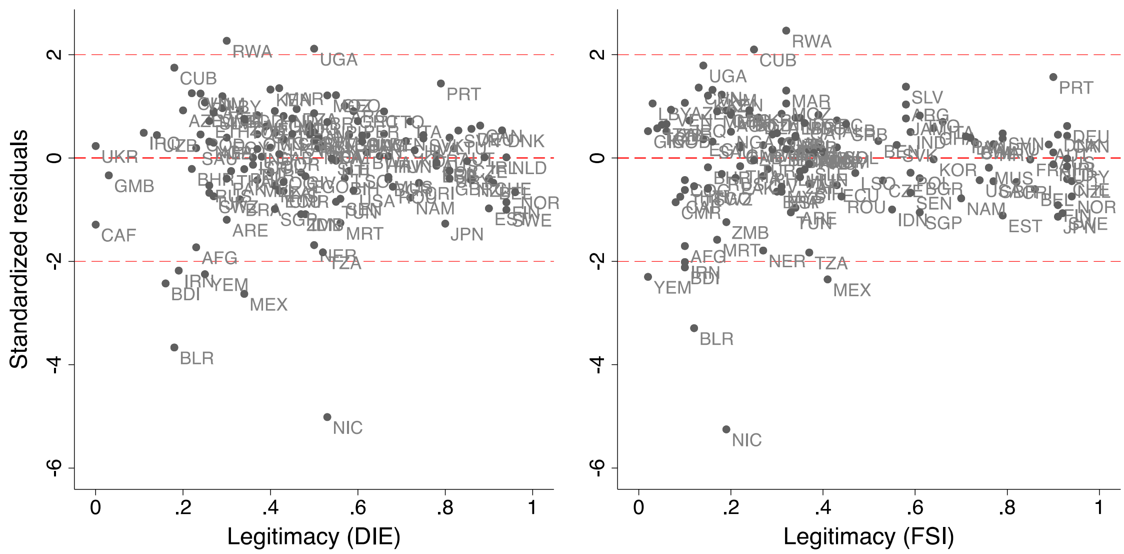
Figure C13: Standardized residuals and state capacity



Note: residuals from model 2 in Table A10 on the left. Residuals from model 4 in Table A10 on the right. Dependent variable is ESI.

Source: authors' construction.

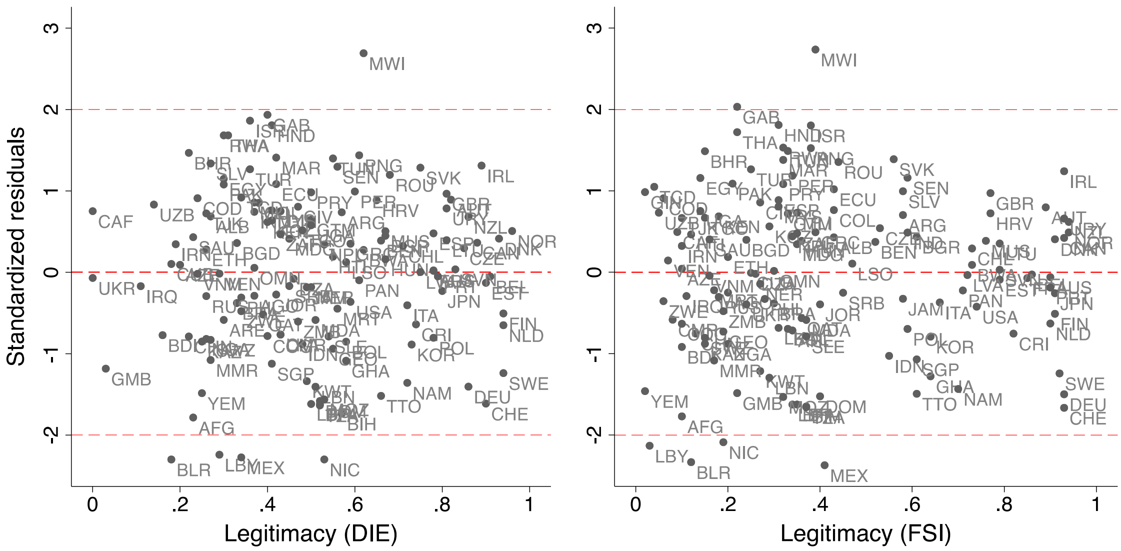
Figure C14: Standardized residuals and state capacity



Note: residuals from model 2 in Table A11 on the left. Residuals from model 4 in Table A11 on the right. Dependent variable is CHI.

Source: authors' construction.

Figure C15: Standardized residuals and state capacity

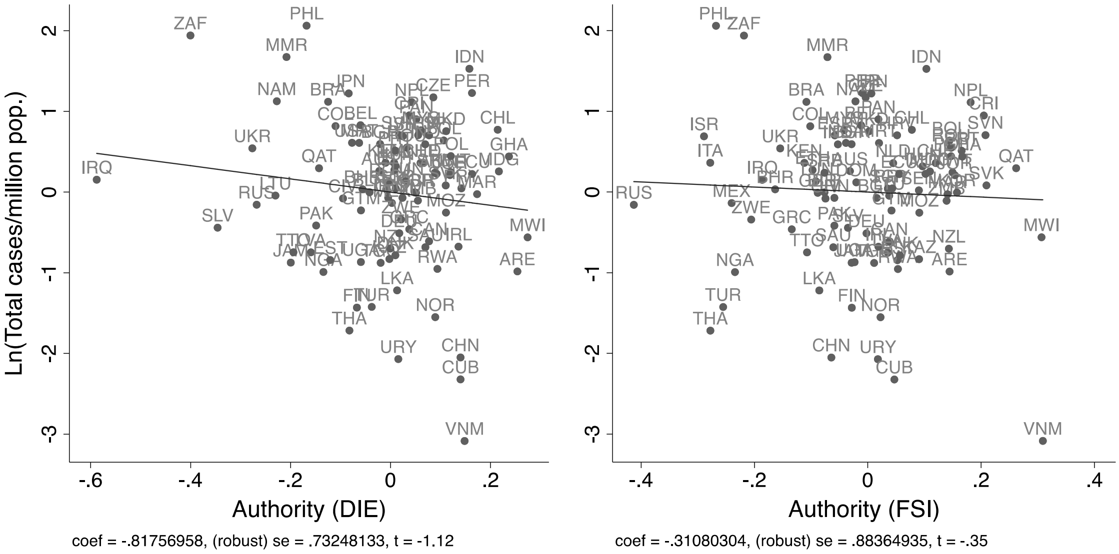


Note: residuals from model 2 in Table A12 on the left. Residuals from model 4 in Table A12 on the right. Dependent variable is ESI.

Source: authors' construction.

Appendix D

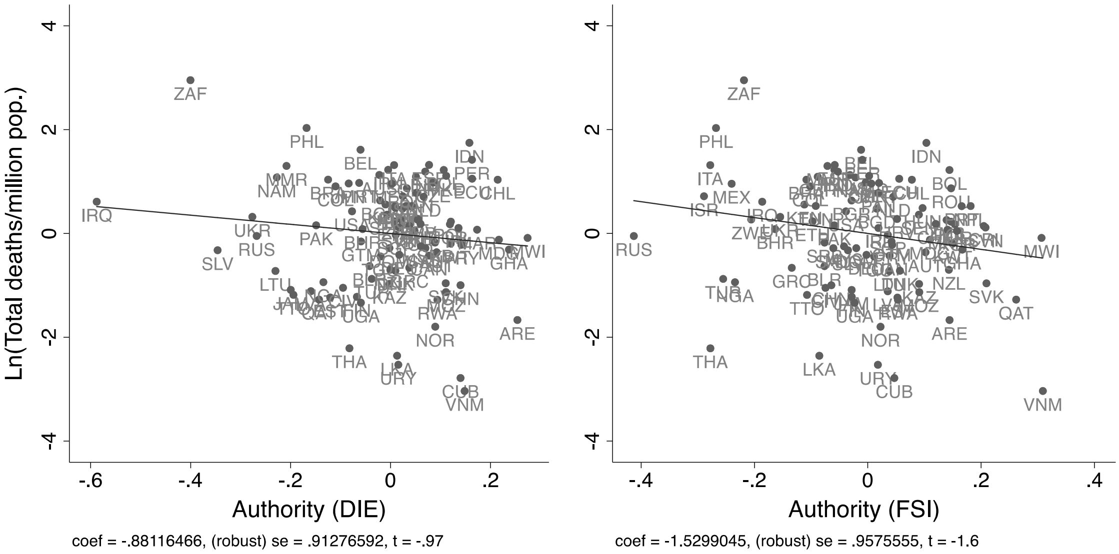
Figure D1: Partial regression plots: relationship between state authority and COVID-19 cases controlling for relevant factors



Note: partial regression plot from model 2 in Table A1 on the left. Partial regression plot from model 2 in Table A2 on the right.

Source: authors' construction.

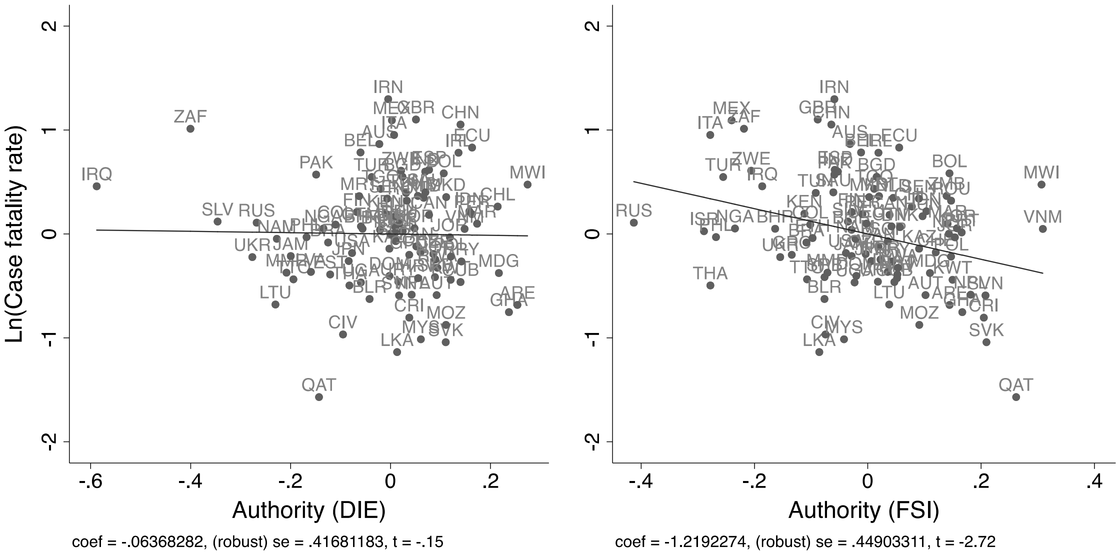
Figure D2: Partial regression plots: relationship between state authority and COVID-19 deaths controlling for relevant factors



Note: partial regression plot from model 4 in Table A1 on the left. Partial regression plot from model 4 in Table A2 on the right.

Source: authors' construction.

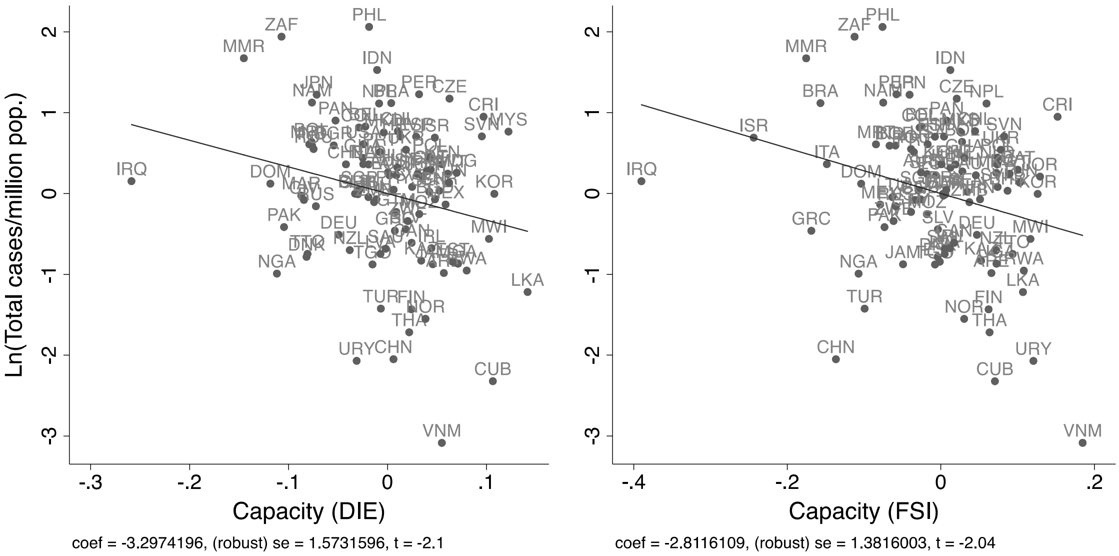
Figure D3: Partial regression plots: relationship between state authority and COVID-19 CFR controlling for relevant factors



Note: partial regression plot from model 6 in Table A1 on the left. Partial regression plot from model 6 in Table A2 on the right.

Source: authors' construction.

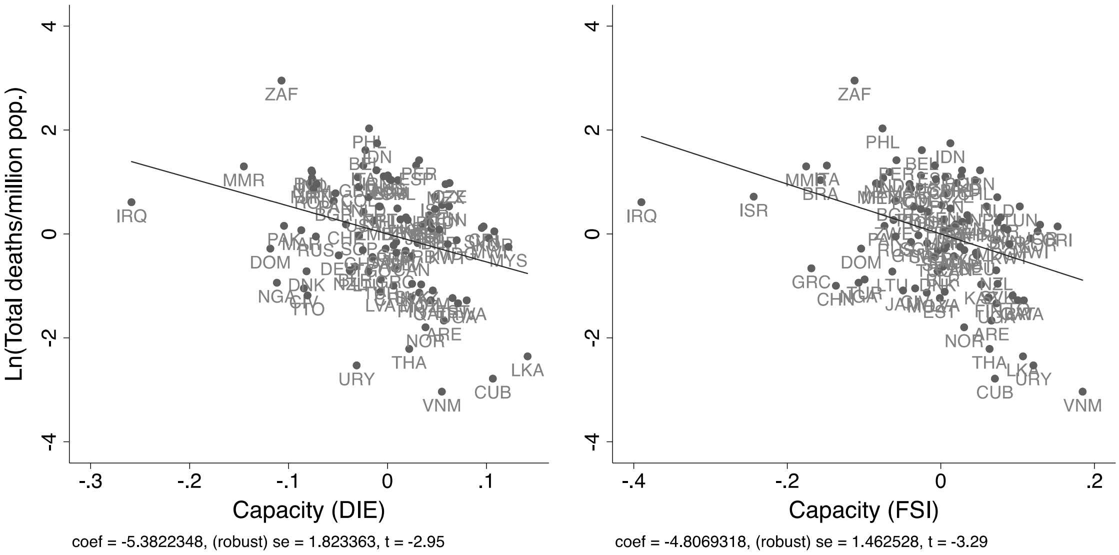
Figure D4: Partial regression plots: relationship between state capacity and COVID-19 cases controlling for relevant factors



Note: partial regression plot from model 2 in Table A3 on the left. Partial regression plot from model 2 in Table A4 on the right.

Source: authors' construction.

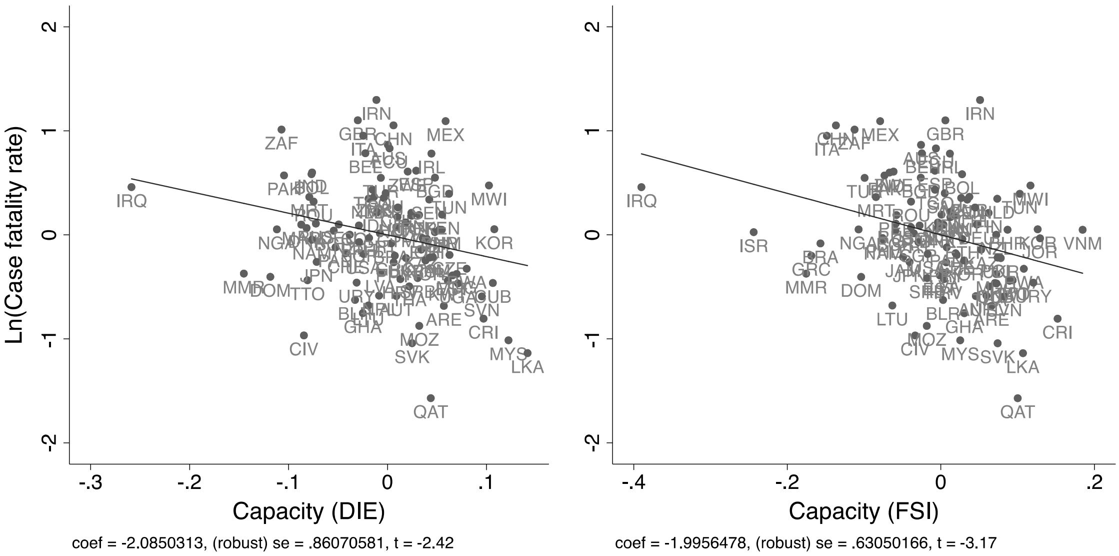
Figure D5: Partial regression plots: relationship between state capacity and COVID-19 deaths controlling for relevant factors



Note: partial regression plot from model 4 in Table A3 on the left. Partial regression plot from model 4 in Table A4 on the right.

Source: authors' construction.

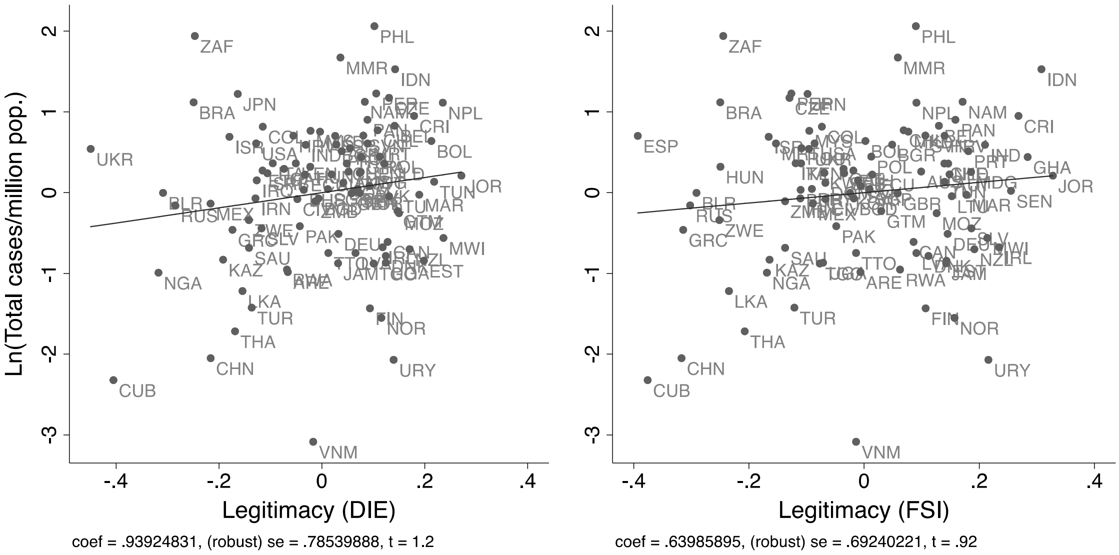
Figure D6: Partial regression plots: the relationship between state capacity and COVID-19 CFR controlling for relevant factors



Note: partial regression plot from model 6 in Table A3 on the left. Partial regression plot from model 6 in Table A4 on the right.

Source: authors' construction.

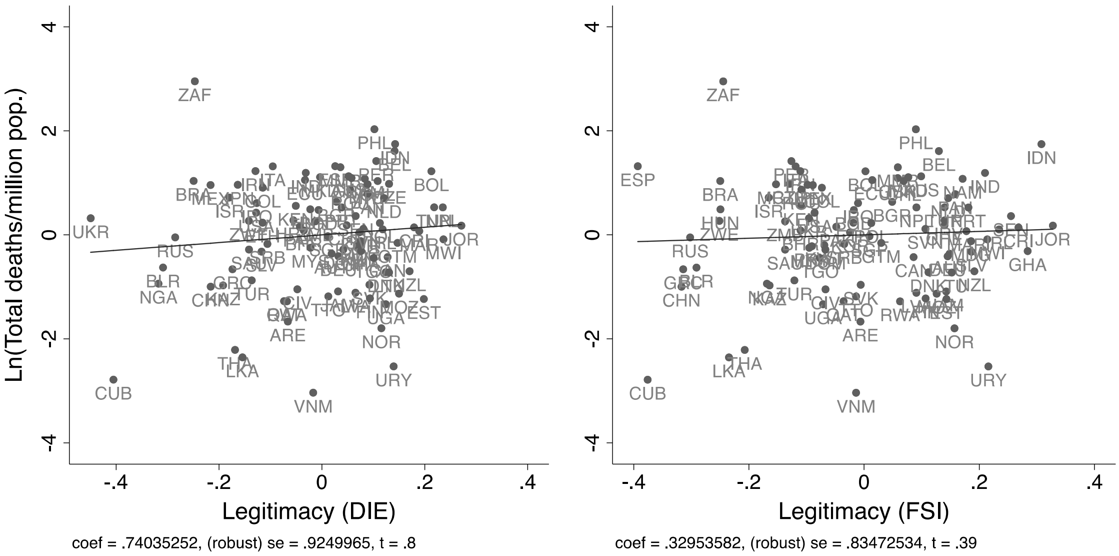
Figure D7: Partial regression plots: relationship between state legitimacy and COVID-19 cases controlling for relevant factors



Note: partial regression plot from model 2 in Table A5 on the left. Partial regression plot from model 2 in Table A6 on the right.

Source: authors' construction.

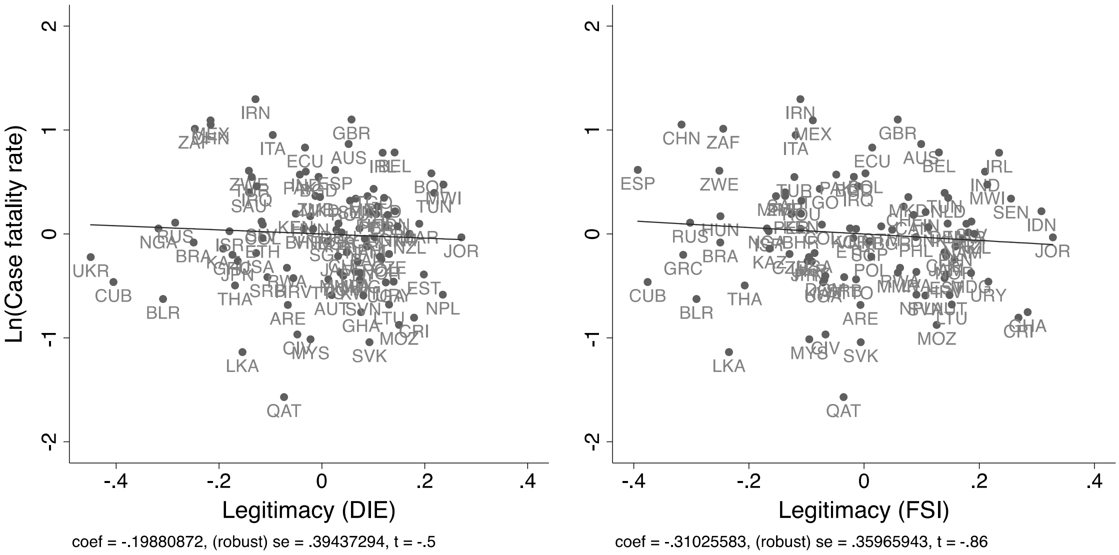
Figure D8: Partial regression plots: relationship between state legitimacy and COVID-19 deaths controlling for relevant factors



Note: partial regression plot from model 4 in Table A5 on the left. Partial regression plot from model 4 in Table A6 on the right.

Source: authors' construction.

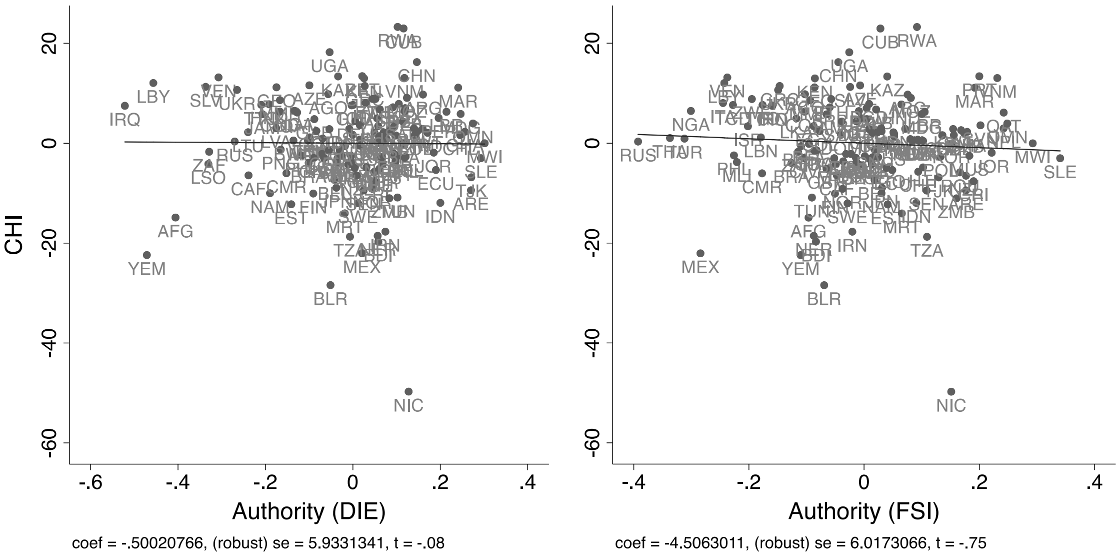
Figure D9: Partial regression plots: relationship between state legitimacy and COVID-19 CFR controlling for relevant factors



Note: partial regression plot from model 6 in Table A5 on the left. Partial regression plot from model 6 in Table A6 on the right.

Source: authors' construction.

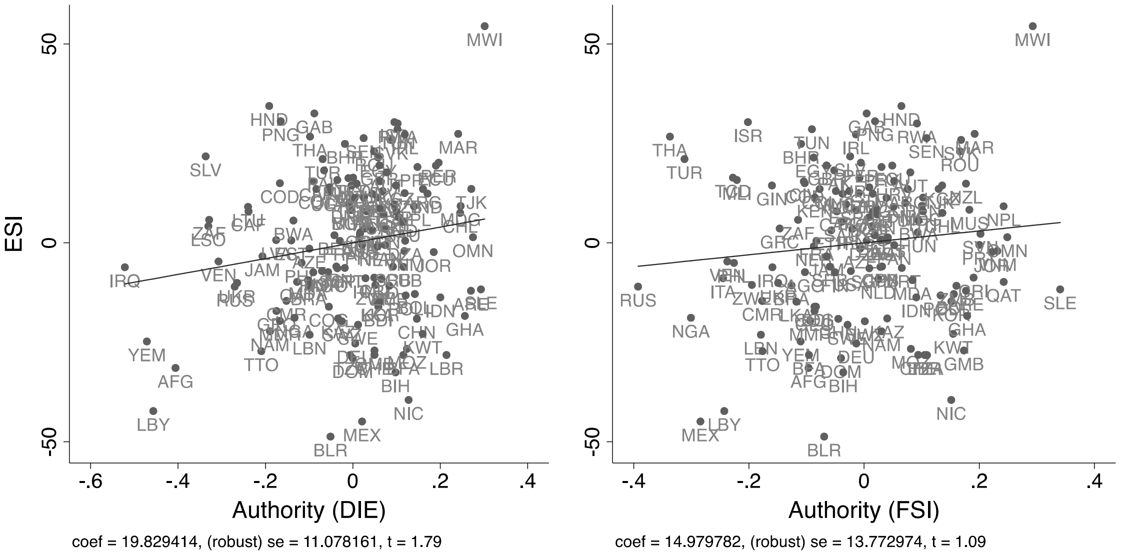
Figure D10: Partial regression plots: relationship between state authority and COVID-19 containment and health policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A7 on the left. Partial regression plot from model 4 in Table A7 on the right.

Source: authors' construction.

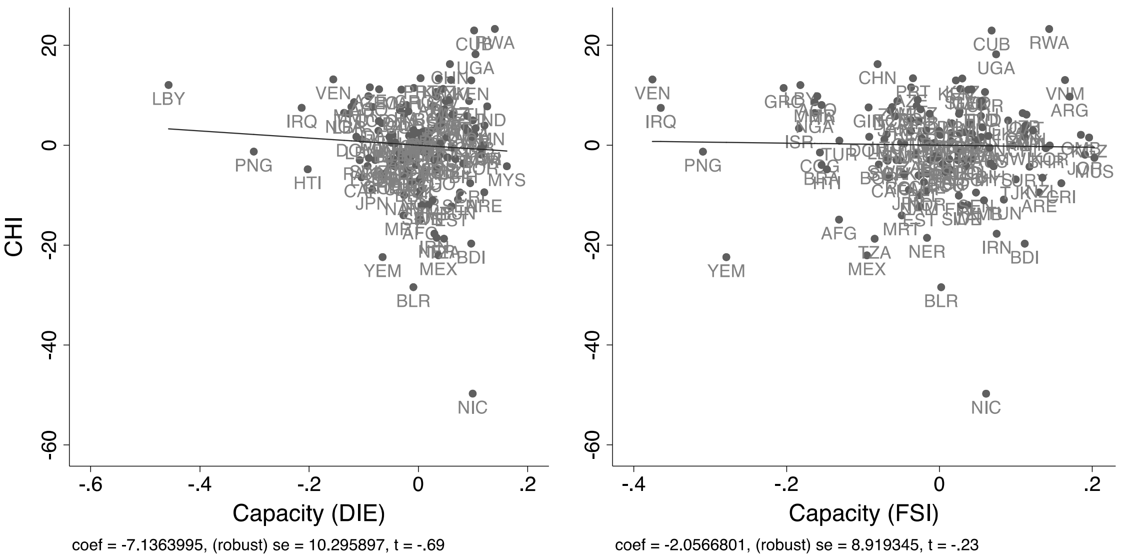
Figure D11: Partial regression plots: relationship between state authority and COVID-19 economic support policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A8 on the left. Partial regression plot from model 4 in Table A8 on the right.

Source: authors' construction.

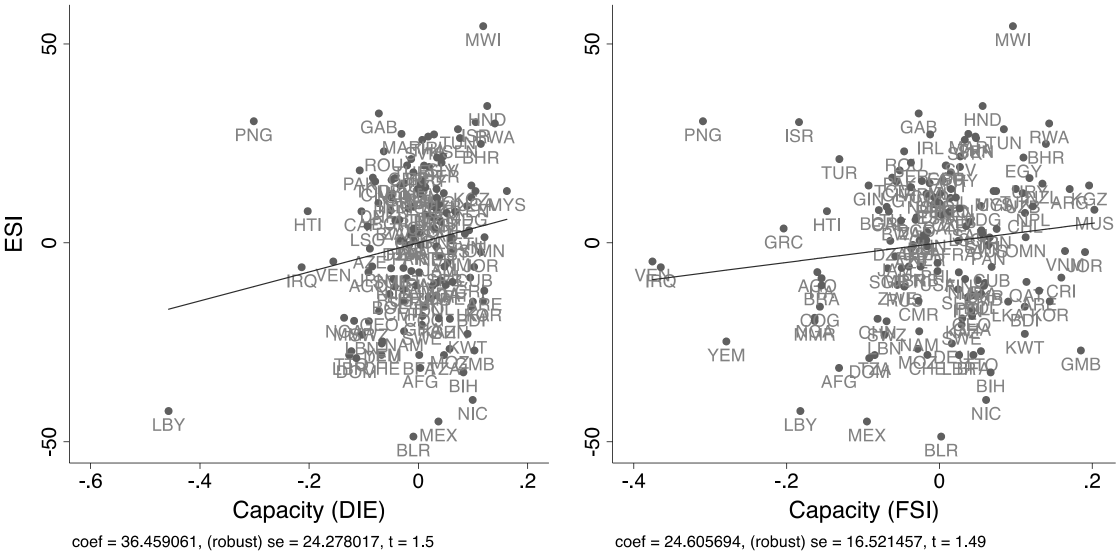
Figure D12: Partial correlation plots: relationship between state capacity and COVID-19 containment and health policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A9 on the left. Partial regression plot from model 4 in Table A9 on the right.

Source: authors' construction.

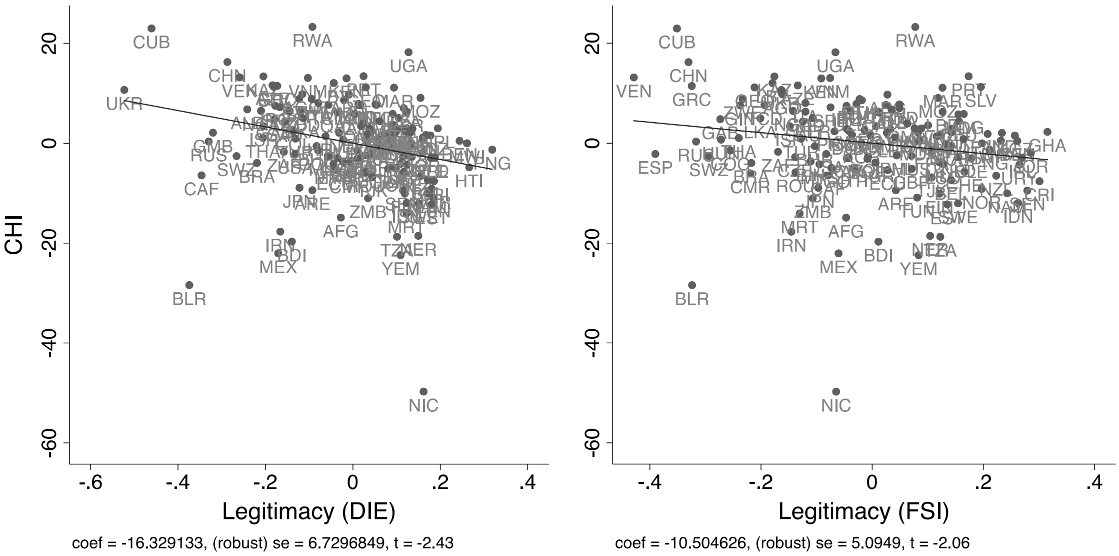
Figure D13: Partial regression plots: relationship between state capacity and COVID-19 economic support policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A10 on the left. Partial regression plot from model 4 in Table A10 on the right.

Source: authors' construction.

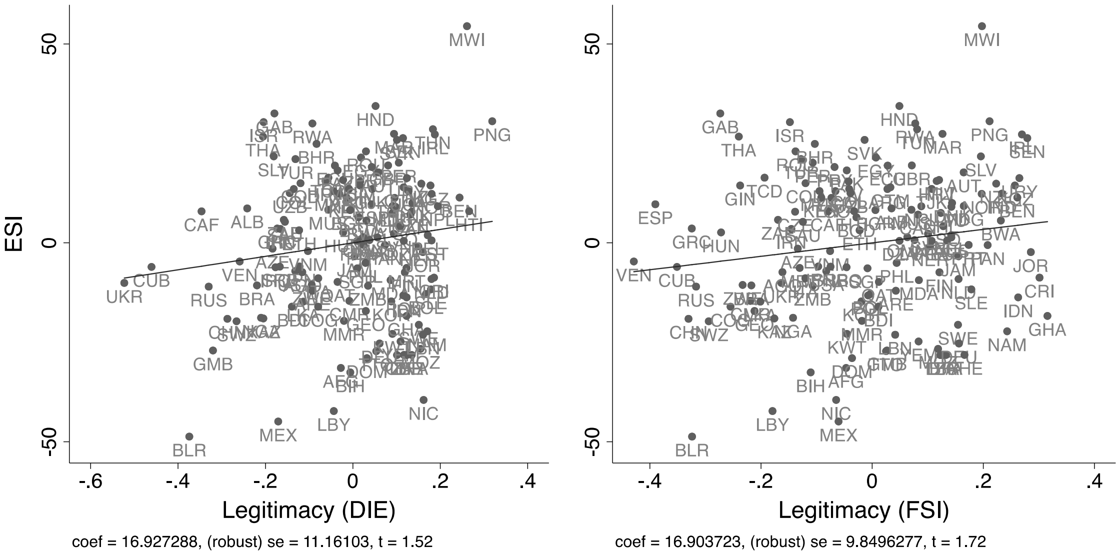
Figure D14: Partial regression plots: relationship between state legitimacy and COVID-19 containment and health policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A11 on the left. Partial regression plot from model 4 in Table A11 on the right.

Source: authors' construction.

Figure D15: Partial regression plots: relationship between state legitimacy and COVID-19 economic support policies controlling for relevant factors



Note: partial regression plot from model 2 in Table A12 on the left. Partial regression plot from model 4 in Table A12 on the right.

Source: authors' construction.

Appendix E

Table E1: Means of cases, deaths, and tests across income levels

Income level	Cases/million pop.		Deaths/million pop.		Tests/1,000 pop.	
	Mean	SD	Mean	SD	Mean	SD
High	18354.86	13709.42	299.74	293.58	356.02	294.03
Upper-middle	11982.69	9213.86	283.71	276.12	107.53	105.17
Lower-middle	3327.13	4670.91	89.86	154.14	33.31	30.66
Low	496.93	421.38	12.47	11.88	14.43	14.16

Note: as of 15 November 2020. Countries are classified according to World Bank's income level classification.

Source: authors' construction.