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Fighting collective threats: socialist revolutions and the management of the COVID-19 pandemic

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Abstract

I investigate why some countries were more successful in containing the death toll than others during the COVID-19 pandemic. I focus on the role of socialism and on the existence of long-term regime-driven legacies that may have had an impact on the containment of COVID-related deaths. I claim that countries that went through successful socialist revolutions have specific features that equip them with better resources to cope with public challenges such as pandemics. Furthermore, these features remain even after the demise of the socialist regime. I find a positive effect of socialist revolutions over COVID-19 containment at the country level. I investigate three possible causal mechanisms for this relationship: authoritarianism, state capacity, and mass mobilization. Through mediation analysis, I find the socialist legacy seems to be channeled through higher levels of mobilization and also more authoritarian institutions.

Keywords: COVID-19 pandemic; socialist regimes; authoritarianism; state capacity; institutional legacies

Introduction

The COVID-19 pandemic has raised numerous questions about the capacity of modern states to address non-armed challenges that endanger lives (Bardhan 2022). Echoing a catchphrase that gained popularity in the 1980s, the pandemic has "brought the state back in." (Sarkar 2021). Discussions have centered on how different types of political regimes have managed to cope with this major public health crisis, also highlighting the detrimental effects of neoliberal policies and populist leaderships on the provision of public healthcare in advanced democracies (Gerbaudo 2021). Although some commentators have pointed to the positive performance of countries like China during the pandemic (Yang 2021), no one has investigated the role of socialism in curbing COVID-related deaths. This paper is the first systematic attempt to examine the impact of socialist regimes and their successors on the pandemic at the country level.

In line with recent scholarship indicating a strong link between revolutionary roots and institutional resilience (Levitsky and Way 2022; Clarke 2023), I argue that countries that experienced successful socialist revolutions in the past possess specific characteristics that equip them with better resources to handle public challenges such as pandemics. I further contend that these characteristics persist even after the socialist regime has ended. I discuss three distinct mechanisms through which socialist revolutionary legacies may influence the containment of exogenous shocks like pandemics (or natural disasters) that necessitate a collective response.

Firstly, most former and actual socialist revolutionary countries share some authoritarian institutional traits that may prove advantageous when lockdowns are necessary to halt the spread

of viruses. Secondly, revolutionary states typically establish more powerful apparatuses (stronger states, in the parlance of state capacity) better suited to dealing with particular types of shocks such as anti-regime protests. Thirdly, socialist revolutionary regimes are adept at mass mobilization efforts. Those efforts are usually more successful when traditionally ostracized groups have been empowered to participate. The COVID-19 vaccine administration process was one such challenge where mobilization skills could make a significant difference.

In the following sections, I first briefly review the political-science literature on pandemic spread, highlighting why a focus on socialist revolutionary legacies may also contribute to explaining the variation in COVID-related death rates we observe among countries. The next section presents the data and some descriptive results that lend support to the paper's central argument. A more systematic analysis of COVID-19 death rates at the country level follows, demonstrating that countries with a legacy of socialist revolutions outperformed countries without that experience – even after controlling for a range of covariates and using different measures of the dependent variable. I employ mediation analysis to explore the impact of three distinct causal pathways on the link between socialist revolutionary legacies and pandemic containment. The final section is dedicated to wrap up the main findings and places them in context.

Overall, I find that socialist revolutions have a positive effect on COVID-19 containment. This effect appears to be mediated by higher levels of societal mobilization, and more authoritarian institutions. Countries with a socialist revolutionary legacy seem to be better equipped to pursue collective goals, although the long-term cost of such approaches may be too high.

What we know about differences in COVID-related deaths

The debate on the main political factors influencing COVID-related infections and deaths has been examined along five main dimensions: regime type, state capacity, trust, leadership, and culture.

The relationship between regime type and public health outcomes remains a subject of debate. On the one hand, several studies have demonstrated that democracies outperform dictatorships in addressing standard public health measures, such as infant mortality rates (Annaka and Higashijima 2021; Besley and Kudamatsu 2006). McMann and Tisch (2021) examined several pandemics that occurred over the past century and found that democracies were more effective in containing their effects than authoritarian regimes.

On the other hand, early papers published in response to the onset of the COVID-19 pandemic presented a contrasting view, suggesting that authoritarian regimes, with China as a prime example, were handling the crisis more efficiently. For instance, Cepaluni, Dorsch, and Branyiczki (2020) found that democracies fared worse than autocracies in terms of COVID-related mortality rates during the pandemic's first wave (see also Bosancianu et al. 2021). Similarly, Annaka (2021) showed that authoritarian regimes performed better during the first year of COVID-19 in terms of mortality rates, although he attributed this success to more extensive testing programs rather than praising anti-liberal measures. Trein (2020) found that countries with a strong legacy of past authoritarian institutions were more likely to implement strict lockdown policies.

Other authors have offered a more nuanced perspective on this relationship. Cheibub, Hong, and Przeworski (2020) found that democracies were more hesitant to adopt stringent policies during the first wave (and therefore, suffered a greater impact from the pandemic shock), but they eventually implemented such measures once death tolls began to rise, which may have compensated for the initial authoritarian advantage (see also Karabulut et al. 2021; Rodríguez-Pose and Burlina 2021). Bayerlein et al. (2021) focused on the impact of populist leaders and found, using first-year monthly data for a sample of 42 countries, that they generated worse outcomes than less polarizing democratic authorities.

Given these mixed results, it is unsurprising that Cassan and Van Steenvoort (2021) found no relationship between regime types and mortality rates. Perhaps these variations stem from the

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authoritarian practice that Neumayer and Plümper (2022) suggest may involve manipulating mortality data. According to these authors, the authoritarian advantage disappears once excess deaths are used instead of a country's self-reported numbers.

I remain agnostic about the direction of the relationship between regime type and COVID-related mortality rates. Nevertheless, I explore whether the potential positive impact of socialist revolutionary experiences on COVID-19 containment can be attributed to the fact that countries with that legacy tend to have authoritarian institutions.

Secondly, state capacity is another commonly mentioned factor in the literature on pandemic management (Majeed and Gillani 2017). It prominently featured in early analyses of the pandemic, such as Fukuyama's (2020). However, more rigorous statistical research methodologies have struggled to find a clear link. Bosancianu et al. (2021) found that state capacity measures do not predict mortality rates well. Similarly, for Kavanagh and Singh (2020), the countries that were supposed to be better prepared to contain a pandemic – as measured by the Global Health Security index – did not outperform those with worse preparedness in terms of mortality rates during the first wave of the pandemic. Countering this result, Serikbayeva, Abdulla, and Oskenbayev (2021) claim that, for a partial period of the first wave, more capable and less democratic states dealt more effectively with the pandemic. In a similar vein, Cooray, Vadlamannati, and De Soysa (2020) suggested that authoritarian countries with more public health capacity yielded lower mortality rates during the first wave, but only when their healthcare systems were more equitable. These findings may indicate that the explanatory power of state capacity needs to be mediated by other factors, such as regime type.

De la Cruz, Tezanos, and Madrueño (2022) categorize countries into four groups based on their capabilities and performance against the pandemic and its associated economic crisis. Interestingly, their first two clusters predominantly include socialist countries, characterized by a combination of poor state capacity and lower mortality rates, though with variations in economic downturns. In the next section, I will explore why socialist revolutionary regimes might have been more effective in dealing with shocks like pandemics compared to countries without such legacies.

The third factor is trust, a concept that was frequently mentioned during the initial stages of the pandemic. It was posited that societies where citizens trusted each other and their political authorities would be more successful in collectively organizing against a public health challenge (Harring, Jagers, and Löfgren 2021). Preliminary evidence supported this assertion. For example, the early success of mitigation policies in certain countries was attributed to substantial social capital reserves (Liu and Wen 2021; though Elgar, Stefaniak, and Wohl 2020 provide mixed evidence for this correlation). Institutional trust also played a crucial role in explaining early variations in COVID-related mortality during the first wave (Charron, Lapuente, and Rodriguez-Pose 2023; Oksanen et al. 2020). Bosancianu et al. (2021) conducted a comprehensive study and concluded that "the two features consistently related to mortality, conditional on healthcare system quality and population health, are trust in the government and trust in other people." (p. 23).

However, these empirical studies are limited in scope, as measures of trust are generally available only for a subset of developed countries. This significantly restricts comparative analysis beyond the developed world. Additionally, it is challenging to isolate the singular causal impact of trust, as its determinants might also be connected to outcomes seemingly driven by trust.

Furthermore, the influence of culture on COVID-19 containment suggests that the marked differences observed in pandemic responses are driven not by institutions or specific behaviors, such as trust, but by deeper societal characteristics. Chen, Frey, and Presidente (2021) observed that countries with more collectivist cultures implemented restrictions on geographic mobility more readily than those with predominant individualistic values. Canatay, Emegwa, and Talukder (2021) analyzed several socioeconomic factors, identifying power distance (the extent of power inequality acceptable to individuals), individualism, gender, and age as the most influential, though they did not consider institutional variables in their analysis.

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The quality of leadership is the final explanatory factor. Anecdotal evidence from the first wave of the pandemic easily highlighted that some of the most successful countries were being ruled by female politicians – such as Jacinda Ardern of New Zealand, Angela Merkel of Germany, and Tsai Ing-wen of Taiwan. In a more systematic fashion, Garikipati and Kambhampati (2021) found that female political leaders did a better job at containing deaths than their male peers. However, this result has raised concerns about reverse causality (Piscopo 2020) and sample limitations (Bosancianu et al. 2021). Countries promoting women to the highest office are countries with specific characteristics that may well be better attuned to dealing with health crises. Bruce et al. (2022) use a regression discontinuity design in close mayoral races in Brazil and observe that female mayors did a better job during the pandemic than male mayors. Although this evidence provides strong evidence for a causal relationship, it is not clear yet how far it can go with respect to its generalizability.

In the empirical analysis, I control for these factors – regime type, state capacity, trust, culture, and leadership – and discuss ways in which some of them may have mediated the influence of socialist revolutionary legacies over pandemic management.

Socialist revolutions, legacies, and collective threats

From the triumph of the Russian Revolution in 1917 to the most recent socialist revolutionary experiences in Venezuela (1999) and Nepal (2006), one of the biggest challenges to regime stability has been the occurrence of popular uprisings fueled by socialist ideals. These revolutions brought about significant changes in both the distribution of political power and economic resources (Goodwin 1994).

In contrast to socialist regimes imposed by foreign occupation, such as Soviet-backed regimes in Central Europe after World War II, socialist revolutionary regimes carry an extraordinary amount of popular legitimacy. In theory, these regimes combine state capabilities, collective goals, and a popular mandate.

To begin with, when rebel-winning parties come into power, they often draw on revolutionary momentum to create more resilient states. In such cases, military, political, and economic leaders, as well as middle-to-top bureaucratic cadres, are either executed or forced to flee. The absence of hostile ruling classes allows for the restructuring of political structures without the usual constraints faced by democratic leaders (Huntington 1970; Levitsky and Way 2022). In the absence of opposition, key new actors like the Party and the Military penetrate all social structures and gain control over their citizens. In Hassan, Mattingly and Nugent's (2022) rendition of the concept of political control, socialist regimes usually excel at infiltrating and indoctrinating their populations.

What is intrinsic to socialist projects is the ambition to launch a complete reorganization of political and economic resources. If the new institutions can avoid corruption and maintain some sources of legitimacy, such as a recruitment and rewards system that promotes those with fewer resources as a means of social mobility, they can endure even after the initial revolutionary fervor subsides. This bond between the revolutionary principles and society can become even stronger when the state faces external threats, such as a foreign power seeking to overthrow the new regime (Clarke 2023). Foreign-imposed economic sanctions that trigger a rally-behind-the-flag effect allow revolutionary leaders to play the nationalist card and garner more support for the nascent institutions (Escriba-Folch and Wright 2010; Grossman, Manekin, and Margalit 2018).

Strong institutions are a prerequisite for achieving long-sought collective outcomes. A hallmark of the revolutionary program is to promote public goals such as land reform, full literacy, and some level of nationalization of commodity-extractive industries. Even if not entirely successful, these programs drastically alter the political and economic foundations of the country. Politically, they empower sectors traditionally excluded from decision-making by creating paths to mobility through official agencies. Economically, they transfer significant resources to the state, which becomes the employer or goal setter for a substantial portion of the workforce.

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Most socialist regimes pursue these three collective projects, but revolutionary ones possess a surplus of legitimacy to enforce them on less receptive constituencies (Thaler 2018). These programs, while often not highly effective in boosting economic growth (Kalyvas 1999), enjoy broad appeal because they benefit large sections of the population. This popularity often endures even after the regime has fallen because some of these outcomes, such as literacy and land reform, are not easily undone. At times, this popularity, coupled with regime promotion, may reshape people's beliefs about fundamental political values, such as whether the pursuit of collective goals should outweigh individual freedoms. These shared societal values may have a lasting impact on how individuals respond to public crises like pandemics.

As Stasavage (2020) has suggested, there is a trade-off between regime types when addressing collective challenges like pandemics: authoritarian regimes may have strong tools (conditional on state capacity) to contain pandemics, but their control of information can create incentives to downplay the true extent of the threat. In contrast, democracies cannot suppress the flow of information, though they face more constraints in implementing stringent anti-shock policies. Perhaps revolutionary regimes are better equipped to address collective problems due to their robust institutions, citizen collectivism, and strong popular foundations.

The intriguing question is why these tools should still be available to countries that have left their socialist revolutions behind and transitioned into other regime types. The literature on communist legacies is extensive (LaPorte and Lussier 2011; Pop-Eleches and Tucker 2017) and typically focuses on institutional patterns and individual attitudes. First, revolutionary regimes rarely transform into liberal democracies (Levitsky and Way 2022). Consequently, these countries continue to benefit from the capacity to enforce compliance that authoritarian regimes typically exhibit. For example, security agencies established during the revolutionary period often remain untouched and survive the fall of the one-party regime. With deep community roots, these agencies may be more effective in maintaining order than comparable bodies in countries without such a history (Yashar 2018, chapter 7).

Regarding behavioral legacies, some collective-oriented beliefs persist even after the regime's downfall. In line with Bondar and Fuchs-Schundeln (2023), Pop-Eleches and Tucker (2017) find that citizens in post-communist societies tend to favor strong state intervention more and express lower support for democracy and markets. They also have more equalitarian gender attitudes (Beloshitzkaya and Reilly 2023). Initially, these perceptions were thought to be influenced by having lived through the communist period. However, there is growing evidence of intergenerational transmission of values, indicating that "the effects of political regimes on preferences can be extremely persistent" (Bondar and Fuchs-Schundeln 2023, 1).

In any case, it is not particularly surprising, as the success of socialist revolutionary movements has been associated with specific socio-economic conditions (Talhelm et al. 2014) or particular kin structures (Todd 2019) that facilitated these beliefs. Regardless of whether these beliefs existed before the revolution or were nurtured by it, they tend to persist and are not easily replaced.

In summary, I argue that countries with a socialist revolutionary past performed better in containing the COVID-19 pandemic than countries without such an experience, regardless of whether they remain socialist.

Data and results

In this section, I first describe the data used to test the link between revolutionary socialism and pandemic management. Then, I offer basic comparisons of means in support of my hypothesis and finally move on to discuss more robust tests.

I am interested in investigating why some countries performed better than others in containing the death toll associated with COVID-19. To this end, my dataset includes all countries in the world with more than 1 million inhabitants. As health policies are devolved to sub-state political

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units in some countries, there is a significant body of literature investigating systematic patterns at the regional level (Charron, Lapuente, and Rodriguez-Pose 2023). However, there is a lack of regional data beyond the developed world, and furthermore, decentralization has not been identified as a key explanatory factor for COVID-19 mismanagement (Kuhn and Morlino 2022). Nonetheless, I control for whether countries have a federal structure as a way to account for intra-state heterogeneity.

The dependent variable in my analysis is the COVID-related death rate by country. I utilize the raw total counts from John Hopkins University from the beginning of the pandemic to May 1, 2022 (downloaded from https://github.com/CSSEGISandData/COVID-19). I examine death rates per 100,000 inhabitants because it provides a more informative measure for evaluating the actual impact of the pandemic when comparing countries with vastly different population sizes. I also re-run my analysis using "excess deaths" associated with COVID-19 data compiled by the World Health Organization (https://covid19.who.int/data). The WHO's method compares all reported deaths during the pandemic, even if seemingly unrelated to COVID-19, with death trends during pre-pandemic years and attributes the increase ("excess deaths") to the pandemic's effect. This method has the advantage of circumventing government efforts to downplay the true number of victims. However, it may impute negative rates (i.e., countries where nobody seemed to die from COVID-19) for approximately 14 percent of the countries in the sample. It also faces challenges in distinguishing deaths where COVID-19 may be the primary cause from those where the virus was merely an intervening factor. Nevertheless, there is a relatively high correlation between the two measures (p-corr value = 0.70; see Figure AII.1 in the online appendix for a visual representation of the two dependent variables).

The critical independent variable is whether the country has a socialist revolutionary experience in its past. I define a "socialist revolutionary" regime as one in which new rulers emerged from popular uprisings with an economic program that nationalized key assets and granted the state central-planning powers, along with a political program that imposed plurality-limiting institutions – a revolutionary regime akin to Skocpol's concept, but with a socialist orientation (Skocpol 1979; Goldstone 2001, 142). The definition excludes Scandinavian social democracies because they never assumed central control of the economy nor limited political plurality. It also does not include Salvador Allende's short-lived period in power, as he failed to dismantle existing democratic institutions. I do code Venezuela and Nepal as positive cases, where leaders came to power through elections riding the wave of large grassroots movements. In Venezuela, Hugo Chavez, despite his fiery rhetoric, may not have initially qualified as a socialist regime. However, after the failed coup against him in 2002, he swiftly moved the country toward more political and economic control with a socialist underpinning (Azicri 2009). In Nepal, Maoist victories in the battlefields forced the state to negotiate a peace plan that ended the authoritarian monarchy and paved the way for their ascent to power (Adhikari 2014). In both cases, the lack of an electoral pathway into power may not have been sufficient to impede their ultimate takeover.

Although my causal argument centers on socialist policies, it also takes into account that those policies were implemented with significant social support – the socialist governments were inaugurated through popular revolutions. In this sense, I make a distinction between endogenous socialist regimes and those where socialism was adopted through foreign imposition (e.g., USSR-backed regimes in Central Europe) or by military coup without grassroots support (such as in Myanmar in 1962 and Libya in 1969). In a few cases, socialist regimes incorporated some of the features associated with revolutionary socialism (such as stronger institutions and large-scale public programs), but without popular support, these policies may have faded away following the fall of these regimes. Most of the time, however, the absence of genuine domestic demand for a socialist takeover left little trace of these policies once their backers were removed from power. (Online) Appendix I includes a list of the regimes I classify as "socialist revolutionary" and their duration.

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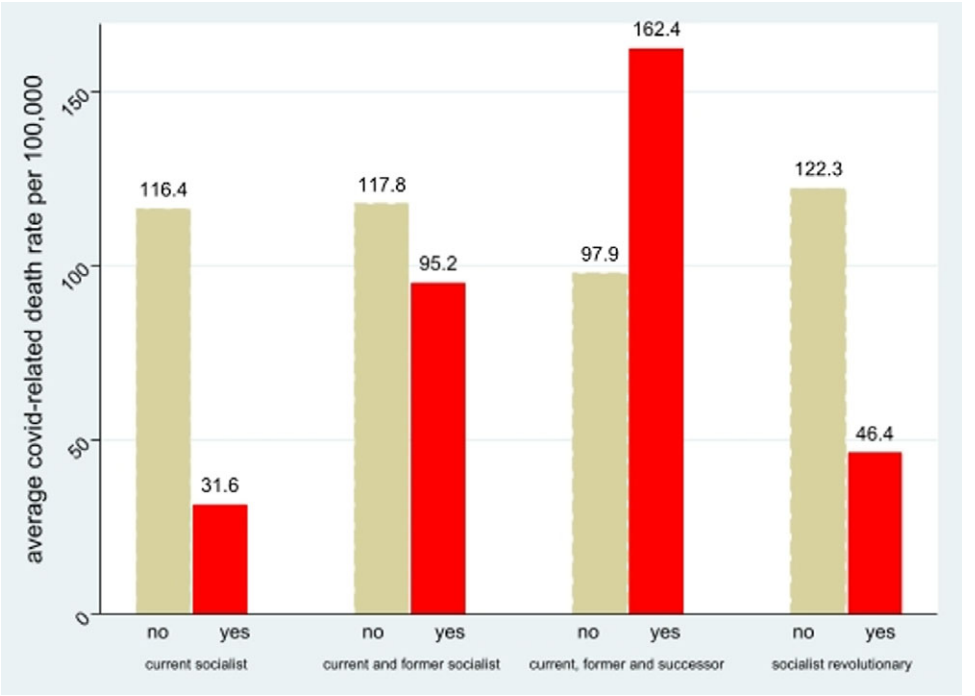

Figure 1. Socialism and COVID-related death rates (as measured by JHU). *Current socialist countries*: China, Cuba, Laos, Nepal, Venezuela, and Vietnam [North Korea is not included because of lack of reliable data]. *Current and former socialist countries*: Afghanistan, Albania, Algeria, Angola, Benin, Bulgaria, Cambodia, Cape Verde, China, Congo, Cuba, Ethiopia, Hungary, Laos, Libya, Madagascar, Mongolia, Mozambique, Myanmar, Nepal, Nicaragua, Poland, Romania, Russia, Serbia, Somalia, Venezuela, Vietnam, and Yemen. *Current, former and successor countries*: All previous, plus: Bosnia, Croatia, Czechia, Estonia, Georgia, Germany, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, North Macedonia, Moldova, Montenegro, Slovakia, Slovenia, Tajikistan, Ukraine, and Uzbekistan. *Socialist revolutionary countries*: Afghanistan, Albania, Algeria, Angola, Cambodia, Cape Verde, China, Congo, Cuba, Ethiopia, Laos, Madagascar, Mongolia, Mozambique, Nepal, Nicaragua, Russia, Serbia, Venezuela, Vietnam, and Yemen.

My initial empirical approach aims to demonstrate that when using straightforward mean comparisons, socialist revolutionary regimes have outperformed other types of regimes. Figure 1 presents four bar comparisons with different subsets of socialist countries (see the list of countries included at the bottom). The left panel shows that the six countries that still identify themselves as socialist have experienced a four times smaller COVID-related death rate than non-socialist countries, though their variance is large enough to push the comparison beyond standard significance levels (it is noteworthy that this variance is driven by Venezuela's underperformance). The center-left comparison includes all countries that had a self-identifying socialist regime at some point after World War II, and the effect diminishes. Similarly, the center-right comparison adds countries that became independent after the dissolution of socialist federations (the Soviet Union and Yugoslavia), and the correlation reverses its direction, becoming significant but in the opposite direction: socialist countries appear to have fared worse than non-socialist countries during the pandemic.

In the previous section, we argued that it is advisable to exclude all countries where socialism was imposed from the top through foreign occupation and/or a military coup. Most successor states would fall into this category, except for Russia and Serbia (Hoepken 1999), which were the origins of their respective socialist revolutions. The right-hand comparison in Figure 1 takes this distinction into account and shows that revolutionary socialist (past and present) countries experienced two-and-a-half times fewer COVID-related per capita deaths than countries without

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that legacy. This effect is statistically significant and does not appear to be driven by the inclusion of specific cases that may be contentious, such as Afghanistan (Halliday 1978) or Yemen (Ishiyama 2005), where socialist-fed rebellions were supported by Soviet intervention (Porter 1984).

From this point forward, my focus is on examining the impact of countries with a socialist revolutionary history on pandemic management. To assess this experience, I employ two indicators. First, I use a straightforward dummy variable that takes on the value of 1 for countries that have undergone a successful revolutionary experience in the past. However, this approach does not account for the duration of the socialist regime and the time elapsed since its collapse (Pop-Eleches 2007). Therefore, I introduce a second indicator that takes into consideration both of these aspects, which I define as follows:

$$socialist\ duration = \ln\left(1 + \left(\frac{SR\ years}{(1 + years\ since\ collape)}\right)\right)$$

By design, countries with lengthy and continuing experiences of a socialist revolution, such as Cuba, Vietnam, and China, score high on this indicator. Countries with brief and bygone experiences, such as Mozambique, Afghanistan, and Yemen, receive low scores. Those without any socialist revolutionary past score zero.

To account for competing arguments, I include a set of independent variables that were discussed in the review section for their explanatory power. First, I incorporate the regime-type debate into the equation by measuring the extent to which each country was "liberal-democratic" in 2020 (all variables are measured the year before the start of the pandemic unless otherwise indicated). I utilize the Varieties of Democracy's "liberal-democracy" index (Varieties of Democracy Project 2022).

Secondly, I control for a country's wealth using the World Bank's GDP per capita at purchasing power parity, which is a traditional measure of state capacity (https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD). I also include the squared GDP per capita to explore potential non-linearities in the relationship between income and COVID-19, as some developing countries like Brazil, Mexico, and South Africa notably underperformed during the pandemic.

Thirdly, social trust has been identified as one of the best predictors of pandemic outcomes. However, obtaining reliable indicators for a globally representative sample of countries can be challenging. I employ Klassen's (2018) compilation of the social trust index, which ranges from 0 to 100 (higher values denote higher social trust). To maximize the number of observations, I include all countries with any data points during the 2000s, resulting in a sample of approximately 130 countries. As this inclusion results in the loss of some countries with socialist revolutionary experiences, I conduct all models with and without this social trust index.

Fourthly, it has been suggested that more open countries are more susceptible to the spread of viruses. I capture this effect using the "Social Globalization Index" measured in 2018, as developed by Gygli et al. (2019). Fifthly, I account for the potentially greater intra-country heterogeneity in federal regimes by measuring whether the regime is confederal/federal or not (data sourced from Wig, Hegre, and Regan 2015). Sixthly, I code those countries where the main executive office was held by a woman before June 2020 (when the pandemic had affected nearly every nation in the world).

Seventhly, I control for health factors that may influence the varying lethality of COVID-19 (Basellini and Camarda 2022; Cegan et al. 2021). I focus on the percentage of inhabitants aged 65 years and older, the prevalence of diabetes in the population, and population density (as a proxy for crowdedness), all collected from the World Bank's database. Finally, one of the most puzzling results of the pandemic has been its lower impact in Africa (Nguimkeu and Tadadjeu 2021). To control for regional and cultural differences, I include simple regional dummies, with Africa serving as the baseline category.

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Table 1 presents the results, and Figure 2 illustrates the effects of the main independent variables. I use two different measures of COVID-related death rates, one based on the John Hopkins University database, and the other drawn from the World Health Organization's excess deaths reports.

Remarkably, countries with a socialist revolutionary experience have encountered lower numbers of deaths associated with COVID-19, regardless of the measure used. Countries with a socialist revolutionary legacy have, on average, 48 fewer COVID-related deaths per 100,000 inhabitants compared to countries without that legacy (using the JHU indicator). For an average country with a population of 40 million people, this translates into 29,365 fewer COVID-related victims in a country with a socialist revolutionary legacy, which is approximately sixty percent fewer than expected in countries without such a legacy (49,475 victims).

The other covariates mostly align with our expectations. Democracies do not appear to fare significantly worse than autocracies. Developing countries are more impacted by COVID lethality rates than both poorer and more affluent ones. Notably, countries with female prime ministers overwhelmingly outperformed those without, experiencing a lower rate of 35 deaths per 100,000 inhabitants compared to 122 deaths in countries led by male prime ministers. This intriguing result may be attributed to institutional features that facilitate the election of women to office, but it could also be influenced by leadership effects that are challenging for standard datasets to capture.

In contrast, the social globalization index and the health indicators seem to have a minimal impact on the count of COVID-related deaths. Finally, Europe and the Americas performed notably worse than African nations in managing the pandemic.

To assess the robustness of these findings, I conducted several additional checks, all of which are reported in (online) Appendix II. Firstly, I replicated the main results with additional independent variables, such as major pre-pandemic death causes and public spending on health as a share of GDP. I collected information about the prevalence in 2019 of the three most typical death causes associated to COVID-19 (ischemic heart disease, hypertension, and diabetes) (Elezkurtaj et al., 2021). The data come from the "Global Burden of Disease Study 2021 – Cause-Specific Mortality 1990–2021" (Global Burden of Disease Collaborative Network, 2024). The results do not vary (see Table AII.1).

I also collected information about how much countries were spending on public health as a share of GDP in 2019, just before the start of the pandemic. The data come from the World Health Organization's Global Health Expenditure Database (https://apps.who.int/nha/database/Select/Indicators/en). The indicator goes in the expected direction (higher spending produced lower deaths), and although not always statistically significant, it seems to marginally make a dent on the impact of revolutionary socialism (see Table AII.2). I explore this more in depth in the next section.

Secondly, I replicated the main results using different dependent variables, including earlier cut points for fatality data and log transformations for two different time points: 02/28/2021 and 05/01/2022. In general, the results remain highly consistent, although, as expected, the impact of having a socialist revolutionary experience appears to be relatively stronger for earlier time periods (Tables AII.3 and AII.4).

Next, I introduced controls for stringency measures, as compiled by Hale et al. (2021). The results indicate that, while lockdowns may slightly diminish the impact of socialist revolutionary legacies, they do not entirely cancel them (Table AII.5).

Lastly, I conducted sensitivity analysis by excluding two of the most successful socialist countries in managing the pandemic: China and Vietnam. The results remained essentially the same (Tables AII.6 and AII.7).

Mechanisms

Countries with a legacy of socialist revolutions, regardless of their current socialist status, consistently exhibit lower COVID-related death rates compared to countries without such a

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Table 1. Regression analysis of COVID-related death rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	JHU data	WHO data	JHU data	WHO data	JHU data	WHO data	JHU data	WHO data
Soc. rev. dummy	−47.95**	−92.45**			−43.98*	−77.46*		
	(−2.61)	(−2.44)			(−1.91)	(−1.78)		
SR duration			−19.22**	−54.32***			−15.70	−49.90***
			(−2.12)	(−3.74)			(−1.48)	(−3.05)
Liberal democracy index	48.78	−178.40*	46.49	−206.86*	74.25	−146.29	75.18	−169.81
	(0.79)	(−1.66)	(0.74)	(−1.86)	(1.07)	(−1.21)	(1.08)	(−1.38)
Social trust index					−1.55**	−3.02***	−1.60***	−2.95***
					(−2.58)	(−3.23)	(−2.76)	(−3.31)
GDP per capita (log)	20.76	140.96***	16.39	138.05***	−4.74	106.49**	−7.82	109.80**
	(0.75)	(2.81)	(0.58)	(2.71)	(−0.17)	(2.22)	(−0.27)	(2.23)
GDP per capita sq (log)	−1.83	−8.96***	−1.55	−8.63***	−0.63	−6.70***	−0.37	−6.66***
	(−1.42)	(−3.69)	(−1.17)	(−3.51)	(−0.56)	(−3.37)	(−0.33)	(−3.29)
Social globalization index	0.78	0.69	0.89	0.71	0.52	−0.47	0.69	−0.22
	(0.82)	(0.39)	(0.92)	(0.41)	(0.44)	(−0.21)	(0.59)	(−0.10)
Level of federalism	−17.30	−37.87	−18.41	−38.14	−11.85	−29.11	−12.56	−26.25
	(−0.90)	(−1.15)	(−0.96)	(−1.17)	(−0.58)	(−0.82)	(−0.62)	(−0.73)
Female prime minister	−86.89***	−126.91***	−85.32***	−121.81***	−95.33***	−138.57***	−93.66***	−133.32***
	(−3.10)	(−3.21)	(−2.99)	(−3.04)	(−3.91)	(−3.96)	(−3.74)	(−3.68)
% of population aged 65 +	3.75	1.71	4.27	3.70	4.79	3.68	4.96	4.29
	(1.02)	(0.32)	(1.08)	(0.64)	(1.00)	(0.54)	(1.01)	(0.61)
Population density	−0.01	−0.01	−0.01	−0.01	−0.00	−0.00	−0.00	−0.00
	(−0.68)	(−0.62)	(−0.76)	(−0.80)	(−0.30)	(−0.15)	(−0.36)	(−0.34)
Diabetes prevalence	4.58**	0.07	4.51**	−0.80	4.40*	0.01	4.16	−1.21
	(2.10)	(0.02)	(2.04)	(−0.21)	(1.72)	(0.00)	(1.58)	(−0.27)
Asia	28.91	51.67	28.13	55.91	55.96**	91.49*	53.96**	94.01**
	(1.50)	(1.37)	(1.45)	(1.45)	(2.39)	(1.93)	(2.32)	(2.01)
Europe	161.99***	282.72***	153.14***	262.63***	190.90***	333.98***	182.47***	317.40***
	(3.22)	(3.83)	(2.94)	(3.43)	(3.28)	(4.23)	(3.03)	(3.89)
North America	49.12	100.92**	48.24	106.56**	69.69**	138.83***	65.91**	133.80***
	(1.62)	(2.19)	(1.56)	(2.27)	(2.14)	(2.85)	(2.01)	(2.74)
Oceania	−55.08*	−39.53	−57.20*	−39.70	6.95	89.69	−0.95	74.99
	(−1.68)	(−0.73)	(−1.78)	(−0.77)	(0.13)	(1.15)	(−0.02)	(0.95)
South America	204.37***	274.63***	205.85***	283.08***	201.94***	262.35***	200.80***	267.26***
	(4.02)	(3.16)	(4.09)	(3.30)	(3.87)	(2.88)	(3.87)	(2.98)
Constant	−94.83	−387.46*	−88.66	−389.11	63.47	−158.69	60.89	−195.55
	(−0.73)	(−1.67)	(−0.67)	(−1.63)	(0.44)	(−0.68)	(0.41)	(−0.81)
R2	0.62	0.41	0.62	0.43	0.63	0.44	0.62	0.46
p	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	148	149	148	149	131	132	131	132

t statistics in parentheses.*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

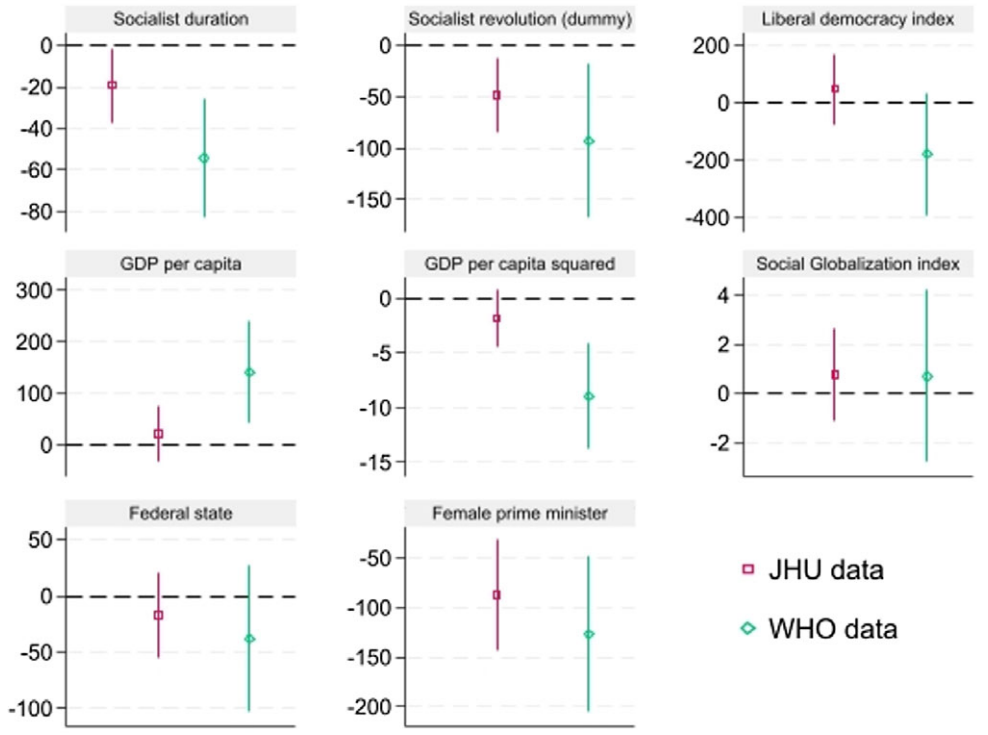

Figure 2. Predicted effects of key factors over COVID-19 death rates.

legacy. This finding remains robust even when using data from the World Health Organization on "excess deaths" and controlling for additional causal factors. I now shift my focus to investigate the mediating factors through which this legacy exerts an influence on contemporary outcomes. I have identified three key mechanisms: authoritarianism, state capacity, and mass mobilization.

In the absence of experimental data, I turn to mediation analysis to examine these channels (Imai, Keele, Tingley, and Yamamoto 2011; for an application, see Carreras, Irepoglu, and Bowler 2019). Mediation analysis relies on the assumption of sequential ignorability, which posits that (i) given pretreatment confounders, the treatment (in this case, the socialist revolutionary experience) is independent of all potential values of the outcome and mediating factors, and (ii) the observed mediator is independent of the outcome, given the actual treatment status and pretreatment confounders (Imai, Keele, Tingley, and Yamamoto 2011). As this assumption cannot be directly tested with observational data, I control for all pretreatment confounders that were included in the previous models.

Imai, Keele, Tingley, and Yamamoto's (2011) method also provides a sensitivity analysis to assess "how severe the violation of the sequential ignorability assumption would have to be for the estimation of the average causal mediation effects (ACME) to be biased" (Carreras, Irepoglu, and Bowler 2019). I will briefly describe the mechanisms and then discuss the results.

Authoritarianism

The success of dealing with COVID-19 in the remaining socialist countries (China, Cuba, North Korea, Laos, Vietnam, and, to a lesser extent, Nepal and Venezuela) has largely been attributed to their authoritarian practices (Yang 2021). Is authoritarianism the mechanism through which socialist ideals contribute to pandemic success? It's worth noting that most countries with a legacy

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of socialist revolutions exhibit authoritarian traits. Using the Varieties of Democracy (V-Dem) regime typology, the fifteen countries that experienced a successful but discontinued socialist revolution during the 20th century are currently categorized as follows: one closed autocracy (Yemen), three electoral democracies (Cape Verde, Mongolia, and Serbia), and the remaining eleven are electoral autocracies (pre-Taliban Afghanistan, Albania, Algeria, Angola, Cambodia, Congo, Ethiopia, Madagascar, Mozambique, Nicaragua, and Russia), with no cases of liberal democracies (Varieties of Democracy Project 2022).

In addition to a measure of autocracy, I also consider policy making procedures, as not all authoritarian regimes follow the same playbook in this regard. Policy styles are the "standard operating procedures" of policy making (Richardson et al. 1982, p.2). Authoritarian regimes usually have top-down policy styles, compared to more "consensus building" styles in democratic countries. Authoritarian regimes usually have trouble in dealing with "principal-agent" and collective action problems, as information does not properly flow from citizens to decision-makers and the latter face risk-adverse factors to take up the lead in tackling problems (Qian 2019). Interestingly, however, socialist revolutionary regimes have traditionally been more open to "policy experimentation" and committee coordination than other authoritarian governments, perhaps because they feel a lower risk of popular revolt against the regime. A measure of devolution to local governments lies at the heart of the policy experimentation's success story in China and Vietnam (Qian 2019, p. 226; Croissant 2019, p. 249).

I approach this policy making factor with an indicator from the Transformation index of the Bertelsmann Stiftung (BTI), as collected by Donner et al. (2022). It measures "the level of difficulty in management," meaning the number of constraints a government faces when it wants to implement some decision. It ranks from 1 to 10 and higher numbers denote more constraints. These constraints come from institutions, civil society, and domestic challengers. In the context of the pandemic, it may be a good way to capture the existence of structural limits preventing governments from taking action in the face of a short-term challenge.

State capacity

Another argument suggests that the key predictor of successful COVID-19 containment is the strength of state institutions. The concept of strong states yielding better outcomes is widely endorsed by multilateral institutions today. States that effectively control their territory (coercion), have a well-structured bureaucracy, and a robust fiscal base (taxation), and are better equipped to translate their policy decisions into tangible results (Acemoglu, García-Jimeno, and Robinson 2015). While higher state capacity can have both positive and negative implications, pandemic containment represents a quintessential example of a task suited for a capable state. Could it be that countries with a socialist revolutionary legacy outperform others in managing COVID-19 because they tend to have stronger state institutions?

I use three proxies for state capacity. Firstly, I rely on Hanson and Sigman's (2021) indicator, which assesses coercion, bureaucracy, and taxation and employs Bayesian latent variable analysis to create unified measures of state capacity from 1960 to 2015. Secondly, I collect information about how much countries were spending on public health as a share of GDP in 2019, just before the start of the pandemic. This is both a measure of policy priorities in the country as well as quality of health infrastructure. Finally, the PRS Group (2024) collates an index of state capacity based on three indicators: corruption, law and order, and bureaucratic quality. Higher values denote lower corruption, stronger law enforcement, and more independent bureaucracies.

Social mobilization

One distinguishing feature of socialist revolutionary regimes is their ability to mobilize their citizenry. These regimes have been known for their mass mobilization campaigns aimed at

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redistributing land (de Janvry 1981), promoting literacy (Arnove and Graff 1987), and vaccinating infants (Vargha 2014). These efforts often involve grand displays of public support through rallies and state-orchestrated large-scale events like sports competitions (Riordan 2007).

It could be argued that this social mobilization mechanism is facilitated through authoritarian practices (enforced population control) and the capabilities of the regime (coercion to compel participation). However, there might also be an individual aspect related to a willingness to participate in collective endeavors driven by an ideological commitment to common causes. I empirically assess this mechanism by examining two different indicators. Firstly, I use BTI's measure of "equal opportunity" (Donner et al. 2022), capturing the extent to which women and minorities are not discriminated from the provision of public goods and civil rights. This indicator is a more structural factor that weighs the propensity of traditionally ostracized groups to participate in public life – a typical purported goal of socialist regimes.

And secondly, I use the vaccination administration process, with data from Mathieu et al. (2021) on the percentage of the population that received at least the first two vaccine doses by the end of 2021. While vaccines were initially created in the developed world, socialist regimes like Cuba and China managed to produce their own vaccines, administer them swiftly within their borders, and offer them to like-minded ideological allies (Suzuki and Yang 2023). The advantages of social mobilization practices during vaccine rollouts, coupled with a more equalitarian attitude toward public participation, may have contributed to reducing the virus's spread in countries with a socialist revolutionary experience, even if their vaccines were perhaps less effective than those widely distributed in the West (Eroglu et al. 2022).

Results

The models estimate the predicted values of each of the three mediators (autocracy, state capacity, and social mobilization) based on the exposure variables (socialist revolutionary dummy and socialist duration). These predicted values are then used to estimate the indirect effect (the ACME), the direct effect, and the total effect on COVID-19 death rates. The results are presented in Tables 2 and 3. For the sake of clarity, they exclude the confidence intervals, but the latter can be found in Tables AII.8 and AII.9. The Appendix also includes similar mediation models with the WHO's dependent variable, reporting very similar results (Tables AII.10 and AII.11).

In general, the indicators for the "social mobilization" mechanism show the strongest mediating impact. For instance, 47 percent of the effect of the duration of a socialist revolutionary legacy is mediated by the success of the vaccination rollout process (Table 3, model/column 6, row 4). The non-profit Vaccine Alliance (Gavi) ranked the ten low-income countries with the strongest efforts to distribute vaccines to their populations. Interestingly, two out of the top four countries have socialist revolutionary legacies (Nepal and Nicaragua) (see https://www.gavi.org/vaccineswork/which-lower-income-countries-saw-biggest-covid-19-vaccination-coverage-gains-2022).

The indicators for the "authoritarian" mechanism are next in terms of mediating impact. Socialist revolutionary regimes face fewer constraints on policy making while simultaneously allowing more leeway for experimentation. This could have fed strong incentives for local officials to contain the spread of the pandemic (Aofei et al. 2022). State capacity indicators display, on average, a smaller effect.

A note of caution, however, comes from the rho coefficients reported in the last row of the two tables. This can be interpreted as the degree of correlation required between the errors in the two estimated equations (the mediating and the outcome equations) for the ACME coefficient reported in the table to not be different from 0. In simpler terms, a higher correlation indicates a more robust point estimate. The success at administering the vaccine seems again to offer the more consistent estimate. The models also indicate a non-negligible direct effect of the legacy on pandemic outcomes, suggesting that other mechanisms untapped in this analysis may still exist.

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Table 2. Mediation analysis, with socialist revolutionary regimes as dummy

	Autocracy (V-dem)	Constraints on management	State capabilities (Hanson & Sigman)	Govt health expenditures as % of GDP	State capabilities (ICRG)	Share of population vaccinated as of 12/01/2021	Equal opportunity
ACME	−12.95	−8.69	−6.11	−7.09	−3.49	−12.81	−9.22
Direct effect	−42.25	−37.58	−43.76	−42.08	−43.35	−33.87	−36.61
Total effect	−55.19	−46.28	−49.87	−49.16	−46.85	−46.69	−45.82
% of total effect mediated	0.23	0.19	0.12	0.14	0.07	0.26	0.20
Rho at which ACME = 0	−0.16	0.11	−0.17	−0.17	−0.21	−0.22	−0.20
N	146	123	146	144	144	146	123

"Autocracy" models are estimated with logit equations; the three other models were estimated with least squares. The results are computed via the "Medeff" package in Stata (Hicks and Tingley, 2011). ACME = Average Causal Mediation Effect.

Table 3. Mediation analysis, with socialist duration

	Autocracy (V-dem)	Constraints on management	State capabilities (Hanson & Sigman)	Govt health expenditures as % of GDP	State capabilities (ICRG)	Share of population vaccinated as of 12/01/2021	Equal opportunity
ACME	−7.35	−5.84	−5.30	−4.67	−3.42	−9.25	−6.73
Direct effect	−19.22	−18.05	−14.84	−16.60	−17.09	−9.35	−16.21
Total effect	−26.57	−23.90	−20.14	−21.24	−20.52	−18.60	−22.94
% of total effect mediated	0.27	0.24	0.26	0.22	0.17	0.47	0.29
Rho at which ACME = 0	−0.18	0.10	−0.16	−0.17	−0.20	−0.22	−0.18
N	146	123	146	144	144	146	123

"Autocracy" models are estimated with logit equations; the three other models were estimated with least squares. The results are computed via the "Medeff" package in Stata (Hicks and Tingley, 2011). ACME = Average Causal Mediation Effect.

Given that the vaccination rollout only started after one year of pandemic, it is worth asking whether other mechanisms had a larger impact during its first year. I reran all the mediation analyses with February 2021 data on death rates (see Tables AII.12 and AII.13 in the Appendix). The share of vaccinated people is no longer the stronger causal path, as expected. Instead, public health spending and the existence of protections for minorities and women in the country stand out as more relevant factors to account for the impact of socialist revolutions on the early development of the pandemic. Against popular perception, authoritarianism did not seem to be that important during the early stages of the pandemic – at least for socialist revolutionary regimes.

Conclusions

The global spread of the COVID-19 pandemic has presented one of the most significant challenges of this century. In less than two years, approximately seven million people have lost their lives to the virus, a toll seven times higher than that of influenza over a similar timeframe, as estimated by the World Health Organization. Alongside other pressing global issues such as climate change and poverty alleviation, the management of pandemics often requires collective

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solutions that may sometimes run counter to longstanding principles of individual freedom and democratic values cherished in Western societies. These solutions can entail difficult choices and dilemmas. As social scientists, our responsibility is to provide the most accurate understanding of the relationships between political factors and these global challenges.

In this paper, I have focused on the COVID-19 death toll in all countries in the world. While considering the well-established determinants of COVID-related deaths, I have specifically examined the impact of socialist revolutionary experiences on COVID-19 containment. Theoretically, countries that have undergone bottom-up, socialist-oriented revolutionary processes have created new institutions with the aim of strengthening the state to reshape their socioeconomic landscapes. Policies such as land reform, mass literacy, and gender equality have far-reaching consequences that are not easily reversible. They can also influence citizens to develop more positive attitudes toward state institutions, including security agencies, and to prioritize communitarian values over individual rights. Social mobilization practices, honed during revolutionary periods, can persist as mechanisms to address collective action challenges even after the downfall of revolutionary regimes.

My analysis reveals that countries with socialist revolutionary legacies consistently exhibit lower COVID-related death rates, even after accounting for various alternative explanations and regardless of the specific measures used as dependent variables. This effect is substantial, with socialist revolutionary countries experiencing, on average, 48 fewer COVID-related deaths per 100,000 inhabitants compared to countries without such legacies. When exploring the potential mechanisms through which this legacy contributes to improved COVID-19 containment, I find that these countries are more adept at leveraging social mobilization dynamics, particularly in the context of vaccination rollout. Additionally, their authoritarian institutions may expedite these processes.

China serves as a prominent example of these findings – a nation characterized by authoritarian governance rooted in revolutionary principles and a citizenry accustomed to collective mobilization practices. However, it's worth noting that even countries that have moved away from socialism, such as Nicaragua, Cambodia, and Ethiopia, also exhibit characteristics aligned with this pattern. While socialist revolutionary countries certainly face their own challenges, including issues related to authoritarianism, biased information flows, limited domestic technological innovation, and migration controls that can exacerbate nationalism and isolation, we should not overlook the potential of other institutional practices that may become vital in addressing future collective action problems.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S1755773924000250.

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Competing interests. The author declares none.

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