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A PRESENT STATE

State capacity through state presence and the COVID-19 pandemic

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Abstract Why have some states been successful in controlling the spread of SARS-CoV-2 and preventing deaths caused by it, while others failed to do so? So far, research has largely overlooked the role of state capacity in explaining this. In particular, the role of the territorial presence of states remains understudied. This thesis aims to fill this gap both theoretically and empirically. Theoretically, I argue that the highly contagious nature of the SARS-CoV-2 virus has put the territorial aspect of the state in focus. Through comprehensive territorial presence, the state can enforce collective action and implement policy on the ground, thus containing the spread of the virus and preventing new surges. The results of a cross-sectional regression analysis on a global sample of 85 countries showed that states that control their territories in full had, on average, up to 39 fewer deaths per 100,000 inhabitants in 2020 than states with less than full territorial presence.

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1 INTRODUCTION

As of 2 May 2022, the world has recorded over 511 million cases of coronavirus disease, and over 6,2 million death cases have been attributed to this (World Health Organization, 2022). The real toll of the pandemic, however, is believed to be much greater than what these confirmed cases exhibit. For example, excess mortality estimates indicate that the actual death rate of the COVID-19 pandemic for the same time period is closer to 21 million, over three times the number of reported deaths (Our World in Data, May 2, 2022). The novel SARS-CoV-2 virus, perhaps better known as the coronavirus that causes coronavirus disease (COVID-19), was discovered in Wuhan, a city in central China's Hubei province in December 2019. In early 2020 it had already spread across large parts of the world and on the 11th of March 2020, the World Health Organization (WHO) declared it a pandemic. Today the virus has spread to nearly every corner of the world, exposing the level of unpreparedness of many countries to respond to such a severe and complex crisis.

The COVID-19 pandemic can be viewed as a large-scale collective action problem, requiring collaboration on all levels of society - from the international to the local. On the national level, this approach puts the state at the center as the organizer and implementer of the public policies that govern the actions of citizens. The importance of the state then becomes that of an external enforcer ensuring successive collective action. In the context of the pandemic, such collective action includes ensuring citizens follow restrictions and guidelines designed to slow the spread of disease. The character and implementation of such restrictions have differed between countries, but have included restrictions on movement, the closing of public meeting places, and urging people to stay at home. If the state fails in this enforcer role, meaning that enough citizens breach these collective agreements, the policy aimed to slow the spread of disease cannot succeed and more people will subsequently be infected with the virus and die from it.

Why have some states been successful in controlling the spread of SARS-CoV-2 and preventing deaths caused by it, while others have failed to do so? Since the beginning of the pandemic, we have observed a wide variance in COVID-19 outcomes in-between countries, commonly measured through cases, hospitalizations, and deaths. Although some of this variance can be explained by differences in detection capacities, reporting, and ways in which a COVID-19 death is defined, it is clear that some states have fared much better than others in face of the pandemic. Furthermore, many countries that we would traditionally expect to fare well during times of crisis - that are democratic and have high levels of state capacity and economic development - have experienced very severe COVID-19 outcomes. This brings into question the well-established notion that states that have high levels of state capacity, especially when in combination with high levels of democracy, are best equipped to respond to severe and complex crises.

Having placed the state at the center of COVID-19 outcomes through its function as a collective action enforcer on the national level, I explore this wide variance in the impact of the pandemic through raising an often-overlooked dimension of state capacity, the infrastructural power of the state understood as being derived from its territorial presence. The territorial presence of states is, I argue, a vital aspect of state capacity in the context of the pandemic. Through this argument, I shift the focus of debate, from the *strength* of the state to the *presence* of the state as a necessary prerequisite for successful state implementation in the context of the pandemic. I theorize that if the state is not present on the ground through its infrastructures of governance (such as its offices and bureaucrats), it cannot ensure that citizens follow government policy and guidelines. This increases the risk of breaches of collective agreements, in turn leading to a higher likelihood of surges in infections, with more deaths as a result. One can then think of variations in COVID-19 mortality as the state failing or succeeding in its roles as an enforcer of collective action and, ultimately, failing in its arguably most fundamental task of protecting its populations.

In this study, I will not view the COVID-19 pandemic as a unique, isolated phenomenon. Instead, I approach it on a higher level of abstraction as a case of a larger phenomenon of unforeseen disastrous events states are continually at risk of facing. To explore the role of territorial presence in the ability of states to protect their populations in times of crisis, one hypothesis will be tested in this study, guided by the following research question:

RQ. *To what extent can the territorial presence of states affect their ability to implement policy on the ground, thus leading to better COVID-19 outcomes?*

I test the hypothesis on the relationship between state territorial presence and COVID-19 mortality on a global sample of 85 countries and using data from the World Mortality dataset, the Varieties of Democracy dataset, the Quality of Government dataset, and a novel indicator created for this study named the Coronavirus History indicator. The hypothesis finds support in the data, indicating that there is a negative relationship between the focal variables. States with higher levels of presence within their geographical territory, on average, had lower COVID-19 mortality rates during the first year of the pandemic. The empirical evidence thus provides support for the theoretical argument that the territorial presence of a state is a necessary precondition for the state to be able to perform its role as an enabler of successful collective action in the context of the COVID-19 pandemic. Furthermore, I look at two other variables of interest: coronavirus history and democracy. The findings indicate that democracy and coronavirus history have a negative confounding effect on COVID-19 mortality. Thus, these findings suggest that countries that have a universally present state, are highly democratic, and have a history of previous coronavirus outbreaks, should have lower mortality rates than countries that do not share these traits.

A broad field of literature in the political and social sciences has highlighted the central role of state capacity in states achieving better outcomes in a wide variety of social areas. In the context of the COVID-19 pandemic, however, state capacity is still an understudied subject. In particular, the territorial dimension of state capacity has so far largely been overlooked in research. Much of the small literature that does study the relationship between state capacity and COVID-19 outcomes has taken on the form of looking at state capacity in terms of policy. At the heart of the state capacity conceptualization, however, is not policy but implementation. With this study, I contribute to the literature on state capacity and the COVID-19 pandemic by studying the role of state territorial presence in COVID-19 outcomes, as I argue that state presence is a prerequisite for state implementation capacity on the ground in the context of the pandemic. On a theoretical level, this study provides a framework linking the territorial presence of the state to its ability to ensure successful collective action amongst its citizens. By making this connection, I provide a new theoretical way to approach the role of the state as a collective action problem solver. Finally, an important contribution of this dissertation is the novel Coronavirus History indicator created by this author. Based on WHO data, the Coronavirus History indicator makes it possible (for this study as well as for future research) to explore the effect of countries' coronavirus history on related outcomes on a global scale.

This paper proceeds as follows. I first review existing research on state capacity, natural disasters, and COVID-19 to provide an overview of the field of research this study is situated within. Next, I introduce the study's theoretical framework. This is followed by a presentation and discussion of its methodological approach and data. Then, I describe the study's main findings by presenting, first, descriptive evidence and, second, multivariate statistical results. Following this, these findings are discussed in view of relevant literature and theory, and the limitations of this study are highlighted. Then, I discuss the diagnostics and robustness tests that I have performed to ensure that the estimates produced are unbiased and reliable. Finally, in a concluding discussion, I present the main results and contributions of this study and point toward avenues for future research.

2 LITERATURE REVIEW

2.1 State capacity

In the last decade, state capacity has become one of the most studied concepts in political science. At its core, the concept refers to the ability of states to implement political decisions, such as policies and official goals (Hanson & Sigman, 2021). Departing from this idea of state capacity as the ability to effectively implement policy, there is a wide heterogeneity across literature in ways in which state capacity is conceptualized. With their foundations in the Weberian idea that state capacity depends on the existence of a rational bureaucracy, well-established conceptualizations of state capacity are those of bureaucratic quality (Nistotskaya & Cingolani, 2016), bureaucratic autonomy (Fukuyama, 2013), and the absence of corruption (Charron & Lapuente, 2010, 2011). Scholars also see the ability of states to provide public goods (Norris, 2012), extract revenues (Levi, 1989), and deliver well-being (Besley & Persson, 2011) as integral properties of state capacity. Within the social sciences field, most scholars now recognize that state capacity is a factor necessary to take into account when exploring variations of success in states delivering benefits to society, such as economic growth (Acemoglu et al., 2016; D'arcy & Nistotskaya, 2020; Dincecco & Katz, 2016; Knutsen, 2013) and the provision of public goods and services (Acemoglu et al., 2015; Brieba, 2018; D'Arcy & Nistotskaya, 2017; Hanson, 2015; Harbers, 2015). In short, we know that the state, and its capacity, matter for human development.

In its broadest sense, I consider state capacity to be the implementation capacity of states. With this departure in mind, state capacity is understood as a form of power. More specifically, I focus on the territorial presence of states as the source of state power in terms of their implementation capacity.

2.1.1 State capacity and public goods and services provision

In its purest form, public goods can be defined as goods that are nonrival and nonexcludable, meaning that they are available to all and that one individual enjoying their benefits does not detract from other individuals being able to do the same (Cornes & Sandler, 1996). Examples of public goods include more basic goods such as access to clean air and water, as well as services such as law enforcement, the rule of law, and health services. Hanson (2015) puts state capacity and democracy at the center of public services provision:

> The degree to which public services have a measurable impact on development indicators is a function of three factors: the level of resources allocated, the manner in which they are distributed, and the effectiveness with which they are used. In theory, democracy and state capacity are key determinants of these factors, but the nature of their interaction is unclear. (Hanson, 2015, 305)

A substantial field of research has demonstrated a positive link between state capacity and public health, a central public good. Higher levels of state capacity (or related measures) have been connected to benevolent health outcomes, such as lower mortality rates for infants, children, and mothers (Brieba, 2018; Hanson & Sigman, 2021; Majeed, 2017), higher life expectancies (Hanson & Sigman, 2021; Majeed, 2017), and states being better able to control the transmission of infectious diseases (Gizelis, 2009).

Focusing on subnational variations in state capacity, research has found that strong capacity on the subnational level matter for public health and infectious disease outcomes. Looking at the subnational government capacity in India and its role in estimating Malaria incidents, Boussalis et al. (2012) finds that high levels of government capacity are connected to less adverse malaria outcomes. Furthermore, the findings indicate that government capacity is more important for moderating the health effects of Malaria than other indicators that we would perhaps expect to be more directly related to such outcomes, such as public health expenditure and economic growth.

Phillips et al. (2015) study the relationship between better civil registration and vital statistics (CRVS) systems and public health outcomes. Through the generation of information that can be used for public health policy and that help ensure the entitlement and access to public health services for individuals, the authors show that well-functioning CRVS systems are directly connected to improved public health outcomes. The focus on CRVS systems can be viewed as falling within a recent strand of research which focus on *information* as the most important attribute of state capacity. This type of measurement belongs to a generalist conceptualization of state capacity which focuses on the territorial reach of the state (a category which this study falls into) (D'arcy & Nistotskaya, 2021). In short, you can think about information as a measurement of the reach of the state. From this perspective, more well-functioning CRVS systems can be an indicator of the state having a greater territorial presence, and then connecting this to better health outcomes.

On a related note, D'Arcy and Nistotskaya (2017) debut a new measurement of the quality of cadastral records to measure state capacity when exploring its link to public goods provision. State capacity is conceptualized as territorial reach and information, and public goods provision is theorized as a collective action problem. The findings indicate that states with higher levels of state capacity, i.e., states that possess more enforcement capacity, perform their role as public good providers more successfully. Furthermore, D’arcy and Nistotskaya bring in the issue of sequencing, showing that states which have a high state capacity before democratizing are better able to fulfill their role as collective action problem solvers through the provision of public goods.

Hanson’s (2015) conceptualization of state capacity also revolves around the idea of territorial reach when exploring the interaction effect of state capacity and democracy on public goods provision. Asking the question of whether state capacity and democracy work as a complement or substitute to the other, Hanson's findings indicate that the two concepts have a strong effect on public services when independent, but that the combination of high levels of state capacity and democracy do not have an increased effect on outcomes. In other words, Hanson's findings indicate that high levels of democracy can compensate for low levels of state capacity.

Harbers (2015) put forward an approach on how to capture subnational variations of state capacity, suggesting a measure based on municipal level revenue collection by comparing local government level tax collection to economic activity in the same area. The need for such a measure, as argued by Harbers, is that weak state capacity on the local level leaves the central state vulnerable to both conflict and capture. Mapping state capacity on the municipal level in Ecuador, Harbers finds that citizens in municipalities with higher state capacity tend to be more satisfied with the services provided by the state.

Acemoglu et al. also study subnational state capacity variations, viewing state capacity as a “network game between municipalities and the national government” (2015, 2364). Conceptualizing state capacity as the presence of state functionaries and agencies, the authors consider state capacity on both the level of the central and the local state with a theoretical focus on the spillovers that municipalities create on their neighbors. Their findings show that local state presence is a significant determinant of prosperity and that much of its impact works through network effects, i.e., is a spillover from the state capacity of neighboring local states.

2.2 Approaching COVID-19

To understand the role of institutional factors (such as state capacity) in relation to variations in COVID-19 outcomes across countries, it is first important to put thought into how the pandemic as a phenomenon is understood. In this dissertation, the COVID-19 pandemic is approached as a case of a larger phenomenon of hazardous situations states continuously risk facing.

2.2.1 Taking lessons from the natural disasters literature

Viewing COVID-19 as a case of a larger phenomenon of disastrous situations highlights some similarities the pandemic shares to other cases of natural disasters, allowing us to take lessons from the literature on this subject. A natural disaster arises through the interaction between a natural hazardous situation and human society. As the World Meteorological Organization puts it, "[n]atural hazards are severe and extreme weather and climate events" which "become disasters when people's lives and livelihoods are destroyed" (World Meteorological Organization, 2022). Viewing natural disasters as emergency situations that are out of our control and therefore become disasters, Ahlbom Persson and Povitkina (2017) argue that the fundamental role of the state is to protect populations and reduce human suffering. Similarly to natural disaster situations, COVID-19 and can be understood as an exogenous shock, originating outside of society. The origin of the SARS-CoV-2 virus was largely outside the control of social actors, but the size and nature of its impact on human lives and livelihoods can be determined by the actions taken by these actors. On this higher level of abstraction, measuring COVID-19 related deaths becomes a measure of the ultimate failure of the state to protect its population.

A substantial literature has connected state capacity to better outcomes during natural disasters, focusing on the human costs of natural disasters, such as lives lost and damage to livelihoods (Ahlbom Persson & Povitkina, 2017; Kahn, 2005; Lewis, 2011; Sjöstedt & Povitkina, 2017). Two factors are highlighted in much of the recent natural disasters literature as key to reducing the impact of natural disasters. These are the importance of investing in preventative disaster measures (rather than mitigating efforts once a disaster has taken place) (e.g., Ahlbom Persson & Povitkina, 2017; Keefer et al., 2011), and the importance of reducing the vulnerabilities of populations (e.g., Ahlbom Persson & Povitkina, 2017; Blaikie et al., 2004; Lewis, 2011; Sjöstedt & Povitkina, 2017). Some studies also make a theoretical connection between state preparedness and population vulnerability. Ahlbom Persson and Povitkina (2017), for example, highlight the role of state preparedness as key to reducing the vulnerability of populations and show that preventative measures work through reducing the vulnerabilities of populations.

Literature on natural disasters has shown that state capacity positively affects natural disasters outcomes. Other factors, such as wealth and democracy, are also raised as important factors determining natural disaster outcomes. Testing several hypotheses to explain the variance of disaster outcomes across countries, Khan (2005) links stronger institutions to fewer natural disaster deaths. Kahn hypothesizes that this relationship could be due to stronger institutions being less corrupt. Kahn's main finding, however, is that economic growth seems to work as a buffer to natural disasters, showing that natural disasters hit poorer nations harder in terms of human lives lost than they do in more wealthy nations. Departing on the identified vulnerability of small island developing states to natural disasters, Sjöstedt & Povitkina (2017) explore the link between government effectiveness and people killed and affected by natural disasters. Departing in theories of how institutions affect collective action and adaptive capacities, their findings show that SIDS with higher government effectiveness tends to have fewer people affected or killed by natural disasters. Ahlbom Persson and Povitkina (2017) study the interaction effect of democracy and institutional quality on natural disaster outcomes. The authors theorize that this relationship is contingent, with the level of democracy determining the availability of public goods to the entire population whilst the level of institutional quality determines the implementation capacity of the state, and therefore its ability to implement policies and distribute said public goods. The findings support this theory, showing that democracy has a positive effect on natural disaster outcomes when institutional quality is high. However, when institutional quality is low, democracies tend to have worse disaster outcomes than autocracies (Ahlbom Persson & Povitkina, 2017).

There is a multitude of conceptualizations of vulnerability in the context of natural disasters. Wisner, an influential scholar within risk management, contends that vulnerability is ‘‘the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard’’ (Blaikie et al., 2004, 11). Although the exact root causes of vulnerability differ across studies, much research focuses on institutional, organizational, or governance factors when examining explanations for variations in vulnerability (Shaw et al., 2010; Sjöstedt & Povitkina, 2017). Some factors that have been described as drivers of vulnerability are corruption (Lewis, 2011), background social conditions (Blaikie et al., 2004), and the interaction between democracy and institutional quality as the processes which shape government action (Ahlbom Persson & Povitkina, 2017).

By approaching COVID-19 under the assumption that the success of state interventions during natural disasters can guide state responses during the pandemic, some lessons can be taken. Literature has put state capacity in a central role as positively affecting natural disaster outcomes, suggesting that it also has a central role in successful state COVID-19 responses. Furthermore, literature has shown that key for mitigating the impacts of natural disasters is state preparedness and reducing the vulnerabilities of populations. Applying these findings to the pandemic, a successful state response in terms of COVID-19 could depend on the ability of the state to ensure the resilience of its population and the preparedness of the state to face unforeseen and complex crises events.

2.2.2 State capacity and COVID-19

The COVID-19 pandemic is still a recent (and ongoing) societal phenomenon. Although quickly growing, the literature on COVID-19 is, therefore, smaller than the field of research that touch on broader topics of public health. State capacity has been shown to play an important role in the relative successes and failures of different states' pandemic responses. Although state capacity is an understudied subject in the context of the pandemic, some findings from previous research indicate that state capacity mitigates deaths caused by COVID-19. Countries with higher levels of state capacity tend to report fewer deaths or have lower levels of excess mortality (Gisselquist & Vaccaro 2021; Beaney et al, 2021; Knutsen & Kolvani, 2022; Serikbayeva et al., 2021).

The existing study which, perhaps, has the most commonalities to this dissertation is conducted by Knutsen and Kolvani (2022). Knutsen and Kolvani look at the effect of state capacity and democracy, both independently and in convergence, on COVID-19 deaths and COVID-19 death reporting. Aiming to explore how states affect development outcomes, the authors theorize that more democratic states with high levels of state capacity should experience lower COVID-19 mortality rates, and report on them more accurately than states with lower levels of democracy and state capacity. In support of this theory, their findings indicate that state capacity, generally, seems to mitigate both actual deaths and COVID-19 death underreporting and that these relationships are stronger in more democratic countries. Countries that combine high levels of democracy and state capacity both experience fewer COVID-19 deaths and provide more accurate tolls of the pandemic's consequences. These findings are explained by political leaders in more democratic countries tending to have stronger incentives to devise better policies, which is complemented by a stronger ability of the state to effectively implement these policies in contexts where state capacity is also high.

Supporting the hypothesis that state capacity matters for COVID-19 outcomes is also a study by Yen et al. (2022). The authors argue that state capacity, understood as the extractive capacity ("a state's ability to collect resources from the society to achieve its policy goals") and administrative capacity ("a state's ability to make and implement policies effectively") of states affect both the timing and configuration of COVID-19 policy responses (Yen et al., 2022, 6-7). The findings indicate that higher capacity states in Asia have more timely and less reactive interventions then lower capacity states.

With these findings, the Yen et al. argue that the preexisting political institutions in a country constrains its COVID-19 response. This follows the logic of this study, which also put the political institutions shaping state capacity as a central factor affecting COVID-19 outcomes. In contrast to this study however, Yen et al. do not focus on policy outcomes, but on the actual policy response as the dependent variable. In their study, Knutsen and Kolvani also raise the important role of the state in successful COVID-19 outcomes focusing on both regime type and implementation capacity, thus providing an important entry point for this study to continue exploring this relationship. To measure state capacity, Knutsen and Kolvani use the V-Dem indicator "impartial and rule-following administration". As the name indicates, this is a measure of impartiality that, arguably, is more consistent with the quality of government concept rather than with state capacity as a concept. It is not uncommon that scholars, when attempting to measure state capacity, include aspects of regime type in the measurement rather than strictly cohering with state capacity understood as state implementation ability. This conflation of terms makes it difficult to differentiate between the independent effects of regime type, quality of government, and state capacity, and therefore, to understand the actual impact of variations in state capacity (D'Arcy & Nistotskaya, 2020). Examining Knutsen and Kolvani's findings with this in mind, it is arguably difficult to draw conclusions on if it is actually state capacity, or other aspects more related to governance quality, that are driving the empirically observed outcomes. Furthermore, the authors' conceptualization and measurement does not include any aspects relating to infrastructural power and territorial reach, something which I will argue plays a vital role in state COVID-19 responses.

3 THEORETICAL FRAMEWORK

3.1 COVID-19 and collective action

In this dissertation, I approach COVID-19 through the perspective of collective action theory. The pandemic can be viewed as a large-scale collective action problem. Its complexity, the number of actors involved, and the vast territorial distance it covers are factors helping in identifying it as such (Harring et al., 2021). Furthermore, a successful COVID-19 response requires individuals to follow state-induced policies and recommendations, such as adhering to social distancing policies and accepting the recommended doses of vaccine. If (enough) people breach these collective agreements (so-called free-riders), the spread of the pandemic may not be contained. The success of state COVID-19 policies, therefore, rests on its ability to ensure collective action through monitoring compliance with anti-pandemic measures and punishing free-riders. Collective action theory departs on the argument that individuals sharing collective interests within a group do not ensure collective action to reach those interests. As Olson puts it:

> [U]nless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*. (Olson, 1965, 2)

This theoretical framework emphasizes the state's function as an external agent that guides the actions of its citizens towards the greatest collective benefit, i.e., social order. The role of the state then is as a coercive force exerting public control (Ostrom, 2015). Thus, collective action theory puts the state at the center of the complex problem that is COVID-19 as the coercive force Olson describes.

Having put the state in the center, literature connecting collective action to state capacity has highlighted the capacity of the state as vital for determining whether the state is capable of fulfilling this role or not. D'arcy and Nistotsakaya's (2017) findings indicate that states with higher levels of state capacity, i.e., states that possess more enforcement capacity, perform their role as public good providers more successfully. Successful enforcement, they argue, requires the state to have 'eyes' and 'teeth'. That is, the ability to "monitor all citizens" and "punish free-riders" (2017, 195):

> If the group is the population of a country and the external enforcer is the state, then the key capacities needed to establish credible enforcement are high capacity to monitor and project power over all those subject to its authority and to apply this power to punish citizens found (through monitoring) to be free-riding. (D'arcy & Nistotsakaya, 2017, 195)

It is through its capacity that the state can become a "credible enforcer", capable of overriding the preferences of its citizens to align individual incentives with collective goals. Lee and Zhang

(2017) focus on the foundations of state capacity, arguing that the capacity of the state in parts depends on its legibility. That is “the breadth and depth of the state’s knowledge about its citizens and their activities” (2017, 118). Lee and Zhang link the legibility of the state to its ability to solve collective action problems through curbing free-riders, as it allows the state to effectively enforce rules and legislations and monitor citizens' behaviors. Thus, both D’arcy and Nistotsakayas (2017) and Lee and Zhang's (2017) findings support the theory that state capacity is key for the state fulfilling its role as an external enforcer, by making the state able to effectively monitor, enforce, and punish. What remains unclear is whether the logic of collective action theory is applicable to the case of the Covid-19 pandemic – something this thesis engages with.

3.2 Some other factors affecting COVID-19 outcomes

Although I theorize that state capacity plays a vital role in ensuring successful collective action resulting in more desirable COVID-19 outcomes, it is important to note that state capacity is not the only factor shaping outcomes related to the pandemic.

Differences in governmental policy responses may explain some variation in how the SARS-CoV-2 virus has hit different countries. Focusing on institutional factors and government response, curfews, lockdowns, and closing public meeting places has been brought forward as some of the most effective (non-pharmaceutical) government interventions for slowing the spread of the virus (Haug et al., 2020). The actual stringency and timing of how said restrictions are imposed have also been highlighted as important for explaining variations in COVID-19 outcomes cross-countries. Focusing on European countries during the first wave of the pandemic, Plümper and Neumayer (2022) show that lockdowns being imposed early on in the pandemic matters more for containing the spread of the virus than these restrictions being more strict.

Social psychological factors have also been highlighted as affecting citizens' behavior and likeliness to follow government regulations. Countries with higher levels of institutional trust, for example, record a lower mortality rate, whereas perceived sociability in a country connects with higher mortality rates (Oksanen et al., 2020). Community capacity understood as the ability of a community, including civil society, to socially mobilize through collective action, has also been shown as a potentially important factor in impending the negative outcomes of COVID-19, especially in contexts where social trust and political legitimacy are low (Hartley & Jarvis, 2020).

Much literature has focused on the role of regime type and democracy (sometimes in interaction with state capacity) in shaping COVID-19 outcomes. Some scholars have demonstrated that more democracy leads to better COVID-19 outcomes. Arguments explaining this relationship often center around how democratic principles and institutions connect to better accountability and transparency, thereby allowing public interests to shape government pandemic responses in more democratic contexts (Beaney et al., 2021). More democratic states also tend to place a higher value on human life and well-being, leading to better pandemic outcomes (Karabulut et al., 2021).

Some scholars, however, have highlighted the fact that more autocratic states tend to have more coercive power, giving them greater capacity to enforce unpopular policies, such as social distancing, putting more democratic states at a relative disadvantage in terms of the pandemic. More autocratic states may also have less 'red tape' to go through compared to more democratic states when implementing COVID-19 policy, making it possible for autocratic leaders to respond quicker and more forcefully in the face of the pandemic (Cassan & Van Steenvoort, 2021; Yao et al., 2021). Turning to the interaction effect between state capacity and democracy, there is a strong consensus in political science literature that it is states that are both strong and democratic that are best able to promote human development (D'arcy & Nistotskaya, 2017). In terms of the pandemic, Knutsen and Kolvani (2022) have suggested that in a context where both state capacity and democracy is high, the implementation *ability* of the state is supported by the political *will* to protect the entire population and reduce the human costs of the pandemic. This suggests a complementary relationship between state capacity and democracy, meaning that the effect of state capacity on COVID-19 mortality is stronger in more democratic settings. The effect of democracy on state capacity and COVID-19 mortality will be explored further in the statistical analysis.

Another factor which may explain some of the variance in COVID-19 outcomes across countries, and that will be explored further in the analysis as a confounding variable, is the viral history of countries. Drawing from literature on natural disasters, I theorize that the viral history of countries can play a role in explaining their level of preparedness in face of the COVID-19 pandemic. Departing from the large variance in earthquake mortality across countries, Keefer et al. (2011) link the earthquake propensity in a country to the political incentives to invest in earthquake preparedness. This means that the countries that are more likely to experience frequent earthquakes have lower opportunity costs for investing in such measures, leading to lower earthquake mortality rates once disaster strikes.

Applying these findings to the COVID-19 pandemic, I theorize that countries that have experienced public health threats that share similarities with the COVID-19 pandemic in their past should have a better level of preparedness to the COVID-19 pandemic. Mirroring the theory of Keefer et al., the previous viral history of countries can both reduce the opportunity costs to invest in preparedness measures and the political incentives to do so. If similar disastrous health situations have taken place before, politicians might realize the risk of something similar happening again in the future, thus investing to prevent this. Having a history of similar crises can also reveal the weaknesses in a country's health system (amongst its other state functions), thus guiding future policymaking. In sum, I hold that countries that, in their recent history, have had experiences with cases of highly pathogenic respiratory viruses might be better prepared to handle future outbreaks of viruses of a similar nature.

The COVID-19 pandemic is a complex and multidimensional phenomenon with a seemingly endless interaction of factors affecting its impact on lives and livelihoods across different contexts. Here, I will argue that state capacity is at the center of these factors as playing a vital role in explaining variations in pandemic outcomes.

3.3 Conceptualizations of state capacity

This study belongs to a field of research that views the reach of the state as an integral characteristic of state capacity. When understanding the territorial presence of states as a foundation for their capacity, Michael Mann's concept of infrastructural power is a helpful entry point. Mann lays out two different dimensions of state power. First, there is despotic power, referring to the power of political elites over society. Infrastructural power is the second (and to Mann most important) dimension of state power. The term refers to the capacity of states to penetrate society and “to implement logistically political decisions throughout the realm” (1984,189). In other words, despotic power could be thought of as power over society, whilst infrastructural power is power through society. Using Mann’s own analogy from Alice in Wonderland, the despotic power of the red queen refers to her ability to order someone's head to be cut off, whilst her infrastructural power refers to her ability to hunt down and capture Alice.

Building on Mann’s infrastructural power (1984, 2008), directly or indirectly, a consequent field of research has advanced his theoretical framework of infrastructural power by focusing on the reach of the state as the key property of state capacity. When explaining state failure in Africa, Herbst (20002) focuses on the failure of many African states to project power over distance. While Herbst emphasizes variation in territorial reach between states, scholars like Hillel (2008), Harbers (2015) and Ch et al (2018) pointed to the sub-national variation in state capacity in general and infrastructural power, in particular.

Focusing on the extent of infrastructural state capacity as the main explanatory variable for variation in COVID-19 outcomes, this thesis’s interest lays in the extent to which the state penetrates society. I argue that the most relevant conceptualization of state capacity for COVID-19 outcomes is the one focusing on territorial presence. In this next section, I will explain why.

3.4 State territorial presence and COVID-19 mortality

Previous research has demonstrated the importance of state capacity for desirable public health- and natural disaster outcomes. Furthermore, drawing on Acemoglu et al. (2016) and Brieba

(2018) amongst others, the territorial presence of the state is a necessary condition for the successful implementation of political decisions. In this study, I depart in this knowledge but explore the logistical foundation of state capacity through the lens of collective action, to theorize on what the necessary foundation of state capacity is. In doing this, I take a step back to argue that before we think of the strength of the enforcer (that is, the state), we first need to think about its presence. In short, the enforcer needs to be present to be able to enforce. If the enforcer is not present, there is an increased danger of collective agreements being breached. Therefore, I hold that we first need to focus on the presence of the state, before considering other characteristics of state strength when approaching the relationship between state capacity and COVID-19 outcomes.

In the context of the COVID-19 pandemic, I argue that the territorial presence of the state is the most important dimension of state implementation capacity. The highly contagious nature of the SARS-CoV-2 virus, displayed through its fast spread across the entire globe, through multiple waves, and spurred on by several mutations has put the territorial aspect of the state in focus (Cingolani, 2022). It is through its territorial presence that the state can detect and contain positive cases, ensure that all areas have access to critical supplies (such as protective equipment, testing equipment, vaccines, ventilators, and oxygen), and spread information and combat disinformation on the virus. Through measures such as these, the spread of the virus can be contained and those infected can be treated.

In short, I theorize that in territories where the state is present through its infrastructural institutions, the state can gain and hold control over the logistical linkages necessary for policy implementation. To understand how state territorial presence is defined and measured, one can think about the share of the country's territory where the state has its infrastructures of governance, such as its offices and bureaucrats, etcetera. In places where the state either has such infrastructural institutions in place, or which are easily (and regularly) reached through these institutions, I hold that the state is present. Through these infrastructures, the state holds control over the logistical linkages necessary for policy implementation (such as the implementation of COVID-19 guidelines and policies). Drawing on Brieba (2018), these logistical linkages include “logistics of information-gathering, coordination, enforcement, and control” (2018, 50).

To illustrate this theory with an empirical example, we can turn to look at urban informal settlements, or slum areas, during the pandemic. It can be argued that the territorial presence of the state in informal settlements around the world, on average, is low (although the level of state presence in informal settlements of course varies across countries, cities, and areas). Several studies, for example, have shown that in Brazil's favela communities, the state's *legal* presence is greatly reduced due to its low *material* presence (as in the lack of urban infrastructures, schools, hospitals, and an effective police force, etcetera) (e.g. Caldeira 2000; Goldstein 2003; Kowarick and Bonduki 1994). And Kibera, a settlement in Nairobi famous for being Africa's largest slum, has been called a “land without law” due to the weak presence of the state within the area, which some argue has been replaced by the presence of NGOs (Hernández Reyna, 2012).

In a cross-country study, Sahasranaman and Jensen (2021) found that neighborhoods with slums contain the highest density of COVID-19 cases across all considered cities, indicating that slums constitute the most at-risk urban locations in the pandemic. Sahasranaman and Jensen theorize that the vulnerability of informal settlements depends on the demographic characteristics of these areas (such as having high levels of population density, poverty and migration), and on the networks these populations use to fulfill their basic human needs, such as using public toilets and water sources on a daily basis.

Departing from my theory on state territorial presence, I argue that the lack of state presence could play a role (both independently and through the factors raised by Sahasranaman and Jensen) in determining the vulnerability of slum areas. Low levels of state presence in many of these areas mean that it is difficult for the state to gather information (on the spread of the virus), coordinate actions (for example, with regard to vaccination), and exert control (for example, to ensure social distancing measures) over citizen actions. In short, making it very difficult for the state to perform its role as an enabler of a successful collective action. This could help explain the on average higher levels of cases found within slum areas and neighborhoods surrounding them. When the state is not able to implement and enforce COVID-19 restrictions, positive cases will be high and spread to surrounding areas leading to surges in cases.

In sum, states with higher levels of territorial presence should be better prepared to deal with the pandemic through their increased ability to implement political decisions and coordinate collective action on the ground. The closer a state is to having a universal presence throughout its territory, the closer the state should be to having better COVID-19 outcomes. Thus, following this line of reasoning, states with higher levels of state territorial presence should have lower levels of excess mortality rates.

Hypothesis. *States with higher levels of territorial presence, holding all else equal, have lower COVID-19 mortality rates than states with lower levels of territorial presence.*

4 METHODOLOGICAL DESIGN

To test the hypothesized impact of state territorial presence on COVID-19 mortality, I perform a multivariate statistical analysis using Ordinary Least Squares (OLS) regression. The OLS analysis builds on the assumption that changes in one variable (COVID-19 mortality) are dependent on changes in the other (state territorial presence). Furthermore, these changes are assumed to be uniform and consistent, making the relationships linear (Mehmetoglu & Jakobsen, 2017). Using the OLS technique allows me to use both an inclusionary and exclusionary strategy, meaning that I can explore the relationship between state territorial presence and COVID-19 mortality while also investigating what other independent variables should be included or excluded in the model to further the understanding of this relationship.

The analysis employs one main statistical analysis to test the hypothesis. It consists of the focal relationship (with the independent variable state authority over territory and the dependent variable excess mortality), together with several plausible confounders. These are population density, population age distribution ages 65 and above (as a percentage of the entire population), coronavirus history, economic development, and the Electoral Democracy Index (used both as a moderating- and control variable).

4.1 Data

For this study, cross-sectional data is used on a global sample of 85 countries. For the dependent variable, data from 2020 is used to capture the cumulative number of deaths in each country for this whole year. To decrease the risk of endogeneity, the independent variables are measured using the latest available data prior to 2020. I employ data from four different sources. For the dependent variable, the World Mortality dataset (WMD) is used (Karlinsky & Kobak, 2021a). This is an openly available dataset created by scholars Ariel Karlinsky and Dmitry Kobak on excess mortality rates during the COVID-19 pandemic. For the focal independent variable, data gathered by the Varieties of Democracy (V-Dem) Institute for the V-Dem Full+Others dataset version 11.1 is used (Coppedge et al., 2021a). For the moderating and control variables, V-Dem data is also used together with data gathered by The Quality of Government (QoG) Institute for the QoG Basic Cross-Section Dataset 2021 (Dahlberg et al., 2021). Additionally, the novel Coronavirus History indicator is used for a final control variable. Important to note is that the WMD has a more limited case coverage than the other sources of data used, covering 118 cases (countries and territories). This is somewhat limiting the final sample of N to 85 countries.

4.2 The Coronavirus History indicator

Countries that, in their more recent history, have had experiences with cases of highly pathogenic respiratory viruses might be better prepared to handle future virus outbreaks of a similar nature. To make it possible to control for the history of health crises that bear similarities to the COVID-19 pandemic in countries, I have created a novel indicator for this study called the Coronavirus History indicator.

This indicator builds on data from the WHO and answers the question of whether a country has recorded any official case(s) of the severe acute respiratory syndrome (SARS) caused by the SARS-CoV virus, or the Middle East respiratory syndrome (MERS) caused by the MERS-CoV virus. Both the MERS and SARS viruses belong to the coronavirus family and have transmission routes that share similarities with the SARS-CoV-2 virus. The SARS-CoV virus is mainly transmitted by close person-to-person contact, through small droplets of saliva, either directly in the air, or indirectly through surfaces touched by those infected. MERS-CoV can be transmitted from animals to humans through contact with infected dromedary camels and, in a similar way to SARS-CoV, through close person-to-person contact (Zhu et al., 2020).

The first case of a SARS infection was detected in China in November 2002 (Hsu et al., 2003). This was the first time that a coronavirus was detected. The global SARS outbreak began in Singapore in March 2003 and was contained in July 2003. During this time, 29 countries (or 26, depending on whether Hong Kong, Macao, and Taiwan are included separately or measured as China) reported cases of the virus. Out of the 8,098 people worldwide who were recorded to have become sick with SARS during the outbreak, about 10.5% died. Since 2004, no cases of SARS have been detected anywhere in the world (CDC, 2016; CDC, 2017). The MERS-CoV virus was first identified in Saudi Arabia in 2012. Since it was first detected, 27 countries have reported cases of MERS. Most cases have been detected on the Arabian Peninsula or have been connected to this region through travel or residency, including a large outbreak in South Korea in 2015. Out of patients reported to be infected with MERS-CoV, about 35% have died. Unlike the SARS-CoV virus, new cases of the MERS-CoV virus are still being detected (World Health Organization, 2019).

The Coronavirus History indicator answers the question of whether a country has recorded cases of the MERS or SARS virus before the COVID-19 pandemic. The WHO is used as a source for data on both SARS and MERS cases, which is then compiled in this indicator (World Health Organization, 2015; World Health Organization, 2019). If a country has had one or more officially confirmed case(s) of either one of these viral diseases, it is coded as having a coronavirus history. If a country has not reported any official cases of either SARS or MERS, it is coded as not having a coronavirus history. This indicator includes reported official cases of SARS from the time of the first detected case until the containment of the global outbreak. That is, between 1 November 2002 and 31 July 2003. The dataset also includes reported official cases of MERS from the time of the first detected case in 2012 until March 2019, as this is the year before the wide spread of the SARS-CoV-2 virus. The Coronavirus History indicator includes data on 194 countries. Out of these, 42 countries are coded as having had confirmed cases of SARS, MERS, or both.

4.3 Variables

4.3.1 Dependent variable: COVID-19 mortality

For this dissertation, COVID-19 mortality is the outcome of interest. There is uncertainty about the actual number of COVID-19 deaths in the world, as made clear when comparing the number of confirmed COVID-19 death cases to excess mortality rates for the same time period. Research has shown that there is a large discrepancy between the number of reported COVID-19 death cases and the actual death toll of the pandemic (Knutsen & Kolvani, 2022). This uncertainty makes it difficult to make comparisons and draw conclusions on cross-country variations in COVID-19 mortality rates (Beaney et al., 2020).

One reason behind this discrepancy is the differences in testing capacities between countries, meaning that countries have different abilities to detect and confirm cases of the virus. Another major factor behind this difficulty is the wide heterogeneity in how a COVID-19 death is defined across different countries. For example, in Russia, a death is only defined as being COVID-19-related if the virus is established as the primary cause of death after the conduction of an autopsy, resulting in very few deaths being labeled as caused by the virus. In contrast, there is a much broader definition of what constitutes a COVID-19 related death in Belgium, where all suspected cases are reported as COVID-19-related (Beaney et al., 2020; Karlinsky & Kobak, 2021b). Furthermore, we have seen that there are large discrepancies in death reporting across countries. Knutsen and Kolvani (2022), for example, have shown that democratic states provide more accurate tolls of COVID-19 mortality rates in their countries, as compared to autocratic states.

These challenges indicate that the choice of measurement of COVID-19 mortality greatly matters when studying the pandemic. In this study, estimated excess mortality will be used to measure COVID-19 mortality. This measurement does not measure reported COVID-19 deaths directly but instead compares the actual mortality rate in a country to the expected mortality rate for the same period of time. In this way, the measurement aims to capture all COVID-19-related deaths, independent of cross-country differences that affect the way COVID-19 deaths are detected, defined, and reported on. Furthermore, measuring COVID-19 deaths through excess mortality makes it possible to take into account both deaths caused directly and indirectly by the virus. Examples of deaths caused indirectly by the virus include deaths related to essential health services and travel disruptions caused by the virus (World Health Organization, n.a.).

To observe excess deaths, I utilize the variable *Excess per 100k* from the WMD. This variable shows excess mortality per 100,000 population during 2020. The dataset version that is used in this study was last updated on the 9th of March 2022 and has a case coverage of 118 countries across all the world's regions (Karlinsky & Kobak, 2021a). To estimate excess deaths for the WMD, Karlinksy and Kobak estimate the expected (baseline) mortality for 2020 (that is without a pandemic event) and compare the actual death rate during the year to this non-pandemic expectation.[1] As the age of a population is expected to strongly affect the infection-fatality rate of the virus, the authors also account for the variance in age structures across countries by raising the number of expected deaths as a population age (Karlinsky & Kobak, 2021b). Since the variable measures deaths per 100,000 inhabitants, it also accounts for population size.

4.3.2 Focal independent variable: state territorial presence

State capacity is an inherently difficult concept to observe, as is demonstrated in the wide variance of ways in which it is conceptualized and measured in literature. Focusing on the territorial reach of the state, state capacity here is conceptualized as state territorial presence.

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[1] To estimate the excess mortality, the authors estimate the expected (baseline) mortality for 2020 using historical data from the previous five years (2015-2019). For countries where data from all of the years between 2015-2019 was not available, data from as many years as possible in this interval was included. The authors also subtract some COVID-19 unrelated causes of excess mortality (such as deaths connected to armed conflicts or heat waves).

There are few measurements for state territorial presence available in the existing literature. Traditional measurements of the infrastructural dimension of state capacity have used the density of roads, railways, schools, and post offices as indicators of the territorial reach of states (e.g. Acemoglu et al., 2015; Herbst, 2000). Most recently, literature has moved to focus on the conceptualization of state capacity as information, turning to the information resources necessary for successful policy implementation to measure this concept (e.g., Cingolani, 2022; D'arcy & Nistotskaya, 2017).

In this study, the V-Dem variable *state authority over territory* (from here on referred to as STAT) will be employed to capture the territorial presence of states (Coppedge et al., 2021a). This indicator measures to what extent the state is recognized as the preeminent authority within its geographical territory, meaning that the state can assert control over any other forces threatening its hegemony within its territory. This choice of measurement is based on the assumption that a state cannot hold hegemonic control over a territory in which it is not, or has a very weak, presence. If this assumption holds, a state not having full authority over its territory points to it also not having a universal presence within its geographical borders. Therefore, I hold that by measuring STAT, I can capture the concept of state territorial presence. Some examples to illustrate circumstances in which the state does not hold effective control over its territory include cases of civil wars, failed states, and where criminal groups or warlords exert control over territory. In cases such as these, the state either fails to control its territory or its claim to rule is hindered or infringed upon by other political forces (Coppedge et al., 2021b).

STAT is coded using data from 2019 as this is the year in which the virus was first detected but before the outcome measure. STAT is a continuous variable ranging between 0-100. It is based on the question: "Over what percentage (%) of the territory does the state have effective control?" (Coppedge et al., 2021b, 188). A score of 0 on the scale indicates that a state does not have effective control over any of its territory, and a score of 100 indicates that a state has full control over its entire territory. In the final sample of N, STAT has 85 observations ranging between 68.143-100. When conducting a comparative analysis, utilizing data that is based on assessments of multiple experts and that is produced by a reputable research organization such as the V-Dem institute, reduces the risk of the subjectivity of the measurement. The choice to use a V-Dem variable to measure state territorial presence is therefore also aimed at improving the accuracy and reducing the risk of potential biases in the findings of this study.

4.3.3 Control and moderating variables

To study the effect of state territorial presence on COVID-19 mortality, it is also necessary to control for other factors that possibly confound this focal relationship through their effect on the spread of disease, or on the ability of states to effectively respond to the pandemic. The control variables used in this study fall into one of two categories. Some confounders pertain to demographic, and some to institutional, factors.

The demographic factors that I control for are population density and population age distribution. To measure population density, the QoG variable *population density (people per sq. km of land area)* measured in 2019, is used (Dahlberg et al., 2021). In a context where the spread of the virus is high and/or the population is more vulnerable due to demographic factors, I expect mortality rates to also be higher, independently of the capacity of the state. Research has shown that the impact of COVID-19 has been disproportionate in highly dense areas (Martins-Filho, 2021). In places where people live their lives closer together, the virus can spread more easily through the increased level of person-to-person contact such contexts bring. Therefore, population density is believed to be an important driver of virus transmission (Ahmadi et al., 2020; Martins-Filho, 2021; Pasha et al., 2021).

To measure population age distribution (from here on referred to as population age), I use the QoG-variable *population ages 65 and above (% of total population)* measured in 2019 (Dahlberg et al., 2021). I include this variable as a potential confounder to control for how large part of a population is made up of the age group most vulnerable to COVID-19. It has been shown that the age of a population is closely connected to its vulnerability to the coronavirus disease, since infection-fatality rates are highly age-dependent. As a population age, the expected infection-fatality rate also increases, meaning that a larger part of those infected with the virus can be expected to fall seriously ill and die from the disease (Karlinsky & Kobak, 2021b). As case-fatality from COVID-19 has been reported to be relatively high in patients aged 65 years or older (Yanez et al., 2020), and this is an age group that has been pointed out as being particularly vulnerable to COVID-19, I control for this factor through including a variable on population age distribution ages 65 and above.

The institutional factors I control for are coronavirus history, economic development, and democracy. Through these variables, I aim to control for factors that may affect the implementation ability of states outside of their state capacity. To control for the coronavirus history of countries, I employ the Coronavirus History indicator. I hold that countries that in their recent history have had experiences with cases of highly pathogenic respiratory viruses should be better prepared to respond to future outbreaks of viruses of a similar nature. A country that has experienced previous outbreaks of coronavirus cases, I argue, will have decreased opportunity costs to invest in preparedness measures, increased political incentives to do so, and have gained important lessons for how these measures should be designed.

To measure economic development (from here on referred to as GDP/capita), I use the V-Dem variable *GDP per capita, logged, base 10* (Coppedge et al., 2021b). I employ the latest available data for this variable, from 2018. Economic development is included as a control variable under the expectation that wealthier countries have more resources available to them to put preventative measures into place and respond quickly and more efficiently in crises situations. Using a variable that measures the GDP per capita transformed by the natural logarithm has the advantage of downplaying extreme values and making the variable more normally distributed.

Democracy will be used both as a control variable and as a moderating variable in this study. To measure democracy, I use the *V-Dem Electoral democracy index* measured in 2019 (Coppedge et al., 2021a). This index focuses on the electoral dimension of democracy, building on the core idea of representative democracy that electoral competition makes political rulers responsive to citizens (Coppedge et al., 2021b). The expectations of democracy in terms of its independent relationship with COVID-19 mortality are somewhat conflicting. Advantages of more democratic states include a stronger political will to satisfy the preferences of electorates through implementing better COVID-19 policies, which is complemented by a higher value being placed on human lives. The relative advantage of more autocratic states, however, is a strong coercive power and the ability to implement stringent policies more quickly and forcefully. When it comes to the moderating effect of democracy on state territorial presence, I expect there to be a complementary relationship between the two, meaning that the effect of state territorial presence on COVID-19 mortality is stronger in more democratic settings. I hold that countries that are both strong and democratic should be best able to meet the COVID-19 pandemic since a political will is complimented by the ability to implement policy in these contexts. If my expectation holds, this should mean that countries that have both high levels of state territorial presence and high levels of democracy, on average, have lower COVID-19 mortality rates. The choice to measure democracy focusing on the electoral dimension of the concept relates to the idea of political will brought forward in the theory. If the major benefit of democracies in face of the pandemic is the political will of democratic leaders to satisfy their electorates, elections are the mechanism that this works through.

4.3 Data limitations

The choices made when attempting to measure concepts can greatly affect the findings of a study. Thus, the measurements and operationalization of data come with several important caveats and limitations. Here, I take some key issues of conceptualization and measurement into account when discussing data limitations.

The choice to use cross-sectional data to measure the dependent variable in the first year of the pandemic comes with some possible limitations. The advantage of using data from 2020 to measure COVID-19 mortality is that this decreases the risk of having an incomplete representation of mortality rates due to missing data. When using more recent COVID-19 mortality data, there is a greater risk of factors such as lags in reporting leading to not all data being available. By focusing on a less recent time period, this risk can be decreased. A constraining effect of the choice to use cross-sectional but not time-series data for the dependent variable in terms of the generalizability of the findings is that this approach cannot capture possible time-dependent outcomes of the independent variables. The relationship between COVID-19 mortality and the dependent variables may vary over time. For example, some argue that although some empirical evidence suggests that democratic states had more deaths during the beginning of the pandemic as compared to autocratic states, this perceived advantage of autocratic states is temporary and will diminish with time through the benefits of democratic institutions (Cepaluni et al., 2020). Time-dependent relationships such as this cannot be captured by my cross-sectional approach. It is therefore important to note that the findings this study produce can only make indications of the relationship between COVID-19 mortality and state territorial presence (as well as the other independent variables in focus) for the first year of the pandemic and do not necessarily say anything about this relationship over other time frames.

Another data limitation pertains to the limited sample of countries the statistical analysis is based on. The WMD version that is used in this study covers 118 countries across all of the world's regions, but lacks estimates for several important countries, such as India, China, and a majority of the African countries, leading to a somewhat uneven representation of the world. To exemplify, the final sample of N used in the regression includes 38 out of 44 European countries, but only seven out of 54 African countries. On average, European and North American states have higher levels of state territorial presence than other countries, which may bias regression estimates.

The Coronavirus History indicator aims to include all pandemics and epidemics in recent history that have a similar pattern of transmission to the SARS-CoV-2 virus. According to this guideline, there is one pandemic event that might have been included in the dataset. This is the 2009-2010 H1N1 pandemic (commonly known as the swine flu). Although the H1N1 influenza virus is not a coronavirus, it shares similar patterns of transmission to the SARS-CoV-2 virus, and it also took place during the time period in focus (CDC, 2019). There are two main reasons for not including the H1N1 pandemic in this dataset. The first reason is the large spread of the virus. As of the end of the pandemic in 2010, the disease was reported to have spread to over 213 countries and territories across the world. If cases of the H1N1 virus were to be included in this indicator, almost every country would be coded as having a recent history of a respiratory virus outbreak, removing any interest that findings based on the dataset may have contributed. The second reason is a lack of data on the exact countries that have recorded official cases of the virus during the pandemic, making it difficult to include this pandemic in the dataset. This exclusion of the 2009-2010 swine flu pandemic means that many countries that recorded cases of the H1N1 virus are coded in the dataset as not having a viral history since they have not had cases of SARS or MERS. This does possibly remove some of the strength of the findings produced with the Coronavirus History indicator and means that the findings are limited to only indicating the effect of countries having a history of coronavirus outbreaks specifically on COVID-19 mortality.

5 ANALYSIS

Having reviewed the data and variables that this study is based on, I will here commence with the analytical section. To provide an introductory understanding of the bivariate focal relationship, the gathered data will first be explored through the use of descriptive statistics. Next, a statistical analysis of the main model of this study will be carried out. This is followed by a discussion in which the main results are highlighted and discussed in view of existing literature. To conclude this chapter, I will raise some important limitations that constrain the conclusions that can be drawn from the findings provided by the statistical analysis.

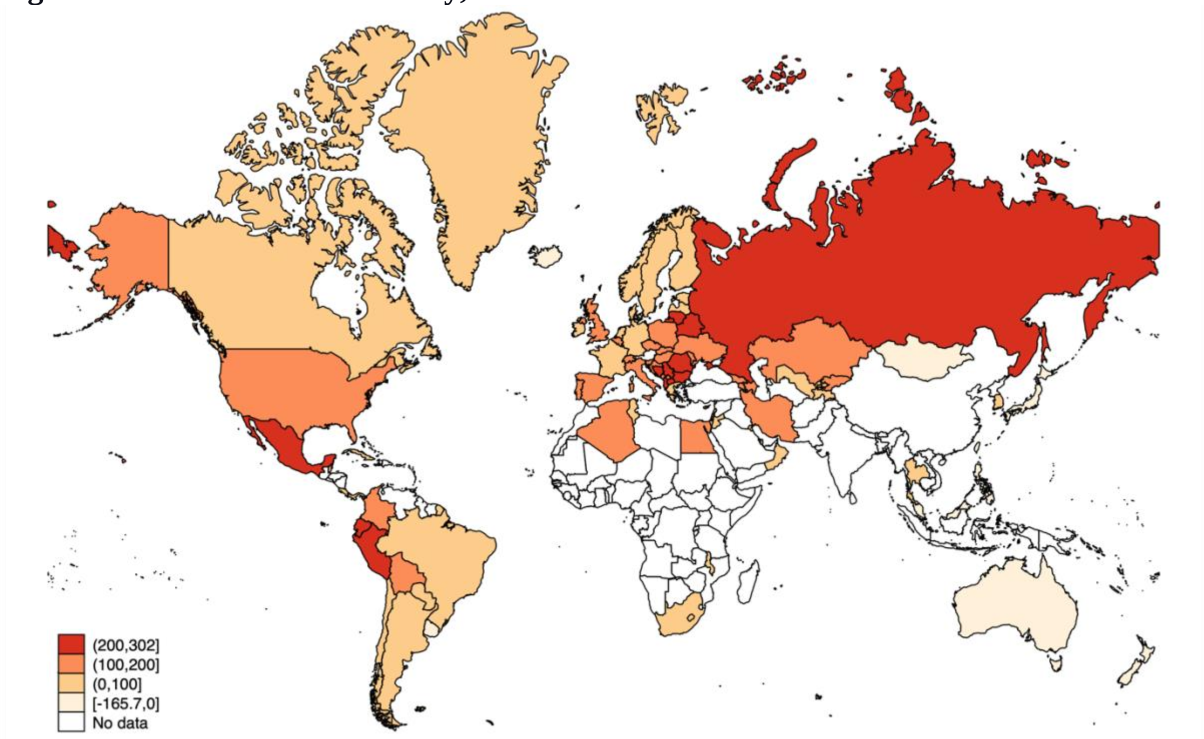
5.1 Descriptive patterns in statistics

Although nearly every country in the world have experienced cases of COVID-19, the actual number of deaths caused directly or indirectly by the virus varies greatly in-between countries, as can be seen in Figure 1. This map of the world shows the level of excess mortality per 100,000 inhabitants for 2020 in the 118 countries covered by the WMD. As is illustrated by the white spots on the map, large parts of the world are still not covered in the dataset. Data is especially lacking for many of the African, Asian, and Middle Eastern countries.

The excess mortality rates found in countries reach from far below the expected mortality baseline to high above it. Some countries (Australia, Barbados, Iceland, Japan, Malaysia, Mauritius, Mongolia, New Zealand, Philippines, Seychelles, Singapore, and Uruguay) have negative excess mortality rates (marked as pale yellow in the world map) in the WMD, indicating that these countries experienced fewer deaths during 2020 than what the expectation for a non-pandemic year was. Although this might seem strange, these negative excess mortality rates can possibly be explained by COVID-19 measures and restrictions having prevented non-pandemic-related deaths. For example, restrictions on movements might correlate with fewer traffic accidents, and social distancing may correlate with reduced transmissions of other kinds of communicable diseases (Beaney et al. 2020).

As can be seen in the world map, a large majority of countries did experience an excess mortality rate of above zero, indicating that these countries had higher death rates during the year than the expected baseline. By far, the highest excess mortality rates found in the WMD belongs to Peru (with an excess mortality rate of 301.9 per 100,000 inhabitants), with North Macedonia (275.7) and Belarus coming after (264.4). Russia also stands out as having high levels of excess mortality, with 255.2 deaths per 100,000 inhabitants over the expected baseline.

Figure 1. Words Excess Mortality, 2020



Note: The world map shows excess mortality (per 100,000 inhabitants) for countries during 2020. Countries in pale yellow had an excess mortality rate of 0 or below for this period, indicating that these countries did not have more deaths than the expected baseline for a non-pandemic year. Countries in darker yellow, orange, and red had a positive excess mortality rate for the same year, indicating that these had more deaths during 2020 than the baseline. Countries in white (including China, India, and much of Africa) are not included in the world mortality data.

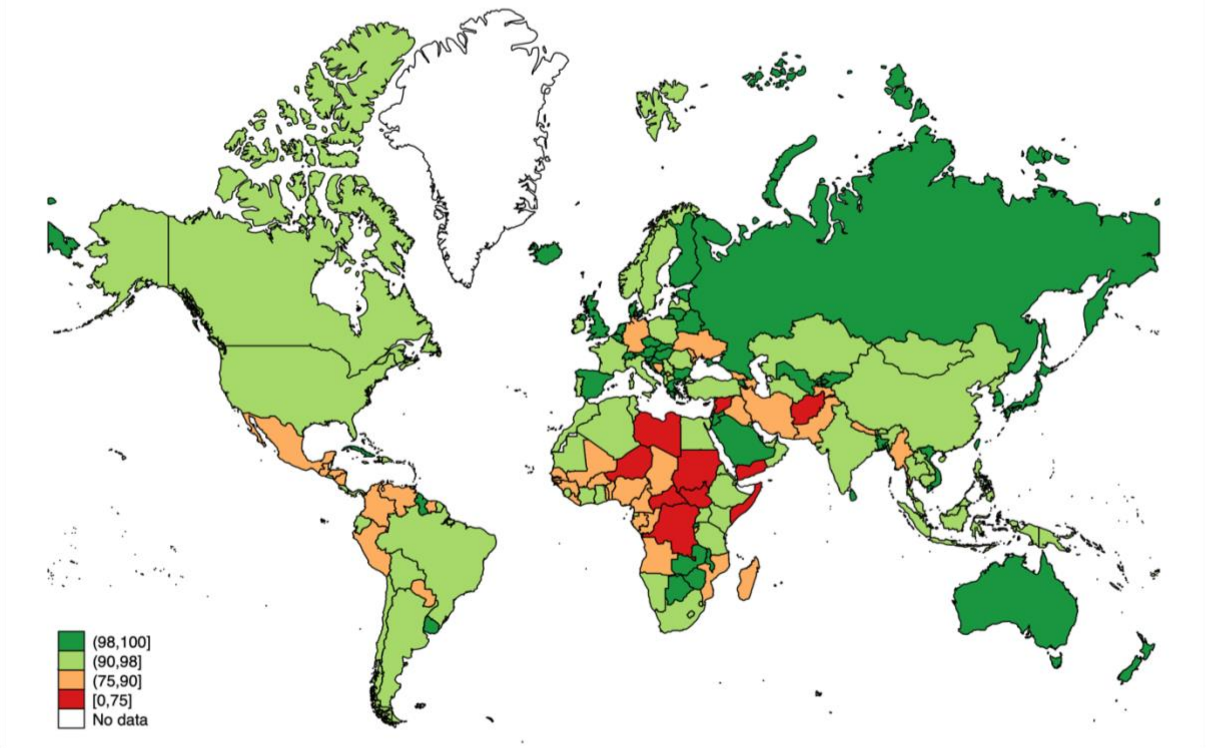
Turning to the focal independent variable of this study, Figure 2 provides us with a visual representation of the variation in state territorial presence, as measured by the V-Dem indicator STAT. It can be observed that large parts of the map are in different shades of green, indicating that most states across the world have a presence that covers over 90% of their territory. Full territorial state presence (measured on the map as states that have a presence that covers 98% or more of their territory and visualized in dark green) can be observed across many of the world's regions. The greatest density of fully present states can be found in Europe.[2] Full state territorial presence is also recorded in Australia, and Russia. A cluster of south African countries have states that are universally territorially present. Namely, Botswana, Malawi, Zambia, and Zimbabwe. In South America, Guyana and Uruguay are represented as having full state territorial presence in the V-Dem data. In Asia, full territorial presence is also recorded in South Korea and in Vietnam. Also notable is that no North American country or territory are represented as having a state that is universally present in its territory. Rather, the north American states are all present in below 98% (but over 90%) of their territories.

By observing the map, it also becomes clear that many of the countries with lower levels of state territorial presence are found in Africa. The lowest level of presence appears to be clustered around the center of the continent, although low levels of state territorial presence can be observed in some South-, Central-, East-, North-, and West- African countries. Due to the lack of coverage in the WMD, it is difficult to explore the relationship between these observed low levels of territorial presence in Africa and excess mortality rates in the same area. In Europe, Poland, Ukraine, Bosnia & Herzegovina, North Macedonia, and Moldova stand out as having low levels of territorial presence for the region (having a value of between 75-90%). Interestingly, some of these countries (especially North Macedonia with an excess mortality

[2] The European countries that are recorded as having a 100% state authority over territory in the V-Dem dataset are Belarus, Croatia, Estonia, Finland, Finland, Greece, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Slovakia, and Switzerland.

rate of 275.7 per 100,000 inhabitants, Bosnia & Herzegovina with a rate of 222.7, and Poland with a rate of 176.5) also stand out in the WMD as having some of the highest levels of excess mortality out of the countries it covers. Other clusters of low state territorial presence can also be observed in the Middle East, and in Latin America. Notably Peru, the country with the highest level of excess mortality in the WMD, has a state territorial presence of 88.2%, putting it in the second to lowest category of presence as measured through STAT.

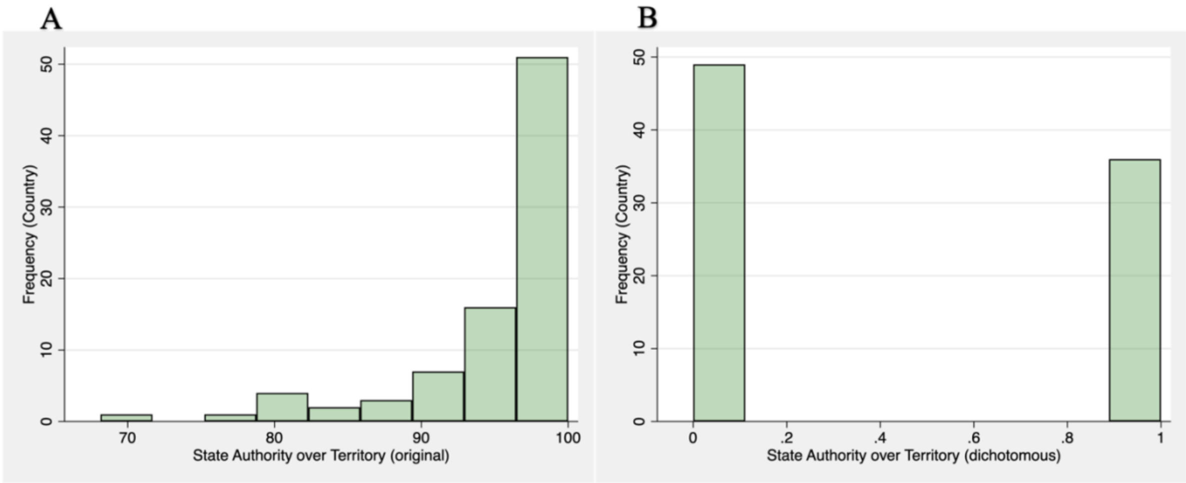
Figure 2. State Authority over Territory in the world, 2019



Note: The world map shows the territorial presence of states in percentage during 2019. Countries in red had a state that was present in up to 75% of its territory. Countries in orange have a state that was present in over 75% and up to 90% of its territory. Countries in pale green have a state that was present in over 90% and up to 98% of its territory. Finally, countries in dark green have a state that was present in 98% or more of its territory. Countries in white (Greenland) are not included in the V-Dem data.

Figure 3 displays the distribution of data for STAT in the final sample of 85 countries and territories. As presented in Figure 3 (A), when STAT is kept in its original continuous form, the data is skewed to the right indicating that most countries have a state territorial presence of above 90%. There is, however, a non-trivial variation in the independent variable, with a number of observations having the values of STAT between 68 and 89. Figure 3 (B) displays the distribution of the data for the focal independent variable when it is dichotomized, with countries covering at least 98% of their territories being coded as “1”, and otherwise as “0”. As Figure 3 (B) shows, there are fewer countries coded as having full control (98 and over) as compared to countries coded as having less than full control (under 98).

Figure 3. Histograms: State Authority over Territory



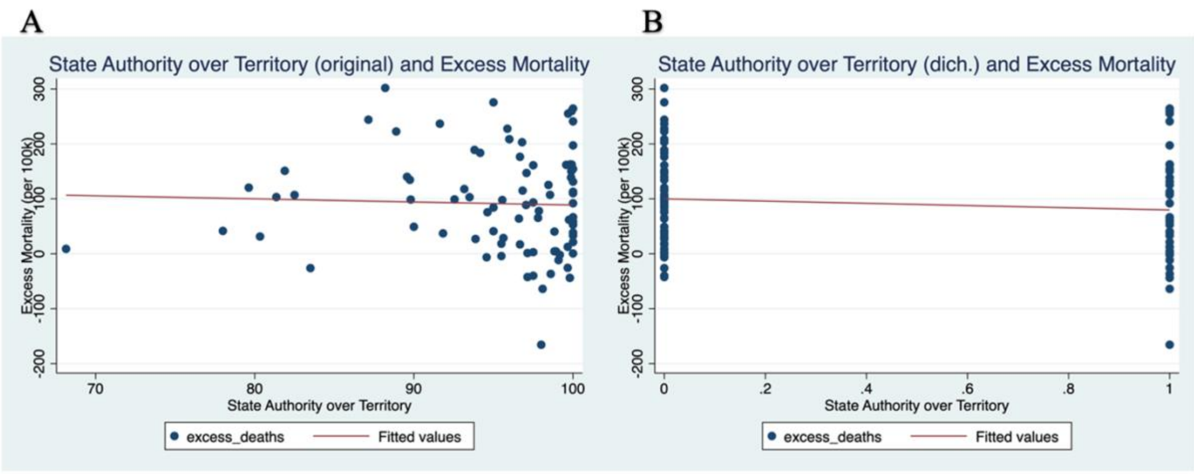
Note: The histograms show the distribution of the level of state authority over territory between countries as obtained in the common sample of 85 countries in this study, when state authority over territory (A) is kept in its original continuous form, and (B) is coded as dichotomous. Countries in the first bar have a territorial presence of below 98%, and countries in the second bar have a value of 98% or over.

Figure 4 (A) shows the bivariate relationship between STAT and excess mortality when STAT is kept in its original continuous form. From this scatter plot we can observe that although the negative direction of the relationship seemingly follows the theoretical expectations of this study, this relationship appears to be weak. Indeed, the Pearson’s r is -0.038, indicating that higher levels of STAT is associated with lower levels of excess mortality, but this relationship does not reach statistical significance on conventional levels (see Table A.1 in the Appendix for correlation matrix). This initial examination points towards the lack of a linear relationship between STAT and excess mortality, which suggests that the linear assumption of OLS is not met. However, the scatter plot shows a potential concave shape of the relationship between STAT and excess mortality, suggesting that relationship between the focal variable could be fit with a quadratic form of regression analysis. Table A.4 in the Appendix report the results of this analysis, in which neither the linear nor quadratic terms of STAT reach statistical significance. To proceed, I will therefore employ a linear regression using a dichotomized measure of state authority over territory – STAT98.

This modelling choice to proceed with STAT98 as a measurement of my focal independent variable is motivated by the theoretical assumption that, from an epidemiological point of view, it is enough for a state to not be present in a very small part of its territory for the risk of the virus spreading to increase. Thus, I explore the difference in COVID-19 outcomes between states that have, versus do not have, full control over their territories. The choice to set this threshold of full state presence at 98% is based on this being very close to 100%, whilst allowing for sufficient number of observations in both groups of countries: full control and less than full control.

Figure 4 (B) visualizes this relationship between STAT98 and excess mortality. Pearson's r is -0.110 demonstrating a slightly stronger (although still not significant) correlation than when the original version of STAT is used. This indicates that countries that are measured as having states with full territorial control are associated with lower levels of excess mortality, but this relationship does not reach statistical significance on conventional levels.

Figure 4. Scatterplots: State Authority over Territory and Excess Mortality



Note: The scatterplots show the bivariate relationship between state authority over territory and excess mortality (per 100,000 inhabitants), when state authority over territory (A) is kept in its original form, and (B) is dichotomized as states having or not having full control over their territories. The scatterplots are overlaid with best-fit lines.

Descriptive statistics can provide an introductory understanding of the bivariate relationship this study set out to explore. The descriptive evidence shows a negative bivariate relationship between my main variables of interest: STAT and excess mortality. Although these findings goes in line with the theoretical expectations of this relationship, any initial robust claims supporting the hypothesis cannot be made at this point since the Pearson's r of this relationship fails to reach significance at conventional levels. Furthermore, visualizations of the data suggest a possible concave relationship between the dependent and focal independent variables. Since a quadratic version of STAT fails to reach significance at conventional levels, I will proceed with a linear regression using a dichotomized version of STAT that categorizes states as having or not having full territorial control. This has two benefits. Using STAT98 solves the linearity issue demonstrated above. Furthermore, this allows me to explore the theoretical assumption that a state needs to be fully present in its territory to be able to successfully control the spread of disease and prevent breaches of collective agreements aimed to do this. From the two world maps, we can gain further insights into the geographic distribution of data, as well as some examples of countries in which high mortality levels also coincide with lower levels of state presence. This evidence does not, however, provide any insights into the direction of these relationships, or the context in which they exist. To provide a better understanding of the effect of state territorial presence on COVID-19 mortality, I will therefore move on to statistical analysis in this upcoming section.

5.2 Multivariate statistical analysis

The main analysis is presented in Table 1, which consists of six regression specifications. Here, I set out to test the hypothesis through examining the impact of STAT98 on excess mortality. The first specification consists of this focal relationship. In the following specifications, plausible confounders are introduced one at a time. In Specification 2, population density is added to the focal relationship. In Specification 3, population age is introduced. Specification 4 introduces coronavirus history, Specification 5 introduces GDP/capita, and finally in Specification 6, which constitute the full model, the democracy index is introduced.

Out of these six specifications, STAT98 reaches statistical significance in three models (at the 90% confidence level in Specification 4 and 5, and at the 95% confidence level in Specification 6). Furthermore, the sign of the STAT98 coefficient is negative through all specifications, as expected. In the bivariate model, the strength of the STAT98 coefficient is -20.20. As population density is introduced as a plausible confounder in Specification 2, the effect size of STAT98 increases to -21.57 and in Specification 3, which introduces population age, the effect size of STAT98 further increases to -33.78. When coronavirus history is introduced to this regression in Specification 4, the effect size of this same variable again increases to -33.78 and reaches statistical significance at the 90% confidence level. As GDP/capita is introduced in Specification 5, the effect size of STAT98 decreases slightly to -33.87 and again reaches statistical significance at the 90% confidence level. As democracy is introduced as a final confounder in the full model in Specification 6, the effect size for STAT98 increases to its highest estimate yet at -39.41 and reaches statistical significance at the 95% confidence level. Reaching statistical significance at the 95% confidence level, the results in Specification 6 shows that when holding population density, population age, coronavirus history, GDP/capita, and democracy, equal, a country in which the state has full control over its territory, on average, will have 39 fewer deaths per 100,000 inhabitants as compared to a country in which the state is not fully in control. From these results, we can see that the focal relationship between STAT98 and excess mortality become stronger and more significant as the aggregate effect of the confounders is considered. The fact that the STAT98 coefficient is significant in the full model (as well as in the models where GDP/capita and democracy are not included as confounders) invites interpretation supporting the hypothesis of this study.

Looking at the control variables, one of my two population variables (population age) reaches statistical significance in Specifications 3, 5 and 6, and the sign is positive, suggesting that as the share of people over the age of 65 grows in a population, excess mortality increases. For every percentage point increase in the population age variable, there are 3-8 more deaths per 100,000 inhabitants. The control for GDP/capita also reaches statistical significance in Specifications 5 and 6 where it is included. The GDP/capita coefficient has a negative sign throughout these regressions, as expected. On average, for every one unit increase in GDP/capita, there are 25-33 fewer deaths per 100,000 inhabitants.

Coronavirus history, which is discussed in the theoretical chapter as possibly having an impact on how the COVID-19 pandemic was managed, and for which I have constructed an original indicator, has a negative sign throughout Specification 4-6 where it is included, and reaches statistical significance at the 90% confidence level in Specification 5. These results shows that when holding STAT98, population density, population age, and GDP/capita equal, a country that has experienced cases of coronaviruses prior to the pandemic, on average, will have 37 fewer deaths per 100,000 inhabitants as compared to a country that has not experienced historical cases of any coronavirus.

Democracy is also a variable of interest in the analysis. The democracy coefficient reaches statistical significance at the 99% confidence level in Specification 6 where it is included, indicating that a country fulfilling the ideal of having a full electoral democracy will have 130 deaths less per 100,000 inhabitants than a country that do not fulfill this democratic ideal. These results indicate that the effect size of democracy on excess mortality is very large. In a separate analysis (see Table A.3 in the Appendix) I run an analysis on the interaction effect between STAT98 and democracy on excess mortality. The coefficients for the interaction terms does not reach statistical significance at conventional levels, meaning that I find no robust support for the level of democracy having a conditional influence on the effect of STAT98 on excess mortality. Therefore, it has not been included in this main analysis.

Table 1. Regression table: STAT98 and excess mortality per 100,000 inhabitants in 2020

	Excess Mortality					
	(1)	(2)	(3)	(4)	(5)	(6)
STAT98	-20.20	-21.57	-33.78	-37.24*	-33.87*	-39.41**
	(-1.00)	(-1.08)	(-1.61)	(-1.80)	(-1.66)	(-2.00)
pop_den		-0.0175	-0.0177	-0.0148	-0.0105	-0.0143
		(-1.53)	(-1.56)	(-1.32)	(-0.94)	(-1.31)
pop_age			2.970*	2.751	4.596**	7.596***
			(1.73)	(1.62)	(2.45)	(3.57)
Virus history				-37.30*	-19.02	-24.45
				(-1.84)	(-0.88)	(-1.17)
GDPpc					-33.43**	-25.92*
					(-2.12)	(-1.68)
Democracy						-129.6***
						(-2.65)
Constant	100.00***	104.7***	71.57***	89.24***	389.5***	364.0**
	(7.64)	(7.85)	(3.08)	(3.60)	(2.71)	(2.62)
Observations	85	85	85	85	85	85
R2	0.012	0.039	0.074	0.112	0.159	0.229
Adjusted R2	0.000	0.016	0.039	0.067	0.106	0.170

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3 Discussion: The impact of state territorial presence on COVID-19 mortality

Turning back to the focal relationship between state territorial presence and COVID-19 mortality, I have theorized that states with higher levels of territorial presence should be better able to respond to the pandemic through their increased ability to implement political decisions and coordinate collective action on the ground. Departing on this theory, I have expected states with higher levels of territorial presence (measured as STAT98) to, on average, have lower levels of COVID-19 mortality (measured as excess mortality).

Overall, the findings of this study invite interpretation supporting this theoretical expectation. The STAT98 coefficient has a negative sign throughout the regression specifications, and gains strength and significance as more potential confounders (population density, population age, coronavirus history, GDP/capita, and democracy) are included. This points to the risk of a mixing of effects being small, wherein the effect of STAT98 on excess mortality is mixed in with the effect of these additional factors.

The empirical evidence suggests that states that are fully present, on average, had between 37–39 fewer deaths per 100,000 inhabitants in 2020 as compared to countries in which the state is not fully present. As the level of excess mortality per 100,000 inhabitants for 2020 in the 118 countries covered by the WMD ranges from 165.7 deaths under the expected baseline (in Seychelles), to 301.9 deaths above the expected baseline (in Peru), 37-39 fewer deaths is not a trivial number. Take Peru as an example, with a population of 32,97 million and a very low state territorial presence of 88%. 38 fewer deaths per 100,000 would represent a 7.94% decrease in mortality rates, translating to 12,529 lives saved in 2020 alone.

These results follow the line of previous research that has connected state capacity with better outcomes in terms of public goods provision, natural disasters, and COVID-19 mortality. But, adding to this existing literature is my focus on state territorial presence as playing a vital role in state COVID-19 responses. Overall, the evidence presented suggests that the territorial presence of states has a significant impact on their ability to respond successfully to complex and unforeseen crises, such as the COVID-19 pandemic. Thus, the findings do not only follow the lines of previous literature in highlighting the role of state capacity for benevolent social outcomes but further this literature by bringing the territorial presence of states into focus as a necessary precondition for successful implementation and enforcement on the ground in terms of the pandemic. With the findings by Yen et al. (2022) and Knutsen and Kolvani (2022) in mind, this evidence contributes to the cumulative understanding of the important role of state capacity in the ability of states to save lives during the pandemic. Furthermore, added to this understanding is the insight that the presence of the enforcer (that is the state) is a crucial precondition for successful implementation (of a COVID-19 response) on the ground. In other words, the findings of this study further the notion of the importance of state capacity in pandemic outcomes, by showing that the presence of the state is a vital characteristic of state strength in the context of COVID-19.

Turning now to the two additional variables of interest, coronavirus history, and democracy. I have theorized that countries that, in their recent history, have experienced cases of highly pathogenic respiratory viruses should be better prepared to respond to subsequent virus outbreaks of a similar nature. Countries with a coronavirus history should, therefore, on average have lower levels of mortality rates, when holding all else equal. The findings provide some support for this theoretical expectation. As expected, the coronavirus history coefficient has a negative sign throughout the specifications, but only reaches significance when the demographic control variables are included in the regression in Specification 4. As the institutional controls are added in Specifications 5 and 6, the coefficient for coronavirus history fails to reach statistical significance at conventional levels. Although the findings indicate support for the theoretical expectations on coronavirus history, the coefficient appears to be sensitive to model specification, meaning that the variable might be correlated with other variables. The findings with regards to this variable should therefore be interpreted with some caution, as it is difficult to know if the 'correct' model is the one where the coronavirus coefficient is statistically significant.

As for democracy, I was interested in its effects on the focal relationship, both as a potential confounder and moderator. The expectations of democracy as a confounder were somewhat ambiguous as the political will of democracies to meet the interests of their electorates and protect lives might be hindered by a potential disadvantage in implementation capacity in terms of the pandemic. As for democracy as a moderator, I expected democracy to have a conditional effect on state territorial presence, meaning that the effect of state capacity on excess mortality is stronger at higher levels of democracy. This, I theorized, is because the increased political implementation ability of highly present states is complemented by a political will to protect the lives of citizens in more democratic states.

As for democracy as a confounder, the regression results suggest that during the first year of the pandemic, when holding everything else equal, fully democratic states, on average, had much lower mortality rates than non-democratic states. In terms of the theoretical expectations of democracy as a plausible confounder, these findings indicate that the political will of democracies far outweighed their potential disadvantage of having a limited implementation capacity regarding lives saved during the first year of the pandemic. When it comes to democracy as a potential moderator on state territorial presence, the interaction term fails to reach significance at conventional levels in all specifications where it is included. This means that I cannot, through this data, be certain of whether the effect of democracy as a conditional variable on state presence is positive, negative, or zero. In other words, I find no significant support for the theoretical expectation that the political will in more democratic contexts will have a conditional effect on the implementation capacity associated with more present states. In line with Hanson's (2015) findings that state capacity and democracy work as substitutes for each other in terms of public goods provision, these results might suggest that although democracy does not seem to have a conditional effect on state territorial presence, high levels of democracy could work as a substitute for low levels of state territorial presence, and the other way around, in terms of COVID-19 mortality.

The R^2 value explains the amount of variance explained by the independent variables in the dependent variable. The R^2 value of Specification 6 that contain the full model is 0.17, which is relatively low. This tells us that the full model that includes the focal relationship and all plausible confounders, explains 17% of the variation in excess mortality. In the social and political sciences, a low R^2 value is not necessarily a problem as social phenomena are complex and multidimensional. An R^2 value, even when small, can be significantly different from 0, meaning that the regression model has statistically significant explanatory power. However, what this value does tell us is that there is a risk of omitted variable bias in the model, indicating that the model is missing one or more variables that are important for explaining the variance in excess mortality rates across countries. What this omitted variable could be, I will go on to discuss in the limitations section of this next upcoming chapter.

5.4 Limitations

The statistical analysis of this study has provided evidence that supports the theoretical expectations on the impact of state territorial presence on COVID-19 mortality, showing that states that have full territorial control on average have lower levels of excess mortality than states that have less than full control. These findings, however, come with some important caveats and limitations that constrain the conclusions that can be drawn from them.

Differences in governmental policy responses may explain some variation in how the SARS-CoV-2 virus has hit different countries. Focusing on institutional factors and government response, curfews, lockdowns, and closing of public meeting places has been brought forward as some of the most effective (non-pharmaceutical) government interventions for slowing the spread of the virus (Haug et al., 2020). The actual stringency and timing of how said restrictions are imposed have also been highlighted as important for explaining COVID-19 outcome variances cross-countries (Plümper & Neumayer, 2020). As discussed in the previous chapter, the low R^2 value of the full regression model suggest the risk of an omitted variable bias. This possible omitted variable may pertain to differences in COVID-19 strategies and policies across countries. This study does not control for differences in COVID-19 policy across countries but rather departs in the assumption that state capacity will lead to better COVID-19 outcomes independent of the actual content of the policy the state wishes to implement. This is because the implementation of policies aimed at slowing the spread of the virus should be more successful in higher-capacity states, leading to better outcomes independently of the actual content of policies. However, as previous research has shown, the content of COVID-19 policies, as well as the strategies surrounding their implementation, are also important factors determining pandemic outcomes. This may be one of the omitted variables that the low R^2 value in the full regression model suggests. In future studies, considering the possible influence of differences in country COVID-19 strategies on the effects of state territorial presence might be a beneficial addition to allow for a deeper understanding of the focal relationship.

Another limitation of the study is that the data for the outcome variable (WMD) is available only for a limited sample of countries. In the version of the WMD dataset that I employ, 118 countries are represented, which then drops to 85 countries when the WMD is merged with other relevant data. This limits the generalizability of the findings from this empirical study. Furthermore, the sample is skewed due to regions where countries tend to have lower state territorial presence being underrepresented. Although I believe that the benefits of looking at excess mortality outweigh the benefits of using other mortality data - looking at excess mortality circumvent differences in how COVID-19 deaths are detected and reported across countries, and the WMD is a trusted source used in many publications - it does limit the type of analysis that is possible and potentially affects its results. For example, descriptive evidence has suggested a possibly curvilinear relationship, and it is conceivable that the inclusion of more data could have led to different results regarding this. At a late stage of research for this study, I came across a potential alternative source for data on excess mortality in a dataset by the Economist. This dataset includes data from the WMD, along with other sources of data such as official government reporting on excess deaths, etcetera. With a case coverage of over 200 countries, the economist expands the cross-country coverage of the WMD significantly (Economist, 2021). In future studies, utilizing Economist data to measure the dependent variable could be advantageous for obtaining a larger and more random sample of observations, allowing for an opportunity to ascertain the stability of the findings produced here.

Another limitation of this study is the way in which state territorial presence is measured. There are, currently, not many alternatives available to capture this concept. The V-Dem state authority over territory indicator is a theoretically grounded indicator from a reputable source, however, it comes with some caveats. Although the V-Dem institute goes to great lengths to ensure valid and reliable estimates of difficult-to-observe concepts such as this, there is always a risk of subjectivity when working with expert data. Furthermore, the indicator is not a direct measurement of the concept I aim to capture, as it measures authority rather than presence directly. Traditionally, state presence is measured through the existence of post offices, as done by Acemoglu et al. (2015, 2016). Although this is an excellent way to measure state presence in the 19th century US, it is not very relevant for measuring and capturing the concept today. If we would set out to measure the presence of the state in the UK today, for example, by looking at the existence of post offices, we would find that the state has a very low presence, as the number of post offices in the UK has halved since the 1980s (Clarke & Booth, 2022). What this means is that there is a need to come up with new ways of capturing this territorial aspect of state capacity. Through the development of new relevant and refined measurements of state territorial presence, new avenues for researching state presence and its role in COVID-19 outcomes could be explored.

To check for robustness, a common approach is to perform regressions using different measurements for the same concepts. An additional limitation of this lack of data in the dependent variable and lack of alternative measures of the focal independent variable is, therefore, that this limits the opportunities for robustness tests. In this next upcoming chapter, I will discuss this constraint in more detail.

6 DIAGNOSTICS AND TESTING FOR ROBUSTNESS

When performing an OLS regression, several assumptions need to be met in order to declare that the regression is optimal and that the estimates it produces are unbiased (Mehmetoglu & Jakobsen, 2017). To test whether these assumptions, often referred to as the Gauss-Markov Theorem, have been fulfilled and to detect any other problems with the model, I have performed several diagnostics and robustness tests. Here, I will discuss any indicated violations of these assumptions in the model and what I have done to get around these potential model flaws.

The low R^2 value of the full model indicates that the independent variables included in the model are not explaining much of the variation of the dependent variable. This may be an indication that the model is not correctly specified, meaning that it includes one or more non-relevant variables or excludes one or more relevant variables. To check for if this is the case, I have performed a link test through the Stata linktest command. The result of the link test is an insignificant hatsquared with a P-value of 0.666, indicating that we should not be able to find any additional statistically significant predictors except for by chance. These results indicate that the model is correctly specified, leading me to adjudge that the low R^2 of the full model is not a problem in terms of model specification.

To test for the influence of single observations on specific coefficients and the full model, I have also performed several tests to screen the data for potential outliers. Through these tests, I have identified Singapore as an outlier in the sample of 85 countries. A scatterplot showing the residuals versus leverage of the observations (see Figure A.1 in the Appendix) reveals that Singapore has high leverage with a value close to 1, far above the threshold Mehmetoglu and Jakobsen (2017) suggest for observations that should be avoided in terms of problematic leverage of 0.5. A DFBETA test has also been performed to measure the effect of each observation on each regression coefficient (see Figure A.2 in the Appendix). From this test, we can see that Singapore stands out amongst the other observations for the population density coefficient. With a DFBETA value of close to 6, much higher than the suggested threshold of 2, the test indicates that Singapore influences the population density coefficient by pulling it upwards (Mehmetoglu & Jakobsen, 2017). Singapore has the highest population density out of all observations (7916 on a 2-7916 scale) but a very low excess mortality rate of -4.2. This combination of extreme values could be an explanation for the observations high DFBETA value. To measure the influence of each observation on the complete model, I have also tested the Cook's distance of all observations (see Figure A.3 in the Appendix). Same as for the other tests, Singapore stands out with a Cook's distance of above 5 and therefore above the suggested cut-off point of 1 (Mehmetoglu & Jakobsen, 2017). This indicates that Singapore is an influential case on the estimates of the full model.

These tests show that Singapore is an outlier that possibly influences the population density coefficient as well as the whole model. However, as Singapore represents a true value from the natural variation in the sample and is likely not an outlier due to a measurement error, removing it from the sample could be criticized as me overfitting the model. As a solution to this, and to check if Singapore has a substantial influence on the regression results for the focal relationship, I run a second regression excluding Singapore in the Appendix (see Table A.7). In this separate analysis, the sign of STAT98 remains negative through all specifications but only reaches statistical significance at the 90% confidence level in Specification 6. The effect size of STAT98 also decreases slightly from -39.41 in Specification 6 in the main model, to -34.07 when excluding Singapore from the same specification. This indicates that Singapore does exert some influence over the focal relationship, as the STAT98 coefficient loses significance in some specifications where Singapore is excluded.

One OLS assumption is that the error term in a model should have a constant variance, meaning that there should be no heteroscedasticity in the model (Mehmetoglu & Jakobsen, 2017). To check for heteroscedasticity, I have used the rvfplot command in Stata. Looking at the distribution of residuals versus fitted values in Figure A.4 (see the Appendix), we can see what appears to be an even and random distribution above and below the 0-line, without any discernable patterns. I am therefore satisfied that the assumption of homoscedasticity has not been violated in the data sample. I also test whether the error term is normally distributed by creating a histogram that provide a visual display of the distribution of the standardized residuals (see Figure A.5 in the Appendix). The histogram shows a nice bell shape, indicating that the residuals are normally distributed.

Through these executed diagnostics tests, we can see that the diagnostic statistics for the OLS regression are within the norm. This support the assumption that the coefficient estimates are reliable and unbiased, meaning that the results produced from the regression are the best possible estimates of the properties of the population I have set out to explore.

A common approach to robustness testing is to perform regressions using different measurements for the same concepts. As discussed in the descriptive evidence, I have set a threshold of full state presence at 98% when dichotomizing the STAT variable. When deciding on this threshold, I also ran separate regressions where full state presence was capped at either 90% or 95% (named STAT90 and STAT95 respectively) (see Tables A.5 and A.6 in the Appendix). The coefficients for both STAT90 and STAT95 fail to reach significance at conventional levels with one exception. In Specification 3, Table A.6, the coefficient for STAT95 reaches statistical significance at the 90% confidence level. The effect size for STAT95 in this specification is -37.55, indicating that when full state control is categorized as states having control over 95% of their territories or more, a fully present state will, on average, and when holding population density and population age equal have about 38 fewer deaths per capita than a state with less than full control.

The fact that STAT90 and STAT95 are statistically non-significant in all specifications except for one, while STAT98 is statistically significant, could be an indicator that the estimates for STAT are not precise, and further analysis should be performed to ascertain the stability of the estimates for the state presence variable. Expanding the number of observations would be an obvious step in the right direction. Having said this, another possible interpretation of the fact that STAT90 and STAT95 are statistically non-significant is that it is only when the state's control reaches a very high threshold of 98% that the state presence becomes consequential for COVID-19 mortality. Again, to assess the validity of such an interpretation it should be subjected to further empirical examination, including both quantitative and qualitative methods.

To check for robustness, a common approach is to perform separate regressions where model specification assumptions are replaced with alternative assumptions. In other words, to use alternative measurements for the same concepts, to see how these model variations affect the robustness of the estimates. An additional limitation of this lack of data in the dependent variable and lack of alternative measures of the focal independent variable is therefore that this limits the opportunities to check for robustness through performing model variation tests. In future studies, as more data on excess mortality becomes available and new approaches to capture state territorial presence are developed, the opportunity for further robustness checks will also increase.

The results presented in this chapter can be concluded as follows. In the statistical analysis, I have found that STAT98 is a statistically significant predictor for excess mortality and that the main analysis supports the hypothesis. To determine whether the model is experiencing problems or breaking any of the OLS assumptions, several diagnostics test have been performed with results that are within the norm. Given the results of the robustness checks and the non-random nature of the sample of observations, however, these results need to be treated with some caution. To ascertain the stability of these findings, a further empirical examination is required.

7 CONCLUSION

The COVID-19 pandemic has exposed the good and bad of state performance. Through the wide variations of mortality across countries, we have seen the differences a successful government response can do in terms of lives saved during a disastrous event such as the pandemic. With this dissertation, I have aimed to study the role of state territorial presence in COVID-19 mortality, to answer the following question:

RQ. *To what extent can the territorial presence of states affect their ability to implement policy on the ground, thus leading to better COVID-19 outcomes?*

Departing from this question, I have viewed the COVID-19 pandemic as a collective action problem and the state as the external agent that guides the actions of citizens towards the greatest collective benefit, using its capacity to be able to fulfill this role. With Mann's concept of infrastructural power as an entry point, I have raised the territorial presence of the state as the most relevant aspect of its capacity in the context of the pandemic. I have argued that the highly contagious nature of the SARS-CoV-2 virus has put the territorial dimension of the state in focus. Through its territorial presence, the state can ensure collective action to contain the spread of the virus to prevent new surges and treat those that have been infected.

In this dissertation, I have performed a multivariate statistical analysis using OLS regression and employing the V-Dem state authority over territory variable to measure state presence and the WMD variable excess deaths per 100,000 inhabitants in 2020 to measure COVID-19 mortality rates. Returning to the hypothesis of this study, I have hypothesized that:

Hypothesis. *States with higher levels of territorial presence, holding all else equal, have lower COVID-19 mortality rates than states with lower levels of territorial presence.*

This hypothesis finds support in the data, indicating that greater state territorial presence indeed appears to make states better able to respond to the pandemic and prevent deaths. In the main analysis, I have found that STAT98 is a statistically significant predictor of excess mortality.

The empirical evidence suggests that, on average, states that have full territorial control had up to 39 fewer deaths per 100,000 inhabitants in 2020 than states with less than full control. As I have assumed that a state cannot hold control over a territory in which it is not present, these findings indicate that fully present states, on average, have lower COVID-19 mortality rates than states that do not have a universal presence within their geographical territory. Turning back to the theory in light of the research question reiterated above, these findings provide support for the theoretical argument that the territorial presence of a state is a necessary precondition for the state to be able to perform its role as an enabler of successful collective action in the context of the COVID-19 pandemic. Given the results of the robustness checks together with the non-random sample of observations the study is based on, these results should be treated with caution. To ascertain the stability of these findings, there is a need for further empirical examination.

By providing insights into the effect of state territorial presence on COVID-19 mortality, this study has contributed to the existing literature by furthering the still limited understanding of the role of state capacity and, more specifically, territorial state presence, in the relative successes and failures of states in responding to the COVID-19 pandemic. The findings have highlighted the role of state territorial presence in the context of the pandemic as an important prerequisite for state-enforced collective action and successful state implementation. This improved understanding of the foundation of state implementation capacity in terms of communicable diseases can also be valuable for future policy making. These insights into the role of territorial state presence in the ability of states to combat the spread of communicable diseases and successfully implement a response in times of complex crisis can help guide the focus of new policy the territorial aspect of state capacity. Finally, an important contribution of this study is the creation of the novel coronavirus history indicator and the analysis it has made possible (for this study and for future research). Through this indicator, I have been able to control for the recent viral history of countries, finding some evidence for the coronavirus history of countries having a negative relationship with COVID-19 mortality rates.

The insights of this study have highlighted some important avenues for future research. As more data on COVID-19 excess mortality becomes available covering a larger sample of countries and allowing for a more even representation of the world, future research can continue to advance the findings of this study. Employing a larger and less-biased sample of observations to explore the impact of state territorial presence on COVID-19 mortality can make it possible for future research to further the understanding of this relationship and confirm the stability of this study's findings.

To improve on avenues for future research on territorial state presence, an important undertaking is also the development of new, more refined measures of state presence. Such a measurement could perhaps include both the physical and digital aspects of state presence, as these two aspects are becoming increasingly complementary in terms of the infrastructural power of states. In view of the pandemic, an epidemiological approach to measuring state presence could also be advantageous. Inspiration for such an approach could be taken from Cingolani (2022), who considers the development of COVID-19 tracing apps as a way for central states to ensure sufficient territorial presence and strengthen their infrastructural power during the pandemic.

Building on the idea of sub-national variations in state capacity brought forward by scholars like Hillel (2008), Harbers (2015), and Ch et al. (2018), future studies can also approach the effect of state territorial presence on COVID-19 outcomes on the sub-national level. Exploring the relationship between state presence and COVID-19 mortality on the regional or local level could provide further insights into the mechanisms through which state presence mitigates pandemic consequences, as well as in how local contexts affects state implementation capacity in terms of its ability to ensure collective action in the context of the COVID-19 pandemic.

During disastrous, complex, and unforeseen events that threaten human lives and livelihoods, the state has a central role as the organizer and implementer of the public policies that govern the actions of citizens. Through looking at the COVID-19 pandemic, I have explored the ability of the state to fulfill its, perhaps most fundamental, role of protecting its citizens during such an event. Despite its limitations and shortcomings, these data have provided an answer to the question of why some countries have been successful in controlling the spread of SARS-CoV-2 and preventing deaths caused by it, while others have failed to do so. Putting the territorial presence of the states in the center, this study find support for the theoretical expectation that this is a central dimension of state capacity in terms of successful COVID-19 state responses. This study presents a modest first step to answer the question of what the role of state presence is in explaining variations in COVID-19 outcomes. Through further empirical examination of this topic in future studies, I am confident that our understanding of the relationship between state presence and COVID-19 mortality can, and will, continue to advance.

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A APPENDIX

Table A.1: Pairwise Correlations Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Excess deaths	1.000							
(2) STAT	-0.038	1.000						
(3) STAT98	-0.110	0.604***	1.000					
(4) Population density	-0.161	0.005	-0.045	1.000				
(5) Population age	0.136	0.242**	0.336***	-0.008	1.000			
(6) Coronavirus history	-0.212*	0.128	-0.125	0.142	-0.106	1.000		
(7) GDP	-0.222**	0.266**	0.167	0.193*	0.434***	0.323***	1.000	
(8) Democracy	-0.117	0.118	0.150	-0.080	0.628***	-0.091	0.362***	1.000

**** $p<0.01$, ** $p<0.05$, * $p<0.1$*

Table A.2.1: Summary Statistics (continuous variables)

STATISTIC	N	MEAN	ST. DEV.	MIN	PCTL(25)	PCTL(75)	MAX
EXCESS DEATHS	85	91.45882	91.66497	-165.7	21.3	151	301.9
STAT	85	95.21481	6.204094	68.143	93.875	99.75	100
DEMOCRACY	85	.6395882	.2460253	.081	.465	.856	.91
GDP	85	9.974588	.7437943	7.02	9.44	10.5	11.94
POPULATION DENSITY	85	234.764	868.0731	2.004286	32.31595	137.1981	7915.73
POPULATION AGE	85	12.90833	6.070221	1.232123	7.136823	18.43087	27.10948

Table A.2.2: Summary Statistics (dichotomous variables)

STATISTIC	N	VARIABLE = 0	VARIABLE = 1
STAT98	85	49 (57.65%)	36 (42.35%)
STAT95	85	25 (29.41%)	60 (70.59%)
STAT90	85	14 (16.47%)	71 (83.53%)
CORONAVIRUS HISTORY	85	53 (62.35%)	32 (37.65%)

Table A.3: Regression table: Including the interaction term (STAT98##Democracy)

	Excess Mortality		
	(1)	(2)	(3)
STAT98	-17.34	-2.79	-34.46
	(-0.85)	(-0.05)	(-0.64)
Democracy	-38.51	-28.10	-126.0**
		(-0.50)	(-2.08)
STAT98##Democracy		-22.46	-7.614
		(-0.27)	(-0.10)
pop_den			-0.0142
			(-1.29)
pop_age			7.604***
			(3.54)
Virus history			-24.28
			(-1.15)
GDPpc			-25.98
			(-1.67)
Constant	123.4***	117.1***	362.3**
	(4.37)	(3.18)	(2.57)
Observations	85	85	85
R2	0.022	0.023	0.229
Adjusted R2	-0.001	-0.013	0.159

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A.4: Regression table: Including the square term of STAT (STAT_SQUARE)

	Excess Mortality
	(1)
STAT	49.32
	(1.57)
STAT_SQUARE	-0.280
	(-1.59)
Constant	-2057.0
	(-1.48)
Observations	85
R2	0.031
Adjusted R2	0.008

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Regression table: Including the 90% threshold for full state control in STAT (STAT90)

	Excess Mortality					
	(1)	(2)	(3)	(4)	(5)	(6)
STAT90	-28.89	-27.31	-35.27	-27.99	-18.67	-19.27
	(-1.11)	(-1.05)	(-1.34)	(-1.05)	(-0.71)	(-0.75)
pop_den		-0.0165	-0.0162	-0.0140	-0.00982	-0.0131
		(-1.44)	(-1.42)	(-1.23)	(-0.87)	(-1.18)
pop_age			2.490	2.146	3.957**	6.612***
			(1.50)	(1.29)	(2.14)	(3.14)
Virus history				-29.83	-13.19	-17.53
				(-1.44)	(-0.60)	(-0.82)
GDPpc					-33.52**	-26.84*
					(-2.07)	(-1.68)
Democracy						-119.6**
						(-2.41)
Constant	144.1***	145.1***	127.4**	129.3**	416.1***	395.1***
	(2.97)	(3.01)	(2.59)	(2.64)	(2.84)	(2.77)
Observations	85	85	85	85	85	85
R2	0.015	0.039	0.065	0.088	0.135	0.195
Adjusted R2	0.003	0.015	0.030	0.043	0.081	0.133

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Regression table: Including the 95% threshold for full state control in STAT (STAT95)

	Excess Mortality					
	(1)	(2)	(3)	(4)	(5)	(6)
STAT95	-33.63	-31.38	-37.55*	-34.62	-26.93	-26.57
	(-1.60)	(-1.50)	(-1.78)	(-1.65)	(-1.28)	(-1.30)
pop_den		-0.0156	-0.0152	-0.0129	-0.00922	-0.0125
		(-1.37)	(-1.35)	(-1.14)	(-0.82)	(-1.14)
pop_age			2.581	2.278	3.992**	6.622***
			(1.58)	(1.39)	(2.18)	(3.18)
Virus history				-30.96	-14.64	-19.00
				(-1.53)	(-0.68)	(-0.90)
GDPpc					-31.61*	-25.09
					(-1.96)	(-1.58)
Democracy						-118.8**
						(-2.41)
Constant	147.6***	147.6***	124.4***	134.6***	407.9***	386.7***
	(4.06)	(4.08)	(3.21)	(3.45)	(2.82)	(2.75)
Observations	85	85	85	85	85	85
R2	0.030	0.052	0.080	0.106	0.148	0.207
Adjusted R2	0.018	0.029	0.046	0.061	0.094	0.146

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A.7: Regression table: Excluding Singapore

	Excess Mortality					
	(1)	(2)	(3)	(4)	(5)	(6)
STAT98	-22.37	-15.47	-27.93	-31.47	-28.03	-34.07*
	(-1.11)	(-0.76)	(-1.32)	(-1.51)	(-1.37)	(-1.71)
pop_den		-0.0848*	-0.0918*	-0.087*	-0.0837*	-0.0775*
		(-1.75)	(-1.91)	(-1.84)	(-1.81)	(-1.73)
pop_age			3.183*	2.962*	4.819**	7.646***
			(1.87)	(1.76)	(2.59)	(3.61)
Virus history				-36.67*	-18.29	-23.55
				(-1.83)	(-0.86)	(-1.13)
GDPpc					-33.60**	-26.43*
					(-2.15)	(-1.72)
Democracy						-123.3**
						(-2.53)
Constant	102.2***	111.4***	76.55***	93.81***	395.7***	370.6***
	(7.74)	(7.92)	(3.30)	(3.79)	(2.78)	(2.68)
Observations	84	84	84	84	84	84
R2	0.015	0.051	0.090	0.127	0.176	0.239
Adjusted R2	0.003	0.027	0.056	0.083	0.123	0.180

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Figure A.1: Residuals versus leverage plot

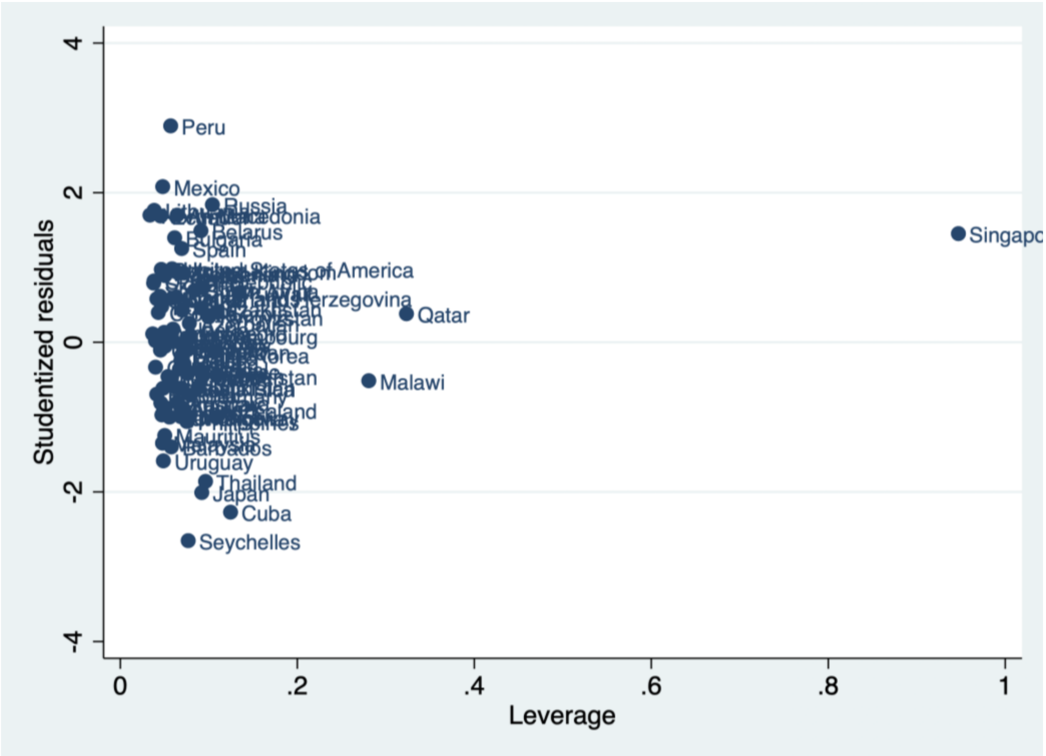

Figure A.2: Results of the DFBETA robustness analysis

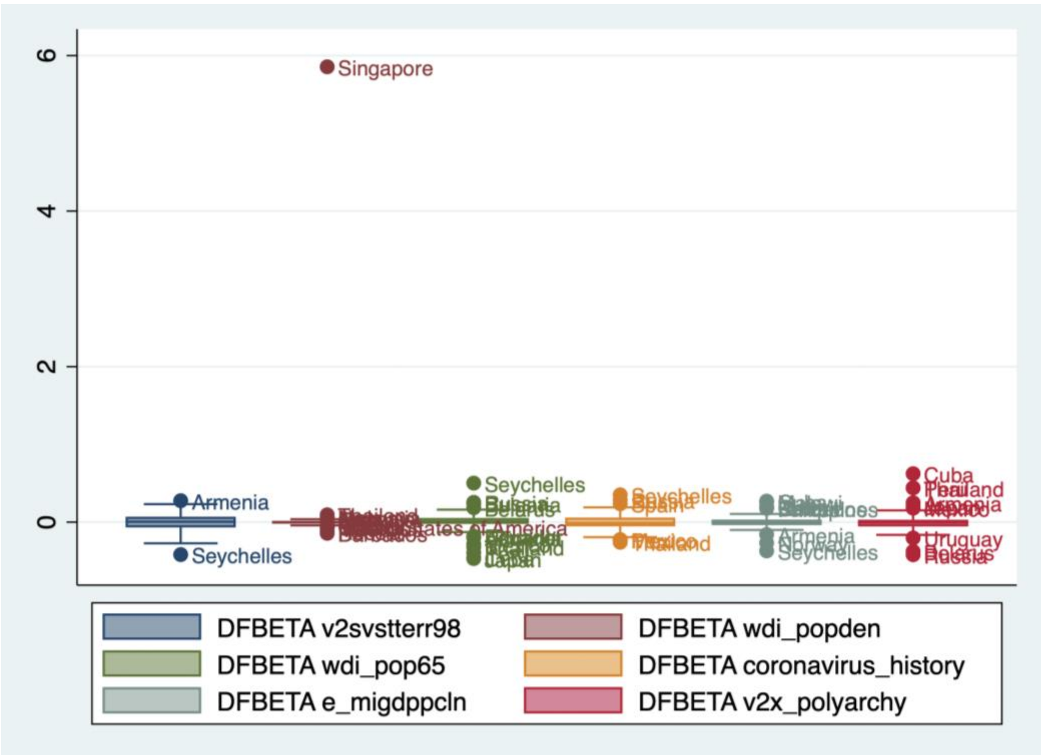

Figure A.3: Plot of Cook's distance

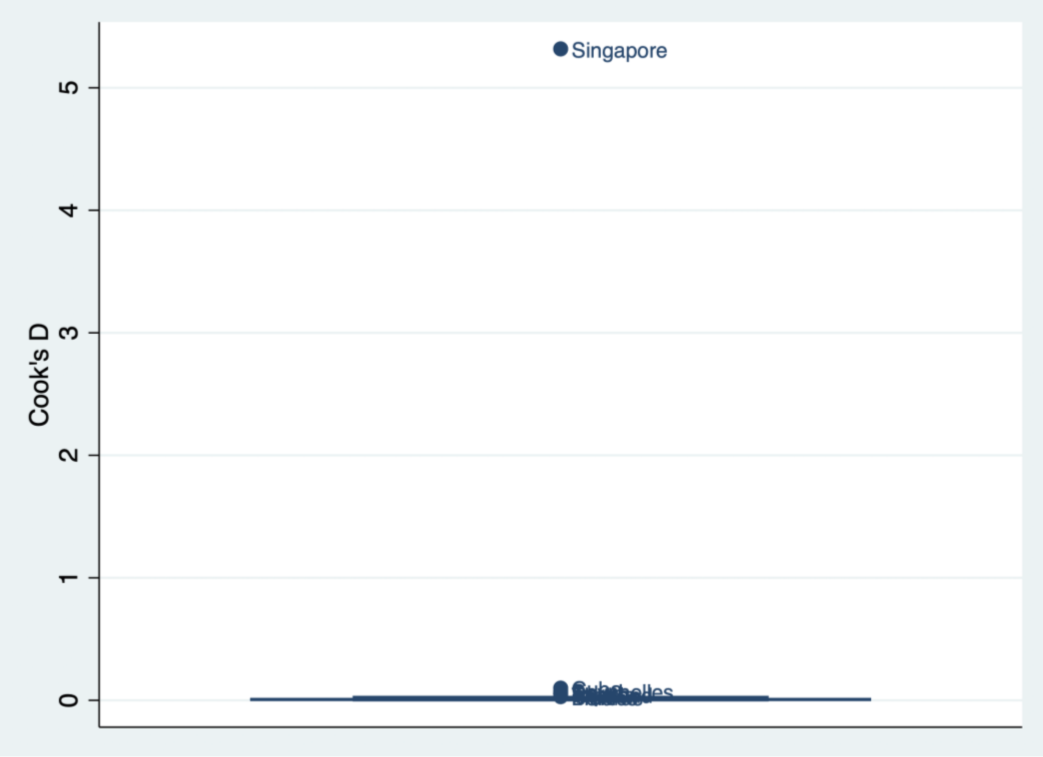

Figure A.4: Rvfplot of the residuals against the fitted values of the dependent variable

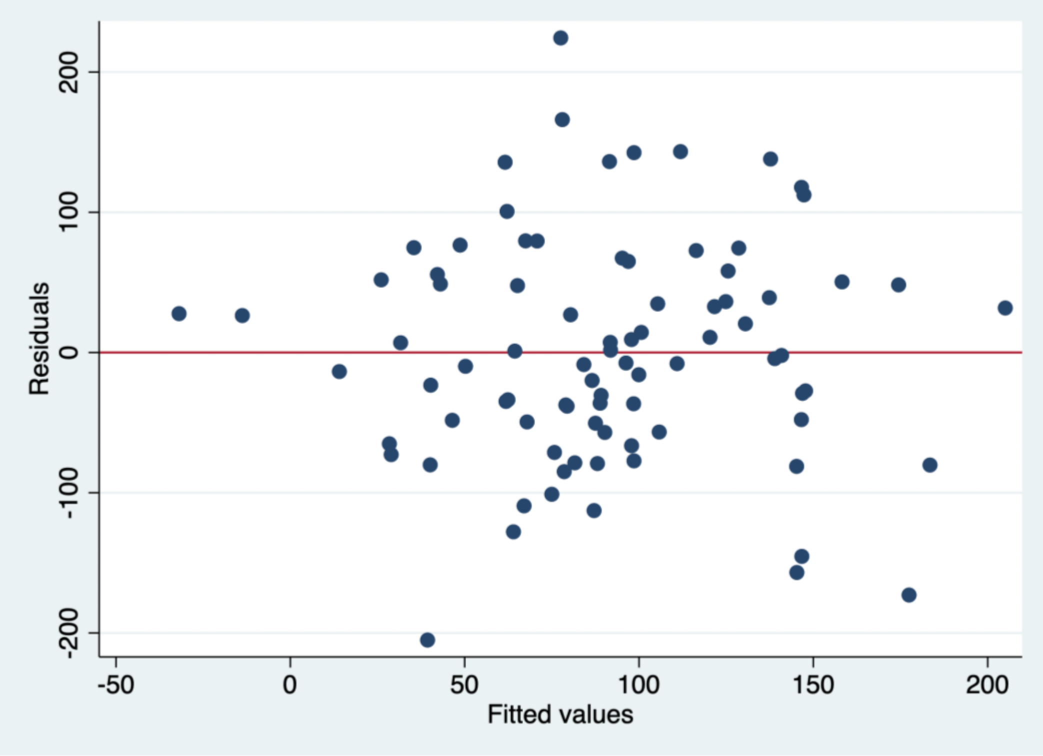

Figure A.5: Histogram of the distribution of residuals