A Global Analysis of Political Regimes and Covid-19 Containment Policies

By Leah Ross

Submitted to
The Wilf Family Department of Politics
New York University

in partial fulfillment
of the requirements for the degree of
Master of Arts

Project Supervisor Professor Chris Canavan

New York City, USA

2023

Abstract

Is there a relationship between the stringency level of containment policies countries put in place during the first year of the Covid-19 pandemic and the type of political regime a country has? Previous research has touched on whether political factors impacted policy response efforts during public health crises but has been especially limited in its application to the case of the Covid-19 pandemic and to a large sample of countries. My research explores the puzzle of why we saw such extreme cross-country variation in containment policies, specifically during a time when policy response efforts were government's main line of defense in reducing the spread of the virus. Based on the social norms and values of political regimes and the authoritarian advantage theory, I hypothesize authoritarian regimes implemented stricter containment policies in the first year of the Covid pandemic compared to democracies. Utilizing a sample of 69 countries and OLS regression analysis, I found evidence to support that the type of political regime had a significant effect in determining the intensity of containment policies by country in the first year of the pandemic. Yet, the direction of this relationship is unexpected, as democratic countries had more stringent policies compared to autocracies, a relationship that needs further exploration.

Introduction

The Covid-19 pandemic represented a unique scenario where virtually every country was faced with the same challenge of preventing the spread of a virus and providing policy support in a time of immense uncertainty. Yet, we witnessed drastically different government responses as some countries implemented city wide lockdowns and others never closed their international borders. Containment policies played a key role in response efforts because they were one of the few tools available to governments to reduce the spread of the virus during the first year of the pandemic – before pharmaceutical interventions were available. These policies included restrictions and limitations on domestic and international travel, gatherings by size, public transportation, public events, school closures, workplace closures, contact tracing, isolation and quarantine guidelines, curfews, and social distancing protocols. While many factors went into determining the level of intensity with which a country implemented containment policies, my research focuses on the role of politics. Specifically, if there is a relationship between the intensity of containment policies countries put in place during the first year of the Covid-19 pandemic and the type of political regime a country has.

My research leans on the authoritarian advantage theory, which suggests authoritarian regimes have an advantage in dealing with and responding to public health crises because they can quickly organize, mobilize, and implement large-scale responses. The key characteristics and values of authoritarian regimes, including collectivism and a strong top-down ruling style, are reflected in their policy outcomes. Based on these factors, I hypothesize that more autocratic regimes implemented more intense containment policies. To test my hypothesis, I take a global perspective to account for the wide variation in containment policy response efforts. I use the

Oxford Covid-19 Government Response Tracker (OxCGRT) data set and the Coronavirus Pandemic (Covid-19) data set from *Our World in Data*.

Using OLS regression analysis, I find the type of political regime is important in explaining containment policy intensity by country. Yet, the direction of this relationship differs from my original hypothesis. I find that more democratic countries are associated with more stringent policies. My findings are significant because they highlight the interconnectedness between the political science and public health fields during public health emergencies. They also provide cautionary evidence for future pandemics and question to what extent countries can borrow and learn from other countries responses during times of crisis.

This paper proceeds as follows: I first provide a timeline of the Covid-19 pandemic and an introduction to containment policies, their purpose, and their applications. I then turn to the limited literature on containment policies and politics. This includes an overview of the literature on how the effectiveness of containment policies is measured, the effectiveness of containment policies based on the type of political regimes, the political implications of these policies, and the limited work on the role of political regimes and the implementation of containment policies. I then introduce my theoretical argument that connects regime values and norms and the authoritarian advantage theory to the expected intensity of containment policies during the first year of the Covid pandemic. I then introduce my methodology, models, and results. I conclude with a discussion of possible interpretations of my findings and highlight the broader implications of my findings on policymaking in future public health crises.

Covid-19 and Containment Policies Background

Covid-19

The Covid-19 virus (SARS-CoV-2) was first detected in Wuhan, China, in December 2019, causing symptoms indicative of severe acute respiratory disease. By January 23, the Chinese government announced that the city of Wuhan, with a population of 10 million, would go into lockdown - restricting travel in and out of the city and enforcing strict stay-at-home orders (Alon et al., 2020). In the following weeks, the virus began its global takeover, and on January 30, 2020 the WHO declared Covid-19 a Public Health Emergency of International Concern (PHEIC). By March 11, Covid was declared to be a global pandemic due to the nature of its ability to spread rapidly on an international scale (Mahdy et al., 2020). By mid-April 2020, 37% of the global population was under full lockdown, 18% was under partial lockdown, and 25% experienced school and university closures (International Energy Agency, 2020)

At the beginning of the Covid-19 pandemic, so much was unknown about the virus, including its pathophysiology (how it spreads), its intermediate hosts (how the virus transferred from its original animal host to humans), and how the pathogen affected humans (Mahdy et al., 2020; Sohrabi et al., 2020). With so much uncertainty in the early days of the pandemic, no therapeutic treatments to respond to infection or aid in immunity, and limited testing capabilities, governments had to use nonpharmaceutical interventions to cope with the disease. The prominent global strategy to limit the virus's spread was containment policies. These policies aim to reduce person-to-person transmission, slowing down the virus's regional spread and preventing public health systems from becoming overwhelmed (Beazley, 2020).

Containment Policies

Public health experts have long relied on containment policies to manage epidemics and pandemics (Beazley, 2020). Such efforts, especially in the early phases of new or reemerging viruses, are beneficial in reducing the spread of highly infectious diseases and protecting high-risk individuals. Such policies were key factors in successfully containing other recent disease outbreaks, including the A/H1N1 2009 Influenza Pandemic, SARS-CoV in 2002-2003, the 2014-2015 Ebola Virus outbreak, and MERS-CoV in 2015 (Chen et al., 2021; Wodja et al., 2015).

Containment policies present a unique scenario where public health experts and politicians must balance disease prevention techniques with being cognizant of the social and economic costs of such policies. Saam et al. (2022) refer to this scenario as weighing public health efforts with democratic values. These policies undoubtedly limit civil liberties and dramatically increase the role of the state by placing restrictions on many of the rights we often take for granted in times of normalcy, including freedom of movement within one's country, freedom to take public transportation, or the freedom to hold a large private gathering. However, it is generally understood that these civil rights are restricted for a limited amount of time and are put in place to save human lives and improve health outcomes on a large-scale (Plumper & Neumayer, 2022). The early days of the Covid pandemic entailed perhaps the most extensive and widespread containment policies we have seen in modern times (Boissay et al., 2020). Common containment interventions ranged from restrictions on domestic and international travel, school and workplace closures, canceling public events, curfews, and social distancing protocols (Damme et al., 2020; Hale et al., 2022a).

With limited multinational coordination, governments were responsible for determining their policy response. As a result, policies varied extensively from country to country (Gordon et

al., 2021). For example, China had fiercely intense Covid policies, especially in the early days of the pandemic. The country put entire cities under lockdown for months, implemented mandatory contact tracing on a national level, and conducted city-wide testing (Gao & Zhang, 2021). In comparison, France, Italy, and Hong Kong had an intermediate response to Covid regarding stringency as they limited non-essential travel early on. Sweden exhibited one of the most 'relaxed' approaches, as they never formally closed their borders. The Swedish government allowed citizens to follow Covid policies voluntarily rather than implement and enforce these policies through government intervention (Damme et al., 2020; Plumper & Neumayer, 2022).

Containment Policies and Politics

The relevant literature on the relationship between containment policies and politics generally falls into one of three categories: how the effectiveness of containment policies is commonly measured, how political regimes experienced varying effectiveness of containment policies measured by health outcomes, and the political impact of these policies. The literature is exceptionally limited in addressing why countries implemented these policies in the first place and why we saw such extensive variation in government response efforts.

Effectiveness of Containment Policies

Scholars in public health and epidemiology often measure the effectiveness of containment policies in terms of health outcomes such as incidence rate (the rate at which new cases occur in a population), prevalence (proportion of the population with a disease at a given time), and mortality rates (number of deaths attributed to a certain disease in a population) (Chen et al., 2022; Coccia, 2021; Khosrawipour et al., 2020; Li, 2022; Xiu et al., 2022). From a

political science perspective, researchers point to several factors that determine the effectiveness of containment policies.

A popular view among researchers claims effectiveness is directly related to how compliant citizens are in implementing and following health guidelines in their communities. Christensen and Laegreid (2020) and Pak et al. (2021) state that the level of trust and capacity citizens have in their governments to wage successful responses to crises determines how compliant they are in following policy response efforts. Nelson (2021) argues that when citizens resist containment policies, it generally is because they are unconvinced that they will be effective. Alternatively, citizens could believe these policies infringe on their civil rights and are inappropriate for governments to enforce. Chen et al. (2022) point to different political regimes as being important in explaining compliance, while Xiu et al. (2022) found that population density and the strength of cultural tightness were important factors. Overall, highly compliant communities are generally more willing to accept stringent government policies (Pak et al., 2021).

Effectiveness of Containment Policies by Political Regime

The next branch of literature examines the relationship between the effectiveness of containment policies and different political regimes (Migone, 2020; Yao, 2021). The authoritarian advantage theory posits that authoritarian regimes have an advantage when responding to crises because they can quickly organize, mobilize, and illicit large-scale policy responses. They can do so because of their top-down ruling styles that focus on centralized decision-making (San et al., 2021; Serikbayeva et al., 2020; Wrage, 1999). San et al. (2021) and Schwartz (2012) point to the example of China's superior response to the 2002 SARS pandemic compared to Taiwan in containing the virus. Schwartz argues that authoritarian China

successfully controlled the outbreak through its top-down decision-making style, strong public support for response efforts, and the government's ability to control the media's narrative. In comparison, democratic Taiwan failed to elicit an effective response, even though its population is far wealthier, healthier, and more educated, because of its decentralized policymaking, lack of public confidence in government decisions, and critical media.

Plumper and Neumayer (2022) note that although autocracies can respond quickly and vigorously during crises, this does not necessarily mean these regimes impose the most effective policies due to their deficiencies in accountability, feedback mechanisms, and biased reporting. However, looking at health outcomes alone, authoritarian regimes fared exceptionally well regarding total Covid deaths and cases during the first year of the Covid pandemic compared to other types of political regimes (Cassan & Steenvoort, 2021; Jain et al., 2022).

The main criticism of the authoritarian advantage theory and its application to Covid is that authoritarian regimes manipulated their health outcome data to appear more favorable due to the inherent lack of free and transparent data in these regimes. This phenomenon is referred to as the biasing autocracy view (Alon et al., 2020; Annaka, 2021; Cassan & Steenvoort, 2021). This concern represents one of the challenges of working with and comparing cross-national Covid health outcome data. For the case of my argument, I am focusing on the intensity of the policies put in place, not necessarily their outcomes or effectiveness. Hence, the potentially biased data on outcomes is not a significant concern for my research.

Turning to democratic governments, their fundamental checks and balances of power between the many levels of government slowed down response time and effectiveness when making Covid containment policies (Karabulut et al., 2021; Nelson, 2021). As democracies had to balance waging strong public health policy responses with not infringing on the personal

freedoms and rights they guarantee, they were largely unable to respond with the speed and enforcement that is necessary when dealing with a highly contagious disease and rapidly evolving public health crisis (Serikbayeva et al., 2020). Additionally, many democratic states failed to coordinate their local, state, and federal level policies. This resulted in inconsistent procedures related to testing and quarantine protocols, contact tracing, social distancing guidelines, and hospital admission protocols. These inconsistencies and lack of coordination delayed response efforts and created mass confusion in deciphering what protocols applied to whom and under what circumstances (San et al., 2021; Schwartz, 2012).

Cepaluni and Dorsch (2021) found that in the early days of the pandemic, democracies experienced worse health outcomes (higher number of deaths and cases) compared to any other political regime type. The authors found that by 2021, democratic countries had a case fatality rate 3.7 times greater than autocratic nations. The authors forecasted that if all the 137 countries in their study had been democratic, the reported global death count in the first eight months of the pandemic would have been 13% greater (equal to 400,000 additional deaths). Democratic countries that experienced excess Covid mortality rates include Brazil, Mexico, the United States, and the United Kingdom.

Political Impact of Containment Policies

Scholars have largely focused on the aftermath and impact of containment policies. Kavakli (2020) examines how the Covid pandemic has contributed to governments' increased abuse of power and the overall weakening of democracies – also referred to as democratic backsliding. It is important to note that during emergencies, governments have reason to restrict certain rights and bypass some protocols to respond to the crisis. The democratic backsliding argument suggests that Covid created an opportunity for governments to increase their political

power while reducing personal freedoms beyond reason. Kavakli studied over 100 countries and concluded that this phenomenon occurred more commonly and to a considerable extent among populist incumbents compared to non-populist incumbents. Bjornskov and Voigt (2020) compare how political regimes declared states of emergency during Covid. They find a key difference to be that when autocracies declared states of emergency, this often correlated with suppressed media freedom.

An example of a government suppressing fundamental freedoms due to containment policies comes from the Philippines. The military reportability humiliated those who violated social distancing policies by publicly locking individuals in dog cages (Kavakli, 2020). Electoral manipulation has been another avenue of democratic backsliding. When strict stay-at-home orders were in effect and normal political processes grounded to a halt, over 70 countries postponed elections between February and August of 2020. However, some governments were accused of purposively postponing elections in attempts to retain power. Hong Kong has been a notable example. In cases where elections continued during this time, significant concerns surrounding low voter turnout, irregularities related to donations and campaign financing, and logistical problems running elections arose (James & Alihodzic, 2020).

Implementation of Containment Policies and Political Regime

Turning to the literature that aligns most with my argument, Plumper and Neumayer (2022) and Kuhlmann et al. (2021) are the leading authors to examine how political factors impacted the variation in containment policies across countries during Covid. Plumper and Neumayer question whether political factors and characteristics of political institutions, such as civil liberties, correlate with the intensity of containment policies. The authors sample 26 European democracies and break their analyses into two periods - the first wave (March 25, 2020

to May 9, 2020) and the second wave (October 27, 2020 to May 19, 2021). They ultimately conclude that political factors did not contribute to policy stringency in the first wave but did have an effect in the second wave. However, their data did not offer much variation in political regime type or policy stringency as they focused on European democracies, introducing concern for multicollinearity. Their limited sample size also means their findings cannot be extrapolated beyond European democracies. Kuhlmann et al. conducted a similar study, finding that political-administrative systems and political values were important in explaining the intensity of containment policies. They argue that this is primarily related to the role of trust and the forcefulness with which these policies were enforced. However, their sample only includes France, Germany, and Sweden – a narrow sample of countries with similar political regimes.

Theory

Political regime refers to the form of government a country follows regarding how leaders are elected, the public's role in politics, and general social norms (Alvarez et al., 1996). For my theoretical argument, key differences in political regimes relate to individual rights and freedoms and influence in politics (i.e., if elections are free and fair) and the extent to which governments are expected to be involved in citizens day to day lives (Alon et al., 2020).

As a type of political regime, democracies emphasize and respect civil rights, including freedom of expression and individual rights (Plumper & Neumayer, 2022). They also highlight personal autonomy, as governments play a limited role in the lives of citizens and value individualism (Alon et al., 2020). As the nature of containment policies drastically reduces individual freedoms and liberties by limiting the ability to travel, gather with others, and take

part in certain in-person activities, imposing strict containment policies goes against the core values of this regime type. And, as elections are free and fair, politicians might be hesitant to impose effective but unpopular policies (such as requiring face masks or stay-at-home orders) if they fear doing so will interfere with their chances of reelection (Serikbayeva et al., 2020).

In comparison, authoritarian regimes have a strong top-down, centralized ruling style where the political elite determine policies for the general masses. Autocracies are commonly associated with collectivism, as policies aim to maximize the common good at the expense of largely disregarding individual rights and freedoms (Serikbayeva et al., 2020; Wrage, 1999). Additionally, compliance with government policies is not only high but expected. Compliance is regularly enforced through threats of harsh punishments and even police violence (San et al., 2021). And, because rulers are not accountable through free and fair elections, they are less concerned with implementing unpopular containment policies (Alon et al., 2020; Nelson, 2021).

Not only do authoritarian regimes hold social norms and values that support large-scale response efforts, but the authoritarian advantage theory also tells us that these regimes implement strict and effective policy response efforts during public health crises. Therefore, I theorize that a country's political regime type is related to the intensity of government-imposed containment policies. And in terms of the direction of this relationship, I hypothesize autocracies opted for more stringent containment policies while democracies imposed less intense policies during the first year of the Covid pandemic. Therefore, I test my hypothesis:

> Hypothesis 1: More autocratic regimes implemented more stringent containment policies during the first year of the Covid pandemic compared to democratic regimes.

My analysis attempts to shed light on what factors went into deciding policy response efforts during a global pandemic. If politics did impact the extent to which stringent containment

policies were implemented, this suggests politics were a key aspect in determining how countries tried to contain the virus. This would highlight the importance of accounting for cross-country differences when making policies in response to public health crises. If, on the other hand, politics is not a significant factor, it is worth investigating what other factors were important and if their effect is surprising.

Methodology

In testing my hypothesis, I take a global approach by including as many countries as the data allows. Doing so accounts for the wide cross-country variation in containment policy response. I focus on the first year of the Covid pandemic when no pharmaceutical therapies were available to the public and containment policies were countries main line of defense against the virus. The time period for the analysis begins when the WHO declared Covid to be a Public Health Emergency of International Concern on January 30, 2020 (Mahdy et al., 2020). This marks the start of when the virus became a global concern, and all countries were pushed to act accordingly.

My outcome variable is the *stringency index* from the OxCGRT data set created by Hale et al. (2021b). This data set has been widely used among researchers studying the relationship between Covid and politics (Cassan & Steenvoort, 2021; Chen et al., 2020), health outcomes (Ma et al., 2021), and health economics (Bajra et al., 2022; Mohamed et al., 2022). This data set is appropriate for my research because it takes a cross-national and longitudinal approach to measuring the intensity of containment policies. The index is normalized on a 0-100 scale, with 0 indicating no containment measures and 100 representing the strictest possible measures for 187

countries. The daily index score is calculated based on 24 indicators of policy responses, including factors such as school and workplace closures, restrictions on gathering sizes, public transportation shutdowns, stay-at-home orders, and limitations on internal and international travel. Oxford researchers calculated the index score by analyzing publicly accessible data from media outlets and government-issued statements and briefings (Hale et al., 2021a).

I prepared the OxCGRT data by narrowing my observations of analysis to the country level (filtering out all subnational data) and imposed my time frame of analysis (January 30, 2020 to December 31, 2020). I transformed the stringency index variable from daily panel data to cross-sectional data by taking the average index value per country within my time period. This resulted in cross-sectional data, where each country is associated with a single value reflecting its average stringency score for this time period.

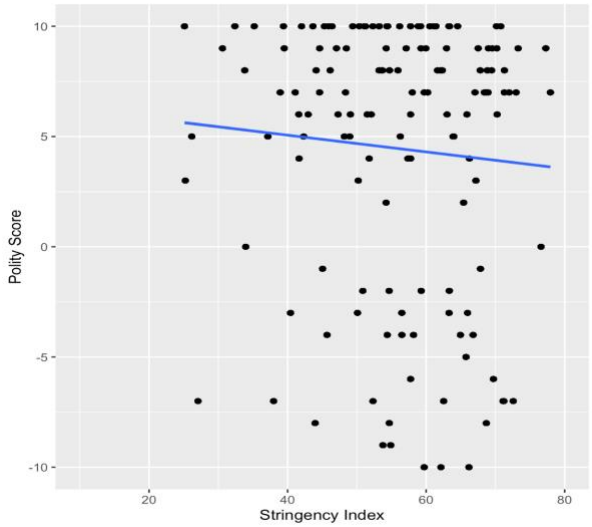
My main independent variable of analysis is *polity*, which reflects the type of political regime a country follows. This variable is from the Polity5 Annual Time-Series data set created by Marshall and Gurr (2020) and reports a polity score from -10 (strongly autocratic) to +10 (strongly democratic) for 199 countries. The data set includes all sovereign countries with a population of at least 500,000 individuals. This data set uniquely measures the characteristics and qualities of governments rather than concrete forms of government. This approach allows for robust cross-national comparisons and accounts for variations that categorical data would miss. Polity is an appropriate measure of political regimes because it accounts for election quality, institutional constraints on leaders, and the extent to which civil liberties are protected.

The most recent Polity data set is from 2018. Even though my research focuses on 2020, using 2018 data is not problematic after confirming the countries in my analysis did not undergo significant political regime changes within these two years (Plumper & Neumayer, 2022). To

verify this, I examined the Freedom in the World 2023 data set, which gives each country a Freedom Index score based on measures of personal, civil, and economic freedoms on a scale from 0-100 (Freedom House, 2023). I found four countries from my sample experienced a 10-point or greater change in their aggregate Freedom Index between 2018 and 2020, including Comoros, Ethiopia, Nicaragua, and Venezuela. As the 2018 Polity5 data does not account for these changes, I excluded these countries from my analysis.

After adjusting the three-digit country codes to ensure uniformity across my data sets, I merged the Polity and OxCGRT data sets together by country code. The correlation coefficient between the stringency index and polity (using only complete observations and Pearson's method) is -0.066. Figure 1 shows a graphical representation of the correlation between these two variables by country. The negative correlation coefficient and downward-sloping line of best fit demonstrate the inverse relationship between polity score and stringency. Meaning as a country becomes more autocratic (decreased polity score), this is associated with an increase in the intensity of containment policies. This is the direction of the relationship my causal story and the authoritarian advantage theory supports.

Figure 1: Correlation Between Polity Score and Stringency Index
Including Outliers

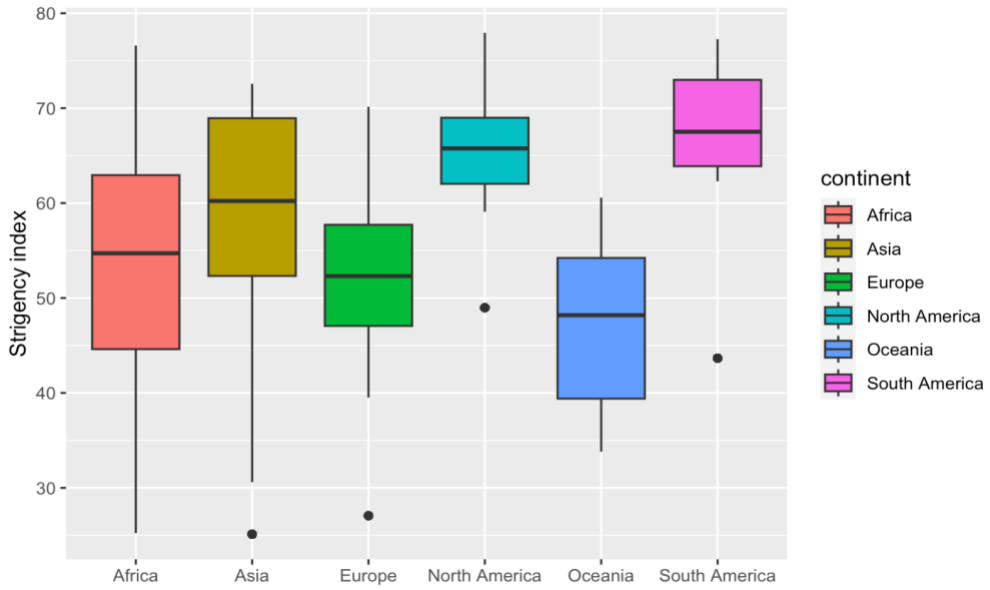


To estimate the relationship between polity and stringency, I use OLS regression. OLS requires the assumption that the data is normally distributed. So, I accessed the distribution of my main outcome variable. The stringency index variable ranges in value from 25 to 78, and its standard deviation is 12, suggesting the data is widely spread out around the mean (equal to 56). The skewness value is -0.16, suggesting the distribution of the variable is skewed to the left of the mean (see Table 1). Figure 2 further highlights the presence of outliers by graphically depicting the distribution of the stringency index values by continent.

Table 1: Stringency Index Variable Including Outliers

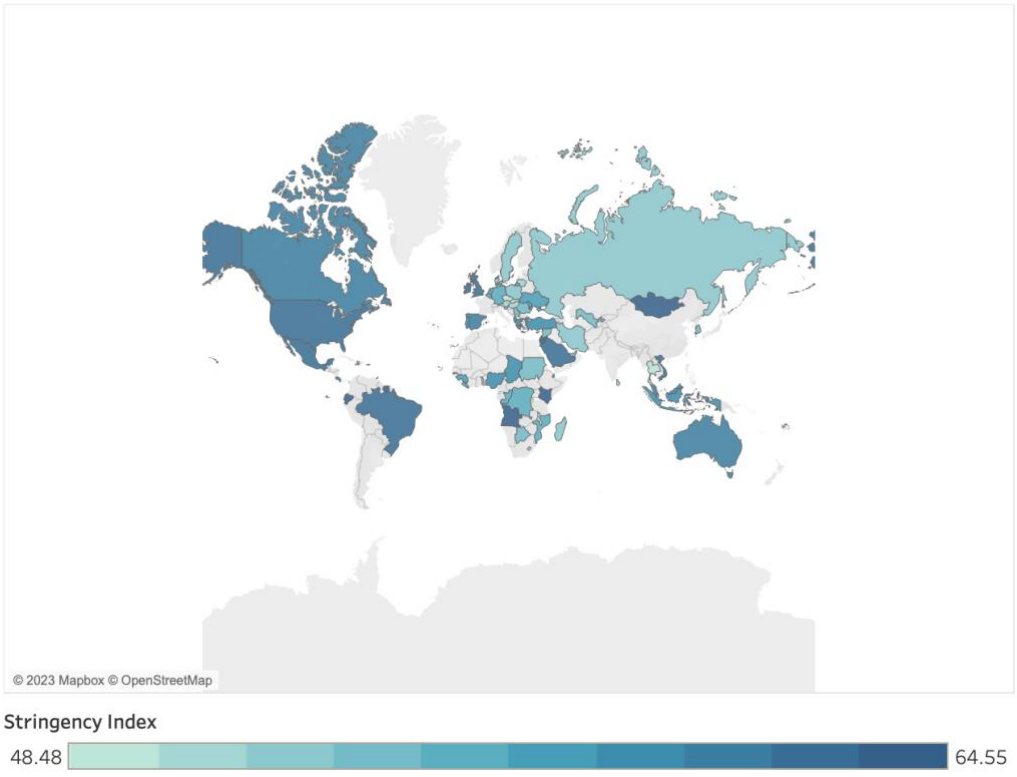
VARIABLE	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum	Standard deviation	Skewness	Kurtosis
Stringency index	25	48	57	56	65	78	12	-0.52	-0.16

Figure 2: Stringency Index Distribution
Including outliers
N = 143 countries



To ensure outliers do not bias my results and to promote linearity, I limited my main sample to include countries with stringency index values that fall within the interquartile range (48.48 to 64.95)[1]. As the interquartile range measures the spread of the middle 50% of the data, it reduces sensitivity to outliers. After doing so, my final sample size is 69 countries. A map of the final countries and their associated stringency index is shown in Figure 3. Table A1 in Appendix A provides a list of the countries and their associated stringency and polity scores used in my analysis, excluding outlier countries. Table B1 in Appendix B provides a full list of all 143 countries in my sample before outliers were excluded[2].

Figure 3: Stringency Index by Country
Excluding outliers
N =69 countries



[1] Interquartile range calculated as lower limit = (Q1 - 1.5(Q3-Q1)) and upper limit =(Q3 + 1.5(Q3-Q1))
[2] Whether I exclude countries with outlier stringency scores (referred to as Model 3) or include all 143 countries (Model 4), my regression analysis results were similar, specifically regarding my main variable of interest, polity. The regression results for Model 4 are shown in Table C1 in Appendix C.

In terms of control variables, I sourced data from the Coronavirus Pandemic (Covid-19) data set, which combines data from the WHO, Johns Hopkins University's Coronavirus Resource Center, and the World Bank to measure the state of the pandemic by country (Mathieu et al., 2020). I chose controls that accounted for the state of the pandemic by country and country-specific demographic characteristics. In cases where my control variables were recorded as panel data, I imposed my time period of analysis.

Total Covid deaths per million include total and probable deaths attributed to Covid by country. This data is originally from the Covid-19 Dashboard created by the WHO. This variable accounts for the state and intensity of the pandemic by country. I expect countries experiencing severe outbreaks to be more likely to impose stringent restrictions compared to countries with less severe outbreaks (Kuhlmann et al., 2021). Total deaths is a preferable variable compared to total cases because it is less likely to be biased and underreported – not to say these problems could not still be present, but they are reduced when analyzing death-related statistics. Additionally, as this variable is standardized on a per million scale, this allows for increased accuracy when comparing across countries with varying population sizes (Plumper & Neumayer, 2022).

Population density accounts for the nature of the virus by area. Because of the highly contagious and infectious nature of Covid, highly populated areas allow the virus to spread faster (Cassan & Steenvoort, 2021; Damme et al., 2020). This variable is calculated as the number of people per given land area and is originally from the World Bank's World Development Indicators. I took the log of this value to make this variable more interpretable and to enhance linearity, as there was initially a large range of values within this variable.

Population aged 65 older represents the proportion of a country's population aged 65 and older. This variable highlights the population's vulnerability, as the risk of extreme Covid related illness and hospitalization increases dramatically in older populations. This variable also captures the potential lethality of the virus by country due to the highly correlated nature between the risk of death and age. Therefore, I expect countries with larger proportions of older individuals to have more stringent containment policies (Kuhlmann et al., 2021).

My final control variable is the *human development index*. This indexed value (0 to 1) was created by the United Nations and reflects basic human development, including life expectancy, expected and actual years of schooling, and GNI per capita. In my data set, this variable ranges in value from 0.40 to 0.96 – the larger the value indicating increased human development. This index includes information on GNI per capita, which is important because it accounts for the level of economic development per country. Following Plumper and Neumayer's (2022) logic, I would expect countries with higher GNI per capita to have higher government capacity and be more able to enact expensive Covid related policies. Economic indicators are also strongly correlated with the quality of a country's healthcare system, as countries with higher economic resources generally have the financial means to spend more on their healthcare systems (Cassan & Steenvoort, 2021). The human development index also includes data on life expectancy, which acts as a proxy for measuring the effectiveness of a country's healthcare system (Galvani-Townsend et al., 2022). Several authors have found that countries with more robust healthcare systems utilized less stringent containment policies because they believed their healthcare systems could absorb the effects of Covid without policy interventions (Cassan & Steenvoort, 2021; Coccia, 2021).

Models

Using RStudio, I ran three OLS regression models to test my hypothesis. Model 1 is a naïve regression with my outcome variable, stringency index, and my main independent variable of interest – polity. Model 2 looks at the extent to which stringency index can be explained by my control variables alone (excluding polity). Model 3 combines the two models, determining if stringency index can be explained by polity in addition to my control variables. Table 2 includes summary statistics of all variables. The equations for each model are as follows:

Model 1:

$$Stringency\ Index\ = B0 + B1(polity) + E$$

Model 2:

$$Stringency\ Index\ = B0\ +\ B1(total\ Covid\ deaths\ per\ million) + B2(\log population\ density) + B3(proportion\ population\ age\ 65\ older) + B4(human\ development\ index) + E$$

Model 3:

$$Stringency\ Index\ = B0\ +\ B1(polity) + B2(total\ Covid\ deaths\ per\ million) + B3(\log population\ density) + B4(proportion\ population\ age\ 65\ older) + B5((human\ development\ index) + E$$

Table 2: Summary Statistic Excluding Outliers

VARIABLES	Countries	Mean	Standard Deviation	Minimum	Maximum
Polity	69	4.74	6.19	-10.0	10.0
Stringency index	69	56.85	4.52	48.48	64.55
Total Covid deaths per million	69	853.66	1,058.85	0.003	4,886.68
Log population density	69	1.89	0.60	0.30	3.89
Population aged 65 older	69	10.04	6.56	1.14	21.50
Human development index	69	0.75	0.16	0.40	0.96

Results

My regression analysis results are shown in Table 3. The first model, the naïve regression between stringency index and polity, shows the coefficient on the polity variable is positive and statistically significant at the 0.10 significance level but negligible in magnitude, indicating no explanatory power. Model 2 includes the stringency index as the outcome variable and four control variables. While this model does not include my main independent variable of interest – polity – it highlights that the control variables are important in explaining the variation in stringency in my sample. In this model, all the control variables are statistically significant at the 99% confidence level, and these variables explain 16.93% of the variation in the stringency index. These findings suggest that the circumstances of the pandemic and country-specific demographics are related to the intensity of the containment policies countries put in place in 2020.

Table 3: Regression Output Excluding Outliers

Outcome Variable: Stringency Index	Model 1	Model 2	Model 3
	OLS	OLS	OLS
VARIABLES			
Polity	0.0055*		0.1875***
	(0.0025)		(0.0032)
Total Covid deaths per million		0.0002***	0.0002***
		(0.0000)	(0.0000)
Log Population density		-1.4108***	-1.1955***
		(0.0255)	(0.0252)
Proportion Population aged 65 older		-0.4160***	-0.5591***
		(0.0039)	(0.0045)
Human development index		14.4681**	16.9551 ***
		(0.1498)	(0.1523)
Constant	56.8266***	52.6076***	50.9126***
	(0.0196)	(0.0950)	(0.0971)
Countries	69	69	69
Observations	84,003	76,293	76,293
R-squared	0.0000	0.1693	0.2060

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

My main model, Model 3, combines the previous two models to include my main variable of interest and controls. The sign and statistical significance levels of all the control variables remain the same in Model 2 and Model 3. As the polity variable essentially has no explanatory power related to stringency in Model 1 but significantly increased in magnitude after accounting for my control variables (Model 3), this suggests Model 1 suffered from omitted variable bias – which is unsurprising. By adding the control variables, I accounted for more of the variation in stringency that was previously unexplained in the univariate model.

In my main model, the R squared has increased to 0.21. I find that a one-unit increase in the polity score (which ranges from -10 being completely autocratic to +10 completely democratic) is associated with an approximately 0.19 unit increase in the stringency index, which is statistically significant at the 99% confidence level, all else equal. In other words, going from the most extreme autocracy (-10 polity score) to the most democratic regime (+10 polity score) would result in a 3.80 unit increase in the stringency score. As the stringency score variable ranges in value from 48.48 to 64.95, this represents a 23% increase. From this OLS regression analysis, I find evidence that a country's political regime did impact the intensity of containment policies implemented in the first year of the Covid pandemic. However, a positive coefficient on polity suggests that as countries become more democratic, they have stricter stringency policies. The direction of this relationship differs from my theoretical logic and the authoritarian advantage theory, meaning I reject my hypothesis.

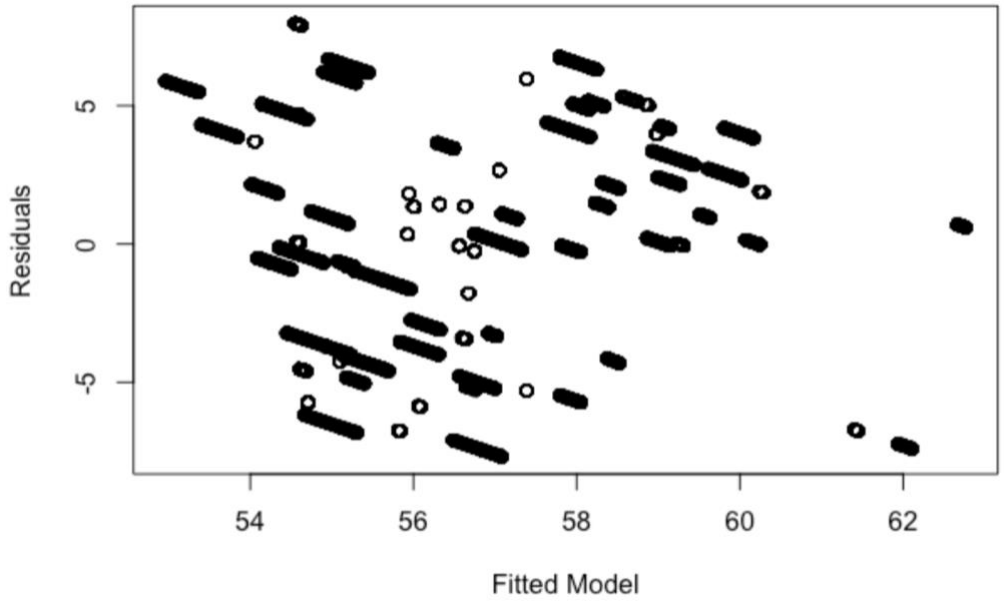
The human development index variable has the largest magnitude of all my variables. A one-unit increase in the human development index is associated with a 16.96 unit increase in the stringency index, all else equal, and statistically significant at the 99% confidence level. Meaning countries with higher human development scores experienced stricter containment policies. Or, put another way, as countries become healthier, more educated, and increase their standard of living, we see increased stringency in their containment policies.

The coefficient on total Covid deaths per million aligns with my previous reasoning. The positive coefficient suggests that as total Covid deaths increase, stringency also increases. An additional 1,000 total Covid deaths per million is associated with a 0.20 unit increase in stringency, all else equal, and statistically significant at the 99% confidence level.

Robustness Checks

I conducted a series of robustness checks to ensure my model meets the assumptions for OLS regression and to confirm that my conclusions are unbiased. These tests confirm heteroskedasticity and multicollinearity are not present and check the distribution of my data. Figure 4 shows the residual values plotted against the fitted values for Model 3. There does not appear to be a clear pattern in the distribution of the residuals; hence we can conclude the variance of the error term is constant, and heteroskedasticity is not a concern.

Figure 4: Robustness Check, Residual vs. Fitted Plot Model 3



To confirm that my data follows a normal distribution and meets the underlying assumptions necessary to use OLS regression without introducing bias, I graphed a QQ plot, as seen in Figure 5. In the plot, we see there is a heavy tail distribution, as a perfectly normal distribution would follow the dashed line. However, looking at the Residuals vs. Leverage plot (Figure 6), no points fall within Cook's Distance, suggesting there are no influential observations in Model 3 (observations that, if removed, would significantly change the coefficients). Therefore, I can conclude that the distribution of my data is not problematic.

Figure 5: Robustness Check, QQ Plot Model 3

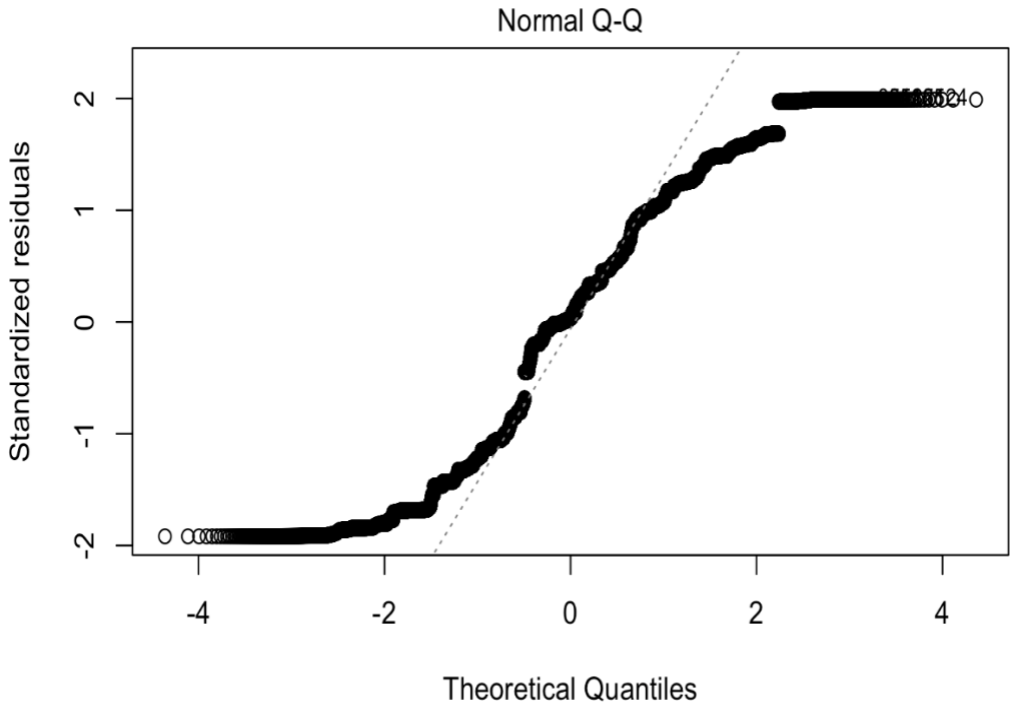
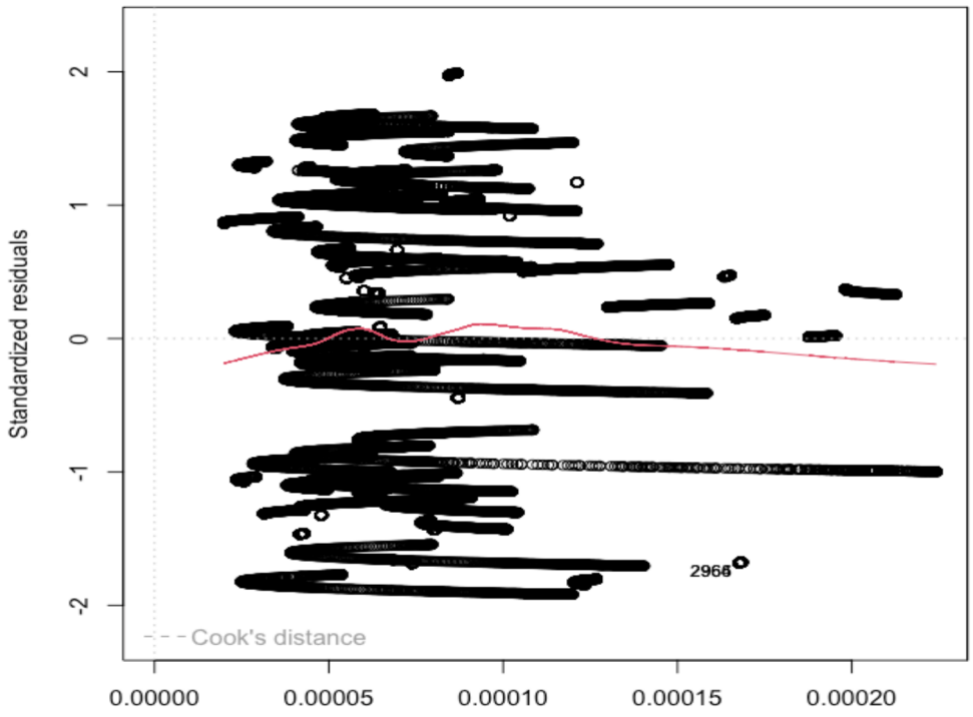


Figure 6: Robustness Check, Residuals vs. Leverage Model 3



To assess multicollinearity, I calculated the Variance Inflation Factor (VIF) values for each of my variables to confirm they are not significantly correlated. Table 4 shows the VIF values associated with each variable. A higher VIF value indicates an increased correlation between the independent variables, which can result in inflated standard errors and inaccurate conclusions regarding statistical significance. As all of the VIF values for my variables are under five (a standard threshold), I can confirm multicollinearity is not a concern.

Table 4: Robustness Check, Variance Inflation Factor (VIF) Model 3

VARIABLE	VIF
Polity	1.7
Total Covid deaths per million	1.4
Log population density	1.1
Population aged 65 older	4.0
Human development index	2.8

Importance of Findings

There are several ways to interpret my findings as to why more democratic countries implemented stricter containment policies. The role of free and transparent media could have been an important factor. Democratic governments could have had heightened policy responsiveness because they were under increased pressure from citizens due to extensive available media from other countries, politicians, and the scientific community (Besley & Burgess, 2002).

Another explanation is democratic countries generally have more resources and organizational know-how, so they could have been more able to implement these costly policies. This line of thinking would follow the state capacity literature that Serikbayeva et al. (2020) explore further. This literature often uses health outcomes (Covid deaths and cases) to measure the effectiveness of state capacity related to Covid (Saam et al., 2022). Following the state

capacity logic, perhaps unorganized governments did not opt for intense containment policies because they did not have the financial means to support their country in doing so. As these policies strongly increased unemployment rates and reduced economic earnings, perhaps only large economies with significant budgets could make these sacrifices. And democracies tend to be more financially able compared to autocracies (Alon et al., 2020).

From a public health perspective, knowing that politics played a significant role in the intensity of containment policies should raise concern because this suggests governments made health-related policies that were strongly influenced by political factors. In terms of the political science perspective, further research is needed to explain why more democratic countries enacted stricter containment policies. Knowing that political factors were important and the extent to which they impacted containment policymaking provides an informative backdrop to future policymaking. One might think countries could have learned from the policy mistakes and successes of those initially hit the hardest in the first few months of 2020, notably China, Italy, India, Brazil, and Peru. Other countries could have used this knowledge regarding what policies worked or did not work well in these initial countries to shape their policy responses. Yet, my findings suggest that comparing policy response efforts would only be helpful in cases of countries with similar political regimes. This is potentially concerning because it suggests countries cannot learn from each other on a wide scale regarding policy responses in states of emergency. Overall, the fields of public health and government must work in collaboration to find and implement future pandemic and infectious disease response efforts that account for both a country's political regime and the intensity of the public health crisis.

Conclusion

Containment policies were one of the few tools governments could draw on in reducing the spread of the Covid-19 virus in 2020, yet countries implemented varying intensities of these policies. In questioning this wide variation in policy response, my research examined if the type of political regime a country has was related to the intensity of containment policies it implemented during this time. To make my argument, I examined the social norms and values associated with political regimes ranging from democracies to autocracies and highlighted the logic of the authoritarian advantage theory. I hypothesized that autocracies implemented more stringent policies than democracies.

To test my hypothesis, I used OLS regression with the stringency index from the OxCGRT data set as my dependent variable. My independent variable, polity, measured the type of political regime a country followed. My control variables accounted for the intensity of the Covid pandemic and country demographics. In my sample of 69 countries, I found that a country's type of political regime was statistically significant in explaining the cross-country variation in the intensity of containment policies. Yet, the direction of this relationship differed from my hypothesis, as I found democracies implemented more stringent policies compared to autocracies. I provided possible explanations for this finding related to the generally higher organizational know-how and state capacity levels in democracies. I also commented on the role of financial resources needed to support a country under strict containment policies, which democracies have an advantage in compared to autocracies.

It is important to note that I cannot claim causal relationships, as my findings are strictly findings of correlation. Additionally, the restrictions I placed on my initial data did limit the

number of countries I had data on. Notably, small countries with a population of less than 500,000 were excluded – as this was a restriction imposed by the Polity5 data set. Another limitation is that I restricted my sample to include data on the country level, so within country variations in political stringency were not captured. This technique could be problematic for studying countries that opted for more decentralized policy approaches, such as the United States. However, as the goal of my study was to make aggregate comparisons across countries, this was not a major concern.

To my knowledge, this is the first study of its kind that takes a global approach to analyzing Covid containment policies related to political factors. This is significant because, due to the extreme variation of data collection methods and transparent data practices, global comparisons on the topic of Covid are difficult to conduct. To overcome these concerns, I sourced my data from organizations familiar with these challenges, including leading intergovernmental organizations and The Center for Systemic Peace. My research is also unique because it provides a holistic approach to explaining stringency by accounting for political, economic, health, and country-specific characteristics. Using 69 countries also means I accounted for a wide variation in stringency and political regimes. My large sample size makes the external validity of this study significant.

While my research studies the intensity of containment policies, it does not address the extent to which the public complied with the respective policies of their country. Future research should explore the connection between stringency, politics, and compliance. It could be that my research found that democracies implemented stricter policies but experienced far less compliance due to a lack of government trust and increased freedom and expression. This effect could provide insights into why some democratic countries with more stringent policies still

experienced poor health outcomes. An additional next step could be to find other variables to measure political factors and rerun the analysis. Other variables could include the type of electoral system, the level of political polarization, and the role of public opinion and trust. Doing so could better account for the variations across political systems and provide further insights into the relationship between how different types of political regimes implemented varying intensities of containment policies.

References

Alon, I., Farrell, M., & Li, S. (2020.). Regime Type and COVID-19 Response. *Sage*, 9(3), 152-160. https://journals.sagepub.com/doi/10.1177/2319714520928884

Alvarez, M., Cheibub, J.A., Limongi, F., & Przeworksi, A. (1996). Classifying political regimes. *St Comp Int Dev*, 31(1), 3-36. https://doi.org/10.1007/BF02719326

Annaka, S. (2021). Political regime, data transparency, and COVID-19 death cases. *SSM Popul Health*, 12(15). https://pubmed.ncbi.nlm.nih.gov/34189240/

Beazley, A. (2020). Contagion, containment, consent: Infectious disease pandemics and the ethics, rights, and legality of state-enforced vaccination. *Journal of Law and the Biosciences*, 7(1). https://doi.org/10.1093/jlb/lsaa021

Besley, T. & Burgess, T. (2002). The political economy of government responsiveness: Theory and evidence from India. *The Quarterly Journal of Economics*, 117(4), 1415–1451. https://doi.org/10.1162/003355302320935061

Bjørnskov, C., & Voigt, S. (2022). This time is different?—On the use of emergency measures during the Corona pandemic. *Eur J Law Econ*, 54, 63–81. https://doi.org/10.1007/s10656921-09696-5

Boissay, F., Rees, D., & Rungcharoenkitkul, P. (2020). Dealing with Covid-19: Understanding the policy choices. *BIS Bulletins.* 19. https://www.bis.org/publ/bisbull19.pdf

Cassan G., & Van Steenvoort M. (2021). Political regime and COVID 19 death rate: Efficient, biasing or simply different autocracies? An econometric analysis. *SSM Popul Health*, 16. https://pubmed.ncbi.nlm.nih.gov/34541281/

Cepaluni, G., Dorsch, M., & Branyiczki, R. (2020). Political regimes and deaths in the early stages of the COVID-19 pandemic. *APSA Preprints*. https://preprints.apsanet.org/engage/apsa/article-details/5ea7229e5d762d001217da9a

Chen, W., Lee, S., Dong, M., & Taniguchi, M. (2021). What factors drive the satisfaction of citizens with governments' responses to COVID-19? *International Journal of Infectious Disease*, 102, 327-331. https://doi.org/10.1016/j.ijid.2020.10.050

Christensen, T., & Lægreid, P. (2020). Balancing governance capacity and legitimacy: How the Norwegian government handled the COVID-19 crisis as a high performer. *Public Admin Rev*, 80, 774-779. https://doi.org/10.1111/puar.13241

Coccia, M. (2021). COVID-19 pandemic over 2020 (withlockdowns) and 2021 (with vaccinations): Similar effects for seasonality and environmental factors. *Environ Res*, 15(208). https://pubmed.ncbi.nlm.nih.gov/35033552/

Freedom House. (2023). *All Data FIW 2013-2023* [Data set]. https://freedomhouse.org/report/freedom-world

Galvani-Townsend, S., Martinez, I., & Pandey, A. (2022). Is life expectancy higher in countries and territories with publicly funded healthcare? Global analysis of health-care access and the social determinants of health. *J Glob Health*, 12. https://jogh.org/wp-content/uploads/2022/11/jogh-12-04091.pdf

Ginsburg, T., & Versteeg, M. (2020). The bound executive: emergency powers during the pandemic. *International Journal of Constitutional Law*, 19(5), 1498-1535. https://academic.oup.com/icon/article-abstract/19/5/1498/6308959

Gordon, D., Grafton, Q., & Steinshamn, S. (2021). Cross-country effects and policy responses to COVID-19 in 2020: The Nordic countries. *Economic Analysis and Policy*, 71, 198-210. https://www.sciencedirect.com/science/article/pii/S0313592621000643

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., Tatlow, H. (2021a). A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human Behaviour*, 5, 529-538. https://doi.org/10.1038/s41562-021-01079-8

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., Tatlow, H. (2021b). *OxCGRT Covid Policy Tracker* [Data set]. https://github.com/OxCGRT/covid-policy-tracker/tree/master/data

International Energy Agency. (2020). *Global Energy Review 2020.* https://www.iea.org/reports/global-energy-review-2020

Jain V., Clarke J., & Beaney, T. (2022). Association between democratic governance and excess mortality during the COVID-19 pandemic: An observational study. *J Epidemiol Community Health*, 76, 853-860. https://jech.bmj.com/content/jech/76/10/853.full.pdf

James, T., & Alihodzic, S. (2020). When is it democratic to postpone an election? Elections during natural disasters, COVID-19, and emergency situations. *Election Law Journal: Rules, Politics, and Policy*, 19(3), 344-362. https://doi.org/10.1089/elj.2020.0642

Karabulut, G., Zimmermann, K., Bilgin, M., & Doker, A. (2021). Democracy and COVID-19 outcomes. *Economics Letters*, 203. https://doi.org/10.1016/j.econlet.2021.109840

Kavakli, K.C. (2020). Populist governments and democratic backsliding during the COVID-19 pandemic. https://www.semanticscholar.org/paper/Populist-Governments-and-Democratic-Backsliding-the-Kavakli/c73f791a07472467d0ba9d82c64962f87f16a287

Khosrawipour, V., Lau, H., Khosrawipour, T., Kocbach, P., Ichii, H., Bania, J., & Mikolajczyk, A. (2020). Failure in initial stage containment of global COVID-19 epicenters. *Journal of Medical Virology*, 92(7), 863–867. https://doi.org/10.1002/jmv.25883

Kuhlmann, S., Hellström, M., Ramberg, U., & Reiter, R. (2021). Tracing divergence in crisis governance: responses to the COVID-19 pandemic in France, Germany and Sweden compared. *International Review of Administrative Sciences*, 87(3), 556-575. https://journals.sagepub.com/doi/abs/10.1177/0020852320979359

Li, K. (2022). Success and challenges: China's state capacity of popular mobilization in the COVID-19 pandemic. *Chinese Studies*, 11, 68-78. https://doi.org/10.4236/chnstd.2022.112006

Mahdy M., Younis, W., & Ewaida, Z. (2020). An overview of SARS-CoV-2 and animal infection. *Frontiers in Veterinary Science*, 7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7759518/

Marshall, M., & Gurr, T. (2020). Polity5: Political regime characteristics and transitions, 1800-2018. *Center for Systemic Peace* [Data set]. https://www.systemicpeace.org/inscrdata.html

Mathieu, E., Ritchie, H., & Rodes-Guirao, L. (2020). Coronavirus pandemic (COVID-19). *Our World in Data.* https://github.com/owid/covid-19-data/tree/master/public/data

Migone, A. (2020). The influence of national policy characteristics on COVID-19 containment policies: A comparative analysis. *Policy Design and Practice*, 3(3), 259-276. https://www.tandfonline.com/doi/full/10.1080/25741292.2020.1804660

Nelson, M. (2021). The timing and aggressiveness of early government response to COVID-19: Political systems, societal culture, and more. *World Development*, 146. https://doi.org/10.1016/j.worlddev.2021.105550

Pak, A., McBryde, E., & Adegboye, O. A. (2021). Does high public trust amplify compliance with stringent COVID-19 government health guidelines? A multi-country analysis using data from 102,627 individuals. *Risk Management and Healthcare Policy*, 14, 293-302. https://doi.org/10.2147/RMHP.S278774

Plümper, T., & Neumayer, E. (2022). The politics of Covid-19 containment policies in Europe. *International Journal of Disaster Risk Reduction*, 81. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9359755/

Saam, N., Friedrich, C., & Engelhardt, H. (2022). The value conflict between freedom and security: Explaining the variation of COVID-19 policies in democracies and autocracies. *PLOS ONE*, 17(9). https://doi.org/10.1371/journal.pone.0274270

San, S., Bastug, M., & Basli, H. (2021). Crisis management in authoritarian regimes: A comparative study of COVID-19 responses in Turkey and Iran. *Global Public Health*, 16(4), 485-501. https://doi.org/10.1080/17441692.2020.1867880

Schwartz, J. (2012). Compensating for the 'authoritarian advantage' in crisis response: A comparative case study of SARS pandemic responses in China and Taiwan. *Journal of Chinese Political Science*, 17, 313-331. https://doi.org/10.1007/s11366-012-9204-4

Serikbayeva, B., Abdulla, K., & Oskenbayev, Y. (2020). State capacity in responding to COVID-19. *International Journal of Public Administration*, 44(11), 920-930. https://doi.org/10.1080/01900692.2020.1850778

Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., Iosifidis, C., & Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery*, 76, 71-76. https://doi.org/10.1016/j.ijsu.2020.02.034

Van Damme, W., Dahake, R., Delamou, A., Ingelbeen, B., Wouters, E., Vanham, G., van de Pas, R., Dossou, J. P., Ir, P., Abimbola, S., Van der Borght, S., Narayanan, D., Bloom, G., Van Engelgem, I., Ag Ahmed, M. A., Kiendrébéogo, J. A., Verdonck, K., De Brouwere, V., Bello, K., Kloos, H., … Assefa, Y. (2020). The COVID-19 pandemic: Diverse contexts; different epidemics- how and why? *BMJ Glob Health*, 5(7). https://pubmed.ncbi.nlm.nih.gov/32718950/

Wojda ,T., Valenza, P., Cornejo, K., McGinley, T., Galwankar, S., Kelkar, D., Sharpe R., Papadimos, T., & Stawicki, S. (2015). The Ebola outbreak of 2014-2015: From coordinated multilateral action to effective disease containment, vaccine development, and beyond. *J Glob Infect Dis*, 7(4), 127-38. https://pubmed.ncbi.nlm.nih.gov/26752867/

Wrage, S. (1999). Examining the "Authoritarian Advantage" in Southeast Asian development in the wake of Asian economic failures. *Studies in Conflict and Terrorism*, 22(1), 21-31. https://doi.org/10.1080/105761099265847

Xiu, Z., Feng, P., Yin, J., & Zhu, Y. (2022). Are stringent containment and closure policies associated with a lower COVID-19 spread rate? Global Evidence. *International Journal of Environmental Research and Public Health*, 19(3). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8835598/

Yao, L. (2021). *Responding to the pandemic: A multicountry study on social- political factors and health outcomes of COVID-19* [Unpublished doctoral thesis]. University of Tennessee Health Science Center. https://dc.uthsc.edu/cgi/viewcontent.cgi?article=1569&context=dissertations

Zhang, P., & Gao, J. (2021). Evaluation of China's public health system response to COVID-19. *Journal of Global Health*, 11. https://doi.org/10.7189/jogh.11.05004

Appendix A: Countries, Excluding Outliers

Table A1: Country List Excluding Outliers

Country	Polity	Stringency Index
Albania	9	60
Angola	-2	63
Australia	10	61
Austria	10	51
Bahrain	-10	60
Belgium	8	56
Botswana	8	55
Brazil	8	62
Canada	10	61
Cape Verde	10	63
Chad	-2	59
Costa Rica	10	59
Cyprus	10	58
Czech Republic	9	48
Denmark	10	50
Djibouti	3	50
Ecuador	5	64
Fiji	2	54
Gambia	4	57
Germany	10	56
Greece	10	59
Guinea	-6	58
Haiti	5	49
Hungary	10	51
Indonesia	9	59
Iran	-7	52
Ireland	10	61
Israel	6	63
Jordan	-3	63
Kenya	9	63
Lesotho	8	53
Liberia	7	58
Lithuania	10	51
Madagascar	6	52

Malawi	6	49
Malaysia	7	60
Mexico	8	62
Moldova	9	57
Mongolia	10	63
Mozambique	5	56
Netherlands	10	54
Nigeria	7	60
Poland	10	52
Portugal	10	59
Republic of the Congo	-4	56
Romania	9	54
Russia	4	52
Saudi Arabia	-10	62
Serbia	8	54
Singapore	-2	55
Slovak Republic	10	49
Slovenia	10	54
South Korea	8	54
Spain	10	61
Sri Lanka	6	51
Sudan	-4	54
Suriname	5	64
Sweden	10	53
Syria	-9	54
Thailand	-3	50
Togo	-2	51
Trinidad and Tobago	10	65
Turkey	-4	58
United Arab Emirates	-8	55
Ukraine	4	58
United Kingdom	8	62
United States	8	62
Uzbekistan	-9	55
Vietnam	-7	63

Appendix B: Countries, Including Outliers

Table B1: Country List Including Outliers

Country	Polity	Stringency Index
Afghanistan	-1	45
Albania	9	60
Algeria	2	65
Angola	-2	63
Argentina	9	77
Australia	10	61
Austria	10	51
Azerbaijan	-7	71
Bahrain	-10	60
Belarus	-7	27
Belgium	8	56
Benin	7	41
Bhutan	7	69
Bolivia	7	73
Botswana	8	55
Brazil	8	62
Bulgaria	9	45
Cameroon	-4	46
Canada	10	61
Cape Verde	10	63
Central African Republic	6	43
Chad	-2	59
Chile	10	71
China	-7	73
Colombia	7	68
Costa Rica	10	59
Cote D'Ivoire	4	42
Croatia	9	47
Cuba	-5	66
Cyprus	10	58
Czech Republic	9	48
Democratic Republic of the Congo	-3	48
Denmark	10	50

Djibouti	3	50
Dominican Republic	7	69
Ecuador	5	64
Egypt	-4	65
El Salvador	8	69
Estonia	9	40
Fiji	2	54
Finland	10	42
Gabon	3	67
Gambia	4	57
Germany	10	56
Ghana	8	46
Greece	10	59
Guatemala	8	69
Guinea	-6	58
Guyana	7	67
Haiti	5	49
Honduras	7	78
Hungary	10	51
India	9	70
Indonesia	9	59
Iran	-7	52
Iraq	6	70
Ireland	10	61
Israel	6	63
Italy	10	70
Jamaica	9	70
Japan	10	35
Jordan	-3	63
Kazakhstan	-6	70
Kenya	9	63
Kuwait	-7	71
Laos	-7	38
Latvia	8	44
Lebanon	6	66
Lesotho	8	53
Liberia	7	58
Libya	0	77
Lithuania	10	51

Luxembourg	10	46
Macedonia	9	31
Madagascar	6	52
Malawi	6	49
Malaysia	7	60
Mali	5	42
Mauritius	10	32
Mexico	8	62
Moldova	9	57
Mongolia	10	63
Morocco	-4	67
Mozambique	5	56
Myanmar	8	68
Namibia	6	47
Nepal	7	71
Netherlands	10	54
New Zealand	10	39
Niger	5	26
Nigeria	7	60
Norway	10	45
Oman	-8	69
Pakistan	7	72
Panama	9	69
Papua New Guinea	5	48
Paraguay	9	68
Peru	9	73
Philippines	8	71
Poland	10	52
Portugal	10	59
Qatar	-10	66
Republic of the Congo	-4	56
Romania	9	54
Russia	4	52
Rwanda	-3	66
Saudi Arabia	-10	62
Senegal	7	45
Serbia	8	54
Sierra Leone	7	39
Singapore	-2	55

Slovak Republic	10	49
Slovenia	10	54
Solomon Islands	8	34
Somalia	5	37
South Korea	8	54
Spain	10	61
Sri Lanka	6	51
Sudan	-4	54
Suriname	5	64
Sweden	10	53
Switzerland	10	46
Syria	-9	54
Taiwan	10	25
Tajikistan	-3	40
Tanzania	3	25
Thailand	-3	50
Togo	-2	51
Trinidad and Tobago	10	65
Tunisia	7	48
Turkey	-4	58
Turkmenistan	-8	44
UAE	-8	55
Uganda	-1	68
Ukraine	4	58
United Kingdom	8	62
United States	8	62
Uruguay	10	44
Uzbekistan	-9	55
Vietnam	-7	63
Yemen	0	34
Zambia	6	42
Zimbabwe	4	66

Appendix C: Regression Specification

Table C1: Regression Output Including Outliers

Outcome Variable: Stringency Index	Model 4
	OLS
VARIABLES	
Polity	0.1984***
	(0.0051)
Total Covid deaths per million	0.0017***
	(0.0000)
Log Population density	1.0479***
	(0.0435)
Proportion Population aged 65 older	-1.3542***
	(0.0071)
Human development index	45.0821***
	(0.2682)
Constant	31.8084***
	(0.1703)
Countries	143
Observations	151,300
R-squared	0.223

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1