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Curse of Democracy: Evidence from 2020

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Abstract

Countries with more democratic political regimes experienced greater GDP loss and more deaths from Covid-19 in 2020. Using five different instrumental variable strategies, we find that democracy is a major cause of the wealth and health losses. This impact is global and is not driven by China and the US alone. A key channel for democracy's negative impact is weaker and narrower containment policies at the beginning of the outbreak, *not* the speed of introducing policies.

Keywords: Democracy, Economic Growth, Public Health, Pandemic, Instrumental Variables

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"We all know what to do, we just don't know how to get re-elected after we've done it."

Jean-Claude Juncker

President of the European Commission (2014-2019)

I Introduction

GDP growth in the US is -3.5% during 2020, while that in China is 2.3%. The number of Covid-19-caused deaths per million is more than 300 times higher in the US than in China. Explaining such vast differences in economic and health performance is a pressing issue for today's world.

An obvious distinction between the US and China is in whether the political system is democratic or autocratic. Democracy is widely believed to promote economic prosperity and the safety of life, but whether democracy causes better outcomes is becoming increasingly debatable. In 2020 and 2021, the US along with other major democracies such as the UK and France face historic recessions and death tolls. The democratic countries stand in stark contrast to China and other autocratic countries, posing a natural question:

> *"Are democracies hampered by inherent inefficiency and political division - or do their openness and diversity make for a more effective mobilization...?"* (*The New York Times,* "The Virus Comes for Democracy," April 2, 2020)[1]

Our goal is to answer this question. We construct a dataset that contains both historical and present-day information on the demographic, economic, health, and geographic characteristics of most of the world's countries. We analyze the data with five different instrumental variables (IV) strategies. Our bottom line is that stronger democracies cause greater GDP declines and higher Covid-19 mortality during 2020. The result is robust to a variety of considerations: (a) how to measure the level of democracy in a country, (b) how to weight countries, (c) whether to control for country characteristics, and (d) the sample definition, especially whether to include extreme countries such as the US or China. The major channel for democracy's adverse effect appears to be weaker and narrower containment policies at the beginning of the pandemic, rather than the speed of policy implementation.

We start by looking at the cross-country correlation between the outcomes and a widely-used index for democracy by Freedom House. The index assesses each country's degree of political freedom and civil liberties. As reported in Figure 1, a standard deviation increase in the democracy index corresponds to a 2.3 percentage-point decrease in GDP between 2019-20. A standard deviation democracy increase is also correlated with 264 more Covid-19-related deaths per million, which is nearly 95% of the global average. To facilitate the interpretation of the finding, a standard deviation change in the democracy index is equivalent to the political-regime difference between Iraq and Indonesia or Indonesia and France.

Does this association of democracy with worse outcomes have any causal meaning? To identify democracy's causal effect, we adopt five of the most influential IVs for political and social institutions:

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[1] `https://www.nytimes.com/2020/04/02/opinion/coronavirus-democracy.html`

- Mortality of European colonial settlers (Acemoglu, Johnson and Robinson, 2001)

- Population density in the 1500s (Acemoglu, Johnson and Robinson, 2002)

- Availability of crops and minerals (Easterly and Levine, 2003)

- Fraction of the population speaking English, fraction of the population speaking a Western European language, and the Frankel-Romer trade share, a measure of how easy it is for a country to engage in foreign trade (Hall and Jones, 1999)

- British, French, and German legal origin (LaPorta, Shleifer and Vishny, 1998)

These IVs help identify the effects of political institutions by tracing back their origins to geographical and historical determinants such as the feasibility and incentives of colonial powers to invest in institution-building, the origin of the legal institution, and natural resource endowments. Indeed, first-stage regressions show that several of these IVs are significant drivers of the cross-country variation in today's democracy levels.

Two-stage least squares (2SLS) estimates show that democracy causes the worse outcomes. For example, with European settler mortality as an IV, a standard deviation increase in the democracy index causes a 3.1 percentage-point decrease in GDP and 441 more Covid-19-related deaths per million during 2020. The magnitude of these estimates is substantial, as the global average GDP growth rate in 2020 is -5.7 percentage points. The average Covid-19-related deaths per million is 285. The estimates are also statistically significant at the 1% level using robust 2SLS standard errors (s.e.). Other IV strategies give similar robust estimates, ranging from -2.5 to -3.5 percentage points for GDP growth and 297 to 441 for Covid-19-related deaths per million. Once we account for this democracy effect, countries in Europe, North America, or South America no longer have worse outcomes.

Our finding is robust to various alternative specifications. Controlling for latitude, temperature, precipitation, population density, median age, and diabetes does not change the results.[2] The baseline results change little even if we use alternative indices for democracy or weight countries differently. Moreover, the adverse effect of democracy is robust to excluding the US and China from the sample. The weakness of democracy is therefore a global phenomenon.

As potential mechanisms that underlie this democracy effect, we explore the severity, coverage, and speed of governmental containment policies. We quantify initial responses' severities using the Oxford COVID-19 Government Response Tracker's Containment Health Index, which measures the severity of containment responses across domains such as school closings, stay-at-home restrictions, and travel restrictions. We represent coverage by the number of domains that containment policies cover. We finally measure speed by the number of days between the 10th confirmed Covid-19 case and the introduction of any containment measure. 2SLS estimates using IVs for political regimes suggest that a stronger democracy causes significantly weaker and narrower containment policies at the beginning of the pandemic. Meanwhile, we do not observe a significant causal effect of democracy

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[2]We also test whether our results are driven by industrial composition by including the share of the service sector as a control variable. Our results change little. Results are available upon request.

on response speed, which suggests that severity and coverage are more critical mechanisms.

Related Literature. Our work is at the intersection of two strands of the literature: the relationship among democracy, economic growth, and public health, and the economics of pandemics. Any cause of macroeconomic growth and national public health is difficult to identify due to omitted variable biases, measurement errors, and limited data size (Klenow and Rodriguez-Clare, 1997; Helpman, 2009). Classic cross-sectional regression studies claim that democracy's cumulative effect on economic growth may be negligible (Barro, 1997; Przeworski and Limongi, 1993; Przeworski et al., 2000). With more quasi-experimental research designs, however, later studies show that democracies experience more stable, long-term growth than non-democracies (Acemoglu et al., 2018; Papaioannou and Siourounis, 2008; Persson and Tabellini, 2006, 2008; Quinn and Woolley, 2001; Rodrik and Wacziarg, 2005). Similar findings exist for democracy's positive effects on health (Besley and Kudamatsu, 2006; Kudamatsu, 2012). More broadly defined Western social institutions are also shown to have positive effects on economic growth (Acemoglu, Johnson and Robinson, 2001, 2002; Easterly and Levine, 2003; Hall and Jones, 1999). We are not aware of a prior study that shows a substantially negative causal impact of democracy.

Other studies inspect more closely the mechanisms behind democracy's effects. Some studies use regional differences in democratic representation to find that higher representation leads to greater investments in education and public health (Baum and Lake, 2003; Doucouliagos and Ulubaşoğlu, 2008; Lake and Baum, 2001; Tavares and Wacziarg, 2001). Studies such as Besley and Case (2003) and Burgess et al. (2015) focus on how different electoral processes within countries lead to different income redistributions and provisions of public goods.

We also contribute to the exploding literature on the economics of pandemics. Many researchers attempt to explain the cross-country heterogeneity in Covid-19-related outcomes. Studies show that obedience to travel restrictions or compliance with social distancing differ by culture, social capital, government communication, and political systems (Frey, Chen and Presidente, 2020; Giuliano et al., 2020; Karabulut et al., 2021; Bosancianu et al., 2020; Schmelz, 2021). None of them finds any root cause of Covid-19-related outcomes.

We integrate these two strands of the literature to find that democracy causes worse economic and public health outcomes during 2020. To our knowledge, this paper seems to be the only study that shows any substantially adverse effect of democracy on any important outcome.

We organize this paper as follows. Section II describes our data and provides descriptive statistics. Section III analyzes the correlation between Covid-19-related outcomes and democracy. Section IV presents our 2SLS estimates of the causal effect of democracy. After Section V discusses alternative specifications and explores the channels behind democracy's effect, Section VI concludes.

II Data

We are interested in how the policy performance of different countries in 2020 depends on their political regimes. We investigate the question by using the following five types of data. Table 1 provides descriptive statistics. For further details on data sources, refer to Appendix Table A1.

Economic and public health outcomes. The first outcome we look at is the GDP growth rate in 2020 from the *World Economic Outlook* by the International Monetary Fund (2020). These are estimates, as the official GDP growth rates for 2020 are still unavailable. Row 1 in Table 1 shows that the average GDP growth rate estimate is -5.7%, the worst since the World War II, for our sample of 175 countries. GDP growth rates also differ drastically across countries, with a standard deviation of 7.1%. Figure 1 visualizes these patterns.

Our second outcome is the total number of deaths per million attributed to Covid-19 in 2020 from the Covid-19 Data Repository Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong, Du and Gardner, 2020). This database collects data on confirmed cases and deaths from local administrative sources. The mean of Covid-19-related deaths per million is 285, while the median is 81. The number of Covid-19-related deaths is also dispersed, with a standard deviation of 376. We focus on these outcomes because they are not only important but also less susceptible to selective reporting than other outcomes, such as the number of COVID-19 cases (Fisher, Teo and Nabarro, 2020).

Democracy indices. Measuring the extent of democracy is tricky. Our baseline measure of the democracy level is from the *Freedom in the World 2020* by Freedom House (2020). Analysts award a country 0 (smallest degree of freedom) to 4 (largest degree of freedom) points for 10 political rights indicators and 15 civil liberties indicators. The index is the sum of these scores. It is widely used in the economics and political science literature as a measure for democracy (Barro, 1999; Frey, Chen and Presidente, 2020; Spilimbergo, 2009; Stepan and Robertson, 2003). For robustness, we also use indices by the Center for Systemic Peace (2018) and the Economist Intelligence Unit (2021). As shown in Table 1, these democracy indices capture our intuitive notion of democratic countries. According to the indices, the most democratic countries are Australia, Finland, and Norway while the least democratic countries are Bahrain, Congo, and Eritrea.

Country characteristics. To control for country characteristics and weight countries, we collect country-level data for GDP, population, absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. We source data from the United Nations, the World Bank and the International Diabetes Federation.

IVs. To identify the causal effect of democracy, we use five of the most widely-used IVs for political institutions, as listed in the introduction and further discussed below. For each IV, we obtain and extend data from the original authors.

Policy responses. To assess how democracy influences policy responses, we use panel data for 160 countries from the Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al., 2021). OxCGRT's Containment Health Index summarizes the severity and scope of government measures by rating responses across various

aspects of civilian life. The last three rows in Table 1 show that the Bahamas implement the strictest containment policies at the beginning of the pandemic, while countries such as Algeria are the most lenient. Moreover, the Solomon Islands are the speediest in their response, while Thailand is the slowest.

III   Democracy is Associated with Worse Outcomes

Before we explore democracy's causal effect, we first see how democratic and authoritarian countries fare during the pandemic. Figure 1 shows that higher levels of democracy are associated with bigger GDP loss in 2020 and more deaths from Covid-19.

To quantify their magnitude and statistical significance, we run the following OLS regressions of each outcome against Freedom House's democracy index:

$$Y_i = \mu + \alpha Democracy_i + X_i' \gamma + \varepsilon_i \tag{1}$$

where Y_i is the outcome variable for country i (GDP growth rates or Covid-19-related deaths per million in 2020), μ is the intercept, $Democracy_i$ is the democracy index (normalized to have standard deviation one), X_i' is a vector of other country-level covariates, and ε_i is a residual. The coefficient of interest is α, which quantifies the association between democracy and the outcome. We weight countries by GDP in the baseline specification. Results are similar with weighting by population and with no weighting.

The OLS estimates in Table 2's Panel B show that democracy is significantly associated with worse outcomes. In column 5, for example, a standard deviation increase in the democracy measure corresponds to a 2.3 (s.e. = 0.6) percentage-point decrease in GDP in 2020 and an increase of 264.0 (s.e. = 65.3) in Covid-19-related deaths per million.

The addition of controls does not change the results. It is plausible that factors such as climate, population density, population aging, and the prevalence of diabetes affect these outcomes. To control for these factors, we add absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence as covariates. The resulting estimates in Panel C's column 6 differ from the univariate regressions in column 5 only by around 15%. The estimates are -2.0 (s.e. = 0.4) for GDP growth rates in 2020 and 333.8 (s.e. = 66.6) for Covid-19-related deaths per million. We obtain similar estimates across different samples with and without controls.

IV Causal Effects of Democracy in 2020

A IVs for Political Regimes

We cannot interpret the above relationship as causal, however. There are many omitted determinants of outcomes that also correlate with democracies. To identify the causal effect of democracy, we adopt five IV strategies. To be valid, the IVs must correlate with political regimes today (relevance) and correlate with Covid-19 outcomes solely through political regimes (exclusion restriction). Our choice of instruments considers several centuries of world history as follows.

European settler mortality IV. European settler mortality is the mortality rate (annualized deaths per thousand mean strength) of soldiers, bishops, and sailors stationed in the colonies between the seventeenth and nineteenth centuries. Acemoglu, Johnson and Robinson (2001) compile mortality data from earliest-available systematic records. Historians document that Europeans used mortality rates to decide where to settle (Curtin, 1989). In colonies with inhospitable germs, Europeans did not want to settle and instead established extractive institutions. These extractive institutions' primary purpose was to transfer the colony's resources to the colonizer and did not provide checks and balances against government expropriation. In colonies with hospitable disease environments, Europeans settled and established inclusive institutions. Such institutions emphasized the protection of individual liberties and encouraged political participation. The effect of these colonial institutions persists to the present, as shown by their original study.

Acemoglu, Johnson and Robinson (2001) use this IV to show that inclusive institutions, which encompass the social, economic, legal, and political organizations of society, promote economic growth. Consistent with the above hypothesis by Acemoglu, Johnson and Robinson (2001), Figure 2a and Appendix Table A2 confirm that countries with higher European settler mortality have substantially lower levels of democracy today. This fact motivates us to use European settler mortality as an IV to estimate the causal effect of democracy.

Fraction speaking English or European, and the Frankel-Romer trade share as IVs. The fraction speaking English or European is the fraction of a country's population speaking English or a major Western European language (French, German, Portuguese, and Spanish) as a mother tongue in 1992. The Frankel-Romer trade share is the predicted trade share of each country's economy, based on the gravity model of international trade.[3] As Hall and Jones (1999) argue, a major feature of world history is the spread of Western European influence. This influence created an institutional and cultural background conducive to Western democracy. The language and trade variables are proxies for such Western influence. Hall and Jones (1999) use these IVs to show that social infrastructure positively affects productivity.[4]

Indeed, the fraction of the population speaking a major European language positively correlates with Freedom

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[3]Frankel and Romer (1999) first estimate a bilateral trade equation using the gravity model. Then, they aggregate the fitted values to estimate the trade share. The gravity model only considers population size and geographic characteristics such as country size and distance from other countries.

[4]The original specification in their paper also uses absolute latitude as an IV. We do not use the latitude IV because it is likely to correlate with Covid-19 outcomes directly.

House's democracy index, as reported in Figure 2b and Appendix Table A2. Intuitively, the Frankel-Romer trade share measures how conducive the country's geography is to international trade. How open a country is to international trade correlates with social and political institutions. The first-stage effect of the Frankel-Romer trade share is less significant (Appendix Table A2), but we include it to avoid cherry-picking IVs and be as consistent with the original study as possible.

Legal origin IVs. These IVs are dummy variables that are turned on if the country's legal origin is English, French, or German[5]. Many countries derived their legal systems from colonization by one of these European powers. Such legal origin determined the general legal infrastructure and influenced how the law protects civil liberties and political rights. By having separate dummies for legal origin, we allow them to have varying effects on political institutions today. With these IVs, LaPorta, Shleifer and Vishny (1998) show that British common-law brings about the strongest, and French civil-law the weakest, legal protections for investors, and stronger legal protections for investors promote financial development. The legal origin IVs turn out to be significant determinants of democracy in our setting, as shown in Appendix Table A2.

The availability of crops and minerals as IVs. Bananas, coffee, maize, millet, rice, rubber, sugarcane, and wheat are dummy variables that take the value 1 if a country produced the particular commodity in 1990. We code copper and silver as 1 if a country mined the mineral in 1990. According to Sokoloff and Engerman (2000), certain commodities induced economies of scale and incentivized the use of slave labor, which led to extractive institutions. Meanwhile, other commodities encouraged production by middle-class family farmers, which induced inclusive institutions. Thus, the dummies for the ability to grow crops or mine minerals reflect historical agricultural endowments, which in turn reflect historical conditions for political regimes. Based on this IV, Easterly and Levine (2003) show that geographic endowments affect development only through social and political institutions and that these institutions encourage economic growth.[6]

Past population density IV. Population density in the 1500s is the number of inhabitants per square kilometer in the 16th century. The intuition behind this IV is that population density at the beginning of the colonial age determined colonial institutions' inclusiveness (Acemoglu, Johnson and Robinson, 2002). Sparse populations at the beginning of European expansion in the 16th century induced Europeans to settle and develop Western-style institutions, while larger populations made extractive institutions more profitable. The effect of these colonial institutions persists to the present. Acemoglu, Johnson and Robinson (2002) use this IV to show that institutions have a positive effect on persistent economic growth.[7]

We are aware that none of these IVs is perfect. Each IV is likely to be threatened by its own mix of measurement errors, omitted variables, and exclusion violations. Our strategy is to use these five different IVs with the expectation that they work as robustness checks with each other.

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[5]LaPorta, Shleifer and Vishny (1998) also use a dummy variable for Scandinavian legal origin as an IV. We do not use it because it has little explanatory power (only applies to four countries in our sample), but adding it as an IV produces similar results. Results are available upon request.

[6]Since Easterly and Levine's dataset only contains data for 71 countries, we extend their data as explained in Appendix B.

[7]They also use a measure for urbanization in the 1500s as an IV. We find that using this IV produces similar estimates to the estimates using population density in the 1500s as an IV. The results are available upon request.

B IV Estimation

This section presents our main results. With the above IVs, we estimate democracy's impact by the following 2SLS regressions:

$$Y_i = \mu + \alpha Democracy_i + X_i' \gamma + \varepsilon_i \tag{1}$$

$$Democracy_i = \zeta + Z_i' \beta + X_i' \delta + \upsilon_i \tag{2}$$

The second-stage equation (1) is the same as Section III's OLS regression. The coefficient α represents the effect of the democracy measure $Democracy_i$ on Y_i, the outcome variable (GDP growth in 2020 or Covid-19-related deaths per million), conditional on a vector of country characteristics X_i' as controls. Given that $Democracy_i$ is far from randomly assigned, we instrument for $Democracy_i$ by each vector of IVs, Z', in the first-stage equation (2).

Does democracy cause worse economic and public health outcomes in 2020? Reduced-form figures using European settler mortality suggest so. Figures 2c and 2d show that higher European settler mortality causes lower levels of democracy, which cause higher GDP growth rates in 2020 and fewer deaths from Covid-19.

Table 2 reports the 2SLS estimates of the effect of democracy, using each of the five IV strategies. They all indicate significant adverse effects of democracy. Columns 1 and 2 show our estimates using log European settler mortality as an IV. The first-stage regression in Appendix Table A2 column 1 shows that higher log European settler mortality results in lower levels of democracy today, with a coefficient of -0.6 (s.e. = 0.2) and an F-statistic of 10.1. The corresponding 2SLS regression estimates in Panel A's column 1 show that a standard deviation increase in the democracy measure causes a 3.1 (s.e. = 0.7) percentage-point decrease in GDP in 2020 and 440.5 (s.e. = 87.6) more Covid-19-related deaths per million. Once we account for this effect, countries in Europe, North America, or South America do not have significantly worse Covid-19 outcomes (Table A3). In column 2, we control for climate, population density, population aging, and diabetes prevalence. The magnitudes of the coefficients change little. The estimates are -2.6 (s.e. = 0.7) percentage points for GDP growth rates and 494.0 (s.e. = 120.0) for Covid-19-related deaths per million.

To check whether the above results are sensitive to the choice of IVs, columns 3 and 4 use as IVs the fraction speaking English or European and the log Frankel-Romer trade share. We continue to find a negative effect of democracy. The corresponding 2SLS estimates in column 3 are -2.7 (s.e. = 0.7) percentage points for GDP in 2020 and 416.9 (s.e. = 127.8) for Covid-19-related deaths per million. Even with controls, the estimates stay almost the same.

The overall pattern remains the same for the legal origin IVs in columns 5 and 6. Appendix Table A2's column 5 shows that British legal origin positively correlates with the democracy index, with an F-statistic of 6.8. The corresponding 2SLS estimates are -3.5 (s.e. = 1.4) for GDP growth rates, and 550.4 (s.e. = 335.6) for Covid-19-related deaths per million. The regression with controls in column 6 produces similar results.

Columns 7 and 8 use dummies for the ability to grow certain crops and mine minerals as IVs. The results are

similar to those in the previous columns. The first-stage regression has an F-statistic of 8.8. The corresponding coefficients in column 7 are -2.5 (s.e. = 0.7) for GDP growth rates in 2020, and 297.4 (s.e. = 90.0) for Covid-19-related deaths per million. Controlling for baseline covariates in column 8 results in similar estimates with smaller standard errors.

Finally, we use population density in the 1500s as an IV in columns 9 and 10. The estimates are consistent with our baseline results. The first-stage relationship's F-statistic in column 9 shows that log population density in the 1500s alone is a weaker IV for democracy. Yet, the F-statistic increases to 5.3 after we control for other control covariates. The corresponding 2SLS estimates are -2.1 (s.e. = 0.7) for GDP growth rates in 2020 and 486.4 (s.e. = 137.9) for Covid-19-related deaths per million.

In general, the 2SLS estimates in Panel A are larger in magnitude than the OLS estimates in Panel B. This suggests that there is omitted variable bias in our OLS estimates. One potential omitted variable is the quality of public health systems. It is likely to be positively correlated with democracy, negatively correlated with Covid-19 deaths, and positively correlated with GDP growth rates in 2020. Another potential explanation is measurement error. In reality, the democratic institutions that matter for performance in the pandemic are complex, and no single measure can capture democracy levels precisely enough. Such measurement error may create attenuation bias in our OLS estimates.

V Discussion

A Alternative Specifications

Our analysis may be sensitive to modeling choices such as how to measure democracy and weight countries. Extreme nations like the US and China may also be driving our results. Below we check whether these concerns threaten our findings.

Alternative democracy indices. We adopt alternative democracy indices by the Center for Systemic Peace (2018) and the Economist Intelligence Unit (2021). We present the resulting 2SLS estimates in Appendix Table A4. Using alternative indices does not change our baseline results.

Alternative weighting. Our 2SLS results so far weight countries by GDP. We believe that GDP weighting is reasonable especially when the outcome is the GDP growth rate. A possible alternative is to weight countries by population or to not weight countries. We compare our 2SLS results with these different weighting methods in Appendix Table A5. The qualitative pattern is the same among the three ways to weight countries.

Exclusion of the US and China from the sample. To check if the US and China drive our results, we show our results without the two countries in Appendix Table A6. We continue to find that democracy significantly causes worse shocks to GDP and higher Covid-19 mortality.

Overall, these additional results support the view that democracy plays an important, negative role in economic growth and public health during 2020.

B Mechanisms Behind Democracy's Effect

Does having a stronger democracy cause worse economic and public health outcomes during the Covid pandemic? Media and policy discussions point to the speed, coverage, and severity of containment policies as potential proximate mechanisms. Indeed, Paul Krugman blames "*catastrophically slow and inadequate*" responses by the US government for its failure.[8] We explore whether this differential in policy responses explain democracy's negative effect we find. Our findings suggest that a key channel for the negative impact of democracy is weaker and narrower containment policies at the beginning of the outbreak. In contrast, the speed of containment policies appears to be less important.

To measure the severity of policy responses, we use the Containment Health Index at the 10th confirmed case of Covid-19.[9] To quantify how widely initial responses cover aspects of civilian life, we look at the percentage of 13 domains in which the government introduced significant containment measures at the 10th confirmed case in the pandemic. The domains are schools, workplaces, public events, gatherings, public transport, stay-at-home requirements, domestic travel, international travel, public information campaigns, testing, contact tracing, facial coverings, and vaccinations. To assess the speed of policy responses, we consider the number of days between the 10th confirmed case and the introduction of any containment policy.[10] We determine the introduction date of any containment policy by looking at the date when the Containment Health Index becomes positive.[11]

For each policy response mechanism M (severity, coverage, or speed of containment response), we estimate the following 2SLS equations:

$$M_i = \eta + \rho Democracy_i + X_i'\phi + \omega_i \tag{3}$$

$$\text{First Stage: } Democracy_i = \zeta + Z_i'\beta + X_i'\delta + \upsilon_i. \tag{4}$$

This approach is similar to Acemoglu et al. (2003)'s, which evaluates channels behind democracy' effects using similar 2SLS.

Table 3 summarizes the results from this analysis.[12] Panel A shows that democracy causes less severe responses at the 10th confirmed case of Covid-19. All estimates with controls show that a standard deviation increase in the democracy index causes the Containment Health Index to decrease by 0.4 to 0.5 standard deviations (see columns 2, 4, 6, 8, and 10). This effect of a standard deviation change in the democracy index is equivalent to around 25% of the mean containment health index at the 10th confirmed case, suggesting that democracies cause significantly less severe containment policies at the beginning of the outbreak.

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[8]Krugman, Paul. 2020. "3 Rules for the Trump Pandemic." *New York Times.* March 19. https://www.nytimes.com/2020/03/19/opinion/trump-coronavirus.html

[9]We get similar results when we use the Containment Health Index at the 100th confirmed case or the mean Containment Health Index during 2020. Results are available upon request.

[10]We get similar results using the number of days between the 10th confirmed case and the introduction of containment policies in each of the 13 domains. We also look at the period between the 100th confirmed case and policy introduction in the mentioned domains, as well as the period between January 1st, 2020 and policy introduction. We continue to get similar results. The results are available upon request.

[11]All countries begin at zero. The index becomes positive when countries introduce any significant policy to contain Covid-19.

[12]We get similar results with alternative democracy indices, alternative weighting, and alternative sample definitions (excluding the US and China). Results are available upon request.

Democracy also narrows the coverage of containment policy, as documented in Panel B. For example, with log European settler mortality as an IV, we estimate that a standard deviation increase in the democracy index causes a decrease in the covered policy domains by 9.5 percentage points (s.e.= 2.7). All columns estimate that democracy causes narrower policy scopes in the pandemic's initial stage.

On the other hand, democracy does not appear to cause slower responses. In fact, in Panel C, 8 out of 10 columns predict that democracy causes *faster* responses. This leads to the bottom line that the severity and coverage of initial containment policies is a more important mechanism for the adverse effect of democracy than their speed.

In Appendix Table A7, we also use causal mediation analysis (Dippel, Ferrara and Heblich, 2020; Imai et al., 2011) to measure how much the three potential channels explain the democracy impact. The results support our point that the severity and coverage of containment policies explain a large portion of democracy's negative effect.

VI   Conclusion

Democracy dampens economic growth and causes more Covid-19-related deaths in 2020 through weaker and narrower containment policies. A likely reason for this result is that democracies tend to introduce weaker incentives and authority to enforce decisive, wide-ranging containment policies. Such containment policies are often unpopular, especially at the beginning of the pandemic when the scope of the crisis was still uncertain. This lack of popularity, or politicians' perception of it, may cause politicians in democracies to avoid such measures. Democracies also often lack the legal power to enforce lockdowns and other restrictive policies.

Our analysis leads to a variety of avenues for future work. First, it is important to update the analysis with better outcome data. The data we currently use for GDP growth rates in 2020 are estimates by the IMF. We will update our analysis once official GDP growth rates are released. Moreover, we recognize reporting policy may affect the reported number of Covid-19-caused deaths. One potential solution is to look at data on excess mortality rates, such as the World Mortality Dataset (Karlinsky and Kobak, 2021). But the dataset is still limited in coverage and currently only covers excess mortality rates for about 80 countries. More conceptually, we plan to measure democracy's effects on other key aspects of policy performance, such as economic inequality and citizen's happiness. Finally, we need to see if the negative impact of democracy will result in geopolitical movements away from democracy. We leave these challenging directions to future work.

The policy implication of our result is not straightforward. Needless to say, our analysis does not imply a general case against democracy, at least for two reasons. First, democracy per se has normative and procedural virtues, regardless of whether they result in good economic and health outcomes. Our analysis does not touch these normative and procedural values. More importantly, despite our finding on democracy's short-run, temporal impacts on outcomes during 2020, democracies may produce better outcomes in the long run. Our preferred interpretation of our findings is that there may be room for improvement in particular aspects of democracy in

particular situations, so that governments can decisively and thoroughly take potentially unpopular, yet effective actions in the middle of an emergency like a pandemic.

Table 1: Descriptive Statistics

	Variable	N	Mean	St. Dev.	Min	Median	Max
Outcomes	GDP Growth Rate in 2020	175	−5.7	7.1	−67 (Libya)	−5 (Afghanistan)	26 (Guyana)
	Covid-19-related Deaths Per Million	175	285	376	0 (Bhutan)	81 (Indonesia)	1,685 (Belgium)
Treatments	Democracy Index (Freedom House)	175	1.9	1.0	0.1 (Eritrea)	2.1 (Malawi)	3.3 (Finland)
	Democracy Index (Center for Systemic Peace)	158	0.7	1.0	−1.6 (Bahrain)	1.1 (Armenia)	1.6 (Australia)
	Democracy Index (Economist Intelligence Unit)	159	2.4	1.0	0.5 (Dem. Rep. Congo)	2.5 (Malawi)	4.4 (Norway)
Weightings & Controls	GDP (Current USD, Billions)	170	501.6	2,058.9	0.4 (Sao Tome)	46.3 (Jordan)	21,433.2 (USA)
	Population (Millions)	175	43.9	155.2	0.1 (Antigua)	9.9 (UAE)	1,439.3 (China)
	Absolute Latitude	175	25.5	17.1	0 (Dem. Rep. Congo)	22 (Botswana)	65 (Iceland)
	Mean Temperature	175	19.2	8.3	−6.0 (Canada)	22.9 (Tanzania)	28.9 (Mali)
	Mean Precipitation	175	97.4	69.0	2.5 (Egypt)	82.3 (Gambia)	298.4 (Micronesia)
	Population Density	175	207.8	677.9	2.1 (Mongolia)	82.6 (Macedonia)	8,357.6 (Singapore)
	Median Age	175	30.2	9.1	15.2 (Niger)	29.6 (Lebanon)	48.4 (Japan)
	Diabetes Prevalence	175	7.7	4.0	1.0 (Benin)	6.6 (Austria)	22.1 (Sudan)
IVs	Log European Settler Mortality	86	4.6	1.3	0.9 (UK)	4.5 (Bahamas)	8.0 (Mali)
	Fraction Speaking English	143	0.1	0.3	0.0 (Algeria)	0.0 (Algeria)	1.0 (Barbados)
	Fraction Speaking European	143	0.2	0.4	0.0 (Angola)	0.0 (Angola)	1.0 (Dominica)
	Log Frankel-Romer Trade Share	143	3.0	0.8	0.8 (China)	3.0 (Iraq)	5.6 (Luxembourg)
	British Legal Origin	172	0.3	0.5	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Antigua)
	French Legal Origin	172	0.5	0.5	0.0 (Antigua)	1.0 (Afghanistan)	1.0 (Afghanistan)
	German Legal Origin	172	0.1	0.3	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Austria)
	Bananas	152	0.7	0.5	0.0 (Afghanistan)	1.0 (Angola)	1.0 (Angola)
	Coffee	152	0.5	0.5	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Angola)
	Copper	161	0.3	0.5	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Albania)
	Maize	152	0.9	0.3	0.0 (Bahrain)	1.0 (Afghanistan)	1.0 (Afghanistan)
	Millet	152	0.5	0.5	0.0 (Albania)	0.0 (Albania)	1.0 (Afghanistan)
	Rice	152	0.7	0.5	0.0 (Antigua)	1.0 (Afghanistan)	1.0 (Afghanistan)
	Rubber	152	0.2	0.4	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Bangladesh)
	Silver	158	0.3	0.5	0.0 (Afghanistan)	0.0 (Afghanistan)	1.0 (Algeria)
	Sugarcane	152	0.6	0.5	0.0 (Albania)	1.0 (Afghanistan)	1.0 (Afghanistan)
	Wheat	152	0.6	0.5	0.0 (Antigua)	1.0 (Afghanistan)	1.0 (Afghanistan)
	Log Population Density in 1500s	159	1.0	1.6	−3.8 (Canada)	1.0 (Mexico)	5.6 (Japan)
Policy Responses	Containment Health Index at 10th Covid-19 Case	160	1.8	1.0	0.0 (Algeria)	1.7 (New Zealand)	3.9 (Bahamas)
	Coverage of Containment Measures at 10th Covid-19 Case	160	48.9	23.4	0.0 (Algeria)	46.2 (Azerbaijan)	92.3 (Bahamas)
	Days between 10th Covid-19 Case and Any Containment Measure	160	−42.5	32.1	−270 (Solomon Islands)	−40 (Azerbaijan)	34 (Thailand)

Notes: Parentheses contain country names corresponding to the minimum, median and maximum values of each variable. When we observe multiple countries corresponding to the same minimum, median or maximum, we choose the first country in alphabetical order. When we do not find a country that corresponds exactly to the median, we choose the country with the closest value. All democracy indices are normalized to have standard deviation one. Variable definitions and data sources can be found in Appendix Table A1.

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Figure 1: Correlation Between Democracy and Outcomes

(a) GDP Growth Rate in 2020
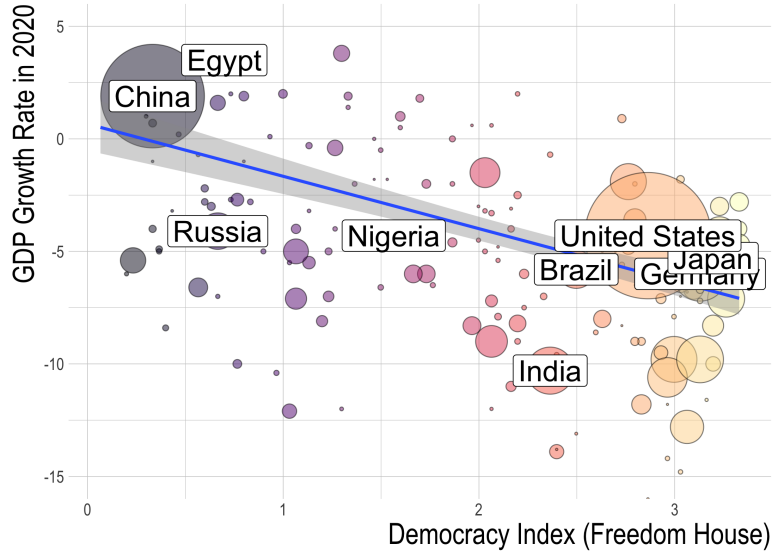
(b) Covid-19-related Deaths Per Million
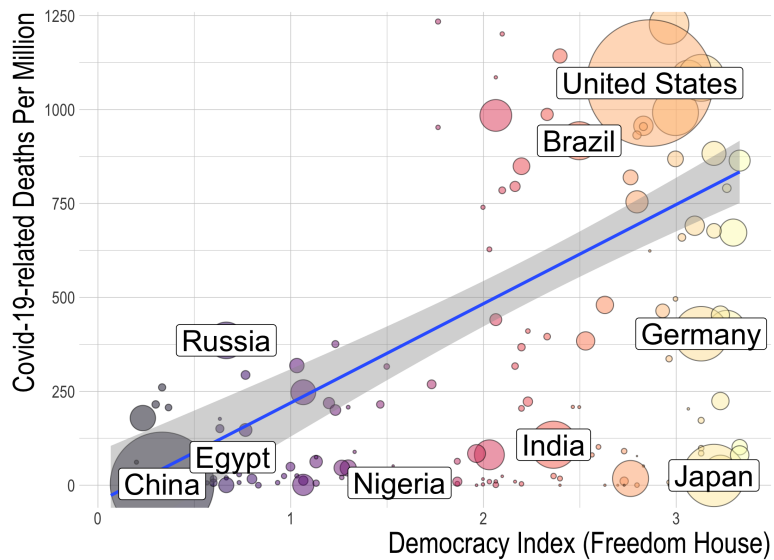
Notes: Figure (a) shows the relationship between democracy and GDP growth rates in 2020. Figure (b) shows the relationship between democracy and Covid-19-related deaths per million. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. The size of each observation point is proportional to the country's GDP. The colors depend on the level of the democracy index (warmer colors for democracy and darker colors for autocracies). The line is the fitted line from a univariate OLS regression of Covid-19 outcomes against the democracy index that weights observations by GDP. The shaded area corresponds to the 95% confidence interval.

Figure 2: Causal Effects of Democracy
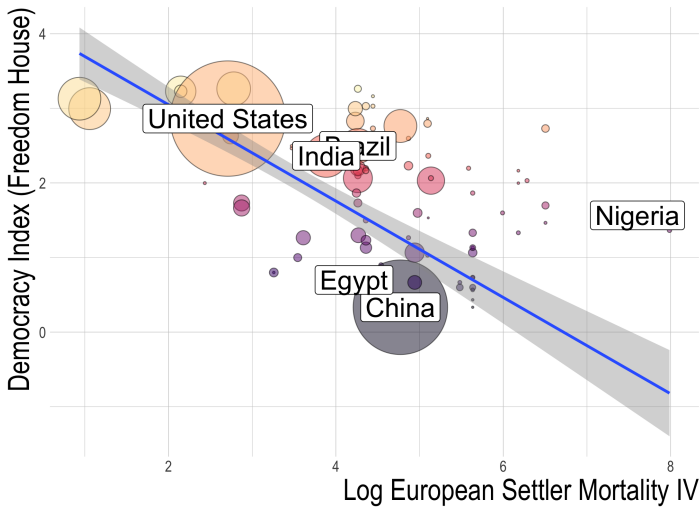
(a) First-stage: Log European Settler Mortality IV
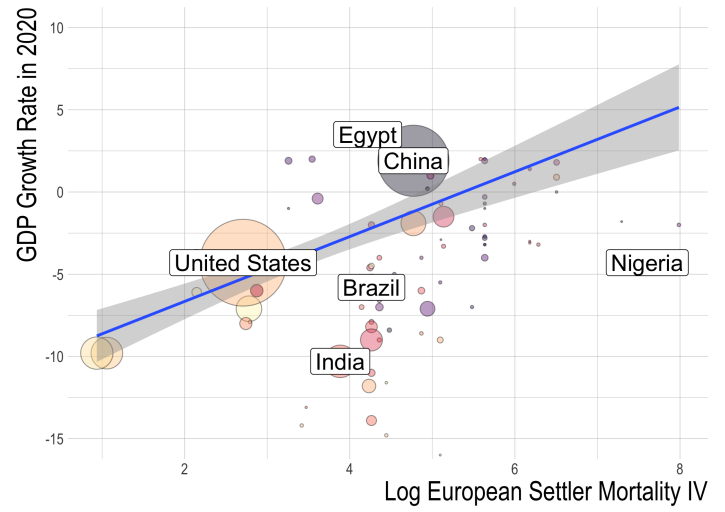
(c) Reduced form: GDP Growth Rate in 2020
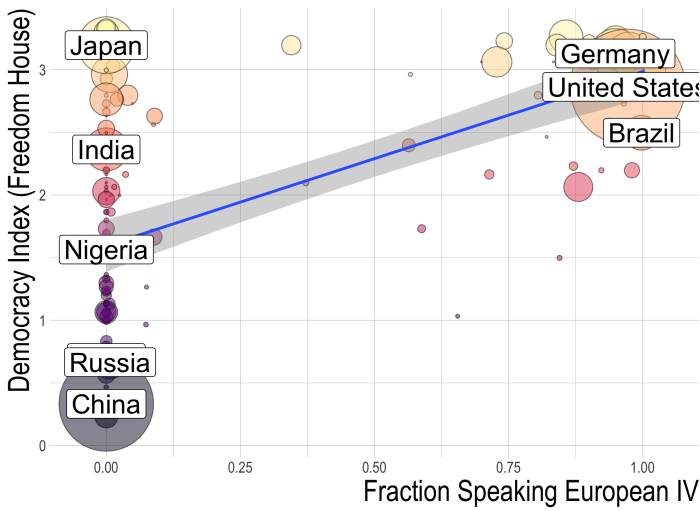
(b) First-stage: Fraction Speaking European IV
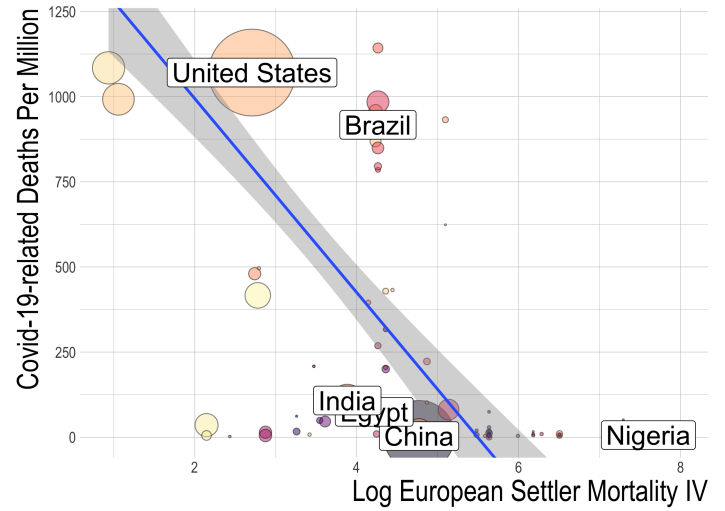
(d) Reduced form: Covid-19-related Deaths Per Million

Notes: Panels (a) and (b) show the first-stage relationship between democracy and two univariate IVs: the log European settler mortality IV and the fraction speaking European IV. Panels (c) and (d) show the reduced-form relationship between the log European settler mortality IV and Covid-19 outcomes: GDP growth rates in 2020 and Covid-19-related deaths per million. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. The size of each circle (country) is proportional to its GDP. The colors depend on the level of the democracy index. The line is the OLS regression fitted line without controls and weights countries by GDP. The shaded area corresponds to the 95% confidence interval.

Table 2: 2SLS Regression Estimates of Democracy's Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Two-Stage Least Squares										
				Dependent Variable is GDP Growth Rate in 2020						
Democracy Index	-3.1***	-2.6***	-2.7***	-2.1***	-3.5*	-2.6***	-2.5***	-2.4***	-0.2	-2.1**
	(0.7)	(0.7)	(0.7)	(0.6)	(1.4)	(0.6)	(0.7)	(0.4)	(3.2)	(0.7)
				Dependent Variable is Covid-19-related Deaths Per Million						
Democracy Index	440.5***	494.0***	416.9**	519.7***	550.4	483.9***	297.4***	389.1***	1035.2	486.4***
	(87.6)	(120.0)	(127.8)	(105.9)	(335.6)	(94.9)	(90.0)	(70.1)	(1051.3)	(137.9)
IVs	settler mortality		language & trade		legal origins		crops & minerals		pop. density	
Number of IVs	1	1	3	3	3	3	10	10	1	1
F-statistics (First-Stage)	10.1	4.3	4.7	8.8	6.8	12.6	8.8	10.3	0.7	5.3
Panel B: Ordinary Least Squares										
				Dependent Variable is GDP Growth Rate in 2020						
Democracy Index	-2.9***	-2.4***	-2.4***	-2.1***	-2.3***	-2.0***	-2.3***	-2.0***	-2.4***	-2.0***
	(0.5)	(0.4)	(0.6)	(0.4)	(0.6)	(0.4)	(0.6)	(0.4)	(0.7)	(0.4)
				Dependent Variable is Covid-19-related Deaths Per Million						
Democracy Index	347.0***	341.2***	264.0***	337.0***	264.0***	333.8***	264.6***	334.6***	277.9***	325.2***
	(61.8)	(56.3)	(65.7)	(67.5)	(65.3)	(66.6)	(65.6)	(67.2)	(67.6)	(59.6)
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
N	85	85	140	140	168	168	149	149	155	155

*p<0.1; **p<0.05; ***p<0.01

Notes: This table reports the 2SLS regression estimates of democracy's effect on Covid-19 outcomes, using five different IV strategies. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. Panel A reports the 2SLS estimates of the effect of democracy on GDP growth rates in 2020 and Covid-19-related deaths per million. The corresponding first-stage coefficients are in Appendix Table A2. Panel B reports the coefficients from OLS regressions of GDP growth rates in 2020 and Covid-19-related deaths per million against the democracy index. Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. Robust standard errors are in parentheses.

Table 3: 2SLS Regressions on Potential Channels Behind Democracy's Effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Severity	Dependent Variable is Containment Health Index at 10th Covid-19 Case									
Democracy Index	-0.4***	-0.4***	-0.4***	-0.4***	-0.5**	-0.5***	-0.4***	-0.5***	-0.9	-0.4***
	(0.08)	(0.09)	(0.07)	(0.06)	(0.2)	(0.07)	(0.06)	(0.04)	(0.5)	(0.07)
Panel B: Coverage	Dependent Variable is Coverage of Containment Measures at 10th Covid-19 Case									
Democracy Index	-9.5***	-8.6***	-9.5***	-11.5***	-12.7*	-12.6***	-9.8***	-11.1***	-25.9	-12.0***
	(2.7)	(2.3)	(1.9)	(1.4)	(5.0)	(1.7)	(1.7)	(0.9)	(19.2)	(1.4)
Panel C: Speed	Dependent Variable is Days Between 10th Covid-19 Case and Any Containment Measure									
Democracy Index	0.7	-6.6**	0.03	-1.4	-10.8	-4.8*	-0.7	-6.3***	-20.0	-6.2*
	(4.1)	(2.4)	(3.3)	(2.2)	(8.1)	(2.4)	(2.9)	(1.7)	(24.8)	(3.1)
IVs	settler mortality		language & trade		legal origins		crops & minerals		pop. density	
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
N	84	84	133	133	155	155	138	138	146	146

*p<0.1; **p<0.05; ***p<0.01

Notes: This table reports the 2SLS regression estimates of democracy's effect on potential channels behind democracy's negative impact, using five different IV strategies. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. Panel A reports the 2SLS estimates of democracy's effect on the containment health index at the 10th confirmed case of Covid-19. The containment health index by the Oxford COVID-19 Government Response Tracker (OxCGRT) measures the strictness of containment policy. It is normalized to have standard deviation one. Panel B reports the 2SLS estimates of democracy's effect on the coverage of containment measures at the 10th confirmed case of Covid-19. The coverage of containment measures at the 10th confirmed Covid-19 case is the percentage across 13 domains where the government introduces any containment response. The domains are schools, workplaces, public events, gatherings, public transport, stay-at-home requirements, domestic travel, international travel, public information campaigns, testing, contact tracing, facial coverings, and vaccinations. Panel C reports the 2SLS estimates of democracy's effect on the number of days between the 10th confirmed case of Covid-19 and the introduction of any containment measure. We calculate the number of days between the 10th confirmed Covid-19 case and the introduction of any containment measure by subtracting the date when the 10th Covid-19 case is confirmed from the date when the containment health index becomes positive (all countries begin at zero). Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. For IVs, columns 1 and 2 use log European settler mortality, columns 3 and 4 use the fraction speaking English, the fraction speaking European, and the Frankel-Romer trade share, columns 5 and 6 use British legal origin, French legal origin, and German legal origin, columns 7 and 8 use the ability to grow crops and mine minerals (bananas, coffee, copper, maize, millet, rice, rubber, silver, sugarcane, and wheat), and columns 9 and 10 use log population density in the 1500s. For all regressions, we weight observations by GDP. Robust standard errors are in parentheses.

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A   Additional Tables

Table A1: Data Sources and Description

	Variable	Data Source	Short Description
Outcomes	GDP Growth Rate in 2020	International Monetary Fund (2020)	Annual percentage change in real GDP between 2019 and 2020.
	Covid-19-related Deaths Per Million	Center for Systems Science and Engineering at Johns Hopkins University (2021)	Total number of deaths per million attributed to Covid-19 between 2020/01/22 (earliest available in dataset) and 2020/12/31.
	Covid-19 Cases Per Million	Center for Systems Science and Engineering at Johns Hopkins University (2021)	Total confirmed cases of Covid-19 per million between 2020/01/22 (earliest available in dataset) and 2020/12/31.
Treatments	Democracy Index (Freedom House)	Freedom House (2020)	Index measuring the degree of democratic freedom by taking the sum of the political rights (0 to 40) and civil liberties (0 to 60) scales. Ranges from 0 (least free) to 100 (most free).
	Democracy Index (Center for Systemic Peace)	Center for Systemic Peace (2018)	Index measuring the level of democracy by subtracting the autocracy score (0 (least autocratic) to 10 (most autocratic)) from the democracy score (0 (least democratic) to 10 (most democratic)). Ranges from -10 (strongly autocratic) to +10 (strongly democratic).
	Democracy Index (Economist Intelligence Unit)	Economist Intelligence Unit (2021)	Index measuring the state of democracy. Ranges from 0 (least democratic) to 100 (most democratic).
Weightings & Controls	GDP (Current USD, Billions)	The World Bank Group (2020b)	Gross domestic product at purchasing power parity in current U.S. billion dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates.
	Population (Millions)	United Nations Department of Economic and Social Affairs, Population Division (2019)	Total population in 2020 in millions.
	Absolute Latitude	Google Dataset Publishing Language (2021)	Absolute value of the latitude of the centroid of each country (i.e., a measure of distance from the equator).
	Mean Temperature	The World Bank Group (2020a)	The average of average monthly temperature from 1991-2016 in degrees Celcius.
	Mean Precipitation	The World Bank Group (2020a)	The average of average monthly precipitation from 1991-2016 in millimeters.
	Population Density	United Nations Department of Economic and Social Affairs, Population Division (2019)	The number of people divided by land area, measured in square kilometers.
	Median Age	United Nations Department of Economic and Social Affairs, Population Division (2019)	UN projections of the median age of the population in 2020.
	Diabetes Prevalence	International Diabetes Federation (2019)	Percentage of population with diabetes aged 20 to 79 in 2017.
IVs	Log European Settler Mortality	Acemoglu, Johnson and Robinson (2001).	The log of annualized deaths per thousand mean strength of European settlers between the seventeenth and nineteenth century.
	Fraction Speaking English	Hall and Jones (1999).	The fraction of the population speaking English as a mother tongue in 1992.
	Fraction Speaking European	Hall and Jones (1999).	The fraction of the population speaking English, French, German, Portuguese or Spanish as a mother tongue in 1992.
	Log Frankel-Romer Trade Share	Hall and Jones (1999)	The log of Frankel-Romer predicted share based on Frankel and Romer (1999).
	British Legal Origin, French Legal Origin, German Legal Origin	LaPorta, de Silanes and Shleifer (2008)	Dummy variables coded 1 if the country's legal origin is British, French, or German, respectively, and 0 otherwise.
	Bananas, Coffee, Maize, Millet, Rice, Sugarcane, Rubber, Wheat	Easterly and Levine (2003); Food and Agriculture Association of the United Nations (2020)	Dummy variables coded 1 if the country produced any of the particular commodity in 1990, and 0 otherwise.
	Copper, Silver	Easterly and Levine (2003); World Bureau of Metal Statistics (2019a,b)	Dummy variables coded 1 if the country mined any of the particular commodity in 1990, and 0 otherwise.
	Log Population Density in 1500s	Acemoglu and Johnson (2005).	The log of the population density in the 1500s measured as the number of inhabitants per square kilometer.
Policy Responses	Containment Health Index at 10th Covid-19 Case	Blavatnik School of Government at the University of Oxford (2020)	The containment health index measures the strictness of government responses by taking the average of 13 sub-scores that considers the severity and geographic scope of measures in its domain. The sub-scores first records severity on an ordinal scale (for example, the school sub-index is on a 0 (no measure) to 4 (require closing) scale) and subtracts 0.5 if it is targeted. Then, the scale is normalized. The domains are schools, workplaces, public events, gatherings, public transport, stay-at-home requirements, domestic travel, international travel, public information campaigns, testing, contact tracing, facial coverings, and vaccinations. We use the index at the date when the 10th case of Covid-19 is confirmed.
	Coverage of Containment Measures at 10th Covid-19 Case	Blavatnik School of Government at the University of Oxford (2020)	The percentage of the 13 domains in which the data records any policy introduction at the date when the 10th case of Covid-19 is confirmed.
	Days between 10th Covid-19 Case and Any Containment Measure	Blavatnik School of Government at the University of Oxford (2020)	The number of days between the date when the 10th Covid-19 case is confirmed and the date when the containment health index becomes positive.

Table A2: First-Stage Regression Estimates of IVs' Effects on Democracy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Dependent Variable is Democracy Index					
Log European Settler Mortality	-0.6**	-0.8**								
	(0.2)	(0.3)								
Fraction Speaking English			0.8*	0.9*						
			(0.3)	(0.4)						
Fraction Speaking European			1.0**	0.8***						
			(0.3)	(0.2)						
Log Frankel-Romer Trade Share			0.6**	0.2						
			(0.2)	(0.2)						
British Legal Origin					-0.5**	0.5				
					(0.2)	(0.4)				
French Legal Origin					-0.9***	-0.3				
					(0.2)	(0.4)				
German Legal Origin					-1.6	-1.0*				
					(0.8)	(0.4)				
Bananas							-0.1	0.1		
							(0.4)	(0.4)		
Coffee							-0.3	0.6*		
							(0.2)	(0.3)		
Copper							-0.5	0.1		
							(0.4)	(0.3)		
Maize							0.7*	1.2*		
							(0.3)	(0.4)		
Millet							-0.5	-0.3		
							(0.4)	(0.2)		
Rice							-0.9	-0.9*		
							(0.5)	(0.4)		
Rubber							-1.8***	-1.8***		
							(0.5)	(0.3)		
Silver							1.0**	0.6		
							(0.4)	(0.3)		
Sugarcane							1.2*	0.7		
							(0.5)	(0.4)		
Wheat							-0.3	0.9		
							(0.4)	(0.5)		
Log Population Density in 1500s									-0.08	-0.2***
									(0.1)	(0.07)
F-statistics	10.1	4.3	4.7	8.8	6.8	12.6	8.8	10.3	0.7	5.3
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
N	85	85	140	140	168	168	149	149	155	155

*p<0.1; **p<0.05; ***p<0.01

Notes: This table reports the first-stage regression estimates of the effect of the five different sets of IVs on democracy. It corresponds to the 2SLS estimates in Table 2. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. Robust standard errors are in parentheses.

Table A3: GDP and Covid-19 Deaths without Democracy's Effect

	(1) Africa	(2) Asia	(3) Europe	(4) N. America	(5) Oceania	(6) S. America
Panel A: GDP Growth Rate in 2020						
Observed Mean	-4.3	-4.8	-6.1	-8.9	-7.1	-7.1
Democracy's Estimated Effect	-4.4	-4.0	-8.0	-7.8	-8.4	-7.3
After Subtracting Democracy's Effect	0.2	-0.7	1.9	-1.1	1.3	0.2
Panel B: Total Covid-19-related Deaths Per Million						
Observed Mean	50.7	151.9	663.5	312.1	5.5	594.8
Democracy's Estimated Effect	631.3	572.6	1140.9	1107.7	1192.8	1032.6
After Subtracting Democracy's Effect	-580.6	-420.6	-477.4	-795.6	-1187.3	-437.8
N	53	44	45	20	8	12

Notes: This table reports each continent's mean GDP growth rates in 2020 and total Covid-19-related deaths per million before and after subtracting the estimated effect of democracy in Table 2's column 1.

Table A4: 2SLS Regression with Alternative Democracy Indices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent variable:									
	Panel A: GDP Growth Rates in 2020									
Democracy Index (Freedom House)	-3.1***	-2.7***	-2.7***	-2.1***	-3.5*	-2.6***	-2.5***	-2.4***	-0.2	-2.1**
	(0.7)	(0.7)	(0.7)	(0.6)	(1.4)	(0.6)	(0.7)	(0.4)	(3.2)	(0.7)
Democracy Index (Center for Systemic Peace)	-3.7***	-2.8***	-3.4***	-2.7***	-4.3**	-3.4***	-2.8***	-2.6***	-0.2	-2.4**
	(1.0)	(0.7)	(0.7)	(0.6)	(1.6)	(0.8)	(0.6)	(0.4)	(3.5)	(0.7)
Democracy Index (Economist Intelligence Unit)	-3.1***	-2.8***	-2.7***	-2.0***	-3.0*	-2.5***	-2.6***	-2.5***	-0.2	-2.1**
	(0.7)	(0.7)	(0.7)	(0.6)	(1.2)	(0.5)	(0.8)	(0.5)	(2.7)	(0.7)
	Dependent variable:									
	Panel B: Covid-19-related Deaths Per Million									
Democracy Index (Freedom House)	440.4***	493.1***	417.6**	519.4***	552.6	484.2***	297.4***	389.4***	1033.0	486.1***
	(87.5)	(119.8)	(128.0)	(105.8)	(337.4)	(95.1)	(90.2)	(70.2)	(1047.9)	(137.9)
Democracy Index (Center for Systemic Peace)	539.9**	525.7***	494.5*	644.3***	588.9	603.0***	312.6**	388.8***	1153.7	543.5**
	(169.3)	(144.2)	(203.4)	(178.6)	(390.4)	(159.0)	(108.5)	(92.2)	(1215.1)	(178.2)
Democracy Index (Economist Intelligence Unit)	442.0***	515.6***	415.5***	519.0***	492.2	460.0***	306.9***	415.7***	875.1	470.5***
	(90.4)	(132.6)	(121.8)	(107.0)	(257.4)	(95.5)	(86.3)	(71.1)	(689.6)	(134.4)
IVs	settler mortality		language & trade		legal origins		crops & minerals		pop. density	
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
N	81	81	128	128	152	152	134	134	145	145

*p<0.1; **p<0.05; ***p<0.01

Notes: This table compares the results of 2SLS regressions on Covid-19 outcomes using democracy indices by Freedom House, the Center for Systemic Peace, and the Economist Intelligence Unit. We normalize all indices to have standard deviation one. Panel A shows the 2SLS estimates of democracy's effect on GDP growth rates in 2020. Panel B shows the 2SLS estimates of democracy's effect on Covid-19 related deaths per million. Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. For IVs, columns 1 and 2 use log European settler mortality, columns 3 and 4 use the fraction speaking English, the fraction speaking European, and the Frankel-Romer trade share, columns 5 and 6 use British legal origin, French legal origin, and German legal origin, columns 7 and 8 use the ability to grow crops and mine minerals (bananas, coffee, copper, maize, millet, silver, sugarcane, rice, rubber, and wheat), and columns 9 and 10 use log population density in the 1500s. For all regressions, we weight observations by GDP. The estimates in this table are slightly different from those in Table 2 because some observations with missing data for the other democracy indices are removed for comparability across indices. Robust standard errors are in parentheses.

Table A5: 2SLS Regression with Alternative Weightings

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Dependent variable:					
					Panel A: GDP Growth Rates in 2020					
Democracy Index	-3.1***	-2.6***	-2.7***	-2.1***	-3.5*	-2.6***	-2.5***	-2.4***	-0.2	-2.1**
	(0.7)	(0.7)	(0.7)	(0.6)	(1.4)	(0.6)	(0.7)	(0.4)	(3.2)	(0.7)
Weighting	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Democracy Index	-4.4***	-4.1***	-2.4	-2.6***	-5.5***	-4.5**	-3.4*	-4.4***	-0.5	-3.2
	(1.3)	(1.0)	(1.6)	(0.8)	(1.5)	(1.5)	(1.4)	(1.2)	(7.0)	(1.7)
Weighting	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop
Democracy Index	-4.8**	-0.3	-3.4**	-2.5	1.3	0.7	-4.0***	-4.3**	-9.6	0.7
	(1.6)	(95.3)	(1.1)	(1.9)	(1.3)	(2.1)	(1.0)	(1.6)	(24.3)	(6.3)
Weighting	None	None	None	None	None	None	None	None	None	None
					Dependent variable:					
					Panel B: Covid-19-related Deaths Per Million					
Democracy Index	440.5***	494.0***	416.9**	519.7***	550.4	483.9***	297.4***	389.1***	1035.2	486.4***
	(87.6)	(120.0)	(127.8)	(105.9)	(335.6)	(94.9)	(90.0)	(70.1)	(1051.3)	(137.9)
Weighting	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP	GDP
Democracy Index	427.9**	393.3***	534.5*	536.1***	117.5	317.0***	451.3**	349.3***	1230.8	731.2*
	(148.0)	(71.6)	(209.9)	(96.3)	(115.8)	(89.1)	(159.6)	(77.5)	(1562.0)	(327.3)
Weighting	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop	Pop
Democracy Index	381.2***	6762.8	258.2***	215.6*	53.4	-260.6*	227.0***	-82.8	1567.7	-190.2
	(100.0)	(69773.6)	(64.9)	(106.7)	(90.4)	(122.4)	(55.1)	(101.9)	(3079.6)	(335.6)
Weighting	None	None	None	None	None	None	None	None	None	None
IVs	settler mortality		language & trade		legal origins		crops & minerals		pop. density	
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
N	85	85	140	140	168	168	149	149	155	155

*p<0.1; **p<0.05; ***p<0.01

Notes: This table shows the results of 2SLS regressions on Covid-19 outcomes with weighting of observations by GDP, weighting by population, and no weighting. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. Panel A shows the 2SLS estimates of democracy's effect on GDP growth rates in 2020. Panel B shows the 2SLS estimates of democracy's effect on Covid-19 related deaths per million. Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. For IVs, columns 1 and 2 use log European settler mortality, columns 3 and 4 use the fraction speaking English, the fraction speaking European, and the Frankel-Romer trade share, columns 5 and 6 use British legal origin, French legal origin, and German legal origin, columns 7 and 8 use the ability to grow crops and mine minerals (bananas, coffee, copper, maize, millet, silver, sugarcane, rice, rubber, and wheat), and columns 9 and 10 use log population density in the 1500s. Robust standard errors are in parentheses.

Table A6: 2SLS Regression excluding the US and China

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Dependent variable:					
					Panel A: GDP Growth Rates in 2020					
Democracy Index	-3.1***	-2.6***	-2.7***	-2.1***	-3.5*	-2.6***	-2.5***	-2.4***	-0.2	-2.1**
	(0.7)	(0.7)	(0.7)	(0.6)	(1.4)	(0.6)	(0.7)	(0.4)	(3.2)	(0.7)
Include US & China?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	85	85	140	140	168	168	149	149	155	155
Democracy Index	-4.2**	-7.6	-2.6	-3.8	3.0*	3.2	-1.4	-2.0	-0.9	-1.8
	(1.3)	(5.1)	(1.7)	(2.2)	(1.5)	(3.7)	(0.9)	(1.3)	(2.2)	(7.9)
Include US & China?	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
N	83	83	138	138	166	166	147	147	153	153
					Dependent variable:					
					Panel B: Covid-19-related Deaths Per Million					
Democracy Index	440.5***	494.0***	416.9**	519.7***	550.4	483.9***	297.4***	389.1***	1035.2	486.4***
	(87.6)	(120.0)	(127.8)	(105.9)	(335.6)	(94.9)	(90.0)	(70.1)	(1051.3)	(137.9)
Include US & China?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	85	85	140	140	168	168	149	149	155	155
Democracy Index	555.3**	912.5	600.8	651.0	-409.2	-1162.7	157.7	-60.4	-14.6	1266.6
	(191.3)	(540.9)	(338.3)	(390.3)	(222.9)	(802.0)	(144.8)	(182.5)	(434.4)	(2340.5)
Include US & China?	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
N	83	83	138	138	166	166	147	147	153	153
IVs	settler mortality		language & trade		legal origins		crops & minerals		pop. density	
Controls	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓

*p<0.1; **p<0.05; ***p<0.01

Notes: This table compares the results of 2SLS regressions on Covid-19 outcomes under two sample definitions (include the US and China vs. exclude the US and China). The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. Panel A shows the 2SLS estimates of democracy's effect on GDP growth rates in 2020. Panel B shows the 2SLS estimates of democracy's effect on Covid-19 related deaths per million. Columns 1, 3, 5, 7, and 9 have no controls, while columns 2, 4, 6, 8, and 10 have the following controls: absolute latitude, mean temperature, mean precipitation, population density, median age, and diabetes prevalence. For IVs, columns 1 and 2 use log European settler mortality, columns 3 and 4 use the fraction speaking English, the fraction speaking European, and the Frankel-Romer trade share, columns 5 and 6 use British legal origin, French legal origin, and German legal origin, columns 7 and 8 use the ability to grow crops and mine minerals (bananas, coffee, copper, maize, millet, silver, sugarcane, rice, rubber, and wheat), and columns 9 and 10 use log population density in the 1500s. For all regressions, we weight observations by GDP. Robust standard errors are in parentheses.

Table A7: Causal Mediation Analysis of Potential Channels

	(1) Severity	(2) Coverage	(3) Speed
Panel A: GDP Growth Rates in 2020			
Total Effect of Democracy	-5.0**	-5.0**	-5.0**
	(1.7)	(1.7)	(1.7)
Direct Effect of Democracy	-1.1	-1.2	-2.0
	(1.4)	(1.3)	(1.3)
Indirect Effect Through Mediator	-3.9	-3.8	-3.0
	(3.0)	(2.7)	(3.9)
Panel B: Covid-19-related Deaths Per Million			
Total Effect of Democracy	382.4***	382.4***	382.4***
	(101.2)	(101.2)	(101.2)
Direct Effect of Democracy	118.5*	130.2**	180.6*
	(54.5)	(47.3)	(77.2)
Indirect Effect Through Mediator	263.9	252.3	201.8
	(137.3)	(130.8)	(232.8)
N	85	85	85

*p<0.1; **p<0.05; ***p<0.01

Notes: This table reports the results of causal mediation analyses of democracy's effect on Covid-19 outcomes with three potential mediators: severity, coverage, and speed of policy responses. All regressions use log European settler mortality as an IV. The Democracy Index (Freedom House) is the sum of the political rights and civil liberties scales from *Freedom in the World 2020* by Freedom House. It is normalized to have standard deviation one. We proxy for severity by Oxford COVID-19 Government Response Tracker's Containment Health Index at the 10th confirmed Covid-19 case, for coverage by the number of domains the policy covers at the 10th confirmed Covid-19 case, and for speed by the number of days between the 10th case of Covid-19 and the date when the government introduces any containment measure. Panel A reports the breakdown of democracy's effect on GDP growth rates in 2020 into its direct effect and its indirect effect through the mediator. Panel B reports the same breakdown for democracy's effect on Covid-19-related deaths per million. All regressions are unweighted. The estimates in this table are slightly different from those in Table A5 because the sample definitions are different (In Table A5, we exclude Venezuela because we do not have its GDP data. In Table A7, we exclude Guinea-Bissau because we do not have data for its containment health index.) Robust standard errors are in parentheses.

B   Extending Easterly and Levine (2003)'s Dataset

Since Easterly and Levine (2003)'s dataset only covers 71 countries, we replicate their data gathering process to extend their dataset to 152 countries. For the dummy variables for crop production in 1990, we first use the values from the replication file. Then, we replace the missing values using data from the Food and Agriculture Association of the United Nations (2020) on crop production in 1990. This data is equivalent to the data that the authors describe in their work. Analogously, for the dummy variables for minerals production in 1990, we first use the replication file's values and then replace the missing values using production data for 1990 from World Bureau of Metal Statistics (2019*a*) and World Bureau of Metal Statistics (2019*b*).

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