The impact of polarisation on Covid-19 outcomes, 2020

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This study examines the impact of polarisation on Covid-19's outcomes. Using a sample of 130 countries in 2020, the authors find that polarisation worsens the pandemic situation, as evidenced by the higher number of Covid-19-related confirmed cases and deaths. These results are consistent across several robustness tests. The authors further find that the adverse impact of polarisation is mainly evident among countries with high income inequality and a democratic regime. In addition, the study document the role of government quality in mitigating the adverse impact of polarisation on Covid-19 outcomes. Overall, these results have important implications for policymakers responsible for containing the pandemic.

Introduction

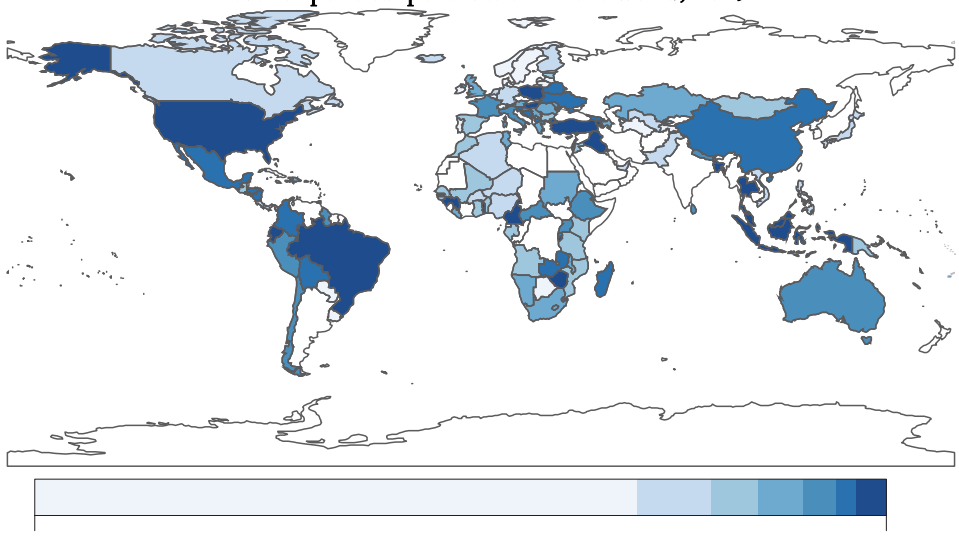
The Covid-19 virus has caused an unprecedented catastrophe for global public health and well-being (Nyikos et al. 2021). The novelty and severity of the pandemic make it a pressing social dilemma that requires concerted efforts from both the public and private sectors in every country to resolve. Anecdotal evidence suggests that the key to containing the pandemic lies in timely and radical governmental policies (Islam et al. 2020, Yang et al. 2021) and, more importantly, a population-wide adoption of these policies (Hsiang et al. 2020, Bargain–Aminjonov 2020). However, although it has been more than two years since the pandemic began, many countries are still suffering from its effects, and our understanding of the factors that affect Covid-19 outcomes is still in its infancy. In this paper, we contribute to the nascent literature and provide novel evidence showing how polarisation could hinder public cooperation and collective adoption of government containment policies, leading to an adverse impact on Covid-19's outcomes.

In principle, polarisation reflects the degree of divergence of attitudes toward political matters in society (McCoy et al. 2018, Sümeghy 2022). Polarisation not only shapes people's opinions but also affects how they lead their lives, causing societies to be divided into 'mutually distrustful "Us vs. Them" camps' (McCoy–Somer 2019). According to Iyengar et al. (2019), a polarised society is characterised by people segregating themselves into groups that confront each other over political parties and ideology. Thus, citizens of a polarised society are more likely to opt for opposite courses of action, and they may act to show loyalty toward their group rather than to serve the benefits of the wider community (Cohen 2003). Similarly, Rieger–Wang (2022) illustrate how political orientation leads people to believe in conspiracies, further lowering their trust in government and their adoption of containment policies. Consequently, this behaviour could widen the divergence in public compliance and their reaction toward government policies (Bruine de Bruin et al. 2020). Taken together, we postulate that polarisation could result in fragmented compliance by a nation's citizens toward the government's Covid-19 containment policies, thereby hindering a country's ability to contain the pandemic.

To test our prediction, we employ the '*Political Polarization*' score retrieved from the V-Dem database as a proxy for the level of polarisation in each country. The '*Political Polarization*' score measures how society is polarised into antagonistic and political camps (Coppedge et al. 2020, Pemstein et al. 2018). A higher score implies a higher level of political polarisation in society. In terms of Covid-19 outcomes, we followed the previous literature and measured Covid-19's position in each country using the number of new Covid-19-related confirmed cases and deaths (Toshkov et al. 2021, Gelfand et al. 2021). Figure 1 depicts the global distribution of polarisation levels, while Figure 2 illustrates the distribution of confirmed Covid-19 cases across countries.

Figure 1

Level of political polarisation in the world, 2019

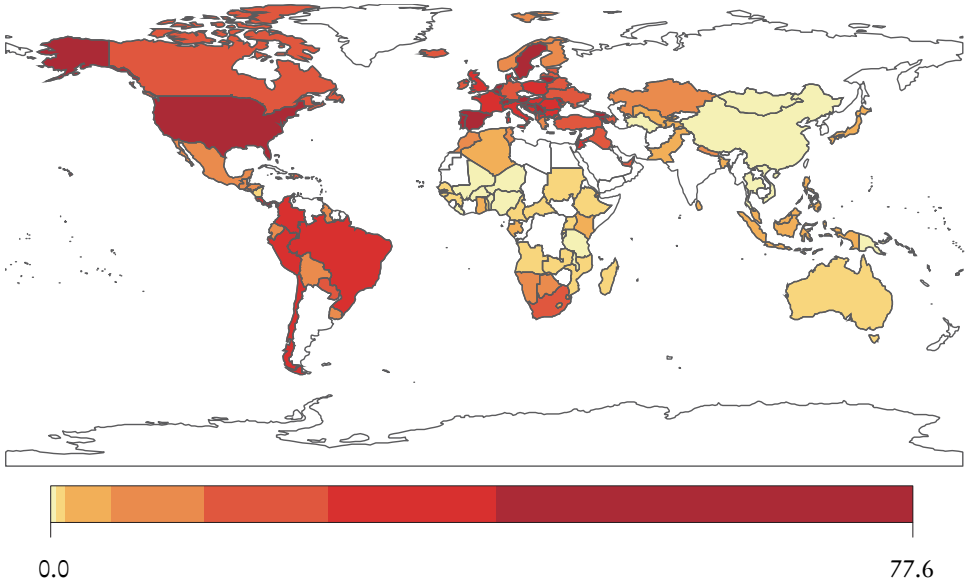


Least polarized Most polarized

Source: Compiled by the author from V-Dem Data, 2019.

Figure 2

Level of confirmed Covid-19 cases in the world, 2020



Source: Compiled by author from the Covid-19 Data Repository, 2020.

Using a sample of 130 countries in 2020, we find strong evidence that polarisation worsened the outcomes of the Covid-19 pandemic. Specifically, we find that countries with a higher level of polarisation are associated with a higher number of confirmed Covid-19 cases and deaths. These findings hold across several robustness tests when we adopt alternative measures of Covid-19 outcomes (i.e. infection and fatality rates), polarisation, and other model specifications. The adverse impact of polarisation is mainly observable for the sub-sample of countries with higher income inequality, as well as the sub-sample of more democratic countries. We also find that government quality could alleviate the adverse impact of polarisation on Covid-19's outcomes.

This study makes an important contribution to the literature. Specifically, we contribute directly to the literature by examining the determinants of Covid-19's outcomes. Prior studies have examined how several factors, including demographics (Toya–Skidmore 2021, Stojkoski et al. 2020), urban population (Whiting 2020), culture (Gelfand et al. 2021), and government response (Yang et al. 2021) influence the pandemic situation. We add to this strand of literature by documenting the impact of polarisation on the outcomes of the pandemic. Extant literature generally points to the negative effect of polarisation on various political and economic facets, such as corruption (Melki–Pickering 2020), economic development (Frye 2002), economic growth (Azzimonti 2011), income inequality (McCarty et al. 2006), institutional quality (Hacker 2004), and volatility in macroeconomic indicators (Azzimonti–Talbert 2014). We corroborate this literature with evidence of the adverse impact of polarisation on public health during the onset of the pandemic. The cross-country context also allows us to reveal the specific circumstances under which the impact of polarisation is more pronounced or nuanced. In this study, we demonstrate that the adverse impact of polarisation is mainly observable for the sub-sample of countries with higher income inequality and a democratic regime.

The remainder of this paper is organised as follows: describtion the data and research methodology, presentation and discussion baseline findings, additional analysis, and conclusion.

Model Specification and data

Model specification

To examine the impact of polarisation on Covid-19's outcomes, we employed the following model:

$$Covid_i = \alpha_0 + \alpha_1 Polarization_i + \alpha_2 X_i + \varepsilon_i \quad (1)$$

where $Covid_i$ reflects the level of Covid-19 outcomes in country *i* in 2020. Following prior studies, we measured the pandemic outcomes based on the number of confirmed cases and deaths (Toshkov et al. 2021, Gelfand et al. 2021). We log-transformed the number of cases and deaths such that they were normally distributed (Gelfand et al. 2021).

To proxy for the polarisation ($Polarization$), we use the '*Political Polarization*' score from the Varieties of Democracy (V-Dem) database. This indicator addresses how political differences affect social relationships beyond political discussions; specifically, societies are highly polarised if supporters of opposing political camps are reluctant to engage in friendly interactions, for example, in family functions, civic associations, their free time activities, and the workplace (Coppedge et al. 2020, Pemstein et al. 2018). Given this definition, a higher '*Political Polarization*' score implies a higher degree of polarisation.

We also incorporate (1) several control variables (X_i) into the baseline model (1), which have been suggested by prior research to influence the pandemic's outcomes. Specifically, we first consider gross domestic product (GDP) per capita (*GDPpc*) as a proxy for the country's economic capacity (Karabulut et al. 2021). We further include the share of health expenditures to GDP (*Health Expenditure*) because earlier investment in healthcare may enhance a country's capacity to withstand the impact of a pandemic (Delis et al. 2021, Karabulut et al. 2021). We also consider population density (*Population Density*), as diseases tend to spread more easily in densely populated regions, boosting the number of infected cases and deaths (Gelfand et al. 2021, Aritenang 2022). *Population Density* is measured as the total population per square kilometre. We further consider the role of income inequality in affecting the outcomes of the pandemic. Income discrepancies are likely to influence health inequities across socioeconomic groups, as the poor are more likely to suffer pre-existing health conditions, greater exposure to the virus, and poorer access to health services, which will eventually result in more Covid-19 cases and deaths (Elgar et al. 2020). We proxy for income equality by using the GINI index (*GINI*). Finally, we control for the level of democracy in a country. Democratic countries may be more globalised, making them more vulnerable to Covid-19 virus (Karabulut et al. 2021, Zimmermann et al. 2020). We measure democracy as a dummy variable (*Democracy*), which equals 1 if the political regime is classified as a democracy, and 0 otherwise.

It is worth noting that we lagged all right-hand side variables for one year to mitigate the potential reverse causality issue. ε_i is the robust standard error clustered at the country level to account for serial correlations in the dataset.

Data and sample overview

In this study, we collected data from several sources. First, we retrieved Covid-19's data in 2020 from 'The Covid-19 Data Repository' database provided by the 'Center for Systems Science and Engineering' at Johns Hopkins University. In this database, the numbers of newly infected Covid-19 cases and deaths in countries were updated daily using data confirmed by regional and local health departments. This dataset is particularly effective at capturing the timing of the Covid-19 spread in countries or regions (Dong et al. 2020), and has, therefore, been commonly used in previous studies regarding the pandemic (Chen et al. 2021, Karabulut et al. 2021, Zimmermann et al. 2020).

Second, for polarisation measurement, we collected data from the V-Dem Project, which provides a dataset assessing countries' democracy on multiple dimensions. The dataset was developed by the V-Dem Institute at the Department of Political Science, University of Gothenburg, and consists of multiple indicators that reflect various aspects of political regimes and state institutions (V-Dem Project 2014). Given the multidimensional nature of the data, several prior studies have employed V-Dem data to capture certain facets of democracy (Karabulut et al. 2021, Delis et al. 2021, Annaka 2021).

Third, we collected data for most of the control variables, including *GDPpc*, *Health Expenditure*, and *Population Density,* from the World Development Indicators database provided by the World Bank. Data on GINI levels across countries were retrieved from the World Bank (PovcalNet) inequality data. Finally, we retrieved information on political regimes (e.g. democracy) from the V-Dem database. A summary of the data and their sources are presented in Table A1 of the Appendix. We retained countries with all available data for our variables in the model. To this end, our sample consists of 130 observations from 130 countries for 2020.

Empirical results

Descriptive statistics and correlation matrix

Table A1 of the Appendix shows the detailed descriptive statistics for all variables. Overall, the mean value of *Cases* (measured as the natural logarithm of the number of confirmed Covid-19 positive cases) for our sample is 10.631, while the figure for *Deaths* (measured as the natural logarithm of the number of confirmed Covid deaths) is 6.580. The standard deviations of these two variables are approximately the same, with values of 2.591 and 2.701, respectively. On average, countries in our sample have a GDP per capita (in natural log) of 8.645 and spend approximately 6.67% of their GDP on healthcare. The mean *Population Density* (measured as the total number of people per square kilometre of land area) is 155.820, with noticeable variations among countries. On average, the *GINI* index is 38.082 (out of 100), indicating that most of the sampled countries experience an adequate level of income equality. The values of this index vary only slightly within our sample, with a standard deviation of 8.177. Finally, 60% of the countries in our sample are classified as having a democratic regime.

Table 1 shows the correlation matrix of variables included in the model. Overall, *Polarisation* is positively correlated with the number of infected Covid-19 cases and deaths. Regarding the other variables, all correlation coefficients are below 0.5. The highest correlation among the explanatory variables is –0.380 between *GDPpc* and *Polarisation*. We also test for multicollinearity using the variance inflation factor (VIF), and present the results in the last column of Table 1. Overall, the scores are well below 2, indicating that multicollinearity is not a significant issue affecting our analysis.

Table 1

Correlation matrix, 2020

Denomination	1	2	3	4	5	6	7	8	VIF
1 Cases	1.000								
2 Deaths	0.946	1.000							
3 Polarisation	0.086	0.118	1.000						1.19
4 GDPpc	0.153	0.167	–0.380	1.000					1.72
5 Health expenditure	0.031	0.138	–0.128	0.228	1.000				1.30
6 Population density	–0.082	–0.150*	0.017	0.246	–0.125	1.000			1.06
7 GINI	–0.138	–0.129	0.127	–0.372	–0.087	–0.182	1.000		1.26
8 Democracy	–0.247	–0.182	–0.263	0.319	0.321	0.034	–0.070	1.000	1.49

Note: This table reports the correlation coefficients of all the main variables used in our study, along with the result of the VIF test. Variable definitions are provided in Table A1 of the Appendix. * denote significant levels at 0.1%

Baseline results

Table 2 reports the baseline model (1) to examine the impact of polarisation on Covid-19's outcomes. Column 1 shows the result of the model when the number of confirmed Covid-19 cases (in natural log) is used as the dependent variable, while Column 2 provides the result of the model when the number of confirmed Covid-19 deaths (in natural log) is used as the dependent variable.

Table 2

The impact of political polarisation on Covid-19's outcomes, 2020

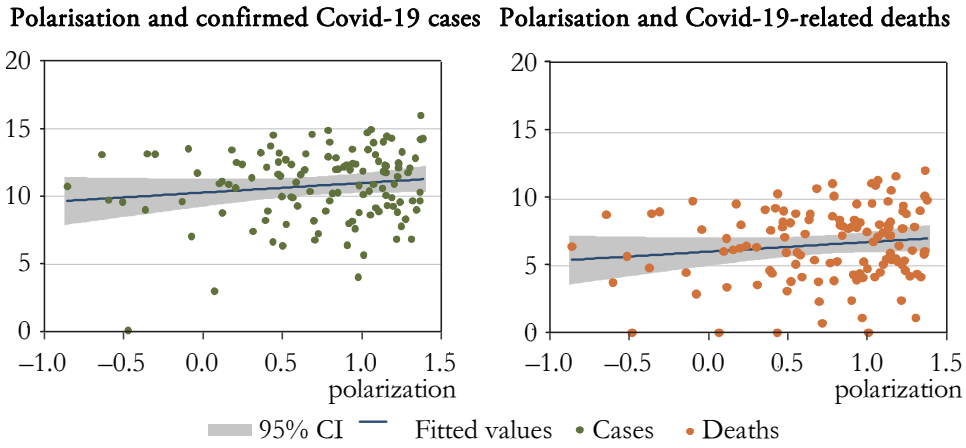
Denomination	Cases (1)	Deaths (2)
Polarisation	**1.057*** **	**1.125*** **
	(0.377)	**(0.350)**
GDPpc	0.869***	0.832***
	(0.176)	(0.181)
Health Expenditure	0.208*	0.247**
	(0.1069)	(0.111)
Population Density	–0.001	–0.001
	(0.001)	(0.001)
GINI	–0.006	0.002
	(0.025)	(0.027)
Democracy	–0.271	–0.186
	(0.645)	(0.566)
Constant	1.507	–2.754
	(2.240)	(2.286)
Observations	130	130
R-squared	0.260	0.264

Note: This table presents the result of the models to examine the impact of polarisation on Covid-19 outcomes. In Column 1, the dependent variable is *Cases*, measured as the natural logarithm of the number of confirmed Covid-19 positive cases in the country. In Column 2, the dependent variable is *Deaths*, which is the natural logarithm of the number of confirmed Covid-19 deaths in the country. In both the columns, *Polarisation* is an index measuring the level of political polarisation in the society, a higher *Polarisation* implies a more polarised society. Definitions of all other variables are provided in Table A1 of the Appendix. Robust standard errors are in parentheses. ***, **, and * denote significant levels at 0.01%, 0.5%, and 0.1% respectively.

The coefficients of *Polarisation* are positive and significant at the 1% level in both columns, indicating that polarisation is associated with a higher number of confirmed Covid-19 cases and deaths. The effect of polarisation is further depicted in Figure 3, which clearly illustrate that polarisation worsens pandemic outcomes. Our results support the prior postulation that citizens of a divided society could opt for varied attitudes and compliance levels toward the government's containment response, leading to a worse scenario during the pandemic (Bruine de Bruin et al. 2020).

Figure 3

Polarisation and Covid-19 outcomes, 2020



Turning to the impact of other control variables, countries with higher GDP per capita and expenditure on health care systems tend to have worse outcomes. This could be explained by the fact that wealthier countries with high perceived capacity may give governments false confidence their control over the pandemic resulting in a lack of timely actions to contain the pandemic (Toshkov et al. 2021).

Robustness tests

In this section, we conduct several sensitivity analyses to ensure the robustness of our results. The results are presented in Table 3.

In Columns 1 and 2 of Table 3, we employ an alternative measure of polarisation, namely the '*Polarization of Society*' score, provided by the V-Dem database. The '*Polarization of Society*' score captures the divergence in opinions in society toward major political issues (Coppedge et al. 2020, Pemstein et al. 2018), with a higher score indicating a lower level of polarisation. It is noted again that '*Polarization of Society*' is measured on the reverse scale compared to our baseline indicator ('*Political Polarization*'). This means that the significant and negative coefficients of *Polarisation* reported in Columns 1 and 2 confirm our previous finding that polarisation worsens the Covid-19 situation.

Table 3

Robustness tests, 2020

Denomination	Alternative measure of polarisation		Alternative measures of the Covid-19's outcomes		Add regional FE		Panel data (2020–2021)	
	Cases (1)	*Deaths* (2)	*Cases/Pop* (3)	*Deaths/Pop* (4)	*Cases* (5)	*Deaths* (6)	*Cases* (7)	*Deaths* (8)
Polarisation	**–0.738****	**–0.858*****	**5.707*****	**0.211*****	**1.021****	**1.143*****	**1.080****	**1.409****
	(0.168)	**(0.156)**	**(1.911)**	**(0.055)**	**(0.421)**	**(0.418)**	**(0.531)**	**(0.670)**
GDPpc	0.750***	0.704***	7.023***	0.132***	0.8640***	0.7934***	5.538***	5.127***
	(0.168)	(0.162)	(1.233)	(0.025)	(0.191)	(0.200)	(1.724)	(1.676)
Health expenditure	0.196**	0.232**	1.692***	0.031**	0.203*	0.256**	0.028*	0.017
	(0.097)	(0.099)	(0.626)	(0.015)	(0.111)	(0.117)	(0.016)	(0.017)
Population density	–0.000	–0.001	–0.0046	–0.000***	–0.001	–0.001	0.008	0.040
	(0.001)	(0.001)	(0.004)	(0.000)	(0.001)	(0.001)	(0.341)	(0.394)
GINI	–0.013	–0.007	–0.227	–0.001	0.007	0.007	0.045	0.028
	(0.024)	(0.025)	(0.160)	(0.004)	(0.032)	(0.034)	(0.294)	(0.279)
Democracy	–0.071	0.069	1.052	0.160**	–0.401	–0.211	1.116***	0.997***
	(0.6226)	(0.5241)	(3.096)	(0.080)	(0.699)	(0.625)	(0.274)	(0.333)
Constant	3.278	–0.836	–50.609***	–1.159***	–0.647	–4.644*	51.489**	45.790**
	(2.085)	(2.043)	(13.032)	(0.265)	(2.617)	(2.741)	(20.325)	(20.700)
Observations	130	130	130	130	130	130	248	248
R-squared	0.309	0.340	0.438	0.344	0.345	0.335	0.371	0.284

Note: This table presents the results of a series of tests to ensure the robustness of the baseline model. In Columns 1 and 2, we use the '*Polarisation of Society*' score, an alternative measure of polarisation. In Columns 3 and 4, we use the infection and fatality rates as alternative measures of Covid-19 outcomes. In Columns 5 and 6, we control for regional fixed effects. In Columns 7 and 8, we present the result using panel data (i.e. 2020-2021). Definitions of all other variables are provided in Table A1 of the Appendix. Robust standard errors are in parentheses. ***, **, and * denote significant levels at 1%, 5%, and 10% respectively.

Next, we use alternative measures of pandemic outcomes. We follow prior literature (i.e. Karabulut et al. 2021, Yang et al. 2021) and employ infection and fatality rates as our dependent variables in Equation (1) to account for the intensity dimension of the pandemic. The infection rate is defined as the number of confirmed Covid-19 cases per thousand people, while the fatality rate is calculated as the number of Covid-19 deaths per thousand people. As seen in Columns 3 and 4, the coefficients of *Polarisation* are positive and significant at the 1% level, which is consistent with our baseline finding on the adverse impact of polarisation on Covid-19 outcomes.

In Columns 5 and 6, we incorporate regional fixed effects into our model to account for regional-specific factors that might influence Covid-19 outcomes. The coefficients of *Polarisation* remain significant and positive, which provides robustness to our baseline results.

Finally, in Columns 7 and 8, we re-estimate the baseline model using a panel dataset comprising data for 2020 and 2021. Country and year fixed effects are also used. Overall, the results remain unchanged.

Additional analyses

Table A2 of the Appendix provides the list of countries used in our analysis. Panel A reports all the countries used. Panel B shows the two groups of countries by GINI levels, whereas Panel C illustrates the two groups of countries split based on democracy levels.

Sub-sample analysis with income inequality

In this section, we test whether the impact of polarisation on Covid-19 outcomes varies across different socioeconomic conditions. Specifically, we hypothesise that for countries with high income inequality, polarisation may further magnify the antagonism between citizens of different political parties as well as income classes. This division may widen citizens' attitudes and lower their collective adoption of government containment policies, leading to a worse Covid-19 scenario.

To test this conjecture, we divide our sample into two groups of countries given their level of income inequality; specifically, a country belongs to the low group if its GINI index is below the median value, while a country with a GINI index above the median value is classified into the high group. We re-estimate our baseline model with these two subsamples and present the findings in Table 4. Specifically, Columns 1 and 2 report the impact of polarisation on Covid-19 outcomes for countries with low levels of income inequality, while Columns 3 and 4 present the analysis for the high-group countries. We only observe significant and positive coefficients of polarisation in the last two columns. Overall, this result is congruent with our prior prediction, suggesting that the adverse impact of polarisation on Covid-19's outcomes is mainly driven by the sub-sample of countries with high levels of income inequality.

Table 4

Sub-sample analysis with income inequality, 2020

Denomination	Low inequality		High inequality	
	Cases (1)	*Deaths (2)*	*Cases (3)*	*Deaths (4)*
Polarisation	**0.283**	**0.382**	**2.329*** **	**2.377*** **
	(0.266)	**(0.320)**	**(0.829)**	**(0.588)**
GDPpc	0.470*	0.423	1.365***	1.384***
	(0.260)	(0.270)	(0.308)	(0.282)
Health expenditure	0.161	0.234	0.194	0.256*
	(0.143)	(0.168)	(0.155)	(0.135)
Population density	–0.000	–0.001	–0.000	–0.002
	(0.001)	(0.001)	(0.003)	(0.003)
GINI	–0.086	–0.040	0.110*	0.078
	(0.104)	(0.104)	(0.058)	(0.054)
Democracy	–0.558	–0.591	0.169	0.248
	(0.707)	(0.769)	(1.141)	(0.899)
Constant	8.883*	3.225	–9.133**	–12.011***
	(4.470)	(4.550)	(4.409)	(4.034)
Observations	68	68	62	62
R-squared	0.182	0.153	0.407	0.460

Note: This table presents the result of the models to examine the impact of polarisation on Covid-19 outcomes in countries having low inequality and countries having high inequality. In Columns 1 and 3, the dependent variable is *Cases*, measured as the natural logarithm of the number of confirmed Covid-19 positive cases in the country. In Columns 2 and 4, the dependent variable is *Deaths*, which is the natural logarithm of the number of confirmed Covid-19 deaths in the country. In all the columns, *Polarisation* is an index measuring the level of political polarisation, a higher *Polarisation* implies a more polarised society. Definitions of all other variables are provided in Table A1 of the Appendix. Robust standard errors are in parentheses. ***, **, and * denote significant levels at 0.01%, 0.5%, and 0.1% respectively.

Sub-sample analysis with a democratic regime

We also predict that the impact of polarisation on Covid-19 outcomes is more pronounced among countries under democracy. In a democratic society, press freedom plays an important role in informing people about a government's actions (Chen et al. 2021, Besley–Burgess 2002), which may result in a varied response from society toward government policies. In this context, polarisation may further exacerbate social perspectives and adherence to government policies, leading to worse Covid-19 outcomes. On the other hand, autocratic governments are more willing to implement stringent policies as well as to use authorisation to make these policies compulsory (Karabulut et al. 2021). Accordingly, polarisation could not have a significant impact on citizens' decisions toward these policies.

To test this hypothesis, based on the '*Regimes of the World*' variable sourced from the V-Dem database, we divided our sampled countries into democracy and autocracy

groups and re-estimated our baseline model.[1] Columns 1 and 2 of Table 5 present the analysis for countries under an autocratic regime, while Columns 3 and 4 report the results for the democratic regime group. As seen in Table 5, the coefficients for the democracy group are positive and significant, while those for autocratic countries are not. Overall, we observe the adverse impact of polarisation on Covid-19 outcome exclusively for the sub-sample of countries with a democratic regime.

Table 5

Sub-sample analysis with democratic regime, 2020

Denomination	Autocratic		Democracy	
	Cases (1)	*Deaths* (2)	*Cases* (3)	*Deaths* (4)
Polarisation	**1.912**	**1.354**	**0.993*** **	**1.175*** **
	(1.501)	**(1.006)**	**(0.309)**	**(0.386)**
GDPpc	0.400	0.436	1.002***	0.938***
	(0.387)	(0.363)	(0.237)	(0.254)
Health expenditure	0.068	0.065	0.319*	0.392**
	(0.129)	(0.120)	(0.161)	(0.171)
Population density	0.001	0.000	–0.006**	–0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
GINI	–0.111**	–0.090**	0.055*	0.060
	(0.045)	(0.040)	(0.032)	(0.037)
Constant	9.046**	4.452	–2.921	–7.094**
	(3.862)	(3.806)	(3.066)	(2.983)
Observations	52	52	78	78
R-squared	0.254	0.216	0.357	0.352

Note: This table presents the result of the models to examine the impact of polarisation on Covid-19 outcomes in autocratic countries and democracy countries. In Columns 1 and 3, the dependent variable is *Cases*, measured as the natural logarithm of the number of confirmed Covid-19 positive cases in the country. In Columns 2 and 4, the dependent variable is *Deaths*, which is the natural logarithm of the number of confirmed Covid-19 deaths in the country. In all the columns, *Polarisation* is an index measuring the level of polarisation of society, a higher *Polarisation* implies a more polarised society. Definitions of all other variables are provided in Table A1 of the Appendix. Robust standard errors are in parentheses. ***, **, and * denote significant levels at 0.01%, 0.5%, and 0.1% respectively.

The mediating role of government quality

Prior literature documents that the effectiveness of Covid-19 control relies heavily on the government's ability to implement timely and comprehensive measures (Hsiang et al. 2020, Islam et al. 2020). To re-examine this notion in the context of this study, we focus on the role of government quality in alleviating the impact of polarisation

[1] The '*Regimes of the World*' variable classifies political regimes into four groups, namely 'closed autocracy', 'electoral autocracy', 'electoral democracy', and 'liberal democracy'. We group the countries under the first two classifications (i.e. 'closed autocracy', 'electoral autocracy') as countries with autocracy regime while the last two classifications (i.e. 'electoral democracy', and 'liberal democracy') are used to identify democratic countries.

on Covid-19 outcomes. Specifically, we introduce a variable capturing the quality of the government (*Government Quality*) and its interaction term with *Polarisation* in Equation (1). We use two proxies for government quality. First, we use the government response index (*Government Response*) from the Oxford Covid-19 Government Response Tracker provided by the Blavatnik School of Government at the University of Oxford. This index ranges from 0 to 100, with higher scores indicating better handling of Covid-19. Second, we use Bureaucracy Quality (*Bureaucracy Quality*) from the International Country Risk Guide to measure the overall quality of government. This index ranges from 0 to 1, with higher values indicating a higher bureaucratic quality.

Table 6

The mediating role of government quality, 2020

Denomination	Government quality is measured as the government response index to the Covid-19 pandemic		Government quality is measured as the bureaucracy quality	
	Cases (1)	*Deaths* (2)	*Cases* (3)	*Deaths* (4)
Polarisation	4.316*	2.873*	1.8784*	2.3984**
	(2.293)	(1.4644	(0.741)	(0.8715
Government Quality	0.193***	0.159***	–0.279	–0.251
	(0.051)	(0.034)	(0.289)	(0.343)
Polarisation×Government Quality	**–0.077***	**–0.045**	**–0.372***	**–0.491****
	(0.046)	**(0.030)**	**(0.201)**	**(0.243)**
GDPpc	0.379*	0.366*	0.877***	0.798***
	(0.202)	(0.209)	(0.206)	(0.237)
Health expenditure	0.293***	0.334***	0.177*	0.258**
	(0.111)	(0.115)	(0.103)	(0.126)
Population density	–0.001	–0.001	0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.002)
GINI	–0.018	–0.008	0.010	0.013
	(0.023)	(0.024)	(0.022)	(0.027)
Democracy	–0.318	–0.272	–0.038	0.122
	(0.575)	(0.542)	(0.482)	(0.597)
Observations	124	124	97	97
R-squared	0.467	0.433	0.317	0.281

Note: This table presents the result of the models to examine the role of government quality in mediating the polarisation-Covid outcome nexus. In Columns 1 and 3, the dependent variable is *Cases*, measured as the natural logarithm of the number of confirmed Covid-19 positive cases in the country. In Columns 2 and 4, the dependent variable is *Deaths*, which is the natural logarithm of the number of confirmed Covid-19 deaths in the country. In both the columns, *Polarisation* is an index measuring the level of polarisation of society, a higher *Polarisation* implies a more polarised society. Definitions of all other variables are provided in Table A1 of the Appendix. Robust standard errors are in parentheses. ***, **, and * denote significant levels at 0.01%, 0.5%, and 0.1% respectively.

The results of the augmented Equation (1) are listed in Table 6. In Columns 1 and 2, government quality is measured using the government response index, while in Columns 3 and 4, government quality is measured using Bureaucracy Quality. As can be seen from the table, the coefficients of the interaction term *Polarisation*×*Government Quality* are generally negative and significant at the conventional level. These results indicate that, although polarisation is associated with a higher number of confirmed Covid-19 cases and deaths, government quality could alleviate the adverse impact of polarisation on Covid-19 outcomes.

Conclusion

This study examines the impact of polarisation on Covid-19 outcomes. By sampling a large number of countries (i.e. 130 countries), we show that the number of confirmed cases and deaths is higher among countries with a high level of polarisation. In addition, we find that the adverse impact of polarisation is mainly observable among countries with high income inequality and a democratic regime. We also document the role of government quality in mitigating the adverse impact of polarisation on Covid-19 outcomes. Overall, our findings highlight the importance of alleviating polarisation among societies to contain this unprecedented pandemic.

Appendix

Table A1

Variable definition and descriptive statistics, 2020

Variable	Definition	Source	Time period	Type	N	Mean
Cases	Natural logarithm of the number of confirmed Covid-19 positive cases in 2020	Johns Hopkins University	2020	Logarithmic	130	10.631
Deaths	Natural logarithm of the number of confirmed Covid deaths in 2020	Johns Hopkins University	2020	Logarithmic	130	6.580
Polarisation	An index measuring the polarisation of society into antagonistic, political camps; a higher index reflects a more polarised society	V-Dem	2019	Index	130	0.665
GDPpc	Natural logarithm of GDP per capita	World Bank, WDI	2019	Logarithmic	130	8.645
Health expenditure	Health expenditure as a percentage of GDP	World Bank, WDI	2019	Percentage	130	6.661
Population density	Total number of people per square kilometre of land area	World Bank, WDI	2019	Ratio	130	155.820
GINI	Deviation of the distribution of income among individuals/households from a perfectly equal distribution, ranging from 0–100	The World Bank (PovcalNet) inequality data	2019	Index	130	38.082
Democracy	Dummy variable, equals 1 if the political regime is classified as democracy, 0 otherwise	V-Dem	2019	Dummy	130	0.600

(Table continues on the next page.)

(Continued.)

Variable	Definition	Std.	p25	p50	p75
Cases	Natural logarithm of the number of confirmed Covid-19 positive cases in 2020	2.591	9.034	11.113	12.416
Deaths	Natural logarithm of the number of confirmed Covid deaths in 2020	2.701	4.654	6.944	8.479
Polarisation	An index measuring the polarisation of society into antagonistic, political camps; a higher index reflects a more polarised society	0.615	0.439	0.842	1.143
GDPpc	Natural logarithm of GDP per capita	1.435	7.526	8.616	9.693
Health expenditure	Health expenditure as a percentage of GDP	2.472	4.734	6.600	8.353
Population density	Total number of people per square kilometre of land area	254.857	30.823	80.565	154.946
GINI	Deviation of the distribution of income among individuals/households from a perfectly equal distribution, ranging from 0–100	8.177	32.740	35.845	43.056
Democracy	Dummy variable, equals 1 if the political regime is classified as democracy, 0 otherwise	0.491	0.000	1.000	1.000

Table A2

List of countries

Panel A: All countries							
Albania	Burundi	Eswatini	Iceland	Madagascar	Niger	Sierra Leone	Uganda
Algeria	Cameroon	Ethiopia	Indonesia	Malawi	Nigeria	Slovenia	Ukraine
Angola	Canada	Fiji	Iraq	Malaysia	North Macedonia	Solomon Islands	United Arab Emirates
Armenia	Central African	Finland	Ireland	Maldives	Norway	South Africa	United Kingdom
Australia	Chile	France	Israel	Mali	Pakistan	Spain	United States
Austria	China	Gabon	Italy	Malta	Panama	Sri Lanka	Uruguay
Azerbaijan	Colombia	Georgia	Jamaica	Mauritius	Papua New Guinea	Sudan	Uzbekistan
Bangladesh	Comoros	Germany	Japan	Mexico	Paraguay	Sweden	Vanuatu
Belarus	Costa Rica	Ghana	Jordan	Moldova	Peru	Switzerland	Vietnam
Belgium	Croatia	Greece	Kazakhstan	Mongolia	Philippines	Tajikistan	Zambia
Benin	Cyprus	Guatemala	Kenya	Monte-negro	Poland	Tanzania	Zimbabwe
Bolivia	Denmark	Guinea	Latvia	Morocco	Portugal	Thailand	
Bosnia & Herzego-vina	Djibouti	Guinea-Bissau	Lebanon	Mozam-bique	Romania	Togo	
Botswana	Domi-nican Republic	Guyana	Lesotho	Namibia	Rwanda	Trinidad & Tobago	
Brazil	Ecuador	Haiti	Liberia	Nepal	Senegal	Tunisia	
Bulgaria	El Salvador	Honduras	Lithuania	Netherlands	Serbia	Turkey	
Burkina Faso	Estonia	Hungary	Luxembourg	Nicaragua	Seychelles	Turkmenis-tan	

(Table continues on the next page.)

(Continued.)

Panel B: Groups of countries based on GINI levels							
Low-GINI countries				***High-GINI countries***			
Albania	Fiji	Liberia	Romania	Angola	Ecuador	Malawi	Solomon Islands
Algeria	Finland	Lithuania	Serbia	Benin	El Salvador	Malaysia	South Africa
Armenia	France	Luxem-bourg	Seychelles	Bolivia	Eswatini	Mauritius	Sri Lanka
Australia	Georgia	Maldives	Sierra Leone	Botswana	Gabon	Mexico	Tanzania
Austria	Germany	Mali	Slovenia	Brazil	Ghana	Monte-negro	Togo
Azerbaijan	Greece	Malta	Spain	Bulgaria	Guatemala	Morocco	Trinidad and Tobago
Bangla-desh	Guinea	Moldova	Sudan	Burundi	Guinea-Bissau	Mozam-bique	Turkey
Belarus	Hungary	Mongolia	Sweden	Cameroon	Guyana	Namibia	Turkmenistan
Belgium	Iceland	Nepal	Switzerland	Central African Republic	Haiti	Nicaragua	Uganda
Bosnia and Herzego-vina	Iraq	Netherlands	Tajikistan	Chile	Honduras	Panama	United States
Burkina Faso	Ireland	Niger	Thailand	China	Indonesia	Papua New Guinea	Uruguay
Canada	Italy	Nigeria	Tunisia	Colombia	Israel	Paraguay	Vanuatu
Croatia	Japan	North Macedonia	Ukraine	Comoros	Jamaica	Peru	Zambia
Cyprus	Jordan	Norway	United Arab Emirates	Costa Rica	Kenya	Philippines	Zimbabwe
Denmark	Kazakh-stan	Pakistan	United Kingdom	Djibouti	Lesotho	Rwanda	
Estonia	Latvia	Poland	Uzbekistan	Dominican Republic	Madagascar	Senegal	
Ethiopia	Lebanon	Portugal	Vietnam				

(Table continues on the next page.)

(Continued.)

Panel C: Groups of countries based on democracy levels							
Autocratic countries				***Democratic countries***			
Algeria	Djibouti	Lebanon	Sudan	Albania	Finland	Malawi	Indonesia
Angola	Eswatini	Madagascar	Tajikistan	Australia	France	Maldives	Senegal
Armenia	Ethiopia	Malaysia	Tanzania	Austria	Georgia	Malta	Seychelles
Azerbaijan	Fiji	Mali	Thailand	Belgium	Germany	Mauritius	Sierra Leone
Bangla-desh	Gabon	Montenegro	Togo	Bosnia and Herzego-vina	Ghana	Mexico	Slovenia
Belarus	Guinea	Morocco	Turkey	Botswana	Greece	Moldova	Solomon Islands
Benin	Haiti	Mozam-bique	Turkmen-istan	Brazil	Guatemala	Mongolia	South Africa
Bolivia	Honduras	Nicaragua	Uganda	Bulgaria	Guinea-Bissau	Namibia	Spain
Burundi	Hungary	Pakistan	United Arab Emirates	Burkina Faso	Guyana	Nepal	Sri Lanka
Cameroon	Iraq	Papua New Guinea	Uzbekistan	Canada	Iceland	Netherlands	Sweden
Central African Republic	Jordan	Philippines	Vietnam	Chile	Ireland	Niger	Switzerland
China	Kazakh-stan	Rwanda	Zambia	Colombia	Israel	Nigeria	Trinidad and Tobago
Comoros	Kenya	Serbia	Zimbabwe	Costa Rica	Italy	North Macedonia	Tunisia
				Croatia	Jamaica	Norway	Ukraine
				Cyprus	Japan	Panama	United Kingdom
				Denmark	Latvia	Paraguay	United States
				Dominican Republic	Lesotho	Peru	Uruguay
				Ecuador	Liberia	Poland	Vanuatu
				El Salvador	Lithuania	Portugal	
				Estonia	Luxem-bourg	Romania	

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