

# Partisan polarization, historical heritage, and public health: Exploring COVID-19 outcomes

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## Abstract

When the COVID-19 virus first arrived in the United States in early 2020, many epidemiologists and public health officers counseled for shutdowns and advised policymakers to prepare for a major pandemic. In 2020, though, US society was rife with major political and cultural divides. Some elected leaders promoted policies at odds with the experts, and many people refused to heed the public health-based communications about the coming pandemic. Additionally, the capacity to respond to a pandemic was distributed in the country in a highly unequal fashion. This paper analyzes the noteworthy geopolitical patterns of COVID-19 illnesses, subsequent demands on hospitals, and resulting deaths. This description is based on a snapshot of archival data gathered in the midst of the pandemic during late January and early February of 2021. Demographic data, indicators of political party support, indicators of citizen attitudes, and public health compliance behaviors are combined in a multivariate analysis to explain COVID-19 outcomes at the local government (county) level. The analysis suggests strongly that regional political culture and local demographics played a substantial role in determining the severity of the public health impact of the COVID-19 pandemic.

## KEYWORDS

COVID-19, pandemic, political culture, race, state and local government

## Key Points

- During the early stages of the COVID Pandemic, regional political culture and local demographics played a substantial role in determining the severity of the public health impact of the COVID-19 pandemic.

- Race, as measured by the percent white of a county, was the single strongest predictor of COVID outcomes.
- Preparing for future pandemics requires us to address social and economic inequality in our society.

## INTRODUCTION

Early in 2020 in Wuhan, China, a new virus apparently made the jump from animals to humans (Kelly & Cahlan, 2020). This novel coronavirus causes a potentially deadly disease called COVID-19. Symptoms of the disease include respiratory distress, as is the case with most coronaviruses; however, persons infected with COVID-19 have exhibited a variety of additional adverse health conditions, including intestinal distress, blood clotting, fever, severe headaches, extreme inflammatory response, and profound fatigue. While some promising therapeutics have been developed, at that time there were no vaccines and no universally effective treatments available to treat seriously ill COVID-19 patients. Several efficacious vaccines have been developed, and mass vaccination is now recommended as the principal public health countermeasure to battle the pandemic, although public resistance to vaccination remains a problem in some segments of the population. At the end of 2020, none of these vaccines had been administered to the general public. Worldwide, as of mid-January 2021, there were approximately 95,000,000 documented cases of infection (Statista, 2021) and over 2,000,000 resulting deaths (Bloomberg News, 2021). The global economy was disrupted, and normal commerce and travel patterns were interrupted.

In January 2020, with more than 25,000,000 cases worldwide (Johncox, 2021), no country had been hit harder by the virus than the United States. As of April 2021, the United States had more than 31,000,000 documented cases of the disease, had seen over 550,000 deaths (World Health Organization, 2021), and had experienced massive economic disruption (Center on Budget and Policy Priorities, 2021). The death toll in the United States from COVID-19 passed the one million mark in May of 2022 (Stein, 2022).

The impact of the pandemic was likely made worse by preexisting inequities in American society (Kaufman, 2021). Citizens in both rural and economically disadvantaged sections in urban areas suffer from less access to health care; likewise, they are also disproportionately prone to engage in unhealthy behaviors. Additionally, morbidity and mortality outcomes are differentially distributed based on race.

This paper explores the partisan and regional differences in the approach Americans took to their COVID-19 pandemic response. Using COVID-19 outcomes data, it documents the political, demographic, attitudinal, and behavioral factors associated with outcomes in terms of deaths, cases of infection, and hospital usage. Groups commonly supportive of the Republican Party and groups in rural areas were resistant to official messages about the need for mask wearing and social distancing and less supportive of business and school shutdowns. As a result, these areas suffered worse outcomes. Additionally, some groups, especially people of color, that have traditionally had poor health outcomes saw this trend exacerbated by the pandemic, regardless of the political control in the areas where they live.

## PARTISANSHIP, REGIONALISM, AND THE CORONAVIRUS

Once COVID-19 was identified as a potential source of a pandemic in the United States, there were major response differences between the dominant political parties and among the diverse regions of the country (Gusmano et al., 2020). Elected leaders and local citizens

in typically Republican-dominated areas, taking the lead from the then-President Donald Trump, dismissed the seriousness of the threat and downplayed the dire warnings voiced by experts (Gao & Radford, 2021; Gusmano et al., 2020; McDonald, 2020). Public health officials, and many Democratic elected and appointed leaders, advised that mask wearing be mandated, social distances be maintained, people stay at home, and many public activities be suspended for the duration of the pandemic. Where this advice was followed, there were varying degrees of success in slowing the spread of infection (Doherty et al., 2020; Gusmano et al., 2020; Ivory et al., 2021; Pei et al., 2020). Many observers argued that the vast majority of serious illnesses and deaths would have been preventable had early federal government action been taken (Brown, 2021; Haeder & Gollust, 2020; Kim & Kreps, 2020; Stolberg, 2020; Woolhandler et al., 2021).

As with most democratic societies, the United States has deep partisan differences of long-standing and ongoing significance (Deane & Gramlich, 2020; Finkel et al., 2020). Republicans and Democrats tend to see policy issues from different perspectives, and they tend to rely on different sources of information (Jurkowitz et al., 2020). Democrats tend to place trust in science-based technocratic expertise (e.g., on global climate change) while Republicans tend to distrust such expertise, viewing most career bureaucrats claiming such expertise as the “deep state” devoted to opposing the will of Republican elected officials. This difference in trust of expertise is quite longstanding (Lovrich, 1985; Meier, 1997) and is illustrated by recent antibureaucratic Republican presidents, including Nixon (Editors, 1976), Reagan (NPR Staff, 2012), and Trump. Democrats and Republicans also pay attention to the content of very different sets of broadcast, print, and social media (Pew Research Center, 2020b, January 24).

As with many major policy decisions, the two parties differed on how to respond to the COVID-19 pandemic (Gao & Radford, 2021; Gusmano et al., 2020). Most Democratic leaders urged Americans to heed the warnings of epidemiologists and public health experts. Republican leaders, in contrast, emphasized intrusions on economic freedom associated with the public health measures advocated by experts. Scientifically incorrect information was received and acted upon by supporters of the Trump Administration (Kim & Kreps, 2020). Indeed, areas that were most resistant to public health advisories were often those with a reputation for voting Republican (Gao & Radford, 2021; Johns Hopkins University, 2021; Pew Research Center, 2020a, June 23).

In addition to these partisan divisions, the United States is also a federal nation with major regional differences in prevailing political cultures. There is also a large urban–rural divide, with significant differences in levels of social trust and compliance with governmental directives and recommendations across the landscape of American society (Kaufman, 2021). Matters of history, patterns of immigration (recent and historical), economic factors, and religious affiliation and practice all play a role in these distinctions going beyond partisanship (Elazar, 1994; Lovrich et al., 2021; Putnam, 2000; Woodard, 2011).

The most widely accepted measure of state and local political culture was developed by Daniel Elazar (1966), who identified *traditionalistic*, *moralistic*, and *individualistic* cultures. For Elazar, the political culture of a society derives from the historical traditions of a foundational settlement group and persists even across substantial subsequent migrations (Elazar, 1994). Colin Woodard (2011) and Lovrich et al. (2021) make similar claims regarding the persistence of local political culture. Elazar's cultures have been linked to county-level governmental boundaries (Lovrich et al., 2021), which make them well-suited to the study of county-level COVID-19 outcomes.

Profound differences exist both within and among American communities in the ways citizens respond to guidance from authorities of the federal, state, and local governments (Jacobsen & Jacobsen, 2020). These differences are likely determined by family socialization, economic status, level of formal education, religious affiliation, and other



factors unique to individuals (Kim & Kreps, 2020). Moreover, trust in public bureaucracies generally is influenced by one's partisan leanings and ideology (Gao & Radford, 2021; Robinson et al., 2013). These differences result in very different understandings of the collective good and in different responses to public pleas for collective action in a pandemic.

## RATIONALISM, COLLECTIVISM, AND COMPLIANCE BEHAVIOR

The term *rational* here refers to “a policy decision that is based on a systematic attempt to engage in probabilistic analysis of the most likely behavioral outcomes to be expected” (Reed et al., 2020, p. 317). Numerous critics of Donald Trump argued that his presidential administration posed a threat to rationalism itself (Goodsell, 2019; Reed et al., 2020). Many Democrats like to think of their call for rational decision making in government as an inherent part of the founding ethos. However, human beings are not entirely rational in the way they come to their decisions (Bowman, 2018; Hertwig, 2012). People become fearful in the presence of a pandemic, and fear has a known powerful effect on human reasoning (Jost et al., 2017; Kim & Kreps, 2020; Pei et al., 2020).

Agencies providing “logically persuasive explanations for their policies” may enhance public trust in those same bureaucracies (Alon-Barkat, 2020, p. 78). American society has become more polarized in the last decade, with a substantial faction equating rationalism with support for the Democratic Party (Deane & Gramlich, 2020; Finkel et al., 2020; Pew Research Center, 2017). This partisan divide resulted in a tendency for supporters of Donald Trump to distrust governmental communication about the pandemic in much of the country and to increased polarization on key pandemic-related issues (Kim & Kreps, 2020).

Utilizing the best available science and data to make and implement public policy would seem important in devising and implementing effective public policy (Ventress, 2012); however, in 2020, the heightened level of partisan division present in the United States raised the danger that even otherwise rational people may be subject to what Finkel et al. (2020, p. 535) have labeled “motivated partisan cognition.” Many Republican public figures have argued that the economic damage to the country from a shutdown was worse than the harm that could come from the spread of the virus itself. In response, many of their Democratic counterparts argued that, over the course of the pandemic, the economic damage from a shutdown was less costly than the damage from the long-term disruption of the economy that would accompany allowing the pandemic to spread unchecked. In this case, what would be viewed as rational depends on starting assumptions about what factors are to be considered and how they are to be weighted.

The intentional spread of scientifically fallacious misinformation via social media has become a common phenomenon around the world (Freelon & Wells, 2020; Swetland et al., 2021). Austin et al. (2021, p. 11) documented the positive impact that greater media literacy has had on compliance with COVID-19 mitigation recommendations, arguing that “Individuals with more media literacy are better prepared and willing to take experts' recommended preventive actions.” Many observers argue that the national response to COVID-19 in the United States has been harmed by the systemic spreading of misinformation (e.g., Abrams, 2021; Austin et al., 2021; Barnes & Sanger, 2020; Kim & Kreps, 2020; Scheufele et al., 2021; Swetland et al., 2021).

Early data showed significant state and regional variations in the impact of the pandemic (Doherty et al., 2020; KFF, 2020). Large cities with higher population concentrations were most adversely affected, as were those places where the virus first appeared in the country (Owens & Baker, 2020). Areas with more ideologically conservative politics were more likely than others to experience greater COVID-19 infection rates as the pandemic gained steam

(Gao & Radford, 2021). The fact that disproportionate numbers of Black people are poor and rely on Medicaid and that the states who have refused to expand Medicaid as part of the implementation of the Affordable Care Act are concentrated in the South (Taylor, 2019) is strong evidence that regional differences are important considerations if we are to understand differential outcomes from a pandemic.

Lower income people and people of color were disproportionately affected by COVID-19 (Centers for Disease Control and Prevention, 2021; McNeely et al., 2020; Rogers et al., 2020; Udalova, 2021). Some of this disparity stems from employment patterns in that many occupations cannot be performed remotely, and some jobs require close interactions with others (McNeely et al., 2020; Rogers et al., 2020). Two such examples were the meat packing industry (Treisman, 2021) and healthcare workers providing direct patient care (Kambhampati et al., 2020). Given that people of color are overrepresented in such occupations, many of which are not well compensated, it is essential to explore in this analysis the economic and demographic data on family income, race, and employment.

Persons of color in the United States generally have worse health outcomes in terms of morbidity and mortality than do Whites. Among Black Americans, the reasons include lower access to health care (Taylor, 2019), considerable distrust of the medical establishment (Kennedy et al., 2007), and greater likelihood of living and working in high-risk environments, such as exposure to environmental pollution and/or violent crime (Kambhampati et al., 2020; Treisman, 2021). People of color have historical reasons to distrust the American government (Rosenthal, 2020), and a solid argument has been made that the American healthcare system as a whole is plagued by systemic racism (Krieger, 2021). All of these factors signal to the need to include some measure of the racial makeup of the counties in the analysis.

Early in the pandemic, anecdotal evidence also indicated that certain groups of people were resistant to the public health advisories being disseminated about hand hygiene, social distancing, and mask wearing (Honeycutt, 2020; Stanley-Becker, 2020). A lack of trust in the recommendations of experts and widespread misinformation on social media hinder the ability to enhance scientific literacy regarding COVID-19 (Scheufele et al., 2021). Thus, one would expect that the level of educational attainment in a county would be associated with variations in compliance behavior in the face of a pandemic.

## MATERIALS AND METHODS

The data examined here consist of a multifaceted snapshot taken during a discrete time period in the midst of the pandemic, from January 21 through February 13, 2021. A total of 3142 unique governments of last resort (e.g., counties or their equivalent) exist in the United States. Most are counties, but there are 64 *parishes* in Louisiana and 29 *organized boroughs or towns* in Alaska. Adding in the District of Columbia and autonomous municipal units in Virginia and several other states yields the total of 3142 units for which political and demographic data can be gathered. Throughout this paper, the word “county” will be used to refer to the jurisdictions in our analysis.

### COVID-19 outcomes data

Four dependent variables are used in this study: (1) COVID-19 cases per 100,000; (2) COVID-19 deaths per 100,000; (3) percentage of hospital beds occupied by COVID-19 patients; and (4) percentage of ICU beds occupied by COVID-19 patients. Data on the COVID-19 cases and deaths per 100,000 were obtained on January 26, 2021 from the

website USAFACTS, which compiles such data at the county level on an ongoing basis. Hospitalization usage reports were obtained online, on January 29, 2021, from the University of Minnesota's COVID-19 Hospitalization Tracking Project.

## Demographic data

Online Census and Bureau of Labor Statistics archives (United States Bureau of Labor Statistics, 2019; United States Census Bureau, 2019) were used to gather information for all government units in the study. Median age, population estimates (as of 2019), the percent of persons in poverty, the median household income, the unemployment rate, the percent white population, and the percent of the population with a college degree were collected for the period in question. Census classifications for each governmental unit, from “large center metropolitan” as the largest classification to “noncore” as the smallest, were recorded.

## Political data

Election results from National Public Radio were used to record the 2020 presidential vote in all 3142 counties. The margin for the Biden/Harris ticket was the variable used in each of the models. Thus, a negative parameter estimate for the “margin” variable would indicate that government units where Biden enjoyed political support had “better” outcomes.

The political party of the state executive also was recorded. An interactive map published by the *New York Times* was used to gather information about mask mandates as of February 4, 2021. The *New York Times* classified states as having a mandatory mask requirement, having one in place some of the time, or having enacted no masking policy.

## Behavioral data

*Unacast* gathers information based on metadata from cell phone usage in Europe and North America. The *Unacast* dashboard grades the compliance of people with social distancing and stay-at-home orders on a letter grade scale ranging from A to F. These cell phone-generated data have the advantage of being nonintrusive measures of individual-level compliance with social distancing recommendations. County-level aggregate data on changes in overall mobility and changes in encounter density are recorded on the dashboard. *Unacast* also includes data measuring changes in nonessential visits; however, because there are no data available for a great many small counties this variable was not included in the analysis. Ratings for all of the units of government in our study were gathered between February 9 and February 13, 2021.

## Political culture data

Data on state or local political culture based on Elazar's classifications are available for interested researchers (Lovrich et al., 2021). The moralistic culture has received by far the most attention by social scientists, in good measure because it has a strong connection (empirical and conceptual) to “social capital”—the key concept at the core of Robert Putnam's (2000) *Bowling Alone*. At the core of both Elazar's work and Putnam's scholarship are the shared major themes of interpersonal trust and devotion to communitarian values,





with a strong sense of commitment to the pursuit of the public interest by government and duty to contribute to the collective good on the part of individual citizens.

## The models

Table 1 summarizes all of the variables included in the analysis. Ordinary least-squares regression models were used to analyze the effects of the political, demographic, attitudinal, behavioral, and political culture variables on the various COVID outcome variables. Combining all predictor variables into a single model allows for the effects of each to be estimated while simultaneously controlling for the effects of all others.

A total of six multivariate models were estimated. Four models were estimated, each with one of the COVID-19 outcome variables and all of the predictor variables. Two additional models with hospital usage outcomes were run with only the larger jurisdictions included, based on the fact that the smallest jurisdictions typically have limited hospital resources. For those two models, the combined total of jurisdictions classified as large center metropolitan, large fringe metropolitan, medium-sized metropolitan, or small metropolitan is 1166.

## RESULTS

The results of these regression models are shown in Table 2. The results of all of the six models are shown in a single table as a way to generate a better view of the effects of the individual predictor variables across all of the dependent variables. The authors are aware that these data are a snapshot and that detailed analysis over time might reveal a more complete picture of the predictors for each individual outcome variable. However, the advantage of this approach is to focus the reader's attention to the effects of predictor variables across outcomes.

The models in which the smaller jurisdictions were removed from the analysis included only two of the outcome variables, hospital usage and ICU bed usage. Removing the smaller jurisdictions from the analysis of hospital bed usage by COVID-19 patients does produce some results that are different than the models including all jurisdictions. Even so, the persistent significance of several variables, including percent White, the urban/rural nature of the jurisdiction, the margin for the Biden/Harris ticket, and the moralistic culture rating of the county is notable.

It is not wealth or income driving these outcomes. It is race, political values and attitudes, and the urban/rural divide that are predictive of the impact of a pandemic. These data are a snapshot from just one brief period early in the pandemic, but subsequent analysis bears out the importance of race and partisan control at the state level as the pandemic matured. For example, the states with the worst outcomes in 2022, in terms of deaths and illnesses, are states that have Republican governors (Milbank, 2022). Later analysis of COVID outcomes a year after our data were collected show a persistent negative effect for people of color (Hill & Artiga, 2022).

## DISCUSSION

The data collected for this paper provide a snapshot of the underlying factors that affected COVID-19 outcomes in America in the middle of the pandemic before vaccines were available for broad use. What is most striking is the consistent effect of race. COVID-19 has hit members of minority groups the hardest in the United States (Centers for Disease Control

**TABLE 1** Variables

	Operationalization	Categorical percentages/ medians
Demographic variables		
Urban/Rural	1 = large center metropolitan, 2 = large fringe metropolitan, 3 = medium metropolitan, 4 = small metropolitan, 5 = micropolitan, 6 = noncore	1—2%, 2—12%, 3—12%, 4—11%, 5—20%, 6—42%
Median age		41.6
Percent in poverty		13.4%
Median household income		\$53,341
Percent white		83%
Unemployment rate		5%
Percent with college degree		19.6
Political variables		
Political Culture: Moralistic rating	0—6, total of county and state ratings for moralistic political culture. 6 = most moralistic	0—54%, 1—8%, 2—9%, 3—6%, 4—11%, 5—10%, 6—10%
Political Party of State Executive	1 = GOP, 2 = Dem	GOP—57%, DEM—43%
Margin	Percentage of votes for Biden minus percentage of votes for Trump	−3.85%
Mask mandate	1 = mandatory, 2 = sometimes, 3 = none	1—64%, 2—11%, 3—25%
Behavioral variables		
Changes in mobility	0 = F, 1 = D, 2 = C, 3 = B, 4 = A	A—0.1%, B—1%, C—10%, D—38%, F—51%
Changes in encounters density	0 = F, 1 = D, 2 = C, 3 = B, 4 = A	A—55%, B—19%, C—5%, D—8%, F—13%
Outcome variables		
Cases	Number of reported COVID-19 cases per 100,000 inhabitants	7921
Deaths	Number of reported COVID-19 deaths per 100,000 inhabitants	124
Hospital bed usage	Percentage of available beds occupied by COVID-19 patients	15%
ICU usage	Percentage of available ICU beds occupied by COVID-19 patients	32%

and Prevention, 2021; Hill & Artiga, 2022), and percent white emerged as a strong predictor of county-level COVID-19 outcomes in all models. The classification of the county on the urban/rural criterion also showed a strong effect on the outcome variables. There were more cases and deaths in rural areas, but more hospital usage in urban areas.



**TABLE 2** Results of regression models

	Cases per 100,000	Deaths per 100,000	% hospital beds occupied by COVID patients	% hospital beds occupied by COVID patients, larger jurisdictions	% ICU beds occupied by COVID patients	% ICU beds occupied by COVID patients, larger jurisdictions
Median age	<b>-153.39***</b>	<b>1.16***</b>	0.0006	0.0001	<b>0.004*</b>	0.001
	<b>10.51</b>	<b>0.36</b>	0.0007	0.001	<b>0.002</b>	0.002
Urban/rural	<b>257.02***</b>	<b>8.11***</b>	<b>-0.01**</b>	-0.008	<b>-0.04***</b>	<b>-0.03**</b>
	<b>44.55</b>	<b>1.54</b>	<b>0.003</b>	0.006	<b>0.008</b>	<b>0.009</b>
Percent in poverty	10.73	<b>1.17*</b>	0.002	-0.002	<b>0.01***</b>	0.006
	16.31	<b>0.56</b>	0.001	0.002	<b>0.003</b>	0.003
Median income	0.0006	-0.0002	<b>0.000001**</b>	0.0000008	<b>0.000003***</b>	<b>0.000003**</b>
	0.007	0.0002	<b>0.0000005</b>	0.0000006	<b>0.000001</b>	<b>0.000001</b>
Percent White	<b>-3009.31***</b>	<b>-135.89***</b>	<b>-0.095***</b>	<b>-0.23***</b>	<b>-0.50***</b>	<b>-0.47***</b>
	<b>387.78</b>	<b>13.39</b>	<b>0.028</b>	<b>0.04</b>	<b>0.07</b>	<b>0.07</b>
Unemployment rate	<b>-152.79***</b>	0.15	-0.0009	-0.004	-0.008	<b>-0.01*</b>
	<b>28.67</b>	0.99	0.002	0.003	0.005	<b>0.005</b>
Pol party of state exec	<b>-311.49**</b>	<b>-25.90***</b>	-0.014	-0.006	<b>-0.06***</b>	<b>-0.06**</b>
	<b>114.51</b>	<b>3.95</b>	0.008	0.01	<b>0.02</b>	<b>0.02</b>
Mask mandate	<b>298.47***</b>	-4.38	0.004	-0.002	-0.004	-0.02
	<b>66.16</b>	2.28	0.005	0.006	0.01	0.01
Margin for Biden	<b>-2078.03***</b>	<b>-36.01***</b>	0.02	<b>-0.08**</b>	<b>-0.29***</b>	<b>-0.25***</b>
	<b>253.19</b>	<b>8.74</b>	0.02	<b>0.03</b>	<b>0.05</b>	<b>0.05</b>
Mobility change	4.34	<b>-10.11***</b>	-0.004	0.009	-0.02	0.003
	72.18	<b>2.49</b>	0.005	0.007	0.01	0.01
Encounters density change	<b>-217.80***</b>	<b>-5.90***</b>	<b>-0.007*</b>	-0.001	<b>0.02**</b>	<b>0.03***</b>
	<b>45.92</b>	<b>1.59</b>	<b>0.003</b>	0.003	<b>0.007</b>	<b>0.007</b>
Percent with College Degree	<b>-47.15***</b>	<b>-1.05***</b>	<b>-0.002***</b>	<b>-0.002*</b>	-0.0005	-0.002
	<b>8.84</b>	<b>0.31</b>	<b>0.0006</b>	<b>0.0008</b>	0.001	0.001
Moralistic Rating	<b>217.92***</b>	<b>4.09***</b>	<b>-0.016***</b>	<b>-0.01***</b>	<b>-0.013**</b>	<b>-0.01*</b>
	<b>25.66</b>	<b>0.89</b>	<b>0.002</b>	<b>0.002</b>	<b>0.004</b>	<b>0.004</b>
Constant	16744.52	224.53	0.29	0.42	0.45	0.65
	846.06	29.22	0.06	0.08	0.13	0.14
Adjusted R <sup>2</sup>	0.25	0.18	0.19	0.17	0.25	0.24

Note: Bold values indicate the variable is statistically significant.

\*significant at the 0.05 level.

\*\*significant at the 0.01 level.

\*\*\*significant at or above the 0.001 level.



**TABLE 3** Summary of significant predictors variables, by model

	Cases per 100,000	Deaths per 100,000	% hospital beds occupied by COVID patients	% hospital beds occupied by COVID patients, larger jurisdictions	% ICU beds occupied by COVID patients	% ICU beds occupied by COVID larger jurisdictions
Median age	Negative	Positive			Positive	
Urban/rural	Positive	Positive	Negative		Negative	Negative
Percent in poverty		Positive			Positive	
Median income			Positive		Positive	Positive
Percent White	Negative	Negative	Negative	Negative	Negative	Negative
Unemployment rate	Negative					Negative
Pol party of state exec	Negative	Negative			Negative	Negative
Mask mandate	Positive					
Margin for Biden	Negative	Negative		Negative	Negative	Negative
Mobility change		Negative				
Encounters density change	Negative	Negative	Negative		Positive	Positive
Percent with college degree	Negative	Negative	Negative	Negative		
Moralistic rating	Positive	Positive	Negative	Negative	Negative	Negative

Note: Empty cells designate variable as not statistically significant.

Full cell contents are statistically significant; contents indicate the direction of the parameter.

Political factors also were shown to be meaningful in most of the models. Support for the Republican Party is associated with worse outcomes. Furthermore, lower levels of educational attainment are associated with worse outcomes. While the emergence of the Omicron variant provided evidence that the vaccine's protective effects wane over time and with the development of new strains of the virus (Andrews et al., 2022), the fact is that the probability of serious illness and death from COVID is much higher for the unvaccinated (Kekatos, 2022). Given the strong relationship between vaccine compliance and party preference (Ivory et al., 2021), it is important to see these significant associations between political and attitudinal factors in the early stages of the pandemic.

Table 3 makes it easier to see what variables were significant and in what direction. Seeing this view, without the magnitude of the parameter estimates, is helpful in visualizing the overall patterns. The consistent strength of the percent white in a county is striking. The greater the percent of the population that identifies as white, the better the outcomes, across the board. Poverty, income levels, and unemployment had a much smaller effect on COVID outcomes. Even where these variables were significant, the magnitudes of the parameter estimates were small and the estimated substantive impacts relatively weak. An effect based on race appears to exist independently of economic factors.

As expected, the political party of the state executive and the margin for the Biden/Harris ticket proved to be significant predictors, with those people living in areas with more support for Democratic elected officials experiencing fewer cases and deaths per 100,000. This is consistent with research conducted by other researchers (Gao & Radford, 2021; Johns Hopkins University, 2021) and reinforces the importance of understanding local political culture in designing responses to public health crises (Kaufman, 2021). Indeed, our primary measure of political culture shows consistent affects across all models as well.

The measures of educational attainment and measures of behavioral change from the *Unacast* data were expected to be powerful predictors of COVID-19 outcomes, but they were not consistently significant across models. In jurisdictions in which a larger proportion of residents have college degrees, we did see better outcomes with regard to cases and deaths. We did see a positive effect for jurisdictions for which we measured better scores on the *Unacast* data for changes in encounter density in response to the pandemic. Unexpectedly, improvements in encounters density, a measure of how effectively people avoided contact with other people during the pandemic, were associated with an increase in ICU bed usage.

## CONCLUSIONS AND POLICY IMPLICATIONS

In preparing for the next pandemic, this study shows that society must do a better job of providing for equity in terms of racial justice. The consistent predictive power of one statistic, the percent of the population in a jurisdiction that identifies as white, is telling. Unfortunately, in many areas of the country the prevailing political winds blow against any efforts to work toward this goal. The political and social cultures of an area are difficult to shift. Patterns of belief, distributions of wealth and privilege, and acceptance of science persist over generations, even when such patterns are demonstratively maladaptive.

The predictive power of the urban/rural classification of the county is very important. Unfortunately, the urban–rural divide in American has widened over the last decade and shows no current sign of weakening. The emergence of the Delta and Omicron variants, with their increases in disease and death, did nothing to weaken the resolve of those who doubted the validity of the science in rural areas. News reports indicate that the areas hit hardest by these variants are the same areas that voted for Donald Trump in 2020 (Wood & Brumfiel, 2021). There are documented cases of people on their deathbed, dying from



COVID-19, insisting that it is all a hoax (Miranda, 2021). Public health officials must learn how to communicate more effectively with a group of people in rural areas who are naturally resistant to messaging that they perceive as coming from remote, largely untrusted official sources.

In those analyses, counties in a state with a high level of moralistic culture had poor COVID-19 outcomes with regard to cases and deaths, controlling for the effects of the other independent variables. This observation provides further support for the idea that readiness for the next pandemic must take into account regional and local variations in political culture.

Public health researchers must do more to analyze the connections between public health outcomes and the political and social culture at the local government level. Austin et al. (2021) found that increases in scientific literacy are associated with greater acceptance of public health recommendations. More research is required on the correlates of public cooperation with government-recommended strategies for reducing communicable diseases. This can be done now, before the next pandemic, by working on other common social and medical maladies that affect the poor more than the rich, such as diabetes, heart disease, and stroke. One of those tactics should include increasing media and scientific literacy in rural communities and less-advantaged inner-city populations because “the same social pathology that exacerbates the pandemic also debilitates our scientific response to it” (Kaufman, 2021, para 14).

Building the capacity of local areas to respond in times of rapid spread of a pathogen will take attention to the building of trust between public health officials and local policymakers. It will also require increasing attention to the spread of misinformation on social media. The very nature of social media is that it is easy to start a rumor or spread a lie but very difficult to correct the problem after the fact. Many governmental units do use social media already, and they will have to become even more nimble in their use (Hu & Lovrich, 2020). They must counter misinformation as soon as possible once predictions about the spread of a pathogen can be made with a reasonable degree of medical certainty.

Another pandemic will come. When it comes, it will exacerbate the existing inequities in human society. It will cause unnecessary death and suffering. The fabric that holds society together is frail. We must strengthen that fabric overall if we are to limit the damage from coming pandemics.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

All data used in the analysis are publicly available.

## ETHICS STATEMENT

The data, models, and methodology used in this research are not proprietary.

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