



Do Black Lives Matter in the American Public's Mitigation Responses to the COVID-19 Pandemic? An Analysis of Mask Wearing and Racial/Ethnic Disparities in Deaths from COVID-19

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Received: 28 April 2021 / Revised: 22 June 2021 / Accepted: 24 June 2021 / Published online: 16 July 2021
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Abstract

Background Mask wearing has varied considerably throughout the COVID-19 pandemic and has been most often associated with political affiliation and specific health beliefs. The purpose of this study was to determine the relationship between mask usage, neighborhood racial segregation, and racial disparities in COVID-19 deaths.

Methods We used linear regression to assess whether the racial/ethnic composition of deaths and residential segregation predicted Americans' decisions to wear masks in July 2020.

Results After controlling for mask mandates, mask usage increased when White death rates relative to Black and Hispanic rates increased.

Conclusions Mask wearing may be shaped by an insensitivity to Black and Hispanic deaths and a corresponding unwillingness to engage in health-protective behaviors. The broader history of systemic racism and residential segregation may also explain why white Americans do not wear masks or perceive themselves to be at risk when communities of color are disproportionately affected by COVID-19.

Keywords Racism · Racial bias · COVID-19 · Health equity

Background

Nationally available data from the CDC and other sources reveal that Black and Latinx Americans account for a disproportionate number of COVID-19-related cases, hospitalizations, and deaths [1–4]. A vast and growing body of research suggests that racial disparities in mortality are associated with underlying differences in comorbidities that are shaped by the influence of structural racism and access to health care [5, 6]. Because COVID-19 is a novel coronavirus, the public, elected

officials, and even scientists are continually learning how to mitigate its devastating impact. While the learning curve may be slow in some ways, there is widespread scientific agreement regarding the use of facial coverings to slow, if not prevent the spread. By mid-July 2020, masks were mandatory in 21 states, with more states considering the adoption of such policies [7]. Yet, mask usage in the USA has proved controversial and selectively adopted. In June of 2020, for example, a national poll found that less than two-thirds of Americans agreed that it was important to wear a mask [8] and only a slightly higher percentage (73%) of Americans stated that they had worn a mask in a public setting [9].

From national polls and peer-reviewed studies conducted during the COVID-19 pandemic, we have learned important correlates of mask usage in the context of a novel respiratory pathogen. Researchers have focused primarily on political affiliation, finding that voting patterns and exposure to misinformation predict adherence to public health guidance regarding masks [8, 10]. Other studies have extended this work, finding that political affiliation is associated with the usage of specific news sources and different levels of knowledge and beliefs related to COVID-19 [11], including mask wearing and efforts to socially distance [12]. Further contributing

In the United States, wearing a mask is not just politicized. It is racialized. (Rhea Boyd, *The Nation*, 7-9-20)

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to uneven mask usage is a significant amount of misinformation circulating regarding the effectiveness of masks, creating what public health experts have called an “infodemic” [13]. Given evidence that masks are an important part of public health efforts to mitigate COVID-19 transmission, research is necessary to understand additional factors that are associated with decisions to adopt this recommendation.

Few studies have explored other social or cultural factors that underlie mask usage, especially considering the continued severity of the pandemic and striking racial/ethnic disparities in COVID-19 infections and outcomes. It is important for researchers, accordingly, to understand when and in what contexts Americans feel compelled to wear masks specifically and follow public health guidance more generally. It is possible, for example, that reasons for refusing to wear a mask may extend beyond political affiliation and exposure to misinformation and differ by race or ethnicity. While a key concern for white Americans who do not wear masks is that mandates infringe on their civil rights [13], there may exist a mask conundrum for Black Americans. After mask requirements were implemented across the country, several news outlets featured stories highlighting the concerns of Black communities regarding the risk of police profiling of Black men wearing face coverings [14–16]. By early June, multiple accounts of Black men targeted for wearing masks—and for not wearing masks—were documented across the country [17]. This lose-lose scenario is captured by the statement of Aaron Thomas, an educator in Ohio: “I want to stay alive but I also want to stay alive” [18]. At the same time, survey data showed that Black and Hispanic Americans were more likely than white Americans to report concern that they would require hospitalization from COVID or unknowingly spread the disease to others, supporting mask wearing among these populations [19]. This evidence suggests that factors other than political affiliation may be important correlates of mask usage.

Because COVID-19 death rates are twice as high among Black Americans in the USA [20], it is possible that mask wearing reflects different perceptions of risk related to COVID-19 exposure and outcomes. More specifically, because American communities continued to be segregated by race [21], white Americans may feel less vulnerable to COVID-19 because fewer individuals in their close proximity may have become infected or have been killed by this novel illness. It is important, accordingly, to consider whether different types of racism, especially residential segregation, are associated with mask usage among white Americans. There is compelling evidence that contemporary forms of racism such as color-blind racism or racial apathy are present in more than half of white Americans [22, 23] and may help perpetuate residential segregation through opposition to policies that advance racial equity [24, 25]. We ask, therefore, whether white Americans wear masks as

often when Black, as opposed to white Americans, are dying at higher rates in the surrounding state. According to prominent pediatrician, public health advocate, and scholar Rhea Boyd, “opposition to public health interventions, like masking, have also become a **material manifestation** of America’s racism, particularly anti-Black racism” [26]. To test this, we assess whether mask usage among white Americans is associated with who is dying from COVID-19 in the surrounding community. To our knowledge, this is the first study to quantitatively examine how mask usage relates to differential outcomes in COVID-19 deaths by race.

Methods

Data

Our data on mask usage, demographic factors, mask mandates, and COVID-19 death rate disparities come from multiple sources. Mask wearing reflects the percentage of state residents who report wearing a mask whenever they are in public and was measured by the Institute for Health Metrics and Evaluation at the University of Washington [27]. State mask mandate indicates whether a state-level mask wearing mandate had been adopted as of July 20, 2020 [28]. Racial segregation data is from 2013 to 2015 and is based on a dissimilarity index, produced by the US Census Bureau where Black-White segregation levels range from 0 to 100, with 100 being the most spatially segregated by race [29].

Our focal independent variables are Black-White and Hispanic-White disparities in racial death rates which included 45 states with available data. To construct indices of racial disparities in COVID-19 deaths, we draw on data from the Kaiser Family Foundation’s State COVID Racial Data Tracker [30] including COVID-19 deaths through July 21, 2020. The racial death disparity index reflects the ratio of Black or Hispanic death rates to White death rates in each state (Black or Hispanic deaths divided by White deaths). If the death rates for Blacks or Hispanics in a particular state are identical to the death rate for Whites, the racial death disparity index will equal 1.0. Racial death disparity index values less than 1.0 indicate that Blacks (or Hispanics) are underrepresented relative to Whites while values greater than unity would indicate that Blacks (or Hispanics) are overrepresented in a state’s COVID-19 death counts. Table 1 reports disproportionate COVID-19 deaths by race and Figure 1 demonstrates the geographic pattern of disparities.

While racial disparity levels vary, the index for Black-White death exceeds 1.0 in 36 states; the index for Hispanic-White death exceeds 1.0 in 18 states.

Table 1 State-level racial (Black-White and Hispanic-White) disparities in COVID-19 deaths

State	Black-White Death disparity	Hispanic-White Death disparity
AK	--	--
AL	2.27	1.02
AR	2.28	1.43
AZ	.96	.88
CA	2.15	1.25
CO	1.89	1.03
CT	1.36	.48
DC	5.53	3.98
DE	1.22	.66
FL	1.47	1.10
GA	1.75	.58
IA	1.87	1.31
ID	.96	.44
IL	2.77	1.71
IN	1.99	.36
KS	4.40	1.20
KY	2.14	1.55
LA	2.23	.54
MA	1.08	.55
MD	1.60	1.28
ME	2.21	--
MI	4.29	.60
MN	1.28	.67
MO	4.50	.71
MS	1.83	.93
NC	1.85	1.09
NE	1.95	2.44
NH	2.37	.89
NJ	1.44	.95
NV	1.45	.60
NY	1.11	.68
OH	1.67	.53
OK	.96	--
OR	1.70	1.05
PA	2.21	.87
RI	.90	.54
SC	2.52	.97
TN	2.87	2.51
TX	1.01	.68
UT	2.89	2.48
VA	1.33	1.26
VT	--	--
WA	.77	.95
WI	4.86	1.91
WY	.00	.93
Total	44	44

States with Black/Hispanic overrepresentation (disparity index >1.00) highlighted in bold

Results

Table 2 provides descriptive statistics for all analysis variables. The focal outcome measure—state mask wearing—shows considerable variation in the percentage of respondents who report wearing masks every time they are in public (mean = 4.22; S.D = 1.33). Our primary predictor variables—racial disparities in COVID-19 deaths—vary widely across the states: Black-White disparities (mean = 1.92; S.D = 1.07)

exceed Hispanic-White disparities (mean = .97; S.D = .59). State policies regarding mask mandates also vary (mean = .279; S.D = .454) with slightly more than one-quarter of states having adopted mandates in some form. Racial segregation levels are relatively high (mean = 58.17; S.D = 11.71), but vary considerably across states and range from 37 to 78 in our sample.

The regression models in Table 3 examine [1] the degree to which differences in COVID-19 deaths by race predict mask wearing; [2] this same prediction after adjusting for the presence of a mask mandate; and [3] this same prediction with the addition of mask mandates and state-level racial segregation; as such, the primary predictor of interest in these models was a disparity in racial/ethnic death rates.

The results reported in model 1 examine the association between state mask-wearing practices and race-specific death rate disparities. Results in the first column show that Black-White COVID-19 death rate disparities are marginally inversely related ($b = -.361, p < .10$) to self-reported mask usage. Residents in states with greater Black-White COVID-19 death disparities report lower levels of mask wearing compared to states with lower disparities. Results in the second column of model 1 show that deaths from COVID-19 among Hispanic populations are strongly inversely related ($b = -.888, p < .001$) to self-reported mask usage. Both Black (Adj. $R^2 = .054$) and Hispanic (Adj. $R^2 = .118$) COVID-19 death rates account for a significant share of the variance in model 1.

The results reported in model 2, which examines the association between state mask-wearing practices and race-specific death rate disparities, with controls for state mask mandates, show that this relationship is reduced but remains significant with regard to both Black-White and Hispanic-White death rate disparities. Black-White death rate disparities are marginally inversely associated ($b = -.279, p < .10$) with state mask-wearing practices while Hispanic-White death rate disparities are moderately inversely associated ($b = -.587, p < .05$) with state mask-wearing practices. Thus, even in states with mask mandates, residents in states with higher racial disparities in COVID-19-related deaths report lower levels of mask wearing compared to residents in states with smaller disparities in Black-White and Hispanic-White COVID-19-related deaths. Not surprisingly, the addition of the state mask mandate measure in model 2 substantially increases the variance accounted for in both the Black-White (Adj. $R^2 = .420$) and Hispanic-White (Adj. $R^2 = .418$) equations.

The results reported in the full model (model 4) examining the association between state mask-wearing practices and race-specific death rate disparities, with controls for mask mandates, also include a segregation index as a proxy measure of a state’s structural racial inclusivity. Segregation appears to substantially mediate the relationship between state mask-wearing practices and Black-White death rate disparities, and to partially mediate the relationship between state mask-wearing practices and Hispanic-White death rate disparities.

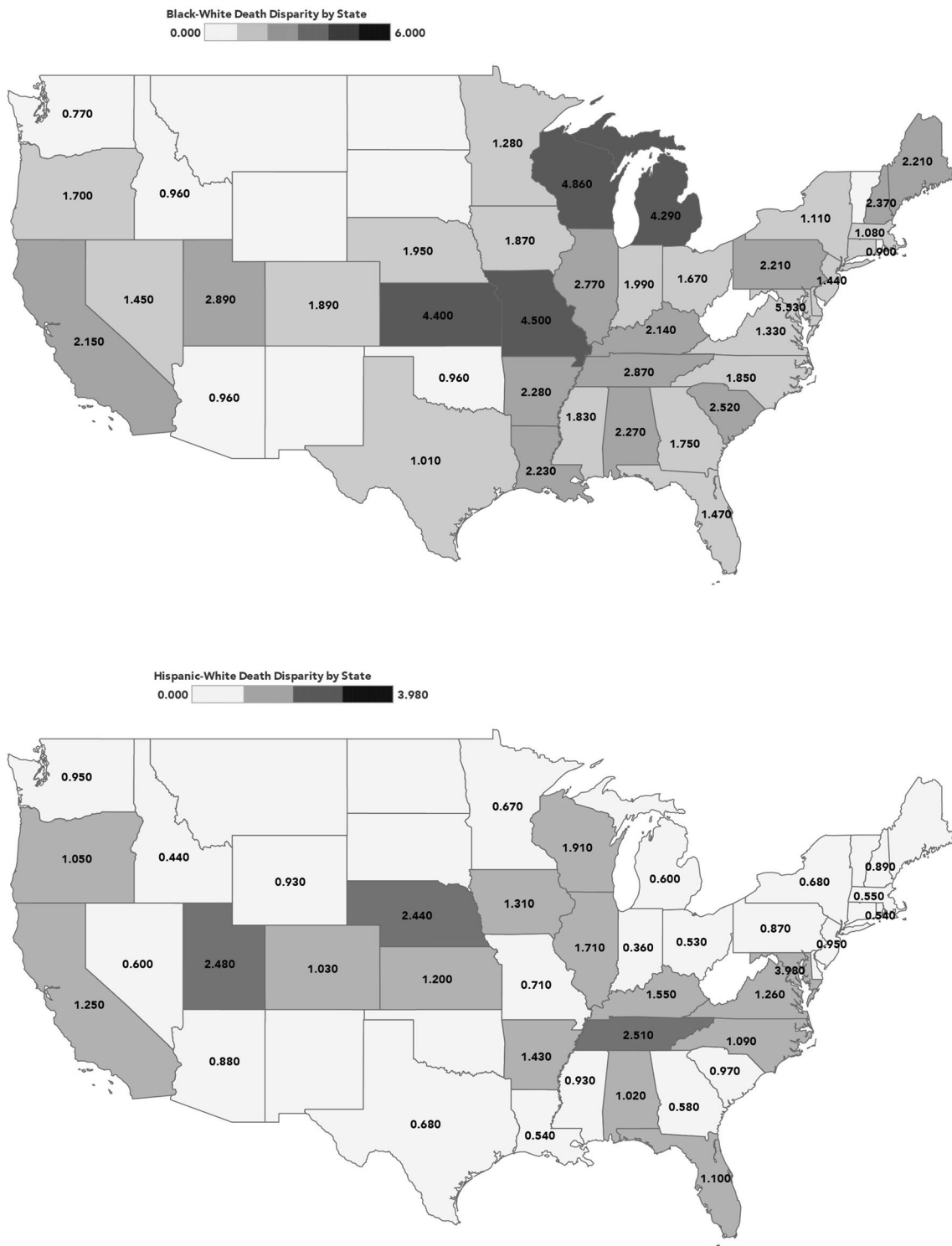


Fig. 1 Racial/ethnic disparity levels by state

When racial segregation (dissimilarity index) is included in the full model, the Black-White death rate disparity measure is no longer significantly associated with state mask-wearing practices. In contrast, including racial segregation in the full model reduces, but does not eliminate, the association ($b=-.446$, $p < .10$) between state mask-wearing practices and

Hispanic-White death rate disparities. The inclusion of the segregation measure in model 3 modestly increases the variance accounted for in both the Black-White ($Adj. R^2 = .453$) and Hispanic-White ($Adj. R^2 = .474$) equations. Mask mandates are clearly the most important determinant of state mask-wearing practices in our analyses.

Table 2 Descriptive statistics for analysis variables

Variable	Mean	S.D
Mask-wearing practices	4.28	1.399
Mask mandates	.279	.454
Black-White Death disparities	1.915	1.068
Hispanic-White Death disparities	.968	.589
Segregation index	58.168	11.706

Discussion

The aim of this study was to understand additional factors that underlie patterns of mask wearing in the midst of the COVID-19 pandemic in the USA. Mask wearing has emerged as a cornerstone of the public health approach to mitigating new infections and deaths from the disease. Still, mask wearing in the USA is uneven and previous studies have mostly focused on the role that political affiliation and ideology play in shaping adherence to this public health recommendation. We explored whether self-reported mask usage in a state is related to COVID-19 death disparities in states, which may serve as a proxy for the level of risk that exists.

Our findings suggest that the percentage of individuals who wear masks is associated with those who are dying from COVID-19 in the state. After controlling for mask mandates, which aim to increase adherence to public health guidelines, mask usage increased when the White death rates relative to Black and Hispanic rates increased. Conversely, individuals wear masks less frequently when Black and Hispanic death rates relative to White death rates are higher. There are two plausible interpretations of these findings that may provide support for two complementary models of how racism shapes COVID-19 outcomes: [1] that Americans do not perceive themselves to be at risk when people of color are dying because US communities are highly segregated by race and [2] because many Americans endorse racial apathy, or at a minimum harbor unconscious implicit biases, they may therefore be less concerned about Black or Hispanic deaths.

Residential segregation persists in the USA as a legacy of institutionalized racism. Many studies document the impact of segregation on wealth accumulation and numerous acute and chronic health conditions such as hypertension, asthma, and infant mortality [31–34]. Residential segregation may shape COVID-19 disparities insofar as chronic diseases, which disproportionately affect Americans of color, and increase vulnerability to morbidity and mortality from COVID-19. But the effects of residential segregation may go even further in damaging public health. If severe and fatal cases of COVID-19 are concentrated in communities of color where many White Americans are not exposed to the severe threat posed by this disease, individuals may be less likely to adopt public health practices, such as mask wearing. Indeed, we find in our study that when controlling for the level of residential segregation in a state, this factor at least partially helps us understand why mask usage may be lower when Black-White and Hispanic-White death rate disparities are more pronounced in a state.

Still, there are likely other factors that are important to consider. In particular, we focus on the persistence of systemic racism, but are unable to directly measure other forms of racism such as racial apathy, or an ambivalence toward policies that are perceived as disproportionately aimed at helping Black or Hispanic Americans [35, 36]. Although this framework has been used to explain support for policies that explicitly focus on racial advancement such as affirmative action, we argue that mask wearing may also be perceived as a race-based policy when deaths are disproportionately concentrated among Black and Hispanic Americans and other people of color. Although our data do not allow us to test this relationship, future research should explore whether racial apathy in particular may be reflected in an insensitivity to Black and Hispanic deaths and a corresponding unwillingness to engage in health-protective behaviors such as mask usage.

Our study has several limitations that are important to consider. First, our use of cross-sectional data does not allow us to assess causality in patterns of mask usage. Second, our use of state-level data does not provide

Table 3 Mask wearing and state racial death disparities

	Model 1		Model 2		Model 3	
	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White
Racial death disparities	-.361†, .197	-.888***, .348	-.279†, .155	-.587*, .287	-.152, .165	-.446†, .280
State mask law, 1=yes			1.890***, .364	1.755***, .373	2.083***, .369	1.994***, .370
Segregation index					-.030†, .016	-.033*, .014
Constant	4.95***, .430	5.14***, .390	4.263***, .361	4.36***, .357	5.752***, .885	6.13***, .845
Adj. R ²	.054	.118	.420	.418	.453	.474

†p ≤ .10; *p ≤ .05; **p ≤ .01; ***p ≤ .001

insight into individual factors that shape mask usage. Finally, we present data from July 2020 when mask usage still varied considerably across the USA [37]. Mask usage continued to rise after this point [38] and as a result varied less between social groups. In addition, the patterns for Black-White and Hispanic-White disparities reflect the specific time period covered in our study. The differences found for Blacks and Hispanics likely reflect the fact that during the early summer of 2020, the eastern and southern states where Black Americans are more concentrated (compared to Hispanics) were also locations where the virus spread most rapidly. As such, patterns of racial disparities changed as different regions of the USA were affected in the third surge of COVID-19 during winter of 2021.

Conclusions

Public health scholars and practitioners have been active in recent years in demonstrating the pernicious effects of racism on public health. Most of this focus has been on structural racism and its impact on numerous social determinants of health. Our study provides evidence that the persistence of anti-Black and anti-Hispanic attitudes in the USA must be included in efforts to identify and address racism in the USA. These attitudes not only shape support for policies that stand to redress long-standing racial/ethnic health disparities [39, 40], but may also help us understand resistance to public health measures, such as mask wearing, during the COVID-19 pandemic. Disparities in morbidity and mortality in the context of the novel coronavirus pandemic have brought to the forefront a much older and more enduring public health crisis: racial discrimination. Exploring and addressing the structural and individual context of racism in the USA will help us improve public health and better prepare for the public health challenges to come.

Availability of Data and Materials All data for this study are publicly available.

Code availability Not applicable.

Author Contribution JHB led the conceptualization of the study, the methodological approach, and formal analysis of the data. BF and AM prepared the original draft. All authors reviewed, edited, and gave final approval for the manuscript.

Declarations

Ethics Approval and Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The authors declare no competing interests.

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