

Do Black Lives Matter in the American Public's Mitigation Responses to the Covid-19 Pandemic? A Cross-Sectional Analysis of Mask Wearing and Racial/ethnic Disparities in Deaths from COVID-19 in the United States

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Abstract

Background: Anti-black and anti-Hispanic attitudes in the U.S. must be included in efforts to understand resistance to public health measures, such as mask wearing, during the COVID-19 pandemic. Focusing on the structural and individual context of racism will enable us to improve public health and better prepare for future public health challenges. The purpose of this study was to determine the relationship between mask usage, 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 the 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.

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 U.S. has proved controversial and selectively adopted.

In June of 2020, a national poll found that less than two-third of Americans agreed that it was important to wear a mask⁸ and only a slightly higher percentage (73%) of Americans stated that they had worn a mask in a public setting.⁹ Researchers have sought to uncover political, social, and cultural factors that shape mask usage, finding that political affiliation and voting patterns shape adherence to public health guidance regarding masks.^{8,10} Other studies have extended this work, finding that following specific news sources is associated with knowledge and perceptions of COVID-19¹¹ which shape mask usage and efforts to socially distance.¹² Adoption of mask wearing has not only been mixed in the U.S., it has also led to contentious public debates about mask mandates which are believed by some to infringe on civil

liberties. Further contributing 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

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 to understand when and in what contexts Americans feel compelled to wear masks specifically and follow public health guidance more generally. It is plausible, for example, that reasons for refusing to wear a mask may differ by race or ethnicity. While some White Americans contend that mask requirements 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 epitomized by 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

Because severe COVID-19 cases and associated deaths have been concentrated in communities of color in the U.S., 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,²⁰ 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. This in turn, may be associated with individuals’ decisions to wear masks to protect others around them. There is compelling evidence that contemporary forms of racism such as color-blind racism or racial apathy are common among white Americans.^{21,22} It is important to consider, therefore, whether White Americans may not be as motivated to wear masks if this practice is perceived primarily as helping nonwhite Americans. 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”.²³ In this study, accordingly, we ask whether decisions to wear masks 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 self-reported mask wearing behaviors and was

measured by the Institute for Health Metrics and Evaluation at the University of Washington.²⁴ State Mask Mandate indicates whether a state-level mask wearing mandate had been adopted as of July 20, 2020.²⁵ Racial Segregation data is based on a Dissimilarity Index, produced by the U.S. Census bureau where Black-White segregation levels range from 0-100, with 100 being the most spatially segregated by race.²⁶

Our focal independent variables are Black-White and Hispanic-White disparities in racial death rates. To construct indices of racial disparities in COVID-19 deaths we draw on data from the Kaiser Family Foundation's State COVID Racial Data Tracker²⁷ including COVID-19 deaths through July 21st, 2020. The racial death disparity index reflects the ratio of Black or Hispanic death rates to White death rates in each state. If the death rates for Blacks or Hispanics in a particular state is identical to the death rate for Whites, the racial death disparity index will equal unity or 1.0. Racial death disparity index values less than unity 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 states COVID-19 death counts. Table 1 reports Black-White and Hispanic-White racial death disparities. Black-White racial disparities in death rates are widespread across all regions of the US (Fig. 1).

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 |
| States with Black / Hispanic Overrepresentation (Disparity Index > 1.00) highlighted in Bold | | |

| State | Black-White Death Disparity | Hispanic-White Death Disparity |
|--|-----------------------------|--------------------------------|
| 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 | | |

While racial disparity levels vary, Black death rates, relative to White death rates are overrepresented in 36 states and Hispanic death rates, relative to White death rates are overrepresented in 18 states.

Results

Table 2 provides descriptive statistics for all analysis variables. The focal outcome measure - state mask wearing - shows considerable variation in how often respondents report wearing masks (Mean = 4.22; S.D = 1.33). Our primary predictor variables – racial disparities in COVID-19 deaths – varies 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.

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 |

The regression models reported in Table 3 examine the effect of race-specific death rate disparities (Black-White and Hispanic-White) without any other covariates (Model 1); after adjusting for state mask mandates (Model 2); and after adjusting for state level racial segregation in the full model, including all covariates (Model 3). As such, the primary predictor of interest in these models was the race-specific death rate disparities.

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† | -.888*** | -.279† | -.587* | -.152 | -.446† |
| State Mask Law 1 = Yes | | | 1.890*** | 1.755*** | 2.083*** | 1.994*** |
| Segregation Index | | | .364 | .373 | .369 | .370 |
| | | | | | -.030† | -.033* |
| Constant | 4.95*** | 5.14*** | 4.263*** | 4.36*** | 5.752*** | 6.13*** |
| | .430 | .390 | .361 | .357 | .885 | .845 |
| Adj. R ² | .054 | .118 | .420 | .418 | .453 | .474 |
| † p ≤ .10; * p ≤ .05; ** p ≤ .01; *** p ≤ .001 | | | | | | |

The results reported in Model 1 examine the association between state mask wearing practices and race specific death rate disparities without controls. Results in the first column show that state Black-White death rate disparities are marginally inversely related ($b = -.361$, $p < .10$) to residents' mask wearing practices. Residents in states with greater Black-White disparities in the incidence of COVID-19 related deaths report lower levels of mask wearing compared to mask wearing among residents in states with smaller Black-White disparities in COVID-19 related deaths. Results in the second column of Model 1 show that Hispanic-White death rate disparities are strongly inversely related ($b = -.888$, $p < .001$) to state mask wearing practices. These results suggest that 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. Both Black-White (Adj. $R^2 = .054$) and Hispanic-White (Adj. $R^2 = .118$) COVID-19 disparities account for a significant share of the variance in state mask wearing practices 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. Mask mandates clearly account for a significant share of the variance in state mask wearing practices in Model 2.

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 racial (cultural and structural) 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. 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.

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 United States. 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 United States 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 decisions to wear a mask may be shaped by perceptions of risk generally and in particular whether COVID-19 was affecting specific racial/ethnic groups.

Our findings suggest that individual decisions to wear masks are associated with state level racial death rate disparities. 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. We believe that these findings 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 U.S. 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 U.S. as a legacy of institutionalized racism. Many studies document the impact of segregation on wealth equality and numerous acute and chronic health conditions such as hypertension, asthma, and infant mortality.²⁸⁻³¹ Residential segregation may shape COVID-19 disparities insofar as chronic diseases increases vulnerability to morbidity and mortality from this novel virus, 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 Americans and especially 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 the negative relationship between mask usage and Black-White and Hispanic-White death rate disparities in a state.

Still, there are likely other factors that are important to consider. In particular, we focus on the persistence of contemporary forms of racism that take the form of racial apathy, or an ambivalence toward policies that are perceived as disproportionately aimed at helping Black or Hispanic Americans.^{32,33} 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. In other words, racism may be reflected in an insensitivity to Black and Hispanic deaths and a corresponding unwillingness to engage in health protective behaviors.

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 insight into individual factors that shape mask usage. Finally, we present data from July 2020 when mask usage still varied considerably across the U.S. Mask usage has since risen considerably and may be less strongly associated with social factors as the pandemic has progressed. In addition, the patterns for Black-White and Hispanic-White disparities reflects 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 U.S. were affected in the third surge of COVID-19 during Winter 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 U.S. must be included in efforts to identify and address racism in the U.S. These attitudes not only shape support for policies that stand to redress long-standing racial/ethnic health disparities,^{34,35} but may 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 U.S. will help us improve public health and better prepare for the public health challenges to come.

Declarations

Ethics approval and consent to participate.

Not applicable.

Consent for publication.

Not applicable.

Availability of data and materials.

All data for this study are publicly available.

Competing interests.

The authors declare that they have no competing interests.

Funding.

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Authors' contributions.

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.

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Figures

Image not available with this version

Figure 1

Black-White racial disparities in death rates are widespread across all regions of the US (Figure 1).