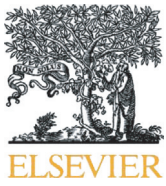




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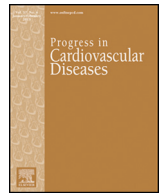
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Racial and ethnic disparities in cardiometabolic disease and COVID-19 outcomes in White, Black/African American, and Latinx populations: Social determinants of health

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ABSTRACT

Racial and ethnic-related health disparities in the United States have been intensified by the greater burden of Coronavirus Disease 2019 (COVID-19) in racial and ethnic minority populations. Compared to non-Hispanic White individuals, non-Hispanic Black and Hispanic/Latinx individuals infected by COVID-19 are at greater risk for hospitalization, intensive care unit admission, and death. There are several factors that may contribute to disparities in COVID-19-related severity and outcomes in these minority populations, including the greater burden of cardiovascular and metabolic diseases as discussed in our companion review article. Social determinants of health are a critical, yet often overlooked, contributor to racial and ethnic-related health disparities in non-Hispanic Black and Hispanic/Latinx individuals relative to non-Hispanic White individuals. Thus, the purpose of this review is to focus on the essential role of social factors in contributing to health disparities in chronic diseases and COVID-19 outcomes in minority populations. Herein, we begin by focusing on structural racism as a social determinant of health at the societal level that contributes to health disparities through downstream social level (e.g., occupation and residential conditions) and individual level health behaviors (e.g., nutrition, physical activity, and sleep). Lastly, we conclude with a discussion of practical applications and recommendations for future research and public health efforts that seek to reduce health disparities and overall disease burden.

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Abbreviations: CDC, Centers for Disease Control and Prevention; COVID-19, coronavirus disease 2019; CV, cardiovascular; CVD, cardiovascular disease; ICU, intensive care unit; PA, physical activity; SARS-CoV-2, severe acute respiratory syndrome coronavirus-2; US, United States.

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By the end of December 2021, more than 280 million people worldwide, including over 50 million Americans, tested positive for Coronavirus disease 2019 (COVID-19), an illness caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).¹ In the United States (US), there is a disproportionate burden of COVID-19 in racial and ethnic minorities, specifically in non-Hispanic Black and Hispanic/Latinx populations. Compared to non-Hispanic White individuals, there are greater risks for hospitalization, intensive care unit admission, and death in non-Hispanic Black and Hispanic/Latinx individuals afflicted by COVID-19.^{2–4} Moreover, the largest documented absolute increase in excess mortality, defined as the increase in all-cause mortality relative to expected mortality, during the COVID-19 pandemic has been observed in the US.⁵ Although the reported numbers of cases and deaths can be strongly affected by testing capacity and reporting policy,⁵ the age-standardized excess death rates in non-Hispanic Black and Hispanic/Latinx individuals greatly exceed those in non-Hispanic White individuals in the US.⁶

The mechanisms underlying racial and ethnic-related disparities in COVID-19 severity and outcomes are complex (see Fig. 1). However, as described in our companion review article,⁷ it is clear that a greater prevalence of cardiometabolic disease, and the associated pathophysiological manifestations, for which non-Hispanic Black and Hispanic/Latinx individuals have a higher prevalence substantially increases the risk for severe COVID-19 infection and death. The overarching purpose of this review is to describe the role played by social determinants of health in contributing to racial and ethnic differences in cardiometabolic disease and worse COVID-19-related health outcomes. We also highlight how the COVID-19 pandemic has exacerbated the racial and ethnic divide pertaining to social determinants of health. Then, we conclude with evidence-based recommendations for public health policy that seek to address social factors contributing to these health disparities.

Social factors contributing to disparities in chronic disease and COVID-19

In the US, racial and ethnic differences in socioeconomic status, education and occupation, and environmental exposures collectively contribute to many health disparities, and the acknowledgement of these inequities has been magnified during the COVID-19 pandemic.^{8,9}

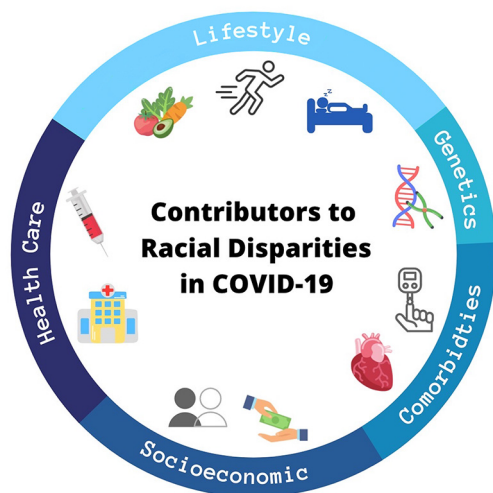


Fig. 1. Illustration of the multifactorial etiology of racial disparities in COVID-19 health outcomes. Though overlap among these factors exists, lower socioeconomic status and segregation/discrimination, inequities in healthcare and vaccine status, health behaviors, (epi) genetic and environmental variation, and an increased burden of comorbidities such as cardiovascular and metabolic disease synergize to increase the prevalence and severity of COVID-19 among racial and ethnic minorities. This figure is also used in our companion paper.⁷ Reused with permission.

Herein, we will review social determinants of health that influence chronic disease at the societal level (e.g., structural racism, which provides a contextual framework), social level (e.g., occupation and residential conditions), and individual level [i.e., health behaviors such as nutrition, physical activity (PA), and sleep] (see Fig. 2).

Public policy, economics, and racism are all societal level factors that affect health. Racism is a social construct that uses race, nationality, ethnicity, and other markers of social position to establish, maintain, and justify differential access to resources and opportunities in society.⁸ The US has a history of chattel slavery and Jim Crow era policies, as well as racial terrorism which provides the backdrop for socioeconomic inequities.^{8,9} In recent history, structural racism, as opposed to overt acts of racism on an individual level, has had the most deleterious effect on health and perpetuation of health inequities.⁹ Structural racism encompasses laws (local, state, and federal), policies and practices, institutions that dictate the economic system, as well as cultural and social norms within a society that provide advantages to racial and ethnic groups deemed as superior, or that in aggregate have higher status.⁹ By providing advantages to certain groups, structural racism also acts to place other groups at a disadvantage.⁹ For example, in the US, neighborhood environments are shaped by institutional and structural racism.^{9–11}

Enacted through federal and local policies and reinforced by real estate practices, such as redlining and racialized violence, racial residential segregation played a large role in shaping the US throughout most of the 20th century.¹² Intentional racial residential segregation arranged the spatial distribution of economic, educational, and environmental characteristics of neighborhoods to advantage White families and disadvantage Black and brown families.¹² In the 1930s, the Home Owners' Loan Corporation (HOLC) commissioned maps to guide home lending institutions.^{12,13} On these maps, the HOLC assigned grades to residential neighborhoods that reflected their “mortgage security” which was largely influenced by the racial composition of the neighborhood inhabitants.^{12,13} The HOLC map would then be visualized using color-coding. Neighborhoods designated as undesirable for lenders received a grade of “D” and were designated as red (i.e., redlining).^{12,13} While the Fair Housing Act of 1968 ended legal racial residential segregation, the legacy of racial discrimination in housing policies has contributed to significant racial disparities in neighborhood environments and resources that persist today.^{12,13}

Contemporary Black Americans are still more likely to experience housing discrimination, continue to face substantial wealth inequality, and are more likely to experience poverty compared to non-Hispanic White Americans.^{14,15} Additionally, non-Hispanic Black Americans are more likely to live in disadvantaged neighborhoods with greater adverse environmental pollution exposure¹⁶ and face higher rates of evictions than non-Hispanic White families.¹⁷ Collectively, these factors contribute to a higher allostatic load that underlies disparities in chronic disease and COVID-19 disease burden.¹⁸ For example, residents in historically redlined areas of several large American metropolitan areas, compared to residents in non-redlined areas, are more likely to be racial and ethnic minorities, have lower household income, and lack health insurance.¹⁹ Residents of these neighborhoods are also more likely to have poor health outcomes such as asthma and obesity.¹⁹ Recent data from the Centers for Disease Control (CDC) indicate that compared to non-Hispanic White adults, non-Hispanic Black adults have a lower probability of survival from age 35 to 75 years for both males (14% lower) and females (9% lower), and that residential segregation is strongly associated with this survival gap.¹⁰ Moreover, this association was partly explained by socioeconomic inequality, suggesting that reductions in segregation and socioeconomic inequities would attenuate the survival gap.¹⁰ Of relevance to COVID-19, in New York City, historically lowly-graded neighborhoods (using historic HOLC data) that are comprised of a greater proportion of racial/ethnic minorities exhibited a higher risk for COVID-19 infection even if they were not currently economically disadvantaged.¹³ Related to education, socioeconomic status,

Social Determinants of Health

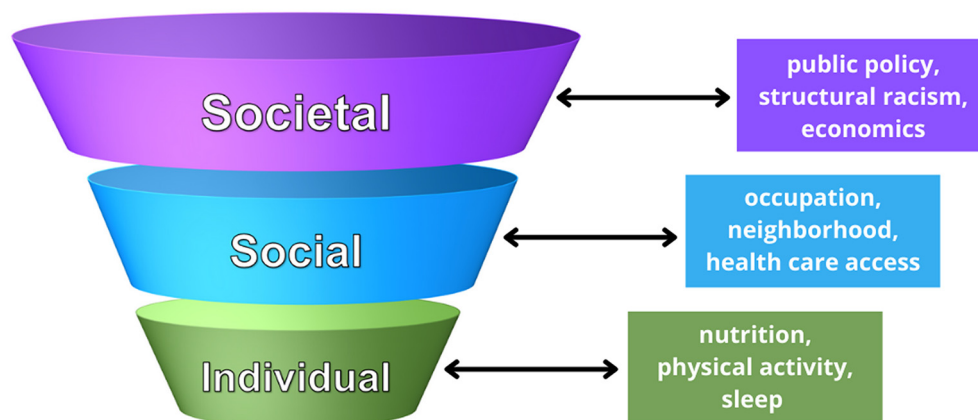


Fig. 2. Illustration of a multiple-tiered framework of social determinants of health. At the macro level are societal level factors such as public policies and the economy. Next, there are social level factors such as occupation and residential conditions. Lastly, factors such as nutrition, physical activity, and sleep are seen as health behaviors attributable to the individual but are actually influenced heavily by social and societal level factors.

and place of residence are job opportunities, access to healthcare and resultant perceptions about healthcare, and health behaviors, all of which play a role in disparities in chronic disease and COVID-19 outcomes.

Employment and COVID-19 risks

One of the commonly discussed factors for racial and ethnic disparities during the COVID-19 pandemic has been jobs. The history and contemporary effects of structural racism in the US has contributed to our labor force being highly inequitable. Essential workers (e.g., grocery store workers, mass transit employees, factory laborers) not employed in the health sector (e.g., physicians and nurses) generally include racially diverse, low-wage employees whose jobs require close interaction with the public and/or working in close proximity to their coworkers without adequate safety precautions.^{20,21} Collectively, these conditions place these essential workers at increased risk of infection compared to white-collar workers who were able to work remotely during the pandemic.²⁰ For additional context, Asian and non-Hispanic White frontline workers are often overrepresented in high-risk jobs (e.g., physicians and nurses) while Black and Latinx frontline workers are generally underrepresented in these jobs.²¹ Yet, these jobs provide more autonomy in workplace decision-making inclusive of taking safety measures that comply with COVID-19 public health recommendations (e.g., personal protective equipment and adequate quarantining when sick). Hispanic/Latinx and non-Hispanic Black frontline workers are overrepresented in jobs with lower occupational status (e.g., grocery store and restaurant workers).^{21,22} Of relevance to Hispanic/Latinx populations in the US, undocumented immigrant workers are largely overrepresented in the most dangerous, hazardous, and otherwise unappealing jobs in the country (e.g., farm and factory labor, non-unionized construction jobs).²² Even prior to COVID-19, undocumented workers were under-compensated for employment in hazardous settings, working in jobs with high fatality, toxic materials, or exposure to heights.²³

Workers in low occupational status jobs had less control and decision-making ability over how their workplaces were run even prior to COVID-19, but the consequences of this lack of autonomy have been magnified during the pandemic.²⁰ The combination of close interaction with the public and/or working in close proximity to their coworkers and inadequate personal protective equipment and/or sanitation or distancing measures presumably leave these employees at greater risk for contracting COVID-19.^{20,24} One recent review

demonstrated that low occupational status essential (i.e., non-healthcare sector) workers were indeed at greater risk of COVID-19 infection and experienced a higher case fatality rate than others in their surrounding community.²⁴ Several occupational sites became 'super-spreaders', due to an inability to socially distance at work and high contact rates among workers.²⁴ For example, there were highly publicized reports of hundreds to thousands of cases of COVID-19 in meatpacking plants and factories.²⁵ Specific to disparities faced by immigrants in the occupational setting during COVID-19, Hispanic/Latinx male workers have the largest overrepresentation in low occupational status jobs associated with the closest physical proximity to others (e.g., carpenters, roofers, and jobs related to food preparation).²¹ Hispanic/Latinx female workers have the largest overrepresentation in low occupational status jobs associated with high infection risk (e.g., maids and other janitorial/cleaning jobs).²¹ Thus, it is likely that many of these workers faced the decision to risk getting sick or being unable to support their families.²⁶ Additional work-related factors, such as limited personal protective equipment and the objective and perceived failures of employers to provide safety measures to reduce risk of exposure left many essential workers at increased risk of "moral injury" in addition to increased risk of COVID-19 infection.²¹

COVID-19 perception

Another important factor contributing to disparities in COVID-19 outcomes includes disparities in vaccination rates (Fig. 1). Recent data from the CDC indicate that as of May 2021, 48.3% of persons ≥ 16 years had received ≥ 1 COVID-19 vaccine dose and 38.3% were fully vaccinated. Vaccine coverage with ≥ 1 dose was lower among non-Hispanic Black (40.7%) and Hispanic/Latinx individuals (41.1%) than among non-Hispanic White individuals (54.6%) or non-Hispanic Asian individuals (57.4%).²⁷ Interestingly, there are documented racial/ethnic disparities in fear and perceptions surrounding COVID-19 and with vaccine hesitancy.²⁸ Indeed, survey data from early in the pandemic indicated that non-Hispanic Black individuals were more likely than non-Hispanic White individuals to believe the pandemic would not end by Summer 2020, more likely to think they would need medical care if infected, and more likely to think they would need to be hospitalized.²⁸ Black individuals were also more likely than any other race to feel a need to protect their family from COVID-19, and Hispanic/Latinx individuals were more fearful than White individuals of catching COVID-

19 in public places.²⁸ After reports of emergency department visits declining by 42% early during the COVID-19 pandemic,²⁹ the American Heart Association started the *Don't Die of Doubt* campaign.³⁰ The campaign survey data indicated that Black and Hispanic/Latinx individuals were substantially more likely than White individuals to report that they were scared to go to the hospital, even if they thought they were having a heart attack or stroke, due to fears of contracting COVID-19.³⁰

Psychometric data indicate that although non-Hispanic Black and Hispanic/Latinx individuals may have experienced greater fear and anxiety pertaining to the pandemic, they also have greater distrust in the healthcare system, which could contribute to vaccine hesitancy. The issue of racial and ethnic differences in vaccine hesitancy and mediating factors such as education and socioeconomic status has been reviewed at length elsewhere.^{31,32} Another important consideration to disparities in vaccination rates is the issue of structural racism and vaccine access. For example, reported levels of vaccine hesitancy are similar in Hispanic/Latinx adults compared to non-Hispanic White adults,³² yet issues such as inadequate placement of vaccine clinics in minoritized communities, transportation barriers, language barriers, less access to technology, and concerns surrounding immigration and discrimination are several of the barriers that have been discussed as contributors to disparities in vaccination rates.^{33,34}

Hospital care

One potential factor that may be contributing to broad disparities in COVID-19 outcomes (i.e., not just racial or ethnic health disparities) is hospital care. Healthcare worker-to-patient ratios and availability of resources, such as hospital beds, ventilators, and certain medications (e.g., remdesivir, monoclonal antibodies) all can influence health outcomes. For example, in a multicenter study of over 2,000 patients with COVID-19 in 65 ICUs across the US, mortality rates varied widely from 7% to 81% with patients admitted to hospitals, and fewer ICU beds was associated with increased risk of death.³⁵ The odds ratio of mortality for patients admitted to hospitals with fewer than 50 ICU beds compared to those with ≥ 100 ICU beds was 3.28 (95% CI, 2.16–4.99).³⁵ Another investigation reported that after adjustment for age, sex, and comorbidities, the odds ratio for in-hospital death was 1.46 (95% CI, 1.07–2.00) in hospitals in the highest quintile of burden compared to all other quintiles.³⁶ Notably, in the sensitivity analyses for this investigation after adjusting for race and household-size adjusted income, COVID-19 burden was no longer associated with in-hospital mortality.³⁶ Collectively the findings suggest that surges in COVID-19 patient volume may be associated with excess mortality.³⁶

There are data indicating that disparities in general healthcare utilization are related to both an individual's racial and ethnic identity and the racial and ethnic composition of their communities.³⁷ However, the data on hospital status contributing to racial health disparities is unclear. In one investigation, after adjustment for clinical and socio-demographic patient characteristics, non-Hispanic Black patients were more likely to die or to be discharged to hospice (odds ratio, 1.11; 95% CI, 1.03–1.19), though this difference became indistinguishable when adjustment was made for the hospitals where care was delivered (odds ratio, 1.02; 95% CI, 0.94–1.10).³⁸ Importantly, sociodemographic and underlying health conditions contribute to COVID-19 outcomes including hospitalization. For example, factors such as high population density, age, sex, obesity, type 2 diabetes, and kidney disease have been associated with need for hospitalization. In one investigation, after covariate adjustment, non-Hispanic Black patients were 70% more likely to be hospitalized than non-Hispanic White patients, but no significant race differences were observed in ICU admission and mortality.³⁹ Among nearly 10,000 patients hospitalized with COVID-19 infection in New York City, non-Hispanic Black patients were less likely than non-Hispanic White patients to have severe illness and to die or be discharged to hospice.⁴⁰ Another study of critically ill patients admitted to the hospital in Atlanta found rates of intubation, ICU length

of stay, and overall mortality were similar between non-Hispanic Black and White patients.⁴¹ At present, it appears that additional data are needed to determine whether differences in hospital care play a role in racial disparities in COVID-19.

Health behaviors

Racial differences in socioeconomic, educational, and environmental factors collectively contribute to many health disparities, including cardiovascular (CV) disease (CVD) and obesity.^{42,43} The link between these social determinants and chronic disease may, in part, be explained by disparities in health-promoting behaviors, such as sleep, PA, and diet. For instance, there are data indicating that although the maintenance of positive health behaviors is low among non-Hispanic White and non-Hispanic Black adults, when compared to non-Hispanic White adults, fewer middle-aged non-Hispanic Black adults maintain positive health behaviors.⁴⁴ Further illustrating the importance of health behaviors for minority health are data exhibiting the protective effect of maintaining multiple dimensions of a healthy lifestyle. The American Heart Association's *Life's Simple 7* is defined as the seven risk factors that people can improve through lifestyle changes. Recent data suggest that Black individuals who maintain six of the seven in optimal ranges are 90% less likely to develop incident hypertension compared to those who maintain zero or one of the seven.⁴⁵

Several epidemiologic studies demonstrate minorities (in most studies non-Hispanic Black adults) exhibit a higher prevalence of short or disordered sleep.^{46–48} Recent data using several sleep dimensions in the Multi-Ethnic Study of Atherosclerosis study demonstrates both Hispanic/Latinx and Black adults are more likely to have poorer sleep compared to White adults.⁴⁹ Notably, Black-White differences in sleep exist even in younger college-aged adults.⁵⁰ There are also data demonstrating neighborhood disadvantage mediates some of the racial disparities in sleep.^{50,51} For instance, the neighborhood built (e.g., housing size/crowding) and social environment (e.g., cohesion, safety) both contribute to sleep.^{52–54} Poor sleep has been linked to increased CV reactivity, indicating impairments in autonomic control of blood pressure.^{55–57} Poor sleep quality and experimentally-induced sleep restriction are also associated with impaired endothelial function^{58–60} as well as arterial stiffness and wave reflections.^{61,62} Short sleep duration and sleep regularity are also linked to obesity and metabolic syndrome through numerous mechanisms including appetite dysregulation, impaired glucose tolerance, and insulin resistance.^{63–65} Survey-based studies demonstrate that racial/ethnic minorities self-report less exercise than non-Hispanic White individuals, with differences becoming more pronounced in middle adulthood.⁶⁶ For example, Hispanic/Latinx adults engage in significantly less leisure time PA compared to non-Hispanic White adults, but there is also significant variability among sub-groups of Hispanic/Latinx adults.^{67,68} Both leisure time PA and high cardiorespiratory fitness reduce the risk of CVD.^{69–72} Recent data also suggest that sport/exercise-related PA is protective against incident hypertension among non-Hispanic Black adults.⁷³ There are documented racial disparities in proximity to recreational facilities, public parks, and safe outdoor spaces for leisure PA, which may contribute to disparities in PA and exercise engagement.^{74–76}

Pertaining to diet and race/ethnicity, disparities in income are linked to an increased likelihood of diets containing high-fat, energy dense foods, meat, and fried food in minority households,^{77,78} and educational inequality may have an even greater influence on diet quality and disease risk.⁷⁹ Studies at the national and local level across the US demonstrate that predominately low-income, minority, and rural neighborhoods are more likely to have poor access to supermarkets and healthful food, while also having a higher relative access to fast-food restaurants and energy-dense foods (e.g., snack foods in convenience stores).^{80,81} Large datasets including the National Health and Nutrition Examination Survey indicate racial disparities in fruit and vegetable intake, dairy products, and fiber (e.g., whole grains).^{78,82–86} Taken together, poorer

sleep and diets, in concert with lower levels of leisure time PA in non-Hispanic Black and Hispanic/Latinx individuals⁸⁷ summate to increase the likelihood of positive energy balance and excess body weight. Taken together the disparities in health behaviors and energy balance contribute to compromised metabolic health, and increased CVD risk as described in our companion review article.⁷ The differences in these health behaviors also pose a large public health challenge as they can likely be linked back to structural racism and racial residential segregation.^{10,18,19} For instance, there are documented racial disparities in proximity to healthful food options,^{80,81,88} and safe recreational spaces.^{74–76} Moreover, these challenges may be magnified further by the COVID-19 pandemic. One example includes data indicating racial disparities related to increased insomnia symptoms during the pandemic, largely due to concomitant disparities in income loss and COVID-19 diagnoses within the socio-familial network.⁸⁹ There have also been concerns surrounding social isolation and reduced PA during the pandemic and how the reduced PA may influence disparities.⁹⁰ Additionally, COVID-19 has been associated with greater food insecurity, particularly in those who were already in financially precarious situations.⁹¹ These unique challenges could further exacerbate disparities in health behaviors and subsequent health outcomes in the future if not addressed. Thus, there is a clear, critical, and urgent need for public health policies, from the societal to the individual level, addressing disparities in social determinants of health to offset the increased risk for morbidity and mortality among minority groups.

Conclusion

In summary, non-Hispanic Black and Hispanic/Latinx individuals are facing an inequitable burden of chronic disease and COVID-19 characterized by greater disease severity and an increased risk for mortality. Though contributors to this racial disparity in COVID-19-related health outcomes are numerous (Fig. 1), inspection of existing literature on the current state of chronic disease in the US highlights the fundamental contribution of a greater prevalence of pre-existing conditions, and specifically CVD and cardiometabolic diseases, in influencing the trajectory of COVID-19-related health outcomes among non-Hispanic Black and Hispanic/Latinx individuals. Social determinants of health seem to account for much of these disparities in chronic disease and COVID-19-related outcomes, highlighting the importance of scientific efforts for improved understanding of how social determinants of health impact physiology, and subsequent action by public policy to address these disparities.

We conclude that the racial and ethnic divide in social determinants of health has been amplified as demonstrated by striking disparities in COVID-19 health outcomes. In the US, structural racism, defined as the collective of ways in which society promotes racial discrimination, perpetuates inequities in education, income potential and access to jobs, housing availability, access to healthcare and medical information, and health behaviors (e.g., diet, exercise, and sleep).⁹ Residential segregation and racial division in access to jobs increase the likelihood of contracting COVID-19 in racial/ethnic minorities, and this inequity is intensified by lower vaccination rates in non-Hispanic Black and Hispanic/Latinx populations. Lower vaccine coverage in racial and ethnic minorities not only increases likelihood of infection, but also increases risk for developing severe COVID-19 symptoms, a problem that may be amplified by disparities in healthcare. Downstream of these societal level factors, racial disparities in individual level health behaviors such as diet, PA, and sleep increase risk for CVD and cardiometabolic diseases as well as severe COVID-19 among non-Hispanic Black and Hispanic/Latinx populations.⁷

Despite the well-acknowledged role of social determinants of health as a principal contributor to racial health disparities, public health policy, at the present, has inadequately addressed these underlying issues. If there is a silver lining of the COVID-19 pandemic, it may be the increased awareness of this public health crisis, which presents a unique

opportunity for corrective actions and evidence-based decision making. Even with the presumption that social determinants of health are the fundamental driver of racial/ethnic health disparities, policies to address social determinants of health will take significant political will and time to legislate and act upon. Thus, an improved understanding of the physiological basis for racial and ethnic disparities in chronic disease may aid in the development of novel and effective therapeutic strategies that help to alleviate disease burden.⁷ As an example, non-Hispanic Black adults have the highest rates of hypertension in the US and are less likely to consume adequate dietary potassium.⁹² The Dietary Approaches to Stop Hypertension (DASH) diet is effective at reducing blood pressure due to its high fiber, potassium, and phytonutrient content. However, many non-Hispanic Black Americans do not have equitable access to fresh fruits and vegetables. Thus, using novel implementation strategies, such as free or reduced-cost food box subscriptions, free community nutrition workshops, and digital health cooking demos may help to improve dietary quality and blood pressure. Another low cost and potentially viable strategy would be to use vitamin D supplementation in individuals with highly melanized skin which may help to curb disparities in Vitamin D deficiency, which have been shown to mediate racial disparities in vascular function⁹³ and may increase risk for severe COVID-19.⁹⁴ Related to evidence for impaired glycemic control in non-Hispanic Black and Hispanic/Latinx individuals, prioritizing regular PA and reducing prolonged sitting with intermittent bouts of light- or moderate-intensity movement could help to attenuate this disparity.⁹⁵

In the midst of many uncertainties surrounding the COVID-19 pandemic, a figurative light has been shed on the definitive inequity in the state of chronic disease that is contributing to worse health outcomes in racial and ethnic minorities. While we don't know how long the COVID-19 pandemic will last, we can be assured that effective efforts to promote health equity across racial/ethnic groups will help to reduce disparities in COVID-19 health outcomes and chronic disease beyond the COVID-19 pandemic. Of particular interest are policy strategies to address social determinants of health (e.g., access to jobs and education, safe housing) and culturally appropriate implementation strategies to promote health behaviors such as eating a healthful diet, increasing exercise, and obtaining sufficient sleep.

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Declaration of Competing Interest

None.

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