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### Perspective

## COVID-19, Obesity, and Structural Racism: Understanding the Past and Identifying Solutions for the Future

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#### **SUMMARY**

Long-standing systemic inequalities—fueling unequal access to critical resources such as healthcare, housing, education, and employment opportunities—are largely responsible for the significant race disparities in obesity and COVID-19. Because of this legacy, public health emergencies like the COVID-19 pandemic disproportionately impact communities of color, exacerbated by high rates of pre-existing chronic diseases like obesity. Learning from this history is instructive for understanding our present situation and for crafting effective solutions that promote health equity. Critical action is needed now to meaningfully address the disproportionate impact of these major public health problems on Black and Brown populations.

#### INTRODUCTION

The COVID-19 pandemic has collided head on with the obesity epidemic. News outlets around the world have run headlines about how having obesity increases the risk of symptomatic infection, hospitalization, and even death from the COVID-19 virus (Popkin et al., 2020). While true, that tells only part of the story. The whole truth is that the relationship between the COVID-19 virus and obesity-and the disproportionate impact of both these diseases among Black and Brown populationsis simply another example of the consequences of long-standing structural racism. History teaches us that, from the earliest existence of Blacks in the US, health disparities are not by chance but by design. They are a direct result of intentional policies that limit access to care or create social circumstances that increase risk of disease. Understanding this history and our current context can help to unpack the root causes of the disparate effects of the twin pandemics of COVID-19 and obesity in order to craft meaningful policy responses, especially as the United States is becoming increasingly diverse.

But first, it is helpful to define the problem.

#### **DISPARITIES IN OBESITY**

Obesity is one of the most significant public health problems of the 21st century. Excess body weight is associated with numerous negative health, psychological, and economic consequences (Wang et al., 2011; Kopelman, 2000; Puhl and Heuer, 2010; Finkelstein et al., 2005). Over 40% of the US adult population has obesity (Hales et al., 2020), and this is expected to be half by 2030 (Ward et al., 2019). A fifth of American children have obesity (Hales et al., 2017) and a majority will have obesity by the time they are 35 (Ward et al., 2017). Obesity disproportionately affects lower-income and minority populations (Ogden

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et al., 2010). Within race groups, Black, Latinx, and Native American adults have a much higher prevalence of obesity than white adults (42%) (Hales et al., 2020; CDC, 2020). Similar disparities are observed among children (Hales et al., 2017; Bullock et al., 2017).

#### **DISPARITIES OF THE COVID-19 VIRUS**

As of January 1, 2021, the United States had more than 19 million infections from the COVID-19 virus and 345,000 deaths. Just as with obesity, communities of color are being hit hardest (Ruprecht et al., 2020)—they get symptomatic infections, develop complications, and die at higher rates than whites and their share of the population. For example, Black, Latinx, and Native Americans die of COVID-19 more than 2.7 times white Americans (APM Research Lab Staff, 2021). Any loss of life is a tragedy. These massive disparities reflect a national disaster.

## WHY DOES HISTORY PREDICT CURRENT HEALTH DISPARITIES FOR BLACKS?

Starting with slavery, structural obstacles have been intentionally stood up that challenge the health of minority communities often in unique ways for different minority groups. The persistence of this unequal treatment has led to entrenched societal structures and policies that continue to foster health disparities, even today. This section briefly focuses on the experiences of Blacks to illustrate the historical context for many of the disparities presently observed.

During slavery, slaveholders were responsible for the health of their slaves, who were viewed as property. Slaveholders viewed investment in slave health as a necessary expense to protect their property (Newson and Minchin, 2007). For example, the dietary provisions for slaves were specifically studied to identify



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the most efficient means of providing calories at the lowest cost (Newson and Minchin, 2007). The inadequate nutrition of the slave population, combined with poor living, harsh working conditions, and insufficient medical care, set the stage for increased risk of disease (Byrd and Clayton, 2000). This, in turn, was used by whites as evidence of inferiority (Byrd and Clayton, 1992), which reinforced and rationalized the notion of white supremacy and subjugation of Blacks as slaves.

After emancipation, there was little infrastructure to deal with the health needs of the newly freed population, and no clear plan for health care. The Freedmen's Bureau, which was established after the Civil War to help address the needs of poor whites and freed Blacks in the South, eventually assumed some responsibility for addressing the health needs of the emancipated (United States Senate, 2021). While this legislation provided medical facilities, staffing and resourcing for the facilities designated for Blacks were very limited (Byrd and Clayton, 2000). This was the beginning of separate healthcare facilities in the US. Due to ingrained racism, many legislators expected that Blacks would simply die off once freed (Downs, 2012; Haller, 1971). Limited access to reasonable healthcare and safe sanitation was used as a weapon to negatively impact the health of the Black population (Downs, 2012). For example, as smallpox spread through Black encampments in the South, whites failed to implement basic guarantine and sanitation practices that were known to limit the spread of the disease (Downs, 2012). Additionally, many legislators justified denial of assistance based on the argument that providing assistance to freed Blacks would create dependency and limit motivation to work toward self-sufficiency (Harrison, 2006).

The Jim Crow era (state and local statutes enacted in the late 19th and early 20th centuries that legalized racial segregation in the south) had far-reaching consequences, including in healthcare. In fact, this period may be most directly linked to the establishment of our current system of healthcare and the disparate access to care that drives many long-standing health disparities. Two key factors are noteworthy. One is the establishment of employer-provided health insurance as the primary means to access high-quality healthcare. Employers began to offer health insurance as a benefit in response to labor shortages during World War II (Thomasson, 2002). This benefit was also non-taxable, making it the cheapest way to obtain insurance (Blumenthal, 2006). However, occupational segregation facilitated by corporate and government policy made it difficult for Blacks to access employer-sponsored health insurance. For example, states such as South Carolina fined Black people if they worked in any occupation other than farming or domestic servitude (History.com. 2010).

The second is the Hill-Burton Act, which passed in 1946 (P.L. 79-725) and authorized millions of dollars in federal construction grants and loans for new hospitals. Despite resistance from senators in the north, senators in the south succeeded in including a separate-but-equal provision stating that discrimination on the basis of race was acceptable (Largent, 2018). This is the only federal legislation in the 20<sup>th</sup> century that explicitly permitted the use of federal funds to provide exclusionary services on the basis of race (Smith, 1999). In practice, this meant that health care facilities dedicated to the service of Blacks often lacked the resources and equipment of the whites-only facilities (Thomas,



2006). It was not until almost 2 decades later, as a result of *Simkins v. Cone*, that the U.S. Court of Appeals found unconstitutional the sections in the original Hill-Burton Act that provided for separate-but-equal hospital accommodations and services (Largent, 2018).

#### **UNDERSTANDING STRUCTURAL RACISM**

Even though the expansion of civil rights granted Blacks access to better care and outlawed overt discrimination based on race, the long tail of these historical injustices continues to exacerbate health disparities today. Structural racism, a result of the longstanding unreconciled legacy of American slavery, is a conceptual lens that help us to understand the substantial race disparities in obesity and COVID-19. Structural racism refers to the ways in which society fosters discrimination through mutually reinforcing systems that rationalize discriminatory beliefs and justify the distribution of resources (based on those beliefs), which together make it difficult for racial and ethnic minorities to secure quality education, jobs, housing, healthcare, and equal treatment in the criminal justice system (Bailey et al., 2017).

From a public health point of view, structural racism is one of the most important ways that racism affects health, by increasing disease risk and reducing opportunities for a heathy life (Williams et al., 2019). Here, we intentionally focus on structural racism, rather than individual racism (defined as a person's beliefs about their own superiority), as it facilitates the identification of concrete and feasible approaches for advancing health equity (defined as everyone having a fair and just opportunity to be as healthy as possible) at the population level.

So what are some concrete examples of structural racism and how it affects health?

Racial residential segregation is a key one. This refers to a powerful constellation of federal, tribal, state, and local policies as well as private sector policies (e.g., mortgage discrimination, redlining) created in the middle of the 20th century that were explicitly intended to enforce and sustain residential segregation (Rothstein, 2017). Together, these rules and practices had such a strong impact that many communities today remain deeply segregated, despite decades of anti-housing discrimination policies and anti-poverty policies as well as growing diversity (Williams and Emamdjomeh, 2018). Persistent and deep segregation such as Detroit, Chicago, and the District of Columbia (Williams and Emamdjomeh, 2018).

This segregation negatively affects health. One way this occurs is by reducing access to quality education in childhood, which reduces economic status in adulthood (Williams and Collins, 2001). Another way is by reducing access to employment opportunities by allowing employers to discriminate against job applicants using their neighborhood as a deciding factor of whether the applicant would be a good employee (Williams and Collins, 2001). In fact, evidence suggests that eliminating segregation would erase Black-white differences in income, education, and unemployment (Cutler and Glaeser, 1997). A third way is that segregation creates areas with concentrated poverty and reduced access to resources (e.g., quality housing, healthy food, quality health care). These aggregated risks make it very hard for residents to live in healthy



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environments and practice healthy behaviors (Bailey et al., 2017; Kramer and Hogue, 2009; White and Borrell, 2011; White et al., 2012; Williams and Collins, 2001).

Let's be even more specific about how structural racism is a common root cause for COVI9-19 and/or obesity among communities of color.

It can be argued that discrimination resulting from structural racism can indirectly and directly increase COVID-19 risk for people of color. Discrimination can lead to chronic and toxic stress, which has been associated with increased risk of obesity, partly through increased cravings for unhealthy food (Scott et al., 2012). Therefore, discrimination could indirectly contribute to worse COVID-19 infection outcomes because obesity is associated with higher rates of symptomatic COVID-19 infection, hospitalization, and death (Popkin et al., 2020). Conversely, discrimination's more direct link to increased COVID-19 risk is through the resulting physiologic response to chronic and toxic stress. With chronic exposure to toxic stress, serum cortisol levels become elevated, and recent work has shown that elevated cortisol levels are independently associated with reduced survival and are also seen as a marker of disease severity in hospitalized COVID-19 patients on admission compared to those without COVID-19 (Tan et al., 2020). While these pathways may exert independent effects, it is highly likely that the direct and indirect effects are compounded for a substantial proportion of the population (e.g., people of color with obesity experiencing chronic discrimination) (Millett et al., 2020).

Other key ways that structural racism spurs both poor COVID-19 outcomes and obesity are through inequitable access to health care and employment. Racial and ethnic minorities are more likely to be uninsured (Berchick et al., 2019). Racial and ethnic minorities are more likely to work in essential jobs (e.g., healthcare facilities, factories, grocery stores, public transportation) (U.S. Bureau of Labor Statistics, 2019), which may increase exposure to the COVID-19 virus (Economic Policy Institute, 2020). Limited job options for racial and ethnic minorities, which are greatly exacerbated by the current economic downturn and relatively slower job recovery (Long et al., 2020), create less flexibility for leaving jobs or missing work, even if sick.

Structural racism also limits access to quality food, which is a much larger problem in poorer, minority neighborhoods (Bower et al., 2014). Lack of access to healthy food increases obesity risk and food insecurity—a lack of reliable access to healthy, affordable food. Food insecurity has more than doubled overall and tripled among households with children since the start of the pandemic (Schanzenbach and Pitts, 2020). Once again, disparities by race and ethnicity are stark. Prior to COVID-19, 15% of Black households (Schanzenbach and Pitts, 2020). As of the summer, 36% of Black households experienced food insecurity compared to 18% of white households (Schanzenbach and Pitts, 2020). As of the summer, 36% of Black households experienced food insecurity compared to 18% of white households (Schanzenbach and Pitts, 2020).

#### WHAT POLICY ACTION HAS OCCURRED IN RESPONSE TO THE COVID-19 PANDEMIC?

In the first 2 months of the pandemic, the federal response was swift. This included the Coronavirus Preparedness and Response Supplemental Appropriations Act (P.L. 116-123) totaling \$8.3 billion, the Families First Coronavirus Response Act (Family First Act, P.L. 116-127) totaling \$192 billion, the Coronavirus Aid Relief and Economic Security Act (CARES Act, P.L. 116-136) totaling \$2.2 trillion, and the Paycheck Protection Program and Health Care Enrichment Act (P.L. 116-139) totaling \$484 billion. Together, these stimulus packages accounted for about 13% of GDP (McCarthy, 2020) and provided critical relief to individuals; tribal, state, and local governments; healthcare systems; and businesses. Recently, and after several months of delay, the next stimulus package passed as part of the fiscal year 2021 appropriations process totaling \$900 billion (P.L. 116-260).

Particularly relevant to the intersection of COVID-19 and obesity are efforts to address food insecurity, which occurred through a variety of enhancements and flexibilities to the federal nutrition safety net included in the Family First and CARES Acts. Key among them are changes to the United States Department of Agriculture (USDA) Supplemental Nutrition Assistance Program (SNAP, formerly called Food Stamps), National School Lunch and Breakfast Programs (NSLP/SBP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

SNAP is by far the largest federal nutrition assistance program, which provides monthly financial assistance to purchase food. It is a proven policy approach to both reduce poverty and decrease food insecurity (Keith-Jennings et al., 2019). Prior to the pandemic, 38 million people participated each month, about half of them children (Cronquist, 2019). From February to May 2020, enrollment in SNAP grew by 17%, which is roughly three times faster than in any prior 3-month period, bringing participation to about 43 million people (DeParle, 2020a). Because SNAP is designed to be economically responsive (as incomes fall, more people become eligible for the program) (Canning and Stacey, 2019), participation has likely increased further as unemployment checks from the stimulus packages have ended and unemployment remains high. The pandemic eliminated 22 million jobs, and only about half of those have recovered, with much slower gains among Black and Latinx workers (Long et al., 2020).

The most significant changes to SNAP through the stimulus bills include allowing states to request waivers from the USDA, the federal agency that administers SNAP, to provide temporary, emergency benefits to existing SNAP households up to the maximum monthly allotment (\$646 for a family of four); suspending the time limit associated with Able-Bodied Adults Without Dependents work requirements during the pandemic; giving USDA broad discretion to provide much more flexibility for states in managing SNAP caseloads (e.g., extending deadlines for participant reenrollment); appropriating \$15.8 billion for anticipated surges in SNAP participation resulting from increased unemployment; and a temporary 15% increase in the maximum SNAP benefit (equivalent to about \$100 for a family of four each month).

NSLP serves free or reduced-price meals to 30 million children daily (reaching approximately 60% of school-age children), and SBP serves 15 million children daily (Tiehen, 2020). These programs operate in 99,000 schools and, for many children, account for more than half of their total daily calories. School closures in the spring and a remote start to the school year in most of the country (Education Week, 2020) have meant that many children lack access to meals (Poole et al., 2021).

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Critical changes in the stimulus bills to help feed children include launching the novel Pandemic-Electronic Benefit Transfer (P-EBT) food assistance to households with children who would otherwise receive free or reduced-price meals if the child's school will be closed for no less than 5 consecutive days (first authorized for school-age children, then extended until September 20, 2021, and expanded to include children at child care centers); granting flexibilities to facilitate meal pick-up (e.g., allowing parents to pick up meals to bring home to their children and/or pick up multiple days' worth of food at once); allowing states to serve free meals to all children (initially through the summer and then extended until September 30, 2021); and emergency relief to help school meal and child and adult care food programs, which are in dire need of financial assistance.

WIC provides essential nutrition to women who are pregnant or postpartum, infants, and young children. Prior to the pandemic, the program served 6.4 million people, including about half of all infants born in the United States (Tiehen, 2020). The pandemic stimulus response has appropriated \$500 million for fiscal year 2020 to support anticipated increases in WIC enrollment and authorized the USDA to waive WIC regulatory requirements at a state's request, including the physical presence requirement (e.g., recipients are not required for in-person office visits at enrollment or re-enrollment and can postpone lab tests such as blood work, weight, and length/height measurements that are typically required to determine eligibility) (Dunn et al., 2020).

The CARES Act and other federal programs have helped to address issues related to health care delivery and access during the pandemic. For example, the CARES Act provided funding for coverage of COVID-19 vaccination by designating it as a preventive health service (making it a requirement for private health insurance plans to provide). Uninsured individuals will be able to get vaccinated for free, with vaccine providers being reimbursed for administration of vaccines by the Health Resources and Services Administration's Provider Relief Fund, which currently contains about \$30 billion (Schwartz et al., 2020). This CARES Act also provided \$200 million to expand telehealth services in order to help providers deliver connected care services to patients at their homes or mobile locations (Federal Communications Commission, 2020). Telehealth has become a critically important means to support delivery of health care during the early wave of COVID-19 to conserve resources and limit in-person contact. The Centers for Medicaid and Medicare Services (CMS) and many commercial insurance plans also made policy changes that expanded coverage of telehealth visits during the pandemic (Centers for Medicare and Medicaid Services, 2020; America's Health Insurance Plans, 2020).

Medicaid has provided critical health care access during the pandemic, especially as jobless rates have rapidly increased, and millions have lost employer-sponsored health coverage. Originally meant to be universally expanded through the 2010 Affordable Care Act (P.L. 111-148) for adults who earn up to 138% of the federal poverty level, the Medicaid expansion was made optional for states by the Supreme Court (*National Federation of Independent Business (NFIB) v. Sebelius*). To date, 39 states have expanded Medicaid (Kaiser Family Foundation, 2020). In the early stages of the pandemic, Medicaid enrollment increased by 1.7 million people in twenty-six states from March

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1, 2020, to June 1, 2020 (Frenier et al., 2020). Results of this analysis showed greater relative enrollment for Medicaid expansion-eligible populations, suggesting that individuals suffering job losses were able to use the safety net to maintain health insurance coverage. In direct response to the pandemic, all 50 states have taken steps to modify their Medicaid programs (e.g., giving people more time to meet certain eligibility criteria, using less restrictive eligibility standards during the crisis) to respond to the pandemic, frequently making it easier for people to qualify and enroll in coverage or cover COVID-19-related services for uninsured populations (Schubel, 2020).

Beyond key changes to the federal nutrition and health insurance safety nets, other important changes have occurred through the stimulus bills including two rounds of checks to individuals; rental protections; expansion of unemployment insurance; education funding to K-12 schools, colleges, and universities; assistance paying monthly internet bills; and help for child care. However, it remains to be seen if these supports are being equitably distributed. For example, there appear to be disparities in the distribution of the first round of stimulus checks, with fewer Black and Hispanic households reporting that they received the payment (Holtzblatt and Karpman, 2020).

#### WHERE IS MORE POLICY ACTION NEEDED?

Undoubtedly, existing efforts have played a critical role. Nevertheless, considerable need persists. This section focuses primarily on changes to the federal nutrition and health insurance safety nets. Critically, these policies may not address root causes of structural racism. Progress in that area will likely require approaches focused explicitly on ameliorating the very real problems of segregation, wealth gaps, and inequities in access to quality education and health care. For example, since May 2020, eight million more people are living in poverty (De-Parle, 2020b).

With respect to needed changes to the federal nutrition safety net, SNAP benefits are widely recognized as being inadequate (Institute of Medicine and National Research Council, 2013). Evidence suggests that the SNAP per-meal benefit does not cover the cost of a meal in 99% of US counties (Waxman et al., 2018), and since the start of the pandemic food prices have risen sharply (Economic Research Service, 2020). Despite heroic and innovative efforts by schools in the spring, over the summer, and this school year to provide children with meals, one study found that during a 9-week period in the spring, 1.15 billion school meals were missed (Kinsey et al., 2020). Another estimate suggests that only about 15% of low-income households with children who qualify for free or reduced-priced school meals are receiving them (Turner, 2020). It is estimated that nearly 8 million people lost employer-sponsored health coverage as of June 2020 (a total of almost 15 million when their dependents are included) (Fronstin and Woodbury, 2020). As mentioned above, the maximum SNAP benefit was temporarily increased by 15%, but given the well-documented inadequacy, a permanent increase is needed.

There is no single road map for policy action to address the twin pandemics of obesity and COVID-19, but there are a number of critical areas where the social safety net can and should be strengthened.



First and foremost, continued stimulus bills will be essential through the long tail of the recovery, especially since most Black (66%) and Latinx (86%) households in New York, Los Angeles, Chicago, and Houston report serious financial problems such as struggles paying for medical care or difficulty paying credit card bills (NPR et al., 2020). Moreover, some of the aid in the December 2020 stimulus bill (P.L. 116-260) will expire as early as March 2021 (e.g., unemployment benefits). And the final bill omitted state and local aid, which may lead to a significant cutting of jobs and services, particularly in states required to balance their budgets annually.

Going forward, policy makers should carefully consider which of the thousands of temporary flexibilities to the safety net in response to the COVID-19 pandemic essentially serve to modernize the programs. For example, strong evidence suggests that making the temporary increase to the maximum SNAP benefit permanent would be associated with increased food expenditures (Nord and Prell, 2011), mitigated declines in calorie intake (Todd, 2015), improved food security (Nord and Prell, 2011), and reduced Medicaid cost growth, especially for people with chronic illnesses with high sensitivity to food insecurity (Sonik, 2016).

Another proven approach to expand the impact of the federal safety net is for all states to implement the Medicaid expansion from the 2010 Affordable Care Act, which would extend eligibility to an estimated 2 to 4 million more people (Cross-Call and Broaddus, 2020; Farfield and Damico, 2020). Medicaid expansion has been beneficial in expanding coverage for low-income families, leading to improved health outcomes and survival, reduced uncompensated care, and increased funding to state and local economies (Sommers et al., 2017).

A third key area of attention is job recovery for Black and Latinx workers. Within SNAP, the employment and training program (SNAP E&T) is one mechanism to facilitate progress in this area. Through SNAP E&T, participants have access to training and support services to assist them in entering or moving up in the workforce.

In addition to enhancing and expanding the safety net, attention should be paid to reversing policies that limit access to critical programs. For example, the Trump administration finalized the "public charge" rule, which allows federal officials to deny legal immigrants a path to citizenship if they participate in certain federal safety net programs, including SNAP (US Citizenship and Immigration Services, 2020). The decision appears to have led to thousands fewer children receiving SNAP (Barofsky et al., 2020) and nearly 700,000 more children without health insurance (Alker, 2020). The Biden administration has said it will rescind this rule, but it could take up to a year—further prolonging the chilling effect (Kanno-Youngs, 2020).

As a result of this horrific pandemic, long-needed updates to the federal safety net may be realized. This is important because federal nutrition assistance programs can play a critical role in obesity prevention, particularly in groups at highest risk for health disparities. For example, the 2009 WIC food package change, which modified the program to include more fruits, vegetables, whole grains, and lower-fat milk, is associated with a reversal and reduction of rapidly increasing childhood obesity trends (Daepp et al., 2019). Another example is the Healthy, Hunger-Free Kids Act (P.L. 111-296), a policy that required stronger nutrition standards for school meals and snacks; had it not been implemented, childhood obesity would have been 47% higher in 2018 among children living in poverty (Kenney et al., 2020). Since these stricter nutrition standards have been relaxed during the pandemic, extended school closures could exacerbate existing disparities in obesity.

Progress across all these policy domains may be accelerated by a deliberate focus on diversity, inclusion, and equity (DIE) in leadership, the incorporation of affected voices, public-private partnerships, and teamwork between infectious and chronic disease prevention teams (e.g., addressing the twin pandemics of obesity and COVID-19 within the same task force). Given the history of legal discrimination, unequal access to public services, and racism in medicine (e.g., Tuskegee experiment) that has characterized the Black experience, it will also be critical to stand up deliberate efforts to spur trust in the federal government. This will be especially important for the rollout of the COVID-19 vaccine, where reluctance among Blacks has been well documented (Pew Research, 2020).

#### THE NEED FOR EVIDENCE

To support evidence-based policy, research is important. To date, there has been limited evaluation of the federal response to the COVID-19 pandemic. There is a critical need for evidence about whether temporary changes to the safety net, such as universal free meals for all school children, should be made permanent. It will be critical to understand whether remote learning has led to accelerated weight gain for children. We need studies to examine the role of front-line health workers in supporting obesity prevention. A pressing question at the intersection of obesity and COVID-19 is whether weight loss or changes in diet quality can mitigate the risk of severe complications with COVID-19 infection. It is unclear if changes in energy balance and diet quality, which have been associated previously with lower levels of inflammatory cytokines, will have an impact on COVID-19 outcomes (Zabetakis et al., 2020). While the impetus to push messages related to losing weight to decrease COVID-19-related morbidity and mortality will be very strong, we should be reminded that these types of messages can be stigmatizing and potentially shift blame for obesity to the individual, as was seen with the UK Government's Better Health Campaign (Editorial, 2020).

All policy approaches and future research should be conducted with an eye toward health equity. As has been said many times, the COVID-19 pandemic has laid bare the significant disparities in health, access to health care, and access to opportunity. To blunt such a massive human and economic toll in a next pandemic or in another wave of COVID-19 infections, a more equitable safety net is sorely needed. To be maximally effective, it must aim to directly ameliorate the broad and persistent inequities fostered by systemic racism—inequities that have fueled the pandemic's devastating impacts on communities of color.

#### CONCLUSION

Obesity is largely preventable, and we have the public health knowledge to meaningfully reduce the spread of COVID-19. Effectively tackling both these pandemics will result in

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tremendous health, social, and economic benefits, particularly for Blacks and other racial minorities. Meaningful progress will

for Blacks and other racial minorities. Meaningful progress will require a deliberate focus on addressing long-standing structural racism. Policy makers need to act now and make a commitment to prioritizing health equity. Research will be critical to support these efforts now and in the future.

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#### REFERENCES

Alker, J. (2020). Children are losing health insurance (Center for Children and Families, Georgetown University Health Policy Institute). https://ccf. georgetown.edu/2020/10/09/children-are-losing-health-insurance/.

America's Health Insurance Plans (2020). Health insurance providers respond to coronavirus (COVID-19). https://www.ahip.org/health-insurance-providers-respond-to-coronavirus-covid-19/.

APM Research Lab Staff (2021). The color of coronavirus: COVID-19 deaths by race and ethnicity in the U.S.. https://www.apmresearchlab.org/covid/deaths-by-race.

Bailey, Z.D., Krieger, N., Agénor, M., Graves, J., Linos, N., and Bassett, M.T. (2017). Structural racism and health inequities in the USA: evidence and interventions. Lancet 389, 1453–1463.

Barofsky, J., Vargas, A., Rodriguez, D., and Barrows, A. (2020). Spreading fear: the announcement of the public charge rule reduced enrollment in child safetynet programs. Health Aff. (Millwood) *39*, 1752–1761.

Berchick, E.R., Barnett, J.C., and Upton, R.D. (2019). Health insurance coverage in the United States: 2018. In Current Population Reports P60-267(RV) (U.S. Government Printing Office).

Blumenthal, D. (2006). Employer-sponsored health insurance in the United States-origins and implications. N. Engl. J. Med. *355*, 82–88.

Bower, K.M., Thorpe, R.J., Jr., Rohde, C., and Gaskin, D.J. (2014). The intersection of neighborhood racial segregation, poverty, and urbanicity and its impact on food store availability in the United States. Prev. Med. 58, 33–39.

Bullock, A., Sheff, K., Moore, K., and Manson, S. (2017). Obesity and overweight in American Indian and Alaska Native children, 2006-2015. Am. J. Public Health *107*, 1502–1507.

Byrd, W.M., and Clayton, L.A. (1992). An American health dilemma: a history of blacks in the health system. J. Natl. Med. Assoc. *84*, 189–200.

Byrd, W.M., and Clayton, L.A. (2000). An American Health Dilemma: A Medical History of African Americans and the Problem of Race: Beginnings to 1900 (Routledge).

Canning, P., and Stacey, B. (2019). The Supplemental Nutrition Assistance Program (SNAP) and the economy: new estimates of the SNAP Multiplier (Economic Research Service, United States Department of Agriculture). https://www.ers.usda.gov/webdocs/publications/93529/err265\_summary.pdf? v=8010.7.

CDC (2020). Summary health statistics: National Health Interview Survey: 2018. Table A-15a. https://www.cdc.gov/nchs/nhis/shs/tables.htm.

Centers for Medicare and Medicaid Services (2020). Medicare telemedicine health care provider fact sheet. https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet.

Cronquist, K. (2019). Characteristics of Supplemental Nutrition Assistance Program households: fiscal year 2018 (US Department of Agriculture, Food and Nutrition Service, Office of Policy Support).

Cross-Call, J., and Broaddus, M. (2020). States that have expanded Medicaid are better positioned to address COVID-19 and recession (Center for Budget and Policy Priorities). https://www.cbpp.org/research/health/states-that-have-expanded-medicaid-are-better-positioned-to-address-covid-19-and.



Cutler, D.M., and Glaeser, E.L. (1997). Are ghettos good or bad? Q. J. Econ. 112, 827–872.

Daepp, M.I.G., Gortmaker, S.L., Wang, Y.C., Long, M.W., and Kenney, E.L. (2019). WIC food package changes: trends in childhood obesity prevalence. Pediatrics *143*, e20182841.

DeParle, J. (2020a). Amid a deadly virus and crippled economy, one form of aid has proved reliable: food stamps (New York Times). https://www.nytimes. com/2020/07/19/us/politics/coronavirus-food-stamps.html.

DeParle, J. (2020b). 8 million have slipped into poverty since may as federal aid has dried up (New York Times). https://www.nytimes.com/2020/10/15/us/politics/federal-aid-poverty-levels.html?campaign\_id=2&emc=edit\_th\_ 20201015&instance\_id=23180&nl=todaysheadlines&regi\_id=76740782 &segment\_id=41232&user\_id=564c9a5529b68522e027dec1a46ed7d7.

Downs, J. (2012). Sick From Freedom: African-American Illness and Suffering during the Civil War and Reconstruction (Oxford University Press).

Dunn, C.G., Kenney, E.L., Bleich, S.N., and Fleischhacker, S.E. (2020). Strengthening WIC's impact during and after the COVID-19 pandemic (Healthy Eating Research). https://healthyeatingresearch.org/research/strengtheningwics-impact-during-and-after-the-covid-19-pandemic/.

Economic Policy Institute (2020). Black workers face two of the most lethal preexisting conditions for coronavirus—racism and economic inequality. https://www.epi.org/publication/black-workers-covid.

Economic Research Service (2020). Food price outlook, 2020 (United States Department of Agriculture). https://www.ers.usda.gov/data-products/food-price-outlook/summary-findings/.

Editorial (2020). UK policy targeting obesity during a pandemic - the right approach? Nat. Rev. Endocrinol. 16, 609.

Education Week (2020). School districts' reopening plans: a snapshot. https:// www.edweek.org/ew/section/multimedia/school-districts-reopening-plansa-snapshot.html.

Farfield, R.O.K., and Damico, A. (2020). The coverage gap: uninsured poor adults in states that do not expand Medicaid (Kaiser Family Foundation). https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/.

Federal Communications Commission (2020). FCC adopts \$200 million COVID-19 telehealth program. https://docs.fcc.gov/public/attachments/ DOC-363498A1.pdf.

Finkelstein, E.A., Ruhm, C.J., and Kosa, K.M. (2005). Economic causes and consequences of obesity. Annu. Rev. Public Health *26*, 239–257.

Frenier, C., Nikpay, S.S., and Golberstein, E. (2020). COVID-19 has increased Medicaid enrollment, but short-term enrollment changes are unrelated to job losses. Health Aff. (Millwood) *39*, 1822–1831.

Fronstin, P., and Woodbury, S.A. (2020). How many Americans have lost jobs with employer health coverage during the pandemic? (The Commonwealth Fund). https://www.commonwealthfund.org/publications/issue-briefs/2020/ oct/how-many-lost-jobs-employer-coverage-pandemic.

Hales, C.M., Carroll, M.D., Fryar, C.D., and Ogden, C.L. (2017). Prevalence of obesity among adults and youth: United States, 2015–2016. NCHS data brief, no 288 (National Center for Health Statistics).

Hales, C.M., Carroll, M.D., Fryar, C.D., and Ogden, C.L. (2020). Prevalence of obesity and severe obesity among adults: United States, 2017–2018. NCHS data brief, no 360 (National Center for Health Statistics).

Haller, J.S. (1971). Outcasts From Evolution: Scientific Attitudes of Racial Inferiority, 1859-1900 (McGraw-Hill).

Harrison, R. (2006). Welfare and employment policies of the Freedmen's Bureau in the District of Columbia. J. South. Hist. 72, 75–110.

History.com (2010). Black Codes. https://www.history.com/topics/black-history/black-codes.

Holtzblatt, J., and Karpman, M. (2020). Who did not get the economic impact payments by mid-to-late May, and why? (The Urban Institute).



### Cell Metabolism Perspective

Institute of Medicine and National Research Council (2013). Supplemental Nutrition Assistance Program: examining the evidence to define benefit adequacy (National Academies Press).

Kaiser Family Foundation (2020). Status of state Medicaid expansion decisions: interactive map. https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/.

Kanno-Youngs, Z. (2020). A Trump immigration policy is leaving families hungry (New York Times). https://www.nytimes.com/2020/12/04/us/politics/ trump-immigration-hunger.html.

Keith-Jennings, B., Llobrera, J., and Dean, S. (2019). Links of the Supplemental Nutrition Assistance Program with food insecurity, poverty, and health: evidence and potential. Am. J. Public Health *109*, 1636–1640.

Kenney, E.L., Barrett, J.L., Bleich, S.N., Ward, Z.J., Cradock, A.L., and Gortmaker, S.L. (2020). Impact of the Healthy, Hunger-Free Kids Act on obesity trends. Health Aff. (Millwood) *39*, 1122–1129.

Kinsey, E.W., Hecht, A.A., Dunn, C.G., Levi, R., Read, M.A., Smith, C., Niesen, P., Seligman, H.K., and Hager, E.R. (2020). School closures during COVID-19: opportunities for innovation in meal service. Am. J. Public Health *110*, 1635–1643.

Kopelman, P.G. (2000). Obesity as a medical problem. Nature 404, 635–643.

Kramer, M.R., and Hogue, C.R. (2009). Is segregation bad for your health? Epidemiol. Rev. *31*, 178–194.

Largent, E.A. (2018). Public health, racism, and the lasting impact of hospital segregation. Public Health Rep. *133*, 715–720.

Long, H., Van Dam, A., Fowers, A., and Shapiro, L. (2020). The COVID-19 recession is the most unequal in modern U.S. history (Washington Post). https://www.washingtonpost.com/graphics/2020/business/coronavirus-recession-equality/.

McCarthy, N. (2020). How global coronavirus stimulus packages compare (Forbes). https://www.forbes.com/sites/niallmccarthy/2020/05/11/how-global-coronavirus-stimulus-packages-compare-infographic/?sh=7b302c4ca52c.

Millett, G.A., Jones, A.T., Benkeser, D., Baral, S., Mercer, L., Beyrer, C., Honermann, B., Lankiewicz, E., Mena, L., Crowley, J.S., et al. (2020). Assessing differential impacts of COVID-19 on black communities. Ann. Epidemiol. *47*, 37–44.

Newson, L., and Minchin, S. (2007). Diets, food supplies and the African slave trade in early seventeenth-century Spanish America. The Americas 64, 517–550.

Nord, M., and Prell, M. (2011). Food Security Improved Following the 2009 ARRA Increase in SNAP Benefits, ERR-116 (U.S. Department of Agriculture, Economic Research Service).

NPR; Robert Wood Johnson Foundation; Harvard Chan School of Public Health (2020). The impact of coronavirus on households in major U.S. cities. https://media.npr.org/assets/img/2020/09/08/cities-report-090920-final.pdf.

Ogden, C.L., Lamb, M.M., Carroll, M.D., and Flegal, K.M. (2010). Obesity and socioeconomic status in adults: United States 1988–1994 and 2005–2008. NCHS data brief no 50 (National Center for Health Statistics).

Pew Research (2020). Intent to get a COVID-19 vaccine rises to 60% as confidence in research and development process increases. https://www. pewresearch.org/science/2020/12/03/intent-to-get-a-covid-19-vaccinerises-to-60-as-confidence-in-research-and-development-processincreases/.

Poole, M.K., Fleischhacker, S., and Bleich, S.N. (2021). Addressing child hunger when school is closed — considerations during the pandemic and beyond. N. Engl. J. Med. Published online January 20, 2021.. https://doi.org/10.1056/ NEJMp2033629

Popkin, B.M., Du, S., Green, W.D., Beck, M.A., Algaith, T., Herbst, C.H., Alsukait, R.F., Alluhidan, M., Alazemi, N., and Shekar, M. (2020). Individuals with obesity and COVID-19: a global perspective on the epidemiology and biological relationships. Obes. Rev. *21*, e13128.

Puhl, R.M., and Heuer, C.A. (2010). Obesity stigma: important considerations for public health. Am. J. Public Health *100*, 1019–1028.

Rothstein, R. (2017). The Color of Law: A Forgotten History of How Our Government Segregated America (Liveright).

Ruprecht, M.M., Wang, X., Johnson, A.K., Xu, J., Felt, D., Ihenacho, S., Stonehouse, P., Curry, C.W., DeBroux, C., Costa, D., and Phillips Ii, G. (2020). Evidence of social and structural COVID-19 disparities by sexual orientation, gender identity, and race/ethnicity in an urban environment. J. Urban Health. Published online December 1, 2020. https://doi.org/10.1007/s11524-020-00497-9.

Schanzenbach, D., and Pitts, A. (2020). How much has food insecurity risen? Evidence from the Census Household Pulse Survey. IPR Radid Research Report. https://www.ipr.northwestern.edu/documents/reports/ipr-rapidresearch-reports-pulse-hh-data-10-june-2020.pdf.

Schubel, J. (2020). States are leveraging Medicaid to respond to COVID-19. https://www.cbpp.org/research/health/states-are-leveraging-medicaid-to-respond-to-covid-19.

Schwartz, K., Freed, M., Cubanski, J., Dolan, R., Pollitz, K., Michaud, J., Kates, J., and Neuman, T. (2020). Vaccine coverage, pricing, and reimbursement in the U.S. (Kaiser Family Foundation). https://www.kff.org/coronavirus-covid-19/issue-brief/vaccine-coverage-pricing-and-reimbursement-in-the-u-s/.

Scott, K.A., Melhorn, S.J., and Sakai, R.R. (2012). Effects of chronic social stress on obesity. Curr. Obes. Rep. 1, 16–25.

Smith, D.B. (1999). Health Care Divided: Race and Healing a Nation (University of Michigan Press).

Sommers, B.D., Gawande, A.A., and Baicker, K. (2017). Health insurance coverage and health - what the recent evidence tells us. N. Engl. J. Med. 377, 586–593.

Sonik, R.A. (2016). Massachusetts inpatient Medicaid cost response to increased Supplemental Nutrition Assistance Program benefits. Am. J. Public Health *106*, 443–448.

Tan, T., Khoo, B., Mills, E.G., Phylactou, M., Patel, B., Eng, P.C., Thurston, L., Muzi, B., Meeran, K., Prevost, A.T., et al. (2020). Association between high serum total cortisol concentrations and mortality from COVID-19. Lancet Diabetes Endocrinol. *8*, 659–660.

Thomas, K. (2006). The Hill-Burton Act and civil rights: expanding hospital care for Black Southerners, 1939-1960. J. South. Hist. 72, 823–870.

Thomasson, M. (2002). From sickness to health: the twentieth century development of U.S. health insurance. Explor. Econ. Hist. *32*, 233–253.

Tiehen, L. (2020). The food assistance landscape: Fiscal Year 2019 Annual Report, EIB-218 (U.S. Department of Agriculture, Economic Research Service). https://www.ers.usda.gov/webdocs/publications/99026/eib-218.pdf? v=7906.8.

Todd, J. (2015). Revisiting the Supplemental Nutrition Assistance Program cycle of food intake: investigating heterogeneity, diet quality, and a large boost in benefit amounts. Appl. Econ. Perspect. Policy *37*, 437–458.

Turner, C. (2020). Children are going hungry: why schools are struggling to feed students (NPR). https://www.npr.org/2020/09/08/908442609/children-are-going-hungry-why-schools-are-struggling-to-feed-students.

United States Senate (2021). Freedmen's Bureau Acts of 1865 and 1866. https://www.senate.gov/artandhistory/history/common/generic/ FreedmensBureau.htm.

U.S. Bureau of Labor Statistics (2019). Labor force characteristics by race and ethnicity, 2018. Report 1082. https://www.bls.gov/opub/reports/race-and-ethnicity/2018/pdf/home.pdf.

US Citizenship and Immigration Services (2020). Public charge. https://www. uscis.gov/green-card/green-card-processes-and-procedures/public-charge.

Wang, Y.C., McPherson, K., Marsh, T., Gortmaker, S.L., and Brown, M. (2011). Health and economic burden of the projected obesity trends in the USA and the UK. Lancet *378*, 815–825.

Ward, Z.J., Long, M.W., Resch, S.C., Giles, C.M., Cradock, A.L., and Gortmaker, S.L. (2017). Simulation of growth trajectories of childhood obesity into adulthood. N. Engl. J. Med. 377, 2145–2153.

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Ward, Z.J., Bleich, S.N., Cradock, A.L., Barrett, J.L., Giles, C.M., Flax, C., Long, M.W., and Gortmaker, S.L. (2019). Projected U.S. state-level prevalence of adult obesity and severe obesity. N. Engl. J. Med. *381*, 2440–2450.

Waxman, E., Gundersen, C., and Thompson, M. (2018). How far do SNAP benefits fall short of covering the cost of a meal? (Urban Institute). https://www. urban.org/research/publication/how-far-do-snap-benefits-fall-short-coveringcost-meal.

White, K., and Borrell, L.N. (2011). Racial/ethnic residential segregation: framing the context of health risk and health disparities. Health Place *17*, 438–448.

White, K., Haas, J.S., and Williams, D.R. (2012). Elucidating the role of place in health care disparities: the example of racial/ethnic residential segregation. Health Serv. Res. 47, 1278–1299.

Williams, D.R., and Collins, C. (2001). Racial residential segregation: a fundamental cause of racial disparities in health. Public Health Rep. *116*, 404–416.

Williams, A., and Emamdjomeh, A. (2018). America is more diverse than ever – but still segregated (Washington Post). https://www.washingtonpost. com/graphics/2018/national/segregation-us-cities/.

Williams, D.R., Lawrence, J.A., and Davis, B.A. (2019). Racism and health: evidence and needed research. Annu. Rev. Public Health 40, 105–125.

Zabetakis, I., Lordan, R., Norton, C., and Tsoupras, A. (2020). COVID-19: the inflammation link and the role of nutrition in potential mitigation. Nutrients *12*, 1466.