NASEM Commissioned Paper:

Uneven and Limited Progress Towards

Racial and Ethnic Equity in Health Care and Outcomes

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Table of Contents

Executive Summary

Background

In 2003, the Institute of Medicine issued the report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* that documented widespread healthcare disparities by minoritized race and ethnicity. This report was accompanied by Congressionally-mandated annual reports by AHRQ on healthcare quality and disparities that were eventually consolidated into the annual National Healthcare Quality and Disparities Report (NHQDR) that chronicles overall progress in healthcare quality and progress for people who are members of minoritized and other socially disadvantaged groups. The 2022 NHQDR annual report and its corresponding appendices include the most comprehensive, longitudinal report on progress toward equal treatment among racial and ethnic minoritized groups. This current commissioned report aims to chronicle progress in towards the elimination of racial and ethnic disparities in health and health care based in part on the NHQDR, other data sources and published studies since 2003.

Our Approach

We used data from the 2022 NHQDR annual report and other relevant literature to:

1) Identify trends in racial and ethnic healthcare disparities over the past 20 years,

2) Provide evidence on the impact of the Affordable Care Act (ACA), the Coronavirus disease 2019 (COVID-19) pandemic and Public Health Emergency Actions, and demographics on healthcare disparities/inequities,

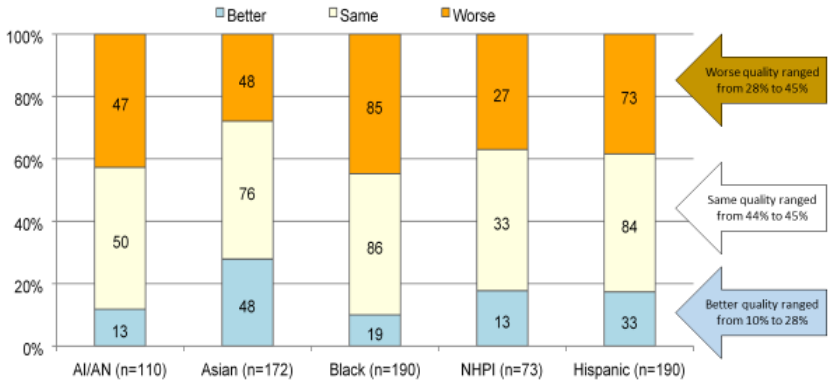
3) Review and discuss the multi-level contributors to healthcare disparities/inequities.

Key Findings

Our central findings are that progress has been poor and uneven, with some areas showing improvements and others demonstrating worsening disparities. Outcomes have been uneven and unequal across patient populations. In selected areas, rising tides lift all boats though not equally, i.e., absolute disparities improve at times while relative disparities persist. In other areas, receding tides lower all boats, often with widening absolute and relative disparities.

Generally, most disparities persisted between respective racial and ethnic populations and the non-Hispanic White population over twenty years. Those differences compared with the non-Hispanic White population ranged from 28% on some quality metrics among the Asian population and up to 45% among the Black population. Fewer than 10% of disparities narrowed over 20 years. Seven percent of the metrics have gotten worse for the Black population. Racial and ethnic disparities in treatment for hypertension control cholesterol, diabetes control, avoidable hospitalizations, and treatment of myocardial infarction contribute to these disparities with impact on racial disparities in mortality from cardiovascular disease (CVD), the leading cause of death in all racial and ethnic groups. Similar results are seen for cancer and other leading health conditions.

Figure 1. Current Disparities in Quality of Care by Race and Ethnicity



Note: Different data sources have different data years for most recent data year (2017, 2018, 2019, or 2020). The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

It is important to note that there are critical gaps in the current quality measurement landscape; many of the quality metrics used in the NHQDR are process measures with uncertain links to meaningful outcomes. There is also a lack of patient-reported outcomes, limiting understanding of how the healthcare system impacts these important measures. We report on some of these outcomes using other data sources. We note that a national survey showed that one in five Black and Hispanic adults One in five Black and Hispanic adults reported being treated unfairly treatment based on their race or ethnicity when receiving health care for themselves or a family member in the past year.[1] Significant portion of members of other minority groups including Asian, and American Indian/Alaskan Native adults reported being treated unfairly or with disrespect by a health care provider in the past three years because of their race or ethnic background at higher rate than White adults.[2] Rates of mistreatment reported by minority women during childbirth. Nearly 30% of women report discrimination (e.g., violations of physical privacy or verbal abuse) while receiving maternity care, with the highest reports of discrimination among Black (40%), multiracial (39%), and Hispanic (37%) women.[3]

National data from patients enrolled in Medicare Advantage underscore the persistence of racial and ethnic disparities in standard quality measures. American Indian/Alaskan Native enrollees received the worst care.[4] They were below the national average on 14 clinical care measures, were similar to the national average on six measures, and were above the national average on two measures—however, the magnitude of the gaps in care where larger than those for other groups. Asian or Native Hawaiian/Pacific Islander enrollee scores were below the national average on five clinical care measures, similar to the national average on 16 measures, and above the national average on 15. Black enrollee scores were below the national average on 14 clinical care measures, similar to the national average on 19 measures, and above the national average on three measures. Hispanic enrollee's scores were below the national average on 11 clinical care measures, similar to the national average on 19 measures, and above the national average on six measures. Non-Hispanic White enrollee scores were similar to the national average on 31 measures and above the national average on five. These findings provide robust evidence that racial and ethnic disparities in core quality measures persist, *even among older adults who are continuously insured and enrolled in managed care plans*. These findings also underscore the poor healthcare for American Indians and Alaskan Native peoples.

A literature review confirms these overall findings while underscoring the role of structural factors that differentially impact minoritized groups through social and behavioral determinants of health across leading causes of death in the US and across the life course. Healthcare disparities observed across the entire healthcare continuum, from symptom awareness to care-seeking, treatment, hospital care, long-term care, and end-of-life care. Robust data show persistent racial disparities in pain management for both acute and chronic pain.

The Affordable Care Act (ACA) substantively improved an important social determinant of health (SDOH) – health insurance, thus improving healthcare access and affordability for low-income individuals and reducing racial and ethnic disparities in health care. One study suggests Medicaid expansion substantially reduced mortality among near-elderly adults. The ACA's impact has been blunted by those remaining uninsured and by the failure of 10 states to expand Medicaid. Evidence to date suggests that alternative payment models, e.g., accountable care organizations (ACO) and bundled payment models, and other value-based payment models have not consistently reduced racial and ethnic disparities in health care. Instead, value-based payment models have at times penalized minoritized-serving hospitals resulting in fewer resources to address the needs minoritized populations.

The COVID-19 pandemic amplified racial and ethnic disparities in SDOH, health, and healthcare. Disparate social conditions and resulting worse health in many minoritized communities, in addition to ensuing disparities in COVID-19 immunizations and treatment resulted in racial and ethnic disparities in hospitalizations and mortality, particularly during the first year of the pandemic. Social programs implemented during the pandemic that helped mitigate racial and ethnic disparities in SDOH were quickly reversed following the end of the public health emergency.

Key Contributors

Structural racism is defined by Krieger as: "the totality of ways in which societies foster [racial] discrimination, via mutually reinforcing [inequitable] systems…(e.g., in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc.) that in turn reinforce discriminatory beliefs, values, and distribution of resources."[5] Multiple studies trace the lingering effects of racist policies including slave ownership, de jure discrimination and Jim Crow laws, and redlining.

We identified three major contributors to what has occurred over the past 20 years related to structural racism:

- Policies (including payment)
- Place
- People

Federal, state, and local policies interact to reduce (or amplify) racial and ethnic disparities in health and healthcare. Public policies whether national, state, or local, often have disparate impacts on minoritized peoples, often based on the place of residence, including racial

segregation. Examples include policies and funding that impact SDOH including support for families and mothers, early child development, food and nutrition, housing, public education funding, employment policies and opportunities, criminal justice policies, public transportation access, digital infrastructure, and health insurance.

Elements of structural racism that have hindered progress towards equal healthcare treatment include inequities in healthcare payments and structures, multilevel separate and unequal systems of care, persistent discrimination and implicit bias in healthcare, and failure by healthcare organizations to assess racial and ethnic disparities in healthcare and commit resources to mitigate them. SDOH and healthcare systems factors likely contributing to increases in maternal and infant mortality in the US that disproportionally affect Black and indigenous women.

Findings are limited by scarce longitudinal data on healthcare disparities for the major minority groups, particularly American Indians/Alaskan Native, and Native Hawaiian/Pacific Islander populations, much less, lack of disaggregation across these and other minority groups, e.g., Hispanic and Asian subpopulations.

Conclusion

Progress towards equal healthcare treatment over the past twenty years has been limited and uneven. Structural racism continues to undermine the health and healthcare of minoritized people. Lack of governmental and organizational commitment at multiple levels towards racial and ethnic health equity has hindered progress. This includes failure to address structural inequities in resources that impact SDOH across life, limited anti-racism initiatives, lack of financial incentives to promote healthcare equity, the erosion of primary care, and little change in the basic structure of the US healthcare system that delivers relatively less value and equity, all likely contribute to lackluster progress in the past two decades.

Section 1: Introduction

This report aims to assess progress in eliminating racial and ethnic disparities in healthcare. Specifically, we have three central aims: 1) Identify trends in racial and ethnic healthcare disparities over the past 20 years; 2) Provide evidence on the impact of the ACA, the COVID-19 pandemic, the Public Health Emergency Actions, and demographics on healthcare disparities/inequities; and 3) Review and discuss the multi-level contributors to healthcare disparities/inequities.

The 2022 NHQDR is the 20th annual report on national disparities in healthcare. In 2003, the Institute of Medicine report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* documented widespread health care disparities by minoritized race and ethnicity.[6] This report prompted Congress to authorize annual reports on healthcare quality and disparities that were eventually consolidated into the annual National Healthcare Quality and Disparities Report (NHQDR) that chronicles overall progress in healthcare quality and progress for people who are members of minoritized and other socially disadvantaged groups.

The 2022 NHQDR and its corresponding appendices are the most comprehensive, longitudinal data on progress toward equal treatment among racial and ethnic minoritized groups. The annual report does not expound on the data's context. Data and context may be used to inform collective action across sectors to eliminate healthcare disparities. This commissioned report aims to summarize critical data, expound upon it, and contextualize it.

This report begins with a summary of the US healthcare system context, including its complexity and key trends relevant to racial and ethnic disparities in health and healthcare (Section 2). Next, we introduce definitions of key concepts, including structural racism and social determinants and their relationships in impacting health and healthcare. Section 4 provides a high-level summary of the 2022 NHQDR, and Section 5 expounds upon this more fine-grained published data. Section 5 also goes into detail regarding the role of structural racism, SDOH, and health behavior on minoritized health. Section 6 integrates NHQDR findings and a review of published results since 2003 on healthcare disparities. Sections 7 and 8 discuss the ACA and the COVID-19 pandemic's role in racial and ethnic disparities in health and healthcare. Section 9 addresses potential mechanism and their contributions to progress. Section 10 summarizes the conclusions.

Section 2: Current Context of the US Healthcare System: Broken, Uneven, and Unfair

The US Healthcare system fares poorly compared to similarly wealthy countries.[7] It ranks poorly in most international performance measures despite performing comparatively well on process measures and having double the cost per person of peer wealthy countries.[7] Life expectancy in the US has fallen further behind wealthy and even non-wealthy countries beginning a half-century ago.[8] The US ranks last among high-income countries in life expectancy at birth, maternal and infant mortality, suicide, and preventable and treatable mortality.[9] A systematic review suggested that politics, economics, and public policy are important determinants of population health.[10] Countries with social democratic regimes, higher public spending, and lower income inequalities have populations with better health.[10]

Unequal Financing with Persistent Gaps in Insurance Coverage

Higher chronic disease and administrative costs in the US compared to peer countries contribute to very high healthcare costs in the US Even after accounting for age, sex, BMI, income, employment status, education, alcohol consumption, and smoking history, the US has a significantly higher prevalence of chronic diseases and combined chronic diseases when compared to Canada, England, and Ireland other countries.[11] Roughly 90% of US healthcare spending is on chronic physical and behavioral health conditions leaving little for disease prevention and health promotion.[12] An analysis by the Commonwealth Fund shows that administrative costs are an important contributor to excess US costs compared to peer countries. More than half of excess US health spending is on administrative costs, including insurance (15% of the excess), administrative costs borne by providers (15%), prescription drugs (10%), wages for physicians (10%) and registered nurses (5%), and medical machinery and equipment (less than 5%).[13] High US healthcare spending is important because of affordability, particularly for the non-wealthy. Between 2000 and 2019, annual healthcare costs accounting for inflation have nearly doubled from $7,174 per person to $13,098.[14] Spending is also important because it crowds out spending on social programs that improve health, healthcare programs, public health, or high-value programs such as federally qualified health centers whose funding is subject to annual Congressional re-authorization.

Older adults and those with qualifying disabilities are typically insured through Medicare, which has multiple components. Roughly half of this population is insured through traditional Medicare administered through CMS.[15] The other half of Medicare beneficiaries are enrolled in Medicare Advantage (Medicare Part C), managed through 43 largely private health plans.[16] Enrollment rates in Medicare Advantage have been steadily rising, with dominance near, raising questions about how Medicare would work through private plans to achieve public purposes that Medicare has served.[17] Despite this market consolidation, insurance providers offered 4,064 different Medicare Advantage plans in 2023. A similar array of Medicare drug plans (Medicare Part D) is administered through private health plans.[18]

Non-elderly people are primarily insured through employer-based insurance with a wide range of premiums, co-insurance, deductibles, copayments, and covered benefits. In 2023, covered workers contributed an average of 17 percent ($1,401) of the cost of single coverage and 29 percent ($6,575) of the cost of family coverage.[19] VA Health Care, administered through the US Department of Veterans Affairs, offers care to veterans through a federally supported, integrated system.[20] Many veterans may also be insured commercially by plans, Medicaid, or Medicare.[21] The Military Health System is separate from the VA. However, like the VA, it is among the largest integrated healthcare systems in the US[22] It is an employer health plan that serves active duty service members, retirees, and their families.[22]

Medicaid is a federal and state-supported payment system for people with low incomes. In 2021, people insured through Medicaid included American Indian/Alaskan Native (1%), Asian/Hawaiian Native/Pacific Islander (5%), Black (19%), Hispanic (29%), and non-Hispanic White (40%) peoples. Eligibility requirements and benefit coverage vary widely by state and region.[23] Medicaid and the Child Health Insurance Plan coverage for low-income children peaked at nearly 95 million during the COVID-19 pandemic.[24] More than seven in ten beneficiaries of Medicaid are enrolled in private Medicaid-managed care plans.[25]

The US has the largest proportion of uninsured people among high-income countries.[7] People who are uninsured are predominantly minoritized (39% Hispanic, 13% Black, 4% Asian/Native Hawaiian/Pacific Islander, 1% American Indian/Alaskan Native, and 38% Hispanic White).[26] Seven in ten uninsured people report being uninsured because coverage is unaffordable.[27] After rising for three consecutive years from 2017 to 2019, the number of nonelderly uninsured individuals dropped by nearly 1.5 million from 28.9 million in 2019 to 27.5 million in 2021.[28]. However, this figure is rapidly rising due to widespread post-pandemic Medicaid dis-enrollment.[7]

In 2022, more than 30.5 million people relied on nearly 14,000 HRSA-funded community health centers.[29] Nearly 19% of health center patients are uninsured.[29] Despite caring for populations with complex medical, behavioral health and social needs, federally-qualified community health centers (FQHCs) rank near the bottom in federal funding.[29,30] The VA is the single largest source of payment for the uninsured.[30] The Indian Health Service (IHS) provides health care to approximately 2.6 million American Indian and Alaska Native peoples who belong to 574 federally recognized tribes in 37 states. Roughly one and a half million VA patients are uninsured.[30] Roughly a quarter of non-elderly adult American Indian/Alaska Natives are

uninsured, with many obtaining health care through the IHS[31] or directly through Tribal health care.[31]

Notably, the U.S. healthcare system is tiered based on resources and disparate insurance reimbursement for care. The apex tier is the very wealthy, who often self-pay, enroll in concierge care, or obtain special care based on board membership or donations to the healthcare system.[32,33] The second tier is the system of commercial health for those with employer-based care. This system itself is tiered based on premiums, benefits, deductibles, and coverage benefits.[34,35] The third tier is Medicare, which insures the elderly, disabled, and those with end-stage kidney disease. Medicare reimburses significantly less than commercial payers.[36] Medicare Advantage is represented by private health plans contracted by CMS to provide care, including additional funding for care management and benchmarks.[37] The fourth tier is Medicaid, which typically reimburses physicians and hospitals the least, i.e. less than Medicare and much less commercial insurance.[38] Community Health Centers, including FQHCs and hospital ambulatory clinics, receive a higher payment than private clinicians, resulting in a large share of patients with Medicaid being cared for by these facilities.[39] The uninsured tend to avoid care due to costs.[28] Sources of care for the uninsured include community health centers that often offer fees adjusted for income and hospitals that offer charity care. However, their impact is limited by poor public awareness, unreliability of price information, and opaque price transparency.[40-44]

Broken Access & Care Coordination

There is no single national healthcare system for everyone in the U.S. Instead, healthcare is a patchwork of fragmented systems with limited integration. Most healthcare is reimbursed based on clinician-driven encounters based on billing codes for diseases and procedures. Beyond brief counseling, interventions to promote healthy eating, physical activity, smoking cessation, safe drinking counseling, healthy sleep, and stress reduction are reimbursed poorly, or not all in the absence of diagnosed disease.[45,46]

(Hidden) Priority Populations

The US has the highest number of people who are incarcerated in the world, with more than 4.9 million people arrested in 2017, more than 1.2 million in federal or state prisons, and more than half a million in jail at any one point in time.[47] Health care behind bars, i.e., within jails, prisons, and detention facilities, is a hidden and poorly accountable source of care, particularly for people, many of whom lack health insurance. People who are incarcerated are disproportionately Black or Brown and afflicted with multiple health physical, mental, and behavioral conditions.[48-50] Health care in jails, prisons, and detention facilities is under-resourced, understaffed, poorly regulated, and without systematic health care quality monitoring.[50-53] A recent survey of jails in the Southeast found that almost 30% of jails routinely lacked on-site healthcare providers, and for most jails, onsite providers' presence was limited.[54] There is little systematic data about actual healthcare quality beyond some process measures.[52,55] Coordination of care with providers is typically poor.[53] Incarceration has adverse effects on individuals' and communities' health.[56-58] Incarceration amplified the impact of the COVID-19 pandemic, resulting in higher mortality rates among those incarcerated than in age-matched individuals residing in the community.[59]

Racial and ethnic health disparities arise largely from the inequities in SDOH.[60] SDOH are "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life, contributing to racial and ethnic health disparities. These forces and systems include economic policies and systems, development agendas, social norms, social policies, racism, climate change, and political systems."[61] SDOH are impacted by political, commercial, and legal determinants of health.[62-65] Federal, state, and local policies, including legacies of redlining and structural racism, affect the distribution of wealth, political power, mass incarceration, and SDOH.[48,63,66-72] These policies affect equity in the distribution of resources by individuals and communities. SDOH also impacts health and well-being through the fulfillment of material and psychological needs and their impact on health behaviors.[73-76]

Many groups from minoritized and indigenous communities view health holistically and in relationship to others, including their community and environment.[77-79] This contrasts with the Western biomedical model, which views health as the absence of disease and the absence of any dysfunction in biological processes.[80] Yet, surveys of people across roles and cultures suggest health is a multi-dimensional construct that includes but is not limited to disease.[81] It reflects biomedical comorbidity and severity, well-being, mental behavioral health, daily function, social relationships, sense of coherence, and a person's capability to be healthy and stay healthy in different environmental and social contexts.[82,83]

Health disparities are the product of structural racism and corresponding inequities in SDOH including health care access and treatment.[6,84-86] Health inequities contribute to inequities in access to treatment due to the failure of the healthcare system to accommodate people from different cultures and people with health impairments.[87,88] For example, a person who has experienced a stroke might struggle to make an appointment by phone due to speech impairment or be unable to climb the steps of a bus due to partial paralysis. Notably, these are features of the design of health care delivery rather than inherent in people. The US healthcare journey is a rocky and difficult one, more so for those confronting inequities in SDOH, discrimination, and racial bias.[89,90]

Section 3: Structural Racism and Health

The concept of structural racism is relevant to framing racial and ethnic disparities in health and healthcare.[91-94] Krieger defined structural racism as the "the totality of ways in which societies foster [racial] discrimination, via mutually reinforcing [inequitable] systems…(e.g., in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc.) that in turn reinforce discriminatory beliefs, values, and distribution of resources."[5] Institutional racism is subsumed under structural racism, referring to racially adverse "discriminatory policies and practices carried out…[within and between individual] state or non-state institutions" based on a racialized group membership.[5]

Structural racism drives racial and ethnic health disparities primarily through corresponding inequities in SDOH, i.e. the conditions of life.[60] SDOH are "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life, contributing to racial and ethnic health disparities. These forces and systems include economic policies and systems, development agendas, social norms, social policies, racism,

climate change, and political systems."[61] SDOH are impacted by political, commercial, and legal determinants of health.[62-65] Federal, state, and local policies, including legacies of redlining and structural racism, affect the distribution of wealth, political power, mass incarceration, and SDOH.[48,63,66-72] These policies affect equity in the distribution of resources by individuals and communities. SDOH impacts health and well-being through the fulfillment of material and psychological needs and health behavior.[73-76] Policies, regardless of purported intent, that have a disparate impact on minoritized racial groups, are structurally racist. Such policies may be enacted in conservative and liberal cities as illustrated by the Rockefeller drugs laws enacted in New York State[95] or New York City police stop and frisk policies involving 5 million stops of overwhelming Black and Brown people between 2004 and 2013.[96]

Section 4: Healthcare Disparities in Access and Quality: Evidence from the NHQDR Report and Other Data

Methods

Minoritized groups tracked in the NHQDR report include people who identify as American Indian/Alaskan Native, Black/African American, Asian, Native Hawaiian/Pacific Islander, more than one race, and Hispanic ethnicity. For racial and ethnic comparisons, the NHQDR used White and non-Hispanic ethnicity as the reference categories. To simplify comparisons, they generally used the combined non-Hispanic White reference group.

The NHQDR used an unweighted linear regression with a minimum of four time-points between 2000 and the most recent year to assess *overall trends in quality* i.e., for the overall population. A trend was defined as "improving" when the average annual relative percentage change, based on slope, was or more significant than 1% per year, and the p-value was less than 0.10. A trend was defined as "not changing" when the average yearly relative change was less than or equal to 1%, and it is defined as "worsening" when the change was greater than 1% in an unfavorable direction and the p-value is less than 0.10. A trend was defined as "improving quickly" in the few instances where the average annual relative percentage change was greater than 10% per year in a favorable direction, and the p-value was less than 0.10.

The NHQDR assessed *disparities in quality at a single point in time* between a disparity group, e.g. African Americans, and the reference group, typically the best-performing group, e.g., non-Hispanic Whites, based on the most recent year of data available and also trends in disparities between a priority population and the best performing group. The first comparison requires that the absolute difference between the priority population and reference group be statistically significant ($p < 0.05$ on a two-tailed test) and that the relative difference between the two groups must be at least 10% when framed positively or negatively. Application of these criteria yields three results: better, the same, or worse (than the reference group) depending on whether both criteria are satisfied for better or worse. If not, the result is deemed "the same."

The NHQDR also assessed *disparities in trends* based on comparing average annual changes for the disparity group and White individuals/ non-Hispanic White individuals using unweighted linear regression. "Improving" is defined as the difference in the average yearly change of the disparity group and the non-Hispanic White group is less than or equal to 1 in a favorable direction, and the p-value is less than 0.10 for test testing that regression coefficients are the same.

"Not change is defined as the absolute value of the difference between the average annual change of the two groups is less than 1, or the absolute value of the difference in average annual change between the comparisons is greater than 1, and the p-value is greater than or equal to 0.10 that the regression coefficients are the same. "Worsening" is defined as the difference in the average annual change of the disparity group and the non-Hispanic White group is greater than 1in an unfavorable direction, and the p-value is less than 0.10 for testing that regression coefficients are the same.

Given the size of the NHQDR appendix, measures based on the type of outcome were prioritized. That is, effectiveness and outcome measures were prioritized over process measures. AHRQ defines effective treatment interventions as those "shown to reduce mortality and morbidity among people with chronic diseases." We also prioritized measures where: 1) there was a disparity by race and ethnicity at baseline; 2) treatments impacted leading causes of death; and 3) data were available to assess longer trends.
Data sources were primarily federal (e.g., Centers for Disease Control and Prevention [CDC], Centers for Medicare & Medicaid Services [CMS]), some professional organizations (e.g., American Hospital Association), and academic institutions (e.g., the University of Michigan Kidney Epidemiology and Cost Center).

We supplemented these NHQDR and CMS Medicare Advantage findings with a targeted review of studies published from 2003 to 2023 using PubMed by matching the text words "disparities" health care/health care and trends in the title, text words ACA or COVID-19 with disparities in healthcare/health care and targeted reviews on selected topics with a focus on studies published in the last three years and/or based on systematic reviews. We also forward-searched articles using references from key papers.

Current Disparities in Quality of Care by Race and Ethnicity: Most Recent Year

American Indian/Alaskan Native population

American Indian/Alaskan Native populations had similar quality of care across 45% (50/110) all of the respective quality of care categories compared to the White population. The patient safety category had the highest similarity (69%, 9/13), and care coordination had the lowest similarity compared to the White population (12%, 1/8).

Eighty-eight percent (7/8) of the care coordination sub-metrics were worse for the American Indian/Alaskan Native populations compared to the White population. None of the affordable care (1) or care coordination (8) sub-metrics showed evidence of improvement.

The rate of overall improvement in quality-of-care disparities was 12% for the American Indian/Alaskan Native population compared to the White population. The effective treatment category improved most (28%, 5/21). However, as many of the effective treatment sub-metrics worsened as improved, 28% (5/21).

Asian population

The Asian population had the highest rates of a better quality of care compared to White people among all racial-ethnic populations. Twenty-eight percent (48/172) of their respective quality metrics showed improvement. However, 28% worsened.

The most improved rates were in the category of coordination, where 76% (16/21) of the respective sub-metrics showed improvement compared to the White population. Affordable care was the only category that neither improved nor worsened.

Black population

Roughly as many quality of care measures that were the same (45%, 86/190) were worse (45%, 85/190) for the Black population compared to the White population.

Patient safety was the category that showed the greatest rate of improvement. Eighteen percent (5/28) of the patient safety sub-metrics were better for the Black population compared to the White population. The care coordination category had the worst rate of improvement. Seventy-seven percent (17/22) of its sub-metrics were worse among the Black population.

Native Hawaiian and Pacific Islander populations

More of the quality metrics were the same for the Native Hawaiian and Pacific Islander (Native Hawaiian/Pacific Islander) populations (45%, 33/73) as compared to the White population, than were better (18%, 13/73) or worse (37%, 27/73).

Care coordination had the worst rate of improvement. Forty-three percent (3/14) of the sub-metrics within the care coordination category were worse. Forty percent of the person-centered care (4/10) and healthy living (12/30) sub-metrics were worse for Native Hawaiian/Pacific Islander populations compared to the White population.

Hispanic population

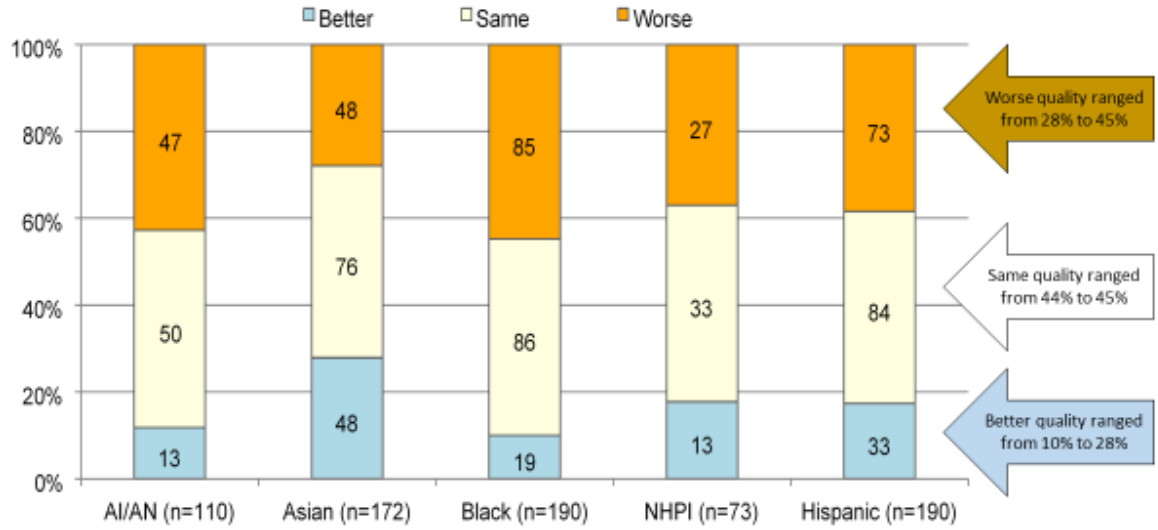
Overall, more of the current quality metrics were the same for the Hispanic population (44%, 84/190) compared to the White population. They had better quality of care for 17% of the measures (33/190) and worse quality of care for 38% (3/190).

Healthy living had the worst rate. Forty-seven percent (33/70) of the sub-metrics within healthy living were worse compared to the White population. Care coordination and patient safety had the highest rates of better care compared to the White population, 23% (5/22) and 21% (6/28), respectively.

Summary of Current Disparities

The most recent cross-sectional data show that 44%-46% of the quality-of-care measures were the same across all racial and ethnic populations compared to the White population (Figure 1). Better quality in comparison to the White population ranged from 10%-28%, whereas rates of worse quality ranged from 28%-45%.

Figure 1. Current Disparities in Quality of Care by Race and Ethnicity



Note: Different data sources have different data years for most recent data year (2017, 2018, 2019, or 2020). The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD.
https://www.ahrq.gov/research/findings/nhqrdr/index.html

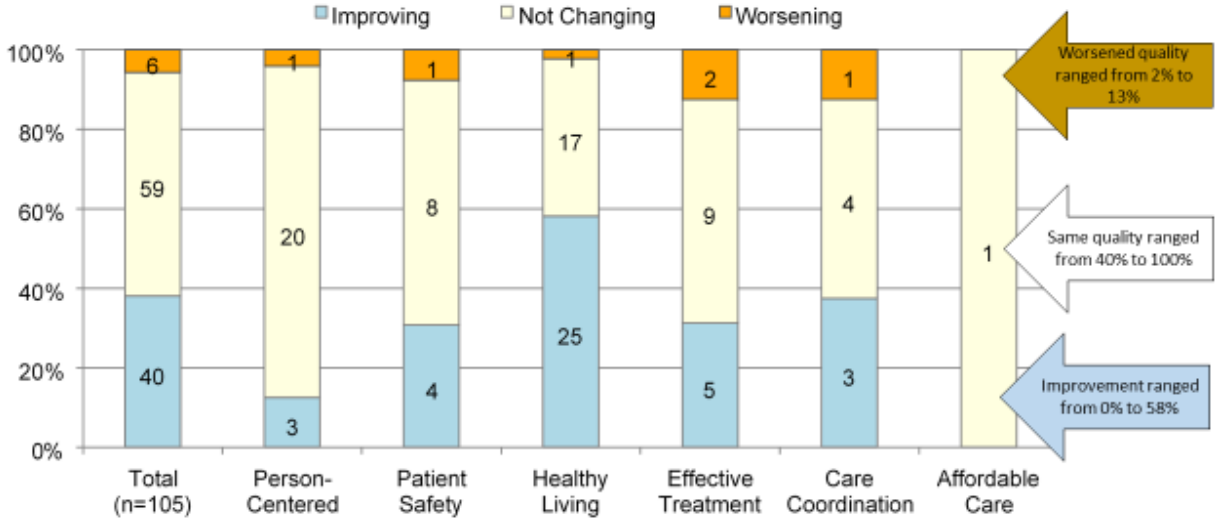
Trends in Quality of Care by Race and Ethnicity

Trends were calculated for each measure with at least 4 data points over time. There are varying measures between groups because of a lack of data and small subpopulations. Measures were determined to be improving, not changing, and worsening by the direction of the average annual percent change. For example, a measure was determined to worsen if the annual percent change was 1% in the undesired direction and $p \leq 0.10$.

American Indian/Alaskan Native population

Most of the quality-of-care disparities did not change from 2000-2020 for the American Indian/Alaskan Native populations (56%, 59/105), (Figure 2). The person-centered measure had the highest proportion of metrics with no change (83%, 20/24) across the six quality of care categories.

Figure 2. Trends in Quality of Care for American Indian & Alaska Native Populations



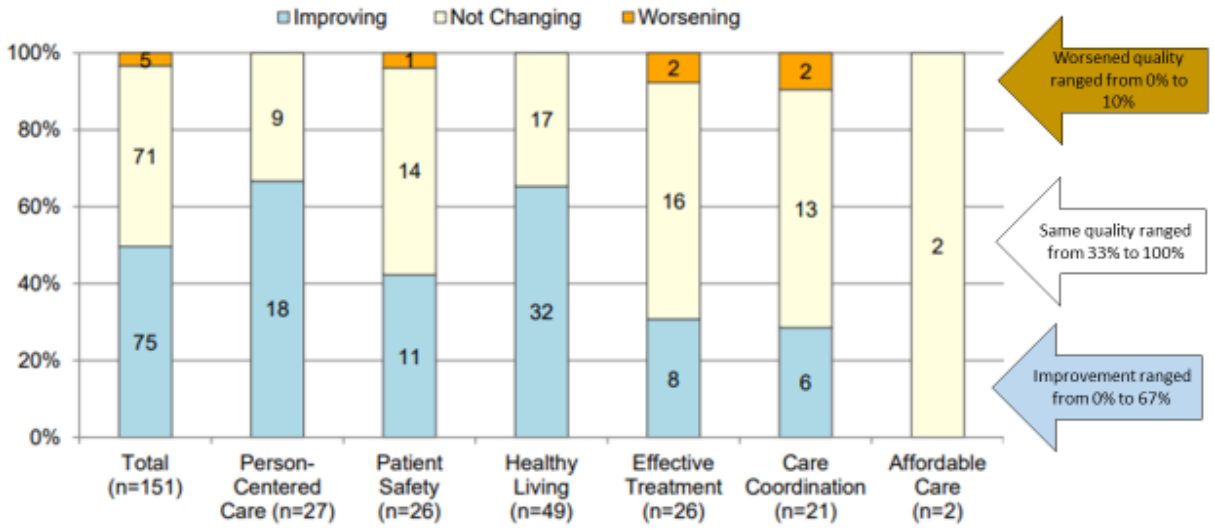
Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

The most frequent improvements for the American Indian/Alaskan Native populations were for healthy living. Fifty-eight percent (25/43) of the sub-metrics in that category improved. There was a worsening in disparities across all categories, with the highest proportion of worsening metrics in effective treatment (13%, 2/16) and care coordination (13%, 1/8).

Asian population

For Asian individuals, half of the quality of care disparities measures improved between 2000 and 2020. The most frequent improvements occurred within person-centered care (67%, 18/27) and healthy living (65%, 32/49) (Figure 3). Notably, none of the metrics in the patient-centered care or health living categories worsened over time.

Figure 3. Trends in Quality of Care for Asian Population



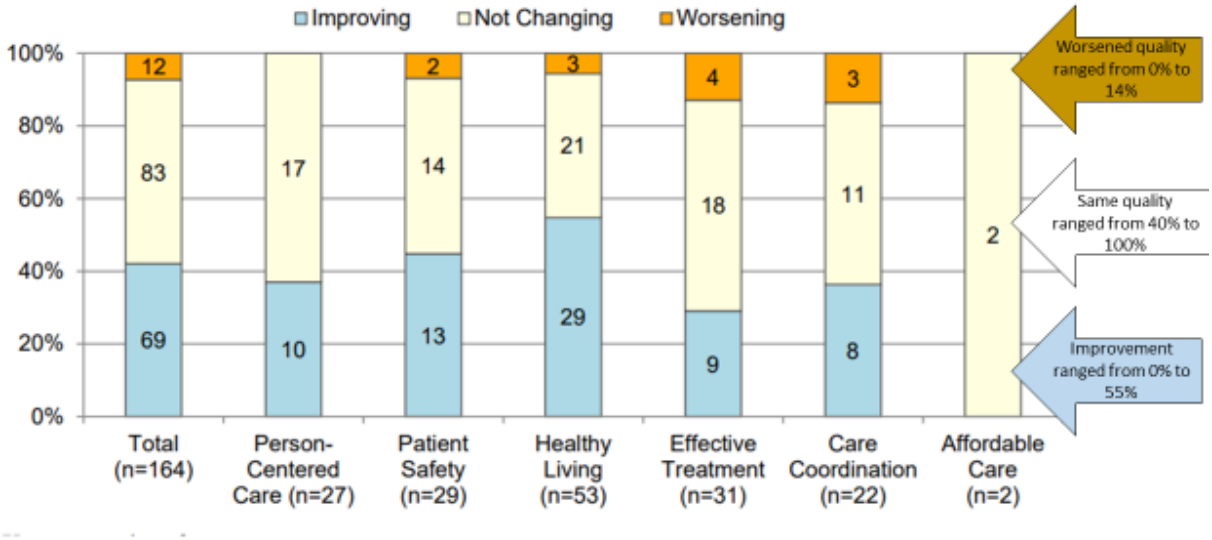
Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

Overall, only 5 out of 151 of the quality-of-care measures worsened over time. Those included metrics in the patient safety (1), effective treatment (2), and care coordination (2) categories.

Black population

Roughly half (51%, 83/164) of the quality-of-care measures did not change for the Black population from 2000-2020, (Figure 4). The most frequent improvements were in healthy living (55%, 29/53) and patient-centered care (45%, 13/29).

Figure 4. Trends in Quality of Care for Black Population



Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

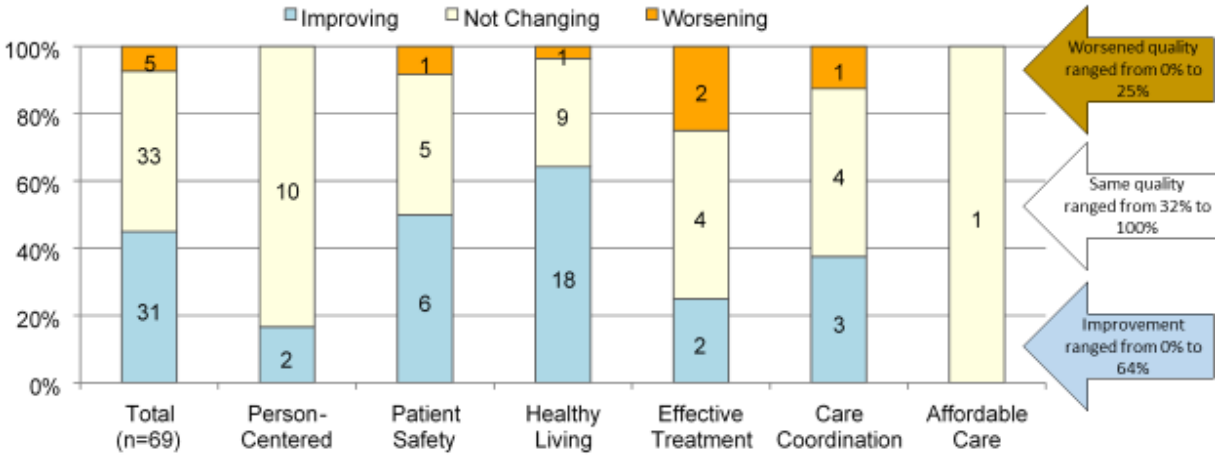
Effective treatments and care coordination were most likely to show worsening disparities, 13% (4/31) and 14% (3/22), respectively.

Native Hawaiian and Pacific Islander population

Almost as many measures improved (45%, 31/69) as did not change (48%, 33/69) for Native Hawaiian/Pacific Islanders. The highest proportion of improvements were in patient safety (50%, 6/12) and health living (64%, 18/28).

The Native Hawaiian/Pacific Islander population had the highest proportion of worsening metrics in the effective treatment category. Twenty-five percent (2/8) of the sub-metrics within that category showed evidence of worsening (Figure 5).

Figure 5. Trends in Quality of Care for Native Hawaiian and Pacific Islander Populations

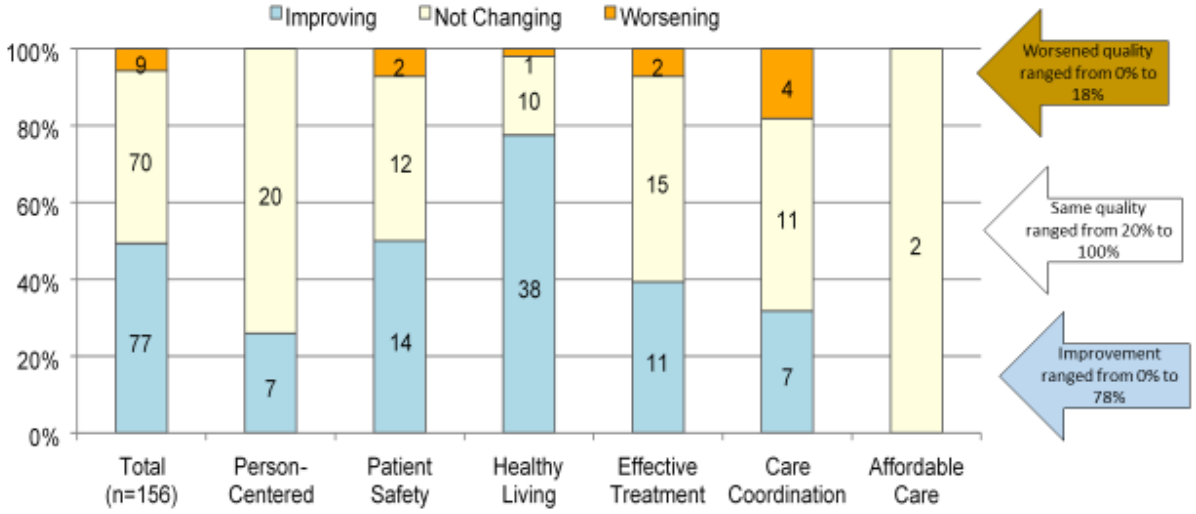


Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

Hispanic population

Almost half of the quality-of-care metrics improved for the Hispanic population over time (Figure 6). The most frequent Hispanic improvement rates were in healthy living and patient safety, 78% (38/49) and 50% (14/28), respectively. Care coordination had the highest proportion of worsening across all categories (18%, 4/22).

Figure 6. Trends in Quality of Care for Hispanic Population



Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

Summary of Trends in Health Care Quality for Minoritized Groups
The trends toward overall quality improvement ranged from 38% among the American Indian/Alaskan Native population to 50% in the Asian population over the twenty-year period. The Hispanic and Native Hawaiian/Pacific Islander had similar trends, with 49% of their metrics trending toward improvement. Across all racial and ethnic populations, the healthy living metric showed the most frequent improvement. Healthy living included clinical preventive services, functional status preservation, rehabilitation, supportive and palliative care, lifestyle modification, and maternal and child health.

Trends in Disparities in Quality of Care by Race and Ethnicity (only metrics with a baseline disparity in 2000)

The following are just for quality measures that had a disparity related to race and ethnicity at baseline year 2000.

American Indian/Alaskan Native population
From 2000 to 2020, disparities between American Indian/Alaskan Native and White populations narrowed on 8% (3/38) of the quality-of-care metrics. The highest proportion of improvement was ineffective treatment (25%, 1/4). None of the quality metrics with a baseline disparity worsened over time.

Asian population
Almost all of the disparities between the Asian and White populations remained unchanged (98%, 41/42). The only change was in the effective treatment measure. One of the three sub-metrics in that category narrowed (improved) over time.

Black population
The majority of the baseline disparities between the Black and White populations were unchanged over time (86%, 62/72). The Black population was the only racial-ethnic group for whom baseline disparities expanded over time. Care coordination (25%, 4/16) and effective treatment (7%, 1/14) both worsened. However, care coordination and effective treatment also showed evidence of narrowing, 19% (3/16) and 14% (2/14), respectively.

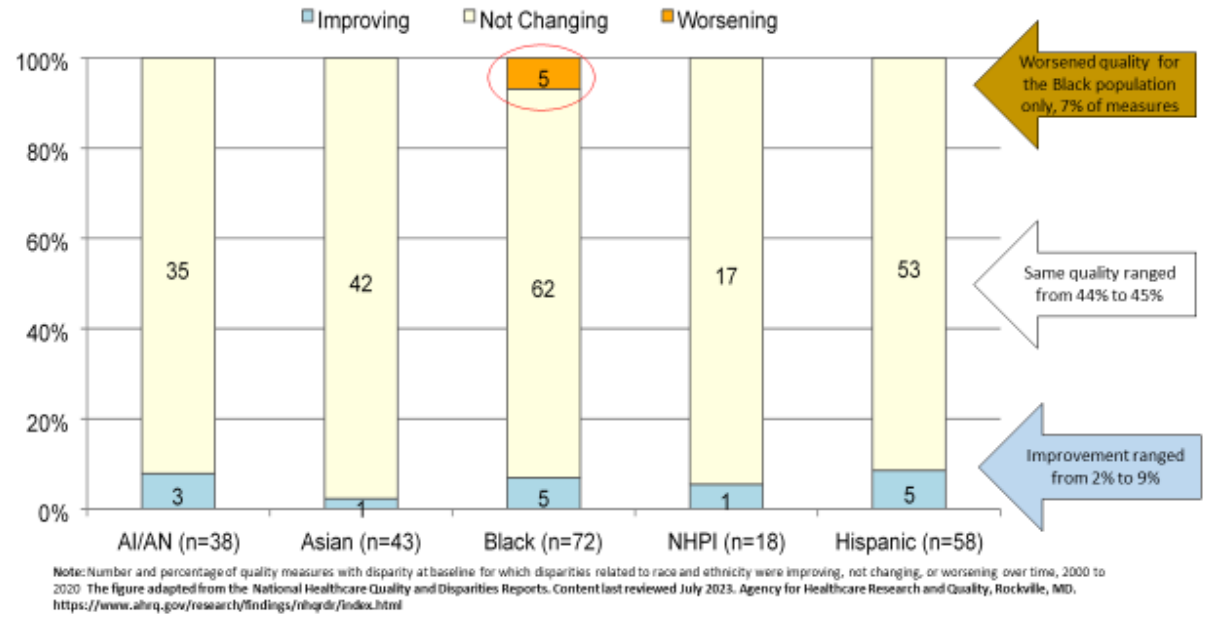
Native Hawaiian and Pacific Islander population
Most baseline disparities between Native Hawaiian/Pacific Islander and the White population were unchanged over time (94%, 17/18). One of the three (33%) effective treatment measures had evidence of the disparity narrowing over time.

Hispanic population
Most disparities between the Hispanic and White populations were unchanged (91%, 53/58). A narrowing in disparities was seen in healthy living (16%, 3/19), care coordination (14%, 1/7), and effective treatment (11%, 1/9). None of the baseline disparities worsened.

Summary of Trends *in Disparities* in Health Care Quality (among those with a baseline disparity)

Almost all (90%, 35/38) of the quality-of-care disparities metrics that had a disparity at baseline remained unchanged across all racial and ethnic populations over time, Figure 7. All groups had some improvement in effective treatment, ranging from 11% among the Hispanic population to 33% in the Asian and Native Hawaiian/Pacific Islander populations. The Hispanic population was the only racial-ethnic group with a reported affordable care baseline disparity, and it was unchanged. The Black population is the only population for whom some disparities expanded.

Figure 7. Changes in Quality of Care Disparities by Race and Ethnicity (baseline only)



Note: Number and percentage of quality measures with disparity at baseline for which disparities related to race and ethnicity were improving, not changing, or worsening over time, 2000 to 2020. The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

Trends in Disparities Related to Access to Care by Race and Ethnicity

We used 2022 NHQDR and targeted literature reviews to examine disparities in access to care. Access to healthcare is defined as "the timely use of personal health services to achieve the best health outcomes."[97] Access is a multidimensional construct.[98] Access to comprehensive, quality healthcare services is foundational for promoting and preserving health, preventing and managing disease, reducing avoidable disability and premature death, and achieving health equity.

AHRQ assesses access based on:

- A usual source of care with whom the patient can develop a relationship.
- Health insurance that facilitates entry into the healthcare system.
- Timely access to needed care.
- The ability to receive care when there is a perceived need for care.

These dimensions are operationalized through a series of measures, including having a usual source of care, insurance, and timeliness.

Usual Source of Care

AHRQ does not report trends in the usual source of care but reports that Hispanic individuals and non-Hispanic Black individuals are less likely to have a usual source, even when they are in fair or poor health. In 1999, those without a usual source of care were estimated at 17.0% for Asian individuals, 13.0% among Black individuals, 20.3% among Hispanic individuals, and 10.6% among White individuals.[99] Between 1999 and 2018, improvements were seen for Asian and Hispanic individuals but not for Black or White individuals.[99] Liaw *et al.* observe a tiered system, whereby r patients who were well educated, White, privately insured, and high earners were more likely to establish care with a person (continuity with a primary care clinician). In contrast, people with less education, income, no insurance, or who were Black, more often identified a facility (rather than person) as their usual source of care compared to their counterparts.

According to data from the National Survey of Children's Health (NSCH), the proportion of children with a usual source of preventive care was highest among non-Hispanic White children and lowest among non-Hispanic Asian (82.5%) and Pacific Islander/Native Hawaiian (82.0%) children (94.6%). Usual source of preventive care is associated with higher household income, from 82.0% at less than 100% Federal Poverty Level (FPL) to 96.2% at 400% FPL or greater. Non-Hispanic White (93.4%) children were most likely to be in excellent or very good health, while non-Hispanic American Indian/Alaskan Native (84.1%) and non-Hispanic Black (85.9%) children were least likely to be in excellent or very good health.

Insurance

Between 2002 and 2019, overall uninsured rates for the entire year dropped 44%. This precipitous decline followed the implementation of the ACA.[100] While there are persistent disparities in insurance by race and ethnicity in 2019, absolute differences in disparities among the uninsured are much smaller [100] (Table 1.16). Mahajan *et al.* report statistically significant reductions in the racial and ethnic differences in some self-reported measures of healthcare access, both with and without income stratification.[99] Notably, following the implementation of the ACA, racial and ethnic inequities in being uninsured improved significantly, with similar but smaller reductions by race and ethnicity in having a usual source of care.[99]

Timeliness

NHQDR reports parents who reported ease in getting appointments for routine care when needed. This measure improved significantly from 2002 to 2019. While absolute differences between non-Hispanic White individuals and Hispanic individuals and non-Hispanic Asian individuals (but not non-Hispanic Black individuals) declined, by 2019, inequities persisted.[101] Among adults who needed care right away, AHRQ does not report trend data. However, NCHS data show a steady rise in people reporting inability to obtain needed care due to cost that peaked in 2010 and then declined following ACA implementation. The NHQDR reports a similar measure for 2019, i.e., "adults who needed care right away for an illness, injury, or condition in the last 12 months who sometimes or never got care as soon as needed." For this measure, the report notes inequities by race and ethnicity. For example, 17.1% of non-Hispanic White individuals reported not being able to obtain needed care compared to 27.7% of Hispanic

individuals, 29.7% of non-Hispanic Asian individuals, and 27.7% of non-Hispanic Black individuals. More American Indian/Alaska Natives, Black, and Hispanic adults more often reported than non-Hispanic White individuals that they had more difficulty making an appointment to see a specialist. In contrast, Asian individuals reported less difficulty.

Affordable Care

In the NHQDR, there is a trend for more people under age 65 paying more for health care. In 2002, 14% of people paid more than 10% of their income for the family's health insurance premium and out-of-pocket medical expenditures. By 2019, this reached more than 18%. Among non-Hispanic White individuals, high costs increased from 15% to more than 20%, which was statistically significant, resulting in this group having the highest rate. Hispanic individuals most often reported not having a usual source of care due to cost or insurance. Nonetheless, the overall rates significantly improved for adults who needed to see a doctor but could not because of cost from 2013 to 2019. Still, rates of affordability in 2019 remained significantly worse for American Indian/Alaska Natives, Hispanic individuals, and non-Hispanic Black individuals in the NHQDR. The US is unique among wealthy countries in the widespread use of crowd-sourcing to pay medical bills. Unfortunately, people from lower-income and minoritized communities where needs are greatest generate less funding from crowd-sourcing.[102]

Disparities in Access and Quality by Income Groups

The following section provides an overview of the status and trends in racial and ethnic disparities in healthcare access and quality among insurance and income-priority populations, as determined by the 2022 NHQDR report. The NHQDR defines access as factors that facilitate accessing healthcare, including having health insurance and a usual source of care.

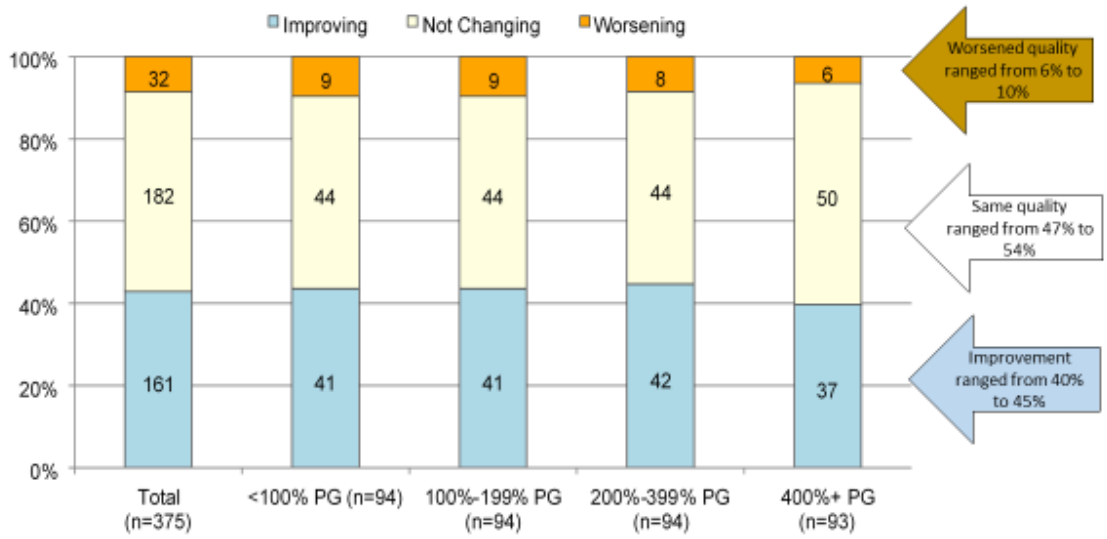
NHQDR comparisons were typically made between a priority population group and a reference group within a population characteristic (e.g., income less than 100% of poverty guideline vs. income greater or equal to 400% of the poverty guideline).

Income

Access to care was worse for people in households with an income of 400% or less than the national poverty guideline. Access to care was worse across 86% of all access measures in the two lowest income groups. Overall, 52% (181/351) of the quality metrics were worse for lower-income groups.

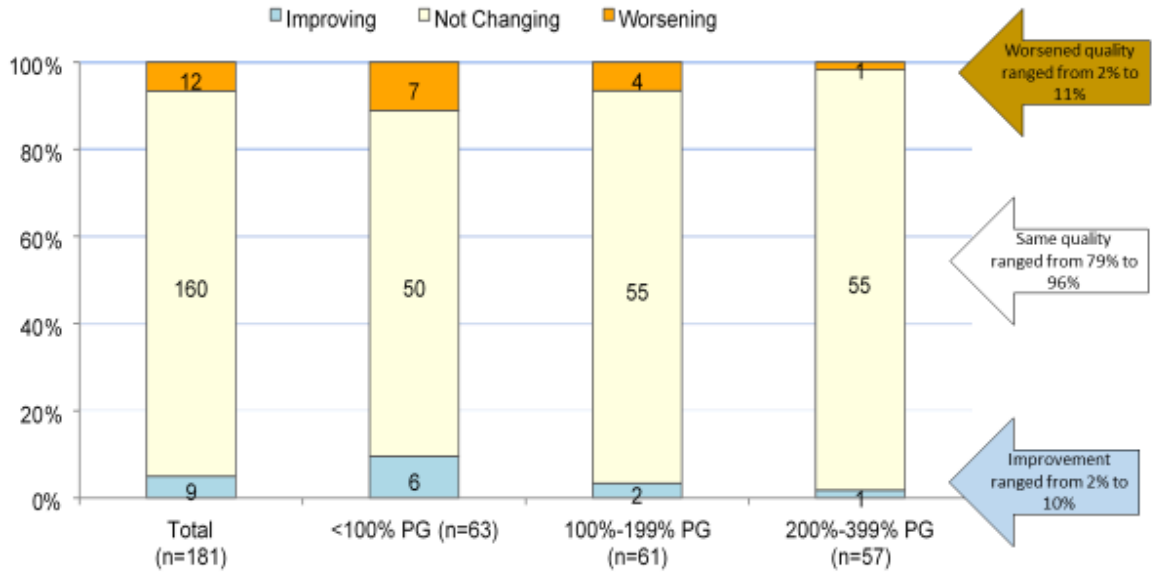
From 2000 to 2020, roughly 43% of quality measures were improving across all income groups, and roughly 9% were getting worse, Figure 8. However, if we only focus on the metrics with a disparity at baseline (year 2000) in households with incomes less than 100% of the poverty guideline, the disparity narrowed and expanded for 10% and 11% of the sub-metrics, respectively, Figure 9.

Figure 8. Trends in Quality of Care by Income Groups



Note: The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/research/findings/nhqrdr/index.html

Figure 9. Changes in Disparities by Income Groups (baseline only)

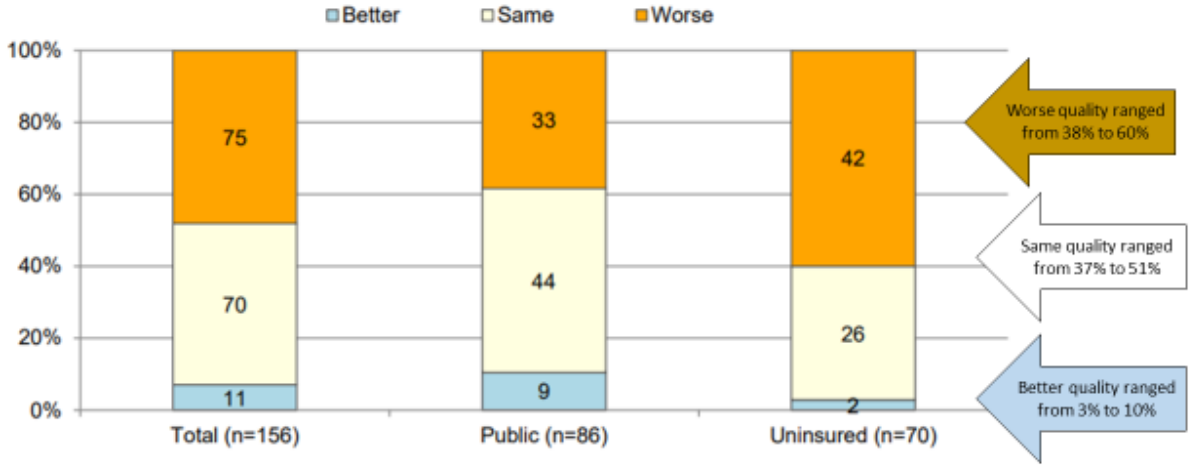


Note: Number and percentage of quality measures with disparity at baseline for which disparities related to race and ethnicity were improving, not changing, or worsening over time, 2000 to 2020. **The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD.** https://www.ahrq.gov/research/findings/nhqrdr/index.html

Insurance

The current quality of care was worse for 48% of the quality-of-care metrics for people with public insurance and among the uninsured compared to those with private insurance. The disparities were larger among people without insurance, where 60% of all quality-of-care measures were worse for them compared to those with private insurance. Figure 10.

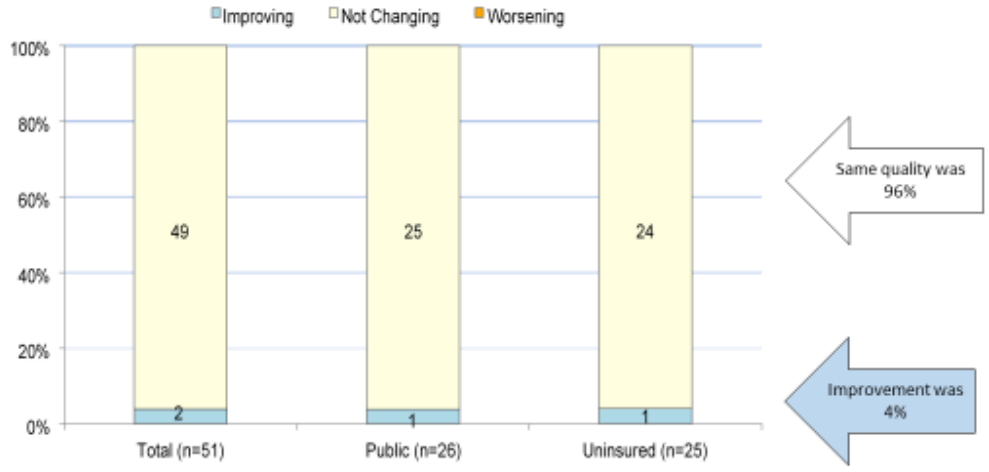
Figure 10. Current Disparities in Quality of Care by Insurance Type



Note: Different data sources have different data years for most recent data year (2017, 2018, 2019, or 2020). The figure adapted from the National Healthcare Quality and Disparities Reports. Content last reviewed July 2023. Agency for Healthcare Research and Quality, Rockville, MD.
https://www.ahrq.gov/research/findings/nhqrdr/index.html

Only 2% of the quality-of-care measures worsened across all insurance status groups over time. People with public insurance showed the most improvement, with 49% of their quality measures. Focusing on metrics that had a disparity at baseline, disparities narrowed for only 4% of the metrics between people without insurance and those with public insurance. Figure 11.

Figure 11. Changes in Disparities by Insurance Groups (baseline only)



Note: Number and percentage of quality measures with disparity at baseline for which disparities related to race and ethnicity were improving, not changing, or worsening over time, 2000 to 2020
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Section 5: Structural Racism and Social and Behavioral Determinants of Health

Structural racism impacts the health of people in Black and Brown communities through traditions, laws, regulations, and practices through their disproportionate impact on these communities. [103] Dehumanization is a critical element. For example, in a recent national survey, respondents who self-identified as White and who indicated more dehumanizing views toward Black people were far more likely to choose the policy options that increased administrative burdens in Medicaid and Supplemental Nutrition Assistance Program (SNAP) (food subsidies for people with low income).[104] These attitudes impact policies, which in turn impact SDOH, yielding inequities in healthcare and health. Policies impacting differences in poverty and wealth, education, racial segregation, racial discrimination, and thwarted economic opportunity and upward mobility all impact healthcare and health.[91,105] Systematic review and meta-analysis confirm the relationship between racism and poorer mental health, including depression, anxiety, psychological stress, and various other outcomes in addition to poorer general and physical health.[106] Examples of downstream pathways through which these macro-level factors contribute to racial and ethnic disparities in health include early life trauma, lifelong chronic stress, and resulting direct impact on health or indirectly through health behaviors.

Since the 1980s, wealth in college-educated households has outpaced noncollege households by a factor of 2.5.[107] Furthermore, for men with a college degree, expected lifetime years married has been relatively stable, decreasing by only one year, from 41 to 40 years, between 1960 and 2019. Yet, expected lifetime years married for men without a college degree has declined dramatically to 27 years, levels not seen since 1880.[108] For non-Hispanic White men, these represent dramatic relative losses that correspond with stagnating life expectancy.[109] The intersection of low education and male gender contributes to higher rates of "deaths from despair" including drug overdoses, alcohol-related deaths, and suicide.[110-112]

Evidence supporting a causal relationship between lower income and psychological distress comes from earned income tax credits, showing that among adults with no college, each additional 10-percentage-point increase in the generosity of state earned income tax credit (EITC)—relative to the federal credit—was associated with fewer reports of frequent mental distress and frequent poor physical health.[113]

Trauma and Chronic Stress

Adverse child experiences (ACEs) including a range of potentially traumatic experiences, e.g., poverty and parental separation, are associated with poorer adult health, including unhealthy behavior.[114] A meta-analysis showed an association between multiple ACEs and the following health behaviors in ascending strength: physical inactivity, overweight or obesity, and diabetes, smoking, heavy alcohol use, poor self-rated health, cancer, heart disease, respiratory disease, sexual risk-taking, mental ill health, and problematic alcohol use, problematic drug use and interpersonal and self-directed violence.[114] ACEs are also associated with criminal justice contact.[115] Notably, ACEs have been associated with accelerated epigenetic aging in children with ACEs,[116] and altered brain function based on functional MRI imaging.[117] Structural racism exposes Black and Brown children to more ACEs via poverty, family disruptions, and violence.[118-120]

Severe acute psychological trauma can result in a mental disorder called post-traumatic stress disorder (PTSD). National surveys showed Asian people were most likely to experience organized violence, i.e., particularly being a refugee, but also had the lowest exposure to all other traumatic experiences. Black people had the greatest exposure to participation in organized violence, sexual violence, and other traumatic experiences, Hispanic people had the highest exposure to physical violence, and White people were most likely to experience accidents/injuries.[121] Notably, racial discrimination has been associated with PTSD, suggesting that among traumatically injured individuals, experiences of racial discrimination are harmful to mental health above and beyond other risk PTSD factors.[122] In a cross-sectional study of women at midlife, greater PTSD symptoms were associated with greater carotid atherosclerosis and, among women at genetically higher risk, i.e. who were APOEε4 carriers, PTSD symptoms were associated with greater brain small vessel disease and poorer cognitive performance.[123] There are treatments for PTSD, including emerging novel treatments.[124,125] Yet, non-Hispanic White race is associated with greater mental health use.[126]

Chronic stress from effects of structural racism affects children and adults through a process of cumulative wear and tear on the human body, referred to as allostasis. ACEs contribute allostatic load.[127] A systematic review found that 50 % of obesity and substance abuse, 75 % of sleep and 62.5 % of combined health risk behavior studies showed a significant association with allostatic load.[128]

Smoking Prevalence and Cessation

Smoking is the leading cause of disability-adjusted life years in the US[129] The NHQDR documents higher rates of smoking among non-Hispanic Black and, Native Hawaiian and Pacific Islander people than non-Hispanic White individuals. Smoking is associated with ACEs and PTSD.[114,130] Reviews of tobacco industry documents show that menthol cigarettes were marketed to be perceived by consumers as healthier than non-menthol cigarettes, with specific social and demographic groups, including African Americans, women, and young people.[131] African Americans who smoke menthol flavor (the dominant flavor among African Americans) are less likely to quit smoking.[132] The Food and Drug Administration (FDA) proposed a ban on menthol favored tobacco in 2019,[133] but it has not yet been implemented. Among all racial and ethnic groups, smoking prevalence declined, with the highest rates among American Indian or Alaskan Native peoples and those with less educational attainment.[134] This historic decline that dates more than fifty years was fostered by national, state, and local tobacco control programs and policies, such as public education campaigns, widespread smoke-free air laws, higher cigarette prices that have been driven by large increases in federal, state, and local cigarette excise taxes.[135] National smoking bans and tobacco taxes reduce smoking, promote uptake of evidence-based smoking cessation intervention, reduce secondhand smoke, improve cardiovascular health outcomes, and reduce mortality for associated smoking-related illnesses.[136-138] Differences in state policies contribute but do not fully explain differences in smoking prevalence by state.[139] In 2020, current cigarette smoking prevalence was higher among individuals who resided in rural areas than among those who resided in urban areas among non-Hispanic Black (38% higher), Hispanic (38% higher), and non-Hispanic White (62% higher) adults; prevalence among non-Hispanic Asian adults was 32% higher among those in urban areas.[140] People who smoke and who are without health insurance are less likely to receive smoking cessation counseling.[141] Among one sample of hospitalized patients, African American smokers were less likely receive

smoking cessation medications.[142] Nationally, men, people without insurance, African American patients, Asian patients, and Hispanic patients were less likely to use medications to assist smoking cessation.[141] A comprehensive primary care-based smoking cessation program was determined to be cost-effective.[143] However, these programs are not routinely covered by most health plans. The NHQDR finds that among smokers who had doctor visits in the last year, Hispanic and non-Hispanic Black adults were less likely to receive advice from their providers to quit than non-Hispanic White adults.

Healthy Eating

High body mass index and dietary risk are the 2nd and 3rd leading causes of disability-adjusted life years in the US, behind smoking.[129] Similar to tobacco advertising targeting minoritized communities, findings from a systematic review suggest that the marketing environments of African American consumers may predispose African Americans to excess caloric consumption and relatively poor dietary quality.[144] Marketing ultra-processed foods to youth may have long-term adverse impact.[145] In contrast to tobacco smoking which has declined over more than 60 years, unhealthy eating, including excessive caloric consumption of ultra-processed food, has worsened over time with significantly less regulation by the government than tobacco.[146,147] Tobacco companies have produced significant amounts of highly palatable, ultra-processed foods.[148] No state has yet implemented excise taxes on sugar or ultra-processed food, although a handful of cities have done so.

Americans consume the most calries per person of any country in the world.[149] Hispanic individuals and college graduates consumed *less* ultra-processed foods and more minimally processed foods than other racial and educational groups.[146] Gertler & Gracner used a regression discontinuity design to examine the impact of sugar-rich diets on the health and economic well-being of those born during food rationing (1950-1953) and just after rationing ended (1955-1959). They observed large adverse effects on the health and economic well-being of adults more than fifty years later who consumed sugar-rich diets.[150]

Obesity is associated with ACEs.[151] Rates of obesity have steadily increased, with a higher prevalence of obesity and severe obesity among younger cohorts.[152] In 2016, obesity was associated with an estimated $260 billion in direct medical costs in the US.[153] Obesity and severe obesity increased in all subgroups except non-Hispanic Black men, whose obesity prevalence didn't increase after 2005-2006, while there was a greater increase in obesity among Mexican American men than non-Hispanic White men.[154] Prevalence is highest among women who are Black or Hispanic.[154] Obesity prevalence varies widely between states from Colorado (23%) to West Virginia (38%),[155] with the highest regional rates in the Southeast and Midwest.[156] Food insecurity in high-income countries is associated with obesity.[157] Under the ACA, all types of insurance nationwide provide preventive screening and brief counseling services, but coverage for other obesity treatment options varies widely nationally.[158] Health insurance policies for intensive lifestyle programs for pre-diabetes, like the Diabetes Prevention Program (DPP), may hinder access to minoritized groups.[159]

Analysis of a national sample from 2007-2012 showed that non-Hispanic Black individuals were less likely than non-Hispanic White individuals to exercise for weight loss.[160] Only 1% of office visits for obesity involved a prescription for an obesity medication,[161] and less than 1% of

eligible individuals receives any anti-obesity medication.[162] Insurance coverage of the full range of recommended treatments is rare.[158] Only six state Medicaid agencies offered coverage for all components of obesity treatment, including behavioral and nutritional counseling and adjunct pharmacotherapy.[163] Newer GLP-1 agonists are typically not covered for treatment of obesity by Medicare, Medicaid, or most insurance plans.[164,165] The implementation of the ACA improved the uptake of bariatric surgery but has not eliminated the racial disparity in the procedure.[166] Better patient-physician relationships are associated with the completion of bariatric surgery regardless of race or ethnicity.[167] Evidence supports primary care lifestyle counseling as well as nurse-delivered counseling.[168,169] However, cultural adaptions may be needed to improve outcomes for diverse patients.[169,170] Current US Dietary Guidelines for Americans do not mention the ultra-processed food category, but the upcoming 2025-2030 Advisory Committee is charged with evaluating research related to the impact of ultra-processed food.[171]

Physical Activity

Physical inactivity is the 11th leading cause of disability-adjusted life years.[129] Chronic stress appears to promote physical inactivity.[172] Time spent on sedentary behavior or physical inactivity increased among US children, adolescents, and adults, from an overall 5.7 hours per day in 2007-2008 to 6.4 hours per day in 2015-2016, [173] with little improvement in adherence to national physical activity guidelines.[174] Physical inactivity is associated with race and ethnicity from highest to lowest: Hispanic, non-Hispanic, Black individuals, American Indian/Alaskan Natives, non-Hispanic White individuals, and Asian individuals.[175] Physical activity advice is associated with lower blood sugar, but only when combined with dietary advice.[176] Structured exercise training that consists of aerobic exercise, resistance training, or both combined is associated with blood sugar reduction in patients with type -2 diabetes.[176] Physical activity improves sleep and cognitive performance.[177,178] Having more ACEs is associated with less physical activity measured by actigraphy, e.g. steps.[179] Available evidence suggests that mass-media campaigns, point-of-decision prompts, and policy approaches are likely effective in promoting physical activity among disadvantaged groups.[180] The NHQDR reports no improvement in the proportion of adults who spend half an hour or more in moderate or vigorous physical activity at least five times a week, with Black individuals having 22% higher rates of inactivity than non-Hispanic White individuals. Physical inactivity varies widely by state from 18% in Colorado to 49% in Puerto Rico, with physical inactivity heavily clustered in the Southern states.[175] The built environment, particularly lower walkability, shows a longitudinal relationship with obesity, type-2 diabetes, and hypertension.[181]

Sleep

Adequate length and quality of sleep are critical for well-being health including minimization of cardiovascular disease.[182] Stress and poor sleep have bidirectional relationships.[183] Non-Hispanic people who are Black or Native Hawaiian/Pacific Islander, or who have lower income and less education have the shortest sleep, with shorter sleep clustered in the Southeast and along the Appalachian Mountains.[184,185] There is also a bidirectional relationship between poor sleep and consumption of ultra-processed food.[186] A systematic review documents an association between experiences of racial discrimination and sleep.[187] Notably, longitudinal analysis suggests that racial discrimination mediates the association with worse sleep among Black individuals.[188] Obstructive sleep apnea is a common sleep disorder among people with obesity that is associated with adverse cardiovascular outcomes and motor vehicle accidents.[189,190]

Effective treatment exist for obstructive sleep apnea and insomnia.[191,192] There are racial and ethnic disparities in drug treatment for insomnia[193] and likely disparities in access to effective non-drug, behavioral treatment.[194]

Life's Essential 8

The American Heart Association identified eight modifiable factors, including health promotion behavior for the prevention of CVD, named "Life's Essential 8."[195] These involve optimizing blood pressure, total cholesterol, blood sugar, body weight, diet, physical activity, smoking, and sleep.[195] Optimization of these factors is associated with reductions in CVD and all-cause mortality,[196,197] in addition to dementia,[198] stroke,[199] chronic kidney disease mortality,[200] non-communicable multimorbidity,[201] diabetic retinopathy and diabetic mortality,[202] liver disease,[203] cancer,[204] and life expectancy free of diseases. These eight factors affect multiple chronic diseases and biological aging.[205] Just five of these factors account for more than 25% of US healthcare spending.[206]

Notably, effective brief and intensive interventions exist to optimize these factors, but often, these interventions are under-reimbursed or not reimbursed at all by healthcare in the absence of a disease diagnosis. Instead, wellness has become an expensive commodity often purchased by the affluent.[207] Between 1988 and 2014, absolute disparities in Life's Essential 7 (sleep was not included in earlier iterations) narrowed but persisted between non-Hispanic Black and Hispanic people and non-Hispanic White people. However, this improvement was largely due to a worsening in these factors among non-Hispanic White individuals.[208] Despite evidence-based programs, including those tested in primary care, there are numerous barriers to implementation related to time, logistics, training, payment, and lack of multidisciplinary teams.[209-212] Cultural adaptations often improve program effectiveness for diverse patient populations,[170] but are not widely implemented in practice

In summary, structural racism often contributes to more adverse social and behavioral determinants of health among Black and Brown people. Public policies, commercial determinants of health, ACEs, trauma, stress, and notably poor access to effective treatments contribute to core social and behavioral determinants of health resulting in inequities in health.

Section 6: Effectiveness of Care: Racial and Ethnic Disparities in Health and Healthcare

In this section, we review trends by race and ethnicity in overall child and adult health, measures for leading causes of death, morbidity, and health in the US, including effective treatments, and trends in racial and ethnic all-cause mortality.

Overall Health Status

The Child and Adolescent Thriving Index 1.0 score is a comprehensive measure for tracking child and teen health involving a weighted mean of 11 indicators used to estimate well-being. The 11 components are non-low birth weight in neonates, preschool attendance in children aged 3-4 years, fourth grader reading proficiency, eighth-grade math proficiency, food security in children younger than18 years, general health status, non-obesity in high school students, nonsmoking in adolescents aged 12 to 17 years, non-marijuana use in adolescents aged 12 to 17 years, high school graduation in young adults aged 18 to 21 years, and nonarrest rate in children aged 10 to 17 years.[213] The index, which has a maximum of score of 1.0, increased from 0.780

points in 2000 to 0.843 points in 2019, with some moderate convergence in geographic, racial and ethnic disparities. Nevertheless, racial disparities persisted in 2019 among American Indian or Alaskan Native (−0.079 points), Black (−0.053 points), and Hispanic (−0.047 points) children and adolescents compared with non-Hispanic White youths.[213] Thriving was lower in the South compared to the Northeast regions of the US

Adult health is tracked using a self-report on a single item with five categories. The two lowest categories (poor and fair health) are grouped to create a binary measure. In 1999, an estimated 10.0% of the adult population was in poor or fair health.[99] The prevalence among Asian, Black, Hispanic, and White individuals was 10.0%, 17.7%, 14.3%, and 9.4%, respectively.[99] Between 1999 and 2018, there was no significant change in the estimated prevalence of poor health across these groups and no substantial change in the estimated gap between White and Black or Hispanic individuals. Between 1999 and 2018, Black individuals with low income had the highest estimated prevalence of poor or fair health in 1999 (29.1%) and in 2018 (24.9%), while White individuals with middle and high income had the lowest prevalence of poor health in 1999 (6.4%) and in 2018 (6.3%).[99] Despite non-Hispanic White individuals having better health than most groups, they had the highest ambulatory spending and total healthcare spending, with Black-White disparities in spending widening over time.[214] These differences reflect social living conditions. Dean *et al*. report that racial differences in annual health care spending were minimal in areas where Black and White adults lived under similar conditions of minimal racial and economic privilege.[215]

Racial differences in low-value care have been reported within Medicare.[216] Racial disparities in avoidable admissions among patients insured through Medicare have not improved after accounting for the effects of avoidable observation stays.[217] Black-White disparities in avoidable admissions are greater with Medicare Advantage than traditional Medicare,[218] largely due to disproportionate enrollment of Black patients in lower quality Medicare Advantage plans.[219] Black-White disparities in these admissions widened during the COVID-19 pandemic.[220] Singh *et al*. report on trends in the health of American Indian and Native Alaskan peoples,[221] observing that roughly 18% of American Indian and Alaskan Native adults reported their overall health as fair or poor, at double the rate of non-Hispanic White individuals, and nearly 10% of this minoritized group experienced serious psychological distress, two to five times higher than the that for other racial/ethnic groups. Notably, American Indian and Alaskan Native adults had the highest overall disability, mental and ambulatory disability, absence of health insurance, unemployment, and poverty rates in the US, with marked variation across tribes.[221]

Racial and Ethnic Disparities in Medicare Advantage

The CMS Office of Minority Health in collaboration with the Rand Corporation issued a report in May 2022 entitled "Disparities in Health Care in Medicare Advantage by Race, Ethnicity and Sex.[4] This report provides the most detailed data on racial and ethnic disparities in health care experiences and clinical care from a 2021 national sample of patients enrolled in private Medicare Advantage (MA) plans, 42% of all people with Medicare at the time. The report drew from two data sources. The first was the Medicare Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey that focuses on patients' healthcare experiences (e.g., ease of getting needed care, how well providers communicate, getting needed prescription drugs) of people with Medicare across the country. The second data source was the Healthcare

Effectiveness Data and Information Set (HEDIS®). As the report indicates, HEDIS data are collected from medical records and administrative data on the clinical quality of care that people with Medicare receive for various medical issues, including diabetes, cardiovascular disease, and chronic lung disease. Notably, scores on CAHPS measures are adjusted for case mix i.e., differences in disease conditions, but HEDIS measures are not adjusted for case mix.[4] .

Enrollees who were Asian American, Native Hawaiian, and other Pacific Islander MA enrollees reported the *poorest experiences of care*.[4] They reported care worse than the national average on six measures and above the national average on one (yearly flu shots). Areas where they reported worse care included getting needed care, getting appointments and care quickly, customer services, doctors who communicate well, coordination of care, and getting needed prescription drugs.

Enrollees who were Hispanic reported care that was below the national average on two measures of experience and care and similar to the national average on five measures.[4] For enrollees who were Black and those who were Multiracial, each reported care that was below the national average on one measure (yearly flu shots) and similar to the national average on six measures. Enrollees who were White and enrollees who were American Indian and Alaskan Native reported care that was similar to the national average on all measures. In general, these findings of modest differences in experiences of care, including worse reported experiences by patients who are Asian, mirror findings from the NHQDR.

More notable racial and ethnic differences were observed for the 36 clinical care quality measures.[4] In contrast to experiences of care that were similar to the national average for many minoritized groups, scores for enrollees who were American Indian/Alaskan Native were below the national average on 14 clinical care measures, were similar to the national average on six measures, and above the national average on two measures. Most of these disparities in clinical quality measures were substantive. Disparities of roughly 10% points or greater were observed for spirometry to document a diagnosis of chronic obstructive pulmonary disease (COPD), continuation of statins for CVD, annual retinal exams among those with diabetes, blood sugar control among those with diabetes, receipt, and adherence to statins among those with diabetes, and treatment with antidepressants among those newly diagnosed with major depression.[4]

For enrollees who were Asian or Native Hawaiian/Pacific Islander scores were below the national average on five clinical care measures, similar to the national average on 16 measures, and above the national average on 15 measures.[4] Measures where these rates were 30% or more below the national average included outpatient follow-up after ED visit for initiation of treatment within 14 days of diagnosis, and subsequent engagement in substance disorder treatment.[4]

For enrollees who were Black, scores were below the national average on 14 clinical care measures, similar to the national average on 19 measures, and above the national average on three measures. Disparities for Black enrollees that were 10% points or greater included measures for continuation of antidepressants for major depression, outpatient follow-up after a hospital stay for mental illness, and outpatient follow-up after an emergency department (ED) visit for mental illness. Several measures where Black rates were 30% or more below the national average included, initiation of substance use disorder treatment within 14 days of

diagnosis, engagement in substance disorder treatment, and receipt of hospital discharge information.[4]

For enrollees who were Hispanic, scores were below the national average on 11 clinical care measures, similar to the national average on 19 measures, and above the national average on six measures.[4] Measures where Hispanic rates were 30% or more below the national average included, initiation of substance use disorder treatment within 14 days of diagnosis and engagement in substance disorder treatment, and receipt of hospital discharge information.[4]

For enrollees who were White, scores were similar to the national average on 31 measures and above the national average on five measures.[4] These findings provide robust evidence that racial and ethnic disparities in core quality measures persist, even among older adults who are continuously insured and enrolled in managed care plans. Findings underscore the very poor healthcare for American Indians and Alaskan Native peoples.

Findings from this report highlight an additional critical point. Disparities in this report are compared to the national average. However, the national average for the delivery of recommended care among this sample of elderly, fully insured sample of patients receiving managed care is often poor with a mean of 66.7%, ranging from 4% for engagement in treatment for alcohol use disorder to 98.4% for avoiding prescription of opioids from multiple pharmacies.[4] The finding that one-third of all Medicare Advantage patients on average failed to receive recommended care highlights the low bar for assessing racial and ethnic disparities in Medicare Advantage and the urgent need to close the gap between evidence-based care and its receipt. A systematic review on interventions to improve health equity in receipt of evidence-based preventive services concluded that for populations adversely affected by disparities, patient navigation, telephone calls and prompts, and reminders involving community health workers increased uptake, particularly for cancer screening.[222]

Cardiovascular Disease (CVD)

Cardiovascular-specific mortality is the leading cause of death in the US, accounting for 695,547 deaths in 2021.[223] Deaths from CVD including all types of heart disease, cerebrovascular disease, and vascular disease declined sharply from 2000 to 2010 with corresponding declines in minoritized populations, largely from improvement in risk factors and the adoption of evidence-based treatments.[224,225] However, these declines have slowed since 2010.[225] Cardiovascular mortality rates among Black women and men were consistently higher in communities with high levels of racial segregation compared with those with low to moderate levels.[226], African Americans have the highest age-adjusted rate, followed by Native Hawaiian and Pacific Islander, non-Hispanic White, American Indian and Alaskan Native, Hispanic, and Asian.[227] Younger Black Americans have significantly higher CVD mortality than White individuals, with recent increases.[226] While there has been some progress in some process measures, there are persistent glaring disparities by race and ethnicity across the cardiovascular care continuum.

The CVD continuum is a chain of events precipitated by several cardiovascular risk factors, which, if left untreated, may culminate in end-stage heart disease and death.[228] Disparities in Life's Essential 8 by race and educational attainment contribute to disparities in CVD and other

morbidity.[229] SDOH have powerful impacts on these factors based on poverty, food and housing insecurity, greater exposure to air pollution, environmental toxin, lack of access to health food, noisy environments, adverse child experiences, and residential racial segregation.[230-232] Black-White disparities in CVD mortality are explained by SDOH, e.g. by unemployment, low family income, food insecurity, lack of home ownership, and unpartnered status, factors in the Life's Essential 8 (current smoking, lack of leisure-time physical activity, and sleep <6 or >8 h/d), and metabolic (obesity, hypertension, and diabetes), underscoring the significance of structural racism acting on social, behavioral and biological determinants of health.[233] American Indian and Alaskan Native, and, Native Hawaiian and Pacific Islander Peoples also have similar risk factors resulting in worse CVD outcomes than non-Hispanic Whites.[234,235]

Hypertension is the 6th leading cause of disability-adjusted life years in the US [129] Hypertension is more prevalent among African Americans, with racial discrimination contributing to higher blood pressure.[236] Hypertension is the most important modifiable medical risk factor contributing to Black-White disparities in CVD, chronic kidney disease, and stroke.[237] Smoking, physical inactivity, high salt intake, obesity, excessive alcohol, poor sleep, stress, and selected medications represent modifiable factors affecting blood pressure.[238] Racial discrimination contributes to worse blood pressure through perceptions, affective response, and potentially epigenetic mechanisms.[236,239,240] Rates of hypertension control exceeding 90% are achievable in highly integrated systems of care with corresponding minimization of racial disparities in control.[241]

Hypertension awareness has improved relatively little over time.[242]Lu *et al.* in an analysis of NHANES data between 2011 and 2018, reported that age-adjusted hypertension awareness *worsened* for Black, Hispanic, and White individuals.[243]Compared with White individuals, those who were Black had a similar awareness and overall treatment rates and received more intensive antihypertensive medication if treated, but had a lower control rate.[243] In contrast, Asian and Hispanic individuals had significantly lower awareness rates and overall treatment rates, received less intensive medication if treated, and had lower control.[243] Hypertension control varied widely by state, with lowest rates in Nevada (51%), Washington DC (52.%), and Mississippi (55%); highest in Kansas (73%), New Jersey (72%), and Iowa (72%).[244] Quality improvement programs have reduced, but not fully eliminated Black-White disparities in hypertension control.[245-247]

Control of high cholesterol is another modifiable risk factor for the prevention of CVD.[248] It is the 7th leading cause of disability-adjusted life years.[129] Time tends show improvement in public awareness of high low-density lipoprotein, yet being unaware and untreated was more common among adults who were Hispanic, who had lower educational attainment, lower income, and no health insurance.[249] In a national sample, Black men and non-Mexican Hispanic women were less likely than non-Hispanic White individuals to receive guideline-concordant statins.[250,251] Absence of insurance and usual source of care contribute to these racial and ethnic disparities.[251] Even among those with known ischemic heart disease or familial hypercholesterolemia, racial and ethnic disparities in cholesterol control are observed.[252,253]

Myocardial infarction is among the leading causes of death in the US, yet disparities in mortality persist.[254] Disparities in public awareness of symptoms contribute to treatment delays.[255] There are also racial disparities in outcomes following cardiac arrest.[256] Differences in the provision of

bystander cardiopulmonary resuscitation, defibrillator usage, and post-resuscitation therapies likely contribute to these disparities in outcomes following cardiac arrest.[257]

Between 1999 and 2019, hospitalization for acute hypertension among Medicare fee-for-service beneficiaries increased significantly from 51.5 to 125.9 per 100,000 beneficiary years.[258] The annual increased rates were higher among Asian, Black, Hispanic, and North American Native than White Medicare beneficiaries.[258] Vaughan *et al.* reported that more than 75% of counties experienced increased hypertension-related CVD death rates among patients from 2010 to 2019.[259] The highest rates were among men and Black populations. All racial and ethnic groups experienced widespread county-level increases.[259] The NHQDR showed a general worsening of hospital admissions (27%) for hypertension from 2016 to 2019. Notably, hospital admission rates in 2018 were 69% higher for Hispanic individuals and five and a half times higher for non-Hispanic Black individuals than for non-Hispanic White individuals. Asian individuals had rates that were 13% lower than non-Hispanic White individuals.

Age-adjusted mortality attributable to heart failure declined between 1999 and 2011, but then increased between 2011 and 2017 across all census regions with most significant increases in the Midwest and South.[260] According to the NHQDR, rates for adult hospital admissions for heart failure per 100,000 population worsened slightly (12%) (2016-2019). In 2019, rates were significantly worse for Hispanic and Black patients compared to non-Hispanic White patients. Yet, both of these minoritized groups experienced lower hospital mortality compared with non-Hispanic White patients for reasons that are not clear.[261]

Quality of heart failure care was generally similar at hospitals caring for a high proportion of Black patients compared with non-minority serving hospitals.[262] However, a few disparities persist between these hospitals.[262] Hospital treatment of myocardial infarction and heart failure has improved, and disparities have improved, but disparities persist.[263-266] The NHQDR reports that non-Hispanic Black individuals are less likely than non-Hispanic White individuals to receive fibrinolytic therapy (clot busting treatment) for myocardial infarction. Racial disparities persist for surgical and structural interventions, e.g., valve repair and heart devices.[266-269] Analysis of within and between hospital disparities suggest that disparities are likely systemic rather than localized to particular hospitals.[270]

Changes in the pediatric heart transplant allocation system in 2016 resulted in improvements among White individuals but not non-White individuals in transplant waitlist mortality.[271] Among adults, transplantation disparities have narrowed but persist.[272] Compared with White patients, Black patients are less likely to be transplanted, even with the new allocation system, and have a higher risk of post-transplantation death.[272] Cardiac rehabilitation following hospitalization is an evidence-based intervention.[273,274] Yet there are long-standing racial and ethnic disparities in its use.[275-277] Black patients with end-stage heart disease are less likely to die at home or hospice than White patients.[278,279]

In short, between 2000 and 2010, better treatment and reduced smoking helped decrease CVD mortality disparities. Still, factors like worsening social and behavioral determinants, stagnant Life Essential 8, hypertension control, and treatment disparities have hindered progress, especially for young African Americans with persistent CVD mortality disparities.

Cancer

Cancer is the second leading cause of death in the US and for minoritized populations, accounting for 605,213 deaths in 2021.[223] Reductions in smoking and improvements in early detection and treatment for some cancers have yielded a continuous decline in the cancer death rate since its peak in 1991 at 215.1 per 100,000 individuals.[280] The drop of 33% through 2020 (143.8 per 100,000 individuals) resulted in an estimated 3,820,800 fewer cancer deaths (2,582,800 in men and 1,238,000 in women) than if mortality had remained at its peak due to a higher male peak and decline.[280]

American Indian and Alaskan Native people have the highest cancer mortality rate, followed closely by Black people.[280] The death rate in American Indian, Alaskan Native and Black men is double than that in Asian men and 18% higher than that in White men. Black-White disparity in overall cancer mortality has declined from a peak gap of 33% in 1993 to 12% in 2020.[280] Notably, progress is driven by declines in smoking-related cancers, particularly the steep drops in smoking initiation among Black adolescents from the late 1970s to the early 1990s.[280]

Cancer incidence is strongly associated with cancer mortality. High overall cancer incidence in Black men is partly due to prostate cancer, which is 70% higher than in White men, two times higher than in American Indian, Alaskan Native and Hispanic men, and three times higher than in Asian/Pacific Islander men.[280] American Indian, Alaskan Native, and White women have the highest cancer incidence, i.e. 10% higher than Black women, who rank third. American Indian, Alaskan Native and Black women have the highest cancer mortality rates, i.e., 16% and 12% higher, respectively, than White women.[280] Black women have 4% lower breast cancer incidence than White women but 40% higher breast cancer mortality, a disparity that has changed little for the past 10 years.[280]

Lung cancer is the leading cause of cancer-related death in the US, followed by colorectal cancer.[280] Lung cancer incidence declined in all groups.[280] In 2000 non-Hispanic Black rates for lung cancer mortality were 12% higher than non-Hispanic White individuals, and by 2020, the groups had reversed order, with non-Hispanic Black being 5% lower than non-Hispanic White individuals due to declines in smoking initiation among earlier cohorts.[280]

There are disparities across the cancer continuum, from awareness and prevention to treatment to end-of-life care, vary by cancer type and contribute to disparities in detection, survival, and well-being. Factors such as smoking, diet, obesity, alcohol intake, and occupational exposures contribute to varying degrees to the incidence in different cancer types.[280] Uptake of cancer-preventing vaccines also varies by race and ethnicity. Members of racial and ethnic minoritized groups are less likely to be aware of the Human papillomavirus (HPV) vaccine than non-Hispanic White individuals.[281] While initial uptake of HPV is higher among children who are from minoritized and racial groups, completion of vaccine series is lower.[282] Similarly, Southeast Asian and other immigrants who have a higher prevalence of Hepatitis B Virus (HBV) are often unaware of this vaccine or their current infection.[283-285] High-risk minoritized family members are less likely than non-Hispanic White individuals to be referred for genetic testing for cancer.[286]

Screening rates for cancer are generally lower among members of minoritized groups than among non-Hispanic White people, with the largest disparities seen for colorectal cancer and lung cancer screening.[287,288] The NHQDR shows improvement between 2000 and 2018 in earlier diagnoses of breast, cervical, and colorectal cancer. The NHQDR also shows Black women are diagnosed later, i.e. at more advanced stages of breast and cervical cancer, and Black individuals have 15% worse mortality rates than White individuals from colorectal cancer.

Follow-up on abnormal screening findings, including lung nodules, is often worse for underserved minoritized group members.[289-292] These disparities likely contribute to delayed diagnosis.[293-297] Community social determinants, including lack of insurance and poor care access, contribute to cancer diagnosis delays.[298-302] A systematic review reported that residence in segregated African-American areas was associated with higher rates of later-stage diagnosis of breast and lung cancers, higher mortality rates and lower survival rates from breast and lung cancers, and higher cumulative cancer risks from exposure to ambient air toxins.[303] Evidence-based interventions exist to address screening disparities but often require additional funding not currently available through health plans.[304]

The NHQDR documents uneven improvement in absolute disparities in cancer treatment and persistent racial and ethnic disparities in treatment. Axillary node dissection for women with stage II-b breast cancer or with clinical stage I breast cancer with a sentinel lymph node biopsy at the time of breast cancer surgery (lumpectomy or mastectomy) is a quality measure. This measure did not change overall between 2005 and 2018 and worsened for non-Hispanic Asian individuals and Black individuals, with disparities emerging in 2018 for these groups (79.8% and 80.7%) compared with 82.4% for non-Hispanic White individuals. Radiation therapy for women who received breast-conserving surgery is another quality measure. This measure improved from 84.1% to 90.9% between 2005 and 2018. Rates did not improve for American Indian/Alaskan Native peoples, but improved for Hispanic individuals and non-Hispanic individuals. Significant disparities persisted for American Indians/Alaskan Natives, Hispanic individuals, and non-Hispanic Black individuals compared with non-Hispanic White individuals. Similarly, radiation therapy recommended or administered following any mastectomy within 1 year of diagnosis of breast cancer for women with 4 or more positive regional lymph nodes is another quality measure that improved significantly for all women, including each subgroup, from 2005 to 2018. However, non-Hispanic Black women had 28% lower rates in 2018. Similar overall improvement and persistent disparities for non-Hispanic Black patients were observed for appropriate combination chemotherapy recommended or administered within 4 months of diagnosis for women underage. These patterns were also observed for indicated adjuvant chemotherapy for Stage III lymph node-positive colon cancer, where disparities persisted for Hispanic and non-Hispanic black patients. Black patients experience more cancer treatment complications requiring emergency visits than White patients.[305]

A review of the literature showed that among early-stage lung cancer, Black patients are less likely to receive curative surgery.[306] There are also racial and ethnic disparities in access to newer immunotherapy and targeted treatments,[304,307-309] despite minoritized patients benefiting as much or more.[310] Disparities are seen for treatment for pancreatic cancer with insurance, SDOH, and treating hospital contributing.[311,312] Racial disparities in post-cancer surgery reconstructive surgery have diminished, but disparities persist.[313-315] Racial and ethnic disparities are seen for

post-treatment into survivorship with less surveillance for minoritized patients and lower quality of life.[316]

In addition to disparities in cancer survival,[317] there are appreciable racial and ethnic disparities near the end of life. Racial and ethnic minorities receive worse cancer-related end-of-life care, including less palliative care and hospice care, greater receipt of aggressive treatment, more avoidable hospitalizations, and ICU admissions.[318-320] Financial toxicity from treatment for advanced cancer has disparate impact among minoritized populations,[321] impacting patients' quality of life.[322] Among Medicare beneficiaries with advanced cancer, disparities in hospice appear to have closed, though variations in these disparities by patient age, cancer, and place persist.[320,323-325]

Racial and ethnic disparities likely result from combinations of SDOH, place, insurance, treating physician, treating hospital, implicit racial bias, and financial burden.[326-334] Equity-focused quality improvement and navigators mitigate disparities,[335 336-341] but remain understudied, underfunded, and under-incentivized.[342-344]

In summary, ACA implementation, progress in cancer screening, effective treatment, and cohort effects from reductions in smoking reduced absolute disparities in cancer mortality between 2000 and 2010, but worsening SDOH, particularly among those with low income, slow progress in healthy eating, persistent disparities in screening and treatment, and growing treatment costs have slowed progress towards equity in cancer mortality, particularly for American Indians, Alaskan native African American peoples. These disparities highlight the gap between evidence and systematic implementation of effective treatments and the need for systems of care that ensure equity in effective treatment.

COVID-19

The COVID-19 pandemic was a national stress test for US health and preparedness. The pandemic highlighted biomedical triumphs and human disasters. In record time, the US and its pharmaceutical partners developed and marketed novel mRNA vaccines and COVID-19 testing, including home testing and treatments. At the same time, the US performed poorly compared to peer countries, experiencing 40% higher excess mortality than Europe.[345] COVID-19 was the third leading cause of death in 2021 in the US, accounting for 416,893 deaths,[223] with the emergence of unprecedented racial and ethnic disparities in mortality.[346] The pandemic exposed the urgent need for integrating a biomedical and holistic approach to public health and healthcare and the failure to anticipate, plan for, and address predictable disparities in access and treatment.

During the early phases of the pandemic, racial and ethnic disparities in COVID-19-related knowledge emerged.[347] These disparities hindered engagement in protective behaviors.[348] New racial and ethnic disparities in vaccine receipt accompanied the development and rollout of the COVID-19 vaccines.[349] These disparities were accentuated by experiences of discrimination and structural barriers to receiving vaccines,[350-353] yielding racial and ethnic disparities by state.[352] Primary care offered a potential means for addressing the vaccine concerns of minoritized patients,[354,355] as the number of primary care physicians per capita was associated with COVID-19 uptake within US counties.[356] Yet the early focus on providing vaccines to hospitals undercut access COVID-19 vaccines from primary care,[357] leaving small primary care practices out.[358]

During the COVID-19 pandemic, disparities in telehealth visits emerged.[359] Whereas more than half of non-Hispanic White patients used video telehealth, most minoritized patients used video for only 33-43% of their telehealth visits.[359] Targeted interventions to promote video visits, particularly among those who lack the resources, skills, or confidence,[360] were never scaled.

Equity-focused strategies were implemented slowly or not all in some regions, e.g., addressing disinformation on social media, addressing mistrust for healthcare, and mitigating structural barriers.[361] Among older patients, vaccination rates were lowest among non-Hispanic American Indian/Alaskan Native people.[362] Early in the pandemic, disparities emerged in access to COVID-19 testing.[353,363] Yet, despite higher rates of infections among minoritized groups,[364] disparities emerged in treatment, including receipt of monoclonal antibody therapies, remdesivir, and dexamethasone,[365] in addition to oral antiviral treatment.[366] During April-July 2022, Black patients were prescribed Paxlovid 36% less often than were White patients; American Indian or Alaskan Native and Native Hawaiian or other Pacific patients were prescribed the drug 23% less often, and Asian patients 19% less often than White patients while Hispanic patients were prescribed Paxlovid 30% less often than non-Hispanic patients.[366] Notably, these disparities in Paxlovid treatment were generally higher among patients at high risk for severe COVID-19, including those aged ≥50 years and those who were immunocompromised.[366] Furthermore, high-vulnerability zip codes had approximately one-half the rates in medium- and low-vulnerability zip codes for dispensing oral antiviral drugs.[367] These findings illustrate Julian Hart's half century old "inverse care law" whereby those with the least need get the most care.[368]

Disparities in racial and ethnic age-adjusted proportionate monthly hospitalization ratios peaked during the summer of 2020.[369] The peak monthly adjusted disparity in hospitalization among Hispanic patients compared to non-Hispanic White patients was more than nine-fold higher in the West and Midwest, more than six-fold higher in the South and three-fold higher in the Northeast.[369] Non-Hispanic Black and non-Hispanic Asian or Pacific Islander individuals were more likely to have a COVID-19-associated hospitalization, ICU admission, or an in-hospital death compared with non-Hispanic White individuals during the first year of the pandemic.[370] Two-thirds of healthcare workers in New York City reported experiencing distress related to awareness of systemic racism and to racial disparities in COVID-19 outcomes (57%), with higher rates among non-Hispanic Black individuals and women.[371] These racial and ethnic disparities in COVID-19 outcomes reflect structural factors related to race and ethnicity, i.e., household composition, access to care, SDOH, and existing comorbidity.[372] High COVID-19 age-adjusted mortality rates in jails and prisons, [373], and in minoritized-serving nursing homes further contributed to these racial disparities in COVID-19 mortality.[374]

Overall estimated life expectancy in the US decreased by more than two years during the COVID-19 pandemic.[346,375] In 2020, Native Hawaiian/Pacific Islander, Hispanic, Black, and Asian American individuals experienced larger decreases in life expectancy and greater losses in midlife than did the non-Hispanic White individuals.[346] Decreases in non-Hispanic White life expectancy grew in 2021 as the pandemic spread to more rural areas. Evidence suggests a higher incidence of long-term COVID-19 symptoms among African American and Hispanic people.[373,376-378]

The pandemic also promoted burnout among health care professionals including doubling planned retirement among physicians.[379-381] Racial discrimination amplified the impact of the pandemic on depression, anxiety, and post-traumatic stress symptoms among healthcare workers.[382] Moreover, the politicization of health and resulting conflicts with patients and families regarding preventive measures and unproven treatments heightened the stress among healthcare professionals during the pandemic.[383] Last, the dehumanization of patients and workers themselves during the pandemic inflicted moral injury, traumatic stress, and thwarted human needs.[384] Given findings that burnout, particularly depersonalization is associated with implicit and explicit racial bias,[385] such COVID-19-induced burnout may have contributed to racial disparities in treatment during the pandemic.

In summary, the pandemic exposed structural racism-related flaws in US social, public health, and healthcare policy that resulted in more than a million deaths with disparate impact on Black and Brown communities. The pandemic also underscored the large gap between effective preventive and treatment modalities and the absence of systems of care needed to ensure their universal implementation. Last, the pandemic unleashed a new epidemic of disinformation related to effective treatment that could undermine response to future pandemics and potentially undermine broader trust in science, public health, and medicine and contribute to future health disparities.

Unintentional Injuries and Substance Use Disorders

Unintentional injury mortality was the fourth leading cause of death in the US in 2021, accounting for 224,935 deaths.[386] Unintentional deaths include those from drug and alcohol overdoses (poisoning), motor vehicle accidents (MVAs), and falls.

Underlying alcohol and drug use is the fourth leading cause of disability-adjusted life years in the US.[387] Between 2000 and 2019 there was more than a six-fold *increase* in opioid overdose deaths, a four and half-fold increase in combined alcohol and opioid overdose deaths, and a two-fold increase in alcohol overdose deaths.[111] Between 1999 and 2016 MVA deaths also rose.[388] Nearly one in three MVA deaths are alcohol-related.[389] The NHQDR reports an increase in opioid overdose deaths between 1999 and 2020 of 2.9 to 21.4, with the highest rates for non-Hispanic American Indian and Alaskan Native individuals compared with White individuals in 2020.

American Indian and Alaskan Native people have the highest rate of deaths from overdoses and MVAs.[390] Between 1999 and 2016 MVA mortality rates declined for both American Indian/Alaskan Native and White Americans, but the sizeable racial disparity persisted.[390] In contrast, mortality rates rose substantially in both groups through 2016. Disaggregation of drug and alcohol overdose showed that the American Indian/Alaskan Native alcohol overdose deaths were about eight times those for White individuals, while drug overdose rates were similar. MVA declined for this population, but disparities persisted.[390] For other unintentional injuries, there was a general rise, with American Indian/Alaskan Native men experiencing the highest rates. Notably, rates varied by state, with no disparities between American Indian/Alaskan Native and White individuals observed in New York or Texas.[390]

The population-based death rate from MVA in the US in 2019 was the highest among 29 high-income countries and was 2.3 times the average for these countries.[391] Even when accounting for distance driven, the US was higher than the average among 20 other high-income countries.[391] The population-based MVA mortality rate in the US increased 0.1% from 2015 to 2019, whereas the average change among 27 other high-income countries declined by 10%.[391] Among children and young adults (up to age 24), there is a persistent mortality disadvantage for young people (ages 1 to 24) living in southern states over the last 50 years, mainly from MVAs and firearm-related homicide, particularly among those residing in the East South Central and West South Central divisions.[392] Recent data suggest racial and ethnic disparities in activities and traffic fatalities. Fatality rates per 100 million miles traveled are worse for Black and Hispanic Americans for cycling and walking typically from accidents involving motor vehicles.[393]

Between 2000 and 2019 large disparities in educational attainment were observed for all overdose deaths, increasing over time for opioid-only and combined alcohol and opioid mortality.[111] For non-Hispanic White Americans, the most significant educational disparities were observed for opioid overdoses, with rates more than seven times higher in low compared to high-education groups. Combined alcohol and opioid overdoses had larger educational disparities for non-Hispanic Black men and women compared to non-Hispanic White men and women, with rates 8.9 (men) and 10.9 (women) times higher in low compared to high education groups.[111]

There is a large gap between the need and uptake of evidence-based treatment. The substance use disorder (SUD) treatment uptake rate remained stable from 2016 to 2019, with a nonsignificant treatment decline from 14% to 12%. Receiving treatment was notable among Native Americans (54%) and Pacific Islanders (94%), and declined for multiracial (−60%), older adults (−70.18%), and youth ages 12−17 (−50.70%). Race, sex, age, insurance status, and receiving mental health treatment were associated with receiving SUD treatment.[394]

Despite some progress in expanding access to evidence-based for opioid use disorder from 2010 to 2017, a substantial gap between opioid use disorder (OUD) prevalence and OUD treatment underscores the critical need to increase access to evidence-based services.[395] Racial and ethnic disparities in access to prevention, i.e., provision of naloxone used by bystanders treatment of overdoses, are reported in major cities.[396-398]

Racial and ethnic differences in the receipt of medications for opioid use disorder (MOUD) after a critical OUD event among patients with Medicare disability were substantial and did not change over time.[399] Similar racial disparities are seen among people with Medicaid and Commercial insurance.[400,401] Worse, rates of MOUD provision are low and unequal by race after overdose, hospitalization, pregnancy, and release from correctional facilities.[401-405] State policies, including ACA implementation, provider availability, and proportion of White residents in a county or served by a hospital, are associated with racial disparities in medications for opioid use disorder (MOUD) receipt.[406-410] Stigma is arguably a fundamental cause of health disparities, and drug and racial stigma intersect to amplify treatment barriers for minoritized populations.[411]

Among people with an alcohol use disorder, treatment *declined* from 2008 to 2017.[412] Similar racial and ethnic disparities are observed for alcohol use disorder (AUD) treatment. In a national

sample, there was a pattern of lower service use among Hispanic individuals and Black individuals (vs. non-Hispanic White individuals) and women (vs. men); further, race-by-gender interactions revealed that Black-White differences were limited to women.[413] In California, Black and Hispanic women were reported to be less likely to receive brief alcohol intervention in primary care than women in other race/ethnicity groups.[414] Yet, Black people may benefit as much or more from these brief interventions.[415] In a national sample of eligible Medicare Part D beneficiaries who had not been treated recently and were hospitalized for a alcohol use disorder in 2016, pharmacotherapy was rarely initiated during hospital discharge or follow-up care.[416] Recent national data confirm the persistence of lower SUD specialty treatment among people who are Black or Hispanic.[417]

Alcohol intake is associated with falls.[418-420] Falls are the leading cause of injury among older adults, e.g., 65 years and older in the US.[421] In 2018, approximately 3 million emergency department visits, more than 950,000 hospitalizations or transfers to another facility, and 32,000 deaths resulted from fall-related injuries among older adults.[421] Falls are largely preventable.[422] Healthcare clinicians can assist their older patients in reducing their risk for falls. Screening older patients for fall risk, assessing modifiable risk factors (e.g., fall-proofing residence, use of psychoactive medications, or poor gait and balance), and recommending interventions to reduce this risk (e.g., modification of home, medication management, or referral to physical therapy[422]) can prevent older adult falls.

Based on data from the 2018 Behavioral Risk Factor Surveillance System, fewer proportions of Black individuals (22.5%) and Asian/Pacific Islanders (15.6%) reported at least one fall than did White individuals (28.3%), and higher proportions of American Indian/Alaska Natives (15.2%) reported a fall-related injury than did White individuals (10.2%).[421] A meta-analysis published in 2021 demonstrated significantly lower fall prevalence among Asian Americans than all other ethnic people at 13.9%. The Hispanic group had a fall prevalence of 18.5%, followed by the Black individuals at 18.6%. White individuals had the highest prevalence at 23.8%.[423] The reasons for racial and ethnic differences in falls are not known.[423]

In summary, two decades of a growing opioid pandemic combined with rising "deaths of despair" from alcohol, drugs, and suicide have resulted in increasing absolute racial disparities in mortality, particularly for indigenous people. These trends underscore the large gap between effective preventive and treatment modality systems of care that ensure their universal and equitable implementation.

Stroke

Before COVID-19, stroke was the third leading cause of death in the US, with markedly higher rates in the Southern "Stroke belt." Risk factors are similar to those for cardiovascular disease, though hypertension effects are even stronger. A systematic review involving studies from 2010 to 2021 examined disparities in access to stroke treatment between racial minorities and White patients.[424] A total of 30 studies were included in the systematic review. White patients were estimated to use emergency medical services at a higher rate than African American, Asian, and Hispanic patients. White patients more often arrived within 3 hours from the onset of stroke symptoms than African American and Hispanic patients. Notably, a greater proportion of White patients received thrombolytic (tissue-type plasminogen activator) as compared with African

American, Hispanic, and Asian patients.[424] Similarly, use of mechanical thrombectomy was also lower for minority than White patients.[424]

In summary, cerebrovascular disease showed a similar pattern as heart disease with large absolute reductions in mortality between 2000 and 2010 with subsequent stagnation, and persistent disparities in treatment for emergent treatment, and disparities in mortality among the Black and Native Hawaiian/Pacific Islander population compared to the White population. These findings highlight the need to close the gap between evidence and treatment for all, including early emergency treatment.

Diabetes

Adult onset or type-2 diabetes is a multifactorial disease. Unhealthy food consumption and obesity are major modifiable risk factors.[425,426] Diabetes prevalence in the US nearly doubled from 7.5% in 1988-1989 to 13.9% in 2016-2018.[427] Strikingly, this prevalence is higher than for other wealthy countries.[428] Prevalence in the US is nearly four times higher than in Ireland (3.2%) and 63% higher than in Canada (8.5%).[428,429] In 2017, diabetes accounted for an estimated $327 billion in total costs.[430] A 2022 systematic review and meta-analysis of longitudinal studies documented dose-response relationships between the consumption of ultra-processed foods and the development of type 2 diabetes.[431]

The NHQDR shows slight improvement in quality of care for people with diabetes between 2008 and 2019. There was no appreciable improvement based on receiving four recommended services in the past year (two or more hemoglobin A1c measurements, dilated eye examination, foot examination, and flu vaccination), with Hispanic individuals having lower rates than non-Hispanic White individuals. Similarly, there was no appreciable improvement in blood sugar control, i.e., hemoglobin A1c of more than 8%, with non-Hispanic Black and Hispanic patients having worse control than non-Hispanic white patients. Comparable findings were observed for worse diabetic control, i.e., A1c more than 9%. These data are borne out by trends based on national representative samples.[432] From 1988-1994 to 2013-2020, the proportion of patients with diabetes who received insulin and achieved glycemic control did not significantly change, from 29% to 28%. Mexican-American patients receiving insulin were less likely than non-Hispanic White patients to achieve blood sugar control, and disparities increased during the study period. The proportion of adults with severe hyperglycemia did not significantly change. Adults who were Mexican American or non-Hispanic Black, were uninsured or had low family income had the highest prevalence of severe hyperglycemia.[432] Several studies suggest that non-White patients are less likely to receive newer, higher-cost non-insulin drugs for diabetes,[433-435] and diabetic technology, including continuous glucose monitors and insulin pumps.[436] In one study, no disparities in blood sugar control were observed among youth with type 1 diabetes.[437]

These disparities translate to disparities in outcomes. NHQDR shows an increase in adult hospital admissions for diabetes complications from 2016 to 2019. with non-Hispanic Black patients having two and half times more hospitalizations than non-Hispanic White patients. Similarly, racial disparities were noted for admissions for diabetes complications for children and adolescents, where Black patients had 70% higher hospitalizations than non-Hispanic White patients. There was also a worsening among all groups except Asian individuals for lower extremity amputations for adults hospitalized with diabetes. Amputations were nearly three times

higher for Black patients and 84% higher for Hispanic patients compared to non-Hispanic White individuals. County-level rates of amputations are associated with SDOH including higher rates of residents with physical distress, greater racial segregation, and a higher proportion of African American residents.[438]

Stagnating progress in healthy behavior, growing costs of medications, and disparities in treatment have yielded little progress in the past 10 years in mortality, along with increasing hospitalizations and large disparities in mortality for the Black, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, and Hispanic populations. These patterns underscore not only stark disparities in outcomes but also the limitations of a costly medical model in the face of failure to implement health-in-all-policies to slow the diabetes epidemic.

Chronic Kidney Disease

Chronic kidney disease (CKD) was the 9th leading cause of death before COVID.[439] It is significant in its prevalence, affecting one in seven people, its disparate impact on minoritized populations, and its costs. [440] Impaired kidney function is the 8th leading cause of disability life years in the US.[129] In 2020 nearly 14% of Medicare fee-for-service beneficiaries aged 66 years and older had a diagnosis of CKD. Yet, they accounted for about one-quarter of fee-for-service Medicare spending, at over $75 billion in annual spending, not including $50 billion in annual spending on end-stage kidney disease (ESKD).[440] Awareness of CKD is low and lower than for hypertension or diabetes and has not improved over time.[441] The major risk factors are hypertension and diabetes, but obesity, smoking, and inactivity also contribute.[442]

Hispanic individuals of all ages are more likely to have ESRD caused by diabetes than White or Black individuals. Black patients in all age groups are more likely to have ESRD caused by hypertension than are White, or Hispanic patients.[443] ESRD rates are higher among people living in areas with worse community social deprivation index (SDI) scores.[444] Yet, large racial/ethnic differences in the rate of incident ESRD persist within these communities. The rate of ESRD among Black individuals in the lowest SDI community was almost four times as high as among White individuals in the lowest SDI community. It was more than twice as high as Hispanic individuals in this category.[443] The NHQDR shows a 50% improvement among adults under 70 years who either registered on a waiting list for transplantation or received a deceased donor kidney transplant within a year of initiation between 2005 and 2019, with improvement across all racial and ethnic groups. However, disparities for Hispanic individuals and non-Hispanic Black patients persisted. According to the NHQDR, receipt of a kidney transplant declined by 30% from 2000 to 2016. Notably, disparities in a kidney transplant persisted for non-Hispanic Black patients, with rates half that of non-Hispanic White individuals (7.9 v 17.4%).

Despite some progress in disparities in CKD treatment, overall progress in disparities in mortality has been uneven and slow, with remaining appreciable disparities in CKD-related mortality for the Black, Native Hawaiian/Pacific Islander, and American Indian/Alaskan Native populations compared to the non-Hispanic White population. Twenty years later, disparities in life-prolonging transplantation persist.

HIV

The development of antiretroviral therapy, combined with AIDS activism that fostered a person-centered approach to HIV prevention and treatment, dramatically slowed the HIV epidemic in the US (and globally). In addition, combined public health and health care approaches supported through federal Ryan White funding addressed the HIV care continuum to address gaps needed to identify those infected, engage and retain them in care, and ensure viral suppression.[445] The NHQDR shows a reduction in new HIV infections among adolescents and adults between 2008 and 2019 for all groups except Native Hawaiian Pacific Islanders, which barely changed, and American Indian/Alaskan Natives, whose rates increased. 2019 rates were significantly worse than non-Hispanic White individuals among all groups except Asian individuals, with Black individuals having the highest rates of new infection. Compared to non-Hispanic White individuals, non-Hispanic Black individuals, American Indian/Alaska Natives, Native Hawaiian/Pacific Islander, and Hispanic individuals eight, three and a half, to two- and three-times higher rates of new HIV infections, respectively. Awareness of being HIV positive were also slightly lower among these groups with the lowest awareness among non-Hispanic American Indian/Alaska Natives. Compared to non-Hispanic White individuals, HIV viral suppression was significantly lower and actually worsened among non-Hispanic Native Hawaiian/Pacific Islander individuals between 2015 and 2019. Early diagnosis, immediate treatment, and access to high-quality care and treatment have been successful in reducing HIV-related deaths.[446] Still, targeted efforts are needed to address persistent racial and ethnic disparities in infections, care, and mortality.[446] There are multiple barriers to use of HIV preventive medication, yielding disparities in access, particularly in the Southern regions of the US.[447,448]

Some of the largest reductions in overall mortality and disparities in absolute mortality have been for HIV-related deaths. However, large relative disparities for African Americans and smaller disparities for American Indian/Alaska Natives, Native Hawaiian/Pacific Islanders, and Hispanic individuals persist despite effective preventive and therapeutic treatment, underscoring the need for systems of care to address these large disparities and end the HIV pandemic.

Maternal Health

Pregnancy is a stress test for maternal health. Adverse maternal and birth outcomes forecast adverse cardiovascular health for the mother.[449-451] The NHQDR shows that non-Hispanic American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, Black, and Hispanic women were significantly less likely to receive early and at least adequate prenatal care, with American Indian/Alaskan Native women having the worst rates. The US has the highest maternal and infant mortality rate among peer countries,[452] due partly to worsening maternal health.[453] Maternal mortality in the US decreased by 68% between 1969 and 1998, but *increased three-fold* from 1999 to 2021.[454,455]

The NHQDR reports a worsening in maternal morbidity from 2016 to 2019, with worse rates for non-Hispanic Black and Hispanic women. It also reports worsening in severe post-partum hemorrhage among all racial and ethnic groups, with worse rates for Hispanic and Asian/Pacific Islander women. African American women have higher rates of Cesarean section birth. Maternal mortality rates per 100,000 live births have increased by 63% between 2019 (20.1) and 2021 (32.9) for all racial groups.[455] This increase comes after tripling between 1990 (8.0) and 2019.[456] Rates of death are 2.6 higher for non-Hispanic Black women than non-Hispanic White women.

Rates for American Indian/Alaskan Native women have increased the most since 1999.[457] Rates differ by state, race, and ethnicity.[457] The prevalence of any maternal mortality or severe maternal morbidity (SMM) increased from 146.8 per 10,000 hospital discharges in 2008 to 179.8 at the end of 2021.[458] However, delivery-related mortality in US hospitals decreased for all racial and ethnic groups, age groups, and modes of delivery during this period, potentially from national strategies focused on improving maternal quality of care provided during delivery-related hospitalizations.[458] Failing to intervene or rescue during hospitalization contributes to SMM and disparities.[459] Rural SMM has increased from 1999 to 2017.[460] Nearly half of the women have an emergency department visit within 24 months of birth. These rates were highest among residents of small rural communities.[461] A systematic review underscores the role of consumption of ultra-processed foods to poor maternal and child health,[462] and a contribution to the multifactorial challenge of maternal morbidity and mortality in the US.[463,464]

Traditional hospital indicators in one study from New York City were not associated with SMM.[465] Moreover, the birth hospital accounts for a slight variance in racial and ethnic differences in SMM in California.[466] Black and Hispanic women with SMM confront higher rates of failure to rescue.[459] In a cross-sectional study of patients with nulliparous, term, singleton, and vertex pregnancies, comorbidity was positively associated with cesarean birth.[467] Comorbidity contributed but did not fully explain racial variation in cesarean delivery rates.[467] Patients, particularly Black and Brow individuals, frequently report being mistreated and ignored during maternity care.[3]

Structural racism, discrimination, and inequities in SDOH impact the health of the mother, quality of care, and birth outcomes.[468-470] Maternal disparities reflect a combination of structural racism, adverse SDOH, underlying health, and quality of care.[3,470-472] A systematic review of barriers to high-quality prenatal and post-partum care underscored the role of structural barriers.[473] The most frequently mentioned barriers were structural, including delays in gaining pregnancy-related Medicaid coverage, challenges finding providers who would accept Medicaid, lack of provider continuity, transportation, childcare hurdles, and legal system concerns. Contributing individual barriers included lack of awareness of pregnancy, denial of pregnancy, limited support, conflicting priorities, and indifference to pregnancy.[473]For people who accessed care, experiences of dismissal, discrimination, and disrespect that were related to race, insurance status, age, substance use, and language were common.[473] Being a person who is Black, unmarried, US-born, less educated, and a rural resident, were associated with 50-114% higher maternal mortality risks.[454]

Regional variations in the availability of birth-attending and primary care providers are associated with maternal mortality.[474] Historic redlining has been associated with SMM in California.[475] Structural racism impacts blood pressure,[94] which affects pregnancy risk. Among women of reproductive age, a national study using electronic health record data showed that Black women had a higher hypertension prevalence (22% vs. 14% for White women), but lower hypertension control (61% vs. 74%) than White women. Notably, state-level hypertension prevalence for reproductive-aged women ranged from 14% (Massachusetts) to 36% (Alabama), and control ranged from 83% (Kansas) to 59% (the District of Columbia).[476] These racial and state disparities in prevalence and control impact maternal and fetal health during pregnancy.[477] Emerging data also suggest that environmental pollutants such as Polybrominated diphenyl

ethers (PBDEs) may have adverse impacts on maternal health with potentially greater exposure for women from minoritized groups.[478,479]

Social policies impact maternal health. States that adopted both the elimination of the asset test and increased the income limit for Supplemental Nutrition Assistance Program (SNAP) eligibility policies showed lower rates of intimate partner violence and other relationship violence compared to states that did not adopt either policy in addition to reduced rates of alcohol use disorder, opioid misuse, substance abuse disorder and needing but not receiving treatment for substance use disorder.[480] Conversely, stranger violence was not affected.[481] Kose *et al.* examined how expanding community health centers (CHCs) affected infant health using the rollout of CHCs.[482] They report maternal access to CHCs improved infant health outcomes within seven years after their introduction.[482] Using population-wide, individual-level administrative data from birth records and a regression discontinuity approach, González *et al.* find that women who received cash assistance were much less likely to have low-birth-weight children.[483] This cash assistance led to a 0.7 percentage-point decline in the fraction of children born under 1500 grams in poorer households in the following five years, an 83% relative risk reduction.[483] A systematic review of income-support interventions on life course risk factors and health outcomes during childhood involving randomized and quasi-experimental studies found positive, small effects of most policies on child birth weight.[484]

A Cochrane Review of 13 randomized trials among more than 17,000 women showed that midwife-led models particularly for low-risk pregnant women, reduced fetal/neonatal deaths.[485] A meta-ethnographic synthesis of qualitative research with the midwife as a birth pilot yielded positive labor and birth experience.[486] In the US, states with regulatory environment supportive of greater integration of midwives into the health system had more midwives and midwife-attended births.[487] This greater integration, in turn, was significantly associated with higher rates of spontaneous vaginal delivery, vaginal birth after cesarean, and breastfeeding at birth and at six months, as well as lower rates of obstetric interventions, preterm birth, low birth weight infants, and neonatal death.[487] Furthermore, culturally-centered models of care during pregnancy, childbirth, and the postpartum period offer promise for improving value and equity in childbirth.[488] There are several initiatives underway to address SMM.[489,490]

Maternal and child health are intertwined. Poor maternal health is associated with poor birth outcomes and vice versa.[491] Resources for mothers appear to matter for birth outcomes. The expansion of Medicaid may alter biological associations across generations by increasing the use of prenatal care, which provides nutrition and drug counseling, immunizations, early diagnoses, and direct interventions. An analysis of Medicaid expansion indicates that prenatal Medicaid's benefits also spillover onto *the next generation's offspring* birthweight,[492] suggesting that expanded prenatal care not only improves the health of the mother, the future child, but also child of the future child, i.e. the subsequent generation.

Unwanted pregnancy is associated with unintended pregnancy. Compared with intended pregnancy, unintended pregnancy is significantly associated with higher odds of depression during pregnancy and post-partum, interpersonal violence, preterm birth and infant low birth weight.[493] However, restrictive pregnancy policies may undermine potential progress in reducing unwanted births.[494] Geographic access to pregnancy termination has worsened following state

restrictions imposed following the Supreme Court's Dobbs v Jackson decision,[495] with the potential to worsen racial inequities in maternal and child health,[496-499] child foster care placement,[500] and infant mortality.[501]

Increases in maternal morbidity and mortality and stark racial disparities underscore the need to improve the pre-pregnancy health of future mothers while developing systems of healthcare that better meet the needs of all women. National maternal and child experts recommend the adoption of a life course perspective that recognizes the significance of time and timing in understanding causal links between exposures and outcomes within the course of people's lives, across generations, and within population-level disease trends including the role of SDOH at critical junctures.[502]

Child Health

Preterm birth, particularly at the extreme, contributes to infant mortality (the number of infant deaths per 1,000 live births in the first 12 months of infant life), particularly deaths within the first month of life.[503] It is the second leading cause of infant mortality in the US in the US behind birth defects.[504] The overall singleton (non-multiple birth) preterm birth rate worsened by an average annual rate of 2% from 2014 through 2019 (from 7.74% to 8.47%). The rate then declined very slightly in 2020.[179] The relative disparity between preterm births between Black and White mothers has changed little in fifty years.[505]

Extreme preterm birth (401 to 1500 grams) is associated with poor maternal health and results in high rates of infant morbidity and mortality.[506] Black mothers born in the US have more than three and half times the risk of giving birth to a highly preterm child than non-Hispanic White mothers born in the US.[507] A Multi-disciplinary scientific work group convened by the March of Dimes concluded that racism is a highly plausible, major upstream contributor to the Black-White disparity in preterm birth through multiple pathways and biological mechanisms, e.g., chronic stress, environmental exposures, etc.[508]

Among infants born extremely preterm, there has been improvement in adjusted rates of mortality and most major morbidities between 2002 and 2016 with little difference by race/ethnicity, but rates of neurodevelopmental impairment increased in all groups over time as more infants survived.[506] There were some narrowing racial and ethnic disparities in key quality measures, including the use of antenatal corticosteroids and cesarean delivery relevant for these infants.[506]

The US ranking in infant mortality has dropped to 49th in the world, below every rich country and many middle-income countries, including countries with less than a fraction of the wealth of the US.[509] Infant mortality in the US has decreased from 9.2 in 1990 to 5.6 deaths in the first 12 months of life per 1,000 live births in 2020.[510] Provisional estimates suggest the infant mortality rate recently increased by 3% for infants born in 2022, with the highest rates among Black and American Indian infants.[511] Similar to many adult trends, while the absolute rates of Black-White disparity in infant mortality have declined, the relative gap has changed little. In 2018, the non-Hispanic Black infant rate was 10.8, followed by infants who were Native Hawaiian or Other Pacific Islander populations at 9.4 and American Indian infants at 8.2. The non-Hispanic White and Asian infants in the US had the lowest rates at 4.6 and 3.6, respectively.[510] Notably,

all groups showed reductions over time except American Indians Infants whose death rates changed little between 2005 and 2018.[510] The NHQDR finds that non-Hispanic American Indian/Alaskan Native, Native Hawaiian Pacific Islander, and Black individuals, and Hispanic individuals groups experienced higher rates of infant mortality compared to non-Hispanic White individuals white non-Hispanic Black infants dying at 121% higher rates than non-Hispanic-White infants.

Black infant mortality varies by region.[512] In an adjusted model, factors associated with lower Black infant mortality included higher state-level Black-White marriage rates, higher state maternal and child health budget per capita, and fewer county-levels racial disparities in socioeconomic privilege and disadvantage. [512] These variables accounted for 35% of the regional variation in Black infant mortality.[512]

The NHQDR showed a steady improvement in exclusive breastfeeding during the first three months of the infant's life across all groups from 2000 to 2018, except Asian mothers, who have the highest rates. However, non-Hispanic Black and Hispanic mothers have persistently lower rates of exclusive breastfeeding than non-Hispanic White mothers.

Structural racism impacts the health of Black and Brown children in part through greater early life adversity and toxic stress with a lasting impact on development. Chyn *et al.* used an instrumental variable approach based on exogenous variation in racial segregation due to the patterns of railroad tracks in the nineteenth century.[513] The authors found that higher segregation reduced upward mobility for Black children from households across the income distribution and White children from low-income households. Notably, segregation reduced academic achievement while increasing incarceration and teenage birth rates. Exploration of mechanisms shows that segregation reduces government spending, weakens support for anti-poverty policies, and increases racially conservative attitudes for White residents.

A study assessed co-occurring adverse child experiences (ACEs) and protective factors (from school, family, and community contexts) and associations with health outcomes among 30,668 Black, Hispanic (12.3%), and non-Hispanic White youth (77.3%) ages 12–17 years who participated in the 2011–12 National Survey of Children's Health (NSCH).[514] Results showed that more ACEs were associated with worse health, while more access to protective factors was associated with better health.[514]Non-Hispanic White youth had fewer ACEs, more access to protective factors, and better health compared to their Black and Hispanic peers.[514] After controlling for demographic, socioeconomic, and familial characteristics, analysis of the NSCH showed parental incarceration was associated with learning disabilities, ADD and ADHD, behavioral or conduct problems, developmental delays, and speech or language problems.[515] Having intersectional disadvantage, e.g. growing up in poverty and being a member of sexual minoritized group was associated with greater exposures to ACEs.[516] Other adverse child exposures involve environmental pollutants and toxins that amplify social disparities in child development.[517,518]

A study of mother–child pairs from the Fragile Families and Child Wellbeing Study showed children's good health to be positively associated with the mother's health (current health and health during pregnancy) across minoritized groups.[519] For African-American children, good

health was associated with mothers' education attainment, receipt of informal child care and public health insurance, and absence of depression. For Hispanic children, good health was associated with mothers' education attainment, receipt of substance-use treatment, and non-receipt of public assistance.[519]

A trajectory characterized by increasing maternal stress in late pregnancy has been linked to blunted development of infant negative affect while trajectories that included increasing or peak maternal stress in late pregnancy were related structural brain changes in the exploratory analysis.[520]

Xiao *et al.* examined eighty-four neighborhood-level, geocoded variables, including bias, education, physical and health infrastructure, natural environment, SES, social context, and crime and drugs on mental health.[521] Children exposed to socioeconomic deprivation showed the worst health, including manifesting more internalizing and externalizing mental health problems, lower cognitive performance, and adverse physical health.[521] A systematic review of longitudinal studies on racial discrimination and child and adolescent health showed frequent effects on behavior problems, delinquency, and risk-taking behavior.[522] Black, American Indian/Alaskan Native and multi-racial children experience greater parental incarceration than White children. In analysis of the NCHS, parental incarceration was associated with worse health and higher chances of not flourishing.[523] Furthermore, parental incarceration was associated with worse physical health, mental health, developmental issues, and educational needs. Notably, participation in free and reduced school lunch programs attenuated the relationship between parental incarceration and general health and flourishing, while family cash assistance attenuated the association between parental incarceration and failing to flourish.[523]

Resources appear to have a causal impact on child health. Using variation from the county-level roll-out of the Food Stamps program between 1961 and 1975, Bailey *et al.* report that children with access to greater economic resources before age five experienced an increase in their adult human capital, in their adult economic self-sufficiency, in the quality of their adult neighborhoods, increase in longevity, and a decrease in the likelihood of being incarcerated.[524] Barr *et al*. leverage the January 1 birthdate cutoff for US child-related tax benefits, yielding families of otherwise similar children receiving substantially different refunds during the first year of life. For the average low-income single-child family in the sample, this difference benefit is roughly $1,300, or 10% of income. Using federal tax data in selected years, Barr *et al.* show that this additional income in infancy increases young adult earnings by at least 1%–2%, with larger effects for males.[525] Similarly, a systematic review found that universal free school meals that included free lunch found positive associations with diet quality, food security, and academic performance.[526] These findings suggest that investment in families and children yield future dividends for individuals and society.

The NHQDR shows child obesity worsened by 27% from 1999-2002 to 2015-2018. Hispanic and non-Hispanic Black children had 70% and 53% higher rates than non-Hispanic White children, while non-Hispanic Asian children's rates were 35% lower. Between 2005 and 2019, there was a steady rise in bariatric procedures among youth (under 20 years).[527] The annual number increased from 839 cases in 2005 to 1785 in 2019. Patients were predominantly female (76%) and White (56%).

Instrumental variables models based on changes in school racial segregation showed that an increase in school segregation was associated with increased behavior issues, probability of having ever drunk alcohol, and drinking at least monthly.[528] Notably, school segregation was more strongly associated with drinking behaviors among girls.[528]

The NHQDR reports improvement in health providers advising about the amount and kind of exercise, sports, or physically active hobbies they should have. Overall rates improved 28% between 2002 and 2018 for most groups except non-Hispanic Black children, who were less likely to receive such advice than non-Hispanic White children in 2018. The NHQDR showed no appreciable improvement in emergency department visits for asthma for children 2-19 years. 2006-2008 to 2017-2019. Rates remained appreciably worse for non-Hispanic Black and Hispanic children than for non-Hispanic White children.

Over time, there were considerable increase in children with public insurance (12 to 46%) and Hispanic individuals (11 to 30%).[527] An analysis of nationally representative emergency department visits between 2005 and 2016 by children (younger than 18) showed Black and Hispanic pediatric patients were less likely than non-Hispanic White individuals to have their care needs triaged as immediate/emergent. Black and Hispanic children were less likely than non-Hispanic White children to be admitted to the hospital following an emergency departart visit. Black and Hispanic children also experienced significantly longer wait times and overall visits as compared to non-Hispanic White children.[529]

A population-based, multisite sample of more than 4,000 children, African-American and Hispanic children, compared with non-Hispanic White children, were less likely to receive an attention deficit hyperactivity disorder (ADHD) diagnosis or ADHD medication after control for sociodemographic factors, ADHD symptoms, and other potential comorbid mental health symptoms.[530]

An analysis of racial and ethnic disparities in advanced science and mathematics achievement during elementary school showed family SES and student science, mathematics, and reading achievement *by kindergarten* consistently explained whether students displayed advanced science or mathematics achievement during first, second, third, fourth, or fifth grade.[531] These findings underscore the importance of early child intervention programs to address these racial inequities.[532]

A systematic review on racial disparities in quality of care for asthma documented racial disparities in asthma controller medicine prescribing, asthma severity assessment, lung function measurement, and asthma specialist referral.[533] A retrospective analysis of data from the Nationwide Inpatient Sample between 2001 and 2018 for children younger than 18 years who underwent appendectomy showed a steady decline in post-appendectomy complications.[534] Yet, Black children consistently had higher rates of complications and perforation, resulting in significantly higher hospital costs.[534] In a different national sample, non-Hispanic Black and Puerto Rican youth, along with all generations of Mexican and Asian youth, were more pessimistic about their future survival compared to non-Hispanic White peers, with foreign-born Mexican youth being the most pessimistic.[535]

Child health, including brain development, is shaped by national, state, and local policies that shape SDOH with disparate impact on Black and Brown children. The scientific evidence over the past 20 years is summarized in reports from the National Academies of Science, Engineering, and Medicine (Institute of Medicine) and the National Research Council.[536-538] Evidence-based solutions exist to improve current child health trajectories and outcomes. Key policies include family income support, family resiliency, healthy communities, transformation of health care, collaboration between education and health, cross-sector goals and collaboration, and health equity.[536]

Wellbeing and Mental Health

Mental health is a multidimensional construct that includes the presence of mental disorders and subjective well-being. Diener *et al.* identified three components of wellbeing: positive affect, negative affect, and cognitive evaluation, e.g. perceived life satisfaction.[539] Gallup tracks life evaluations since 2008. Black and Hispanic Americans began exceeding those of non-Hispanic White Americans shortly after the 2008 presidential election but Black Americans declined below those of non-Hispanic White individuals and Hispanic White individuals in 2013. By 2016, non-Hispanic White individuals' evaluations exceeded both groups, and Black Americans' life evaluations reached a nadir in 2016 and then slowly increased.[540] Although, by 2021, non-Hispanic White individuals reported higher life evaluations than either non-Hispanic Black or Hispanic individuals.[540] In a national sample of working-age adults, reports of psychological distress rose steadily from 1999 to 2018, with rates for non-Hispanic White individuals rising faster, resulting in higher rates for this group by 2018 compared to non-Hispanic Black individuals and Hispanic individuals.[541] Notably, suicide rates have steadily climbed from 2000-2019, with those for non-Hispanic American Indians/Alaskan Native people exceeding those for non-Hispanic White people.[542] In 1999, the estimated percentage of people who reported severe psychological distress was 0.8% among Asian individuals, 3.0% among Black individuals, 3.2% among Hispanic individuals, and 2.3% among non-Hispanic White individuals. Between 1999 and 2018, estimated rates of severe psychological distress significantly increased for Black (+1.3 percentage points), Hispanic (+1.5 percentage points), and non-Hispanic White individuals (+1.5 percentage points) but was not statistically changed for Asian individuals (+1.1 percentage points).[99]

An analysis of mood disorder indicators and suicide-related outcomes in the national cohort, severe psychological distress in the prior month and suicide-related outcomes, including suicidal ideation, plans, attempts, and deaths by suicide in the last 12 months also increased among young adults 18-25 from 2008-2017, with a 71% increase in severe psychological distress.[543] The increase in psychological distress was most significant among Hispanic young adults and smallest among Black young adults. Notably, the increase in adolescent mood disorder episodes was largest among White and Hispanic young adults and smallest among Black young adults. Similarly, increases in suicidal ideation adolescent and young adults were largest among White Americans and smallest among Black Americans.[543]

Environmental factors are associated with the risk for affective psychosis, e.g. bipolar disorder. These include advanced paternal age, early or and late gestational age, childhood adversity, and substance misuse.[544] In a retrospective analysis of patients of Kaiser Permanente Northern

California, there were racial and ethnic variations in new onset of a psychotic disorder.[545] Compared with White members, the risk of nonaffective psychosis diagnosis was higher among American Indian or Alaskan Native members and lower among Asian and Hispanic members.[545] A systematic review documented racial disparities in clozapine prescribing for psychosis.[546] There are similar racial disparities in the use of second-generation long-acting antipsychotic drugs.[547]

National data from 2018 to 2019 show that the use of any outpatient mental health service use was more than twice as high for White individuals as for Black or Hispanic individuals.[548] Among those receiving outpatient mental health care, Black (69.9%) and Hispanic (68.4%) patients were significantly less likely than White (83.4%) patients to receive psychotropic medications, but Black (47.7%) and Hispanic (42.6%) patients were significantly more likely than White (33.3%) patients to receive psychotherapy.[548] Among adults receiving antidepressants, discontinuation during the first 30 days of treatment was significantly more common among Hispanic individuals than non-Hispanic individuals as well as among patients with fewer than 12 years of education and patients with low family incomes, compared with those with greater education or income.[549] Similar racial disparities and lack of improvement are seen for treatment of post-stroke depression; non-Hispanic Black and Hispanic patients are less likely to receive treatment than non-Hispanic White patients.[550]

The percentage of children and adolescents receiving any outpatient mental health service increased by 45% from 9.2% (1996–1998) to 13.3% (2010–2012). Significant overall increases occurred in the receipt of psychotherapy (from 4.2% to 6.0%) and psychotropics, including the use of stimulants and related drugs, antidepressants, and antipsychotic drugs.[551] There were increases in children diagnosed anxiety and depression, decreases in child physical activity, in caregiver mental and emotional well-being, and coping with parenting demands. Between 2010 and 2017, rates of any past year mental health care use among Black youth decreased (from 9% to 8%), while rates increased for White youth (from 13% to 15%) and Hispanic youth (from 6% to 8%).[552] Following adjustment for mental health need, there were significant Black-White and Hispanic-White disparities in any mental health care use and any outpatient mental health care use in 2010-2011 and 2016-2017, with significant worsening of Black-White disparities over time.[552] White youth were more than twice as likely as Hispanic youth to receive psychotropic medications. Hispanic-White and Black-White disparities in psychotropic medication prescription fill persisted over time.[552]

The NHQDR showed no appreciable improvement in treatment for depression from 2008 to 2020 and documented significantly lower treatment for Hispanic individuals (50%), than for non-Hispanic White individuals (70%) in 2020. Results for children mirrored these results.

The prevalence of suicidal ideation has substantially increased among US adults with past-year OUD from 2009 to 2020. Yet, over half of those with suicidal ideation reported needing mental health treatment but did not receive it in the past 12 months.[553] In adjusted analyses, non-Hispanic White individuals had the highest rates. In a nationally representative sample, the highest estimated suicidal thoughts and behaviors prevalence was observed among Hispanic and non-Hispanic Black bisexual women in nonmetropolitan counties, highlighting intersectionality.[554] A systematic review found an association between racism and suicidal

ideation and suicidal attempts among minoritized groups with a strong association between acculturation and suicidality.[555] Between 2014 and 2019, the suicide rate increased by 30% for Black individuals (from 5.7 to 7.4 per 100 000) and 16% for Asian or Pacific Islander individuals (from 6.1 to 7.1 per 100 000).[556] non-Hispanic American Indian and Alaskan Native individuals had the highest rates in 2019, more than double the second group, non-Hispanic White individuals. For youth and young adults aged 15 to 24 years, suicide rates in 2019 were highest among female American Indian or Alaskan Native youth (23.0 per 100 000) and non-Hispanic White youth (6.1 per 100 000) relative to Black youth (4.3 per 100 000), Asian or Pacific Islander youth (5.1 per 100 000), and Hispanic youth (4.4 per 100 000) for all years.[556]

Rising deaths of despair from suicide, particularly stark among Indigenous populations, underscore the need for the implementation of early intervention and social policies to address this growing despair.[112,557,558] Nelson *et al.* evaluated the impact of a VA program involving temporary financial assistance for housing-related expenses on all-cause mortality, suicide attempt, and suicidal ideation using observational methods.[559] At 12 months following program enrollment, the authors observed a 30% risk-adjusted decrease in the risk of all-cause mortality and a 20% decrease in suicidal ideation, with similar results at 24 months. The authors noted that effects were restricted to Veterans enrolled in the rapid rehousing and houseless component of the program.

Emergency and Surgical Care

Racial disparities are documented during emergency transport, often for trauma. These include disparities in the administration of ketamine and analgesics more generally.[560] A 2023 systematic review showed that Black, non-Hispanic patients with long bone fractures were significantly less likely to receive out-of-hospital analgesics compared with non-Hispanic White patients.[561] A 2019 systematic review documented that Black and Hispanic patients are less likely to receive the equivalent analgesia medication for acute pain in the emergency department than non-Hispanic White patients.[562] Another systematic review (2021) found that most studies reported an association between Black/African American, Hispanic, or non-White race/ethnicity and decreased receipt of imaging in the emergency department.[563] A 2023 systematic review found that Black adult emergency department patients were more likely to be placed in restraints than adults from other racial or ethnic groups.[564] Another study documented racial disparities in emergency restraints for children.[565] Furthermore, race and ethnicity appear to be independently associated with imaging decisions in the pediatric emergency department.[566] In a large national study conducted from 2012 to 2017, racial and ethnic disparities in mortality were observed among children treated for acute medical emergencies but not for traumatic injuries.[567] Increased pediatric emergency department readiness was associated with reduced disparities. The authors estimated that increasing hospitals' emergency department pediatric readiness levels in the 3 lowest quartiles would yield an estimated 3-fold reduction in disparity for pediatric mortality.[567]

There are long-standing disparities in access to surgery and outcomes by race and ethnicity in the US.[568-573] Between 2005 and 2014, racial disparities in postoperative mortality for Medicare beneficiaries narrowed.[574] Specifically, rates for Black and White patients improved by 0.10 percent per year and 0.07 percent per year, respectively, which significantly narrowed the Black-White difference. The reduction occurred primarily within hospitals rather than between hospitals. A study on hospital data from 2012 to 2017 concluded that despite national initiatives

to address surgical disparities, such disparities have persisted for all analyzed procedures and worsened for one-third of the analyzed procedures.[575] A study on cancer surgeries performed from 2007 to 2016 found that overall improvement in national mortality rates following cancer surgery was lower for both Black and White patients.[576] However, these reductions were predominantly attributable to within-hospital mortality improvements vs between-hospital mortality improvements. Across the 9 different cancer surgery procedures, there was no significant difference in mortality changes between Black and White patients during the period under study.[576] A systematic review examined two questions:[577] (1) Does racial/ethnic discrimination in surgery ? (2) If yes, are there ways suggested to reduce racial/ethnic discrimination in surgery? Results showed there was evidence of racial discrimination, and the results were justified by strong scientific evidence.[577] The second question's answer was affirmative based on scientific recommendation.[577] A different systematic review on surgical access reported that contributors to disparities in surgical access included healthcare literacy, ability to navigate the healthcare system, mistrust of healthcare providers and hospitals, healthcare affordability, misunderstandings regarding disease severity and available treatment options, and limited access to adequate health care facilities and qualified personnel.[578] Systems of care are urgently needed to address these factors and ensure health equity in emergency medical services, emergency treatment, and access and quality in surgical procedures

Patient Safety

NHQDR reports no appreciable improvement in perioperative hemorrhage or hematoma from 2016 to 2019, requiring surgical drainage or evacuation with worse rates for non-Hispanic Asian Pacific Islander and Black patients. Postoperative pulmonary embolism or deep vein thrombosis among adults improved appreciably for White and Hispanic patients, but not for non-Hispanic Asian Pacific Islander and Black patients. Black patients remained appreciably worse than non-Hispanic White patients in 2019. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation also improved appreciably overall from 2016 to 2019 from 5.7 to 3.0 and among all groups, yet disparities persisted for Hispanic patients and non-Hispanic Black patients compared to non-Hispanic White patients. Accidental puncture or laceration during a procedure showed no appreciable improvement from 2016 to 2019. non-Hispanic Asian Pacific Islander and Black patients had the highest rates in 2019. Postoperative sepsis following elective surgery for adults improved among all groups, but Hispanic, non-Hispanic Asian Pacific Islander, and Black patients had higher rates of sepsis than non-Hispanic White patients. non-Hispanic Black patients showed improvement in post-operative kidney injury between 2016 and 2019, but disparities persisted.

Oral Health

Oral health affects pain, ability to chew, appearance, and other psychosocial outcomes, including getting and keeping a job and marital quality.[579-584] In addition, oral health is associated with multiple non-communicable diseases, e.g., adverse pregnancy outcomes, diabetes mellitus, chronic kidney disease, cardiovascular disease, dementia, psoriasis, cancer (breast, pancreas, prostate, lung, head, and neck), cognitive decline and dementia.[585] Some of these associations may be partly causal through plausible mechanisms.[586] A 2023 systematic review documented an association between the consumption of ultra-processed foods and dental caries among children and adolescents.[587]

Child tooth decay or early child caries (ECC) develops early, particularly among minoritized children living in poverty. The national prevalence of ECC among children five and younger decreased from 2013 to 2014 (20%) to 2015 to 2016 (17%) but then increased from 2017 to 2018 (to 19%).[588] Prevalence in 2017-2018 was 32%, 23%, 20%, and 13% for Mexican American and non-Hispanic Asian, Black, and White children, respectively.[588]There was a clear gradient in SES with children living in poverty having a higher prevalence (25%).[588] Food insecurity is associated cross-sectionally with caries.[589] Notably, the relationship is attenuated with family participation in the Women, Infants, and Children (WIC) program.[590]

Disparities in oral health are seen across the lifespan.[591,592] The NHQDR report no improvement among the proportion of adults with dental visits from 2000-2019. American Indian/Alaskan Native, non-Hispanic Asian, Black, and Hispanic adults all had lower rates than non-Hispanic White adults. Patterns were the same when analysis was restricted to preventive dental visits. Among children, the NHQDR reports similar disparities in dental visits in the past year or having a preventive dental visit. Untreated dental caries among Black children decreased by 45% overall from 2001-2004 to 2015-2018 but Black children remained significantly more likely than White children to have untreated dental caries. The absence of dental coverage and experiences of discrimination contribute to disparities in dental utilization.[593]

Massachusetts expanded Medicaid dental coverage in 2006 to all adults ages 19–64 years whose annual income was at or below 100 percent of the federal poverty leve.[594]This expansion was associated with increased dental care use, particularly among low-income adults.[594] Findings from the Oregon Health Insurance Experiment Expansion of Medicaid covering emergency dental care substantially reduced unmet need for dental care, increased emergency dental visits and medication use, and did not change patient use of uncovered dental services.[595] Improved oral health promotion, universal dental coverage, and systems of oral health care that prioritize early prevention are needed to address racial and ethnic disparities in oral health.

All-Cause Mortality

Population-level age-standardized all-cause mortality in the US improved from 2000 to 2019.[225] Absolute disparities by race and ethnicity narrowed but persisted over these twenty years. All-cause mortality was highest among the Black population in 2000, but the American Indian/Alaska Native population replaced the Black population with the highest mortality in 2019.[225] All-cause mortality rates were lowest for the Asian population, followed by the Hispanic population. Analysis of longer time trends shows that health equity in mortality improved from 1969 to 2019, but 73% of this increase occurred prior to 1990 and minimally (4%) since 2000.[596]

The leading causes of death in the US in 2022 were heart disease, cancer, unintentional injury (accidents, falls, overdoses, etc.) COVID-19, stroke, chronic lung disease, Alzheimer's disease, diabetes, kidney disease, and chronic liver disease.[597] Many of these diseases are preventable, and most are treatable. Age-standardized all-cause mortality varies by race and ethnicity in the US. Notably, mortality rates and disparities vary widely by US county.[225] Narrowing of Black-White disparities in all-cause mortality from 2000 to 2010 has been largely attributable to steep rises in death rates among White Americans without college degrees.[598]

Race, ethnicity, and income affect life expectancy. Life expectancy in the US is strongly associated with income and is widening.[599] The relationship is non-linear, i.e., an increase in income of a given dollar is associated with smaller gains in life expectancy at higher income levels.[599] Area life expectancy for low-income individuals is associated with local health behaviors, proportion of immigrants, median home values, college graduates, and local government expenditures.[599]

Section 7: Affordable Care Act

The ACA had three core goals:[600] 1) Make health care more affordable; 2) Expand Medicaid coverage; and 3) Promote innovative medical care delivery methods that improve value, i.e., improve outcomes relative to overall costs.

Affordability

One study showed that ACA implementation was associated with 2 million fewer adults with catastrophic expenditures each year, with the greatest impact for the lowest income quartile with little change in higher income quartiles or among the privately insured.[601] Another study found that Medicaid expansions under the ACA were associated with lower out-of-pocket spending and a lower likelihood of catastrophic financial burden for low-income adults in the third and fourth years of the ACA's implementation.[602] These changes no doubt benefited racial and ethnic minorities in these categories. The ACA removed deductibles and copayments for evidence-based preventive services and immunizations. A 2022 review showed that the impact of cost-sharing elimination varied depending on the specific clinical service, with most findings showing improvements in uptake of preventive services, particularly among more financially vulnerable groups.[603]

Medicaid Expansion

To date, 41 states (including DC) have adopted ACA funded Medicaid expansion, and 10 states (Alabama, Georgia, Florida, Kansas, Mississippi, South Carolina, Texas, Tennessee, Wisconsin, and Wyoming) have as yet failed to expand Medicaid.[604] This expansion contributed to significant reductions in being uninsured among people of color. Nonelderly Hispanic people experienced the largest absolute increase in insurance coverage, with their uninsured rate falling from 32.6% to 19.1%. Nonelderly Black, Asian, and American Indian/Alaskan Native people also had larger percentage point increases in coverage compared to White people over that period, resulting in historic reductions in racial and ethnic disparities in being uninsured.[100]

Studies of Medicaid expansion often but not universally show improvement in disparities in quality among low-income patients. An analysis of inpatient data from twenty-nine states and ED data from twenty-six states for the period 2011–2018 found that Medicaid expansions decreased disparities in preventable hospitalizations and ED visits between non-Hispanic Black and White nonelderly adults by 10 percent or more but no significant effects on disparities between Hispanic and non-Hispanic White nonelderly adults.[605] Levine *et al.* analyzed the Medical Expenditure Panel Survey data from (2011-2013) and (2014-2016). They reported that the ACA was associated with improved patient experience, communication, and access and decreased out-of-pocket costs, but little to no change in quality, utilization, and total cost.[606] Adults with lower income, i.e., less than 400% of the federal poverty level (FPL), received increased high-value care (diagnostic and preventive testing) compared with adults with higher

income, i.e., greater than or equal to 400% FPL. In addition, people with lower income had more significant improvements in experience, communication, access composites, receipt of primary care, and reductions in out-of-pocket costs than people with higher income.[606]

A systematic review of 77 studies showed that Medicaid expansion was associated with improved insurance coverage, service use, quality of care, and Medicaid spending with little evidence of negative consequences, e.g., increased wait times for appointments.[607] A different review of 43 studies that used quasi-experimental research designs showed evidence of improvements in health status, chronic disease, maternal and neonatal health, and mortality.[608] Medicaid expansion was associated with improvement in perceptions of care among racial and ethnic minorities.[608] In national and multi-state samples, Sommers *et al.* found consistent evidence that Black and Hispanic individuals were much more likely than White individuals to report that the ACA had personally helped them.[609] In addition, those with Medicaid were also much more likely to report that the ACA had helped them, as were those with Marketplace coverage in the 7-state sample.[609] People remaining uninsured felt the law had hurt them,[609] underscoring the limitations of incomplete insurance coverage through ACA and the need for universal coverage. People with lowest-income reported more favorable views toward the ACA in the 7-state sample, even after adjustment for health insurance and race/ethnicity.[609] Nonetheless, Black and Hispanic individuals reported receiving worse quality of care than non-Hispanic White individuals, with 16%-70% of these gaps explained by differences in insurance. These findings suggest that ACA expansion of coverage reduced but did not eliminate racial and ethnic disparities in care.

Miller *et al.* used federal survey data linked to death records to examine the impact of Medicaid expansion on mortality by comparing *changes* in mortality for near-elderly (ages 55-64) adults in states with and without Medicaid expansion.[610] The authors report that prior to the ACA, mortality rates between expansion and non-expansion states trended similarly, but diverged beginning in the first year of the policy.[610] These adults experienced significant relative reductions in mortality in states that opted for expansion relative to those that declined federal funding for expansion. These effects were driven by a reduction in disease-related deaths and grew over time with an estimated 4,800 fewer annual deaths among this population due to ACA Medicaid expansion, or roughly 19,200 fewer deaths over the first four years of Medicaid expansion.[610] These findings suggest that Medicaid expansion saved lives and indicate the potential for further reduction in mortality with Medicaid expansion among the remaining 10 states that have yet to expand Medicaid.

Care Models Intended to Promote Value May Undermine Equity

The ACA promoted alternative payment models, e.g., Accountable Care Organizations (ACOs), Medicare Shared Saving Programs, and bundled payment programs.[611] However, there is little evidence these models reduce racial and ethnic disparities in outcomes.[575,612-614] There is mixed evidence for risk selection, i.e. programs serving patients with different health needs. For example, surgeons who participated in Comprehensive Care for Joint Replacement models tended to avoid older and higher-risk patients,[615] and hospitals in lower SES communities are less likely to enroll in voluntary or mandatory bundled payment programs.[616] Furthermore, minoritized patients are more likely to be enrolled in lower-quality ACOs.[617] ACOs serving larger proportions of minoritized patients are more likely to exit the program.[618] However,

physician-led ACOs do not appear to avoid enrolling minoritized patients, and those with larger minoritized patient populations join at similar rates,[619,620]

Another ACA program, the Medicare Hospital Readmission Program, shows statistically significant reductions in readmission rates overall as well as for vulnerable populations, especially for acute myocardial infarction patients among hospitals serving low-income patients and high-risk patients.[621] More generally, evidence is not favorable regarding the impact of hospital-based value programs on disparities.[622] Notably, the financial penalties incurred appear to have disparate impact on hospitals serving low-income and minoritized populations.[621-625] For example, Aggarwal *et al.* reported that hospitals that cared for a high proportion of Black adults were more frequently penalized by CMS value-based programs than other hospitals in 2019, after accounting for safety-net status.[626] Adverse financial impacts on these hospitals were observed for the Hospital Value-Based Purchasing Program, the Hospital Readmissions Reduction Program, and the Hospital-Acquired Condition Reduction Program).[626] These CMS penalties undermine the capacity of these hospitals to care for Black patients with potential to worsen racial inequities in care.[627]

Medicare Spending

Growth in Medicare spending has slowed significantly following ACA implementation. Between 2008 -2011 and 2012 -2015, the annual Medicare spending growth rate per beneficiary (Parts A and B) declined from 3.3% to −0.1%. From 2016 to 2018, it improved relative to the previous period but remained lower than in the baseline period at 1.7% per year.[628] Analysis of contributors showed that changes in payment rates, Congressional sequestration measures, and changes in beneficiary characteristics explained 44% of the difference in overall per-beneficiary spending growth between 2007- 2011 and 2012- 2015; and 63% between 2007- 2011 and 2016 to 2018.[628] According to the New York Times if Medicare spending had grown at historical rates, federal spending would have been $3.9 trillion higher since 2011.[629] Given the timing of ACA reductions in Medicare's payments to hospitals and Medicare Advantage plans, it is plausible that ACA also contributed to these Medicare costs savings and possibly to the culture surrounding healthcare spending.

Section 8: COVID-19 Pandemic Public Health Emergency Measures

The pandemic prompted legislation and executive actions under the US COVID-19 Public Health Emergency (PHE) that impacted SDOH in unprecedented ways. Enactment of the American Rescue Plan's Child Tax Credit reduced child poverty by 46% from 9.2% in 2020 to a historic low of 5.2% in 2021.[630] In addition, the ARP improved health care affordability by extending ACA subsidies to higher-income people who didn't previously didn't qualify, increased ACA subsidies for lower-income people who already qualified, provided maximal ACA subsidies for individuals who received unemployment benefits in 2021; and prevented taxpayers who misestimated their income in 2020 from having to repay excess premium tax credits at tax time.[631]

The American Rescue Plan's stimulus payments provided up to $1,400 for qualifying children and kept a comparable number of children out of the poverty line in 2021 as the Child Tax Credit expansion.[631] Garfinkel *et al*. estimated the annual $97 billion of the program would generate social benefits of $929 billion per year which translated to nine dollars saved for each dollar one

invested in the program.[632] Studies show that the program's cash improved adult well-being and food insecurity.[633,634] More than six in ten non-Hispanic Asian, women, nearly six in ten Hispanic women, and more than half of non-Hispanic Black women used some of their tax credit dollars to buy food.[635] Notably, the program appeared to improve children's diet, i.e. it was associated with *decreases* in children's consumption of added sugar, sugar-sweetened beverages, and sweetened fruit beverages.[634]

The expiration of the child tax credit resulted in an unprecedented 138% increase to 12.4% in child poverty, equaling the overall level of US poverty.[636] Discontinuation of the child tax credit resulted in the greatest increases in poverty rates for those groups that had the highest likelihood of poverty before the pandemic, as old patterns returned. The increases in poverty among Black and Hispanic children were larger, with the Black child poverty rate increasing from 8.3 percent to 18.3 percent and Hispanic child poverty rising from 8.4 percent to 19.5 percent.[636] Following the discontinuation of the child tax credit program, food insecurity rates increased by 17%, 21%, and 23% among households with annual incomes less than $50 000, $35 000, and $25 000.[637]

The formal ending of the US COVID-19 public health emergency resulted in several key changes in healthcare.[638,639] First, the public health emergency had made it possible to continue covering millions of people under Medicaid, even if their eligibility had changed. The Kaiser Family Foundation estimates that anywhere from 5 to 14 million people could lose Medicaid coverage as states begin to disenroll patients.[640] Given that Medicaid serves a disproportionate minoritized population, this suggests that racial and ethnic disparities will climb. Second, HHS has taken steps to ensure people have access to COVID-19 vaccines at no cost and are able to access COVID-19 treatments.[638] However, concrete details for access for people without health insurance or who are undocumented are limited, and even when states or counties make them available, outreach is required to promote awareness. Third, access to free over-the-counter COVID-19 tests ended with the expiration of the public health emergency.[641] However, some Medicare Advantage plans may continue to provide coverage as a supplemental benefit. Last, the 20% increase in Medicare reimbursements that hospitals received for COVID-19 patients ended with the expiration of the public health emergency.[640] This may indirectly affect patients hospitalized for COVID-19 with a disparate impact on patients who are members of minoritized groups with gaps in their coverage.

Section 9: Mechanisms that impact Health Care Disparities

Social Determinants of Health

Link and Phelan developed the Fundamental Cause Theory that explains how inequities in social conditions and resources affect health and health care.[642] They suggest that other social factors such as stigma, cultural trauma, and racism may also satisfy the criteria for fundamental causes of health.[643-645] Structural racism impacts these fundamental causes. Fundamental cause theory further suggests the need to address these 'root causes' to ensure lasting change. There has been relatively little progress over the past two decades in doing so.

The World Health Organization's (WHO) Commission on SDOH was explicit regarding the relationships between SDOH and health disparities: "The poor health of poor people, the social gradient in health within countries, and the substantial health inequities between countries are caused by the unequal distribution of power, income, goods, and services, globally and

nationally, the consequent unfairness in the immediate, visible circumstances of people's lives—their access to health care and education, their conditions of work and leisure, their homes, communities, towns, or cities—and their chances of leading a flourishing life."[646] Most importantly, SDOHs act early in life, often affecting health trajectories.[647] Weathering and accelerated aging are two examples of early developmental effects from inequities in SDOH.[648-650] Continued exposure to adverse SDOH, whether it is housing or food insecurity, neighborhood violence, exposure to pollutants and toxins in the air, water, or housing, and the chronic stress of racism have a cumulative toll that is not fully captured by disease morbidity. SDOH are associated with higher rates of smoking, obesity, inactivity, poor sleep, poor mental health, suicide, and violence.[73,111,651,652] In other words, inequities in social conditions are fundamental drivers of inequities in health.

Trends in Racial and Ethnic Disparities in Social Determinants of Health

SDOH, by definition, impact health. Racial and ethnic disparities in SDOH are key drivers of health disparities. Below, we review these trends.

Wealth, Income, Neighborhood, and Economic Mobility

Wealth is powerfully related to access to income, other resources, agency, and education.[653] A longitudinal analysis showed that within-person differences in mental and physical health were explained by increases or decreases in wealth after controlling for other factors.[653] Racial and ethnic disparities in wealth are large in the US. In 2019, the median net worth of non-Hispanic White families was roughly *eight times* that of Black families in contrast to a two to one difference in income.[654] Notably, gaps in the wealth held by Black and Hispanic families compared to non-Hispanic White families has remained relatively unchanged over thirty years.[654]Kent *et al.* trace these long-standing differences to slavery when enslaved Black people typically owned few or no assets, and also to historical discriminatory policies including those related to land ownership, access to housing, access to education, and access to credit.[654] Chetty *et al.* documented variation in intergenerational mobility with significant advancement in mobility among Hispanic Americans but not Black Americans.[655] Chetty *et al.* further observed that differences in family characteristics, including parental marital status, education, and wealth, or the person's ability explained little of the Black-non-Hispanic White income gap when controlling for parental income. [655] Strikingly, Chetty *et al*. find that when controlling for parental income, Black male youth had lower incomes in adulthood than White youth in 99% of census tracts. Chetty *et al.* reported that the few areas in which Black-White gaps are comparatively smaller tended to be low-poverty neighborhoods with low levels of racial bias among White individuals and high rates of father presence among Black male youths. [655] Notably when Black males moved to these neighborhoods earlier in childhood, they earned more as adults and were less likely to be incarcerated. However, fewer than one in twenty Black children grow up in such neighborhoods.[655] These findings highlight how social structures, including residential racial segregation, create and maintain racial differences in wealth, income, and economic mobility.

Education

Early childhood education, parental educational attainment, income, and disciplinary actions influence students' success in school. These factors affect different racial and ethnic groups

unevenly and lead to educational disparities. Research has shown that education is linked to health and well-being.

The National Center for Education Statistics (NCES) used data from 1992 to 2017 (or the most recent year available) to examine disparities in reading and math achievement test outcomes. The average reading scores for White 4th- and 8th-graders were higher than those of their Black and Hispanic peers; however, some achievement gaps have narrowed. For example, the White-Hispanic achievement gap in grade 8 narrowed from 26 points in 1992 to 19 points in 2017.[656.] Yet, by twelfth grade, the White-Black achievement gap was wider in 2015 (30 points) than in 1992 (24 points), while the White-Hispanic achievement gap in 2015 (20 points) was not measurably different from the corresponding gap in 1992. Between 1990 and 2017, the White-Black fourth-grade mathematics achievement gap decreased from 32 points in 1990 to 25 points in 2017. The White-Hispanic gap in 2017 remained relatively stable at 19 points compared to 1990. At the 12th-grade level in 2015, White students scored 30 points higher than Black students and 22 points higher than both American Indian/Alaskan Native and Hispanic students. The scores for White 12th-grade students consistently exceeded those of their Black and Hispanic peers since 2005. The White-Black and White-Hispanic achievement gaps in 2015 remained relatively stable compared to 2005.

College graduation rates have increased for all populations. In 1972, Black individuals were just 40.5% as likely as White individuals to have a four-year college degree (12.6% for White individuals and 5.1% for Black individuals), compared to 71.9% today (40.1% for White individuals and 26.1% for Black individuals).[657] Examining data in the year 2000 post-period shows some overall progress but persistent gaps:

- HS Diploma: 78.5% for Black individuals in 2000 and 88.4 for NH White individuals. By 2019, it was 97.9 for Black individuals and 94.6 for White individuals.[656]

- College Grad: In 2000, 16.5% for Black individuals and 28.1% for NH White individuals. By 2019, it rose for everyone; however, it was 26.1 for Black individuals and 40.1 for NH White individuals.[656]

Employment

A study by the Economic Policy Institute found that the median hourly real wage growth rates have not kept pace with growth in productivity (output per worker), regardless of race or gender post-2000 (and before).[657] After controlling for racial differences in education and experience, Black workers are more likely to reside in lower-wage Southern states and had an unexplained wage gap of 14.9% in 2019 (out of a total average gap of 26.5%). This is up from an unexplained gap of 8.6% in 1979 (out of a total average gap of 17.3%). Disparities also persist in unemployment rates. Black job seekers are about half as likely to secure employment during a consecutive four-week search period as are White job seekers. Despite Black people making progress in high school and college graduation rates over the past decades, the 2-to-1 unemployment rate disparity between Black and White job seekers has changed relatively little.

Homeownership

The benefits of homeownership have also been unequal and uneven. In fact, the Black-white gap in homeownership rates was the same in 2020 as it was in 1970, just two years after the passage of the Fair Housing Act of 1968.[658] In the second quarter of 2022, the homeownership rate for White households was 75% compared to 45% for Black households, 48% for Hispanic households, and 57% for non-Hispanic households of any other race.

Poverty

There is a persistent racial/ethnic gap in US poverty rates. It has risen since 2000 for Black and Hispanic individuals up to ≥24% in 2013. It has risen slightly for White individuals, from 8% in 2000 to 10% in 2013. The Asian-White disparity had dissipated by 2013. In 2021, poverty estimations were highest among the American Indian/Alaskan Native population (12.4%), followed by Black (11.3%), Hispanic (11.2%), and non-Hispanic White (5.7%) populations.[659]

Food Insecurity

There have been consistent disparities in food insecurity across race, ethnicity, age, and gender. The proportion of people in the US experiencing food insecurity doubled from 9% to 18% between 2005 and 2012. Although reports of food insecurity declined across all racial and ethnic groups between 2011 and 2017, Black people had the highest percent of food insecurity, followed by Hispanic people, with lower proportions of other racial and ethnic minorities and non-Hispanic White people reporting food insecurity. In addition, those living at less than 100% of the poverty level reported significantly higher food insecurity than those above 100%.[660]

Place: Legacies of Racism

Studies suggest that counties and regions with high concentrations of slaves often have worse health in the present. Esenwa *et al.* analyzed counties with a history of slavery in 1860 and compared the number of slaves per county to present-day stroke mortality for that respective territory. They found a strong and highly significant dose-response of slave density in 1860, on stroke mortality from 2011 to 2013 for Black, but not for non-Hispanic White adults.[661] They developed a multilevel model through which these effects occur.[661] Kramer *et al.* report a slower decline in heart disease mortality among African Americans residing in counties with a history of highest versus lowest concentration of slavery.[662] The association varied by region (stronger in the deep south than upper south states) and was partially explained by intervening socioeconomic factors.[662] Elman *et al.* reported that the Black-White all-cause mortality gap was the most prominent among people born in a former plantation region with a legacy of pre-1860s enslavement and subsequent high-productivity plantation farming under sharecropping.[663] These effects are presumably mediated by the intergenerational transmission of racial attitudes and structurally racist policies, wealth, residential segregation and poverty, and lower upper mobility. and potentially epigenetic factors.[655,664-667] Reece reports larger Black-White disparities in life expectancy in counties that had more enslaved people per capita than those with fewer.[668] Kihlstrom and Kirby report related findings in which counties the highest historic rates of lynching subsequently experienced the lowest life expectancies.[669]

Redlining was a racist zoning practice in the US that blocked fair access to home loans that began in the 1930s and ended in 1968. A systematic review recently summarized the health effects of redlining on African-American health from 12 studies.[670] The authors reported associations with preterm birth, gunshot-related injuries, and multiple health outcomes, and

cancer, asthma, self-rated health, heat-related outcomes, and COVID-19 incidence and mortality.[670]For example, a meta-analysis of three studies found the odds of having preterm birth were significantly higher among women living in redlined areas compared to non-redlined areas.[670] Review of other outcomes revealed that gunshot-related injuries, asthma, heat-related outcomes, and multiple chronic conditions were worse in redlined areas, while associations with cancer varied by cancer type.[670]

Policies

Policies at the federal, state, and local levels can interact to play a critical role in reducing disparities. The policies may broadly address the social determinants of health, specifically targeting education, employment, maternal health, transportation, digital infrastructure, food and nutrition, criminal justice, and health insurance. Below we highlight some of the challenges faced by well-intentioned policies to reduce disparities in healthcare quality and access across the various levels.

Affordable Care Act: Health Insurance Coverage Policies

The Health Exchange

The ACA Health Exchange was a type of health insurance market that was a near-universal federal policy that facilitated access to affordable health insurance coverage for all Americans. The overarching goals of the market were to set federal minimum requirements as to what would be covered by the insurers and that states would implement and enforce these requirements as part of their legal insurance oversight powers.[671] Prior to the ACA, health insurance marketplaces such as the Massachusetts Health Connector, the Utah Health Exchange, and California's Pac Advantage had been state-led.[672] The ACA was an attempt at a national approach to expand access to health care.

Despite the financial support of the federal government, the uptake of the exchange proved to be uneven and, for some, uneventful. There were some states that blocked or delayed the development of their exchanges. The participation in the exchange was largely a reflection of partisan politics where governors that opposed the ACA generally opted for a hands-off approach. Every state and the District of Columbia has a health insurance exchange. Those that are run by the state are generally easier to navigate and offer more resources to their local consumers. They also tend to have greater participation.

Medicaid Expansion

Medicaid Expansion was another provision under the ACA. In 2014, The ACA allowed states to expand their Medicaid programs to cover low-income individuals and families, providing them with access to essential healthcare services. The ACA afforded states the authority to expand Medicaid eligibility to individuals under age 65 in families with incomes below 133 % of the Federal Poverty Level and standardized the rules for determining Medicaid eligibility.[673]

Again, despite the federal government's financial support, the uptake of the expansion proved to be uneven and, for some, uneventful. To date, 40 states and the District of Columbia have

adopted Medicaid expansion, and 10 states have declined federal support to expand Medicaid expansion.[674] The states that have not expanded their Medicaid coverage are largely politically conservative and support the Republican Party in federal elections.[675,676]

Healthy Food Policies

Policies that increase access to healthy and affordable food can improve nutrition and access to healthy foods. Federal nutrition assistance programs such as SNAP or WIC, the National School Lunch and School Breakfast (School Meals) Programs, and the Food Distribution Program on Indian Reservations are all examples of programs that address inequities in access to food and corresponding food insecurity.

Telehealth Policies

Telehealth is an essential strategy for improving access to health care, particularly for those living in rural or remote areas with limited access to local health care. The COVID-19 pandemic laid bare the digital divide.[677] Many of those needing telehealth lacked the infrastructure and resources to access it. The Affordable Connectivity Program (ACP) was an attempt by the federal government to help people connect to broadband internet. The ACP provided a monthly subsidy to offset the cost of internet service for eligible households. rly studies demonstrate unwarranted variations exist in the uptake of the ACP across geographies,[678,679] suggesting community-level factors, e.g., local promotion of awareness of the program play more of a role than the individuals' needs. As of August 2023, 20 million eligible families had participated in the program across all 50 states. In the absence of congressional re-authorization, the program will end in 2024, potentially leaving millions without service.[680]

Summary of Place, People, & Policies

Federal policies aimed at reducing healthcare access and quality disparities have sometimes-required states and local governments to implement the policies. A patchwork of implementation strategies across states resembles partisan politics. The uneven and unequal optimization of the promise of the policies has thwarted the reduction in disparities.

Structural Racism in the Healthcare System

Addressing structural racism has been hindered by historic reluctance to using the word "racism" in mainstream medical publications. Krieger *et al.* reviewed the use of the term "racism" in articles from 1990-2020 in the four leading medical journals (*BMJ*, *JAMA*, *Lancet*, and *NEJM)*, and the American Journal of Public Health.[681] The authors report a dramatic increase in the number of articles that contained the word "racism" in 2020. However, among these four leading medical journals, nearly 90 percent of the articles, including the word "racism," were commentaries, viewpoints, or letters, and only 4-10% were original empirical investigations or review articles with a strong empirical foundation.[681] These findings underscore some progress, i.e., greater willingness to use the term "racism," but more importantly, illustrate the challenge of publishing empirical literature on structural racism, particularly interventional. A scoping review of racism in health care on articles published through 2020 showed that articles documenting the pervasiveness of racism were largely descriptive and atheoretical [682] Thus, while racism is now much more recognized in medical publications, there is a critical gap in publication of research on effective strategies for dismantling structural racism in healthcare.

Key elements of structural racism that have hindered progress towards equal healthcare treatment include healthcare payment and structures, multilevel separate and unequal systems, persistent discrimination and bias in healthcare, and failure by healthcare organizations to assess healthcare and health inequities and commit resources to mitigating them. These factors loosely correspond to the map for structural racism in healthcare published by Furtado *et al*.[683]

Healthcare Insurance, Payment, Structure, and Costs

Health insurance is a necessary but not sufficient condition for achieving health equity. It is both an illustration of structural racism and a SDOH with disparate racial and ethnic impact. The ACA represented a significant step forward in addressing racial and ethnic disparities in coverage, but progress has been hindered by a Supreme Court decision restricting federally authority over federal Medicaid payments and by 10 states failure to expand Medicaid to its qualifying residents, leaving persistent racial, ethnic disparities in coverage.

As noted earlier, inequities in financing different systems for healthcare coverage are powerful examples of structural racism, with more people who are Black and Brown insured through state-operated plans of Medicaid that reimburse the least and often include more restrictive coverage. These structural inequities in payment and coverage are amplified by frequent lapses in Medicaid coverage and by the imposition of state or even county work requirements that further undermine the coverage. A systematic review of Temporary Assistance for Needy Families (TANF), which includes Medicaid work requirements, showed that African Americans entered TANF and stayed on TANF at a higher rates than White individuals and were subject to sanctions more frequently and stringently than White individuals were, suggesting that African Americans may disproportionately experience reduced access to care through sanctioning such as lockout periods.[684] A systematic review concluded that coverage lapses are common and adversely associated with the receipt of cancer care and survival.[685]

Disruptions improved following the ACA in expansion states, and men, racial and ethnic minorities, and those without chronic illnesses experienced the largest improvements in coverage continuity.[686] But many states have rushed to disenroll people from Medicaid once the COVID-19 PHE expired. As of November 1, 2023, more than 10 million people roughly 40% of whom are children were disenrolled from Medicaid insurance, largely for procedural reasons.[687]

The US healthcare remains ridden with high costs that cascade through healthcare with a disproportionate impact on people with less income or insured through lower quality health plans and inequities in receipt of medications. Given large disparities in income and wealth between the Black, and Brown, and White communities, there is disparate impact. Systematic reviews show that enrollment in high deductible plans is associated with lower quality diabetic care,[688] and more generally with lower health care costs due to avoidance of health care, including appropriate and needed care.[689] Enrollment in high deductible plans has been associated with racial disparities in access to care among cancer survivors.[690] Cost is an important contributor to racial and ethnic disparities in receipt and adherence to medications.[691-694] Other barriers to equity in pharmacotherapy include SDOH such as public transportation, geographic access to pharmacies, patient income and wealth, patient beliefs about medications, patient trust and language, and clinician prescribing.[691] A systematic review of Medicare Part D implemented in 2006 showed consistent positive effects on drug use and costs.[695] Other research showed Part D

reduced racial and ethnic disparities.[692] Racial disparities in cost-related non-adherence are smaller in the VA, where costs are much less.[696] Furthermore, interventions help. Receipt of a Medicare Part D comprehensive medication review was associated with reductions in racial and ethnic disparities in adherence to diabetes, hypertension, and hyperlipidemia medications among Medicare beneficiaries aged 65 years and older.[697] Insurance and affordability remain important contributors to racial and ethnic disparities.

Separate and Unequal

As noted earlier, Medicaid pays less than Medicare and much less than commercial insurance contributing to less funding for healthcare for minoritized populations.[38] Legally sanctioned racial segregation in hospitals ended with the Civil Rights Act of 1964,[86] Yet, practices of de-facto racial segregation persist based on insurance and geographic residence. The clustering of Black and Brown patients within less-resourced hospitals contributes to disparities in healthcare and outcomes. Among Black-serving hospitals, after accounting for cases mix and other confounders, mean revenues were $283 lower/patient day, and mean profits were $111/patient day lower at Black-serving hospitals than at other hospitals.[698] Equalizing reimbursement levels would have required $14 billion in additional payments to Black-serving hospitals in 2018, a mean of approximately $26 million per Black-serving hospital.[698]

An analysis of surgical procedures among patients with Medicare showed that a small percentage of hospitals provided a disproportionate amount of surgical care to racial and ethnic minoritized Medicare patients with inferior surgical outcomes, suggesting that ongoing segregation of racial and ethnic minorities within certain hospitals may contribute to surgical disparities.[699] Another study underscored nuances.[700] Patients at hospitals with a more than 50% Black or Hispanic population had a decreased adjusted rate of delayed appendicitis diagnosis compared with hospitals with a less than 25% Black or Hispanic population. Conversely, patients at hospitals with more than 50% of discharges of Medicaid patients had a much higher adjusted rate of delayed diagnosis compared with hospitals with less than 10% of discharges of Medicaid patients, suggesting that diversity of patient population improves care but fewer resources worsen it.[700] Similar effects are seen within Medicare Advantage related to which plans are offered in minoritized communities. Specifically, while racial and ethnic minoritized patients had lower enrollment in higher quality plans (4-4.5 stars) than White patients, this difference decreased significantly after accounting for county-level offerings of higher-rated Medicare Advantage plans.[701]

Nursing home care is expensive and racially segregated.[702] Because Medicaid pays much less than private pay, nursing homes with a higher proportion of patients insured through Medicaid have fewer resources to care for patients. Consequently, Black patients are much more likely than White patients to reside in nursing homes that have serious deficiencies, lower staffing ratios, and greater financial vulnerability.[702] The NHQDR reports on improvement pressure ulcers or 'bed sores' 2016-2019 with persistent Black-White disparities. Other data show that from 2003 to 2008, the prevalence of pressure ulcers among high-risk nursing home residents was higher among Black residents than among White residents, and this disparity is partly related to the site of nursing home care.[703] Between 2005 and 2014, hospitalizations for primary pressure ulcers declined, though racial disparities persisted.[704]

Notably, segregation may occur *within healthcare systems* either through implicit bias or by assigning patients with commercial insurance to faculty and patients with Medicaid or no insurance to "teaching clinics," potentially creating disparities in personal continuity and quality of care.[705-709] This de facto segregation contributes to a "hidden" medical school curriculum based on implicit values that Black and Brown people, particularly those living in poverty do not deserve the same care.[710]

In summary, structural factors, including inequities in healthcare funding and payment for entities serving disproportionately minoritized populations, e.g., Medicaid, the Indian Health Service, federally qualified health centers, and minoritized serving hospitals, are important but under-appreciated drivers of racial and ethnic healthcare disparities.[38,698,711,712]

Racial Discrimination, Dehumanization, and Implicit Bias

National survey data document patient experiences of racial and ethnic discrimination. One in five Black and Hispanic adults report being treated unfairly treatment based on their race or ethnicity when receiving health care for themselves or a family member in the past year.[1] Nearly one in four Hispanic adults and over one in three undocumented Hispanic adults reported that it was very or somewhat difficult to find a doctor who explains this in a way that is easy to understand. Roughly one in ten nonelderly adult women who visited a healthcare provider in the past two years said they experienced discrimination because of their age, gender, race, sexual orientation, religion, etc., during their healthcare visit.[713] A 2020 nationally representative sample of more than 1,000 US Black and Hispanic/Latino households showed that experiencing racism in healthcare is associated with significantly worse quality of healthcare and lower trust in doctors reported by patients.[714] Another national survey found that one in five people (21%) reported they had experienced discrimination in the health care system, and most (72%) of those who had experienced discrimination reported experiencing it more than once, with racial/ethnic discrimination being the most frequently reported type of discrimination.[715]

Experiences of racial discrimination extend to maternity care in the US. Among mothers with children, 20% reported mistreatment while receiving maternity care for their youngest child. Roughly 30% of Black, Hispanic, and multiracial respondents reported mistreatment.[3] Approximately 40% of Black, Hispanic, and multiracial respondents reported discrimination, and nearly half (45%) of all women reported holding back from asking questions or discussing concerns with their provider.[3]

Analysis of medical records notes shows that clinicians use more stigmatizing language to describe patients who are non-Hispanic Black compared to patients who are non-Hispanic White.[716] Black and Hispanic patients were 14% more likely to have home visit notes with judgment language than White patients.[717] Judgment language was associated with less time for a home care visit.[718] Sun *et al*. report that Black patients had two and half times the odds of having at least one negative descriptor in medical notes compared to White patients.[719] Among hospitalized patients, Black, Hispanic, or other race and ethnicity patients were less likely to receive a higher amount of EHR actions compared with White patients.[720] Among patients coming to the emergency department, patients who identified as Black, Hispanic, and other race and ethnicity were assigned less acute emergency severity index scores than non-Hispanic White

patients despite having received more involved physician workups, suggesting some degree of mistriage and implicit bias.[721]

Since the publication of the Report on Unequal Treatment, evidence supporting the role of implicit bias in healthcare has grown. Systematic reviews document the widespread prevalence of implicit bias among healthcare professionals, with potentially adverse patient impacts.[722-724] However, actual implicit bias effects tend to be small,[725] and the impacts on clinical decision-making are mixed and likely dependent on context.[724] One study in which Black and White standardized patient patients who portrayed a patient with advanced cancer pain were randomly assigned to primary care physicians and oncologists.[331]The findings showed that physicians with greater implicit bias provided lower quality care to Black standardized patients than White standardized patients including fewer renewals for an indicated opioid prescription and less patient-centered pain communication but similar routine pain assessment.[331] Notably, these racial disparities were attenuated among standardized patients trained to be activated and ask more questions.[726] Systematic reviews indicate that Black patients consistently experienced poorer communication quality, information-giving, patient participation, and participatory decision-making in general than white patients and communication was improved with racial concordance, that implicit bias conveyed nonverbally adversely impacts communication and outcomes, and minoritized patient experience less empathy during visits.[717,727,728] The mixed findings regarding the impact of implicit bias on clinical decision-making may reflect weaknesses in the use of clinical vignettes,[729] but also contextual factors that affect dehumanization of patients. Implicit bias is most often triggered during brief, rushed encounters, involving new patient particularly in the presence of cognitive overload, stress, and burnout.[385,730,731]

Healthcare can be dehumanizing due to organizational culture, frequent exposure to human suffering, a mechanistic medical model, and healthcare professional burnout.[732-735] When human needs are unmet, work demands exceed capabilities, employees experience a lack of organizational support and employee values conflict with perceived organizational values, rates of burnout increase.[736,737] Burnout, particularly depersonalization, appears to have the most adverse impacts on patient empathy and patient care.[738,739] Notably, burnout is associated with the dehumanization of stigmatized groups and racial bias.[385,740] Burnout and dehumanization appear to contribute to Black deaths by police and likely to disparities in emergency responders.[741-745] A meta-analysis found that implicit racial (Black) bias in pain perception of pain experienced by others was consistently associated with bias in pain treatment recommendations.[746] Moreover, increased dehumanization of people who are Black and decreased inter-racial contact predicted racially biased pain perception and treatment recommendations although the effects were small.[746] These findings suggest that organizational culture and work stress impact burnout, which in turn may contribute to dehumanization and racial bias.

A longitudinal study among non-Black students showed that more frequent and favorable contact with Black people before medical school predicted less bias in residency, independently of more recent contact during medical school.[747] Accounting for participants' previous contact, more favorable interracial contact during medical school further predicted less explicit and less implicit bias during residency.[747] While implicit bias is prevalent, its impact on clinical decision-

making is not univeral as evidenced by nationally representative data from office visits that show selective disparities.[748] Furthermore, differences in the source of care and patient beliefs, e.g. concerns about vaccines, can produce disparities in treatment.[701,749,750]

Implicit bias, racist mental models, and dehumanizing beliefs also impact public policies through voting behavior.[751] Racial bias is transmitted intergenerationally through multiple mechanisms, while exposure to peers of different races can mitigate these effects, particularly during adolescence.[752-756] Implicit inequitable mental models reinforce structural racism and impact healthcare disparities at the level of public policies, organizations, and individuals.[683] This web of complex interactions at multiple levels hinders progress toward racial equity in healthcare and health.[91]

In summary, evidence supports the existence of racial discrimination and implicit racial bias in healthcare. Effects are contextually dependent, There is compelling evidence for racial disparities in the treatment of pain. Dehumanization of people who are Black and/or who are members of stigmatized groups likely contributes to disparities in pain and other treatments.

Impact of Place: States and Territories

State policies contribute to racial and ethnic disparities in healthcare. Examples include expansion of Medicaid, physician workforce policies including number of primary care providers, state support for safety net infrastructure, state public health programs, and investment in community programs, and public tracking of healthcare disparities.

Racial and ethnic disparities in healthcare differ by state.[757]States with the smallest disparities in healthcare, starting with the best, include Massachusetts, Hawaii, the District of Columbia, Rhode Island, New Hampshire, California, Maryland, Connecticut, Virginia, and Pennsylvania.[757] States with the largest disparities starting with the worst performing states include Mississippi, Wyoming, Tennessee, South Carolina, West Virginia, North Dakota, Arkansas, Oklahoma, Alaska, and South Dakota.[757] Notably, these differences are not explained by Medicaid Expansion or state wealth (though many of the lowest-performing states are poorer). Instead, these findings appear to be most closely associated with states' healthcare access and affordability and comparative investment prevention and treatment. Furthermore, in some states, particularly those in the South, as many as one in four state residents have medical debt.[757]

People born in the US territories are US citizens or nationals. However, much of the populations in these territories live in poverty and territorial resources are limited to improve the SODH.[758] This challenge of addressing the healthcare needs of people living in these territories is amplified by key differences in how federal Medicaid payments are structured in these territories compared with states. Federal funding for Medicaid in territories is capped by federal statute and federal matching rates are fixed.[758] In contrast for states, federal Medicaid funding has no cap, and the federal contribution varies based on states' per capita income.[758] Thus, federal law enshrines disparate Medicaid funding within territories relative to states. Consequently, Medicaid benefit coverage and delivery systems vary between territories and states with only Guam offering long-term services, and Guam, American Samoa, and the Northern Mariana Islands providing nearly all Medicaid services through a single public hospital.[758] Puerto Rico is the only territory to

operate a managed care delivery system. However, all the territories have been challenged by low provider reimbursement, provider shortages, poor infrastructure, and restricted access to specialty care and mental health services.[758] Guam, Puerto Rico, and US Virgin Islands have expanded their Medicaid programs under ACA.[758]

Data are scarce regarding the quality of care provided in territories. Puerto Rico is the largest US territory and home to more than 3.2 million Americans with a median household that is less than one-third of the US median household income, and with 42% of people in Puerto Rico living below federal poverty.[759] An analysis of 2011 Medicare Advantage enrollees showed that Hispanic Medicare Advantage enrollees residing in Puerto Rico received worse care compared with Hispanic enrollees in the mainland US for 17 quality measures, with absolute differences in performance rates ranging from 2.2% points for blood pressure control among patients with diabetes to 31.3% points for use of disease-modifying rheumatologic drug therapy.[760] Adjusted differences in quality measures between Hispanic Medicare Advantage enrollees in Puerto Rico and Hispanic Medicare enrollees in the mainland US exceeded 20% points for 3 measures.[760] An analysis of Medicare Advantage data from 2006 to 2019 reported that Medicare Advantage plans in Puerto Rico received lower CMS payments than those in the 50 US states or the District of Columbia, and this gap widened after ACA implementation.[760]

In summary, where a person lives impacts the quality of care they receive, with a disparate impact on minoritized populations. Medicaid funding disparities between US states and territories illustrate the impact of structural racism on healthcare for minoritized populations.

Healthcare Commitment to Healthcare Equity

The concept that healthcare can address racial and ethnic disparities in quality has been promulgated for more than two decades.[761] Yet, healthcare organizations have been slow to adopt meaningful step to promote health equity. Instead, most quality improvement, with notable exceptions, appears to have be "color blind" i.e., these initiatives have typically not examined racial and ethnic disparities in quality performance.[762-766]

Furthermore, hospital's investment to community health is small relative to overall expenses. Zare *et al*. examined the characteristics of non-profit hospitals who offer more community benefits and charity care than value of their tax exemptions and how this relationship changed between 2011 and 2018.[767] They report that on average, non-profit hospitals spent 5.9% of their total expenses on community benefits; 1.3% on charity care; and received 4.3% of total costs in tax exemptions. Furthermore, 38.5% of non-profit hospitals did not provide more community benefit and 86% did not provide more charity care than the value of their tax exemption. Bai *et al.* note that nonprofit hospitals with superior financial performance provided disproportionately *lower* levels of charity care compared to hospitals with worse performance.[768] Nonprofit hospitals don't appear to provide more charity care than for-profit hospitals after controlling for expenses,[769] but do offer more social services.[770] Wen *et al*. linked hospital community benefit data to health outcome data from Area Health Resource Files, the Map the Meal Gap, and to Medicare claims at the county level and found that higher community benefit expenditures were not associated with an improvement in the selected health outcomes at the county level.[771] Compensation of hospital board members was associated with *less* provision of charity care,[772] and increases in hospital profits are not reflected in greater provision of charity care.[770] Zare *et*

al. found that nonprofit hospitals, in states that required community benefit reports, spent a higher percentage of total hospital expenditures on community benefits (9.1%) compared to hospitals in states lacking these requirements (7.2%), with similar association between the percentage of charity care and total hospital expenditures (2.3% and 1.5%).[773] Notably, hospitals using equity as a guiding theme in their community health needs assessment reported significantly greater alignment in terms of access to care, substance use, and social determinants of health.[774] These findings show that hospitals' contributions to community health are primarily limited to tax benefits, but state requirements likely increase these contributions. Potential mandates and financial incentives may be necessary to enhance hospital system alignment with health equity and community benefit.

Medical debt is a type of SDOH with adverse health consequences.[775] Yet, some hospitals, including nonprofit ones, pursue extremely aggressive collection of unpaid bills.[776,777] Awareness of patients of these policies, particularly low-income patients, acts as a powerful deterrent to seeking medical care.[778]

A review of federal lobbying disclosures from the ten highest spending health insurance and healthcare provider organizations and other relevant associations between 2015 and 2019 showed that although five of the organizations reported lobbying on some SDOH issues, including financial strain, employment, food insecurity, and interpersonal safety, none reported lobbying on other issues, such as non-healthcare-related employment, housing instability, transportation, or education.[779]

Commitment to health equity likely reflects leadership. Herrin *et al.* reported that hospitals with greater representation of racial and ethnic minorities in leadership positions had greater commitments to diversity initiatives.[780] Yet, progress in achieving diversity among medical school deans has stalled.[781] Similarly, members of boards of directors on leading hospitals do not represent those being served, much less include health care expertise.[782,783] Based on a national survey, half of the hospital boards (45%-51%) reported having no ethnic minoritized board members across the study period until 2021, when 38% said that they had no ethnic minoritized board members.[784] Almost two-thirds of hospital equity officers reported that limited diversity among staff was an obstacle. More than half agreed that racist beliefs by people in the hospital or health system were obstacles, and more than half also reported that institutional or structural policies intentionally or unintentionally perpetuated racism.[785] These systemic challenges likely reflect leadership commitment to equity, the absence of financial incentives to address inequities in health care, or to address the structural racism that drives these inequities. The Joint Commission issued a requirement effective January 1, 2023, to reduce health care disparities. This is applicable to all organizations in the Joint Commission's ambulatory health care, behavioral health care, human services, critical access hospitals, and hospital accreditation programs.[786] Potentially, this requirement could accelerate progress.

Poor Accommodation for Geography, Language, Health Literacy, Disability and Mistrust

Healthcare is poorly designed to accommodate the needs of diverse populations. The total number of hospital-based emergency departments decreased from 4,500 in 2005 to 4,460 in 2015, including 200 closures, 138 mergers, and 160 new hospital-based emergency departments. The number of hospital admissions and beds did not change much in urban areas but declined in

rural areas.[787] Rates of patients leaving emergency departments before evaluations have increased due to increased wait time.[788] Transportation times are longer for Black patients residing in the rural South.[789] Patients are at higher risk of leaving without being seen when they seek care at hospitals serving a high proportion of low-income and poorly insured patients.[790] Language interpretation is not universally accessible, even in hospitals with worse access reported among for-profit hospitals.[791-793] Only 16 states reimburse providers for interpreter services through Medicaid or the Children's Health Insurance Program incurring additional financial burdens on providers serving people from these programs.[794]

Personal and organizational health literacy practices enable people to exert greater control over their health care. However, strategies to effectively and systematically address health literacy and equity are limited.[795] During the COVID-19 pandemic, most state health departments' website on regarding COVID-19 testing and treatment were not accommodating to people with limited English proficiency and low literacy.[796] Although the proportion of substance abuse treatment facilities offering language services has increased from 2013 (40%) to 2019 (53%), this leaves out nearly half of the population with limited English proficiency.[797] Language access is worse among substance abuse treatment facilities than mental health treatment facilities, with only 69% offering language services, largely through commercial language service vendors.[798] Despite legal requirements, barriers persist to healthcare access among people with disabilities with failure by healthcare organizations to accommodate various impairments.[799-802] Patients' prior experience with racial discrimination in healthcare is associated with greater medical mistrust.[803-805] Medical mistrust hinders healthcare use and is associated with vaccine hesitancy.[806-809] These intersecting factors hinder healthcare access to patients with diverse needs for accommodation.

A Fundamental Misalignment of Healthcare and Societal Goals

Equity and value in healthcare are inextricably intertwined which is why both are included in the NHQDR. Value refers to optimizing desired outcomes relative to costs. The US performs poorly on both aspects of value compared to peer countries. Non-Hispanic White patients have lower life expectancy than their European counterparts,[810] lowering the standard reference for comparison. Furthermore, much of the recent historic narrowing of life expectancy among people who are Black or Brown compared to those who are White has largely been driven by *lower gains* in White life expectancy, minimizing absolute gain for the minoritized population.[811] Conversely, "value" loses meaning if it only applies to more socially advantaged populations. Neither equity nor value is prioritized compared to optimizing service revenue based on organizations' strategies, culture, funding, processes, people, leadership, or systems, resulting in a misalignment between ostensible national goals and actual goals.[812]

When healthcare value is defined exclusively based on the treatment of disease and resulting short-term costs,[81,813] its meaning is further eroded. Health is reduced to a commodity bought and sold on the market.{Pellegrino, 1999 #19001} Most people desire health in terms of well-being, function, adaptability, and capability to interact and care for others.[814] This requires lifelong investment in people beginning early life. In contrast, healthcare adopts a biomedical model that invests in diagnosing and treating diseases.[81] Federal research and the biomedical industry invest heavily in developing silver bullets to cure or control diseases.[815] When a new drug receives FDA approval, it is typically covered by most payers regardless of its incremental value or cost.

In contrast, evidence-based interventions such as community health workers that have been repeatedly proven to improve value and equity are typically not reimbursed.[222]

This fundamental misalignment of goals within US healthcare yields a vicious cycle that undervalues primary prevention and overvalues biomedical treatment of disease based on payment for treating disease. Roughly 90% of healthcare dollars are spent on chronic disease.[12] The status quo is supported by healthcare lobbying that has increased 70% between 2000 and 2020, with pharmaceuticals and health product manufacturers comprising 43% of all current healthcare lobbying spending.[816] In contrast, healthcare organizations report lobbying on some, but not many, important SDOH issues between 2015–2019.[779]

Failing to address the primary causes of chronic disease results in continued growth in burden of chronic disease, increased spending and poorer health. US healthcare freely pays for new FDA-approved drugs and devices of marginal benefit but is loath to invest directly in people themselves or in additional personnel such as community health workers or lifestyle change experts that could improve health equity.[817-819]

The US approach to type-2 diabetes is prototypical of poor value and equity.[820] Type-2 diabetes is both costly and preventable and is the most costly medical condition,[430] with 57% of the costs of diabetic complications spent on treating stroke and coronary heart disease.[821] Notably, 2019 mortality rates for diabetes for African American, American Indian/Alaskan Native, and Native Hawaiian people were double those of non-Hispanic White people, while Hispanic people have a 26% higher rate.[822].

Globally and in the US, obesity is the primary risk factor for Type 2 diabetes, accounting for more than 50% of type-2 diabetes disability-adjusted life years (DALYs) (60% in the US). In terms of contribution to variation in type 2 diabetes DALYs, the largest contributors were obesity and poor diet (25%), environmental and occupational risks (20%), tobacco use (12%), low physical activity (7%), and alcohol use (2%). In a scoping review, Egede *et al.* illustrate how structural racism acts as an upstream social determinant of diabetes impacting behavioral factors and ultimately diabetic health outcomes.[820] No doubt healthcare needs to ensure equitable and affordable access to newer drugs as sodium-glucose co-transporter-2 (SGLT-2) inhibitors and glucagon-like peptide 1 (GLP-1) agonists and devices such as continuous glucose monitors. However, to optimize equity in outcomes, healthcare organizations will need forge new partnership with communities to address policies that prevent diabetes and reduce racial and ethnic disparities in incidence.

Primary Care the Foundation for Equity and Value is Eroding

The National Academies of Sciences, Engineering, and Medicine (NASEM) recognizes that primary care is the foundation for US healthcare and that primary care is in serious trouble.[46] A primary care professional's (PCP) longitudinal, personal relationship between patients is central to promoting patients' health, to guiding patients through healthcare, preventing avoidable hospitalizations, and ultimately, delaying the onset of chronic disease through health promotion and screening.[46,823] Access to primary care promotes healthcare value, equity, and population health. [824-826] For example, PCP visits for patients who are dually eligible for Medicaid and Medicare are associated with reductions in avoidable hospitalization in both rural and urban

areas.[827] PCPs are trained to promote health and deliver acute, chronic, and end-of-life care in the context of a personal relationship. Most importantly, PCPs support patients in shared decision-making and assist them in navigating the healthcare systems, including coordinating care and advocating for them. PCPs are critical to improving racial and ethnic equity in healthcare.

Primary care is in trouble. A systematic review of primary care burnout in the US conducted pre-pandemic reported a prevalence of PCP burnout ranging from 13.5% to 60%.[828] A longitudinal analysis showed primary care has the highest rates of burnout among medical specalities.[829] The primary care practice environment was the most frequent predictor of PCP burnout; primary care physicians were less likely to be burned out and more likely to stay in their current practice if their own values aligned with those of administration and leadership.[828] Clinician burnout often reflects a mismatch between patient needs, time, and team support to perform the task.[46]

Comparatively low reimbursement for primary care coupled with a fee-for-service model creates a fundamental mismatch between the social, behavioral, and chronic care needs of patients and the limited time available by primary care clinicians to address these needs.[830] Privett and Guerrier estimated the time required by PCPs to the US Preventive Services Task Force A and B recommended preventive services across a typical adult patient panel. They estimated delivering only these preventive services, and nothing else would require 8.6 hours per working day, accounting for 131% of available physician time.[831] Others used different methods and have reached the same conclusion that there is not enough time for PCPs to provide high-quality primary care.[832] The mismatch between patients' needs and PCP time is even greater due to the time required for EHR work. A time-motion study in ambulatory care showed physicians spent 27% of their total time on direct clinical face time with patients and 49% of their time on EHR and desk work. When meeting with patients, physicians spent 53% of the time on direct clinical face time and 37.0% on EHR and desk work. An audit study of time logs from the EHR showed primary care clinicians spent 5.9 hours of an 11.4-hour workday in the EHR per weekday, including 4.5 hours during clinic hours and 1.4 hours after clinic hours.[833] Clerical and administrative tasks, including documentation, order entry, billing and coding, and system security, accounted for nearly one-half of the total EHR time. Inbox management accounted for another minute (23.7%).[834] This fundamental mismatch is greater for patients with greater biopsychosocial needs.[830] The current broken system is burning out PCPs and depriving patients of high-value care and undermining a platform for addressing equity.[829,835-837]

Nearly half the physician workforce is 10 years from retirement,[838] and fewer US medical students are choosing primary care. Only 8.1% of US medical students matched in family medicine in 2023.[839] There has been a 50% drop in internal medicine residents planning to enter primary care over the past decade.[840] According to KFF Health News, the percentage of US physicians in adult primary care has been declining for years. It is now at 25%, considered a potential tipping point beyond which many Americans won't be able to find a PCP at all. Access to primary care is much worse for Medicaid and rural regions, where PCPs are often the only source of medical care.[841,842] Saxena *et al* report worrisome trends based on hospital data reflecting Prevention Quality Indicators.[843] The central problem is that compared to other countries, the US invests a lower proportion of healthcare spending on primary care,[46] in part due to the high proportion of specialists to PCPs in the US.

The US healthcare system spends comparatively little on equipping people with the resources, skills, and support to prevent diabetes despite the existence of evidence-based programs.[159] PCPs cannot perform this task alone. They need teams of people with relevant expertise to do this, but funding mechanisms are inadequate. As Formagini *et al.* note, Black and Hispanic patients are less likely than non-Hispanic White individuals to achieve the performance benchmark required for full Diabetes Prevention Program (DPP) reimbursement, thus discouraging providers from delivering DPP to these groups.[159]

The healthcare system does even less to address upstream determinants such as food insecurity, which is associated with unhealthy diets, or promote uptake of family income support programs for patients. Eliminating racial and ethnic disparities in diabetes morbidity and mortality requires shifting more funding to prevention, addressing social and commercial determinants of health, adequately funding evidence-based, culturally adapted lifestyle programs, and ensuring equitable treatment through robust accountability. Doing so would not only reduce the incidence of diabetes but also reduce the onset of many other diseases related to similar lifestyle factors. This will require a major transformation of healthcare along the lines recommended by NASEM in its report on implementing high-quality primary care in the US.[46] Doing so would enable primary care to fulfill its mission, potentially bolstering FQHCs, the major primary care source for poor and underserved patients and improve healthcare equity in the process.

Moral Determinants of Health

Donald Berwick, former Director of the CMS, argues that "a moral determinant of health' is some form of a moral compact, implicit or explicit, needed for the basis of a just society.[844] Berwick goes on: "How do humans invest in their own vitality and longevity? The answer seems illogical. In wealthy nations, science points to social causes, but most economic investments are nowhere near those causes vast expensive repair shops (such as medical centers and emergency services) are hard at work, but minimal facilities are available to prevent the damage."

Berwick's comments point to implicit values and moral judgments embedded in how the US allocates funding both between social programs and healthcare and within healthcare as illustrated by findings in this report. Federal, state, and local governments vary widely in the allocation of funds to address racial and ethnic health and healthcare inequities. These represent moral judgments that impact population health and progress towards the elimination of racial inequities in health and healthcare.

Section 10: Discussion and Conclusions

Summary of Findings

Twenty years after the publication of the report *Unequal Treatment*, national progress has been slow and uneven towards the elimination of racial and ethnic disparities in healthcare, much less the elimination of disparities in health. The NHQDR reflects this poor progress, with some process measures improving and intermediate outcomes either remaining unchanged or even worsening. Racial disparities in intermediate outcomes such as control of blood pressure, blood sugar, and HIV viral load persist. Racial disparities in avoidable hospitalizations persist. Findings from the past twenty years confirm widespread persistent racial and ethnic disparities

across health conditions, health care, and patient ages. These findings are further reinforced by systematic disparities observed among patients with Medicare Advantage where every patient is insured by Medicare and ostensibly receives "managed care."

In the NHQDR, people who are Black show the most disparities. In the past twenty years, Black-White healthcare disparities are as likely to have worsened as to have improved. The NHQDR highlights two minoritized populations where data has been scarce: American Indian/Alaskan Native and Native Hawaiian and Pacific Islander peoples. Small samples and suboptimal data quality hinder the detection of healthcare disparities for these groups although data suggest these groups often receive lower quality care. National mortality data show that all-cause among Americans and Alaskan Native peoples has overtaken that for Black people, largely because of escalating "deaths of despair," i.e., from alcohol, drugs, and suicide. American Indian and Alaskan Native populations have the highest rate of being uninsured[100] and the IHS receives less funding per person than the VA, Medicare, or Medicaid.[711]

Data from Medicare Advantage underscore that even with insurance, American Indian and Alaskan Native peoples have significantly worse healthcare quality than the national average and worse than other minoritized groups. Thomas Sequist in highlighting the health and healthcare needs of American Indians and Alaskan Native population writes:[845] "The US has an important ethical and legal responsibility to support the health and well-being of the American Indian/Alaskan Native population, dating back to the US Constitution and affirmed by the Supreme Court." These findings underscore the gap between these ethical and legal responsibilities and reality.

Unfortunately, the Medicare Advantage report on disparities lacks separate data on Native Hawaiian and Pacific Islander peoples and groups them with Asian patients. In both the NHQDR and in Medicare Advantage reports, Asian patients often have healthcare quality approaching White patients with the notable exception of experience of care (which is typically worse for Asian compared to White patients). A 2021 NIH workgroup noted very limited data on the epidemiology, risk factors, and outcomes for most conditions for the Native Hawaiian and Pacific Islander populations and that most existing data for these groups are not disaggregated by subgroup.[846] The same challenge of disaggregation holds for the Asian and Hispanic subgroups. Medicare Advantage from 2015-2016 showed lower quality care among Hispanic Medicare Advantage enrollees living in Puerto Rico compared to Hispanic enrollees residing in the mainland US likely reflecting the impact of SDOH among people living on the Island coupled with substantively lower Medicaid funding over the course of their lives.

Racial disparities persist despite high economic costs. LaVeist *et al.* estimated the economic burden of racial and ethnic health inequities was in excess of $400 billion and of education-related health inequities exceeded $900 billion.[847] They noted that most of the economic burden was attributable to the poor health of the Black population, but the burden attributable to American Indian or Alaskan Native and Native Hawaiian or Other Pacific Islander populations was disproportionately greater than their share of the population. However, current misalignment of healthcare payments with the goals of equity and value, provides health organizations with little economic incentives to address the economic burden imposed by these disparities.

Structural racism impacts both health and healthcare. Structural racism impacts health through poverty, economic opportunity, adverse SDOH, stigma, marginalization, discrimination, and adverse child experiences, trauma and chronic stress throughout life, and despair and also through the impact of these factors on health behavior through various mechanisms. Commercial determinants of health tend to have a disproportionate impact on people who are minoritized and or low-income. Healthy nutrition and body weight have steadily worsened for most groups, fueling growing prevalence of diabetes particularly among minoritized populations.

Core inequities in the structure of healthcare insurance, payment, and delivery models, coupled with inequities patient-born costs have remained largely unchanged over the past two decades. The ACA funded Medicaid expansion and the establishment of market exchanges, expansion of FQHCs, and removal of patients' costs for preventive care. There is robust evidence that ACA implementation substantively reduced racial and ethnic disparities in insurance coverage, and access and affordability among the racial minority patients near poverty levels. Some of the progress reported in the NHQDR likely reflects those reforms in addition to passive diffusion of evidence and slow improvements from race-blind quality improvement initiatives.

Progress has been hampered by some state's resistance to Medicaid expansions, the persistent disparate impact of SDOH, lack of financial incentives for healthcare organizations to address inequities within healthcare, separate and unequal systems of care at state, territory, insurance, and hospital levels and the continued erosion of the foundation for healthcare, primary care.

The COVID-19 pandemic exposed structural racism including inequities in SDOH that drive health inequities, inequities in access to vaccinations and treatments, and disparate hospitalizations and mortality among Black and Brown patients. These effects were amplified by medical disinformation campaigns that undermined trust in public health and vaccinations. Ironically, rather than uniting the country in a collective response to the worst global pandemic in more than a century, the COVID-19 pandemic was accompanied by a pandemic of ideological polarization. Social programs implemented during the pandemic with the potential to mitigate inequities in SDOH were quickly abandoned.

Eliminating racial and ethnic disparities in health and healthcare will require making health and healthcare equity for all a national priority such that social and healthcare resources are allocated based on the patient needs and in full partnership with minoritized populations. Advancing health and healthcare equity will also require multilevel commitments to dismantling structural racism while rebuilding a healthcare system that ensures equity and value for all people. The growing recognition of the role of structural racism in healthcare inequities and of the need to diversify the healthcare workforce coupled with the willingness of accreditation agencies such as the Joint Commission to hold healthcare organizations accountable for addressing healthcare disparities offers a modicum of hope for progress. At the same time, the megatrends in US society and within US healthcare including worsening political polarization, growing anti-science sentiments, attacks on antiracism, growing corporate consolidation (including healthcare), and corporate political influence at all level of government, erosion of primary care, and a flawed healthcare system could hamper future progress towards health and healthcare equity.

Limitations

The availability of longitudinal data primarily limits these findings. The NHQDR used multiple existing national data, but longitudinal, high-quality data are limited if not non-existent for American Indians and Alaskan Natives, Native Hawaiians, and Pacific Islanders, and the numerous Asian and Hispanic subgroups. Similarly, longitudinal data are lacking on intersectional social disadvantage, e.g., by race/ethnicity and income, sexual minority status, disability, etc.

This review, including data sources used by the NHQDR and the CMS Medicare Advantage report rely on reporting of quality measures. Findings are limited by data quality including misreporting of race and ethnicity, much less various ways "to game" quality performance that overstate genuine improvement.[848-850] Current hospital ranking systems for health equity rely heavily on process measure with uncertain links to outcomes, adopt questionable metrics, and lack consensus for core measures among the different ranking systems.[851]

Last, there is a dearth of empirical data on optimal strategies for addressing health and healthcare disparities, particularly those that address upstream causes. Data are emerging regarding the impact of various policies on health and healthcare equity, but there are limited data that test the impact of policies, if not bundles of policies, on longitudinal changes in health and healthcare equity at different units of analysis, e.g., state, county, city or healthcare organization. Notably, there are large variations in health equity and healthcare equity at the state level, but there are comparatively few studies that tease out the impact of different state policies on the longitudinal health and healthcare disparities, much less on different subgroups, e.g., by race, ethnicity, ages, community disadvantage, etc. There is a notable lack of rigorous evaluation of the impact of the various state Medicaid waivers on health equity and new models of care designed from the ground up.

Conclusions

Progress towards equal healthcare treatment over the past twenty years has been poor and uneven. The recent increase in racial disparities in maternal morbidity and mortality underscore the gravity of health care disparities in the US. Structural racism continues to undermine the health and healthcare of minoritized people. Lack of governmental and healthcare organizational commitment at multiple levels towards racial and ethnic health equity has hindered progress. Notably, poor progress reflects failure to address structural inequities in resources that impact SDOH across life, persistent discrimination, dehumanization, and racial bias, limited anti-racism initiatives, lack of financial incentives to promote healthcare equity, erosion of primary care, and little change in the basic structure of the US healthcare system that delivers comparatively less value and equity. All likely contribute to lackluster progress over the past twenty years.

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