REPORT

US COUNTY-LEVEL HEALTH DISPARITIES: 2000–2019

INSTITUTE FOR HEALTH METRICS AND EVALUATION
UNIVERSITY OF WASHINGTON

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This analysis was conducted in close collaboration with our funders from the National Institute on Minority Health and Health Disparities; National Heart, Lung, and Blood Institute; National Cancer Institute; National Institute on Aging; National Institute of Arthritis and Musculoskeletal and Skin Diseases; Office of Disease Prevention; and Office of Behavioral and Social Science Research, US National Institutes of Health. For more data related to US life expectancy, please visit https://vizhub.healthdata.org/subnational/usa. For a detailed explanation of the methods used to generate the estimates used in this report, please visit the related research article published in *The Lancet*: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00876-5/fulltext.

CITATION: Institute for Health Metrics and Evaluation (IHME). US County-Level Health Disparities: 2000–2019. Seattle, WA: IHME, 2022.

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Published October 2022.

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Acronyms

AIAN	non-Latino and non-Hispanic American Indian or Alaska Native
BRFSS	Behavioral Risk Factor Surveillance System
DALYs	disability-adjusted life years
GBD	Global Burden of Diseases, Injuries, and Risk Factors Study
HALE	healthy life expectancy
NCHS	US National Center for Health Statistics
NHPI	Native Hawaiian and Pacific Islander
NIH	National Institutes of Health
NVSS	US National Vital Statistics System
OMB	Office of Management and Budget
SES	socioeconomic status
YLDs	years lived with disability
YLLs	years of life lost

Executive summary

In the United States, health disparities among race and ethnicity groups and by socioeconomic status are widespread and persistent. For instance, a Black man in a Louisiana county may not face the same health issues or experience the same life expectancy as another Black man in a county in Illinois. Detailed local-level data, beyond the national numbers, are necessary for researchers and for decision-makers to understand the scope and complexity of the health inequities across the country. These data are also important for clinical and public health practice and research.

IHME produced, for the first time, county-level estimates of life expectancy by five race and ethnicity groups and by sex over a 20-year time period. Modeling both geographically and by race and ethnicity offers granular insight into the progress—or lack thereof—in people's longevity over the first two decades of the 21st century.

IHME's life expectancy estimates represent the initial offering of an ongoing series of US county-level analyses by race and ethnicity. By revealing the large geographic variation within and across race and ethnicity groups, these findings allow decision-makers to develop more tailored, nuanced policies so that everyone can live healthy and full lives.

This report highlights the following:

- Life expectancy overall in the US improved by 2.3 years between 2000 and 2019, but by race and ethnicity group, national life expectancy improvements ranged from 0 years for the American Indian and Alaska Native (AIAN) population to 3.9 years for the Black population.
- Within each race and ethnicity group, life expectancy varied widely at the county level. For instance, life expectancy for the Latino population in 2019 ranged from 71.3 years in Huerfano County, Colorado, to 94.9 years in the Aleutians West Census Area, Alaska.
- From 2000 to 2019, 88% of counties experienced an increase in life expectancy. At least 75% of counties saw increases for the Asian, White, and Latino populations. The same was true for Black populations, where the largest increases in life expectancy were found scattered across the southern- and northern-most regions of the East Coast. While estimated life expectancy for the AIAN population increased in roughly 38% of counties, with counties in northern Georgia and southern Arizona seeing larger improvements, estimates declined for the AIAN population in nearly 62% of counties, with concentrations of the poorest outcomes scattered throughout California, Oklahoma, and the Northern Plains states.
- This analysis covering the two decades preceding the COVID-19 pandemic demonstrates the pressing need to reduce, and ultimately eliminate, racial and ethnic health disparities.
- Looking forward, the next US county-level analyses in production include generating mortality, years of life lost (YLLs), incidence, prevalence, years lived with disability (YLDs), and disability-adjusted life years (DALYs) estimates for select diseases for each year, county, sex, and age, by race and ethnicity or by education level.

Introduction

Background

When it comes to life expectancy and health care outcomes, the US lags behind other high-income countries.[1] This can be attributed in part to challenges the US faces in reducing health disparities, which vary widely by geographic location, race and ethnicity, and socioeconomic status (SES). On a granular level within the US, IHME previously reported a more than 20-year range in life expectancy[2] among US counties and showed that many US counties stagnated or declined in their life expectancy trends.

In this report, we present novel county-level life expectancy estimates stratified by race and ethnicity and by sex from 2000 to 2019, prior to the COVID-19 pandemic. Notably, this analysis is the first to produce county-level time-series estimates for the American Indian and Alaska Native (AIAN) and Asian populations and estimates at the county level corrected for misclassification of racial and ethnic identity on death certificates. These are also the initial findings of a larger, ongoing project to produce county-level estimates of mortality, incidence, prevalence, and morbidity from leading causes of disease, injury, and risk factors by age, sex, race and ethnicity, and SES for all US counties.

Scale of the project

The IHME team devoted great time and effort to produce these estimates, and we took a methodical approach to tackle the enormity and complexity of the task at hand. First, we conducted a landscape assessment of available data sources and published studies, cataloged the data sources for posterity, then extracted and transformed data as appropriate for our new analysis.

Second, we systematically accounted for differences in data sources and biases in several ways, such as accounting for how physicians have changed the way they record certain causes of death on death certificates over time and redistributing "garbage codes"—codes for underlying causes of death that are vague or implausible on death certificates—to their likely true underlying cause.

As mentioned, the life expectancy estimates are but one portion of a larger, intricate project of modeling US county-level estimates for a variety of health outcomes. Several analyses are underway to accomplish the project objectives. For one, researchers are identifying the key SES indicators (such as educational attainment, occupational prestige, and household income) to expand to county-level estimations for all-cause mortality and cause-specific mortality, stratified by race and ethnicity and separately stratified by SES.

The project also aims to estimate at least four other summary measures of health at the US county level by race and ethnicity and SES. Researchers are hard at work computing years of life lost (YLLs, or years lost due to premature mortality), years lived with disability (YLDs, or years lived in less than full health), disability-adjusted life years (DALYs, or the sum of YLLs and YLDs), and healthy life expectancy (HALE, or a measure of life expectancy that takes into account mortality and nonfatal outcomes). We are also estimating prevalence and incidence of select diseases; exposure to risks like high fasting plasma glucose, high systolic blood pressure, and high body mass index; and the burden of disease attributable to those risk factors. Due to the increased scale and dimensions of results for this project, researchers must modify key components of the existing computational framework to produce these summary metrics at the county level. The challenges we encountered regarding computing power and small numbers in county-level estimation are discussed in greater detail in the Challenges encountered section of this report.

As demonstrated, the scale of this project cannot be understated. The endeavor is made possible through a strong collaborative effort between the multi-institute working group consisting of IHME; National Institute on Minority Health and Health Disparities; National Heart, Lung, and Blood Institute; National Cancer Institute; National Institute on Aging; National Institute of Arthritis and Musculoskeletal and Skin Diseases; Office of Disease Prevention; and Office of Behavioral and Social Sciences Research. The working group shares a strong desire to improve access to existing data resources, strengthen and expand existing analytic strategies, and present data that inform policy decisions and change to improve health equity for populations who face systemic racism, marginalization, and related health disparities.

Methods

This section briefly outlines the groupings for county and race and ethnicity and the approach taken to estimate life expectancy.

County

We refer to the 3,110 geographic areas studied as counties. In some cases, these are combined county units since several county boundaries shifted between 2000 and 2019. To create these combined county units, we used a previously developed system[3] of mapping counties to temporally stable geographic units.

Race and ethnicity

Based on the standards issued by the Office of Management and Budget (OMB) in 1977, we combined race and Latino or Hispanic ethnicity into a single categorization (race and ethnicity group) with five mutually exclusive groups:

- non-Latino and non-Hispanic American Indian or Alaska Native (AIAN)
- non-Latino and non-Hispanic Asian, including Native Hawaiian and Pacific Islander (Asian)
- non-Latino and non-Hispanic Black (Black)
- Latino or Hispanic (Latino)
- non-Latino and non-Hispanic White (White)

We were unable to produce separate estimates for the Native Hawaiian and Pacific Islander (NHPI) population and Asian population for several reasons. While the OMB updated reporting standards in 1997 to require that federal data collection systems provide separate Asian and NHPI categories, and to allow individuals to identify as two or more races, these updates were not implemented on death certificates in all states until 2017. Secondly, death certificate data before 2011 used a combined "Other Asian and Pacific Islander" residual category, making disaggregation into separate Asian and NHPI groups difficult.

Further, estimates of misclassification of race and ethnicity on death certificates are currently only available using the older 1977 OMB categorization.[4] Race and ethnicity misclassification ratios, defined as the ratio of deaths among individuals of a particular race or ethnicity group as indicated by self-report to deaths among individuals of a particular race or ethnicity group as indicated on death certificates, constituted a key component of our statistical analysis. The Asian population in the US — both nationally and in most counties—is many times larger than the NHPI population. Estimates for the combined group largely reflect the experience of the Asian population while concealing the

experience of the NHPI population. We therefore attribute the estimates for this combined group to the Asian population, to avoid giving the impression that these same outcomes apply to the NHPI population.

It is an objective of this group to conduct analyses that disaggregate health outcomes for the Asian and NHPI populations as data become available and accumulate over time, including accurate data on misclassification of race and ethnicity.

Estimating life expectancy

For this analysis, we used mortality data and population estimates—broken down by age group, sex, race and ethnicity group, and year – from the US National Vital Statistics System (NVSS) and the US National Center for Health Statistics (NCHS), respectively. We also incorporated data extracted from various sources on post-secondary education, income, poverty, nativity, and population density as covariates in the statistical models.

We used these data in a three-stage statistical analysis. First, we used small area estimation models to estimate mortality rates by county, race and ethnicity group, sex, age, and year, using the race and ethnicity group reported on death certificates. Second, we adjusted these mortality rates by applying the race and ethnicity misclassification ratios. Third, we used standard demographic techniques and methods to generate life expectancy estimates.

As a final step, we suppressed, or "masked," the life expectancy estimates in two instances: in every year when the mean annual population for a race or ethnicity in a county was less than 1,000 and for any individual year in which the uncertainty interval was wider than 10 years. Further details on the statistical models are found in the appendix of the article "Life expectancy by county, race, and ethnicity in the USA, 2000–19: a systematic analysis of health disparities," published in *The Lancet* in 2022.

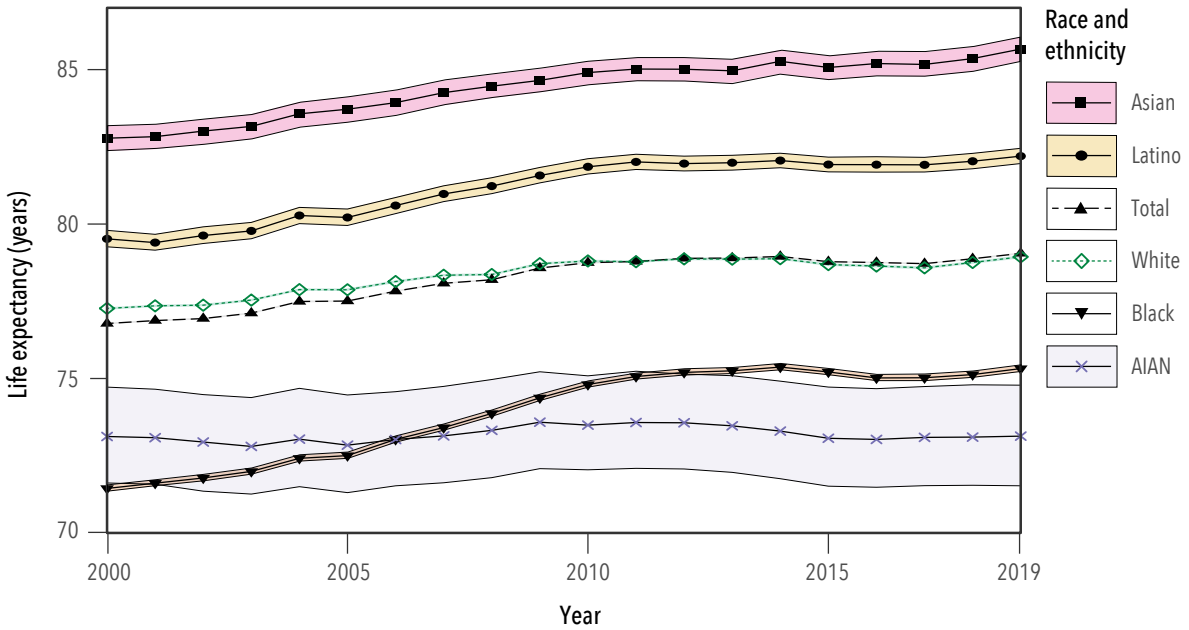
Initial findings

National trends

Overall life expectancy in the US improved from 76.8 years (95% uncertainty interval 76.8–76.8) to 79.1 years (79.0–79.1) between 2000 and 2019, with the Asian population having the longest life expectancy among all race and ethnicity groups for the whole time period. However, as shown in Figure 1, the overall 2.3-year increase (2.2–2.3) in nationwide life expectancy obscures unsettling trends over time and among the five race and ethnicity groups. Of greatest concern, there was no change in life expectancy for the AIAN population, stagnating at a life expectancy of 73.1 years (71.5–74.8) in 2019. The other four race and ethnicity groups experienced gains in life expectancy, led by a 3.9-year increase (3.8–4.0) for the Black population, followed by a 2.9-year increase (2.7–3.0) for the Asian population, a 2.7-year increase (2.6–2.8) for the Latino population, and a 1.7-year increase (1.6–1.7) for the White population. However, most of the growth in life expectancy for these four race and ethnicity groups occurred prior to 2010 – none of the groups experienced an improvement in life expectancy greater than one year from 2010 to 2019. Notably, from 2000 to 2019, the gap widened between the race and ethnicity groups with the lowest and highest life expectancies, swelling from 11.3 years (10.9–11.8) between the Black and Asian populations in 2000 to 12.5 years (10.8–14.1) between the AIAN and Asian populations in 2019.

FIGURE 1

ESTIMATED LIFE EXPECTANCY AT BIRTH BY YEAR AND RACE AND ETHNICITY GROUP, 2000–2019



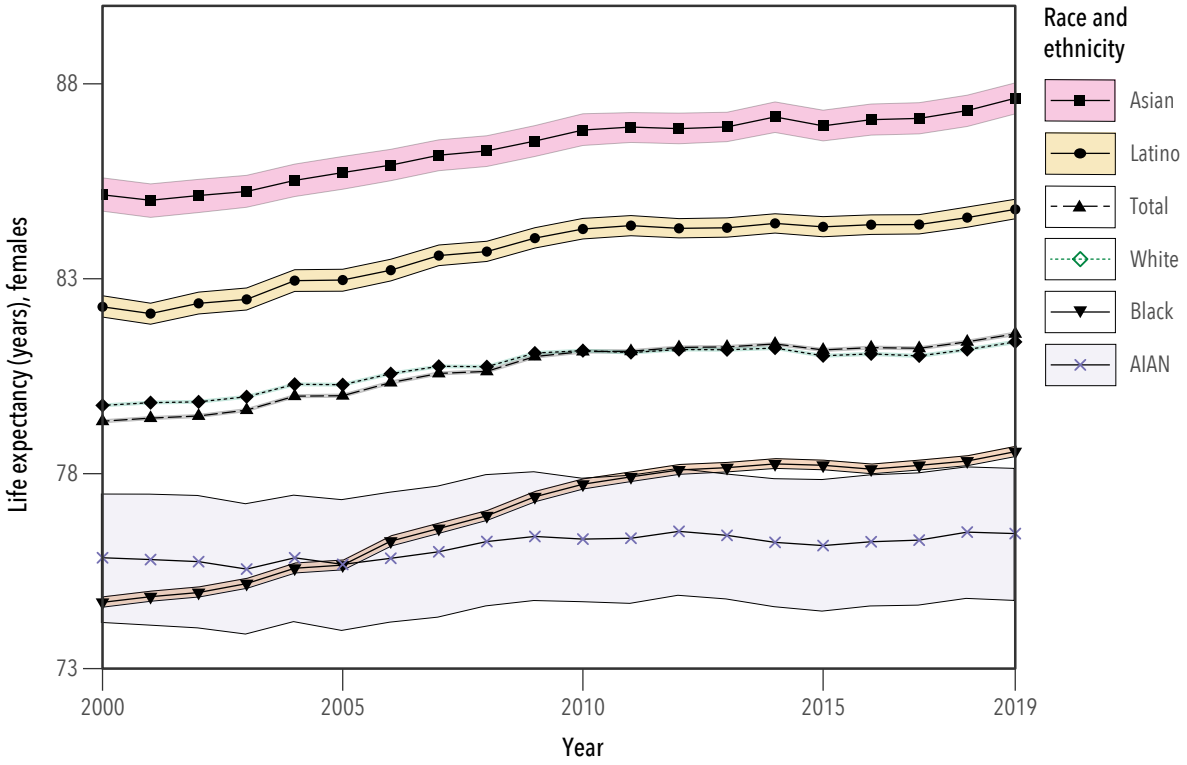
We also compared the life expectancies of the four marginalized race and ethnicity groups with that of the White population. This is not to imply that the White population is the "default" in the US—it constitutes 61% of the total US population, making it the majority group in the country and in most counties. Since the life expectancy of the AIAN population largely did not change over the 20-year period, the AIAN population's life expectancy disadvantage compared to the White population grew by 1.7 years (1.3–2.0).

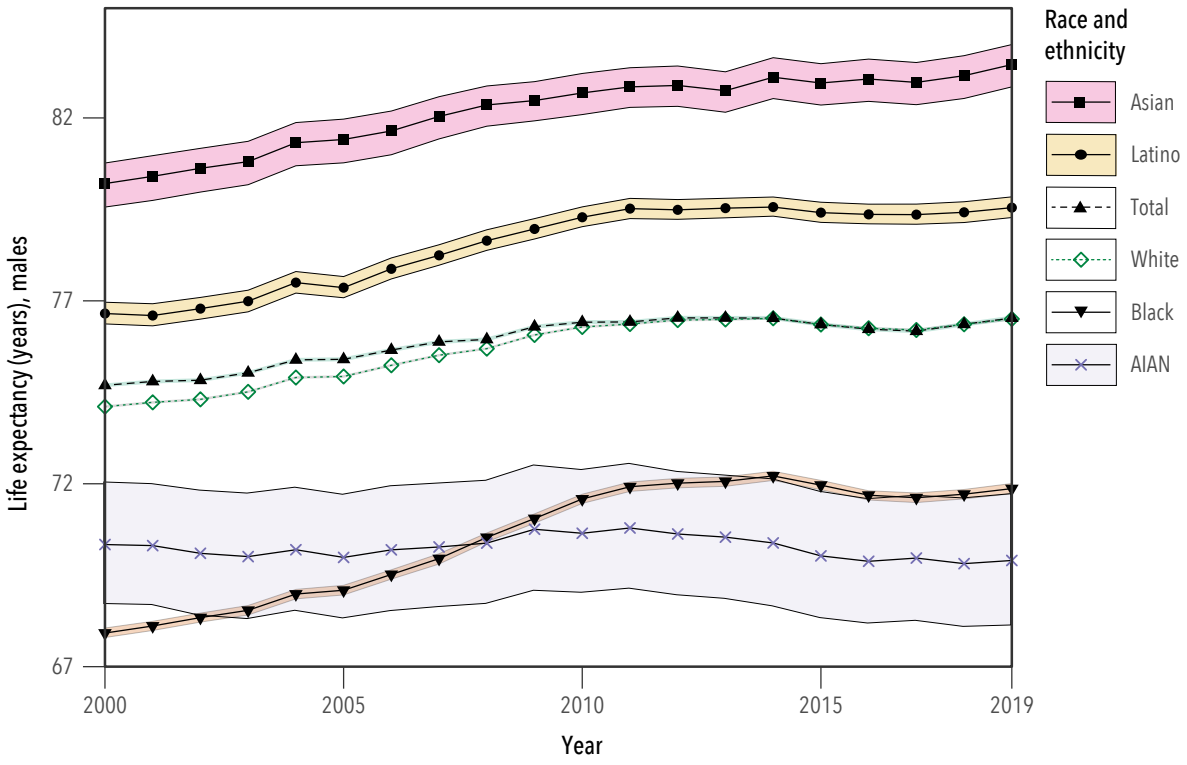
The Black population remained at a substantial life expectancy disadvantage in 2019, but the group narrowed the gap by 2.2 years (2.1–2.3) over the 20-year period. The Asian and Latino populations had higher life expectancies than the White population in 2000 and increased their life expectancy advantages by 1.2 (1.1–1.4) and 1.0 years (0.9–1.1), respectively, by 2019. These changes were due to the White population making more moderate life expectancy gains compared to the other three groups.

If we break down the national trends even further by sex, the trends over time largely follow those of the race and ethnicity groups overall. However, it becomes readily apparent that females of all race and ethnicity groups have higher life expectancies than males. By 2019, the life expectancy of females ranged from 76.5 years (74.8–78.1) for AIAN females to 87.6 (87.2–88.0) for Asian females, whereas the life expectancy of males ranged from 69.9 (68.1–71.7) for AIAN males to 83.5 (82.9–84.0) for Asian males.

FIGURE 2

ESTIMATED LIFE EXPECTANCY AT BIRTH BY YEAR, RACE AND ETHNICITY GROUP, AND SEX, 2000–2019





County-level estimates

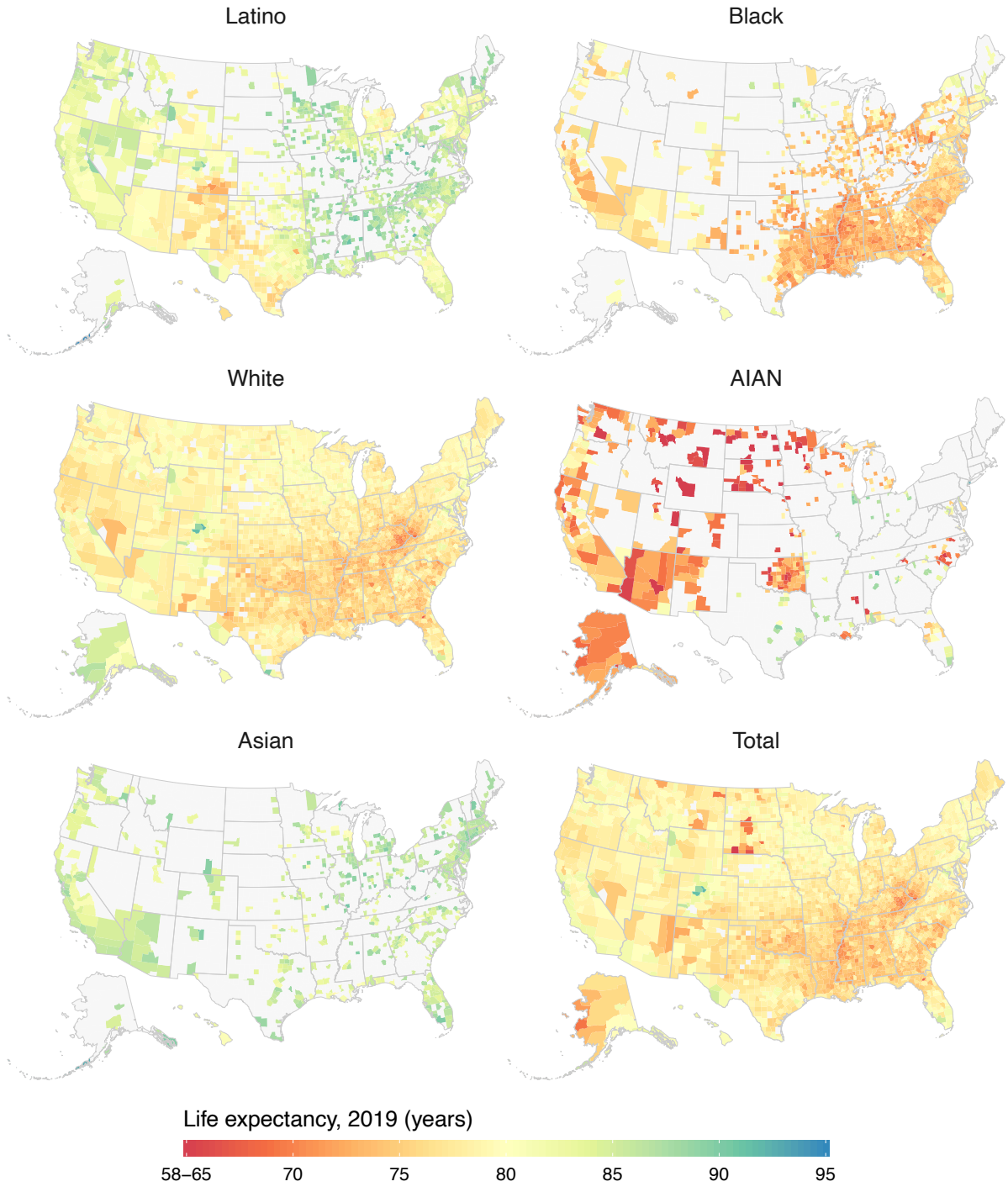
2019 estimates

Our analysis went beyond the national-level trends by producing estimates at the county level. Figure 3 illustrates the considerable variation in life expectancy at the county level in 2019, the final year of our analysis. For all race and ethnicity groups and males and females combined, estimated life expectancy in 2019 among counties with unmasked estimates ranged from 64.5 years (63.4–65.7) in Oglala Lakota County, South Dakota, to 91.7 years (90.1–93.8) in Summit County, Colorado. Within and across each of the race and ethnicity groups, there was also quite a wide range in life expectancy.

- Life expectancy for the Latino population ranged from 71.3 years (69.7–73.0) in Huerfano County, Colorado, to 94.9 years (86.4–96.1) in the Aleutians West Census Area, Alaska.
- Life expectancy for the Black population ranged from 66.5 years (65.2–67.7) in Martinsville City, Virginia, to 88.8 years (84.6–93.3) in Kandiyohi County, Minnesota.
- Life expectancy for the White population ranged from 67.4 years (66.1–68.7) in Petersburg City, Virginia, to 91.9 years (90.2–94.1) in Summit County, Colorado.
- Life expectancy for the AIAN population ranged from 58.6 years (56.5–60.9) in Neshoba County, Mississippi, to 93.3 years (89.2–94.7) in Queens County, New York.
- Life expectancy for the Asian population ranged from 78.5 years (76.6–80.4) in Washington County, Arkansas, to 92.7 years (87.3–93.7) in the Aleutians West Census Area, Alaska.

FIGURE 3

ESTIMATED COUNTY-LEVEL LIFE EXPECTANCY AT BIRTH BY RACE AND ETHNICITY GROUP, 2019



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https://ghdx.healthdata.org/record/ihme-data/united-states-life-expectancy-by-county-race-ethnicity-2000-2019

The results are striking when the county-level estimates are stratified even further by sex. Figures 4 and 5 show that female life expectancy in 2019 was generally higher than the male life expectancy in the same county. For instance, a Black female in Ingham County, Michigan, had an estimated life expectancy of 76.9 years (75.7–78.0), which was 5.6 years longer than a Black male also living in Ingham County (71.2 years [70.0–72.6]).

FIGURE 4

ESTIMATED COUNTY-LEVEL LIFE EXPECTANCY AT BIRTH BY RACE AND ETHNICITY GROUP, FEMALES, 2019

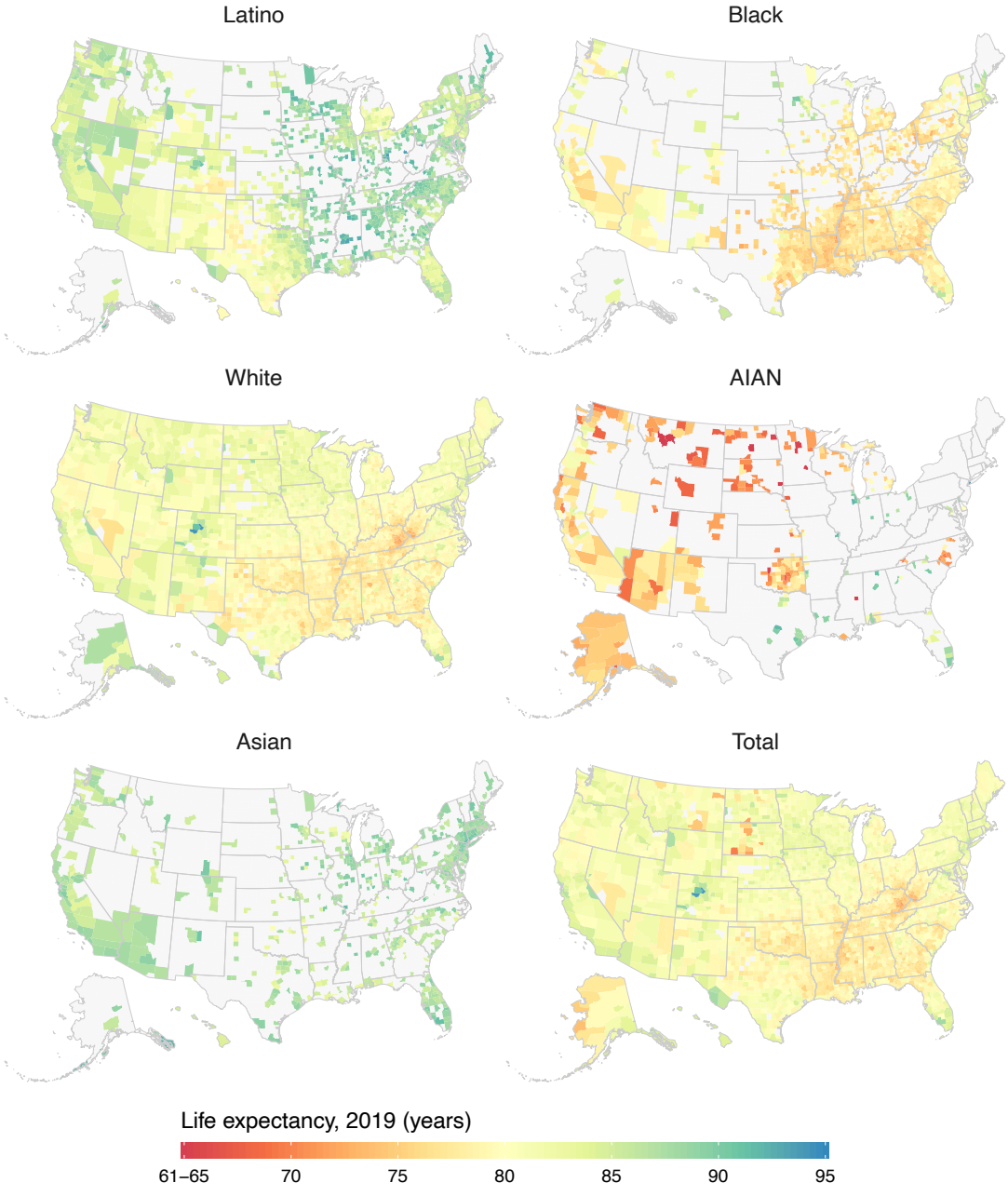

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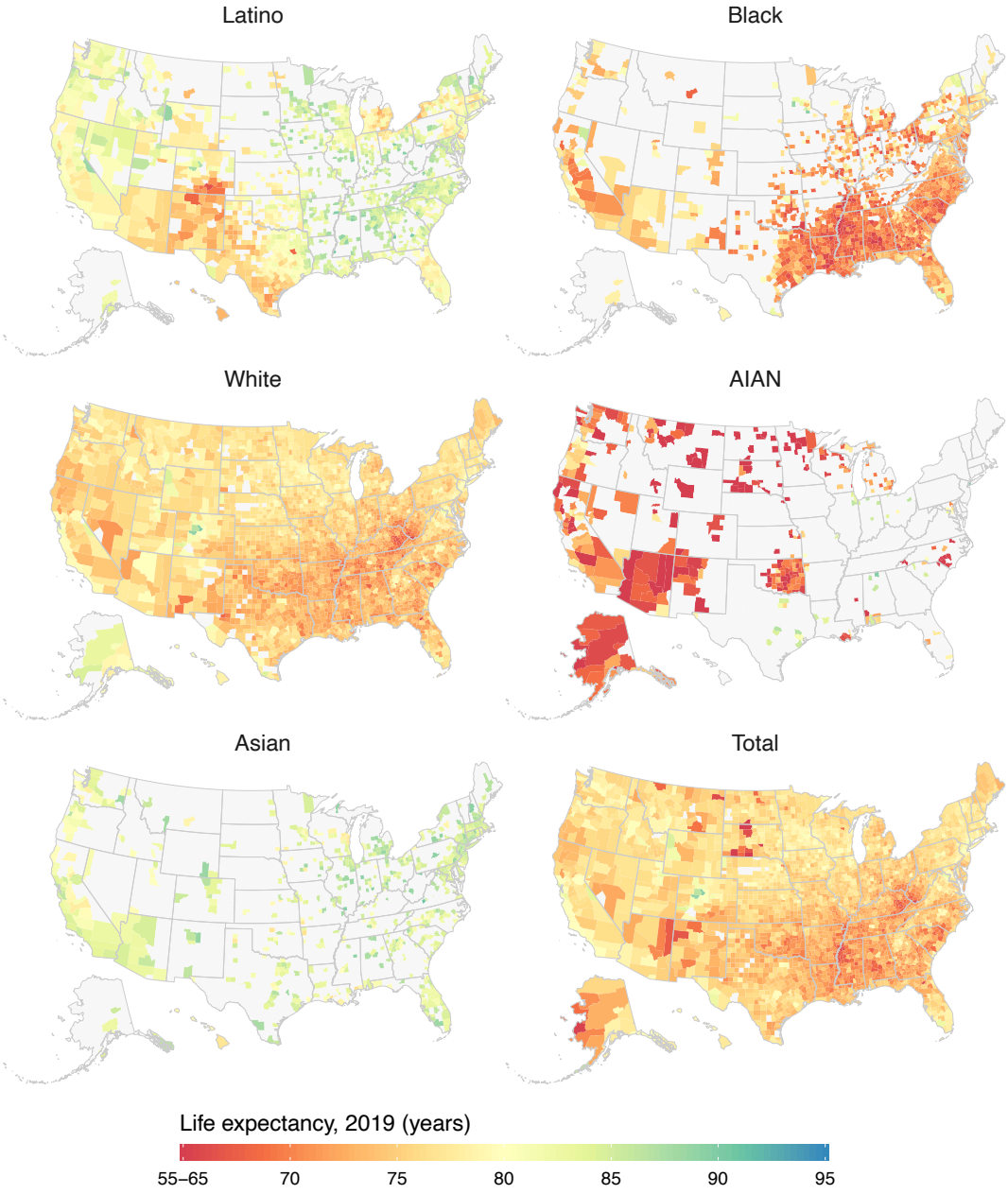
FIGURE 5

ESTIMATED COUNTY-LEVEL LIFE EXPECTANCY AT BIRTH BY RACE AND ETHNICITY GROUP, MALES, 2019



We also note that the counties with the highest life expectancies by race and ethnicity are not often heavily populated with people from that race and ethnicity group. Table 1 displays the 10 largest counties by absolute population for the five race and ethnicity groups in 2019 and the life expectancy of each. Los Angeles County, California, had the largest populations for three of the five race and ethnicity groups. In Los Angeles County, the Asian population had an estimated life expectancy of 86.1 years (85.6–86.4), the

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Latino population had an estimated life expectancy of 83.4 years (83.1–83.7), and the White population had an estimated life expectancy of 81.3 years (81.2–81.5), all of which were at least six years less than the longest life expectancy of each of the three race and ethnicity groups.

TABLE 1

TOP 10 LARGEST COUNTIES BY ABSOLUTE POPULATION FOR EACH RACE AND ETHNICITY GROUP, 2019

	AIAN	Asian	Black	Latino	White
1	Maricopa County, Arizona Population: 79,612 Life expectancy: 72.6 (70.3–74.9)	Los Angeles County, California Population: 1,559,306 Life expectancy: 86.1 (85.6–86.4)	Cook County, Illinois Population: 1,223,186 Life expectancy: 73.3 (73–73.6)	Los Angeles County, California Population: 4,866,362 Life expectancy: 83.4 (83.1–83.7)	Los Angeles County, California Population: 2,718,100 Life expectancy: 81.3 (81.2–81.5)
2	McKinley County, New Mexico Population: 54,256 Life expectancy: 70.4 (69.5–71.4)	Santa Clara County, California Population: 763,174 Life expectancy: 88.0 (87.6–88.3)	Harris County, Texas Population: 896,195 Life expectancy: 74.5 (74.2–74.8)	Harris County, Texas Population: 2,046,212 Life expectancy: 82.8 (82.4–83.1)	Maricopa County, Arizona Population: 2,433,481 Life expectancy: 80.2 (80.0–80.4)
3	Robeson County, North Carolina Population: 53,076 Life expectancy: 68.1 (66.7–69.5)	Orange County, California Population: 707,407 Life expectancy: 86.6 (86.2–87)	Los Angeles County, California Population: 841,027 Life expectancy: 75.8 (75.4–76.1)	Dade County, Miami–Dade County, Florida Population: 1,874,814 Life expectancy: 82.7 (82.5–82.9)	Cook County, Illinois Population: 2,225,416 Life expectancy: 81.5 (81.3–81.7)
4	Apache County, Arizona Population: 51,814 Life expectancy: 70.7 (69.9–71.6)	Honolulu County, Hawaii Population: 653,005 Life expectancy: 82.4 (82.0–82.8)	Kings County, New York Population: 809,663 Life expectancy: 80.9 (80.6–81.3)	Maricopa County, Arizona Population: 1,381,924 Life expectancy: 80.1 (79.7–80.5)	Adams County, Arapahoe County, Boulder County, Broomfield County, Denver County, Jefferson County, Weld County, Colorado Population: 2,027,222 Life expectancy: 80.6 (80.4–80.9)
5	San Juan County, New Mexico Population: 49,734 Life expectancy: 72.2 (70.8–73.7)	Queens County, New York Population: 640,218 Life expectancy: 86.6 (85.9–87.2)	Montgomery County, Prince George's County, Maryland Population: 791,258 Life expectancy: 79.4 (79.1–79.8)	Cook County, Illinois Population: 1,338,799 Life expectancy: 84.3 (83.6–85)	San Diego County, California Population: 1,555,446 Life expectancy: 81.6 (81.4–81.7)
6	Navajo County, Arizona Population: 48,138 Life expectancy: 68.9 (67.6–70.2)	Alameda County, California Population: 563,403 Life expectancy: 87.1 (86.8–87.5)	Wayne County, Michigan Population: 691,683 Life expectancy: 71.8 (71.5–72.2)	Riverside County, California Population: 1,231,509 Life expectancy: 82.7 (82.3–83)	Harris County, Texas Population: 1,380,851 Life expectancy: 79.2 (79.0–79.4)
7	Tulsa County, Oklahoma Population: 44,644 Life expectancy: 71.9 (69.7–73.9)	King County, Washington Population: 476,029 Life expectancy: 86.0 (85.5–86.5)	Philadelphia County, Pennsylvania Population: 669,986 Life expectancy: 74.2 (73.8–74.5)	Bexar County, Texas Population: 1,207,878 Life expectancy: 78.8 (78.5–79)	King County, Washington Population: 1,358,528 Life expectancy: 82.0 (81.7–82.2)
8	Coconino County, Arizona Population: 37,139 Life expectancy: 72.4 (71.0–74.1)	San Diego County, California Population: 441,670 Life expectancy: 86.0 (85.4–86.5)	Dallas County, Texas Population: 604,325 Life expectancy: 74.5 (74.2–74.8)	San Bernardino County, California Population: 1,182,203 Life expectancy: 81.0 (80.7–81.4)	Orange County, California Population: 1,313,421 Life expectancy: 81.9 (81.8–82.1)
9	Bernalillo County, New Mexico Population: 30,814 Life expectancy: 72.9 (70.4–75.4)	Cook County, Illinois Population: 419,605 Life expectancy: 86.6 (85.5–87.6)	Broward County, Florida Population: 565,343 Life expectancy: 80.0 (79.6–80.4)	San Diego County, California Population: 1,135,034 Life expectancy: 83.2 (82.9–83.6)	Middlesex County, Massachusetts Population: 1,185,241 Life expectancy: 81.5 (81.3–81.7)
10	Oklahoma County, Oklahoma Population: 28,468 Life expectancy: 71.9 (69.4–74.5)	Harris County, Texas Population: 347,023 Life expectancy: 84.5 (83.6–85.5)	Shelby County, Tennessee Population: 513,371 Life expectancy: 72.7 (72.4–73.1)	Orange County, California Population: 1,077,508 Life expectancy: 84.0 (83.6–84.4)	Suffolk County, New York Population: 1,027,743 Life expectancy: 80.7 (80.5–80.9)

We refer to the 3,110 geographic areas studied as counties. In some cases, these are combined county units since several county boundaries have shifted over time.

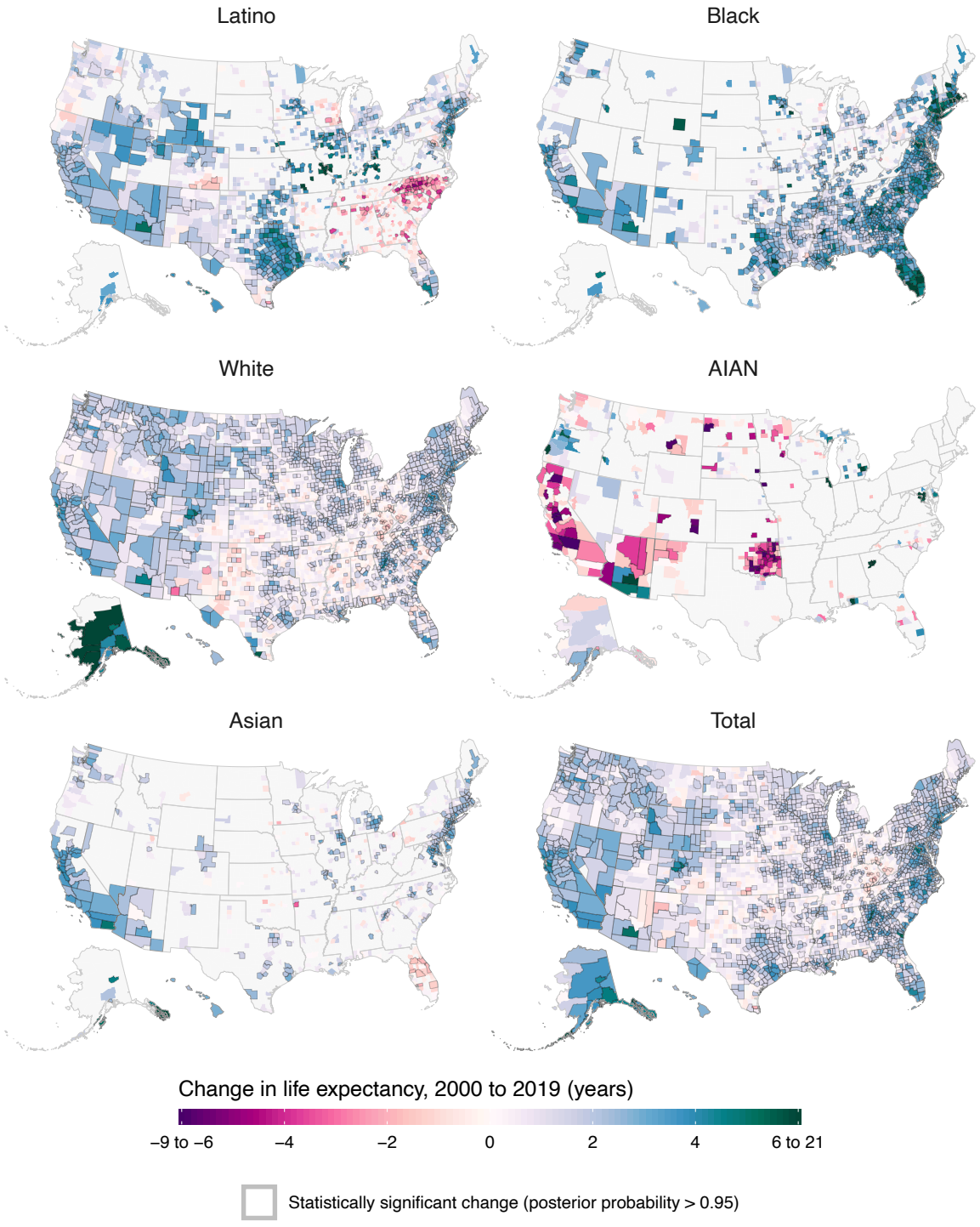
County trends

88% of the 3,079 counties that had unmasked estimates in both 2000 and 2019 experienced an increase in life expectancy from 2000 to 2019. Figure 6 shows that by race and ethnicity group, the Black population experienced an increase in life expectancy for nearly all counties with unmasked estimates. Black people in Bristol County, Massachusetts, experienced the greatest increase at 9.0 years, from 69.4 years (68.5–70.4) in 2000 to 78.4 years (77.5–79.4) in 2019. Smaller majorities of counties also saw increases for the Asian, White, and Latino populations: 84.7% of 667 counties had increases for the Asian population, 81.5% of 3,049 counties had increases for the White population, and 76.7% of 1,474 counties had increases for the Latino population. As for the AIAN population, it experienced a 20.5-year life expectancy gain, from 58.5 years (54.5–62.1) in 2000 to 79.0 (75.1–83.3) in 2019 in Gwinnett County, Georgia, but estimated life expectancy declined for the AIAN population in 61.8% of 359 counties.

For counties that did experience gains, these followed the national-level trends where most increases were accumulated before 2010—only 40.1% of 3,079 counties experienced an increase from 2010 to 2019. This trend of smaller gains, or declines, was also observed in each race and ethnicity group.

FIGURE 6

ABSOLUTE CHANGE IN ESTIMATED COUNTY-LEVEL LIFE EXPECTANCY AT BIRTH BY RACE AND ETHNICITY GROUP, 2000–2019



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Differences in life expectancy relative to the White population

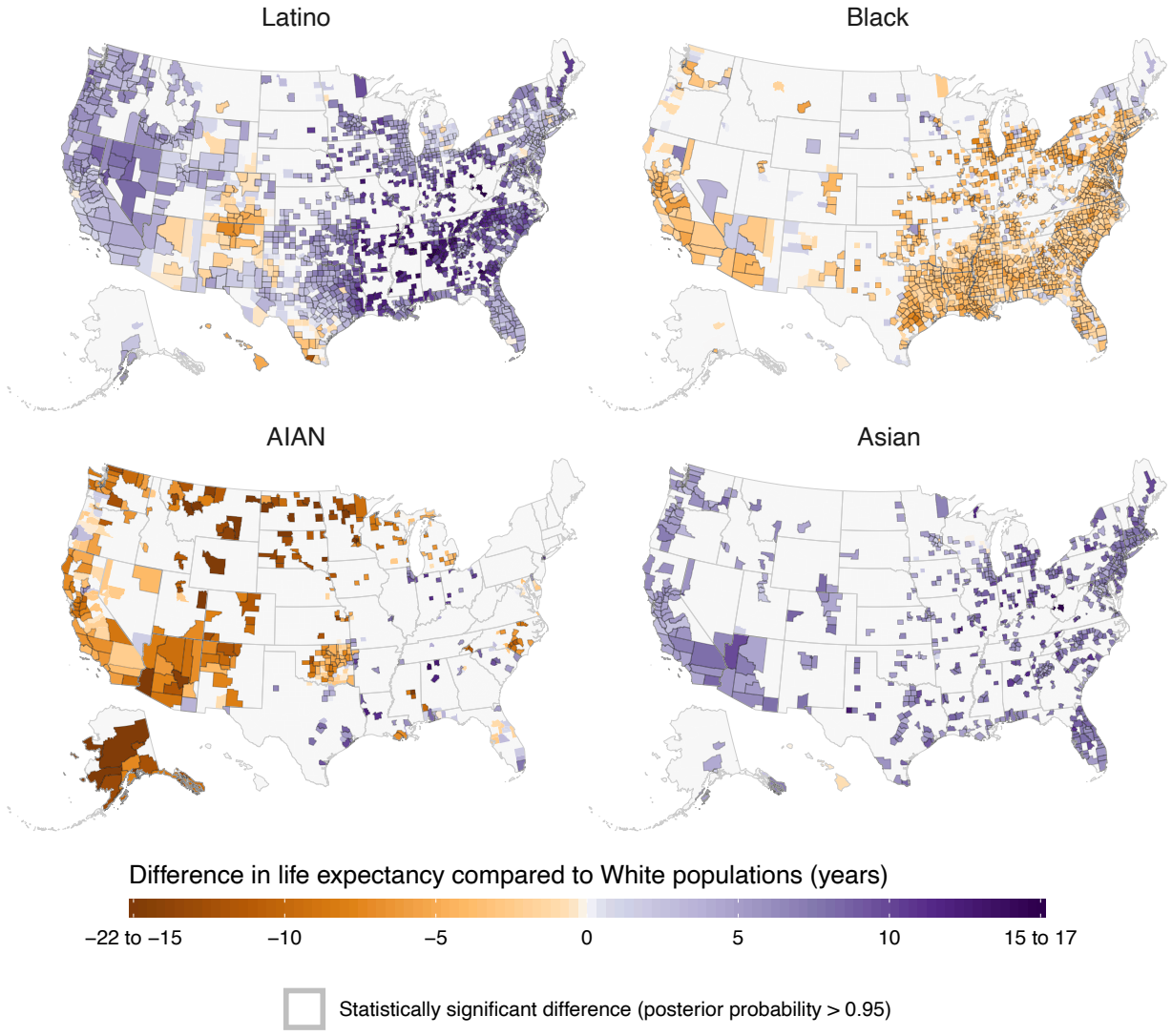
Figure 7 clearly illustrates in purple that in a majority of counties in 2019, Latino and Asian populations had longer life expectancies than the White population. The Latino population (87.0 years [84.8–88.8]) in Walker County, Alabama, had the greatest life expectancy advantage compared to the White population in the same county (70.5 years [70.0–71.1]) at 16.5 years. The Asian population in Cabell County, West Virginia, had an estimated life expectancy of 87.6 years (85.5–89.4), a 14.9-year advantage compared to the White population at 72.7 years (72.1–73.3). While in 2019, the Latino and Asian populations had a life expectancy advantage compared to the White population in 92.4% and 98.5% of counties, respectively, the size of the advantage shrank in many counties from 2000 to 2019.

Black and AIAN populations in many counties generally had shorter life expectancies than the White population, as drawn in orange in Figure 7. The differences in life expectancy ranged from a 15.5-year disadvantage to a 7.9-year advantage for the Black population compared to the White population: Black people in Washington, DC, had an estimated life expectancy of 71.6 years (70.9–72.2) compared to 87.1 years (86.5–87.7) for the White population, while Black people residing in Kandiyohi County, Minnesota, had an estimated life expectancy of 88.8 years (84.6–93.3) compared to 80.9 years (80.3–81.5) for White residents. Over time, the life expectancy disadvantage for the Black population decreased in 78.4% of counties, with a small proportion (8.4%) of those counties – spread throughout the country – flipping the disadvantage into a life expectancy advantage. This same flip from disadvantaged to advantaged over time occurred in 5.1% of disadvantaged Hispanic counties and 2.9% of disadvantaged AIAN counties.

The AIAN population had a lower life expectancy than the White population in 75.1% of counties in 2019. The greatest disadvantage clocked in at 21.7 years in Hennepin County, Minnesota, where the AIAN population had an estimated life expectancy of 60.1 years (57.1–63.2) compared to the White population's estimated life expectancy of 81.8 years (81.5–82.0). Meanwhile, the greatest advantage occurred in Lawrence County, Alabama, at 13.9 years, as the AIAN population had an estimated life expectancy of 87.3 years (81.7–91.4) compared to 73.4 years (72.8–74.1) for the White population. The decreases in life expectancy for the AIAN population were more widespread, with 58.6% of counties experiencing a widening life expectancy disadvantage for the AIAN population compared to the White population from 2000 to 2019. Furthermore, in 15.2% of counties (primarily in California and in Oklahoma) where the AIAN population had higher life expectancies compared to the White population in 2000, the life expectancy advantage reversed to a life expectancy disadvantage by 2019.

FIGURE 7

ABSOLUTE DIFFERENCE BETWEEN THE WHITE POPULATION AND THE OTHER FOUR RACE AND ETHNICITY GROUPS IN ESTIMATED COUNTY-LEVEL LIFE EXPECTANCY AT BIRTH, 2019



This section of the report highlights just a small portion of our life expectancy findings. To explore additional life expectancy trends in this dataset, data for public download are available at https://bit.ly/MortalityUS.

The data on which these maps are based is available in an accessible format from Global Health Data Exchange. We provide this link for information and convenience. The content of external, non-Federal websites is not subject to Federal information quality, privacy, security, and related guidelines. We do not guarantee that outside websites comply with Section 508 accessibility requirements of the Rehabilitation Act.

https://ghdx.healthdata.org/record/ihme-data/united-states-life-expectancy-by-county-race-ethnicity-2000-2019

Discussion

This assessment of life expectancy covering the two decades preceding the COVID-19 pandemic demonstrates the pressing need to reduce, and ultimately eliminate, racial and ethnic health disparities. While the life expectancy gap between Black and White populations narrowed at the national level between 2000 and 2019, most gains occurred in the earlier 2000–2010 period, indicating that progress has slowed or stagnated in recent years, and the Black population continued to experience a life expectancy disadvantage relative to the White population. Indeed, provisional estimates for 2020 show that life expectancy overall, and for the Black, Latino, and White populations in the US,[5] has plummeted due to COVID-19, such that the advancements made in the study period by the Black population in comparison to the White population have been effectively erased. Furthermore, other studies have found that Black, Latino, AIAN, and NHPI populations had higher rates of COVID-19 mortality[6] and excess all-cause mortality[7] compared to the White population.

Our comprehensive study was the first county-level time-series analysis of life expectancy for the AIAN and Asian populations. There is a paucity of research on the life expectancy trends of both groups, so our analysis provides an opportunity to renew pursuits to tackle the health outcomes that disproportionately affect those communities. The life expectancy trends among the AIAN population stand out as the most troubling findings of the analysis: the substantial life expectancy disadvantage for AIAN populations compared to White populations widened even further from 2000 to 2019 in most counties.

The persistent and widespread life expectancy disadvantages observed for Black and AIAN populations compared to the White population in this analysis reflect the effects of systemic racism. Systemic racism is a root cause of the poor health outcomes among marginalized groups in the US,[8-10] and previous research has highlighted the link between systemic racism and social determinants of health like socioeconomic disadvantage and inequitable access to life-conserving resources.[11] It is vital to continually improve our understanding of the nuanced relationship between racism and negative health outcomes in order to implement evidence-based policy solutions that make health increasingly equitable. The reasons for the relative lack of improvement in life expectancy since 2010 need to be better understood. Furthermore, the pronounced exacerbation of racial and ethnic health disparities associated with the start of the COVID-19 pandemic in 2020 shows that improvements in life expectancy are not guaranteed. Our detailed assessment aims to help policymakers reinvigorate efforts to close the life expectancy gap in a health landscape altered by COVID-19.

Asian and Latino populations led all race and ethnicity groups with the highest life expectancies both nationally and in nearly all counties. However, heterogeneity within major race and ethnicity groups can obscure disparities between Asian and NHPI populations and for other race and ethnicity groups, such as for Latino and Black populations of different national origins or for immigrants versus US-born populations. Notably, despite the life expectancy advantage for Asian and Latino populations, the size of the advantage for both groups compared with the White population shrank over the 20-year study period. As we acknowledged in the Methods section of this report, the estimates for the combined Asian and NHPI group (labeled "Asian" in this report) likely obscure the frequently lower life expectancy of NHPI individuals, so further research is needed to parse out the life expectancy trends of the Asian and NHPI populations.

In a similar vein, the life expectancy trends within Latino populations are understudied, particularly for Afro-Latino populations,[12,13] which have shorter life expectancies than White Latino populations. Our analysis also reveals shorter life expectancies for Latino populations in southwestern counties compared to Latino populations in other counties across the country, namely along the southern Texas border, New Mexico, and southern Colorado. Additional analysis on the aspects leading to this geographic variation should be considered. Additionally, unmeasured and unexplored cultural advantages of Latino populations that positively affect health outcomes merit further consideration.

This county-level analysis reveals geographic disparities both in overall life expectancy and within each race and ethnicity group. Previous research has pinpointed several factors that likely drive these disparities, including the prevalence of health risks such as smoking and diabetes; the proportion of people in a county who were born outside of the US; health promotion efforts at the local level; and social determinants of health like income, educational attainment, exposure to environmental risks, the built environment, and access to and quality of health care.[2,14-19] Counties of particular interest from our analysis are those where the life expectancy differences changed between the White population and the other four race and ethnicity groups studied. For instance, in Eau Claire County, Wisconsin, the life expectancy disadvantage for the Black population compared to the White population in 2000 flipped to become a life expectancy advantage by 2019. Such patterns warrant further examination of the factors present and policies implemented in Eau Claire County, and other similar counties, that led to these reversals. The county-level life expectancy estimates can serve as a crucial tool in observing similarly unique trends at a granular level and creating appropriate health interventions tailored for local contexts and in collaboration with communities.

Challenges encountered

We drastically underestimated how time-consuming the process of cleaning and preparing data for analysis would be. Even the senior researchers on this team, who have studied US-specific health data for many years, were surprised by the complexity of the data. Further, revisions in reporting standards for educational attainment and race and ethnicity created complications in maintaining consistency across the full time series. For instance, when we conducted our crosswalking analysis (identifying our "gold standard" definition of a variable and adjusting all other survey response definitions to be in line with the gold standard) for educational attainment, we had to make several assumptions to account for a revision in US reporting standards from counting total years of education to maximum completed grade level.

The misclassification of racial and ethnic identity on death certificates remains a prominent hurdle in any work in tracking life expectancy trends by race and ethnicity. In an attempt to minimize the effect of misclassification, we used an imperfect method of adjusting our estimates with national-level misclassification ratios. However, using these misclassification ratios requires operating under a set of assumptions that could greatly affect the estimates for Latino, Asian, and AIAN populations. The development of county-specific misclassification ratios could aid future county-level analyses, but it is more important to ensure that the race and ethnicity an individual self-identified as while they were alive is reflected on their death certificate.

We experienced a delay in producing nonfatal and risk factor estimates due to challenges in the availability of and access to data; data were limited at the US county level and sometimes even at the state level. Data that did exist were not always released to us for our analysis. For instance, the CDC collects state-level data from the Behavioral Risk Factor Surveillance System (BRFSS), the world's largest continuous health survey,[20] but stopped making county-level estimates publicly available after 2012. As a result, we asked each of the 50 US states to share their county-level data. Some states declined, but we ultimately received county-level data from about a third of the states. In some other cases, we were only allowed to access data if we traveled to central data centers to use and analyze the data, but those data centers did not have the computational capacity to perform this extremely complex analysis. Lastly, we encountered unexpected hurdles when the COVID-19 pandemic hit. Since many government offices closed early in the pandemic, it was even more difficult to gain access to data.

Next steps

We recognize that our life expectancy work is but one part of our ongoing county-level analyses on racial and ethnic health disparities in the US. We are working on completing a number of county-level analyses by race and ethnicity and by education, which include generating mortality, YLL, incidence, prevalence, YLD, and DALY estimates for select causes of disease and estimating HALE, exposure, population attributable fractions, and attributable burden of risk factors. Now that we have overcome the tremendous challenges of developing a replicable system for cleaning and preparing the data, and establishing clear definitions for variables, we can improve upon the framework put in place.

Outside of the work we are currently measuring, we note that addressing inequities in social and structural determinants of health is vital to reduce racial and ethnic disparities. The COVID-19 pandemic has shone a bright light on the health inequities that plague the US, which have disproportionately impacted marginalized race and ethnicity groups. It is incumbent to take a multi-sector approach to tackle historical, social, structural, and environmental factors that continue to drive health disparities.

To properly monitor the trends of racial and ethnic health disparities in the US, the shortage of data must be addressed. Not only should it be simpler to gain access to existing data, but the data collection process should also be refined to ensure the correct race and ethnicity information is recorded on death certificates and in other data collection systems. Improving data collection is particularly key for AIAN populations, who are commonly racially misclassified on death certificates,[21] and for NHPI populations, who have historically lacked disaggregated data.

We turn to institutional leaders like NIH to launch a roundtable of peers to discuss data improvements and to implement a system that promptly releases data for the common good. For our part, we have made these life expectancy estimates available through an interactive data visualization tool on the IHME website at https://vizhub.healthdata.org/subnational/usa. IHME will continue to release all computed variables associated with this ongoing project so that other researchers can use the results —and improve upon them—in future research on the drivers of racial and ethnic disparities.

However, providing the data is just the first step; these must be utilized in data-driven solutions. Creating accessible training programs aimed at local public health professionals, policymakers, and communities on how to access and use the data can better equip local leaders with tools to identify and address the disease burdens specific to their communities. These training programs would ideally empower local community and health professionals to secure funds for addressing leading sources of disease burden, translate data into policy action, and transform local public health programs for the betterment of all populations.

Conclusion

Our findings illustrate that, as time marches on, improvements in life expectancy are not guaranteed. As research methods become more sophisticated and data collection definitions become more consistent, local leaders and communities will be increasingly better equipped with data to create evidence-based solutions. Further, the gaps in life expectancy between race and ethnicity groups demonstrate that a one-size-fits-all approach is insufficient: local policies must address the specific needs of each race and ethnicity population and foster their strengths.

The life expectancy estimates, and the other work that is underway, are just the beginning. There is more work ahead to ensure that all people, regardless of race or ethnicity, live long lives in full health.

References cited

1. Why is life expectancy in the US lower than in other rich countries? [Internet]. Our World in Data. [cited 2022 Aug 10]. Available from: https://ourworldindata.org/us-life-expectancy-low.

2. Dwyer-Lindgren L, Bertozzi-Villa A, Stubbs RW, et al. Inequalities in Life Expectancy Among US Counties, 1980 to 2014: Temporal Trends and Key Drivers. JAMA Intern Med 2017; 177: 1003–11. PMCID: PMC5543324.

3. Dwyer-Lindgren L, Bertozzi-Villa A, Stubbs RW, et al. US County-Level Trends in Mortality Rates for Major Causes of Death, 1980-2014. JAMA. 2016;316(22):2385–2401. doi:10.1001/jama.2016.13645.

4. Arias E, Heron M, Hakes J. The validity of race and Hispanic-origin reporting on death certificates in the United States: an update. Vital and Health Statistics [Internet]. 2016;2(172). Available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_172.pdf.

5. Arias E, Betzaida T-V, Ahmad F, Kochanek K. Provisional life expectancy estimates for 2020. https://doi.org/10.15620/cdc:107201.

6. Ahmad FB, Cisewski JA, Miniño A, Anderson RN. Provisional mortality data–United States, 2020. MMWR Morb Mortal Wkly Rep. 2021; 70: 519-522.

7. Rossen LM, Ahmad FB, Anderson RN et al. Disparities in excess mortality associated with COVID-19–United States, 2020. MMWR Morb Mortal Wkly Rep. 2021; 70: 1114-1119.

8. Bailey ZD, Krieger N, Agénor M, Graves J, Linos N, Bassett MT. Structural racism and health inequities in the USA: evidence and interventions. The Lancet. 2017; 389: 1453-1463.

9. Williams DR, Lawrence JA, Davis BA. Racism and health: evidence and needed research. Annu Rev Public Health. 2019; 40: 105-125.

10. Williams DR, Lawrence JA, Davis BA, Vu C. Understanding how discrimination can affect health. Health Serv Res. 2019; 54: 1374-1388.

11. Phelan JC, Link BG. Is racism a fundamental cause of inequalities in health? Annu Rev Sociol. 2015; 41: 311-330.

12. Arias E, Johnson NJ, Vera BT. Racial disparities in mortality in the adult Hispanic population. SSM Popul Health. 2020; 11100583.

13. AMA J Ethics. 2022;24(4):E283-288. doi: 10.1001/amajethics.2022.283.

14. Chetty R, Stepner M, Abraham S, et al. The Association Between Income and Life Expectancy in the United States, 2001-2014. JAMA 2016; 315: 1750–66. PMCID: PMC4866586.

15. Cullen MR, Cummins C, Fuchs VR. Geographic and racial variation in premature mortality in the US: analyzing the disparities. PLoS One. 2012; 7e32930.

16. Arora A, Spatz E, Herrin J et al. Population well-being measures help explain geographic disparities in life expectancy at the county level. Health Aff (Millwood). 2016; 35: 2075-2082.

17. Grembowski D, Bekemeier B, Conrad D, Kreuter W. Are local health department expenditures related to racial disparities in mortality? Soc Sci Med. 2010; 71: 2057-2065.

18. McCullough JM, Leider JP. Government spending in health and nonhealth sectors associated with improvement in county health rankings. Health Aff (Millwood). 2016; 35: 2037-2043.

19. Frederick C, Hammersmith A, Gilderbloom JH. Putting 'place' in its place: Comparing place-based factors in interurban analyses of life expectancy in the United States. Soc Sci Med. 2019; 232: 148-155.

20. CDC - BRFSS [Internet]. 2022 [cited 2022 Aug 10]. Available from: https://www.cdc.gov/brfss/index.html.

21. Jim MA, Arias E, Seneca DS, Hoopes MJ, Jim CC, Johnson NJ, Wiggins CL. Racial misclassification of American Indians and Alaska Natives by Indian Health Service Contract Health Service Delivery Area. Am J Public Health. 2014 Jun;104 Suppl 3(Suppl 3):S295-302. doi: 10.2105/AJPH.2014.301933. Epub 2014 Apr 22. PMID: 24754617; PMCID: PMC4035863.

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