



How Growing Geographic and Racial Disparities Inhibit the Ability to Live Longer and Healthier Lives

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Executive Summary

This is the first report in an AARP series, “How Growing Geographic and Racial Disparities Inhibit the Ability to Live Longer and Healthier Lives,” discussing geographic disparities in life expectancy at mid-adulthood. This first report provides an analysis at the national level from 1980-2014, with additional analyses of Black residents. Future reports will include state-level analyses and will include additional analyses of Latinos, Native American and Asian American residents.

1. Where you are born and where you are living at age 50 both matter.

- Where you are born matters. Previous research has shown major disparities in life expectancy exists from county to county across the U.S.
- New research highlighted in this report suggests that geographical disparities impact people not just at birth, but across the life course; it is, therefore, critical to work to change the impact of geography and economic inequality on life expectancy in mid-adulthood, in addition to during childhood.

- Successful solutions addressing both the challenges and opportunities of aging societies related to local geographic, economic and racial disparities, which are increasingly limiting healthy longevity, will likely require interventions at the national, state and local levels.
- Life expectancy at age 50 may be a better measure of the impact of the COVID-19 pandemic on U.S. life expectancy than life expectancy at birth because it measures mortality in people at higher risk for serious illness and death.

2. Geographic disparities in life expectancy grew across the U.S. from 1980 to 2014.

- While life expectancy rose in most U.S. counties from 1980 to 2014, the gap between the best- and worst-performing counties widened.
- While life expectancy at age 50 also rose between 1980 and 2014, geographic disparities in that life expectancy measure also increased. Between 1980 and 2014, life expectancy at age 50 increased in the best-performing county by 5.6 years.

Table 1: Geographic disparities in life expectancy at life and at age 50 years

	Geographic disparity in life expectancy at birth	Geographic disparity in remaining life expectancy at age 50
Difference between best & worst performing in 1980	18.2 years	11.7 years
Difference between best & worst performing county in 2014	20.0 years	14.9 years
Change in difference between best & worst performing county	1.8 years	3.2 years

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In that same time period, life expectancy at age 50 in the worst-performing county only increased by 2.4 years. This means that geographic disparities in life expectancy at age 50 between the best- and worst-performing county grew by 3.2 years from 1980 to 2014.

- The growth of geographic disparities in life expectancy between 1980 and 2014 is larger when measured at age 50 (3.2 years) than when measured at birth (1.8 years)
- This increase in geographic disparity means that residents in the best-performing counties are benefiting from increasing longevity while the residents in the worst-performing counties are not given the same opportunity.
- The rising inequality in life expectancy observed at the county level between 1980 and 2014 may have laid the groundwork for subsequent decreases in overall life expectancy in the U.S. between 2015 and 2017.¹


3. Geographic disparities between counties reflect economic and racial disparities.

- Racial disparities underlie many of the geographic disparities we find between counties.
- Improvements in life expectancy at age 50 in counties in which the majority of residents are Black lag almost three decades behind the improvements in life expectancy at age 50 experienced by residents of counties with less than 5% Black residents. In 1980, residents in majority Black counties had a lower life expectancy at age 50 than residents in counties with less than 5% Black residents. It took Black counties until 2008, or 28 years, to catch up and have the same life expectancy at age 50 as counties with less than 5% Black residents back in 1980.
- Black-majority counties experienced an increase in median life expectancy at age 50 from 1980 to 2014 similar to the counties with less than 5% Black residents. However, if we are to achieve equity in life expectancy, counties with a disproportionate share of Black residents, on average, need to make greater increases to life expectancy than the national average in order to make sufficient gains toward achieving equity.
- The major economic shock in the U.S. that has resulted from the global COVID-19 pandemic could potentially widen existing economic and racial inequities. Black workers also suffered from a weak job recovery after the Great Recession.²

4. While the data from this analysis predates COVID-19, rising geographic disparities may share common root causes with today's dramatic disparities in mortality during the pandemic.

- Disparities matter more than ever at a time when U.S. counties with a higher percentage of Black residents have accounted for more than half of coronavirus cases and deaths.³
- As the U.S. seeks to rebound from the pandemic, we as a nation need to address the underlying systemic causes of the growing inequity in longevity, such as disparities in access to quality health care, housing, work and transportation.



A photograph showing two men playing chess on a concrete table outdoors. The man on the left is older, with white hair and glasses, wearing a brown jacket. The man on the right is younger, with a beard and a grey jacket over a yellow shirt. They are both looking intently at the chessboard. In the background, there is a park-like setting with a tree, a bicycle, and some people walking. A red banner with white text is overlaid on the image.

INTRODUCTION

The Importance of Place

When it comes to how long you will live, where you live matters. Conditions and the general environment in which people live, learn, work, play, worship and age have tremendous influence on their health and longevity.⁴ Emblematic of this constant reality is that since the beginning of the COVID-19 pandemic, U.S. counties with a higher percentage of Black residents have accounted for more than half of coronavirus cases and deaths.⁵ The pandemic and its related trends follow a 2010-2020 decade in which life expectancy stayed flat in the United States.⁶ The United States is experiencing something even greater than a “mere” global pandemic that has infected millions of Americans and taken an ever-rising death toll that has climbed into the hundreds of thousands, disproportionately impacting communities of color. We are seeing what the public-health sector would call a “syndemic;” that is the concurrent and previously present epidemics of economic inequality and systemic disparities have compounded the impact of the COVID-19 pandemic. The synergy has resulted in a perfect storm—with GDP falling at a 32.9% annual rate, the deepest decline since records began in 1947. This resulting economic shock threatens to widen economic and racial inequities even further. Addressing these issues requires solutions on all fronts. For starters, from the health care perspective, improving the health of the nation as a whole will require geographically targeted investments at the county level.

Geographic disparities in life expectancy at the county level may reflect racial disparities in counties with the lowest life expectancy. People of color disproportionately live, work, and play in communities with health challenges and therefore differences in neighborhood characteristics are a major factor that explain the poorer health of many minority groups relative

to national averages.⁷ Counties with a higher percentage of residents of color could also have a higher number of segregated neighborhoods and communities. While racial mix of neighborhood does not determine overall livability, racially concentrated communities are generally associated with poorer health because segregated communities can concentrate poverty—resulting in the exclusion and isolation of many residents from mainstream resources necessary for economic mobility, such as good schools, good jobs and access to banks and capital for business development. It can be harder to eat right in many of these communities because there are fewer grocery stores to offer fresh fruits and vegetables and other healthy foods.⁸ Further, too many of these neighborhoods lack access to health-enhancing resources, such as safe places to play and exercise.⁹ These same communities were hit hardest by the home-mortgage lending crisis, which crushed wealth opportunities and disproportionately affected communities of color.¹⁰ A recent Kaiser Family Foundation report described how people of color generally face increased risk of exposure to coronavirus due to their living, working and transportation situations. To cite just a few such factors, they are more likely to be working in low-income jobs that cannot be done from home and to be living in larger households in densely populated areas.¹¹ Finally, geographic disparities in longevity may reflect barriers to health care providers, hospitals and clinics. We can see evidence of this in the COVID-19 pandemic in how people of color, despite being at increased risk of exposure to the virus, did not have markedly higher testing rates but were more likely to be positive when tested. They also were more likely to require a higher level of care at the time they tested positive for COVID-19.¹²

In this report, AARP examines the roots of the disparities in longevity, with new analysis of county-level life expectancy at age 50 between 1980 and 2014, providing insights relevant to older adults who today are between the ages of 56 and 90. Life expectancy at age 50 is a calculation of the number of additional years of expected life, or how many more years a person might expect to live after age 50. Historically, increases in a country's life expectancy occur in conjunction with lifespan equity—that is, the similarity of lifespans of individuals. This new AARP-sponsored analysis, conducted by the Institute for Health Metrics and Evaluation at the University of Washington (IHME), shows that while life expectancy rose in most U.S. counties during the period between 1980 and 2014, the gap between the best- and worst-performing counties widened. Over the arc of human history, greater lifespan equity has accompanied sustained increases in national life expectancy. Conversely, the rising inequality in life expectancy observed in the United States between 1980 to 2014 may have laid the groundwork for the subsequent decreases in life expectancy between 2015 and 2017.¹³ In addition, this rising inequity may share common root causes with today's dramatic disparities in mortality during the COVID-19 pandemic. As the risk of death from COVID-19 increases with age, life expectancy at age 50 may also serve as an important measure of the impact of the pandemic on life expectancy.¹⁴ As we seek to rebound from the pandemic, we as a nation need to address the underlying systemic causes of the growing inequity such as disparities in access to quality health care, housing, work and transportation.¹⁵ We need a more equitable reset, not a return to the status quo.

This is the first of a series of AARP reports on How Growing Geographic and Racial Disparities Inhibit the Ability to Live Longer and Healthier Lives. This first report on life expectancy at the county level will focus on an analysis at a national level with additional analyses of Black residents. Future reports will include state-level analyses and additional analyses of Latinos, Native American and Asian American residents.

A Strong Relationship between Lifespan Equity and How Long We All Live

Since the mid-1800s, the world has seen a steady increase in life expectancy, although not everyone is living longer and better. Figure 1 shows the continuum of life expectancy at birth and lifespan equity in human populations across different societies and different times in human history. Among countries that have done the best in terms of longevity, one trend is clear: where life expectancy has increased, it has done so in lockstep with increased lifespan equity. This relationship between

life expectancy and lifespan equity can be seen in Sweden, for example, where life expectancy has increased consistently since the mid-1800s. This can also be seen when comparing countries such as Japan and France, which have higher life expectancies and life span equity than the United States. This dual advance is a major achievement of modern civilization. Across history, an increase in life expectancy has been accompanied by an increase in lifespan equality: people live longer in a society where more people live longer.¹⁶

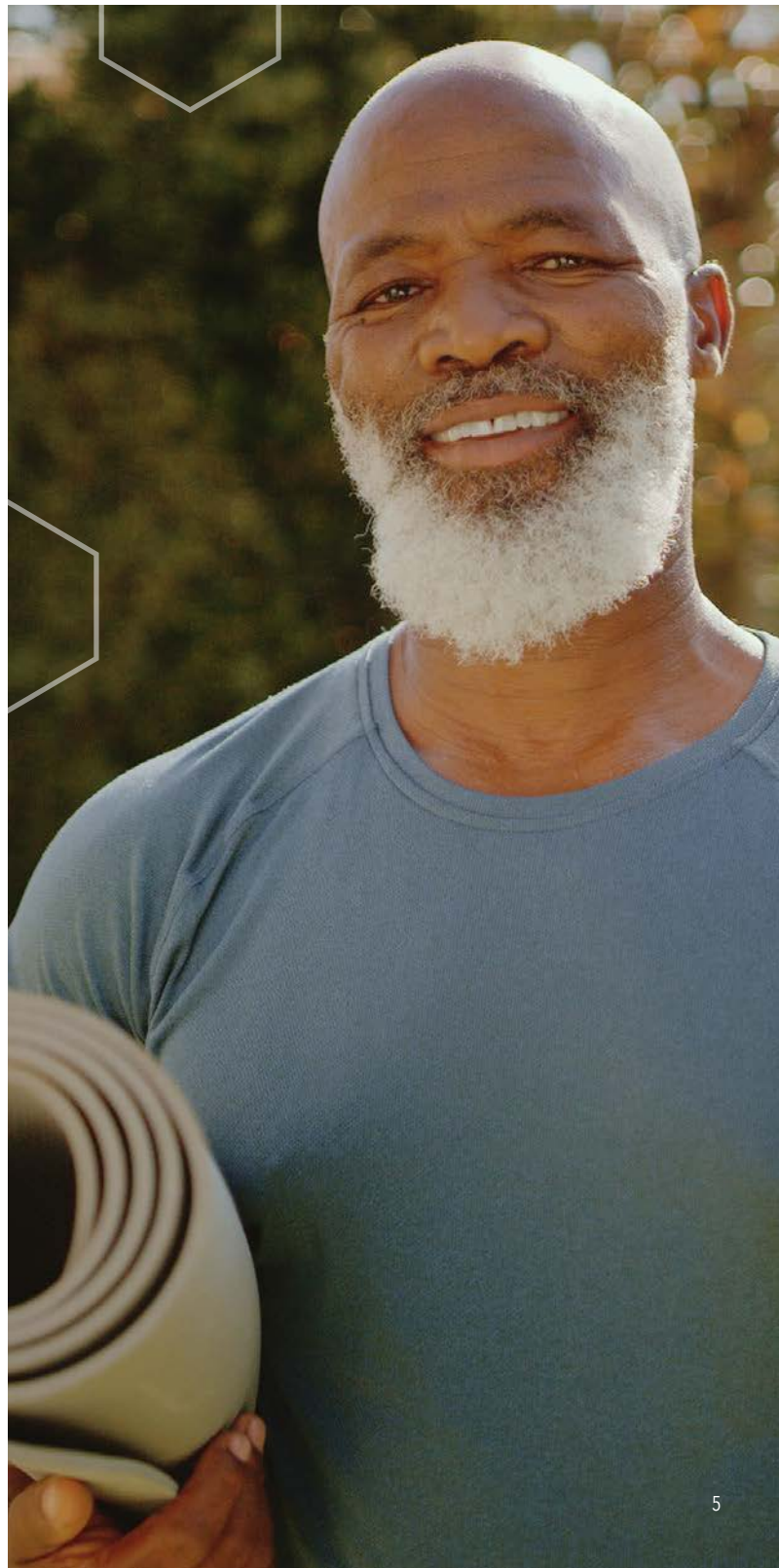
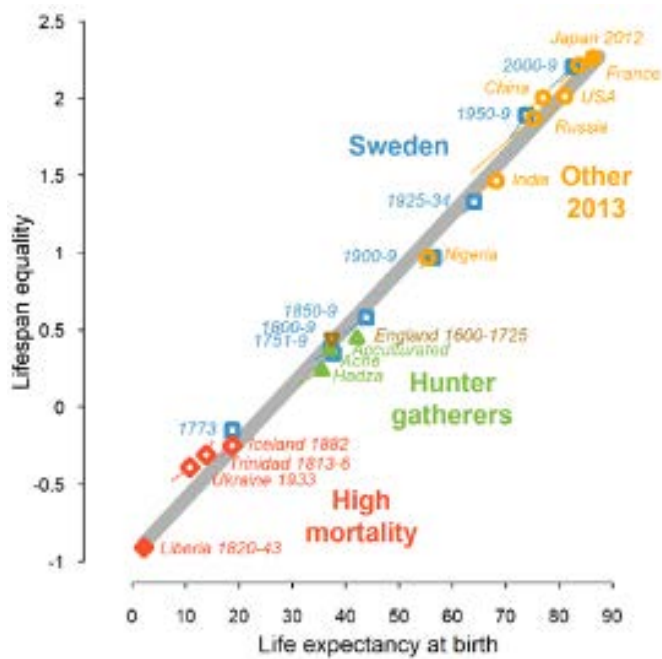


Figure 1. The continuum of life expectancy at birth and lifespan equity in human populations.



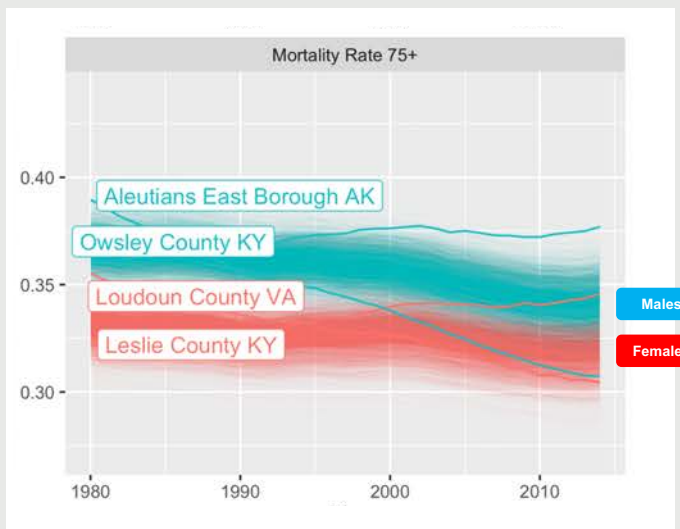
(Figure adapted from original by Fernando Colchero et al¹⁷ and reprinted with permission from the AARP International Journal¹⁸)

Where You Live Matters More than Ever

Previous research has shown major disparities in life expectancy across the U.S. from county to county. For example, Figure 3 and Table 2 show how a child born in 1980 in Billings County, SD, the county that did the best in the U.S. that year for life expectancy, can expect to live 18.2 years longer than a child born in Oglala Lakota County, SD, the county with the worst life expectancy. In 2014, the difference between the best-performing county (Summit, CO) and the worst-performing county for life expectancy at birth (Oglala Lakota County, SD) had grown to 20 years. Even though life expectancy increased from 1980 to 2014 in both the best-performing countries (7.3 year increase) and the worst-performing countries (5.5 year increase), the gap between the best- and worst-performing counties grew by 1.8 years over this time-period (See Figure 5 and Table 2). Put another way, the geographic disparity for life expectancy at birth grew almost two years from 1980 to 2014.

However, these geographic disparities are not limited to the county of your birth. In this report, we highlight new research that shows how these geographical disparities impact people across the life course. While previous research has looked at life expectancy at birth, or how long a person might expect to live at the time of birth, this report focuses on remaining life expectancy at age 50—how many more years a person might expect to live based on his or her county of residence at that time in their life (see Figure 4).

Changes in Life Expectancy over time



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Figure 2. Change in all-cause mortality risk among older adults (annual probability of death among people aged 50+) by county and sex, 1980-2014

Figure 2 shows the mortality rate for residents age 50 and older across all the counties in the United States. The figure separates the mortality between men and women with women having better (lower) mortality across this time-period, with few exceptions. The figure highlights largely steady declines in mortality risk experienced by males and females in nearly all counties in the U.S. Among males, the greatest declines in mortality risk among older adults were observed in parts of Alaska (the annual probability of death in the Aleutians declined from 0.25 to 0.19 for males aged 50+). Among females, the greatest declines were observed in Loudoun County, VA (the annual probability of death declined from 0.22 to 0.19 for females aged 50+). On the opposite end of the spectrum, older male and female residents of Owsley County and Leslie County, KY, respectively, experienced small increases in mortality risk over this time span (increasing from 0.23 to 0.24 among males and from 0.20 to 0.22 among females).

These findings suggest that communities can change their destinies, and we have the potential to change patterns of geographic and economic inequality on life expectancy in mid-adulthood.

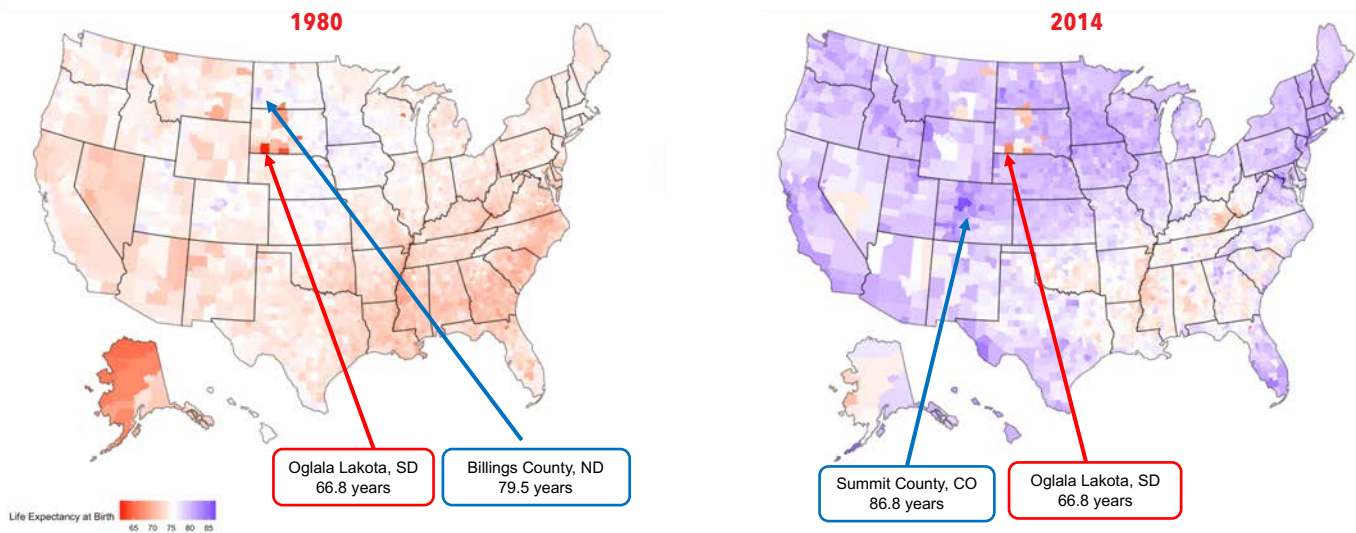
In 1980, a 50-year old resident of Summit County, CO, which was ranked the best in the country in terms of remaining years of life expectancy at age 50, could expect to live 32.9 more years, to the age of 82.9. Meanwhile a 50-year old resident of Oglala Lakota County, SD, the worst-ranked county, could expect to live only an additional 21.2 years, to the age of 71.2 (a difference of 11.7 years). In 2014, Summit County, CO, was still ranked best in terms of life expectancy at age 50. There, a 50-year old resident could expect to live 38.5 years, to the age of 88.5 years, while a 50-year old resident of Union County, FL could expect to live only an additional 23.6 years, to the age of 73.6 years (a difference of 14.9 years). From 1980 to 2014, the disparity in life expectancy had grown from 11.7 years to 14.9 years—meaning that when looking at the best- and worst-performing the geographical best-performing county in life expectancy is larger at age 50 than they are at birth (see Table 2).

Looking at life expectancy at age 50 provides additional important information: while mortality in a population at all

ages will impact life expectancy calculations, deaths that occur at or near the age of the calculation will have a greater impact on the calculated life expectancy. For example, infant mortality has a greater impact on the calculation of life expectancy at birth, as compared to deaths at older ages. Life expectancy at age 50 can also provide an understanding of the geographic risk of COVID-19 deaths, given that 8 in 10 people who have died from COVID-19 were age 65 and older.¹⁹

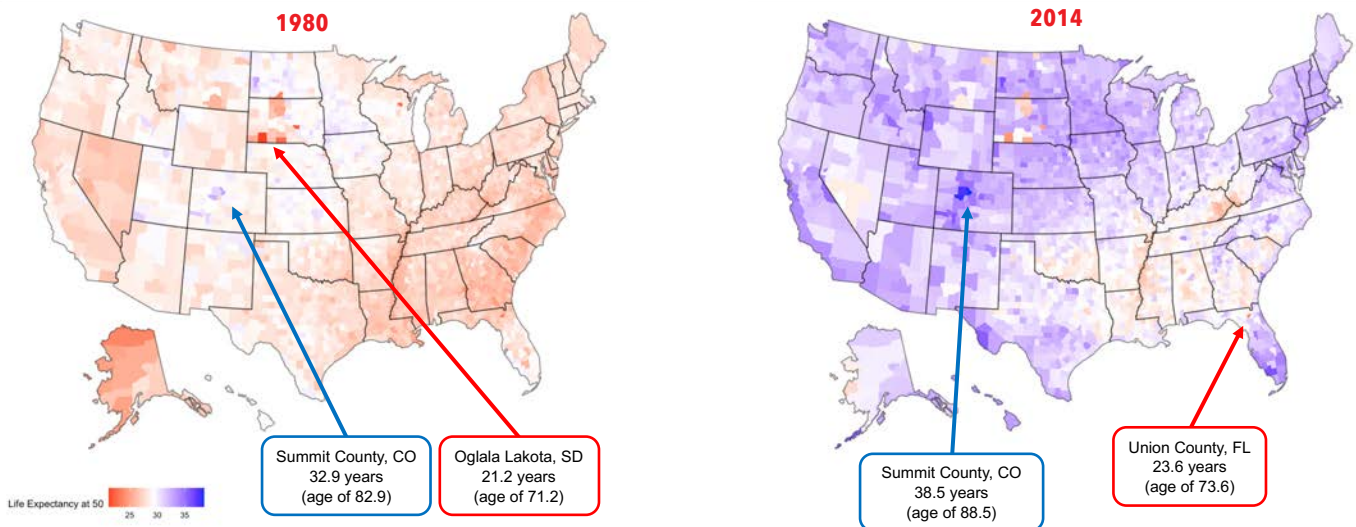
Measuring life expectancy at age 50 may be a better calculation of healthy longevity because it is more sensitive to mortality that is related to age-related chronic disease that can be preventable. The age of 50 is also a time when the mortality from diseases associated with aging remain low. This is the age when the prevalence of chronic diseases begins to rise and when access to healthy lifestyle options and access to recommended preventive health care services (e.g. colon cancer screening) becomes increasingly important.²⁰

Figure 3. Life expectancy at birth



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Figure 4. Additional years of expected life at age 50

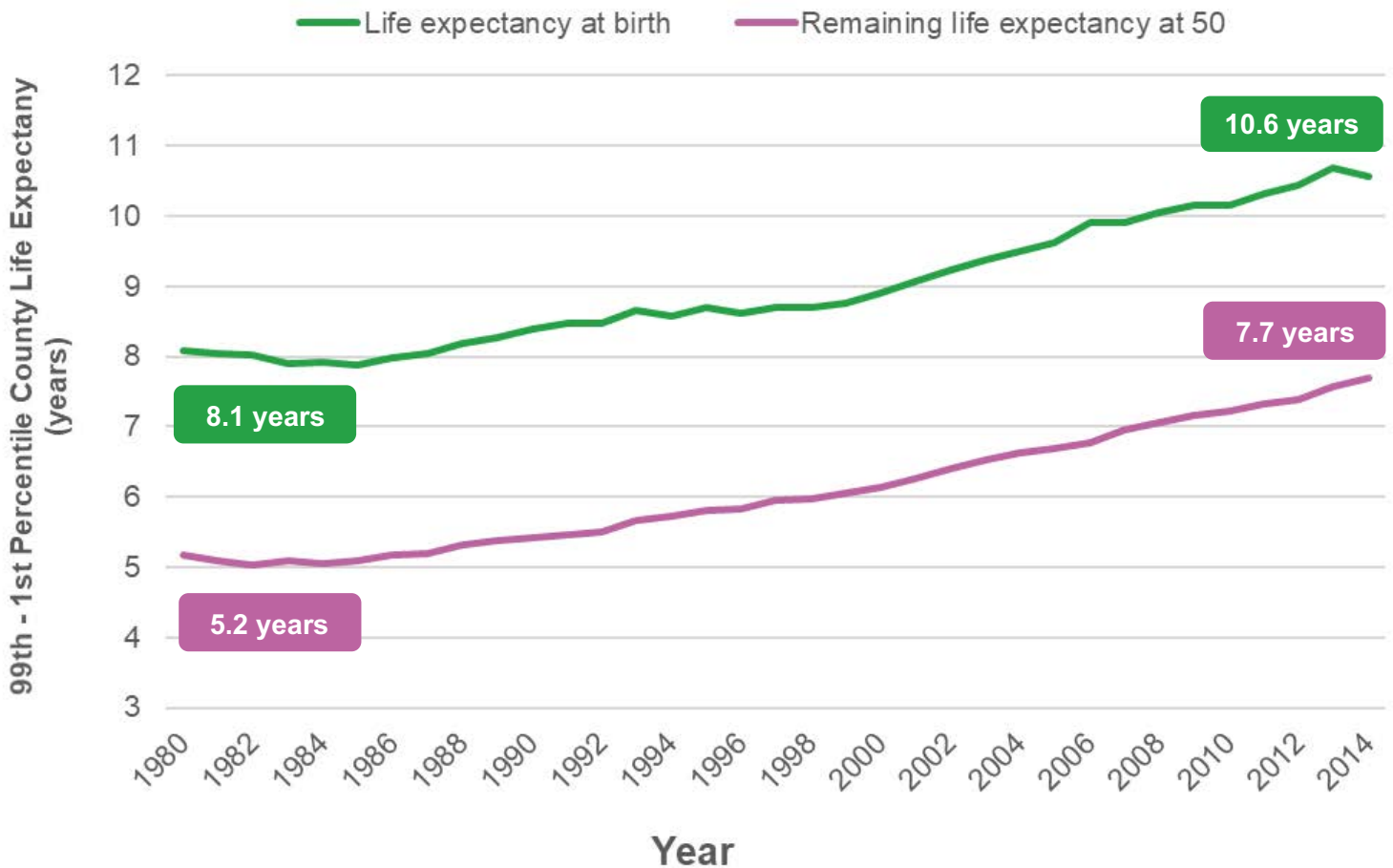


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Figure 5 below shows how geographic disparities in life expectancy increased from 1980 to 2014 when comparing the top and bottom 1% of counties in terms of life expectancy. A 50-year-old in the best-performing 1% of U.S. counties in 1980 could expect 30.4 additional years of life (age of 80.4 years), which is just 5.2 years longer than a 50-year-old living in the bottom 1% of U.S. counties, who could expect to live an additional 25.2 years (age of 75.2 years). This disparity

grew 49%, to 7.7 years, in 2014 as 50-year-olds in the best-performing counties could expect 34.6 years of additional life (age 84.6 years) as compared to just 26.9 years (age 76.9 years) in the worst counties for life expectancy. This means that from 1980 to 2014, there has been an increase of 2.5 years in the disparities between the best 1% of counties and the worst 1% of counties, resulting in an increased advantage of 7.7 more years of expected life for those in the top counties.

Figure 5: Growing geographic inequity between the best 1% and worst-performing 1% of counties in terms of life expectancy at birth and at age 50.



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Despite overall improvements in life expectancy, between 1980 and 2014, the gap between better- and worse-performing counties steadily widened. Geographic inequality in overall life

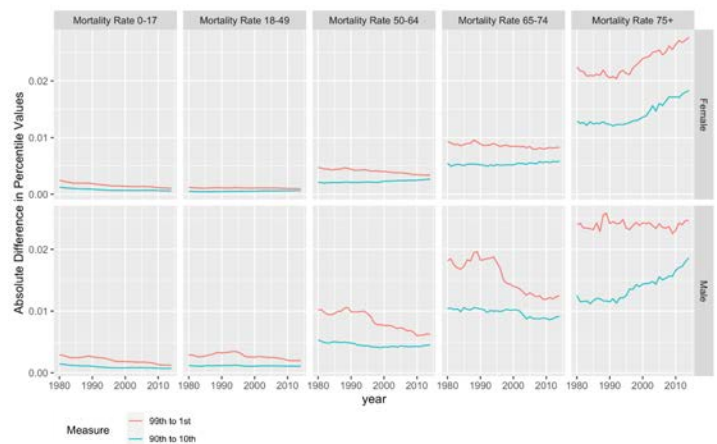
expectancy at birth increased by 2.5 years (8.1 years to 10.6 years) while geographic inequality in remaining life expectancy at age 50 increased by 2.5 years (5.2 to 7.7 years)

Table 2. Comparison of best- and worst-performing counties for life expectancy at birth and at age 50 in selected years 1980 and 2014

	Life expectancy at birth	Remaining life expectancy at age 50
Best-performing county 1980	Billings County, ND 79.5 years	Summit County, CO 32.9 years (age of 82.9)
Worst-performing county 1980	Oglala Lakota County, SD 61.3 years	Oglala Lakota County, SD 21.2 years (age of 71.2)
Difference between best- & worst-performing	18.2 years	11.7 years
Best-performing county 2014	Summit County, CO 86.8 years	Summit County, CO 38.5 years (age of 88.5)
Worst-performing county 2014	Oglala Lakota County, SD 66.8 years	Union County, FL 23.6 years (age of 73.6)
Difference between best- & worst-performing	20.0 years	14.9 years

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Figure 6 shows why the magnitude of geographic disparities in life expectancy measured at age 50 is even more stark than disparities in life expectancy at birth. Instead of looking at life expectancy, Figure 6 presents geographic disparities in mortality risk for selected age ranges, allowing us to understand the geographic disparity at selected bands of age across the life course. Also, instead of just looking at the top and bottom 1% of counties, Figure 6 expands the analysis to the top and bottom 10% of counties to get a more representative sample of these disparities. Figure 6 shows that as probability of death increases with increasing age, so does the geographic disparity in this mortality risk. Figure 6 illustrates that, at the county level, there are marked differences in the magnitude of geographic disparities in mortality risk for older adults as compared to children and younger adults. While measures of geographic disparities have remained largely flat (or even declined) among younger age groups, they have increased markedly and steadily for adults age 75+ since 1990.



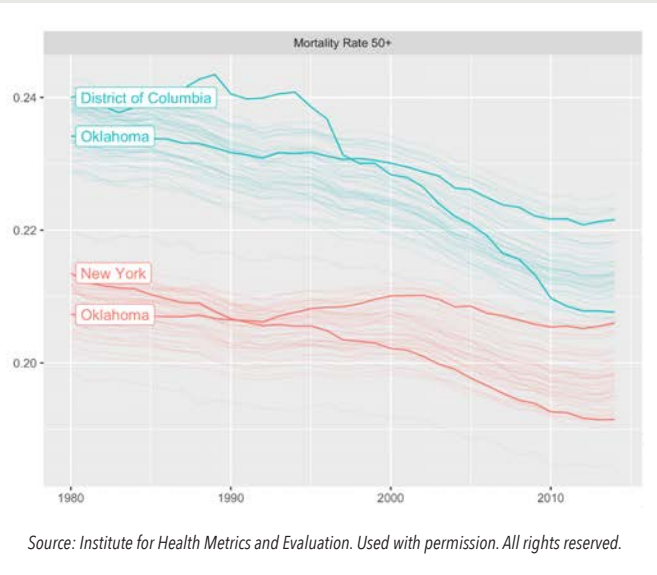
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Figure 6 a-j. The difference in mortality across the lifespan between best and worst performing counties for selected age ranges (0-17; 18-49; 50-64; 65-74; and 75+ for males and females, 1980 - 2014

Figures 6a-e show mortality for females and **Figures 6f-j** show mortality for males.

Gender Disparities in Life Expectancy

Annual probability of death among the 50+



Between 1980 and 2014:

Male residents of the District of Columbia experienced the greatest absolute decrease in mortality risk among older adults; female residents of New York state also experienced marked declines in mortality risk. Male and female residents of Oklahoma experienced the least change in mortality risk.

Figure 7: Change in all-cause mortality risk among older adults by state and sex, 1980-2014

Women live longer than men in every state in the US and in almost every society across the globe.²¹ Between 1980 and 2014, male residents of the District of Columbia experienced the greatest absolute decrease in mortality risk among older adults; female residents of New York state also experienced marked declines in mortality risk. Residents of Oklahoma experienced the least change in mortality risk.

Racial and Geographic Disparities in Life Expectancy

Geographic disparities may also reflect racial disparities because of the impact of systemic disparities. Figures 8-11 provide a county-level view of demographic composition of counties in terms of white, Black and Latino residents. These maps show that counties with high percentages of Black residents tended to be concentrated in the Southeastern and Mid-Atlantic U.S., while counties with high percentages of Latino residents tended to be concentrated in Texas, California and the Southwest, with evidence of increased distribution from 1980 to 2014.

As noted earlier, racial concentrations are generally linked to worse health when poverty is concentrated, thereby reducing opportunities for economic mobility. Racism also impacts the environmental and social determinants of health, such as pollution levels and access to healthy food, along with quality of housing and transportation options. Finally, the chronic stress from systemic disparities is exacerbated in segregated communities, where there might be limited options to exercise or play outside.²²



Demographic and Socioeconomic Indicators

Figure 8: % White (1980 and 2014)

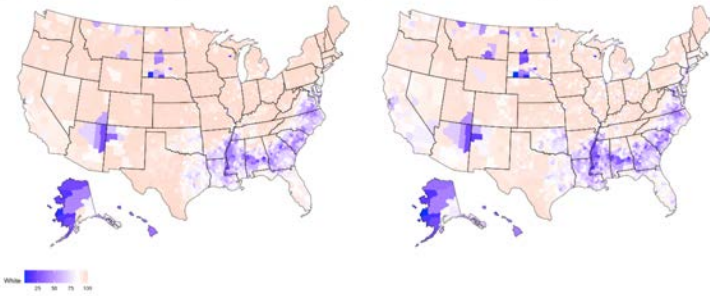


Figure 9: % Black (1980 and 2014)

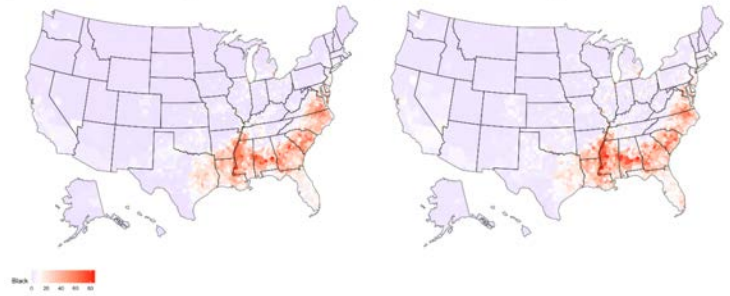


Figure 10: % non-white/non-Black (1980 and 2014)

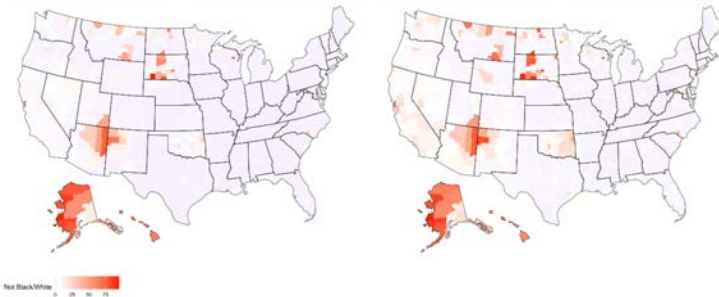
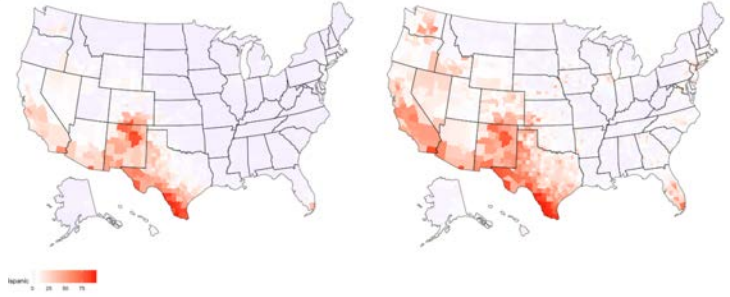


Figure 11: % Hispanic (1980 and 2014)



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Figures 8 to 11 U.S. counties in 1980 and 2014 showing percentages of county composition by selected demographic groups.

These maps show the concentration of racial and ethnic minorities in the U.S. at the county level. These maps also provide a sense of how race and ethnicity can be intertwined with geography.

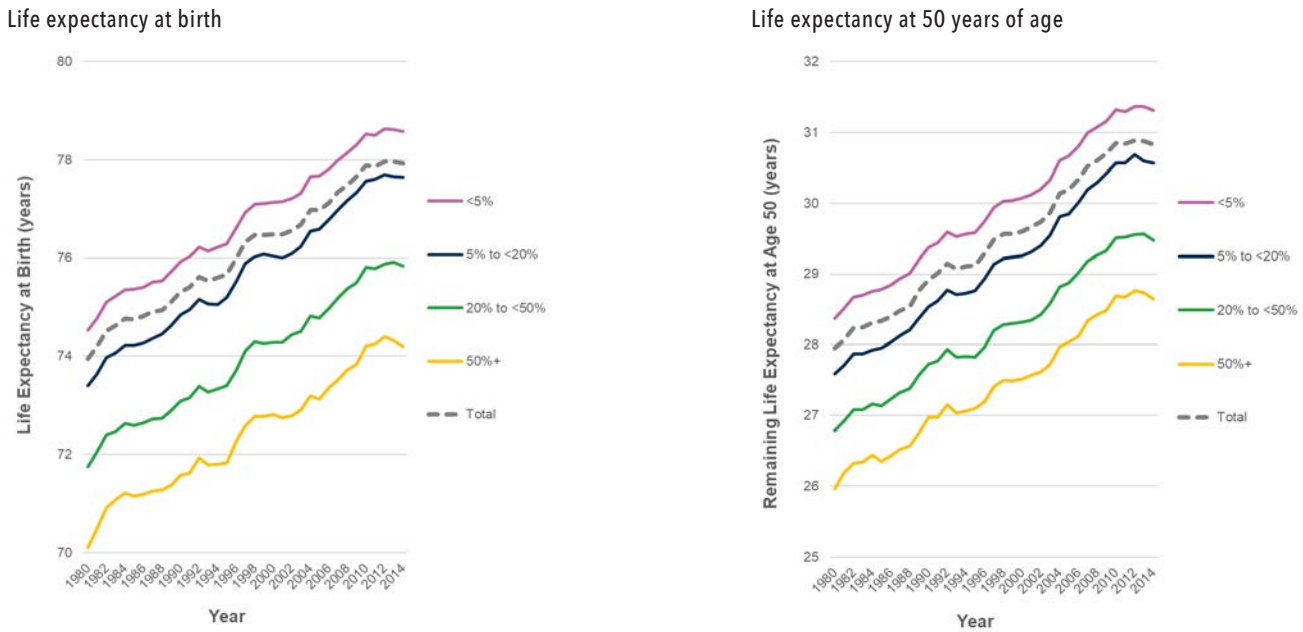
The impact of systemic disparities can be seen in the disparities in deaths due to COVID-19. While Black people comprise 13% of the U.S. population, the 20% of U.S. counties in which greater than 13% of the residents were Black accounted for 52% of COVID-19 diagnoses and 58% of COVID-19 deaths nationally.²³ Discrimination, including discrimination in health care, housing, education, criminal justice and finance, is one of the reasons identified by the Center for Disease Control and Prevention (CDC) for existing disparities in COVID-19 deaths. These racial disparities underlie many of the geographic disparities we find between counties.

By stratifying the nation's 3,110 counties by the percentage of the residents that identified as Black, we see that racial disparities for life expectancy at age 50 are contributing to the story of geographic disparities. As part of the new analysis, IHME combined its data on deaths with over the 35 years of data on race compiled by the CDC National Center for Health Statistics. The results in Figure 12 show persistent disparities in life expectancy at age 50 among counties, especially when

comparing the 1,908 counties comprised of less than 5% Black residents to the 100 counties where the majority of residents (50% and greater) were Black.

Figure 12 and Table 3 show that while counties with high and low percentages of Black residents experienced increases in life expectancy at age 50 from 1980 to 2014, there were stark, absolute differences that the observed progress in life expectancy never corrected. The counties comprised of less than 5% Black residents experienced an increase in median life expectancy at age 50 of 2.9 years, rising from 28.4 additional years (age 78.4) to 31.3 additional years (age 81.3). The 100 counties where the majority of the population were Black residents experienced a similar increase in median life expectancy of 2.8 years. However, the Black-majority counties started in 1980 with a much lower median life expectancy at age 50 with 26.0 additional years (age 76), increasing to 28.6 additional years (age 78.6) in 2014. While the Black-majority counties experienced a similar increase in median life expectancy at age 50 from 1980 to 2014 to the counties with less than 5% Black residents, this increase nevertheless meant that it wasn't until 2008 that the Black-majority counties achieved the life expectancy at age 50 enjoyed by counties with less than 5% Black residents in 1980. If we are to realize equity in life expectancy in the United States, counties with higher levels of Black residents must experience greater increases to life expectancy than the national average in order for them to reach equity.

Figure 12. Change in Life Expectancy by County stratified by percentage of Black residents 1980 to 2014



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Table 3: Median life expectancy between 1980 and 2014 for U.S. counties stratified by the percentage of the population that are Black

Counties by Percent Population Black	Median Life Expectancy at birth in 1980	Median Life Expectancy at birth in 2014	Median remaining Life Expectancy at age 50 in 1980	Median remaining Life Expectancy at age 50 in 2014
<5% (n = 1,908)	74.5 years	78.6 years	28.4 years	31.3 years
5% to <20% (n = 683)	73.4 years	77.6 years	27.6 years	30.6 years
20% to <50% (n = 419)	71.7 years	75.8 years	26.8 years	29.5 years
50%+ (n = 100)	70.1 years	74.2 years	26.0 years	28.6 years

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The data available for Asian Americans, Native Hawaiians/Pacific Islanders, American Indians and Alaskan Natives is more limited in the 1980s. Future reports will include state-level analyses and

will include additional analyses of Latinos, Native American and Asian American residents.



Causes of Changes in Geographic Inequality and Life Expectancy

The increased disparities in life expectancy at the county level measured between 1980 and 2014 may be linked to the rising levels of economic inequality that occurred during the time period studied. A 2015 National Academies of Science, Engineering and Medicine Consensus Report, *The Growing Gap in Life Expectancy by Income*, found that income inequality has risen noticeably in the United States over the past three decades prior to 2015. This study found that from 1990 to 2010, the gap in life expectancy between higher-income individuals and those lower on the socioeconomic distribution has been expanding. In 1980, the richest fifth of American men at age 65 could expect to live 3.4 years longer than the poorest fifth, and by 2010, this gap had risen to 6.2 years, an increase of 2.8 years.²⁴

It is possible that geographic disparities in life expectancy have increased due to increased economic inequality as well as related policies or social trends starting in the mid-1980s that increased the impact of economic inequality on life expectancy. An analysis of Social Security Administration data and death records by Harvard economist Raj Chetty and his team concluded that between 2001 and 2014, individuals in the top 1% of income distribution gained around three years of life expectancy, whereas individuals in the bottom 1% experienced no gains. This study also showed that life expectancy varied by location as measured by "commuting zones."²⁵ Using data that begins in 1980, we further show that these geographic disparities in life expectancy began to increase in the mid-1980s.

The impact of increasing disparities on life expectancy could be even greater than the data initially reveal. Notably, the observed overall increase in life expectancy between 1980 and 2014 is due in large part to a 44% decrease in the mortality rate from cardiovascular diseases, the single largest cause of death category for older adults. This dramatic decrease in an important specific cause of mortality may have obscured social determinants of health, such as the rising impact of economic inequality and racism, on life expectancy.

From 2015 to 2017, life expectancy fell in the United States for three years, resulting in flat life expectancy gains for the decade starting in 2010. A major contributor has been an increase in mortality from specific causes (e.g., drug overdoses, suicides, organ system diseases) among young and middle-aged adults of all racial groups.²⁶ This increase in mortality at midlife has been described as "Deaths of Despair" and has been linked to rising economic inequality affecting multiple generations of Americans with a high school education or less.²⁷ This report captures the beginnings of this trend. From 1980 to 2014, mortality from mental health diagnoses and substance use disorders among older adults increased by nearly 150%, with mortality risk specifically due to drug use disorders among adults 50 and older increasing more than 10-fold and mortality risk due to alcohol use disorders increasing by 10%.

More recently, we have seen increased risk of infection and death by COVID-19 for Black Americans, which may "reflect and compound longstanding underlying social, economic and health inequities that stem from structural and systemic barriers across sectors, including race discrimination."²⁸ Additionally, historical discrimination in employment with increased

occupational risk, inequities across educational, income and wealth gaps and historical discrimination in housing have also increased the risk of exposure to COVID-19 with subsequently higher rates of infections and deaths.²⁹

The COVID-19 pandemic is likely to reduce life expectancy as measured by remaining years at age 50. While serious risk of death from COVID-19 is more closely linked to certain chronic diseases, these specific disease risk factors are more common as people age.³⁰ COVID-19 is now the third leading cause of death in the United States after cardiovascular disease and cancer.³¹ As of September 2020, the current IHME projections for COVID-19 deaths in the U.S. is just over 400,000. Researchers calculated that 250,000 deaths would reduce lifespans by about a year, which would further extend the stagnation of life expectancy in the United States.³²

Research Conclusions

While life expectancy at age 50 rose overall between 1980 and 2014, geographic disparities in life expectancy increased. Between 1980 and 2014, life expectancy at age 50 increased in the best-performing county by 5.6 years. In that same time period, life expectancy at age 50 in the worst-performing county rose only by 2.4 years. This means that disparity in life expectancy at age 50 between the best- and worst-performing counties grew from 1980 to 2014 by 3.2 years.

Racial disparities underlie many of the geographic disparities we find between counties. While the Black-majority counties experienced an increase in life expectancy during this time period similar to the counties with less than 5% Black residents, Black-majority counties took nearly three decades, until 2008, to reach the same level of life expectancy at age 50 as counties with less than 5% Black residents in 1980. If we are to achieve equity in life expectancy, counties with higher levels of Black residents need to make greater increases to life expectancy than the national average.

Economic and racial inequality may share many of the root causes of the life expectancy stagnation we have experienced over the past decade, and this rising inequality has amplified the impact of the COVID-19 pandemic. The racial and economic disparities that are fueling the death toll of the coronavirus pandemic have been with us for decades, and these disparities have actually grown for at least two decades starting in the mid-1980s. The growth of the disparities in life expectancy has been partially obscured by the drop in cardiovascular mortality that has in part driven rising life expectancies until 2014. Yet the cumulated cost of racial and

economic disparities have also grown, with decreases in U.S. life expectancy from 2015 to 2017 and, even more recently, the glaring disparities of the current COVID-19 pandemic. Just as the medical advancements that led to the dramatic reduction in cardiovascular death failed to correct existing disparities in the two decades following the mid-1980s, we cannot rely solely on COVID-19 vaccines and treatments to address the disproportionate cost of the pandemic on Black communities.

Moreover, the new research we present in this report regarding how geographic disparities affect people throughout their life course underscores that individuals in their 40s and 50s (Generation X), and Millennials, who begin to turn 50 in 2031, are at critical stages of their lives in determining their health spans. Ultimately, a societal embracing of equity—specifically the understanding that as the potential for longevity increases, so does the importance of addressing disparities—will provide more people the opportunity to live healthier, longer lives.





The Road Ahead

As we confront the current coronavirus pandemic, we need to address the root causes of the disparities in deaths of Black Americans, Latinos and Native Americans. This will require us to correct the racial and economic disparities that increased geographic disparities in life expectancy at midlife. Successful solutions will require interventions at the national, state and local levels that address both the challenges and opportunities of aging societies. Achieving equity will require the public, non-profit and private sectors to expose and address the growing inequities across the lifespan that impact life expectancy in the following ways.

1. Creating strategies and action plans that engage the public, non-profit and private sectors at the state and local level

The longstanding history of growing disparities at the county level requires that we work collectively across all levels and all sectors of society to expose and address the growing inequities across the lifespan that impact life expectancy. National and local leadership must address the underlying chronic problems that lead to disparities that inhibit people's ability to live longer and healthier lives. In fact, several states and cities are moving in this direction. Many states have created task forces to examine the impacts of COVID-19 and health disparities. Ohio, for example, formed the Minority Health Strike Force after early data showed that 21% of individuals who tested positive for COVID-19 were the Black residents who comprise 14% of Ohio's population. Louisiana created the COVID-19 Health Equity Task Force to address racial disparities related to the COVID-19 pandemic and identify possible solutions for curbing the high rate of deaths within the state's Black community and other affected populations.

Chicago, one of the largest jurisdictions in the United States, created a new Office of Equity and Racial Justice and hired a new chief equity officer whose job it is to address systematic disparities and look at the outcomes, practices and services of different departments within the city in order to combat pervasive inequity. This is a new cabinet-level position with the primary goal of examining systemic disparities that exist in the city and identifying policies to help correct those racial disparities.³³

Engaging the private sector is essential, and in fact promoting health equity makes good business sense. Health inequities pose a heavy economic burden on our nation as our country grows more diverse. While addressing the underlying causes of the disparities we see in the COVID-19 pandemic will require economic investments, a 2018 W.K. Kellogg Foundation report³⁴ conducted by Altarum provides a business case for racial equity. The report calculates that we have lost 3.5 million life years due to racial inequities, with an economic cost of \$175 billion from these disparities in lifespan. The report further quantifies the untapped productivity due to health disparities at \$42 billion in 2018, and concludes that by 2050, the U.S. could realize an \$8 trillion gain in GDP by closing the U.S. racial equity gap.

For these reasons—and the fact that people of color will soon represent the majority of the country's population, workforce and consumers³⁵—it is imperative that policymakers invest now in comprehensive strategies to promote health equity. Such efforts will ensure that the nation's changing demographic makeup is "disruptive" only in the most positive sense. On the private-sector side, it is important to make the business case for creating healthier communities.

2. Ensuring equity in public health and health care

The 2003 Institute of Medicine Report (now National Academy of Medicine, or NAM), *Confronting Racial and Ethnic Disparities in Healthcare* (Confronting Racial and Ethnic Disparities), identified that “racial and ethnic minorities tend to receive a lower quality of health care than non-minorities.” People who are racial and ethnic minorities may also experience a range of other barriers to accessing care, even when insured at the same level as white people, including barriers of language, geography and cultural familiarity.³⁶ These barriers identified in 2003 continue to contribute to health disparities today, including the disparate impact of the coronavirus pandemic.

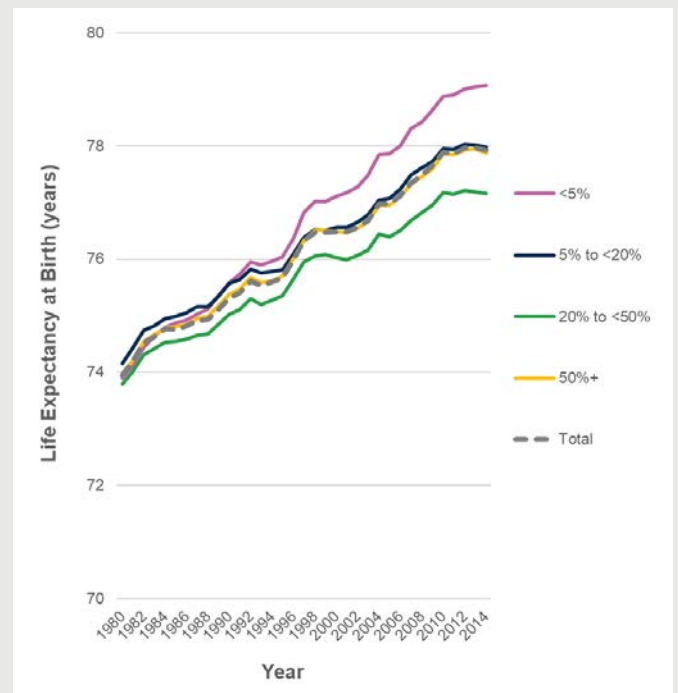
The COVID-19 pandemic has demonstrated how people of color have had less access to health services.³⁷ Ensuring that there is equitable access to interventions such as safe and effective vaccinations or therapeutic interventions for COVID-19 could help to mitigate many of the existing disparities in COVID-19 illnesses and deaths. If better-resourced communities have access to the newest treatments and vaccines while communities with more people of color are experiencing disproportionate deaths, disparities in COVID-19 deaths could increase or remain. We must instead make sure that any new treatments and vaccines be deployed with the intention to achieve equity. *Confronting Racial and Ethnic Disparities* identified the need for culturally appropriate education programs to improve the public’s knowledge of how to access care and their ability to make the best medical decisions for themselves and their families.

Once safe and effective interventions are available for COVID-19, national and local communications strategies will need to support health literacy and address existing suspicion of the medical establishment that is a result of negative personal experiences. In the Black community there are additional longstanding suspicions resulting from and a history of unethical research, such as the infamous 40-year Tuskegee Study of Untreated Syphilis.³⁸ A successful educational campaign could utilize trusted sources, including health professionals, as messengers. It will also require micro-targeted messaging, such as in-language toolkits that community health workers can share with populations hesitant to receive a vaccine or treatment.

The onus for health literacy lies with public health and medical providers, due to the power differential in health care relationships. The American Medical Association Board of Trustees recognized in July 2020 that “racism in its systemic, structural, institutional and interpersonal forms is an urgent threat to public health, the advancement of health equity and a barrier to excellence in the delivery of medical care.”³⁹

Confronting Racial and Ethnic Disparities recommended that cross-cultural curricula should be integrated early into the training of future health care providers, and practical, case-based, rigorously evaluated training should persist through practitioner continuing education programs. Finally, explicit and implicit biases in the provision of health care need to be addressed, along with the implementation of focused programs that lead to the goal of equitable outcomes.

Rural and Urban Life Expectancy



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Figure 13 Median change in life expectancy by percentage of rural households in the county (1980-2014)

Figure 13 shows that disparities between urban and rural counties did not exist in 1980, and only started to emerge in 2000 when the most urban counties experienced greater increases in life expectancy. It should be noted that counties that are at least 80% rural in household representation have had consistently greater life expectancy than those with 50% to 80% rural households. Further analysis is needed to understand how county level urban/rural composition and life expectancy intersect with poverty, race and ethnicity.

3. Addressing workforce shortage in underserved areas

Addressing local health care workforce shortages should be part of a larger realignment of health care resources to address disparities in life expectancy. Creating and/or enhancing incentives—such as education loan repayment or debt forgiveness—to encourage health care professionals to establish practices in underserved communities can be an important strategy to balance the distribution of health care providers in underserved urban and rural areas. Low-income and minority communities often have the most pressing need for health care services, but they are served by a dwindling number of providers and institutions that lack resources to expand and improve services. State and federal governments have attempted to address this imbalance by providing incentives such as funds for graduate medical education programs in both urban and rural communities.

The National Health Service Corps is a federal program that awards scholarships to students training to be health care workers and pays the school loans for current primary health care workers in underserved communities in many urban centers. These solutions address the geographic maldistribution of health care services that likely contributes to geographic disparities in life expectancy. The problems they address are, in part, the by-product of residential segregation and economic pressures that reward the concentration of services in outer suburbs and wealthier communities, while creating disincentives for practicing in urban centers and rural areas. These communities are disproportionately designated as “Health Professional Shortage Areas” and medically underserved areas, meaning they lack sufficient geographic and financial access to appropriate care. Federal funding should prioritize investment in cost-efficient primary care, especially as many people have experienced disrupted preventive health services during the COVID-19 pandemic. The University of Washington School of Medicine WWAMI Regional Medical Education Program is an example of a multi-state partnership in the western U.S. that serves the states of Washington, Wyoming, Alaska, Montana and Idaho (hence the acronym “WWAMI”). The program provides UW medical students training at a range of clinical training settings, from a Level I trauma center in Seattle, WA, to a small primary care clinic in Libby, MT, to facilities in Anchorage, AK working with Alaska Natives.⁴⁰

4. Investing in older workers, as healthy longevity requires economic security

As we seek to build a more equitable society, we must address the financial inequities faced by low-wage workers (who are disproportionately people of color). We see that

historically sustained increases in life expectancy have been accompanied by increases in lifespan equity. By contrast, starting in the mid-1980s, in the U.S. the growing geographic disparities in life expectancy at midlife from 1980 to 2014 have been followed by three years of declines in life expectancy and the tragic disparities in COVID-19 deaths. The existing economic disparities faced by older low-wage workers have been exacerbated by recent layoffs and an awareness that it will likely take them longer to recover from a job loss. Older workers in particular often face longer spells of unemployment than younger workers, as well as age discrimination. The Joint Center for Political and Economic Studies Future of Work program is engaged in a project on the Future of Work in the Black rural South⁴¹ that combines a geographic and cultural focus in seeking to identify occupations for which older Black workers are both overrepresented and at risk of future work displacement. The Center has also developed “career ladders” to empower low-wage workers in fields such as home care with the opportunity to advance their career trajectories as they age through fields like nursing. Most low-wage older workers have little to no savings to fall back on⁴², which elevates the need to preserve programs such as Social Security, develop and expand programs that support emergency savings accounts and consider state government-sponsored retirement contribution plans that are accessible to low-wage workers.

5. Supporting physical activity and food security

Where you live affects your ability to eat nutritious foods, play and exercise, all of which have a tremendous influence on health and longevity. Empowering residents to establish healthy behaviors—from exercising regularly to eating well-rounded, nutritious meals—will also help address geographic disparities. Families and children who live in lower-income communities of color have less access to green spaces and recreational facilities than those in higher-income or predominately White communities.^{43,44} This is particularly important as the COVID-19 pandemic has elevated the appeal of outdoor recreation. Closing the disparities gap moving forward is, therefore, critical. Initiatives from various sectors can address these issues.

- To promote healthy living and reduce health disparities through physical activity, AARP sponsored Outdoor Fitness Parks organized by FitLot. These outdoor fitness parks are designed for adaptive use by people with a wide range of abilities and exercise needs. Thus far, AARP has opened 28 outdoor fitness parks and will open an additional 28 outdoor fitness parks by the end of 2021. Accompanying each open and future park will be a grant to activate the fitness park, permitting municipalities to offer a minimum of 54 instructor-led courses each year over the next three years.



- Access to nutritious food is also an issue for lower-income communities. Well before the COVID-19 pandemic became a national emergency, millions of older Americans were already food insecure—meaning they skipped meals, did not eat balanced diets, cut food portions or sometimes even went hungry because they could not afford food. The Supplemental Nutrition Assistance Program (SNAP)—the federal program that provides extra resources for food to eligible low-income people—is more crucial now than ever. Additional cross-sector efforts to improve access to healthy food options by making changes to the retail food environment are also needed. One example is Elderly Simplified Application Project (ESAP), a simplified SNAP application for older New Yorkers, while another is New York’s Food Retail Expansion to Support Health (FRESH) program, which provides zoning and financial incentives to promote the establishment and retention of neighborhood grocery stores in underserved communities throughout the five boroughs.⁴⁵

6. Investing in an age-friendly framework for neighborhoods to meet the needs of all generations

Neighborhoods in counties where residents are experiencing geographic disparities in life expectancy can benefit from the adoption of policies and programs aimed at creating livable communities that address the social determinants of health of residents of all ages. For example, communities should have a variety of supportive housing options that are affordable and can be adapted to the needs of residents as they age, enable access to quality health care and nutritious food options, be walkable, feature transportation options and provide opportunities for people of all ages to interact and participate through employment, volunteerism and play.

- Tools like the AARP Livability Index can be used to identify specific needs in counties experiencing disparities in life expectancy. This web-based tool measures the degree to which a community has the elements necessary to meet individuals’ needs regardless of their age, income, physical ability, ethnicity and other factors. The Index can help local decision makers gauge the gaps between what the community offers and what residents need, and can help inform policy development, new initiatives and community participation to improve the quality of life for community residents.⁴⁶ AARP’s Livable Communities webpage contains numerous additional tools communities as well as individual residents can use to improve their homes’ and community’s livability.⁴⁷
- The AARP Network of Age-Friendly States and Communities is an independent affiliate of the World Health Organization Global Network for Age-Friendly Cities and Communities.

The network encourages states, cities, counties, towns and rural areas to prepare for the rapid aging of the U.S. population by paying increased attention to the physical and social factors that influence the health and well-being of older adults. The common thread among the 470 communities, six states and one U.S. territory is the belief that neighborhoods are more livable and better able to support people of all ages when local leaders commit to continually improving the quality of life for the very young, the very old and everyone in between.

7. Planning housing and communities for longer lifespans

To achieve equity in the future, we must build housing and create communities that are safe and affordable for all, while also facilitating multigenerational interaction. Housing and communities should be designed for the hundred-year life so that they enable people at different functional levels across the lifespan and allow people to age in their homes or communities for as long as possible. The Here to Stay: Home Upkeep for All program was developed by the AARP Foundation, in collaboration with The Hartford, to provide cost-effective home-maintenance tips and resources that make it easier for older adults to continue to live comfortably at home as they grow older. The goal is to make home safe, affordable and healthy for a lifetime. The program features an interactive assessment tool and directory of local providers, a toolkit with budgeting tips, cost estimates, how-to guides, advice on getting affordable help and other topics, and a series of home maintenance and repair workshops.

Since Here to Stay: Home Upkeep for All launched in June 2019, the program has served more than 16,000 people and held workshops in California, Florida and Maryland, with plans to expand to Kansas, Michigan, South Carolina and Wisconsin. Another way to help people remain in their communities as they age is to include recreational as well as rehabilitation centers and other post-acute care settings within those communities. For example, the Emeryville Center of Community Life (ECCL) in Emeryville, CA, has been called an urban version of the old town square, a place where all members of the community, regardless of age or economic background, come together for social, educational and recreational activities. The center houses the city's elementary school, intermediate school and high school, community services offices, a "lifelong medical care" center and dental clinic, all of which are near the Emeryville's senior center. Remediation and revitalization enabled the city to transform the land from manufacturing to housing, retail and office space with extensive transit options for lower-income and older residents.

Post-COVID-19 we must invest in creating livable communities where there are currently high levels of disparities, and facilitate health and well-being for people of all ages, fostering regular engagements between older and younger residents in shared public spaces that allow people to remain a part of the life of their communities as they age.

8. Ensuring access to broadband and technology innovation for all communities

We must ensure that any medical, financial and technological responses developed and deployed in response to the COVID-19 pandemic do not exacerbate inequity. Given that people with the greatest access are likely to be the initial adopters of new products and technologies, we must strive for equity of outcomes, which may require interventions that disproportionately target resources to communities at the greatest risk. For example, an AARP report *Disrupting Disparities: the continuum of care for Michiganders 50 and older*⁴⁸ found that about a third (31.8%) of the older adults surveyed by AARP are interested in using telehealth—such as a video call—to communicate with their primary health care providers or specialists. Additionally, 39% would be interested in using remote patient monitoring to track key health information that could be transmitted to a provider. The barriers that were identified in this 2019 report include a lack of awareness about telehealth, privacy concerns, lack of computer savvy among some older individuals and fear that telehealth might eliminate the opportunity to have an in-person visit with a provider. Now, with the pandemic-related disruption of in-person preventive care, barriers to telehealth that were an inconvenience could now represent ongoing barriers to accessing certain types of medical services such as mental health care.

Nearly 40 million households lack a quality connection, cutting them off from work, school and social connections,⁴⁹ and the digital divide is even greater for Black households. According to the Pew Research Center, only 66% of Black Households have broadband as compared to 79% of white households.⁵⁰ Recent research shows that smartphones have enabled more Black and Hispanic individuals to go online, yet the older adult population continues to lag.⁵¹ The pandemic has resulted in a greater reliance on technology among older adults; the percentage of older adults who had ever participated in a telehealth visit rose sharply from 4% in May 2019 to 30% in June 2020.⁵² However, physical access and affordability remain obstacles, which further elevates the need for collaborations that make sure that Black and Latino communities have access to technologies that can improve their health outcomes and lessen the longevity gap. Efforts to evaluate the availability of

broadband and fiber optic service, and expand the availability of these high-speed internet options could address both the rising importance of and rising disparities in access to broadband and technology innovation.

9. Impacted communities must have a voice in the solutions to problems

Successful interventions that lead to equity in life expectancy will need to empower the communities in counties where disparities exist. As mentioned above, building trust is especially critical in getting widespread acceptance of a COVID-19 vaccine, when vaccinations become available. In the philanthropy sphere, organizations should integrate affected community members into their strategy development process. The Robin Hood Foundation has a Design Insight Group⁵³ of about 1,400 people living in poverty in New York City who are paid members of the grant-making team. They make funding decisions along with program experts, data analysts and the organization's leaders.

Another important issue in urban settings is gentrification and displacement, which can deprive current residents of benefiting from investments in their communities and contribute to geographic disparities. Leaders in New York, for example, have proposed a statewide law modeled on New York City's "Right to Counsel" law that guarantees legal representation in court to low- and moderate-income tenants facing unwarranted evictions, which is even more important during the coronavirus pandemic. In order to address both the legacy of historic and ongoing discrimination in real estate, community advocates are encouraging inclusionary zoning,

property tax exemptions and Community Land Trusts (CLTs), including a first right of refusal to CLTs in the sale of publicly owned land in New York City. Another proposal is to allocate funding for the state's 2007 Community Development Financial Institutions (CDFI) Fund to invest in low- and moderate-income neighborhoods not adequately served by mainstream banks. (CDFIs are pivotal to providing sound, affordable loans and other responsible financial products and services to people and communities of color, immigrants and small businesses.) Other proposals include preserving and expanding limited equity co-ops to encourage affordable homeownership and undertaking a housing needs assessment to identify regional and neighborhood needs, particularly for older, low-income residents.⁵⁴

In summary, it is our collective responsibility to not return to the status quo of pre-pandemic times, since opportunities to live longer healthier lives were not shared equally. Now is the time to work collectively across all of America—and across all levels of government and the non-profit and private sectors—to expose and address the growing inequities across the lifespan that impact life expectancy. It is a matter of life and death.

We are very grateful to the Institute for Health Metrics and Evaluation for ongoing support and analysis. In particular, we would like to thank Kate Gillespie and Zachary Jones.



Appendix - Methods

We obtained our estimates of county level life expectancy and mortality risk from the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, which produced these estimates using the methods described below. A detailed explanation of the modeling framework used to generate the estimates used in this report was published by Dwyer-Lindgren et al. (2016).⁵⁵

Data inputs and data processing

This analysis of county-level life expectancy and mortality risk is based on de-identified death registration data from the National Vital Statistics System (provided by the National Center for Health Statistics [NCHS]). Specifically, we extracted data on all 80,412,524 deaths that occurred within the United States from January 1, 1980, through December 31, 2014, including the age, sex, and county of residence at the time of death for each decedent, as well as the registered underlying cause of death, with ICD9 codes for deaths prior to 1999 and ICD10 codes for deaths that occurred in 1999 or later. To produce accurate estimates of cause-specific mortality risk, we used validated redistribution methods to recapture mortality data that would have been lost to so-called garbage coding, the practice of assigning to death certificates implausible or non-specific cause of death codes, including potentially non-informative mechanisms of mortality (e.g., cardiopulmonary arrest) rather than underlying disease codes (e.g., congestive heart failure). The proportion of registered deaths that are assigned garbage codes varies by county, year, and true underlying cause, and failure to appropriately redistribute these deaths could lead to erroneous conclusions about geographic patterns, time trends, and the relative burden of different causes of death.

We obtained population count data from the US Census Bureau (1980–1989)⁵⁶ and NCHS (1990–2014)^{57, 58, 59} and produced a time series covering 1980 through 2014, scaled to match the total population in each year provided by the Human Mortality Database.⁶⁰

County-level estimates of population by race (White, Black, and non-White/non-Black) were derived from self-reported race data compiled by the US Census Bureau (1980-1989)⁶¹ and NCHS (1990-2014)^{62, 63, 64}. County-level estimates of Hispanic ethnicity were derived from the US Census Bureau (1980)⁶⁵ and NCHS (1990-2014)^{66, 67, 68}. Linear interpolation was used to fill in any intermediate years between data sources. The percent of households in a county classified as rural was derived from US Census data (1980, 1990, 2000, and 2010).

Modeling framework

Using the death and population count data, we constructed life tables for each county using small area estimation methods to derive stable estimates of life expectancy and mortality rates for each subpopulation by age and sex. Specifically, we used Bayesian spatially explicit mixed-effects regression models to smooth mortality rates over space, time, and age. In addition to borrowing information over space, time, and age, these models incorporated seven county-level sociodemographic covariates⁶⁹ measured well at the county level and expected to be predictive of county-level mortality (i.e., measures of educational attainment, income, race/ethnicity, Native American reservations, and population density). These measures were derived from a range of sources including the US Census Bureau, American Community Survey, Census Small Area Income and Poverty Estimates, and the Bureau of Labor Statistics.^{70, 71, 72} This modeling approach allowed us to simultaneously incorporate information on geographic spatial patterns, time, and age associations, and relevant population-level covariates to achieve valid cause-specific mortality rate estimates without pooling data

across years for counties with small sample sizes.

We produced 1,000 draws (i.e., simulated values) of each model parameter sampled from the posterior distribution to derive 1,000 estimates of the mortality rate for each county, year, and age group. We report the mean value of these draws as the point estimates for each quantity of interest. We also produced 95% uncertainty intervals for each estimate, representing the 2.5th and 97.5th percentiles of the draws.

We raked estimates (scaled along multiple dimensions) to ensure consistency between county-level estimates of all-cause mortality and cause-specific mortality. We also ensured that the population weighted average of the county-level mortality rates was equal to the national-level mortality rate for each cause.

These small area estimation techniques yielded unbiased county-level summary measures of cause-specific mortality rates across the United States and estimates of temporal trends in these rates. Standard demographic methods were then used to construct period life tables for each county and year from the age-specific mortality rates estimated by the small area model. Life expectancy at birth and age 50, and probability of death for specific age groups were extracted from these life tables. State- and national-level estimates were produced by aggregating age-specific mortality rates at the county level using population weighting.

All analyses were carried out at the county level. In a small number of cases, county boundaries shifted between 1980 and 2014. To account for these changes, we merged several counties to create historically stable units of analysis (a total of 3,156 unique counties were collapsed to 3,110 historically stable county units (Table 4).

We estimated life expectancy at birth and remaining life expectancy at age 50, as well as all-cause and cause-specific mortality risk for the following age groups: 0-17, 18-49, 50-64, 65-74, 75+, and 50+. All estimates were produced by sex (males, females, and both sexes combined) and for each year across a 35-year times series (1980–2014).

Table 4. List of counties combined to ensure historically stable units of analysis⁷³

State	Group	Areas
Alaska	1	Kusilvak Census Area (2158), Wade Hampton Census Area (2270)*
	2	Kobuk Census Area (2140)*, Northwest Arctic Borough (2188)
	3	Aleutian Islands Census Area (2010)*, Aleutians East Borough (2013), Aleutians West Census Area (2016)
	4	Dillingham Census Area (2070), Lake and Peninsula Borough (2164)
	5	Denali Borough (2068), Yukon-Koyukuk Census Area (2290)
	6	Hoonah-Angoon Census Area (2105), Skagway Municipality (2230), Skagway-Yakutat-Angoon Census Area (2231)*, Skagway-Hoonah-Angoon Census Area (2232)*, Yakutat City and Borough (2282)
	7	Ketchikan Gateway Borough (2130), Petersburg Borough (2195), Prince of Wales-Hyder Census Area (2198), Prince of Wales-Outer Ketchikan Census Area (2201)*, Wrangell City and Borough (2275), Wrangell-Petersburg Census Area (2280)*
Arizona	1	La Paz County (4012), Yuma County (4027)
Colorado	1	Adams County (8001), Arapahoe County (8005), Boulder County (8013), Broomfield County (8014), Denver County (8031), Jefferson County (8059), Weld County (8123)
Florida	1	Dade County (12025)*, Miami-Dade County (12086)
Hawaii	1	Kalawao County (15005), Maui County (15009)
Maryland	1	Montgomery County (24031), Prince George's County (24033)
Montana	1	Park County (30067), Yellowstone National Park (30113)*
New Mexico	1	Cibola County (35006), Valencia County (35061)
South Dakota	1	Oglala Lakota County (46102), Shannon County (46113)*
	2	Jackson County (46071), Washabaugh County (46131)*
Virginia	1	Fairfax County (51059), Fairfax City (51600)
	2	Rockingham County (51165), Harrisonburg City (51660)
	3	James City County (51095), Williamsburg City (51830)
	4	Prince William County (51153), Manassas City (51683), Manassas Park City (51685)
	5	Rockbridge County (51163), Buena Vista City (51530)
	6	Spotsylvania County (51177), Fredericksburg City (51630)
	7	Augusta County (51015), Staunton City (51790), Waynesboro City (51820)
	8	Pittsylvania County (51143), Danville City (51590)
	9	Greensville County (51081), Emporia City (51595)
	10	Albemarle County (51003), Charlottesville City (51540)
	11	Bedford County (51019), Bedford City (51515)*
	12	Halifax County (51083), South Boston City (51780)*
	13	Southampton County (51175), Franklin City (51620)
	14	Alleghany County (51005), Clifton Forge City (51560)*
	15	York County (51199), Newport News City (51700)

*County no longer exists due to boundary or name change.

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