Institute for Health
Metrics and Evaluation

Current state of health in the US

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Chief Strategy Officer, Population Health
University of Washington

History of IHME

2007	Founded as an independent institute of excellence in health measurement, with initial funding from BMGF and the State of Washington, IHME began with a core team of three members.
2017	IHME received the Global Public Goods grant of $279 million from the Bill & Melinda Gates Foundation to provide a foundation for work in several key research and institutional areas.
2022	IHME celebrated its 15-year anniversary with a FY23 fiscal budget of $85M and workforce of nearly 500 faculty, staff, students, and fellows.

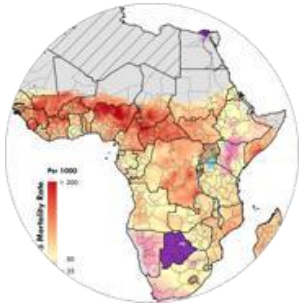
IHME's research

Global Burden of Disease

The Global Burden of Disease (GBD) provides a comprehensive and comparable picture of mortality and disability across countries, time, age, and sex. It quantifies health loss from hundreds of diseases, injuries, and risk factors, so that health systems can be improved and disparities eliminated.

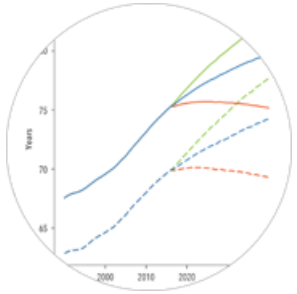
Financing Global Health

IHME reports patterns of global health financing flows from 1990 to 2050 with development assistance for health (DAH) levels and changes over time by source, channel, recipient region, and health focus and program area. DAH disbursed or received by population, disability-adjusted life years, gross domestic product, and government health spending are available.



Local and Small Area Estimation (LSAE)

The Local and SmallArea Estimation (LSAE) project produces estimates of selected health outcomes and related measures at a more granular resolution, measuring health outcomes and related measures that cover entire continents, combining local detail with broad coverage.



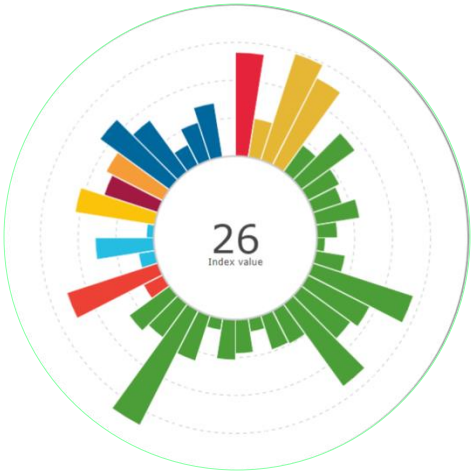
Future Health Scenarios

Forecasts the global burden of disease, using GBD estimates of more than 370 diseases and injuries, more than 80 risk factors, sociodemographic indicators and other drivers of health. These forecasts provide policymakers, donors, researchers and the general public with high-quality forecasts and custom scenarios in order to assess the impact of new policies, interventions or technologies on health.

Antimicrobial Resistance

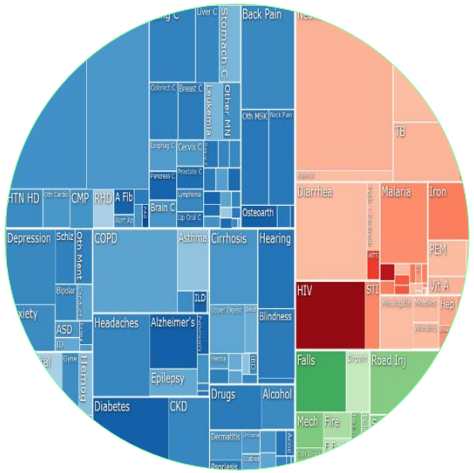
IHME conducts research on AMR as part of a global initiative called the Global Research on Antimicrobial Resistance (GRAM) Project. We estimated deaths and disability-adjusted life years associated with and attributable to bacterial AMR for 23 pathogens and 88 pathogen-drug combinations in 204 countries and territories.

IHME data track progress toward SDGs, socio-demographic impact on burden, Human Capital Index, and Health access and quality



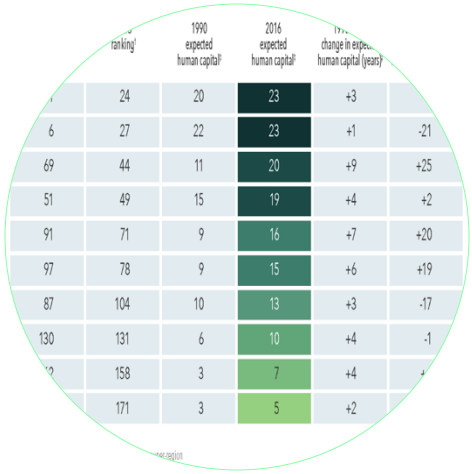
Progress toward achieving the Sustainable Development Goals

IHME measures progress toward achieving the United Nations Sustainable Development Goals (SDGs) for 195 countries and territories toward 41 health-related SDG indicators and where they might stand in 2030 on the basis of past trends.



Measure geographies on a spectrum of development

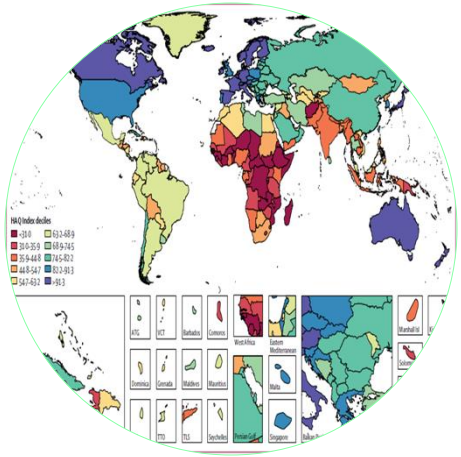
IHME's SDI summary measure identifies a geography's socio-demographic development. SDI contains an interpretable scale: zero represents the lowest income per capita, lowest educational attainment, and highest total fertility rate. SDI values are available for GBD geographies and groupings.



ranking	1990 expected human capital	2016 expected human capital	change in expected human capital (years)	
	24	20	23	+3	
6	27	22	23	+1	-21
69	44	11	20	+9	+25
51	49	15	19	+4	+2
91	71	9	16	+7	+20
97	78	9	15	+6	+19
87	104	10	13	+3	-17
130	131	6	10	+4	-1
	158	3	7	+4	
	171	3	5	+2	

Internationally comparable index of human capital

IHME's Human Capital Index offers a measure of expected human capital that incorporates educational attainment, education quality or learning, functional health status, and survival for 195 countries from 1990 to 2016.



Health care access and quality

The Healthcare Access and Quality (HAQ) Index is a summary measure based on 32 causes that in the presence of high-quality health care should not result in death. IHME reports HAQ for 195 countries and at the subnational level for some.

What is the GBD?

- GBD study is a systematic, scientific effort to quantify the magnitude of all major diseases, risk factors and intermediate clinical outcomes.
- **“Rules-based evidence synthesis for global health”**
- The first GBD study began in 1991 for eight regions 106 conditions and ten risk factors, 5 age groups for the year 1990.
- The GBD 2021 estimates for each year from 1990 to the present for 371 diseases and injuries, as well as 3,499 clinical outcomes (sequelae) related to those diseases and injuries, for 204 countries and territories and for subnational units in 21 countries.

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The Global Burden of Disease Study at 30 years

Christopher J. L. Murray[1,2]

The Global Burden of Disease Study (GBD) began 30 years ago with the goal of providing timely, valid and relevant assessments of critical health outcomes. Over this period, the GBD has become progressively more granular. The latest iteration provides assessments of thousands of outcomes for diseases, injuries and risk factors in more than 200 countries and territories and at the subnational level in more than 20 countries. The GBD is now produced by an active collaboration of over 8,000 scientists and analysts from more than 150 countries. With each GBD iteration, the data, data processing and methods used for data synthesis have evolved, with the goal of enhancing transparency and comparability of measurements and communicating various sources of uncertainty. The GBD has many limitations, but it remains a dynamic, iterative and rigorous attempt to provide meaningful health measurement to a wide range of stakeholders.

The Global Burden of Disease Study (GBD) is a systematic, scientific effort to quantify the magnitude of all major diseases, risk factors and intermediate clinical outcomes in a highly standardized way, to allow for comparisons over time, across populations and between health problems. The first GBD began in 1991 and led to the first results being published in 1993, which documented for eight regions the burden of disease for 106 conditions and ten risk factors, broken down into five age groups for the year 1990. The GBD now provides estimates for each year from 1990 to the present for 371 diseases and injuries, as well as 3,499 clinical outcomes (sequelae) related to those diseases and injuries, for 204 countries and territories and for subnational units in more than 20 countries. The full time series produced in each round of the GBD is updated on an annual basis[1–5], although the coronavirus disease 2019 (COVID-19) pandemic has delayed the release of the next GBD assessment. Since serialization in 2010, 1,842 publications on the GBD have appeared in the scientific literature.

Although there are many efforts in many countries to measure outcomes relating to single diseases or risks or groups of these, the GBD stands apart because of some core principles consistently applied over the last 30 years. Beginning in 1991, when the first GBD was undertaken as background work for the *World Development Report 1993: Investing in Health*[6], the GBD was committed to the principles of best estimates, comprehensive accounting, comparable measurement, summary measures of fatal and non-fatal health outcomes and thoughtful and repeated assessment of face validity of findings. In this Perspective, we reflect on lessons learned from 30 years of the GBD. We begin by reviewing the core principles, and then we examine the universe of data for tracking health, the ongoing evolution of the statistical methods to support the GBD, the history of the broader GBD collaboration and some key future directions for the effort.

Core principles

Best estimates. The GBD estimates each quantity of interest for every location. Even when data are highly inconsistent or there are no data for a disease or risk, a best estimate is produced along with our best estimate of uncertainty. The logic is that decisions have to be made, and a best estimate borrowing insight from where data are available is better than no estimate, provided that there is clarity around the level of uncertainty. All too often, ‘no data’ has been historically equated to ‘no problem’, biasing prioritization and agenda-setting toward diseases, injuries and risk factors for which data have been collected and/or advocacy groups exist. This commitment to best estimates has catalyzed a continuous search for better global data (volume, veracity, variety and timeliness are all prized) as well as continuous efforts for better statistical estimation methods to deal with missing data and conflicting data that inevitably remain. It also sharply distinguishes the GBD from many government or intergovernmental efforts both in health and in other social sectors and remains the most frequently misunderstood part of the GBD.

Comprehensive accounting. This second core principle applies across diseases, injuries and risks. Comparable information on the magnitude of different health problems provides an objective framework to help establish health priorities and, importantly, can also provide important insights into what topics may be neglected. In the 1990s, the GBD finding that the burden of mental health disorders was substantial relative to infectious diseases, heart disease and cancer prompted the World Health Organization (WHO) and many countries to devote more policy attention to these neglected problems[7]. A high-level view of the comparative magnitude of health problems has also highlighted the rapidity of the epidemiological transition in many middle-income (and former low-income) countries where the profile of burden has shifted from communicable, maternal, neonatal and nutritional deficiencies to non-communicable diseases and injuries[2]. In more recent years, this principle has had increasing benefits as this comprehensive estimation has become a somewhat unique resource, in allowing the holistic forecasting of population health effects in an ever more rapidly changing and challenged world.

Comparability of measurement. Comprehensive accounting requires a focus on comparability of measurement. Many authors and statistical authorities have argued that the most important comparisons are within a country; but, from the beginning of the GBD, we have seen the value of emphasizing comparability over time and across place. Decision-makers who use the GBD results are drawn to understanding why their community may have a larger or smaller burden from a condition or, even more importantly, faster or slower rates of decline or increase in a disease, injury or risk factor,

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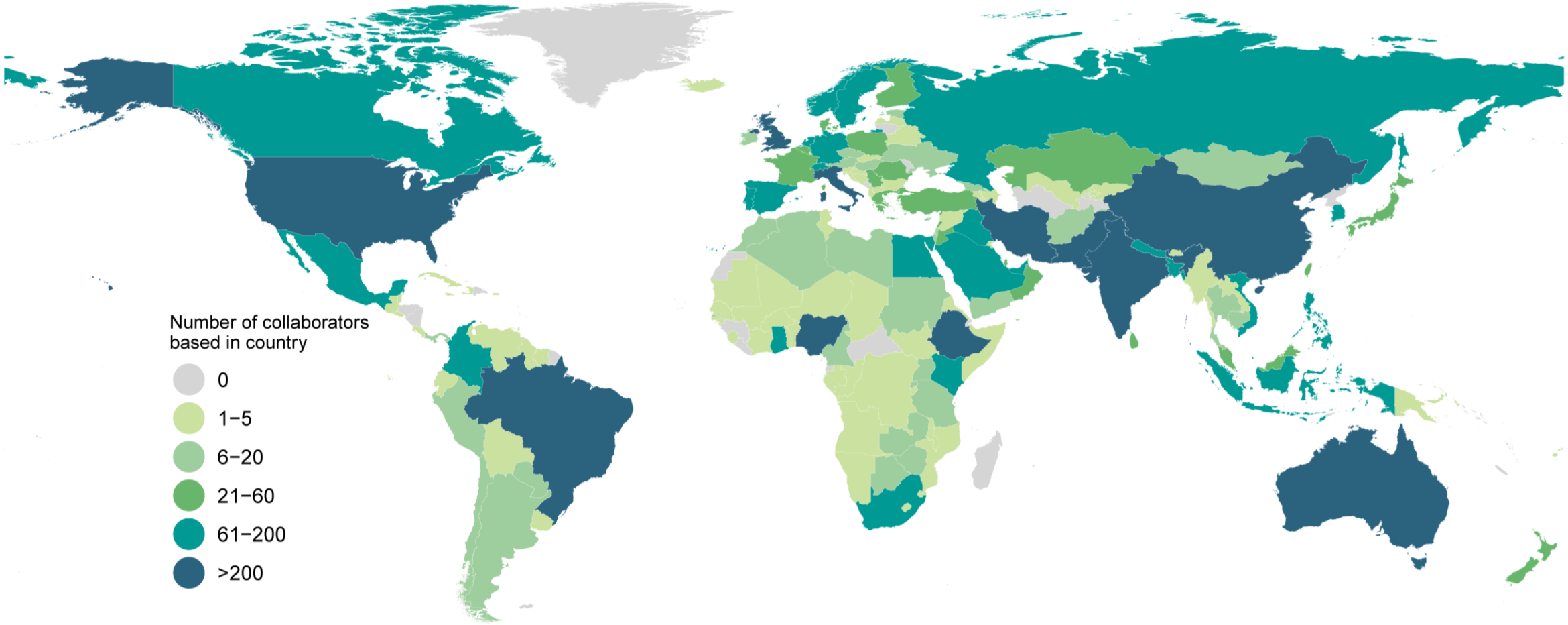
Murray CJL. The global burden of disease study at 30 years. *Nature Medicine. October 2022.*

GBD collaboration

A health metrics ecosystem comprised of over **13,618 Collaborators in 164 countries and territories**



GBD Compare: on-line tools providing access to detailed results, www.healthdata.org

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Updated May 16, 2024

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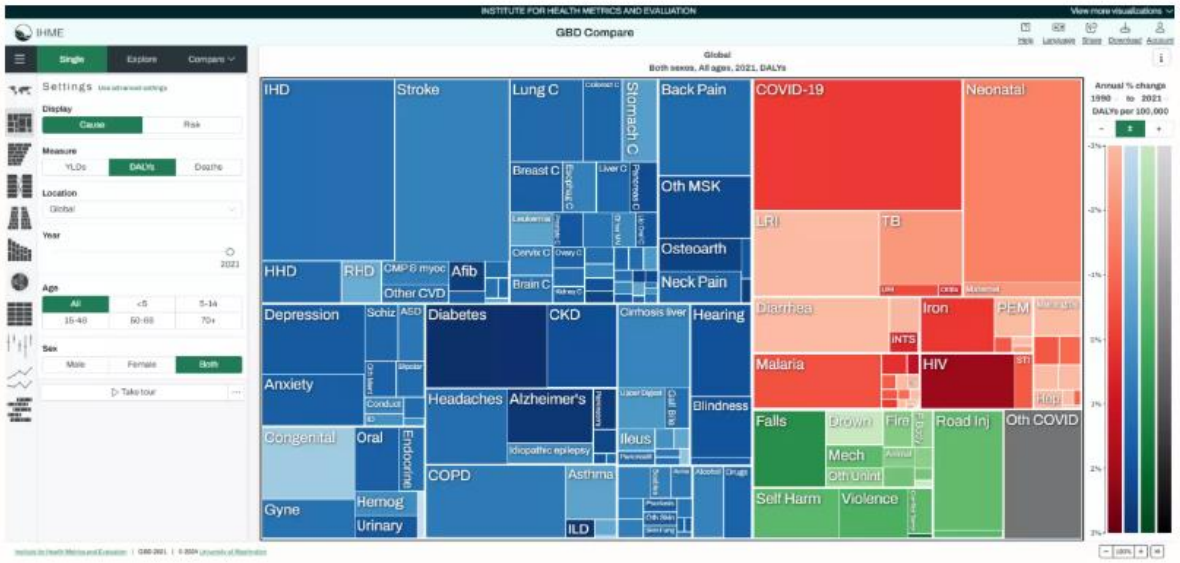
Locations

GLOBAL



US Burden of Disease and Health Disparities Project

Goal: Estimate burden of disease and health disparities in the US at the county level, stratified by racial and ethnic population.

Using the same conceptual approach as the Global Burden of Disease (GBD) Study:

- Focus on all aspects of health loss, and various metrics:
  - *Traditional measures*: mortality, incidence, and prevalence rates
  - *Impact measures*: years of life lost (YLLs), years lived with disability (YLDs)
  - *Summary measures*: disability adjusted life years (DALYs), healthy life expectancy (HALE)
- Consider a wide range of health conditions
- Estimate both exposure to and burden attributable to selected risk factors

This project is funded by NIH, and undertaken in collaboration with the NIH US Burden of Health Disparities Working Group

US Burden of Disease

State-level burden of disease, 1990-2021	The US continues to fall behind the rest of the world; overweight and obesity is the largest risk factor
10 Americas: Disparities by race and geography, emphasizing significant variations in health outcomes across locations.	Expansion of Eight Americas: US population divided into eight groups (by race, county, socioeconomic indicators) to study life expectancy gaps and mortality disparities, 1982-2001
Health forecasting to 2050 at the state level	US will continue to lag behind other countries
Human development index by race, ethnicity, and county level	Where and who are the worst off in the US.
Obesity and forecasting at the state level, focusing on children and adolescents	Need to address rising rates of overweight and obesity, which contribute to health loss and CVD

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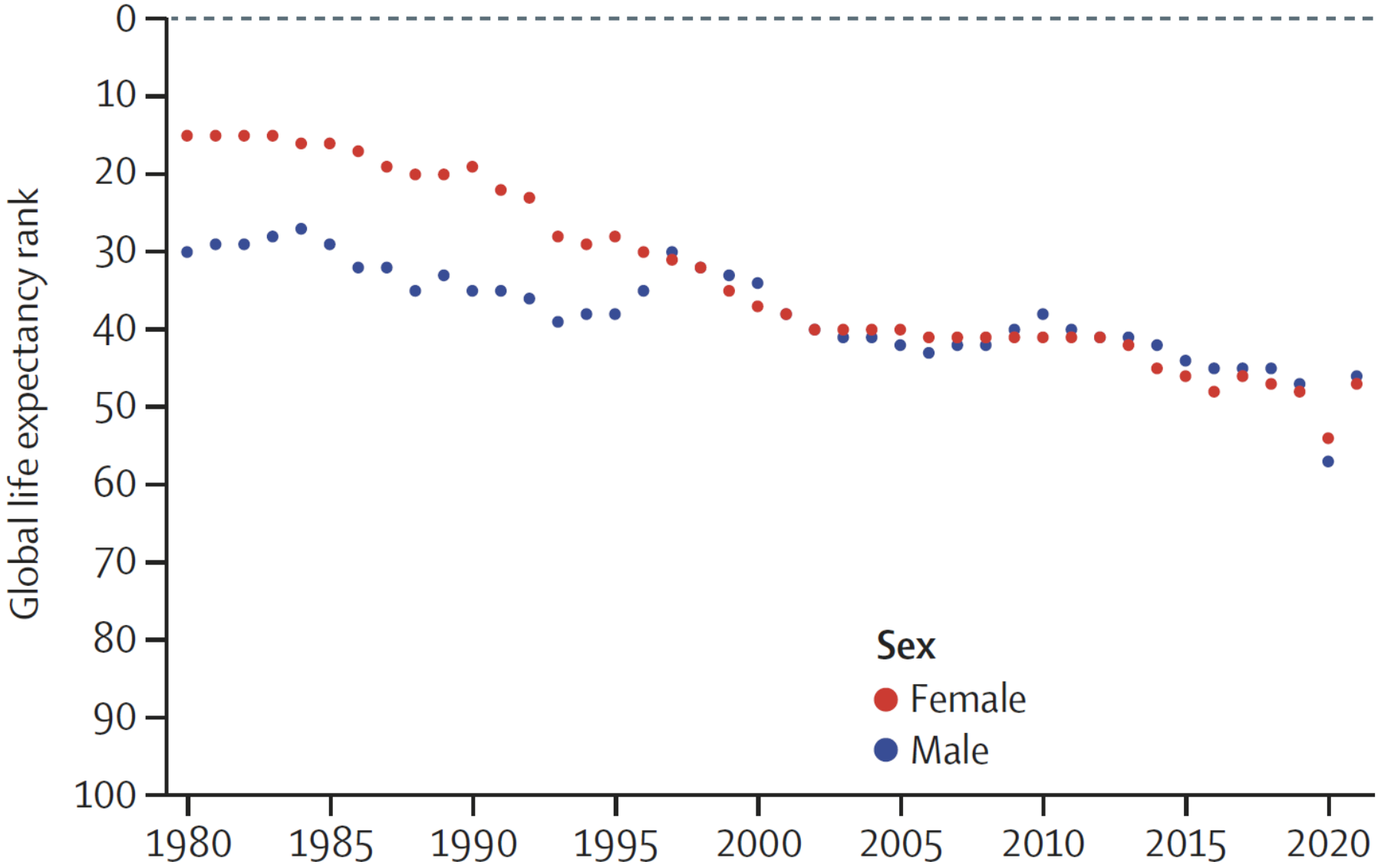
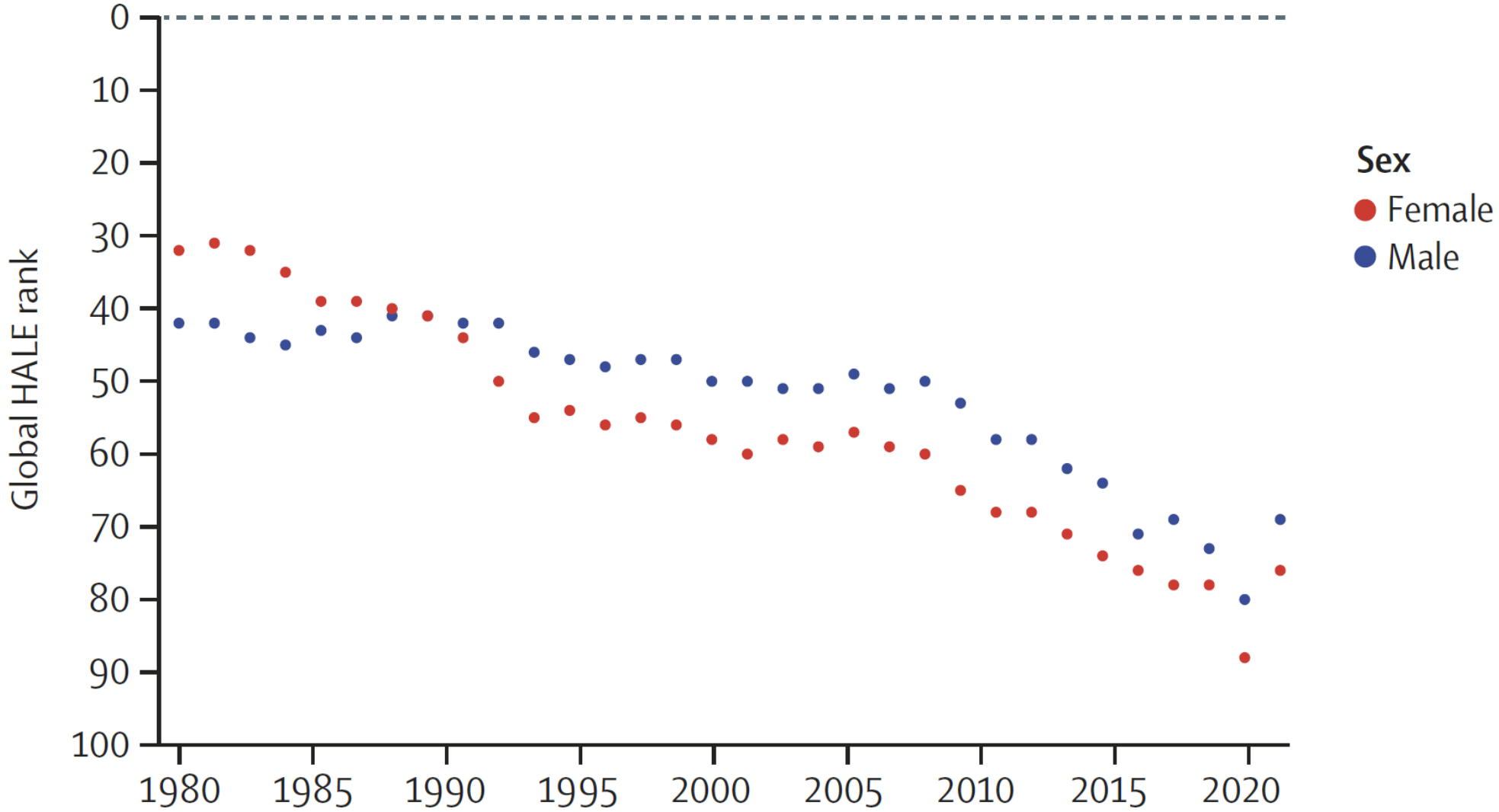
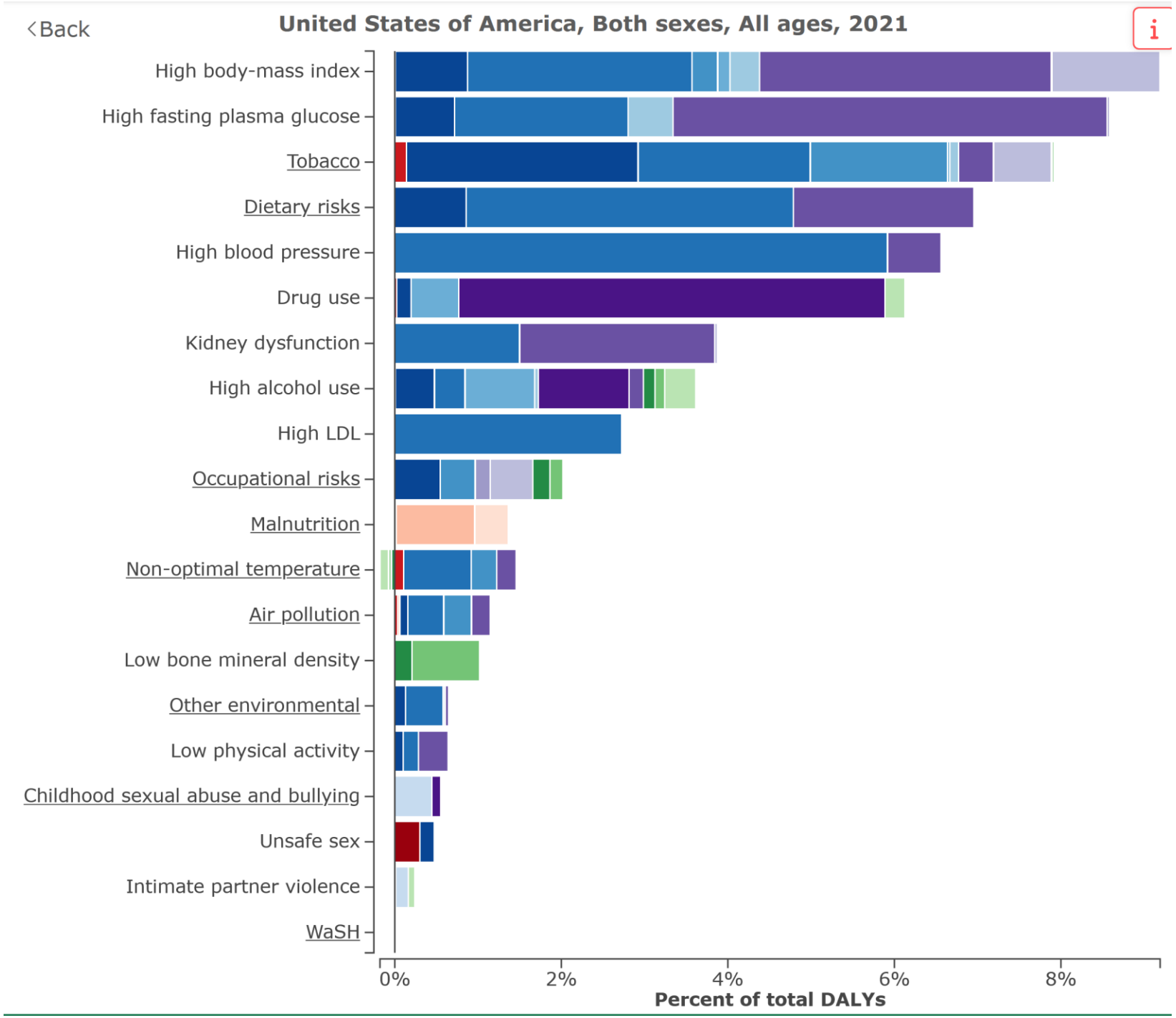
Steady decline over 40+ years: Global life expectancy ranking for the USA, 1980-2021



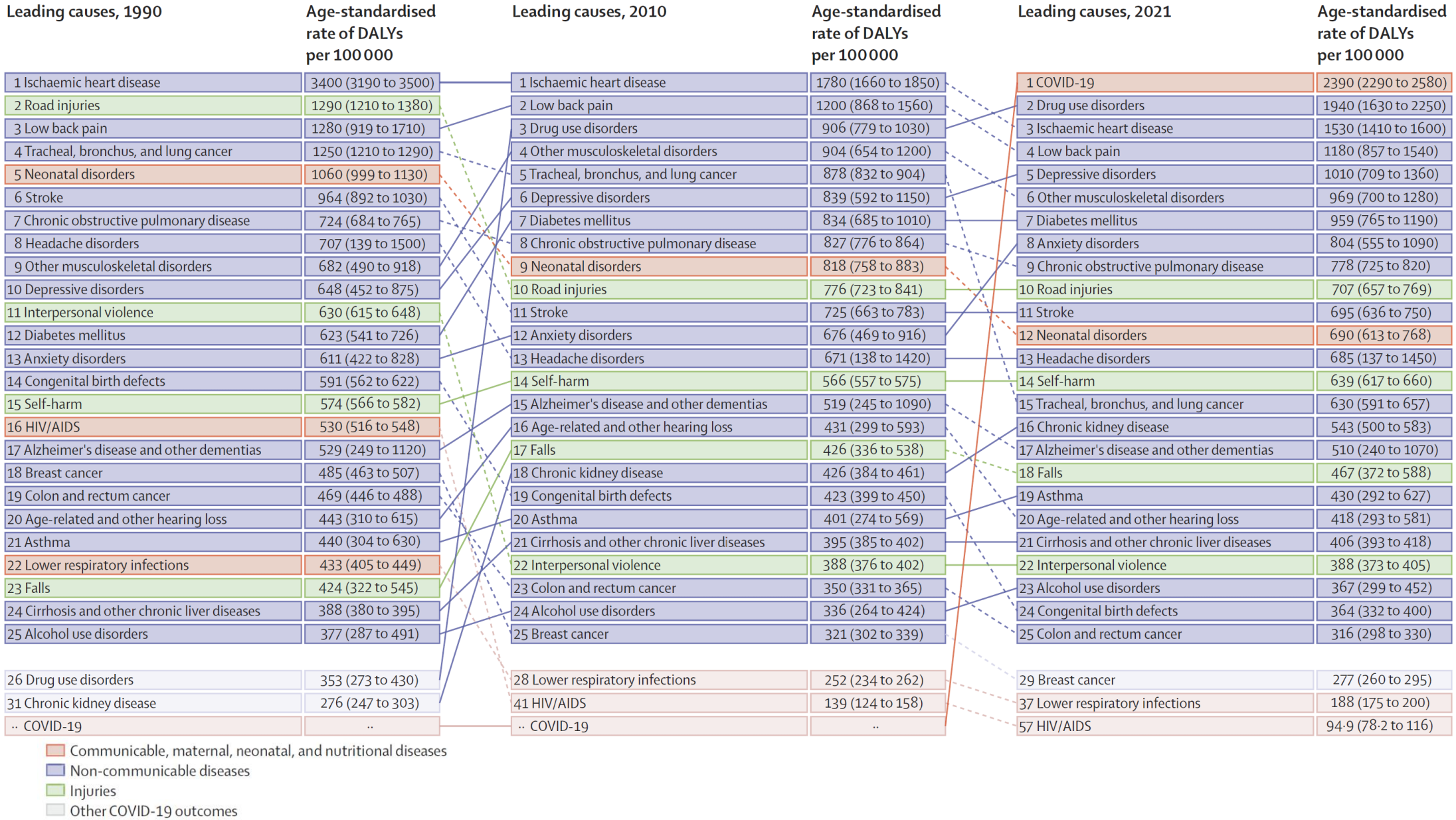
High disease prevalence means Global HALE ranking of the USA are even lower than for life expectancy



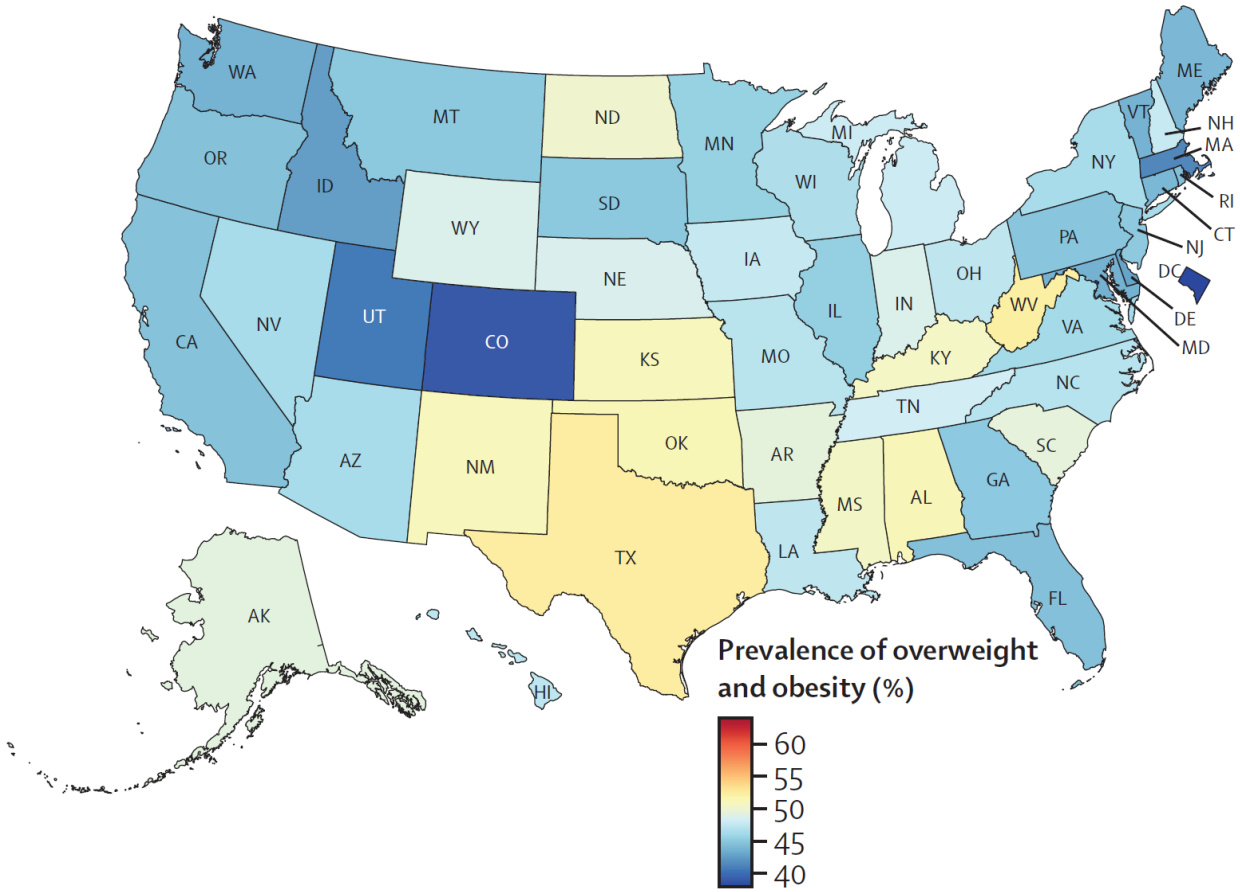
Risk factors contributing to US burden of disease 2021



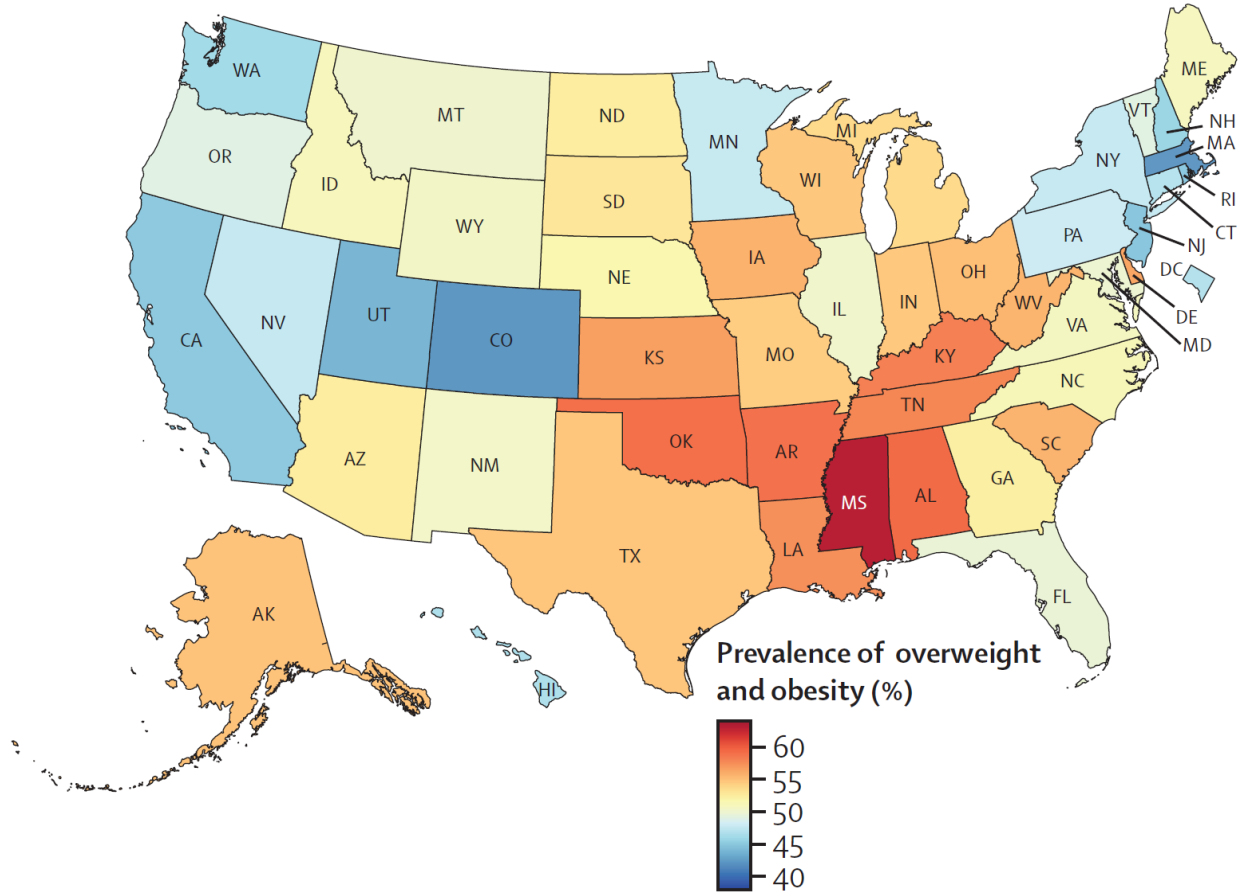
Years of healthy life lost in 1990, 2010, and 2021



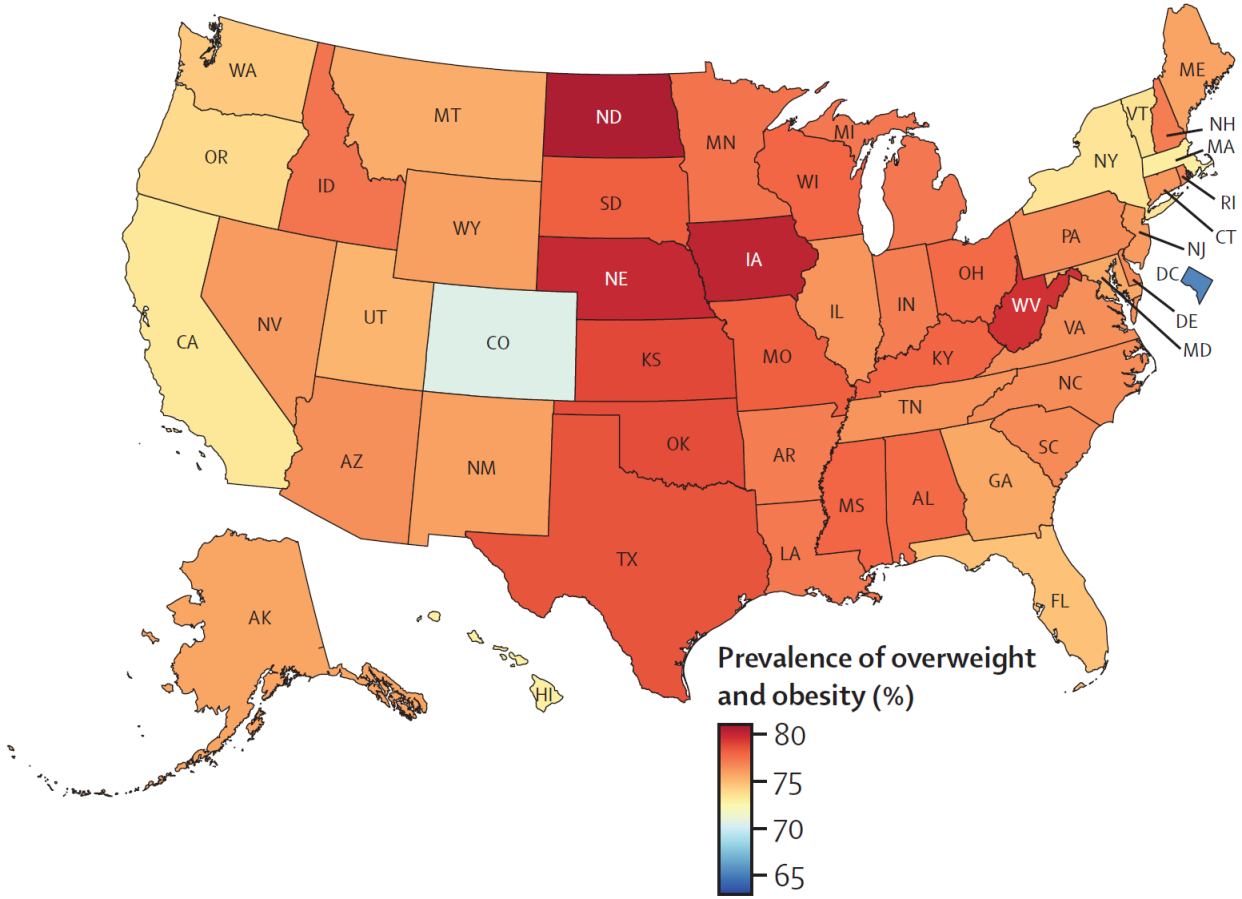
A Older adolescent males (aged 15–24 years)



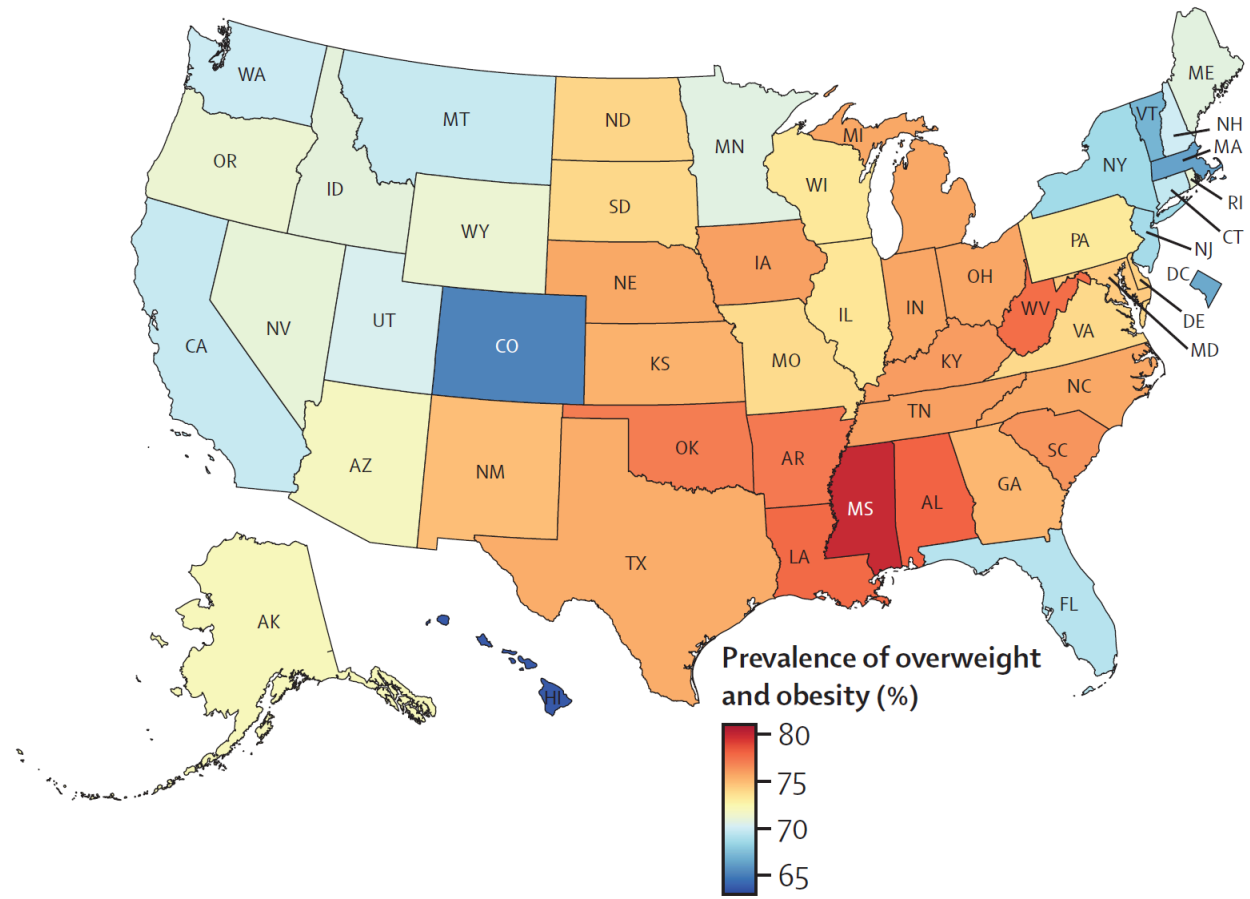
B Older adolescent females (aged 15–24 years)

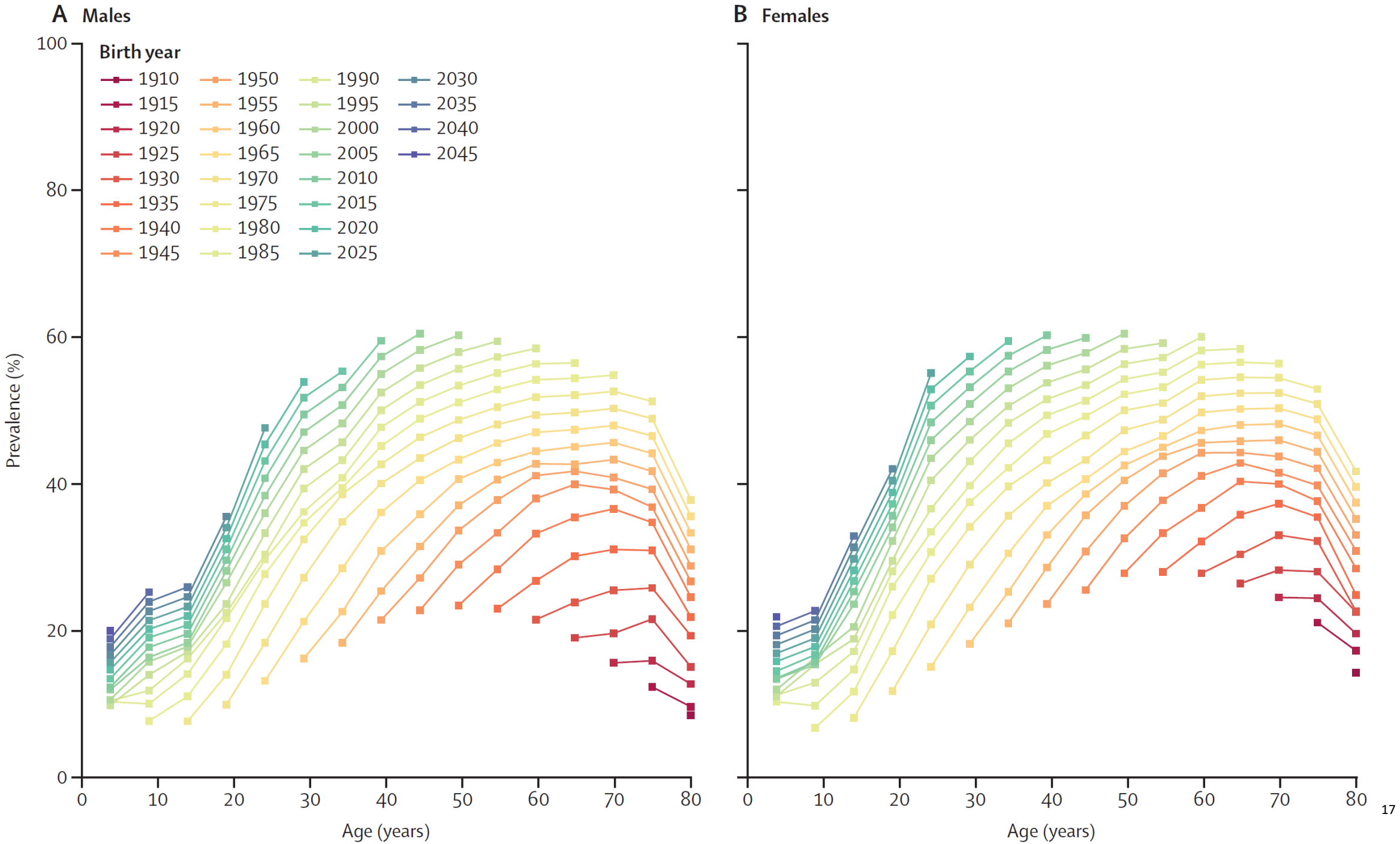


C Adult males (aged ≥25 years)

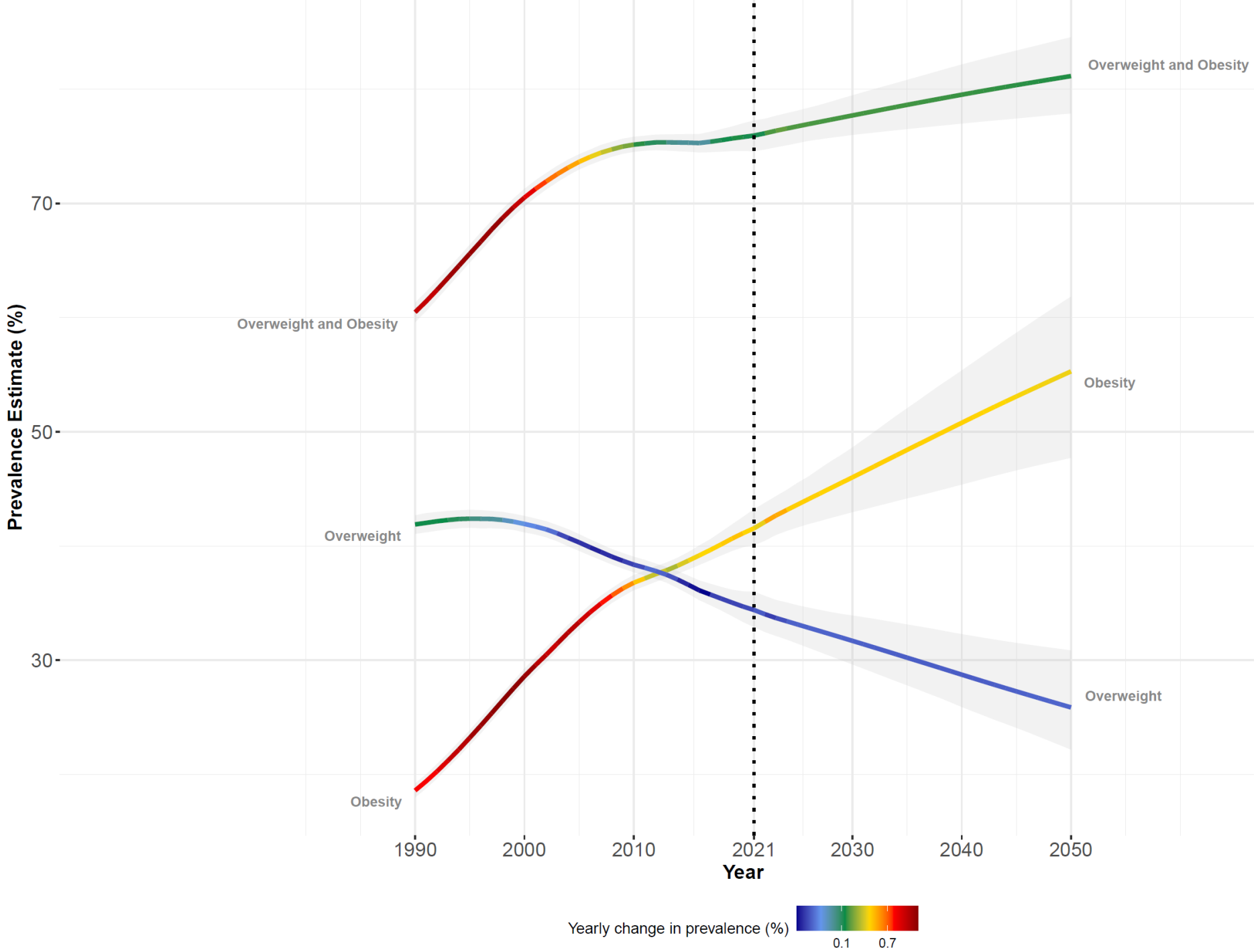


D Adult females (aged ≥25 years)



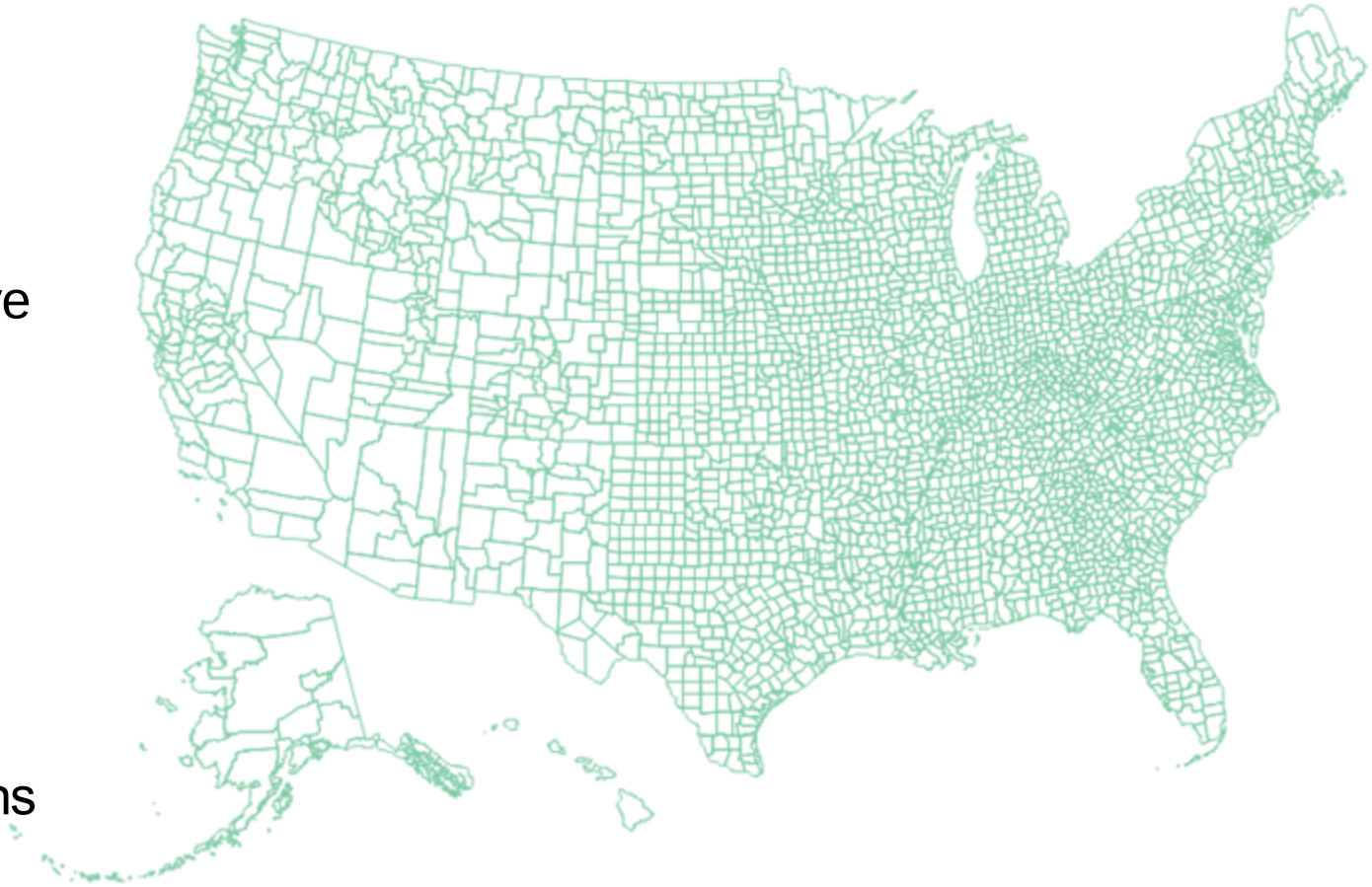

A Males
B Females
Birth year
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
Prevalence (%)
0
20
40
60
80
100
0
10
20
30
40
50
60
70
80
Age (years)
Age (years)

Prevalence of overweight and obesity: US states 1990-2050



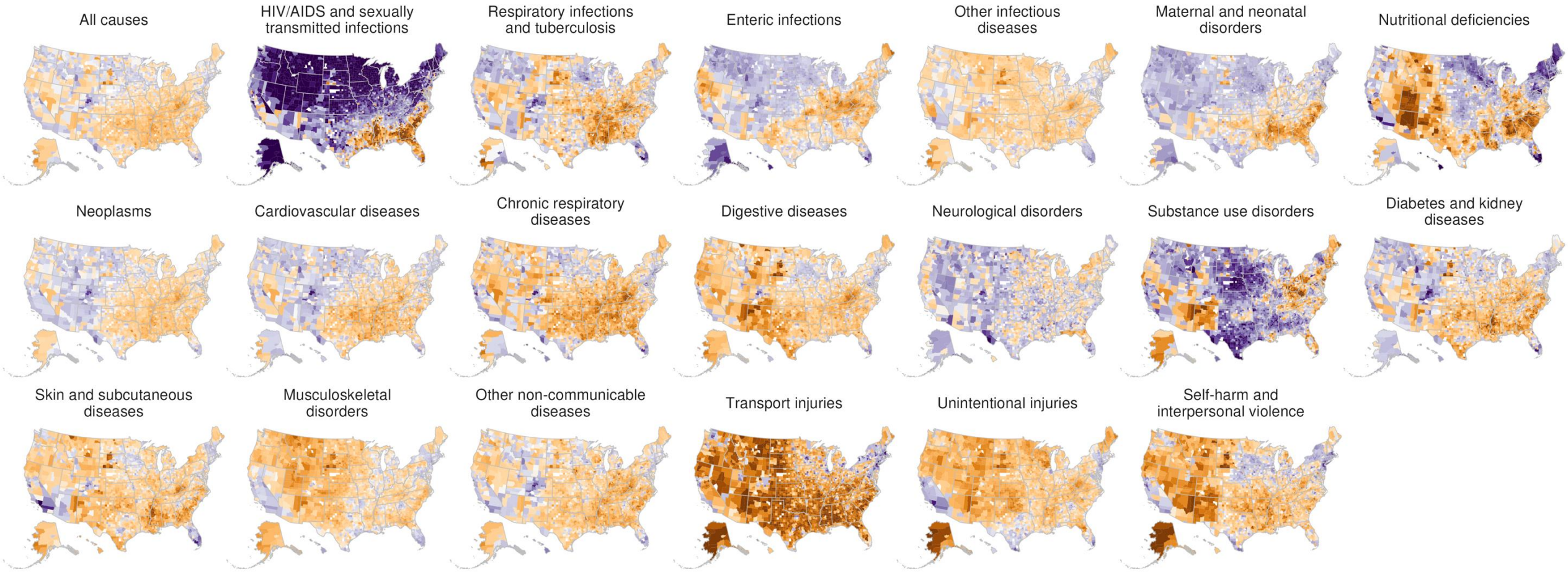
We currently estimate for:

- 20 years: 2000–19
- 3,110 counties
- 5 racial and ethnic populations
  - American Indian or Alaska Native (AIAN)
  - Asian and Native Hawaiian or Pacific Islander (Asian*)
  - Black
  - Latino
  - White
- We “mask” estimates for populations < 1000

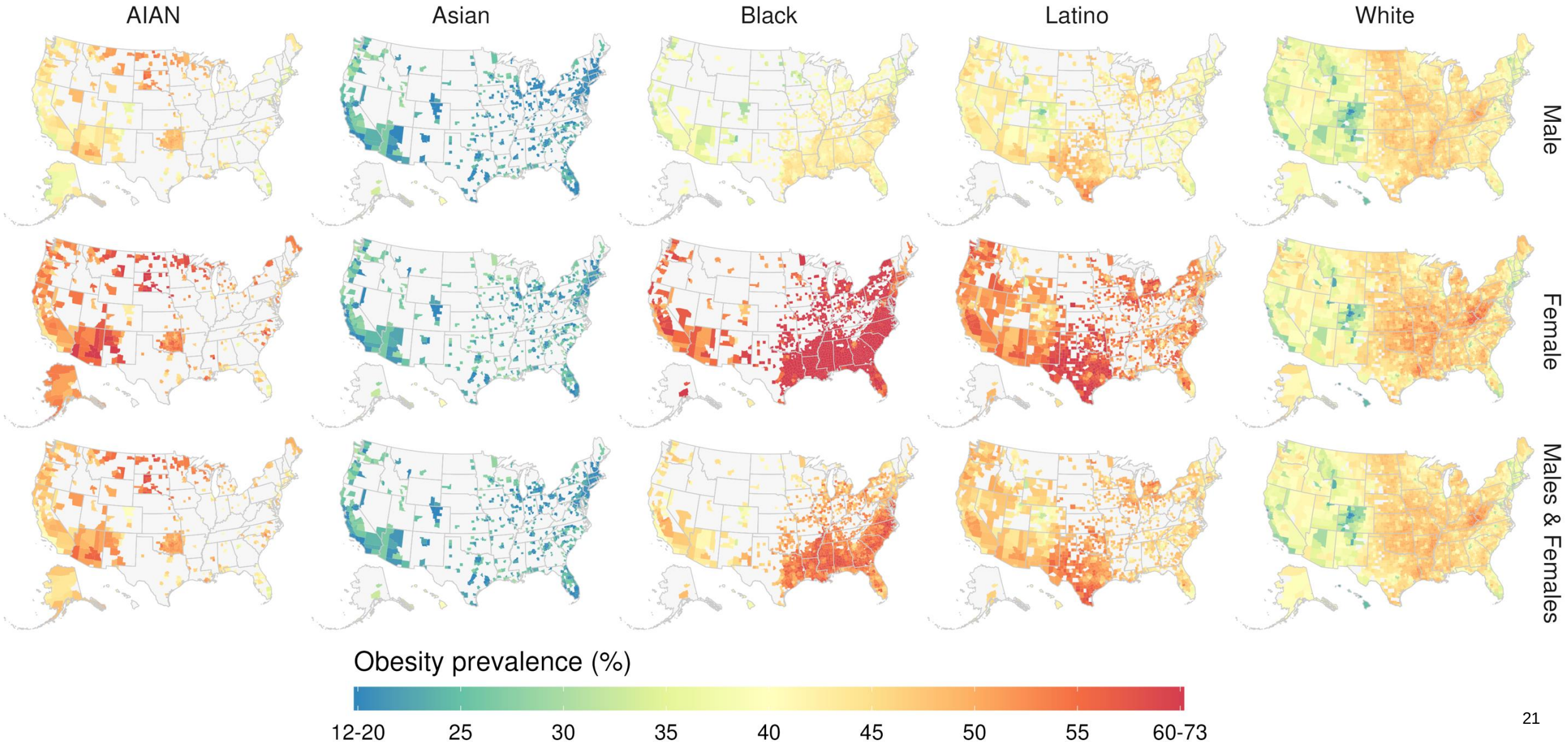


**We refer to the combined Asian and NHPI group as “Asian”, recognizing that the results for this combined group primarily reflect the experience of the Asian population which is much larger nationally and in most counties.*

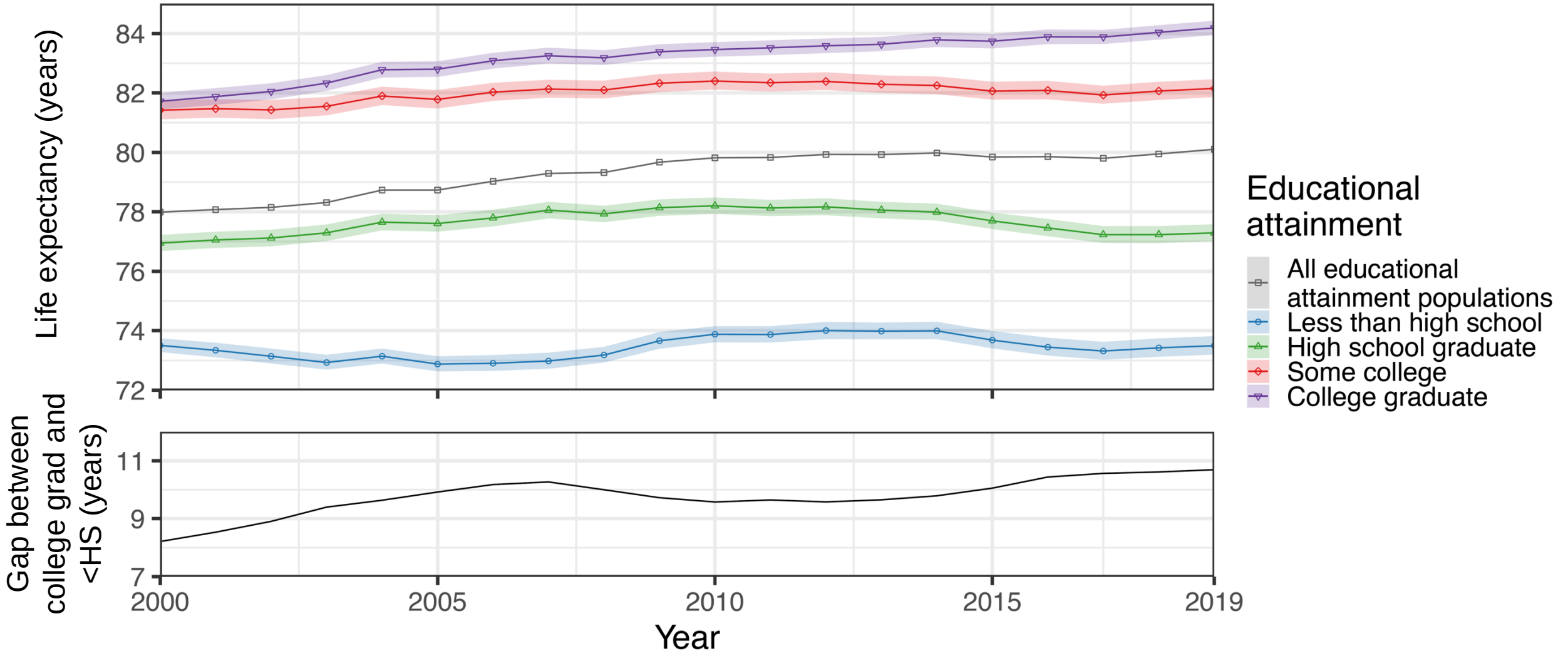
County Mortality Patterns, 2019



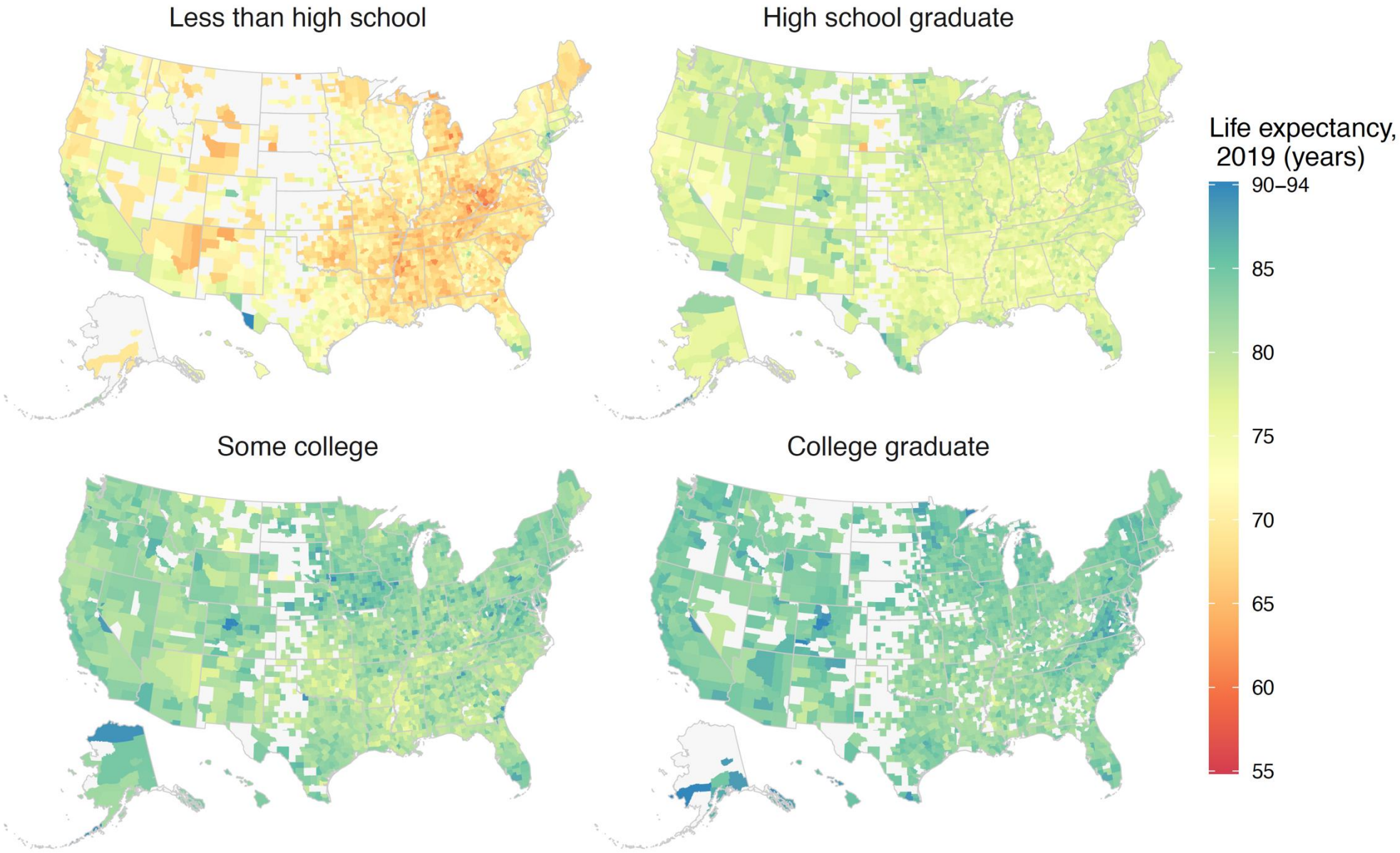
County Obesity Prevalence (age 20+), 2019



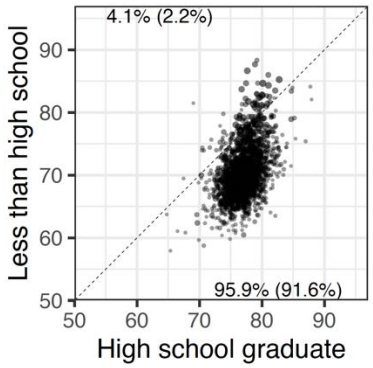
National Life Expectancy, 2000–19

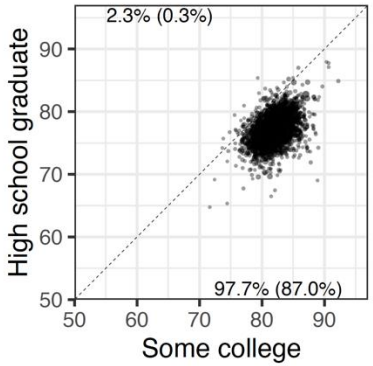


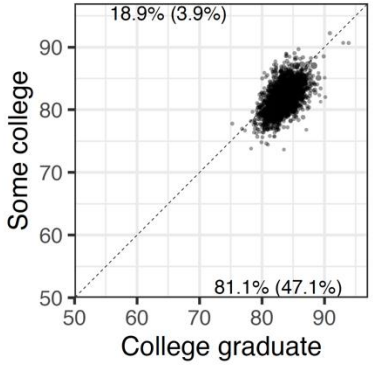
County Life Expectancy, 2019

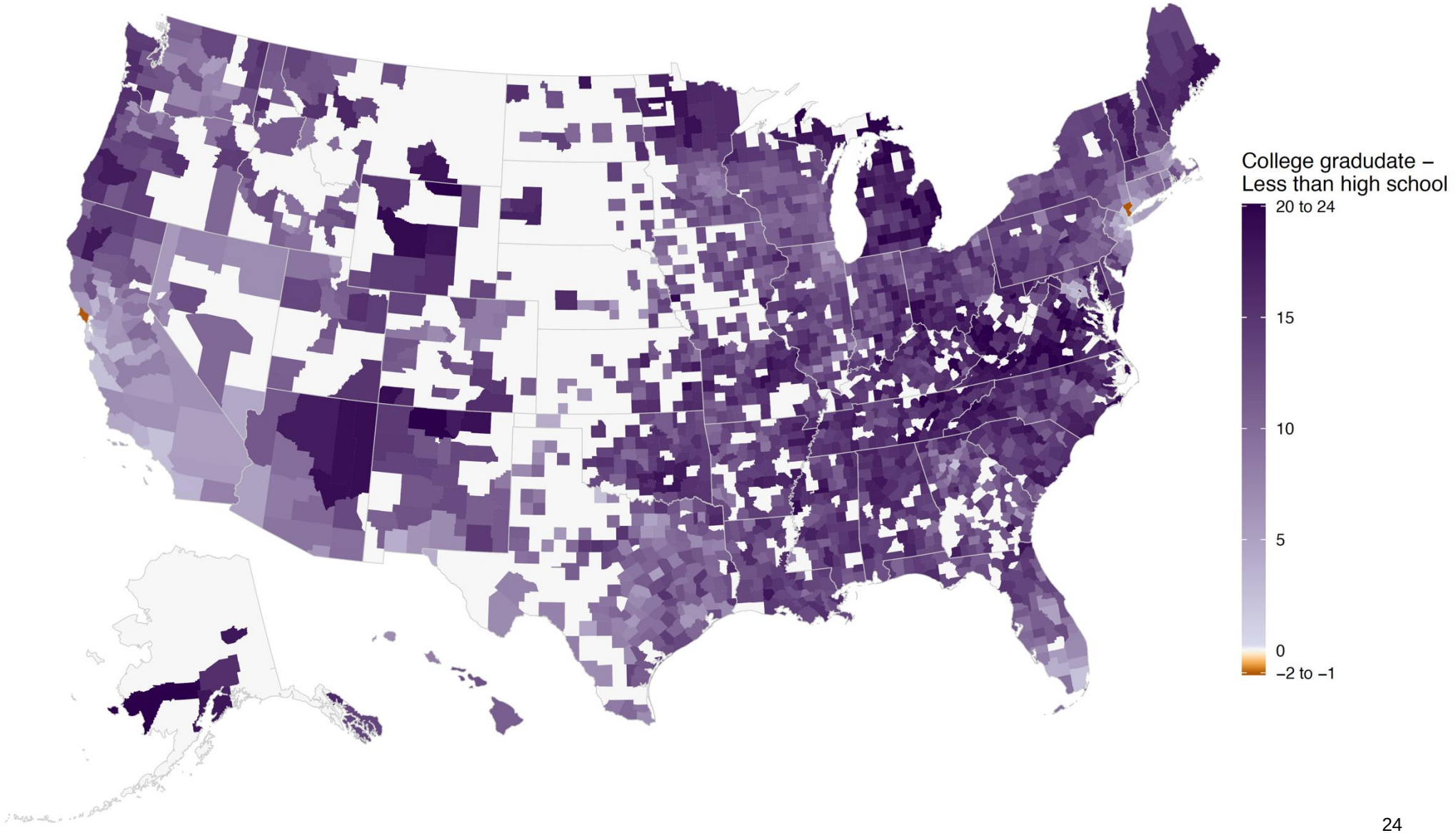


Disparities in Life Expectancy, 2019

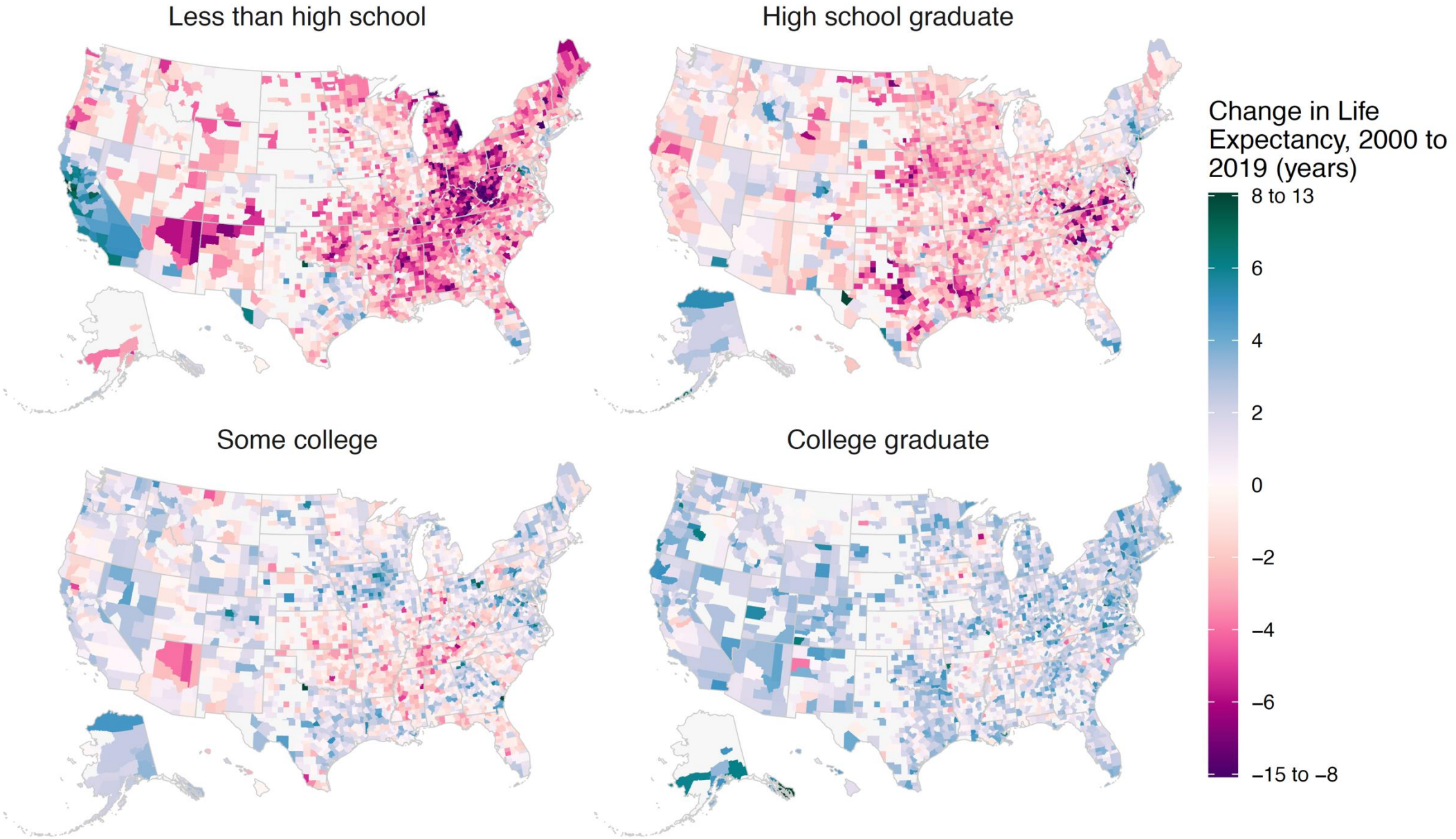




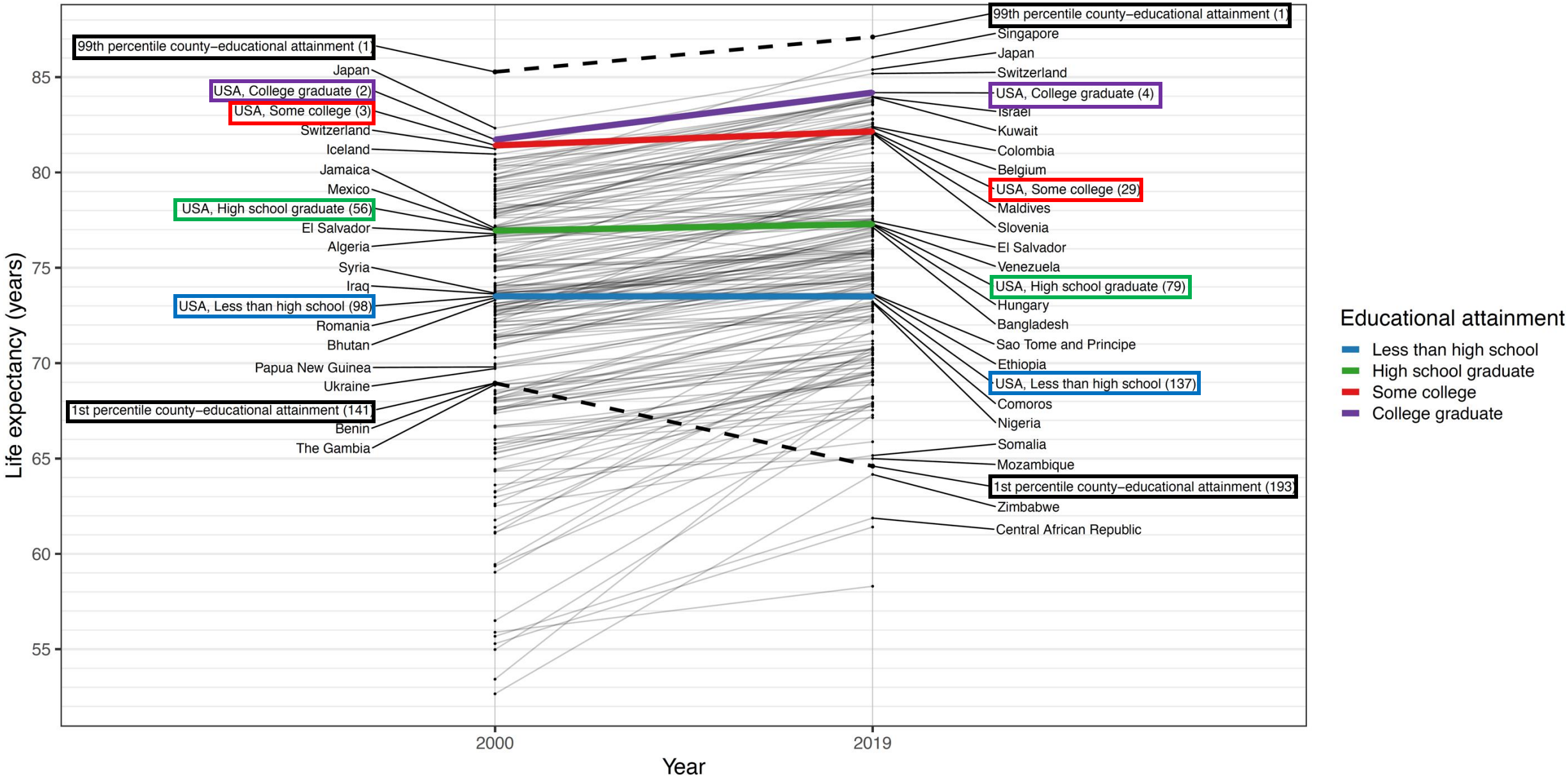




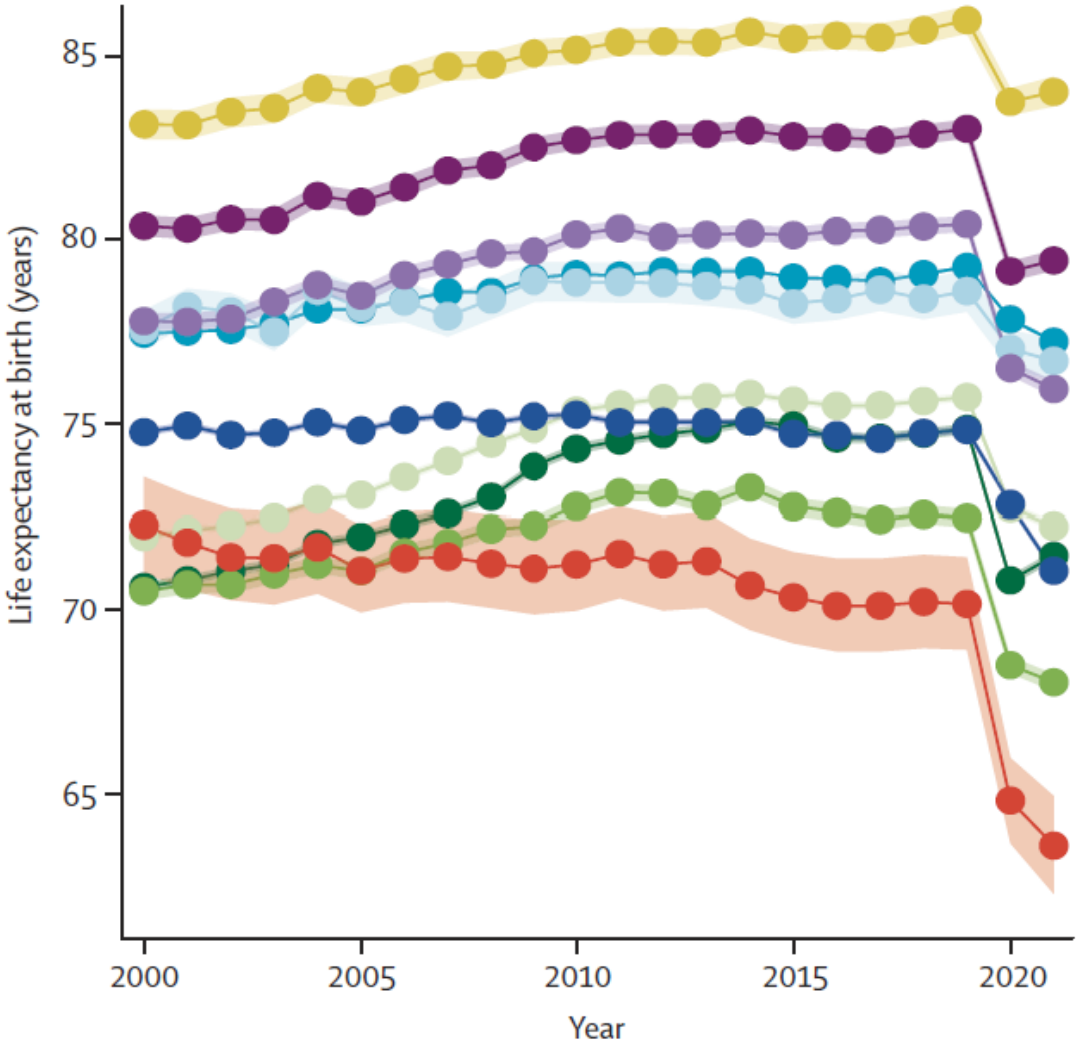
Change in Life Expectancy, 2000–19



Comparison to Other Countries



Life expectancy at birth in the ten Americas, 2000-21



- America 1: Asian
- America 2: Latino | Other counties
- America 3: White (majority), Asian, AIAN | Other counties
- America 4: White | Non-metropolitan and low-income Northlands
- America 5: Latino | Southwest
- America 6: Black | Other counties
- America 7: Black | Highly segregated metropolitan areas
- America 8: White | Low-income Appalachia and Lower Mississippi Valley
- America 9: Black | Non-metropolitan and low-income South
- America 10: AIAN | West

Shaded areas indicate 95% uncertainty intervals. AIAN=American Indian or Alaska Native.

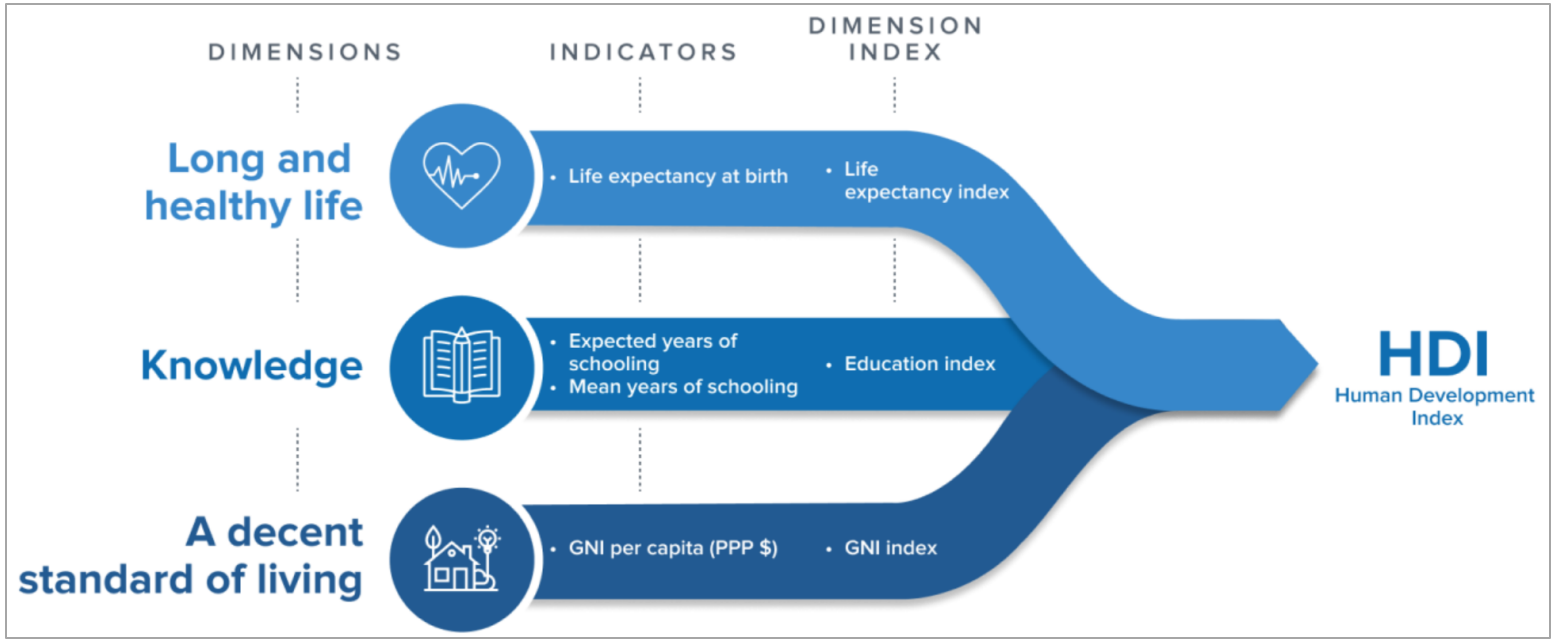
Who and where are the worst off in the US?

An important strategy to address poor US performance and widening disparities is to identify who are the worst-off and where do they live.

Targeting health and social policy towards the worst-off can provide a mechanism for enhancing health and other outcomes.

Human Development Index (HDI)

Since 1990, UNDP has reported a country-level “Human Development Index” (HDI) as part of its annual Human Development Report. This index is designed to represent three fundamental aspects of human development:



https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

Dimension indices are constructed as $\frac{x-min}{max-min}$

HDI is calculated as the geometric mean of the dimension indices

Individual-level HDI in the USA

We adapted HDI to examine human development at the individual level in the US.

To do this, we leveraged two data sources:

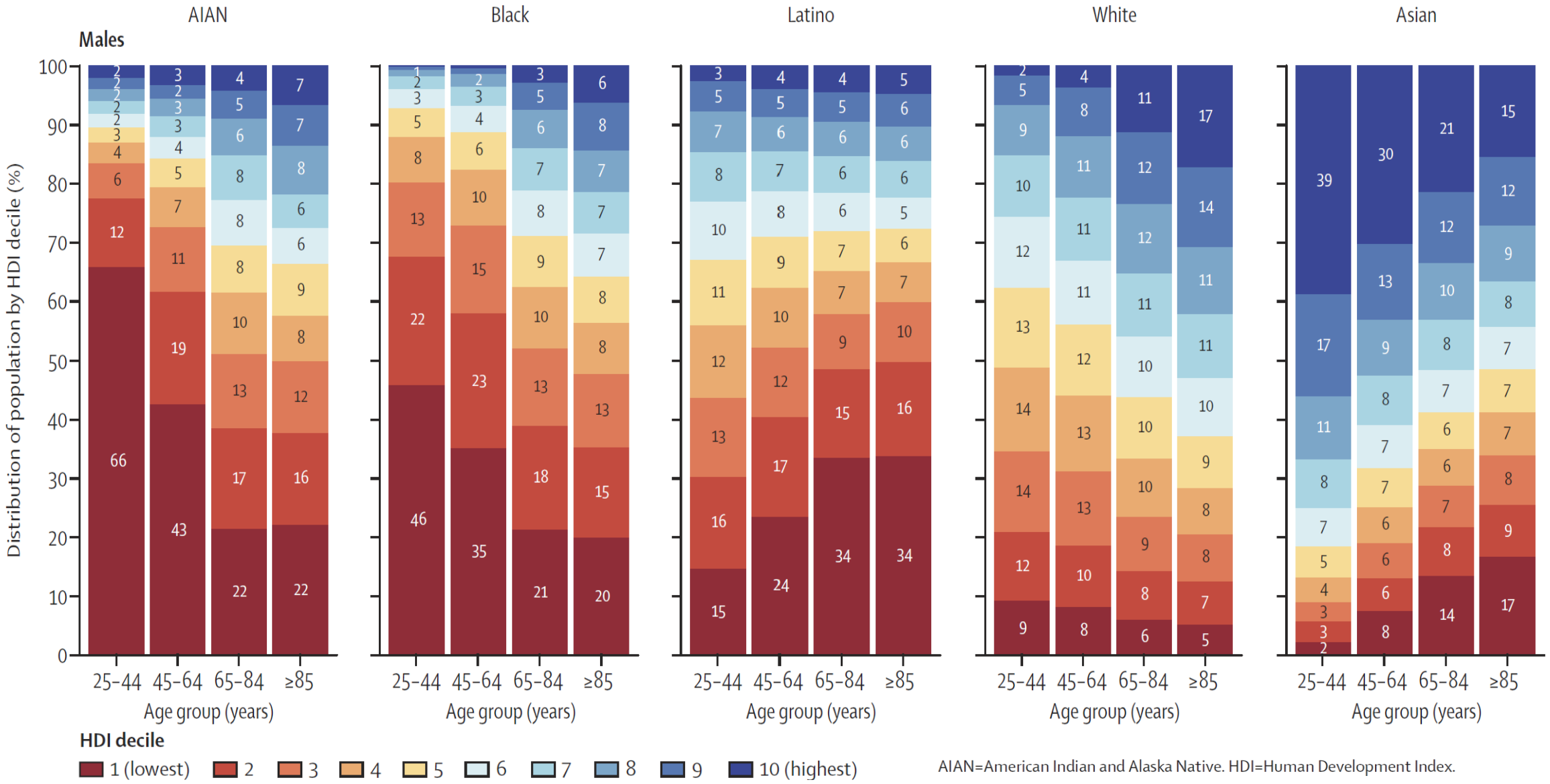
- The **America Community Survey (ACS)** public use microdata sample – an annual 1% sample of the US population conducted by the Census Bureau and containing detailed demographic and economic variables
- **IHME's estimated life tables** by county, race and ethnicity, age, sex, and year

And consider three indicators analogous to the ones used in UNDP's HDI:

- **Expected life span**, defined as an individual's age plus their estimated remaining life expectancy ($x + e_x$), and based on their geographic location, race and ethnicity, age, sex, and year
- **Years of education**, based on an individual's self-reported educational attainment, and mapping from grades/degrees completed to years of education (kindergarten = 1 yr, 1st grade = 2 yrs, etc.)
- **Household consumption**, based on a household's self-reported income (adjusted for inflation and regional price differences), divided by the square root of the number of people in the household

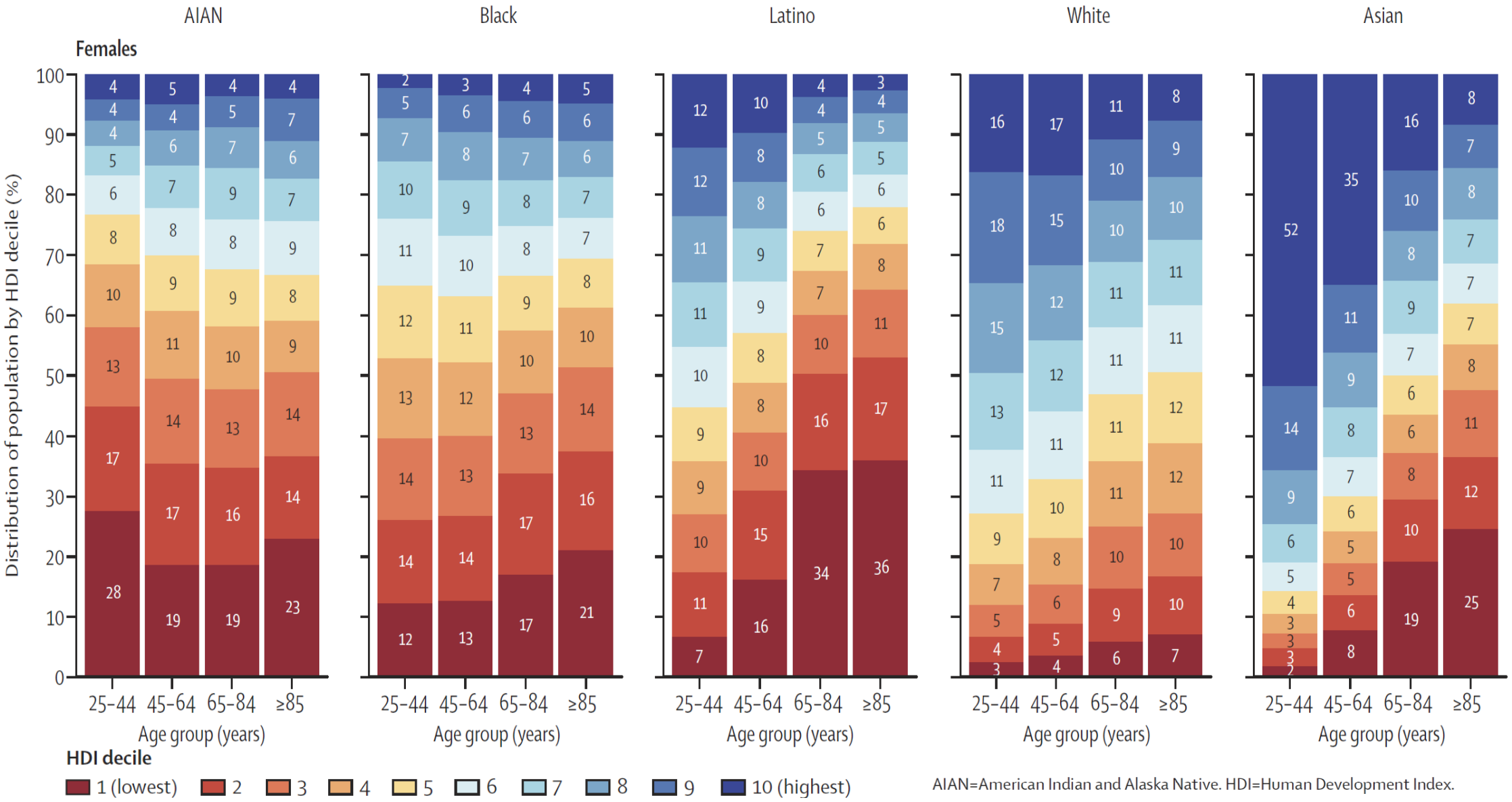
We modified the approach to calculating the dimension indices (we use the percentile score), but retain the same method for combining into HDI (ie, geometric mean)

Distribution of the HDI within each race and ethnicity and sex population, by age group, 2008-21, males



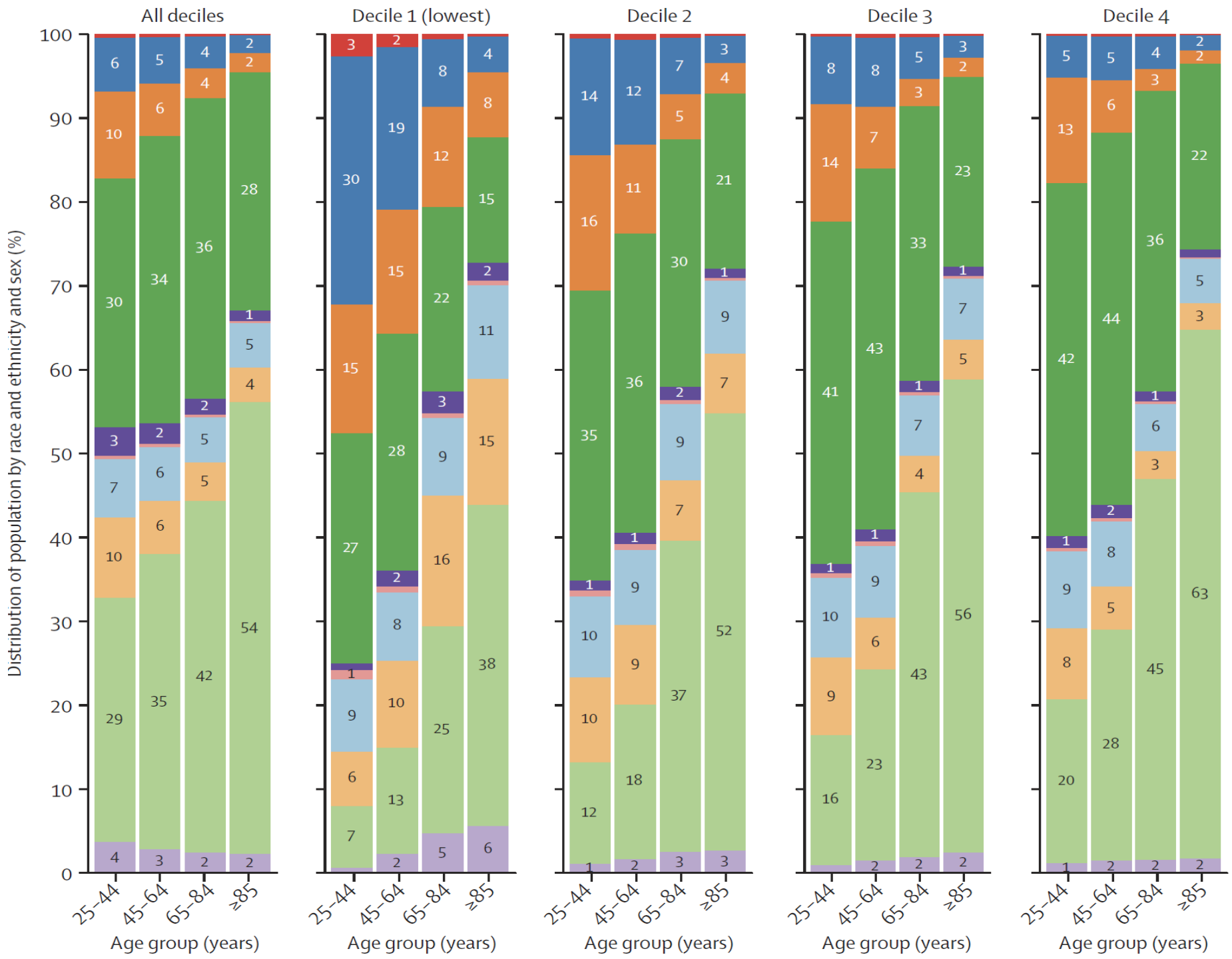
AIAN=American Indian and Alaska Native. HDI=Human Development Index.

Distribution of the HDI within each race and ethnicity and sex population, by age group, 2008-21, females



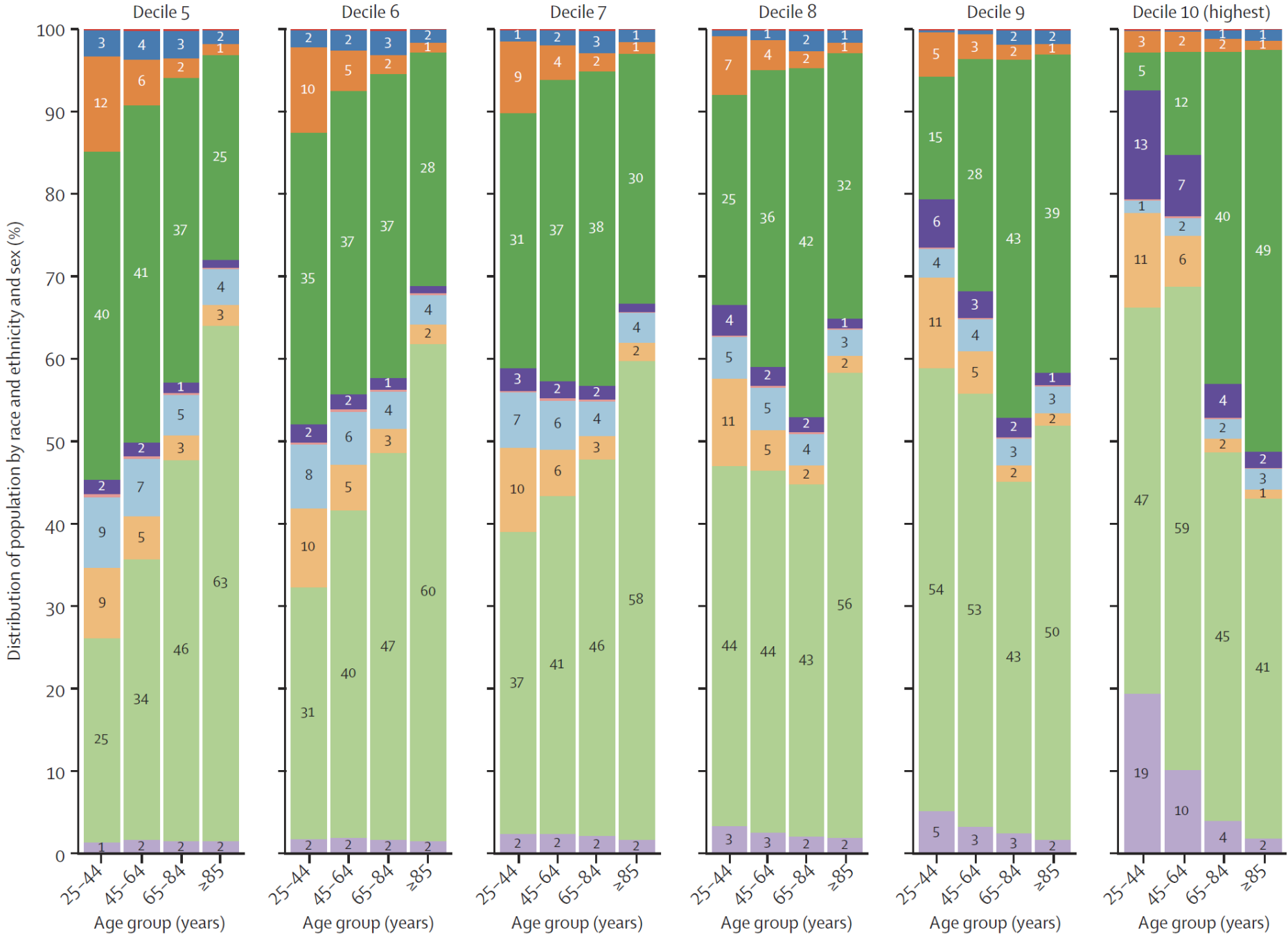
AIAN=American Indian and Alaska Native. HDI=Human Development Index.

Composition of each HDI decile by race and ethnicity and sex, by age, 2008-21



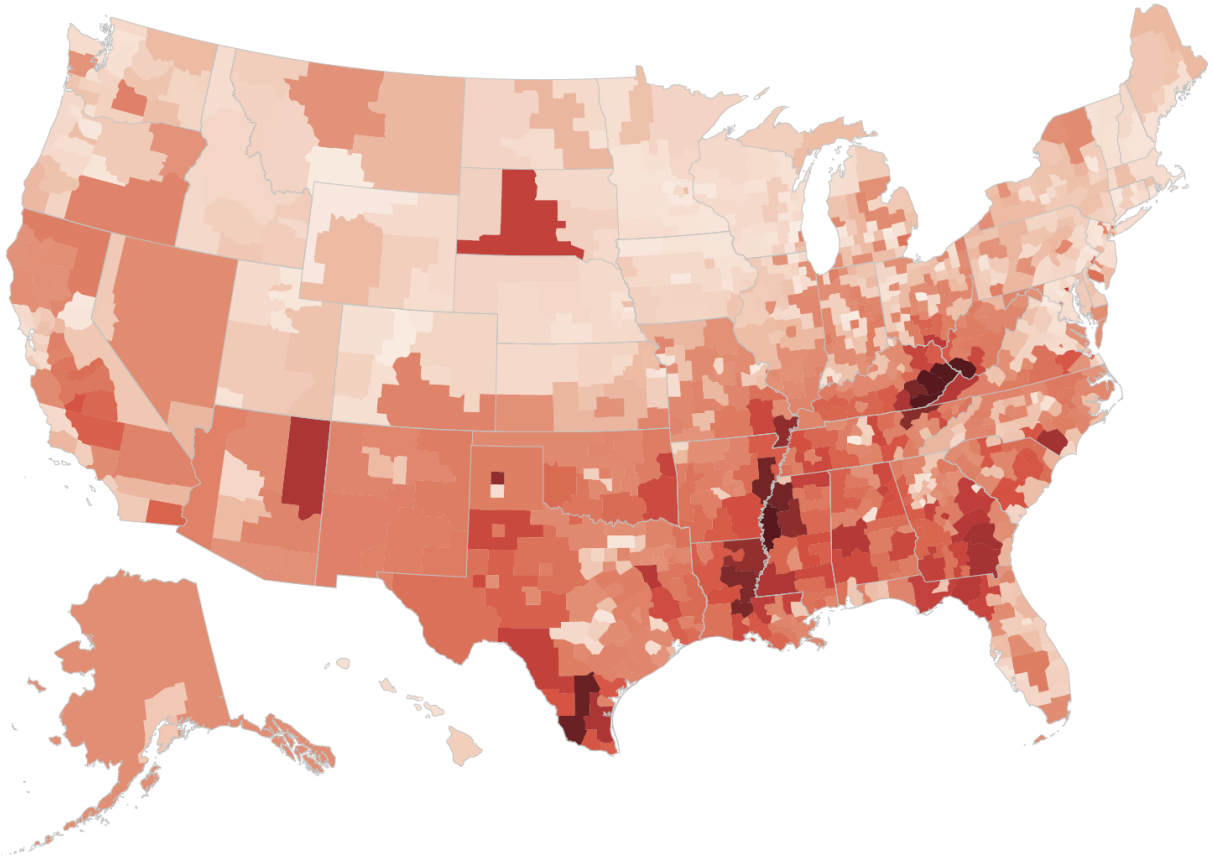
AIAN=American Indian and Alaska Native.
HDI=Human Development Index.

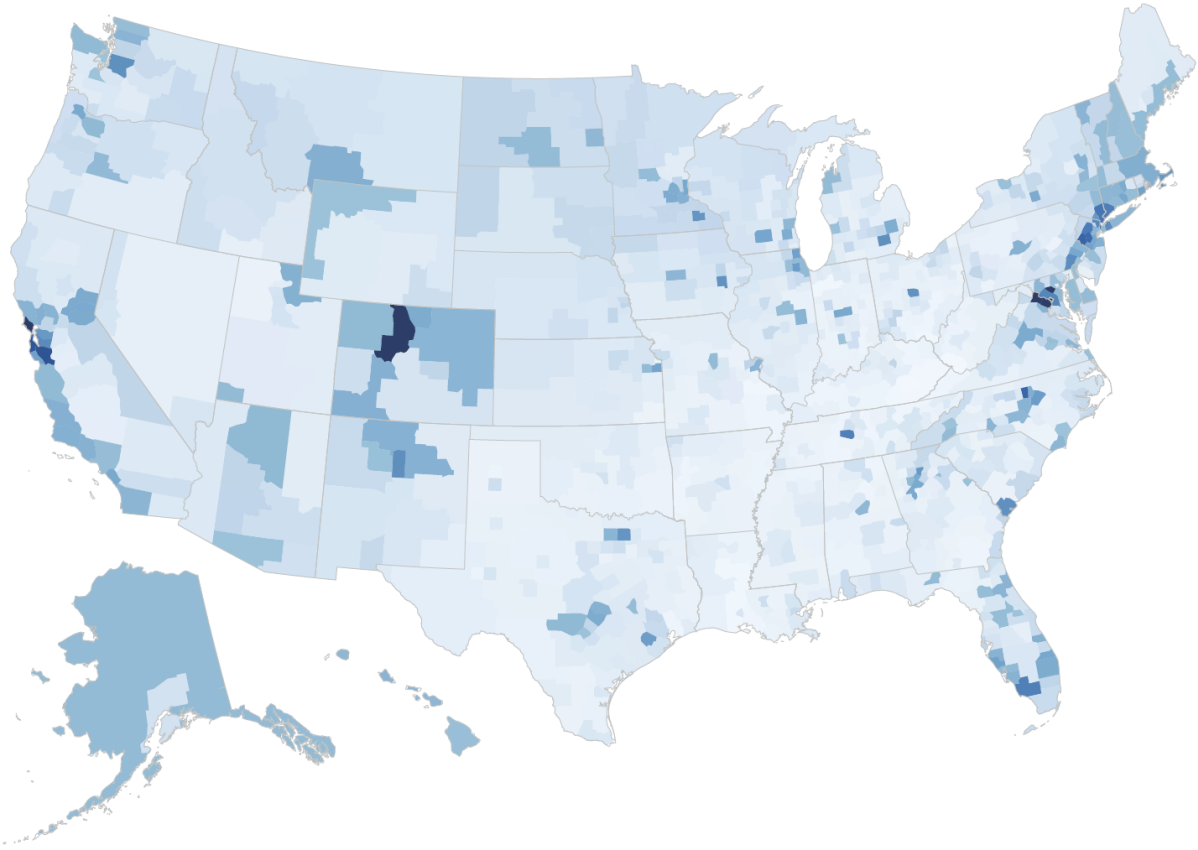
Composition of each HDI decile by race and ethnicity and sex, by age, 2008-21



AIAN=American Indian and Alaska Native.
HDI=Human Development Index.

Proportions of population in the lowest and highest HDI deciles by PUMA-county, 2012-21





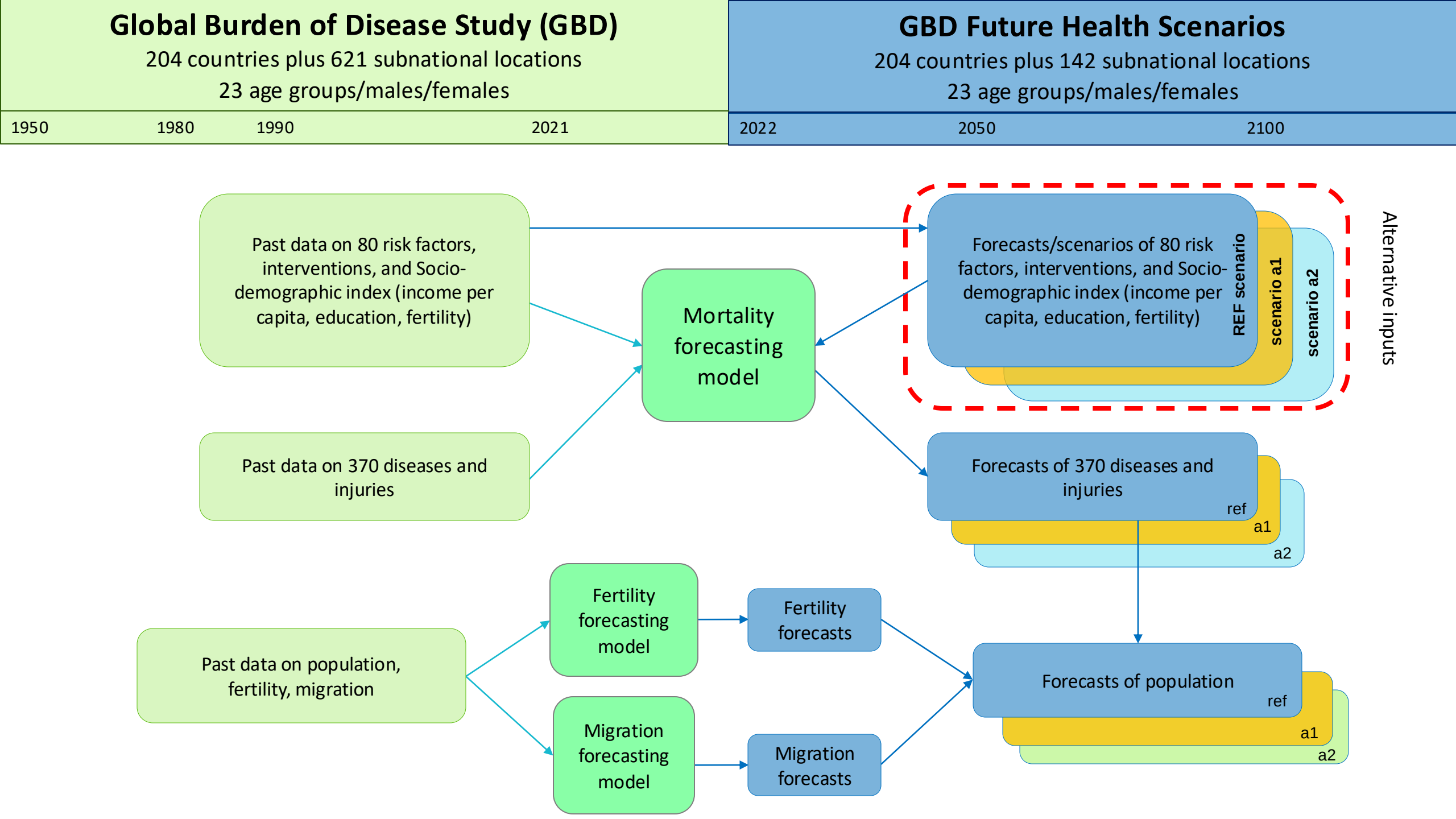
Population in lowest HDI decile (%)

0 10 20 30 40–50

Population in highest HDI decile (%)

0 10 20 30 40–55

PUMA-counties are geographical units each made up of one or more PUMAs and one or more counties and are the most detailed geographical subdivision that both counties and PUMAs nest within. Location-specific results are reported for 2012–21 only, as American Community Survey data before 2012 used a different set of PUMAs. HDI=Human Development Index. PUMA=Public Use Microdata Area.


Global Burden of Disease Study (GBD)
204 countries plus 621 subnational locations
23 age groups/males/females
1950
1980
1990
2021
GBD Future Health Scenarios
204 countries plus 142 subnational locations
23 age groups/males/females
2022
2050
2100
Past data on 80 risk factors, interventions, and Socio-demographic index (income per capita, education, fertility)
Past data on 370 diseases and injuries
Mortality forecasting model
Forecasts/scenarios of 80 risk factors, interventions, and Socio-demographic index (income per capita, education, fertility)
REF scenario
scenario a1
scenario a2
Alternative inputs
Forecasts of 370 diseases and injuries
ref
a1
a2
Past data on population, fertility, migration
Fertility forecasting model
Fertility forecasts
Migration forecasting model
Migration forecasts
Forecasts of population
ref
a1
a2

History

- **1997:** Forecasting mortality and disability 1990-2020
- **2015:** FHS team established at IHME
- **2018:** Forecasting mortality, life expectancy and risk attributable burden – better/worse scenarios (type 1)
- **2020:** Forecasting populations to 2100
- **2024:** Forecasting 370 causes, deaths, YLLs, YLDs, DALYs, incidence, prevalence, life expectancy, healthy life expectancy (HALE) – target scenarios with avoidable future burden 2020-2050

THE LANCET

Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study 1997

Christopher J L Murray, Alan D Lopez

Summary

Background Plausible projections of future mortality and disability are a useful aid in decisions on priorities for health research, capital investment, and training. Rates and patterns of ill health are determined by factors such as socioeconomic development, educational attainment, technological developments, and their dispersion among populations, as well as exposure to hazards such as tobacco. As part of the Global Burden of Disease Study (GBD), we developed three scenarios of future mortality and disability for different age-sex groups, causes, and regions.

depression, road-traffic accidents, cerebrovascular disease, chronic obstructive pulmonary disease, lower respiratory infections, tuberculosis, war injuries, diarrhoeal diseases, and HIV. Tobacco-attributable mortality is projected to increase from 3·0 million deaths in 1990 to 8·4 million deaths in 2020.

Interpretation Health trends in the next 25 years will be determined mainly by the ageing of the world's population, the decline in age-specific mortality rates from communicable, maternal, perinatal, and nutritional disorders, the spread of HIV, and the increase in tobacco-related mortality and disability. Projections, by their nature,

Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: referenc and alternative scenarios for 2016–40 for 195 countries and territories 2018

Kyle J Foreman, Neal Marquez, Andrew Dolgert, Kai Fukutaki, Nancy Fullman, Madeline McGaughey, Martin A Pletcher, Amanda E Smith, Kendrick Tang, Chun-Wei Yuan, Jonathan C Brown, Joseph Friedman, Jiawei He, Kyle R Heuton, Mollie Holmberg, Disha J Patel, Patrick Reidy, Austin Carter, Kelly Cercy, Abigail Chapin, Dirk Douwes-Schultz, Tahvi Frank, Falko Goettsch, Patrick Y Liu, Vishnu Nandakumar, Marissa B Reitsma, Vince Reuter, Nafis Sadat, Reed J D Sorensen, Vinay Srinivasan, Rachel L Updike, Hunter York, Alan D Lopez, Rafael Lozano, Stephen S Lim, Ali H Mokdad, Stein Emil Vollset, Christopher J L Murray

oa

Summary

Background Understanding potential trajectories in health and drivers of health is crucial to guiding long-term investments and policy implementation. Past work on forecasting has provided an incomplete landscape of future health scenarios, highlighting a need for a more robust modelling platform from which policy options and potential

Published Online October 16, 2018 http://dx.doi.org/10.1016/

Fertility, mortality, migration, and population scenarios for 195 countries and territories from 2017 to 2100: a forecasting analysis for the Global Burden of Disease Study 2020

Stein Emil Vollset, Emily Goren, Chun-Wei Yuan, Jackie Cao, Amanda E Smith, Thomas Hsiao, Catherine Bisignano, Gulrez S Azhar, Emma Castro, Julian Chalek, Andrew J Dolgert, Tahvi Frank, Kai Fukutaki, Simon I Hay, Rafael Lozano, Ali H Mokdad, Vishnu Nandakumar, Maxwell Pierce, Martin Pletcher, Toshana Robalik, Krista M Steuben, Han Yong Wunrow, Bianca S Zlavog, Christopher J L Murray

oa

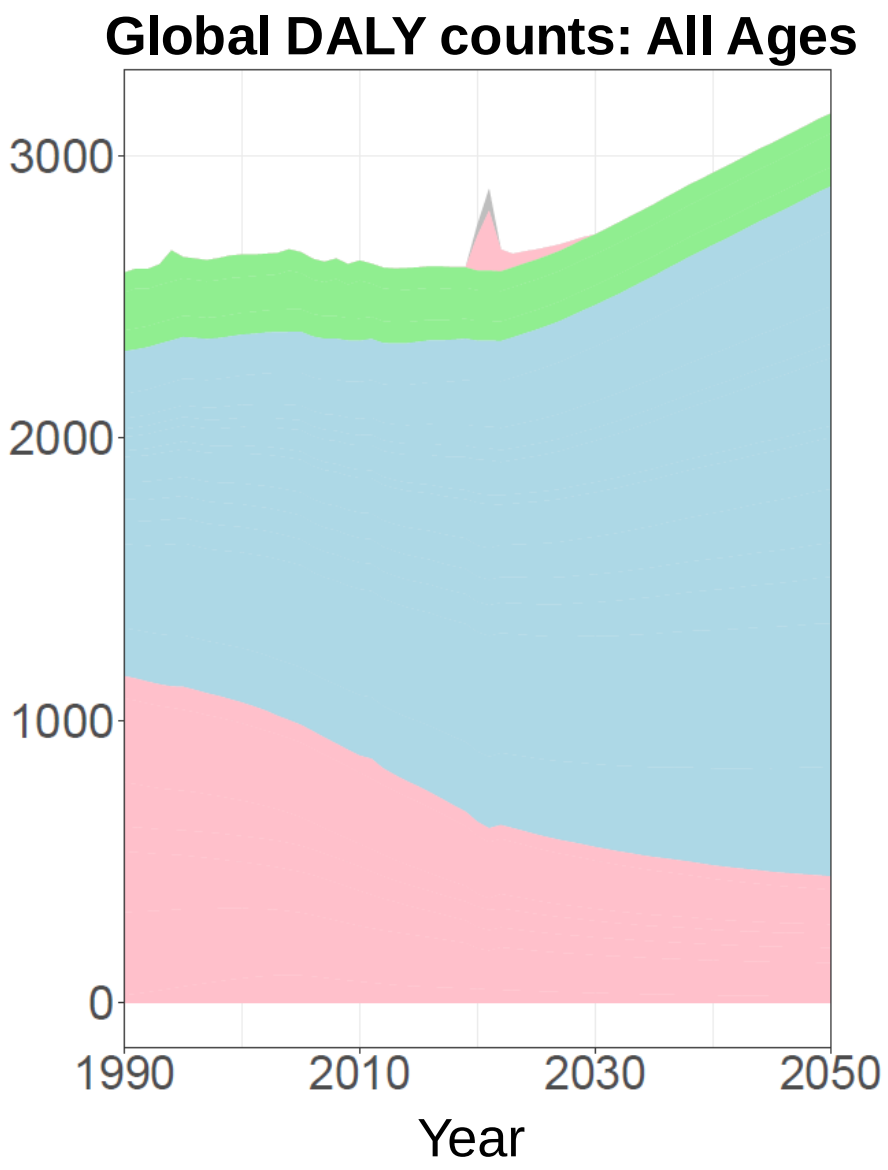
Summary

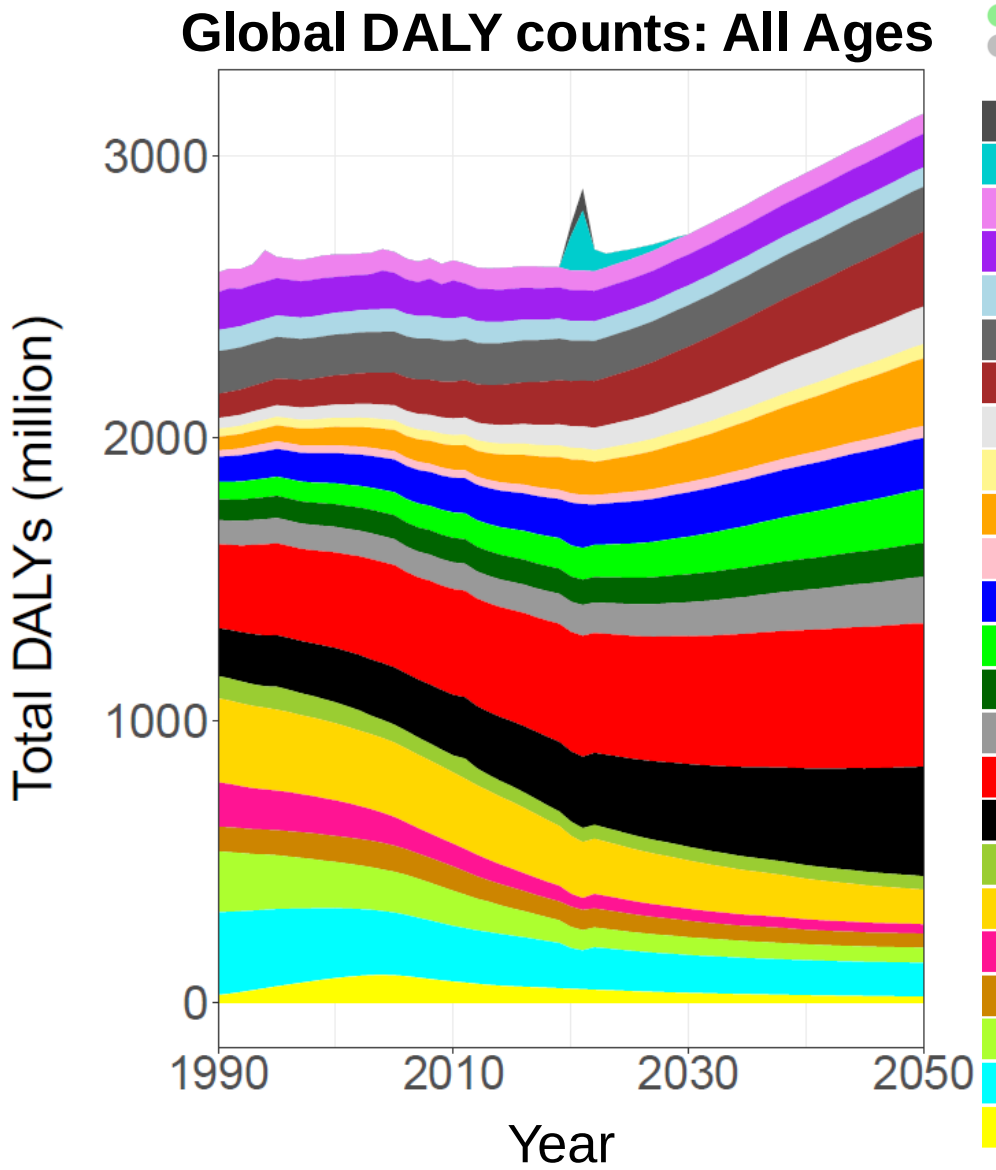
Background Understanding potential patterns in future population levels is crucial for anticipating and planning for changing age structures, resource and health-care needs, and environmental and economic landscapes. Future fertility patterns are a key input to estimation of future population size, but they are surrounded by substantial uncertainty and diverging methodologies of estimation and forecasting, leading to important differences in global population projections. Changing population size and age structure might have profound economic, social, and geopolitical impacts in many countries. In this study, we developed novel methods for forecasting mortality, fertility, migration, and population. We also assessed potential economic and geopolitical effects of future demographic shifts.

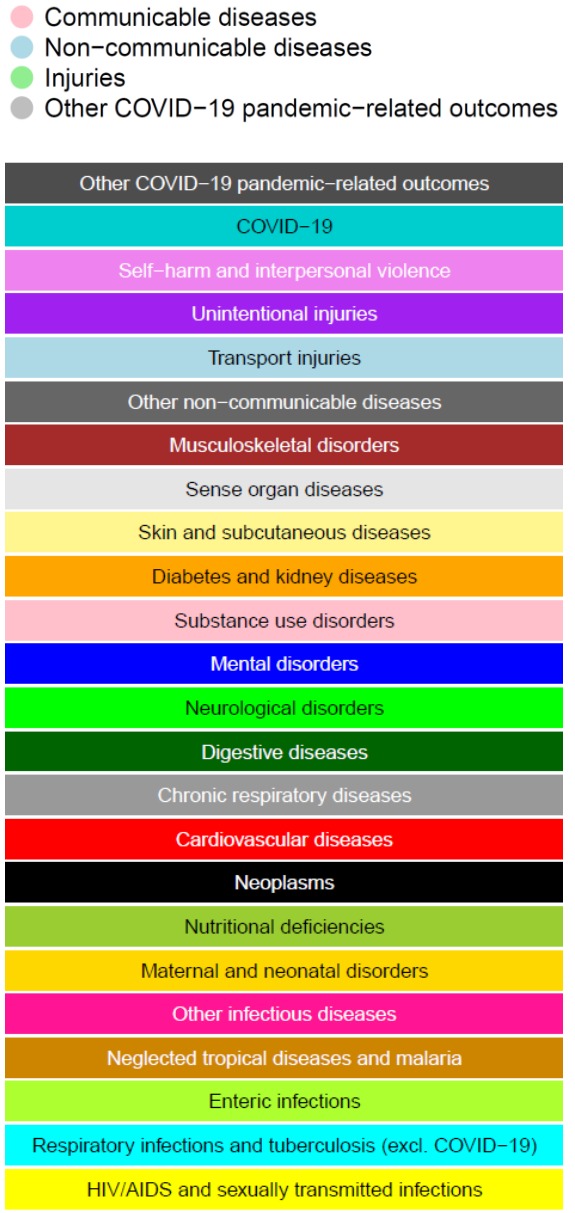
Published Online July 14, 2020 https://doi.org/10.1016/ S0140-6736(20)30677-2

See Online/Comment https://doi.org/10.1016/ S0140-6736(20)31522-1 and S0140-6736(20)31523-3

Global DALYs (million) 1990-2050



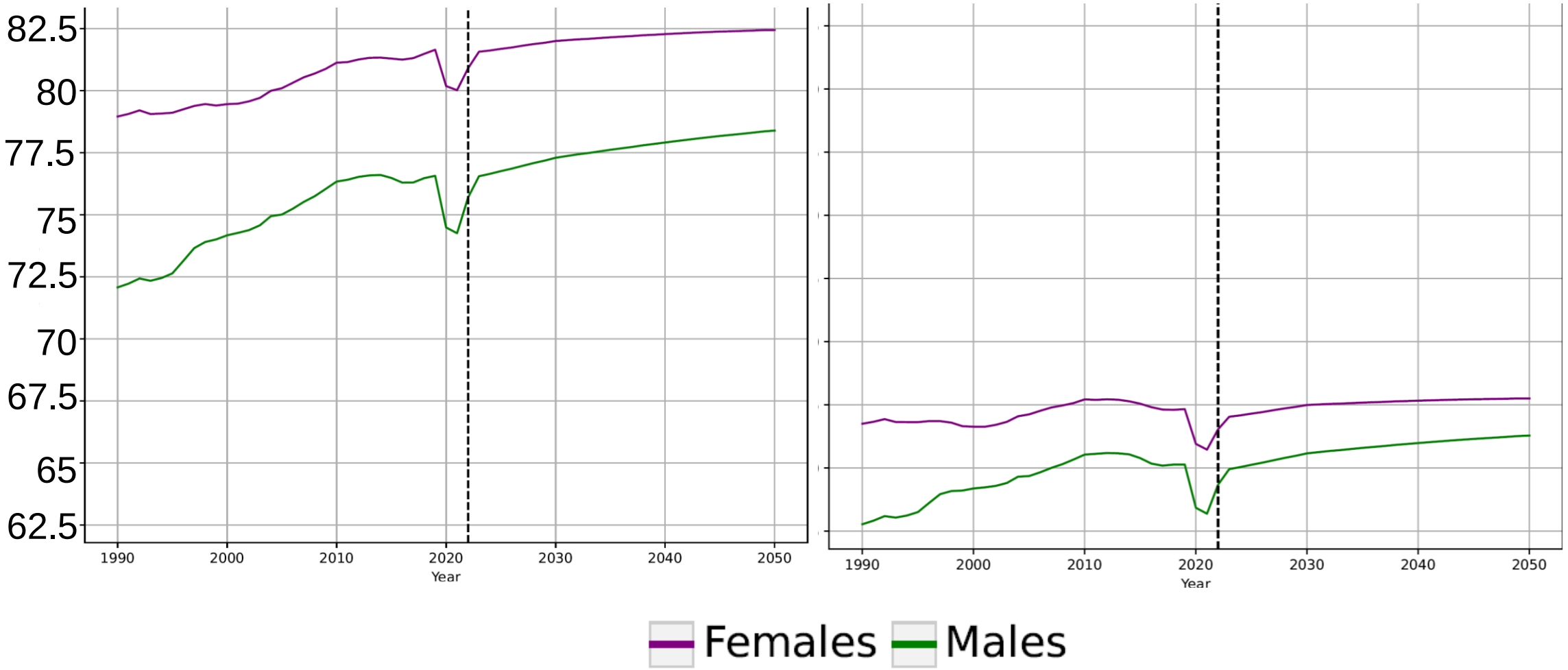




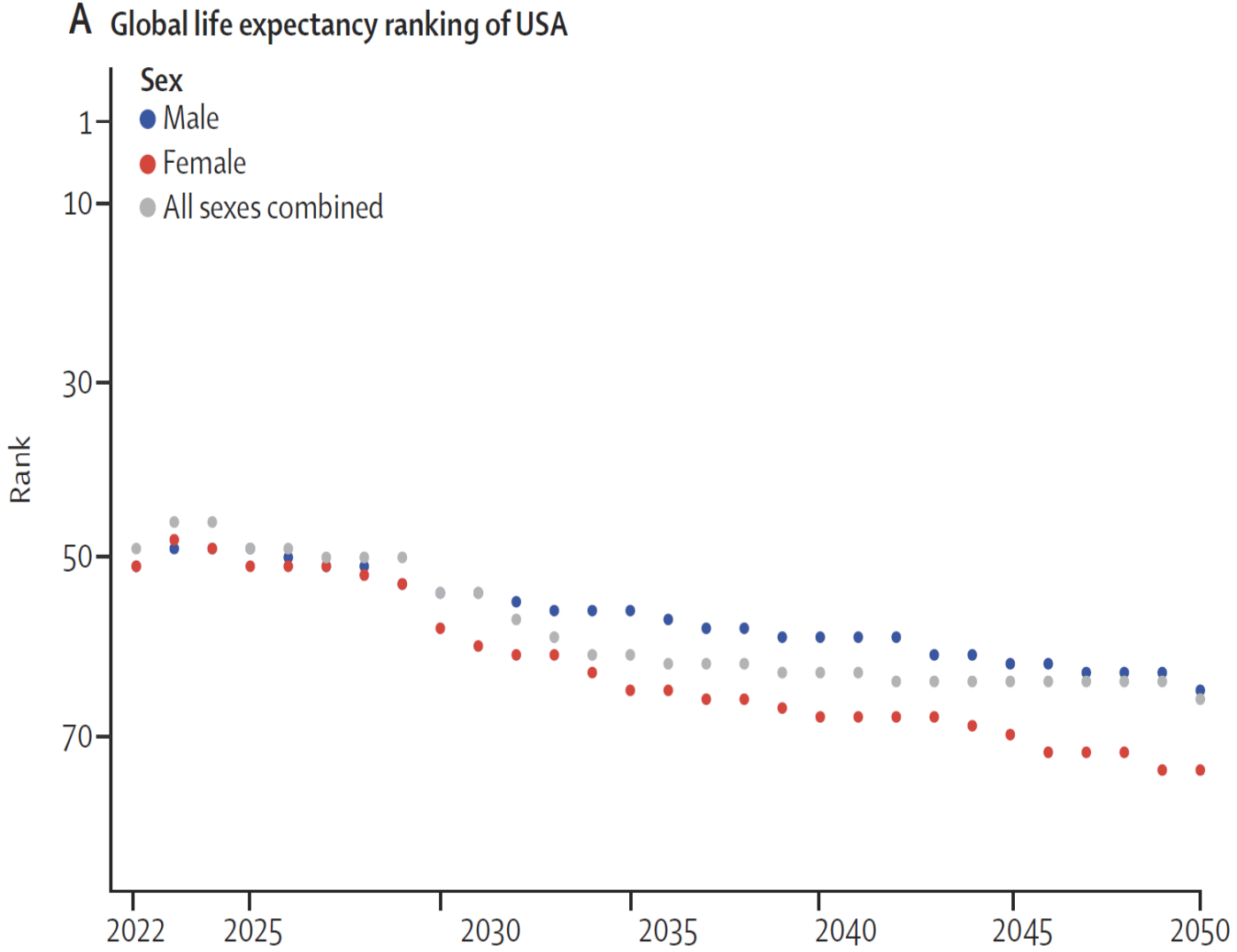
Forecasts: USA slight improvement

Life expectancy

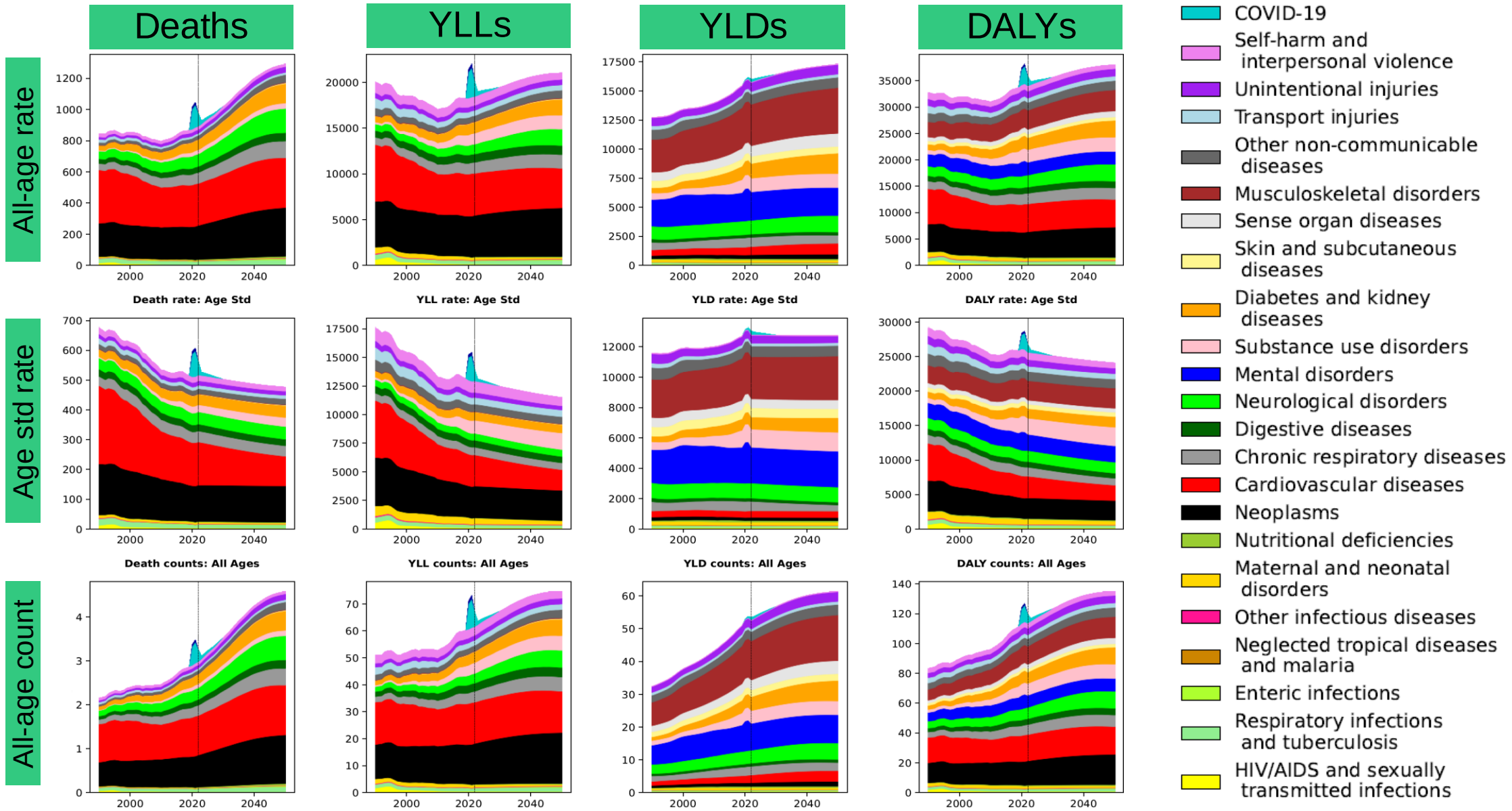
Healthy life expectancy (HALE)



US rank expected to continue declining: Global life expectancy ranking of the USA, 2022-2050, reference scenario



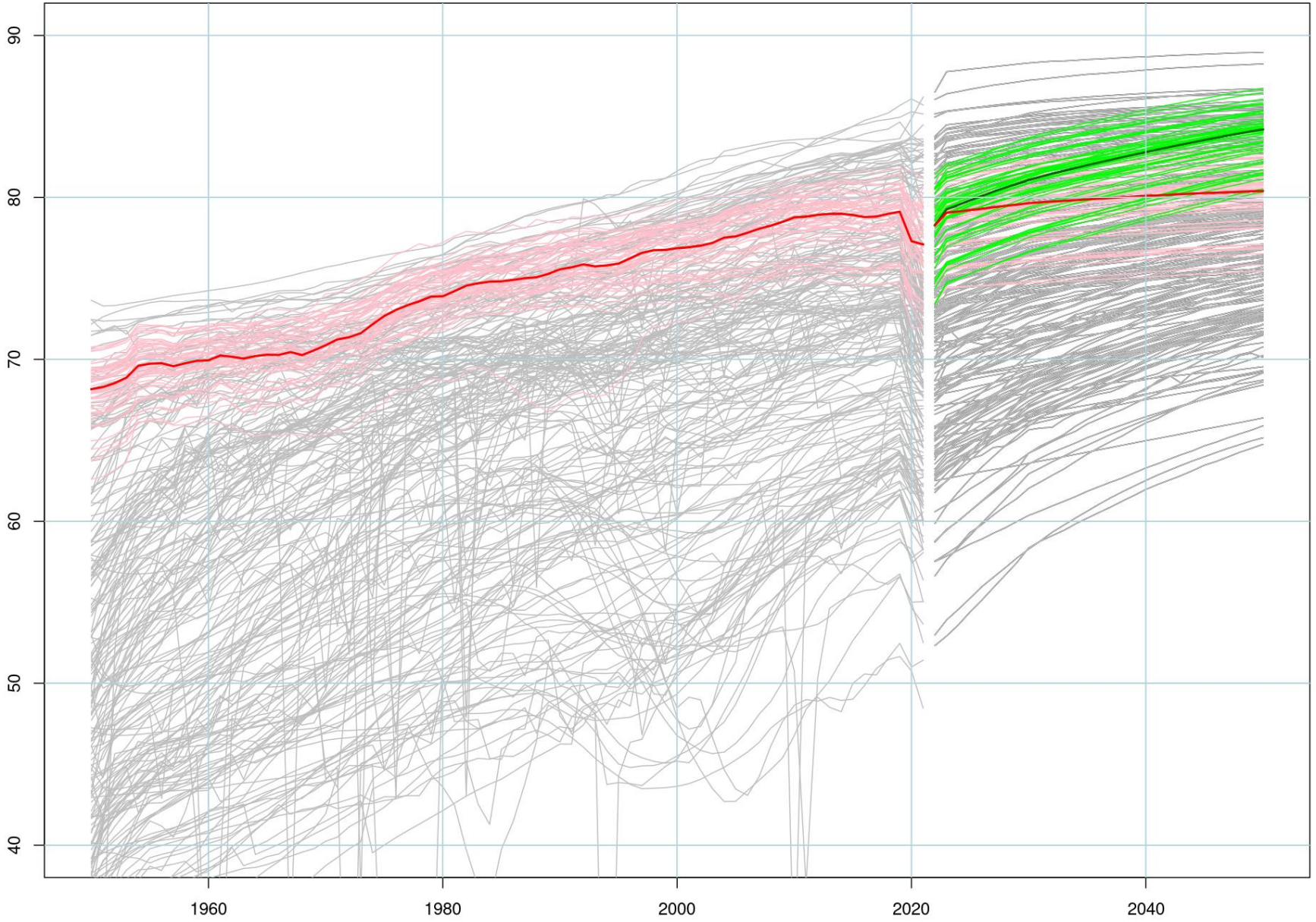
Burden by measure, level 2 cause



Target scenarios

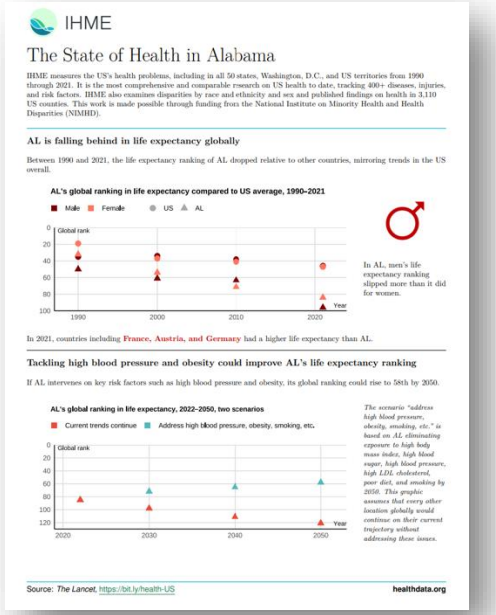
	Scenario	Components	Description
0	Reference	All drivers	Drivers follow past trends
1	Safer Environment	• Unsafe water, sanitation, hygiene • Particulate matter and household air pollution • Non-optimal temperature	WaSH and household air pollution will be linearly eliminated by 2050. Temperature and particulate matter pollution follow SSP1.9 scenario (representing net 0 CO_2 emissions by 2050)
2	Improved behavioral and metabolic risk factors	• High BMI, systolic blood pressure, LDL, fasting plasma glucose • All diet risk factors • Smoking	Exposure to all metabolic and diet risk factors linearly eliminated to 0 by 2050 (e.g. all exposed or consumed at a level that minimizes health risk). Linear reduction of current tobacco smokers to 0 by 2050 and no new smokers after 2022.
3	Improved childhood nutrition and vaccination	• Child growth failure • Vitamin A and iron deficiency • Sub-optimal breastfeeding • Vaccine coverage	Exposure to CGF, vitamin A and iron deficiency and sub-optimal breastfeeding linearly eliminated by 2050. Universal vaccine coverage of 100% by 2050
4	Combined	All components from scenarios 1-3 above	All components 1-3 above

US and US states compared to country forecasts, green is the behavioral risk factor scenario



United States health briefings

4-page summary of results for each US state, Washington, D.C., and US territory from 1990 through 2021.


IHME

The State of Health in Alabama

IHME measures the US's health problems, including in all 50 states, Washington, D.C., and US territories from 1990 through 2021. It is the most comprehensive and comparable research on US health to date, tracking 400+ diseases, injuries, and risk factors. IHME also examines disparities by race and ethnicity and sex and published findings on health in 3,110 US counties. This work is made possible through funding from the National Institute on Minority Health and Health Disparities (NIMHD).

AL is falling behind in life expectancy globally

Between 1990 and 2021, the life expectancy ranking of AL dropped relative to other countries, mirroring trends in the US overall.

AL's global ranking in life expectancy compared to US average, 1990–2021

Male Female US AL

Global rank

Year

In AL, men's life expectancy ranking slipped more than it did for women.

In 2021, countries including **France, Austria, and Germany** had a higher life expectancy than AL.

Tackling high blood pressure and obesity could improve AL's life expectancy ranking

If AL intervenes on key risk factors such as high blood pressure and obesity, its global ranking could rise to 58th by 2050.

AL's global ranking in life expectancy, 2022–2050, two scenarios

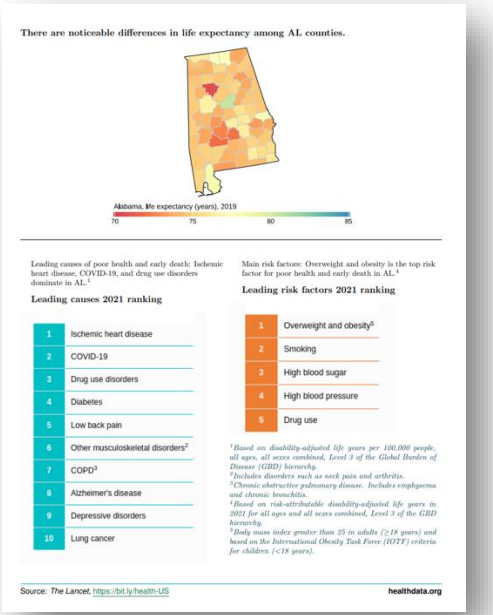
Current trends continue Address high blood pressure, obesity, smoking, etc.

Global rank

Year

The scenario "address high blood pressure, obesity, smoking, etc." is based on AL eliminating exposure to high body mass index, high blood sugar, high blood pressure, high LDL cholesterol, poor diet, and smoking by 2050. This graphic assumes that every other location globally would continue on their current trajectory without addressing these issues.

Source: *The Lancet*, https://bit.ly/health-US healthdata.org


There are noticeable differences in life expectancy among AL counties.

Alabama, life expectancy (years), 2019

70 75 80 85

Leading causes of poor health and early death: Ischemic heart disease, COVID-19, and drug use disorders dominate in AL.[1]

Leading causes 2021 ranking

1	Ischemic heart disease
2	COVID-19
3	Drug use disorders
4	Diabetes
5	Low back pain
6	Other musculoskeletal disorders[2]
7	COPD[3]
8	Alzheimer's disease
9	Depressive disorders
10	Lung cancer

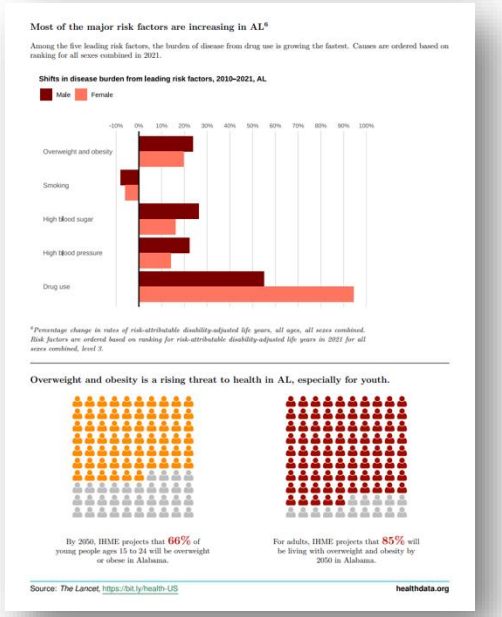
Main risk factors: Overweight and obesity is the top risk factor for poor health and early death in AL.[4]

Leading risk factors 2021 ranking

1	Overweight and obesity[5]
2	Smoking
3	High blood sugar
4	High blood pressure
5	Drug use

[1] *Based on disability-adjusted life years per 100,000 people, all ages, all sexes combined, Level 3 of the Global Burden of Disease (GBD) hierarchy.*
[2] *Includes disorders such as neck pain and arthritis.*
[3] *Chronic obstructive pulmonary disease. Includes emphysema and chronic bronchitis.*
[4] *Based on risk-attributable disability-adjusted life years in 2021 for all ages and all sexes combined, Level 3 of the GBD hierarchy.*
[5] *Body mass index greater than 25 in adults (≥18 years) and based on the International Obesity Task Force (IOTF) criteria for children (<18 years).*

Source: *The Lancet*, https://bit.ly/health-US healthdata.org


Most of the major risk factors are increasing in AL[6]

Among the five leading risk factors, the burden of disease from drug use is growing the fastest. Causes are ordered based on ranking for all sexes combined in 2021.

Shifts in disease burden from leading risk factors, 2010–2021, AL

Male Female

Overweight and obesity
Smoking
High blood sugar
High blood pressure
Drug use

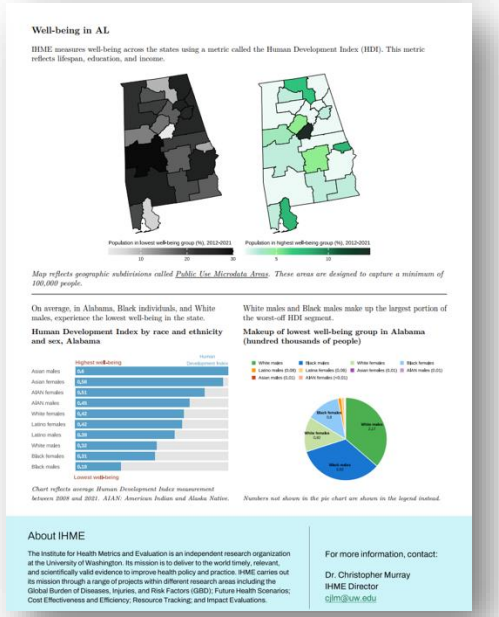
[6] *Percentage change in rates of risk-attributable disability-adjusted life years, all ages, all sexes combined. Risk factors are ordered based on ranking for risk-attributable disability-adjusted life years in 2021 for all sexes combined, level 3.*

Overweight and obesity is a rising threat to health in AL, especially for youth.

By 2050, IHME projects that **66%** of young people ages 15 to 24 will be overweight or obese in Alabama.

For adults, IHME projects that **85%** will be living with overweight and obesity by 2050 in Alabama.

Source: *The Lancet*, https://bit.ly/health-US healthdata.org


Well-being in AL

IHME measures well-being across the states using a metric called the Human Development Index (HDI). This metric reflects lifespan, education, and income.

Population in lowest well-being group (%), 2012-2021

Population in highest well-being group (%), 2012-2021

Map reflects geographic subdivisions called Public Use Microdata Areas. These areas are designed to capture a minimum of 100,000 people.

On average, in Alabama, Black individuals, and White males, experience the lowest well-being in the state.

Human Development Index by race and ethnicity and sex, Alabama

Highest well-being

Lowest well-being

Chart reflects average Human Development Index measurement between 2009 and 2021. AIAN: American Indian and Alaska Native.

White males and Black males make up the largest portion of the worst-off HDI segment.

Makeup of lowest well-being group in Alabama (hundred thousands of people)

Numbers not shown in the pie chart are shown in the legend instead.

About IHME

The Institute for Health Metrics and Evaluation is an independent research organization at the University of Washington. Its mission is to deliver to the world timely, relevant, and scientifically valid evidence to improve health policy and practice. IHME carries out its mission through a range of projects within different research areas including the Global Burden of Diseases, Injuries, and Risk Factors (GBD); Future Health Scenarios; Cost Effectiveness and Efficiency; Resource Tracking; and Impact Evaluations.

For more information, contact:

Dr. Christopher Murray
IHME Director
cjlm@uw.edu

Some strategies to improve the US

1) Close the education gaps between boys and girls and between poor disadvantaged groups the rest of the US. Early child development programs likely will be a critical part of this solution.

2) Address the nexus of obesity, diet and physical activity. Both through subsidies, taxes, community health worker led programs, and GLP1s.

3) Achieve universal health coverage as a way to enhance access to preventive interventions, primary health care and reduce catastrophic spending.

4) Address the other key risk factors especially tobacco and high blood pressure.

IHME

Thank you!

Ali H. Mokdad, PhD

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Professor, Health Metrics Sciences

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UNIVERSITY of WASHINGTON

Institute for Health Metrics and Evaluation

SocioDemographic Index (SDI)

Composite Score with 3 Components:

- Economic Capital + Human Capital + Demographics

Indicators

- Economic Capital:
  - GDP per capita (Lag dependent)
- Human Capital:
  - Average educational attainment of population over 15 (both sexes)
- Demographics:
  - Fertility rate under 25

Calculation

- Same as development index; equal weight to all 3 indicators and re-scale to 0-1 using geometric mean
  - 0.06 in Mozambique in 1987; 0.978 in Washington DC 2015
- Reported in quintiles

Socio-Demographic Index values for all estimated GBD 2019 locations, 1990-2019

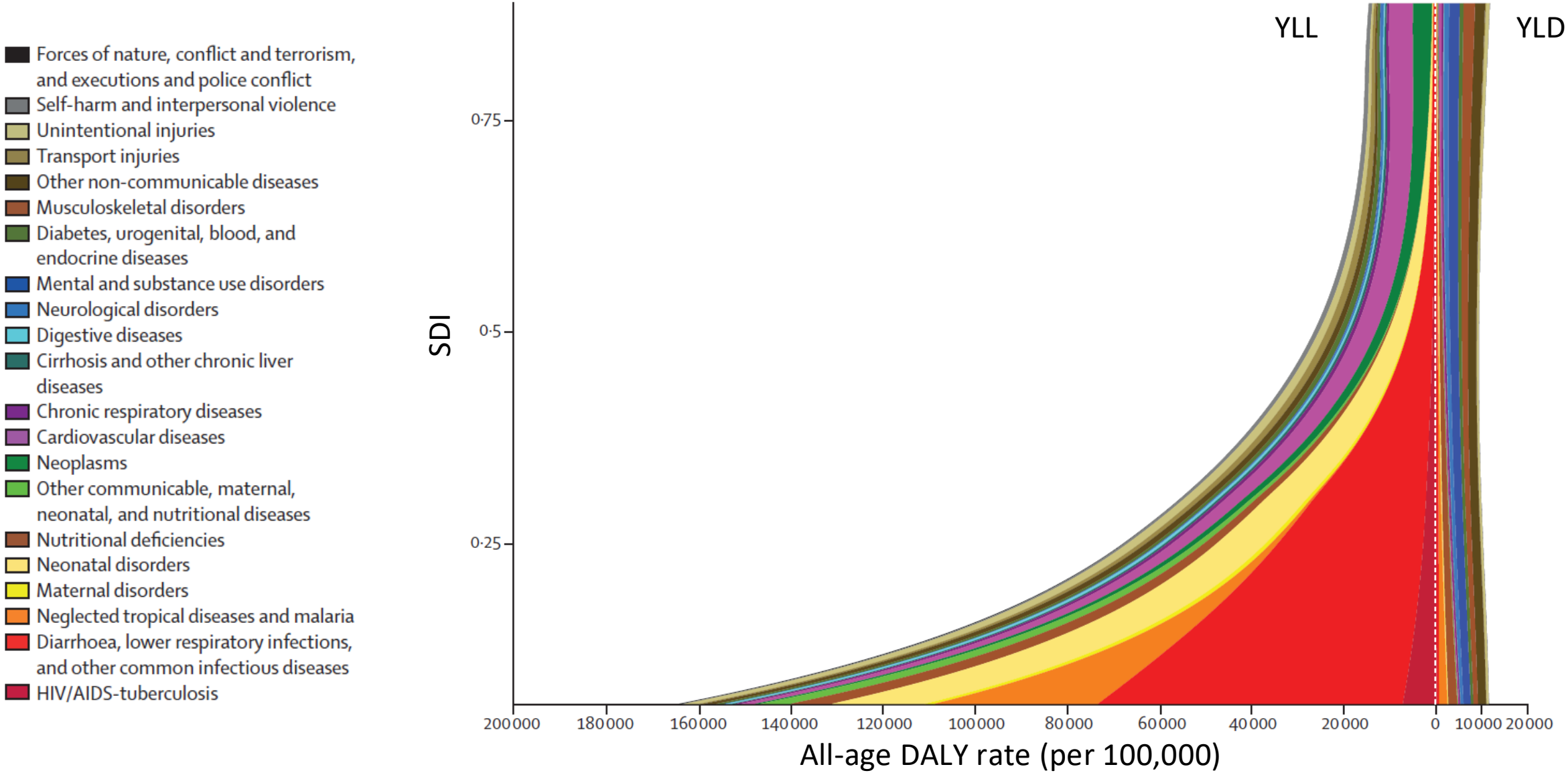
Location	1990	2019
Global	0·511	0·651
Central Europe, eastern Europe, and central Asia	0·648	0·76
Central Asia	0·551	0·663
Armenia	0·536	0·689
Azerbaijan	0·576	0·683
Georgia	0·654	0·702
Kazakhstan	0·602	0·723
Kyrgyzstan	0·532	0·596
Mongolia	0·465	0·606
Tajikistan	0·468	0·539
Turkmenistan	0·548	0·67
Uzbekistan	0·49	0·631
Central Europe	0·641	0·788

Yohannes Kinfu
GBD Collaborator

Suggested change to SDI instead of "developing" / "developed"

http://ghdx.healthdata.org/record/ihme-data/gbd-2019-socio-demographic-index-sdi-1950-2019

Expected relationship between all-age YLL and YLD rates and SDI for 21 causes



Ratio of observed-to-expected age-standardized DALY rates on the basis of SDI alone