

Why health?

Data, determinants, and decision-making for better health

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Vice Provost for Interdisciplinary Initiatives

1. A fraught history of health



“ When health is absent, wisdom cannot reveal itself, art cannot manifest, strength cannot fight, wealth becomes useless, and intelligence cannot be applied. ”



The Triumph of Death by Pieter Bruegel the Elder, circa 1562, oil on panel. Museo del Prado. (via WIKIMEDIA COMMONS)



In this 1625 illustration, Londoners fleeing the plague are barred by country dwellers. NEW YORK PUBLIC LIBRARY/SCIENCE SOURCE

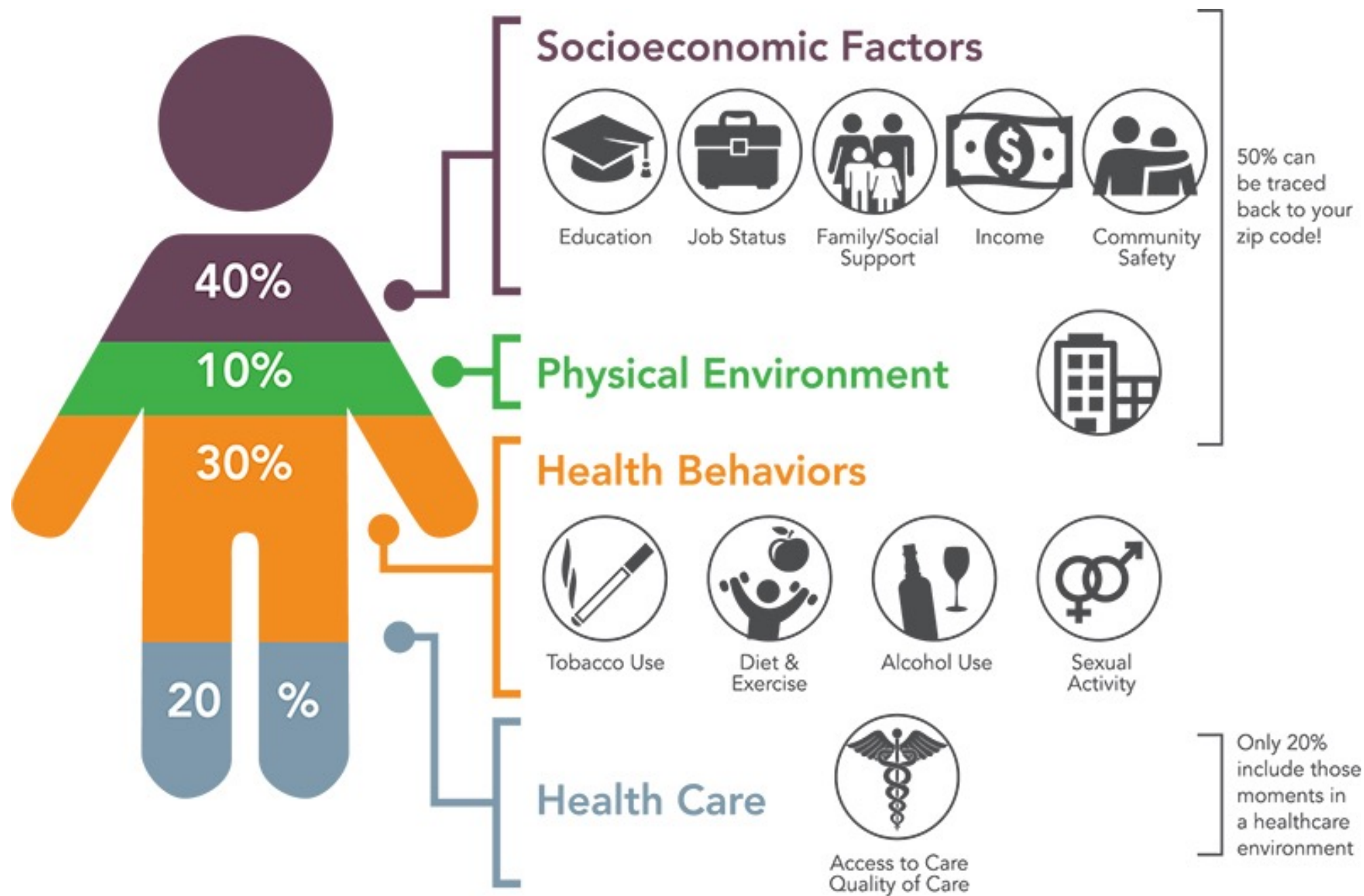


In this 14th century manuscript by the French chronicler Gilles li Muisis, residents of a town stricken by the plague burn Jews, who were blamed for causing the disease. (via WIKIMEDIA COMMONS)



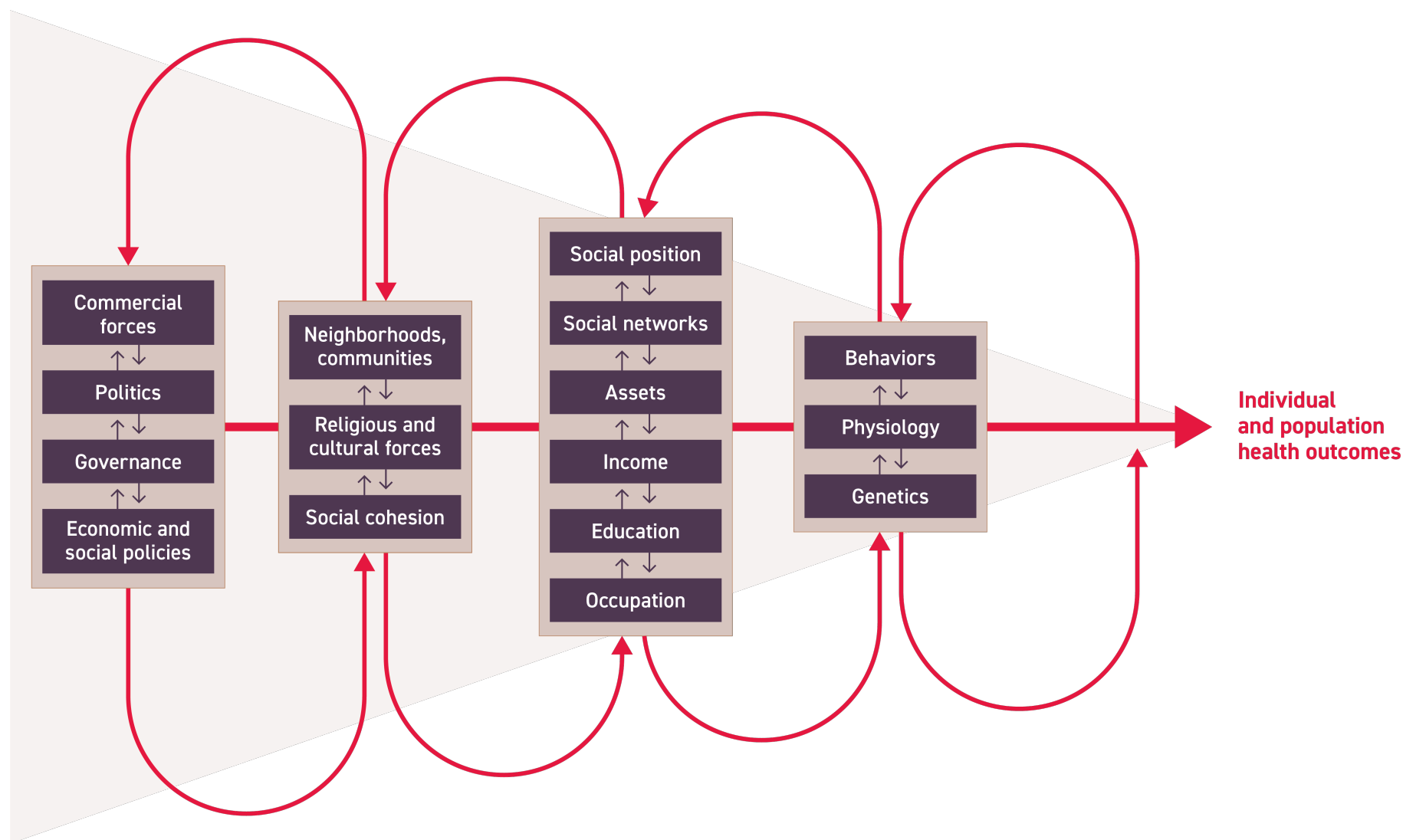
2. So, what causes health?





Social determinants, life course, and health

..... Accumulation of risks and benefits across life course



..... Emotions, values, luck, historical legacies

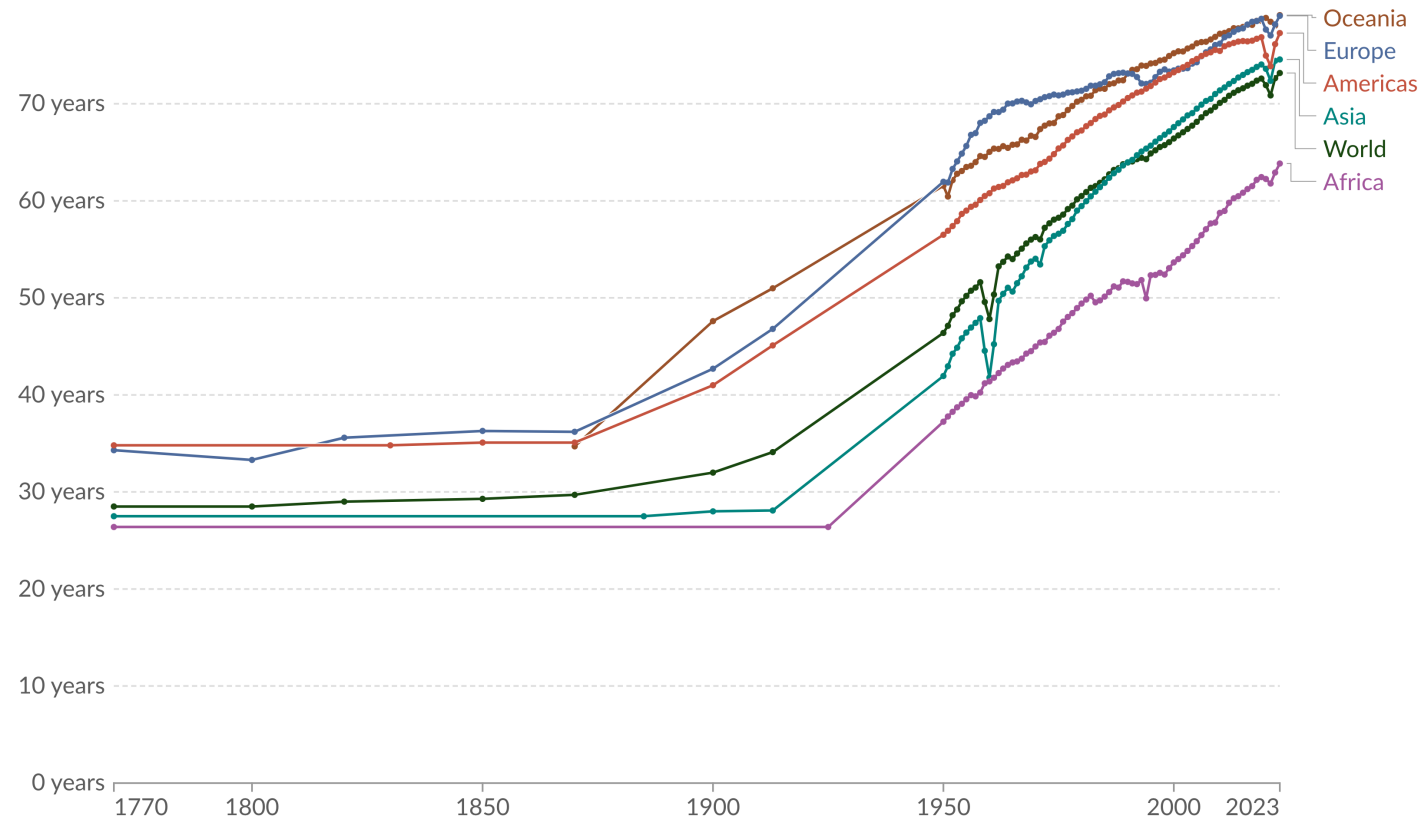


3. How are we doing on health?

Life expectancy

The period life expectancy¹ at birth, in a given year.

Our World
in Data



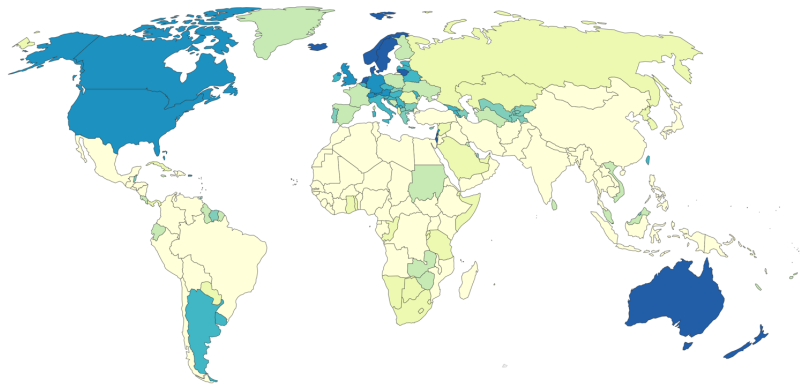
Data source: UN WPP (2024); HMD (2024); Zijdeman et al. (2015); Riley (2005)

OurWorldinData.org/life-expectancy | CC BY

1. Period life expectancy: Period life expectancy is a metric that summarizes death rates across all age groups in one particular year. For a given year, it represents the average lifespan for a hypothetical group of people, if they experienced the same age-specific death rates throughout their whole lives as the age-specific death rates seen in that particular year. Learn more in our articles: "Life expectancy" – What does this actually mean? and Period versus cohort measures: what's the difference?

Life expectancy, 1940

The period life expectancy¹ at birth, in a given year.



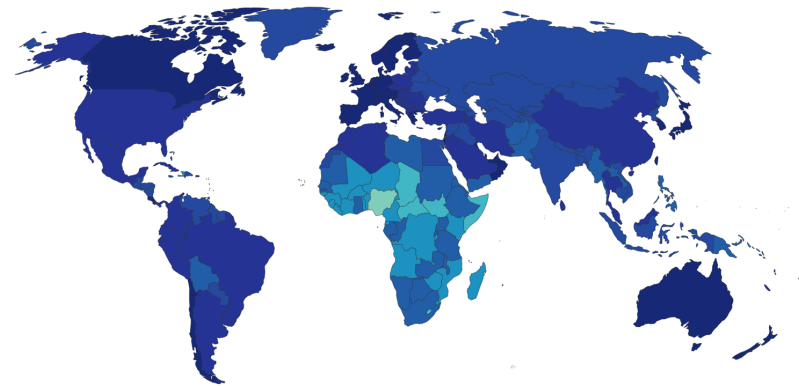
Data source: UN WPP (2022); HMD (2023); Zijdemann et al. (2015); Riley (2005)

OurWorldinData.org/life-expectancy | CC BY

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Life expectancy, 2023

The period life expectancy¹ at birth, in a given year.



Data source: Human Mortality Database (2024); UN, World Population Prospects (2024)

OurWorldinData.org/life-expectancy | CC BY

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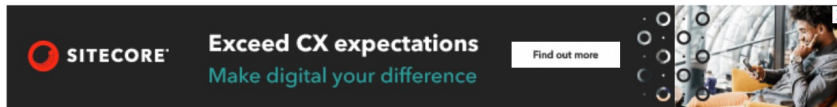
IRUS

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THE VACCINE RACE

CASE COUNT

THE COVID STORM SERIES



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Pfizer's Covid-19 Vaccine Proves 90% Effective in Latest Trials

Drugmaker and partner BioNTech could seek FDA authorization by end of November



The New York Times

The Road to a Coronavirus Vaccine

[Vaccine Tracker](#)

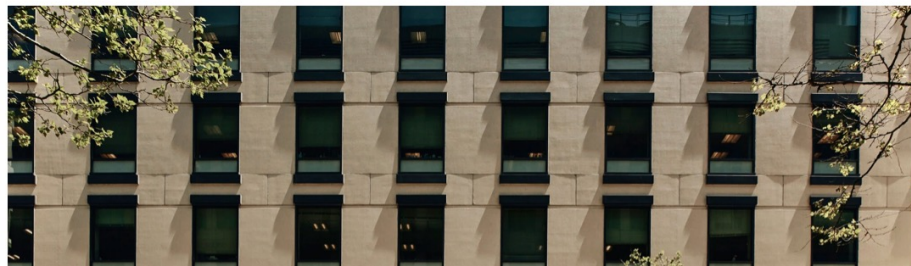
[FAQ: Pfizer's Vaccine](#)

[After the First Vaccine](#)

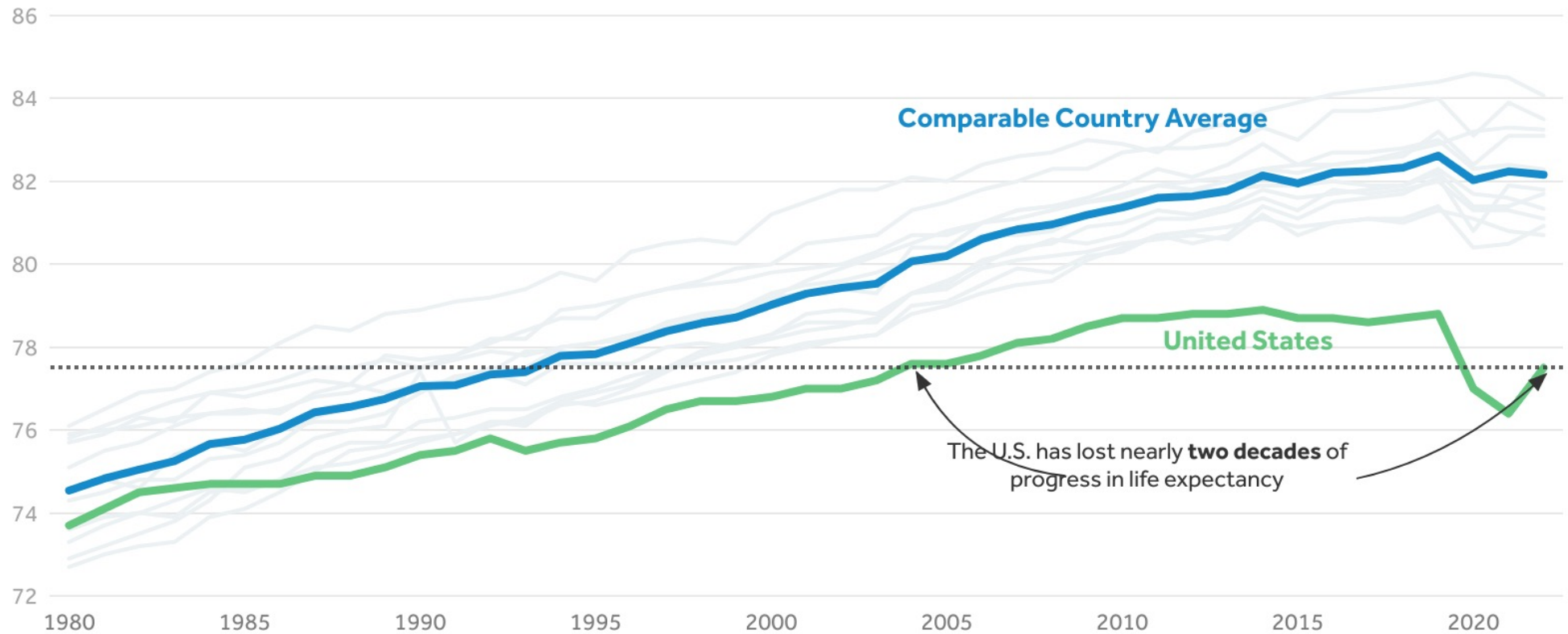
[Understanding Long-Term Safety](#)

Early Data Show Moderna's Coronavirus Vaccine Is 94.5% Effective

Moderna is the second company to report preliminary results from a large trial testing a vaccine. But there are still months to go before it will be widely available to the public.



Life expectancy at birth, in years, 1980-2022



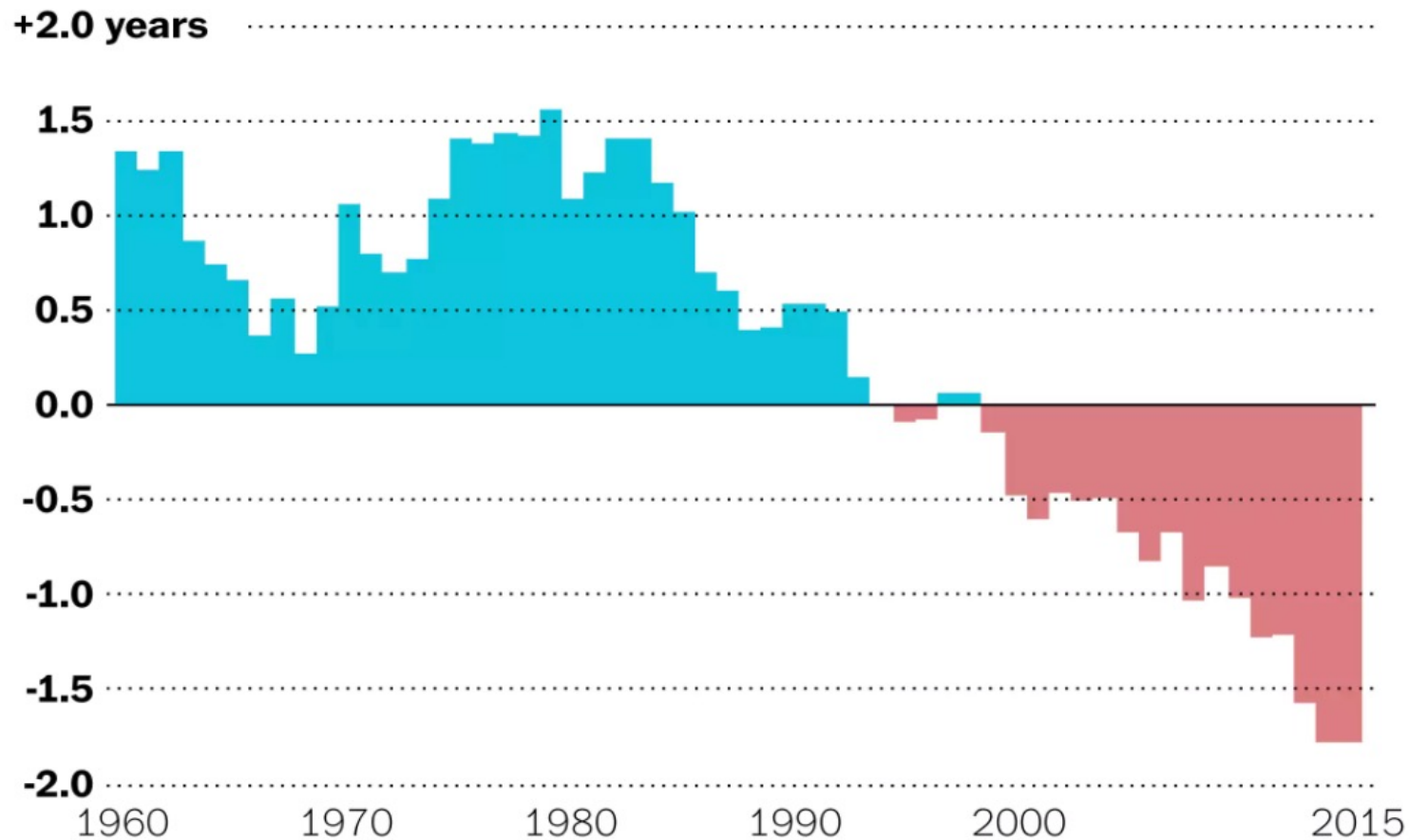
Notes: Comparable countries include Australia, Austria, Belgium, Canada, France, Germany, Japan, the Netherlands, Sweden, Switzerland, and the U.K. See Methods section of "How does U.S. life expectancy compare to other countries?"

Source: KFF analysis of CDC, OECD, Australian Bureau of Statistics, Japanese Ministry of Health, Labour, and Welfare, Statistics Canada, and U.K. Office for National Statistics data

Peterson-KFF
Health System Tracker

American exceptionalism

Difference between average American life expectancy, and OECD average life expectancy, 1960 –2015



WASH. POST/WONK BLOG

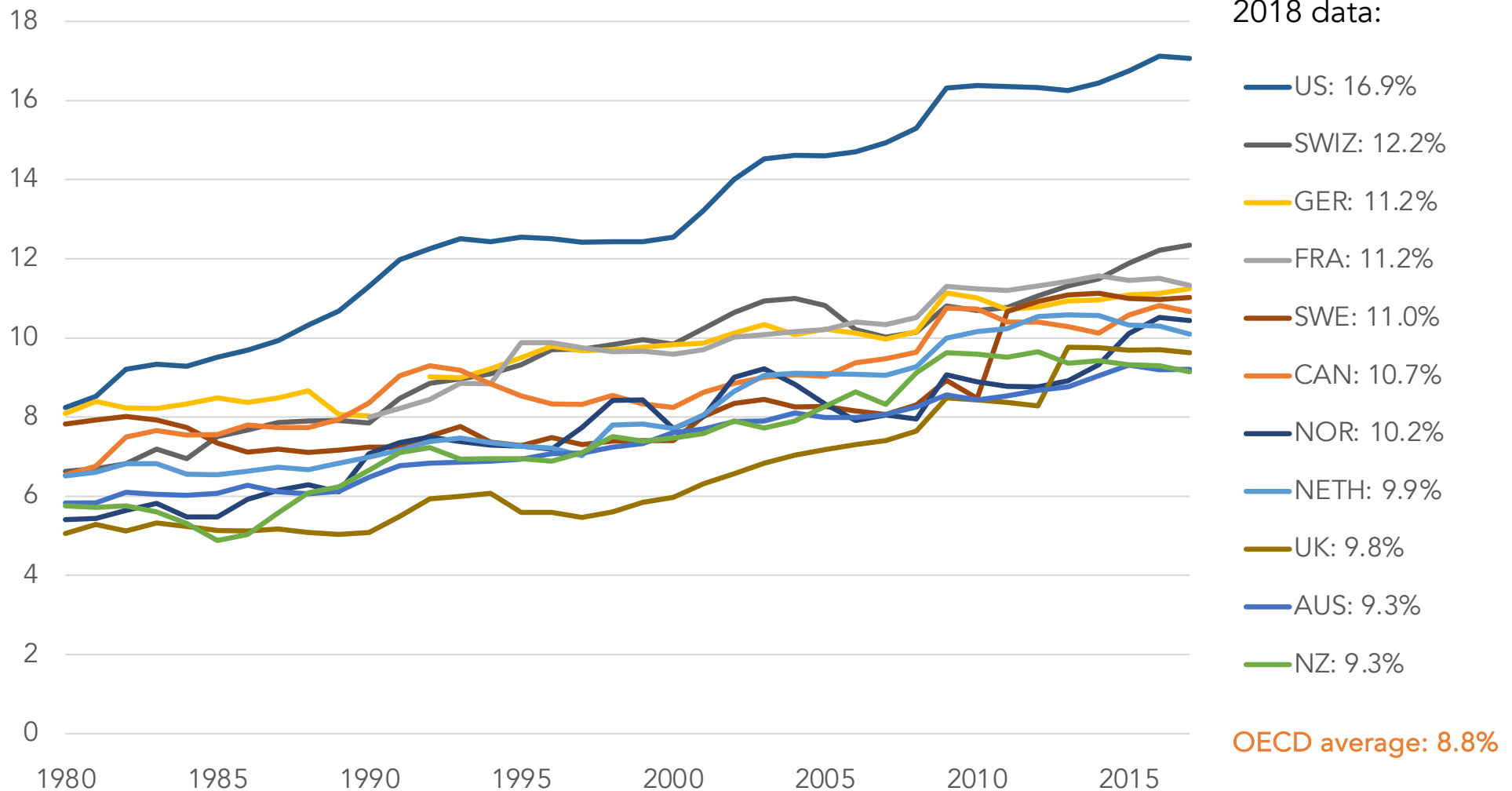
Source: OECD, U.S. Census Bureau

Ingraham C. Americans are dying younger than people in other rich nations. *Washington Post*. December 27, 2017.

https://www.washingtonpost.com/news/wonk/wp/2017/12/27/americans-are-dying-younger-than-people-in-other-rich-nations/?utm_term=.d8ef8a27023a Accessed December 27, 2017.

Health Care Spending as a Percent of GDP, 1980–2018

Percent (%) of GDP, adjusted for differences in cost of living



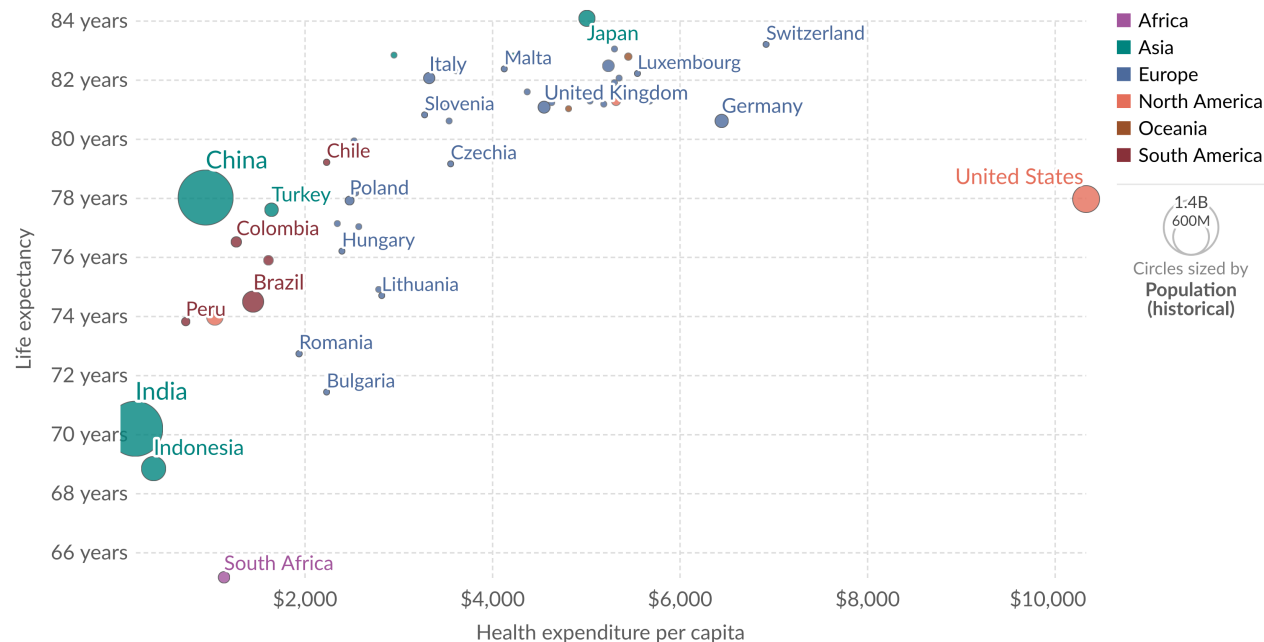
Notes: Current expenditures on health. Based on System of Health Accounts methodology, with some differences between country methodologies. GDP = gross domestic product. OECD average reflects the average of 36 OECD member countries, including ones not shown here. * 2018 data are provisional or estimated.

Data: OECD Health Statistics 2019.

Life expectancy vs. health expenditure, 2022

Our World
in Data

Health expenditure includes all financing schemes and covers all aspects of healthcare. This data is adjusted for inflation and differences in the cost of living between countries.



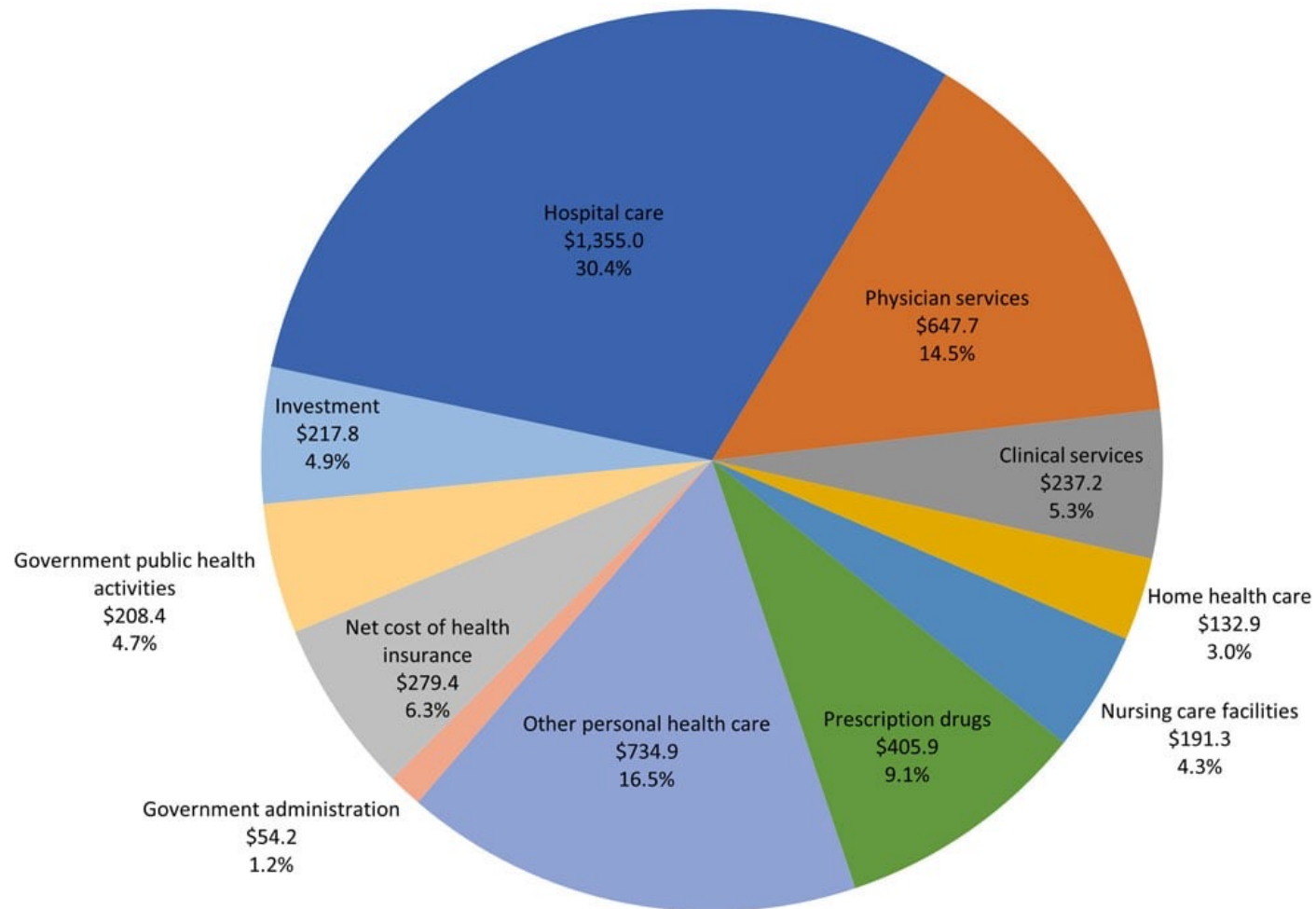
Data source: UN, World Population Prospects (2024); OECD Health Expenditure and Financing Database (2023)

Note: Health expenditure data is expressed in international-\$¹ at 2015 prices.

OurWorldinData.org/financing-healthcare | CC BY

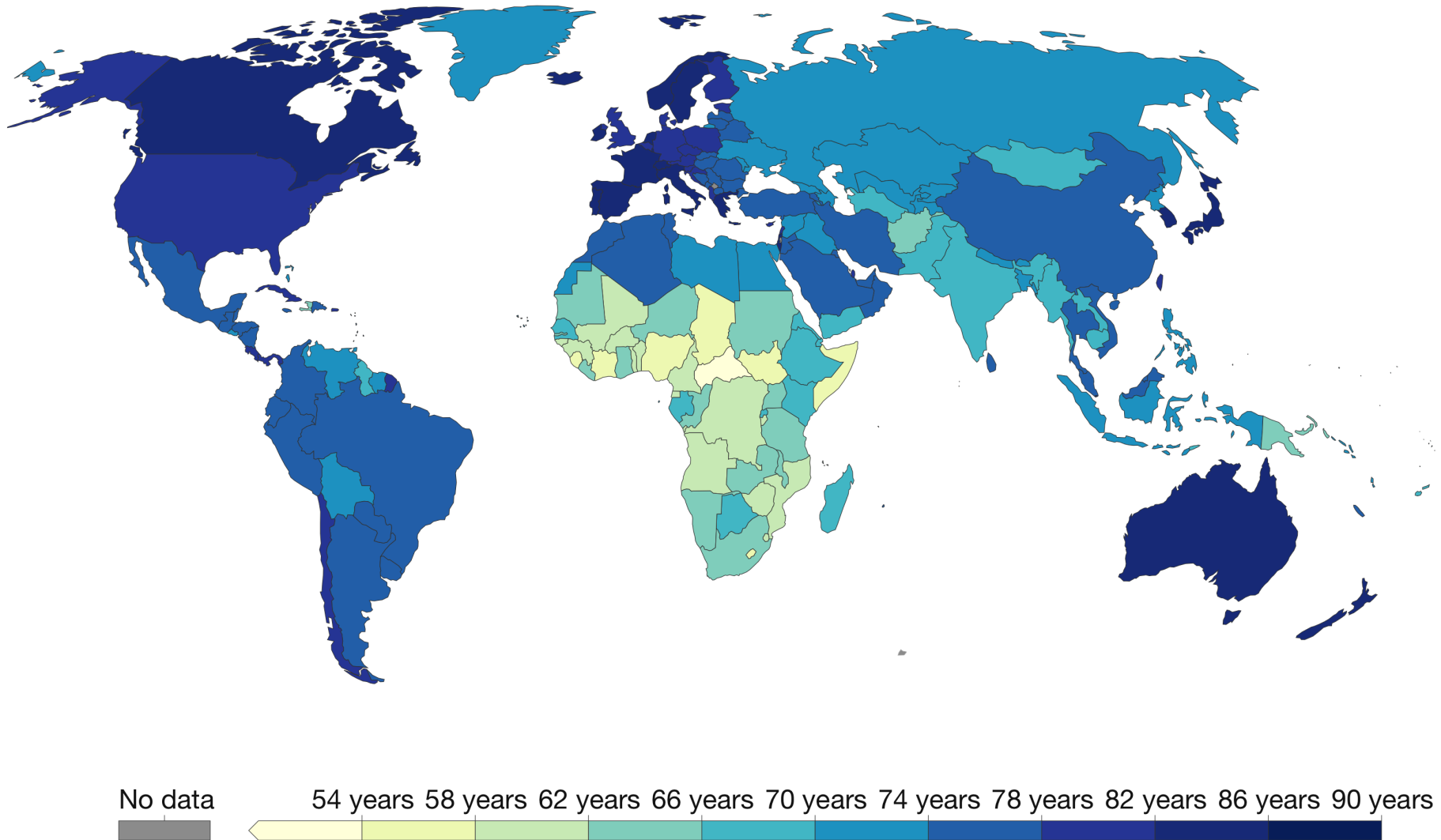
1. International dollars: International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: What are Purchasing Power Parity adjustments and why do we need them?

**The U.S. spent \$4,464.6 billion on health care in 2022
where did it go?**



4. How are we doing on health gaps?

Life expectancy, 2019



Source: Riley (2005), Clio Infra (2015), and UN Population Division (2019)

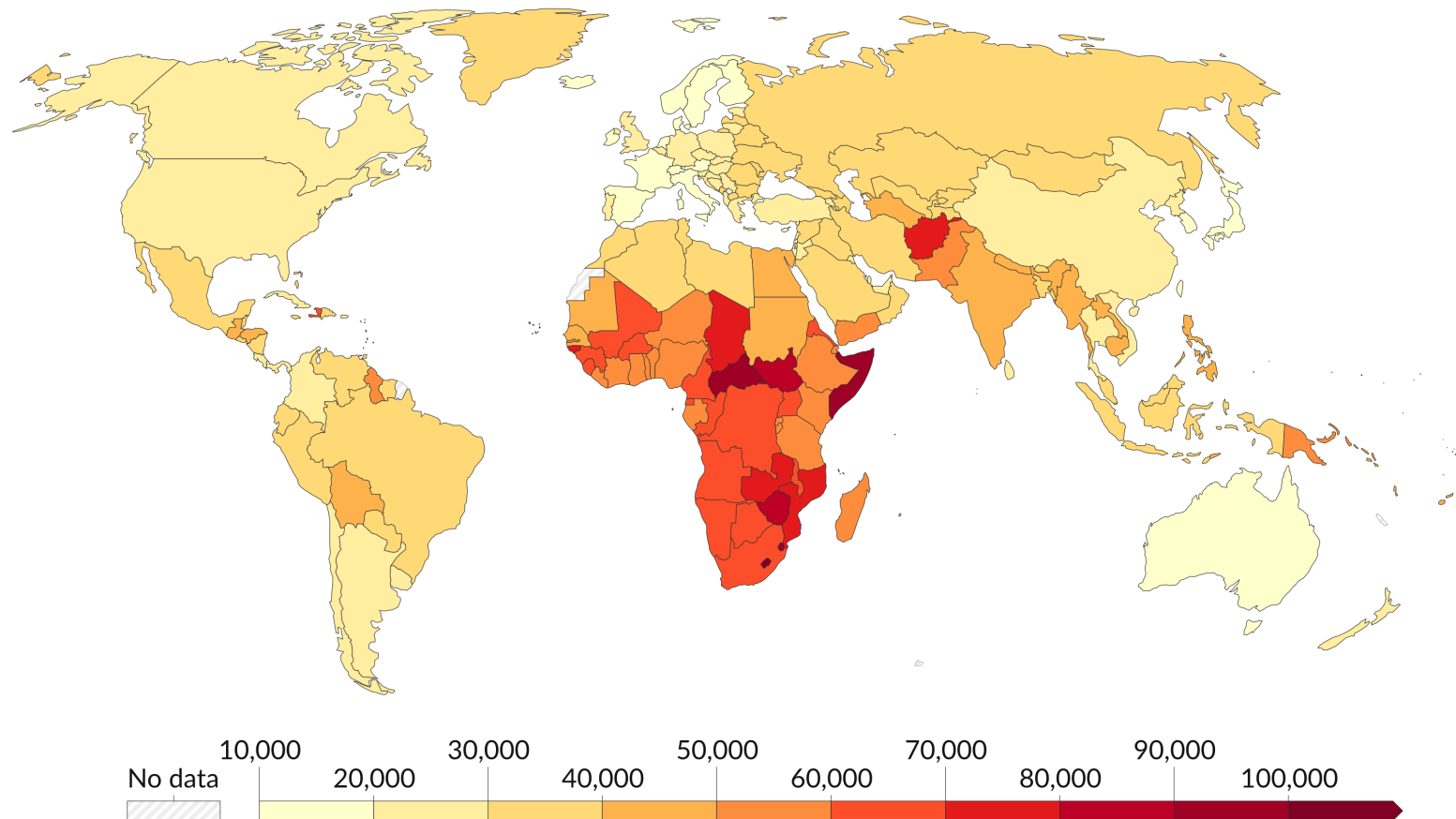
OurWorldInData.org/life-expectancy • CC BY

Note: Shown is period life expectancy at birth, the average number of years a newborn would live if the pattern of mortality in the given year were to stay the same throughout its life.

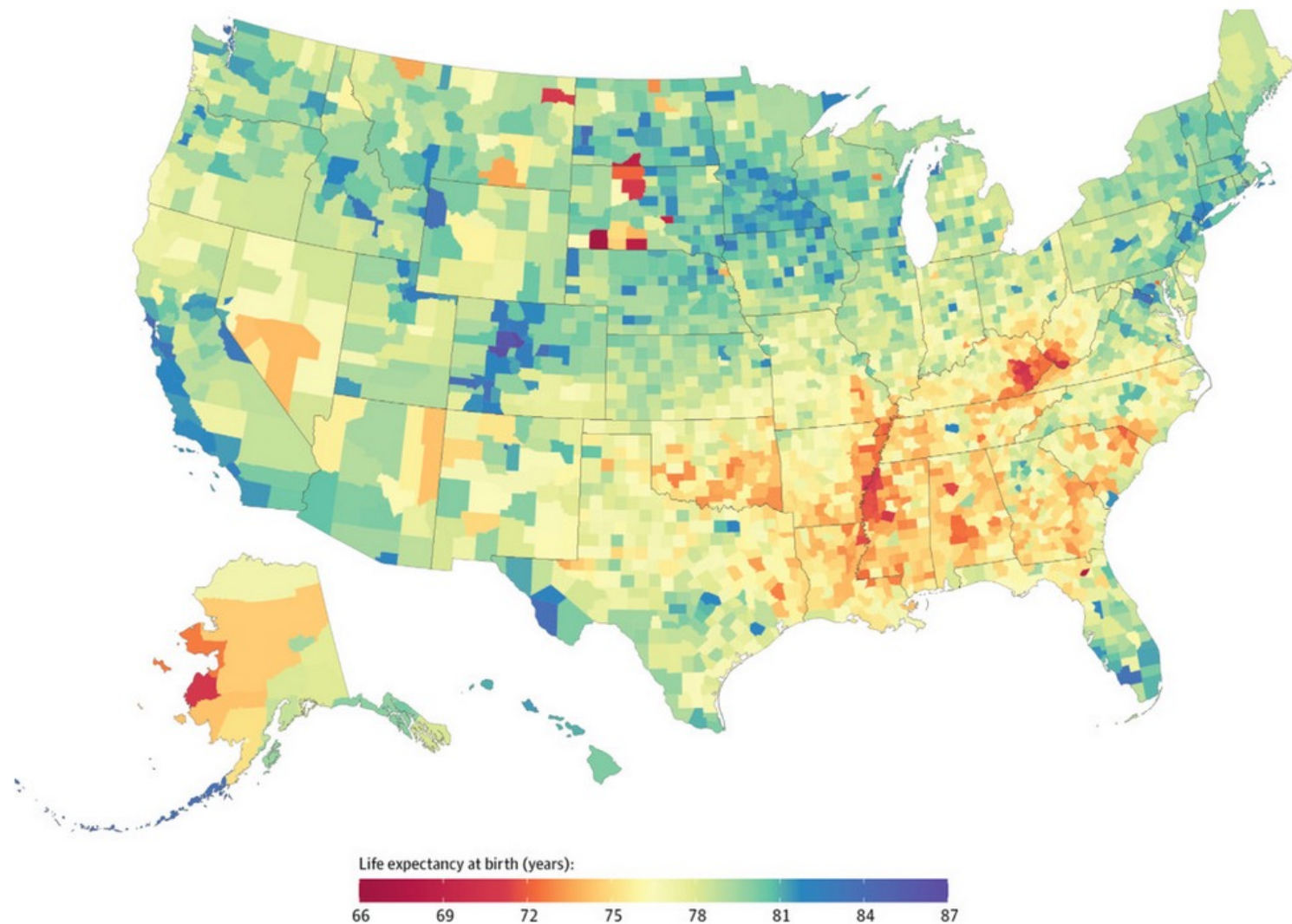
Burden of disease, 2021

Our World
in Data

Disability-Adjusted Life Years (DALYs) per 100,000 individuals from all causes. DALYs measure the total burden of disease – both from years of life lost due to premature death and years lived with a disability. One DALY equals one lost year of healthy life.



There is a 20-year gap between counties with the lowest and highest life expectancies

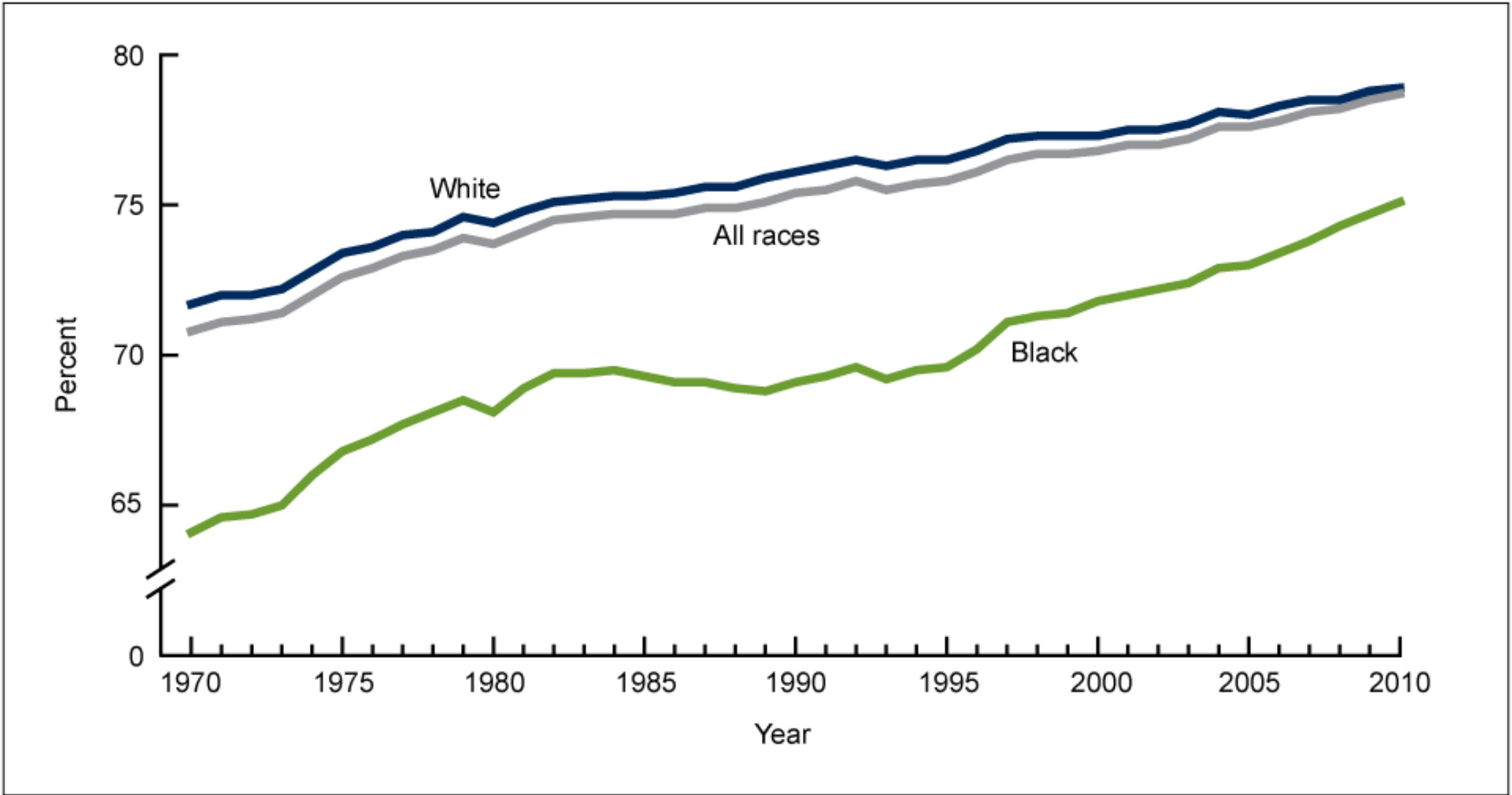


JAMA

Belluz J, Frostenson S. These maps show how Americans are dying younger. It's not just the opioid epidemic. Vox. May 9, 2017.

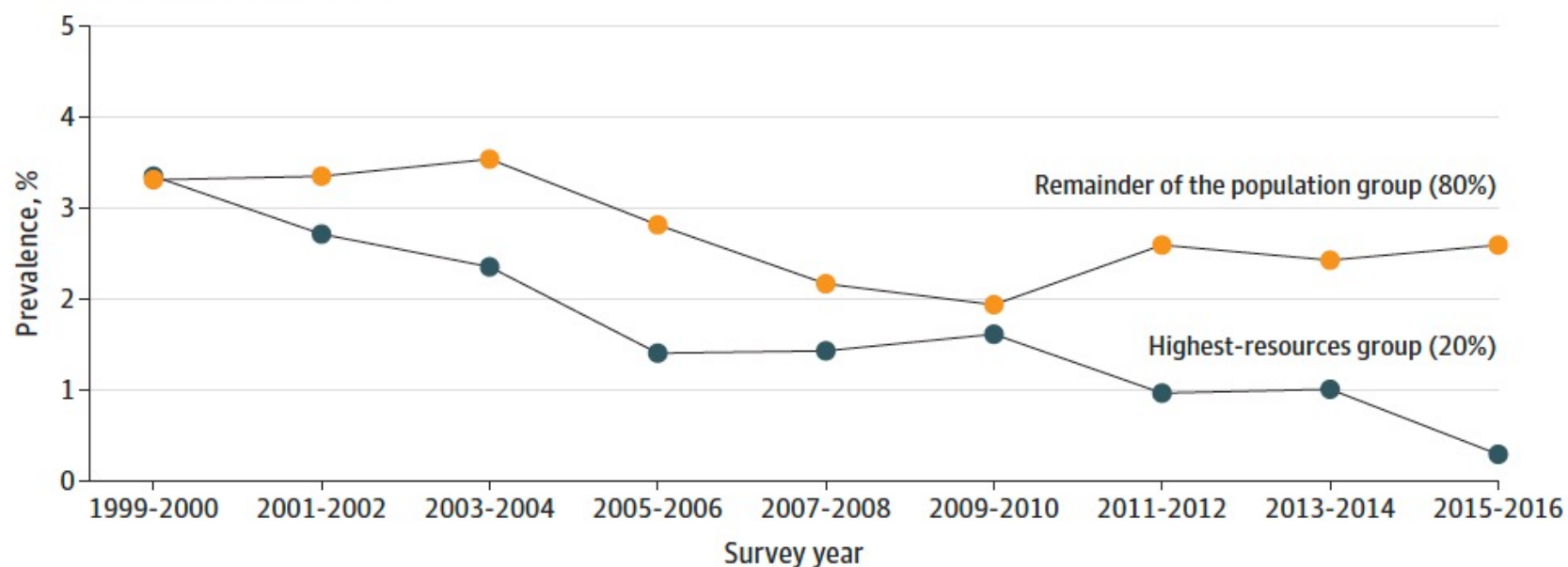
<https://www.vox.com/2016/12/13/13926618/mortality-trends-america-causes-death-by-county> Accessed May 14, 2017.

Figure 1. Life expectancy, by race: United States, 1970–2010



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

B Trends in angina prevalence



C Trends in heart attack prevalence

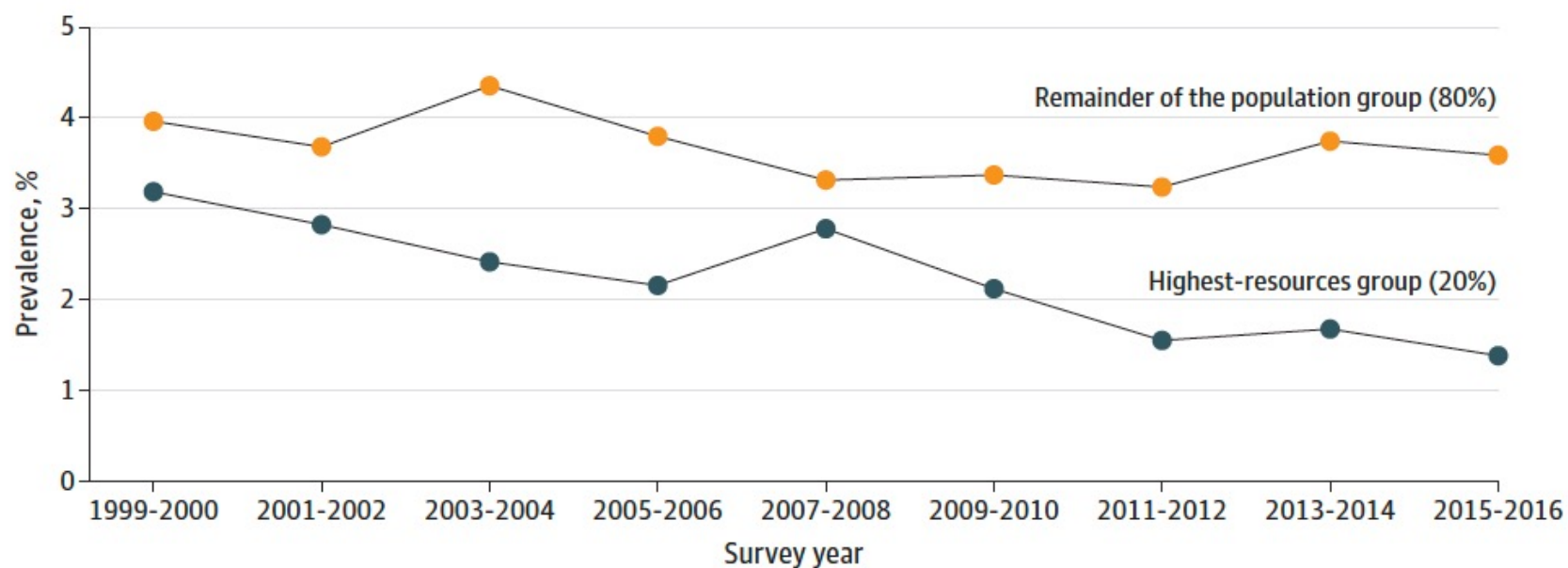
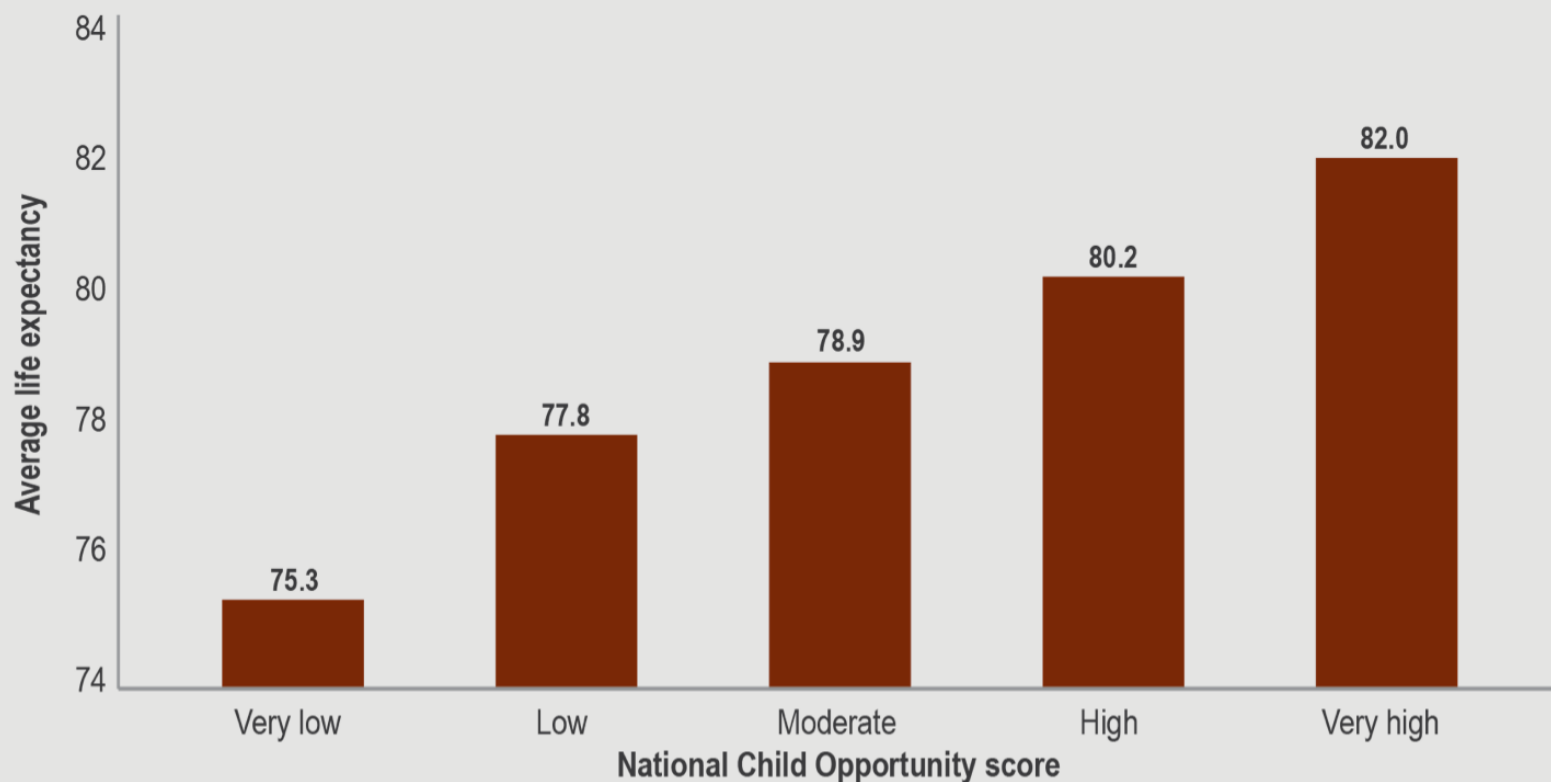


Figure 2.2 Child neighborhood opportunity level and average life expectancy at birth in the 100-largest U.S. metropolitan areas



Notes: Life expectancy is the average number of years a person can expect to live at birth for individuals born in a given neighborhood (Census tract) for the years 2010–2015. Each neighborhood is assigned to one of five opportunity levels (very low, low, moderate, high, or very high) based on its COI 2.0 score. Each opportunity level contains 20% of the U.S. child population. Average life expectancy at birth was calculated across all Census tracts with the same opportunity level weighted by the population of children 0–17 years of age in each tract.

U.S. Department of Health and Human Services, Office of Surgeon General. (2021). Community Health and Economic Prosperity Engaging Businesses as Stewards and Stakeholders—A Report of the Surgeon General. Retrieved from <https://www.hhs.gov/sites/default/files/chep-sgr-full-report.pdf>

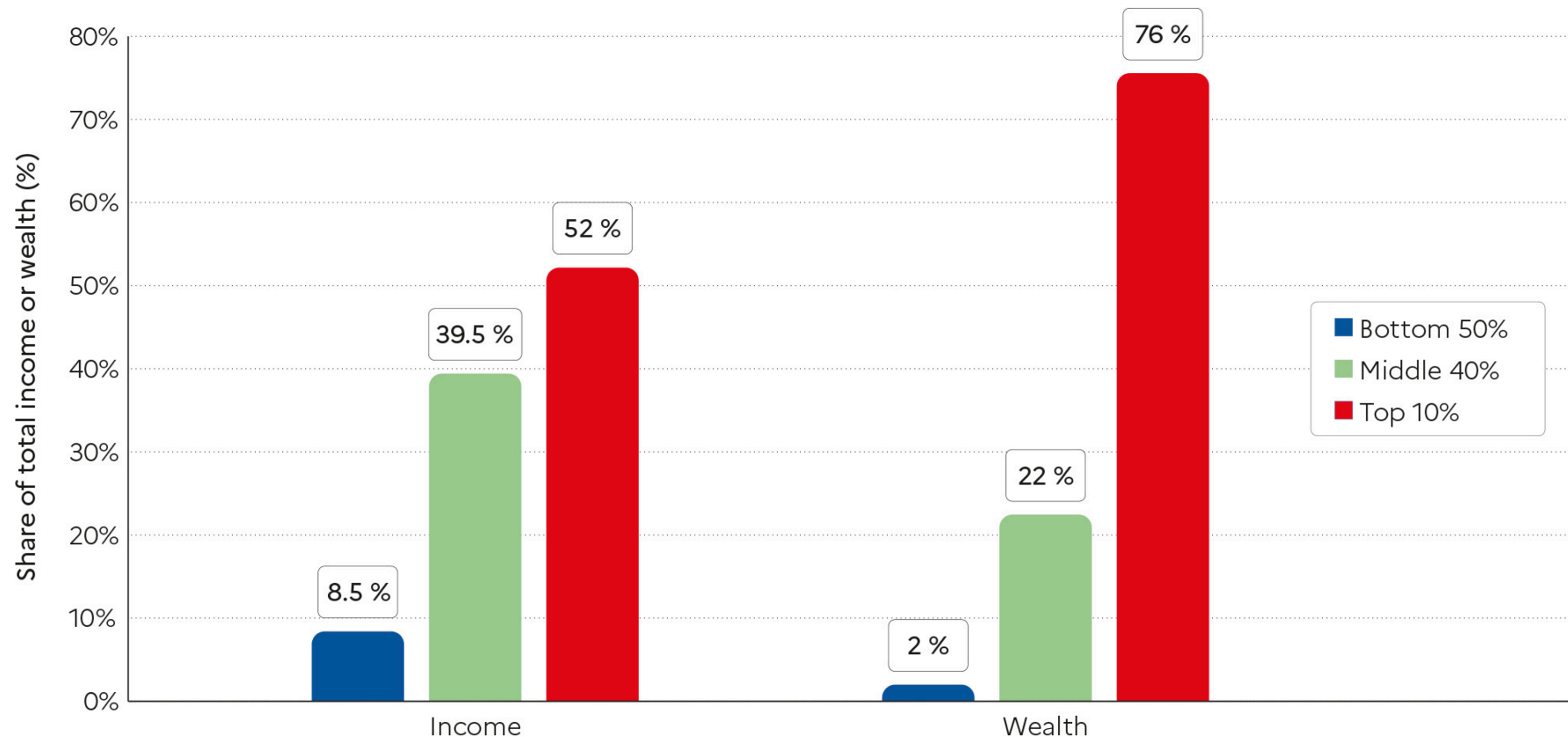
Child Opportunity Index 2.0, 2019: diversitydatakids.org. (n.d.). *Child Opportunity Index 2.0, 2019*. Waltham, MA: Brandeis University, The Heller School for Social Policy and Management, Institute for Child Youth and Family Policy; and Life expectancy data from the U.S. Small-Area Life Expectancy Estimates Project (CDC-NCHS).

“ Health equity is...the allocation of resources according to need, in a way that preventable differences in health outcomes are minimized, and access is fair. ”

Maani N, Abdalla SM, Ettman C, Parsey L, Rhule E, Allotey P, Galea S. Global health equity requires global equity. Under review.

Culyer AJ, Wagstaff A. Equity and equality in health and health care. *Journal of Health Economics* 1993;12(4):431-57. doi: [https://doi.org/10.1016/0167-6296\(93\)90004-X](https://doi.org/10.1016/0167-6296(93)90004-X)

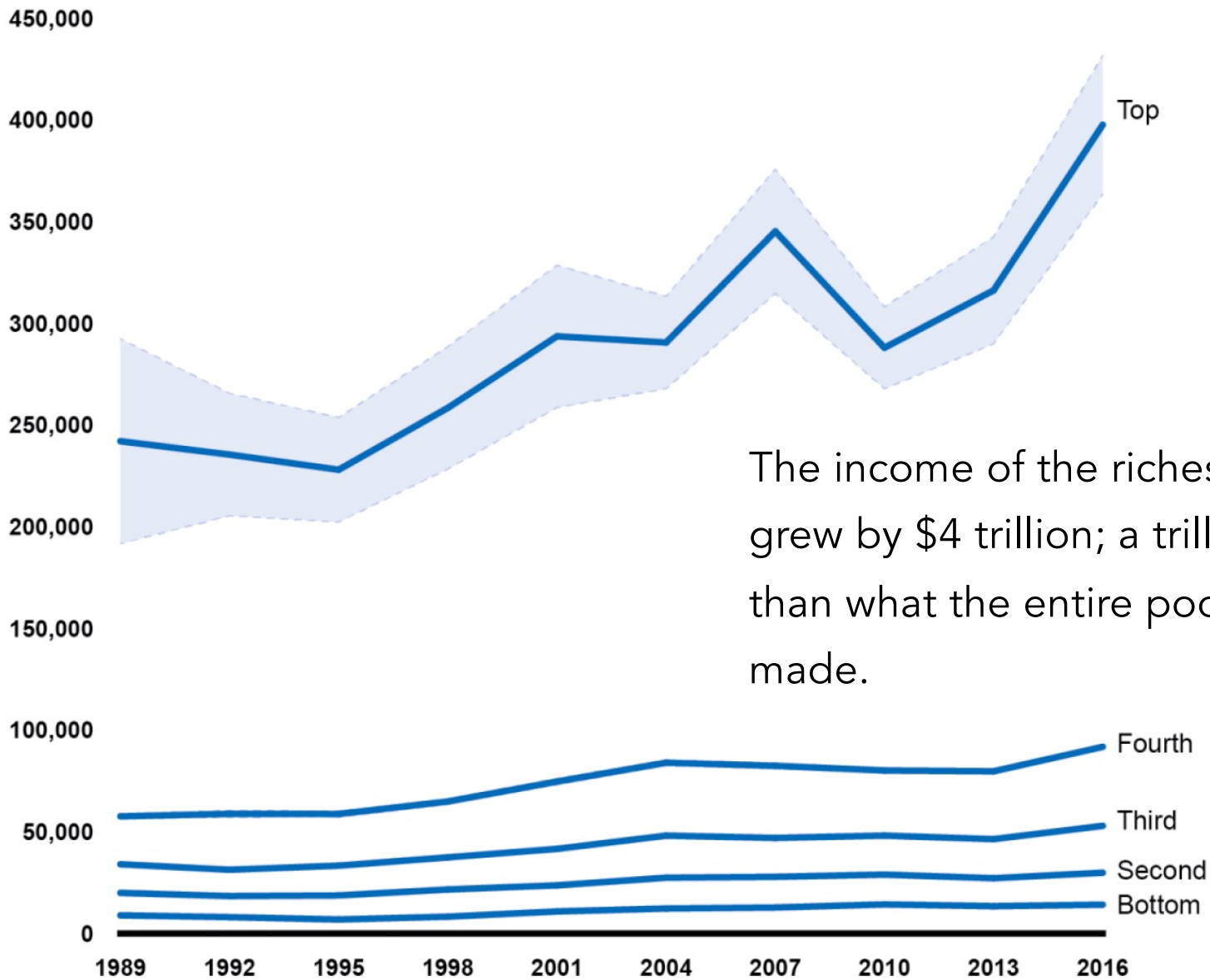
Figure 1 Global income and wealth inequality, 2021



Interpretation: The global 50% captures 8% of total income measured at Purchasing Power Parity (PPP). The global bottom 50% owns 2% of wealth (at Purchasing Power Parity). The global top 10% owns 76% of total Household wealth and captures 52% of total income in 2021. Note that top wealth holders are not necessarily top income holders. Incomes are measured after the operation of pension and unemployment systems and before taxes and transfers. **Sources and series:** wir2022.wid.world/methodology.

Figure 1: Estimated Average Household Income of Older Households by Income Quintiles, 1989 to 2016

Average household income (in 2016 dollars)



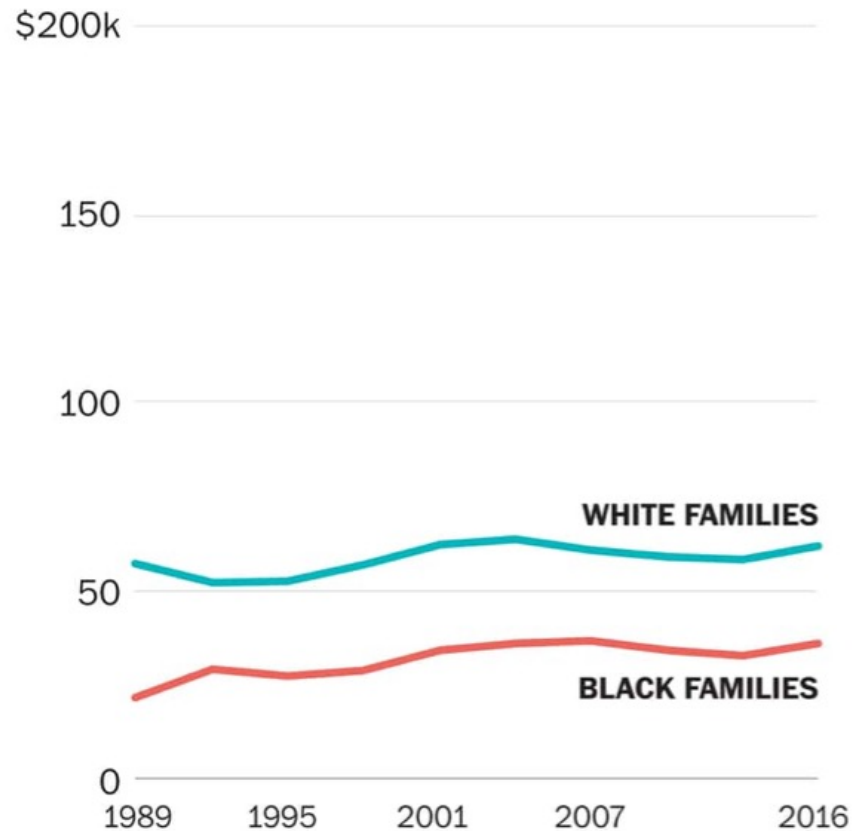
The income of the richest 20% grew by \$4 trillion; a trillion more than what the entire poorest 80% made.

Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

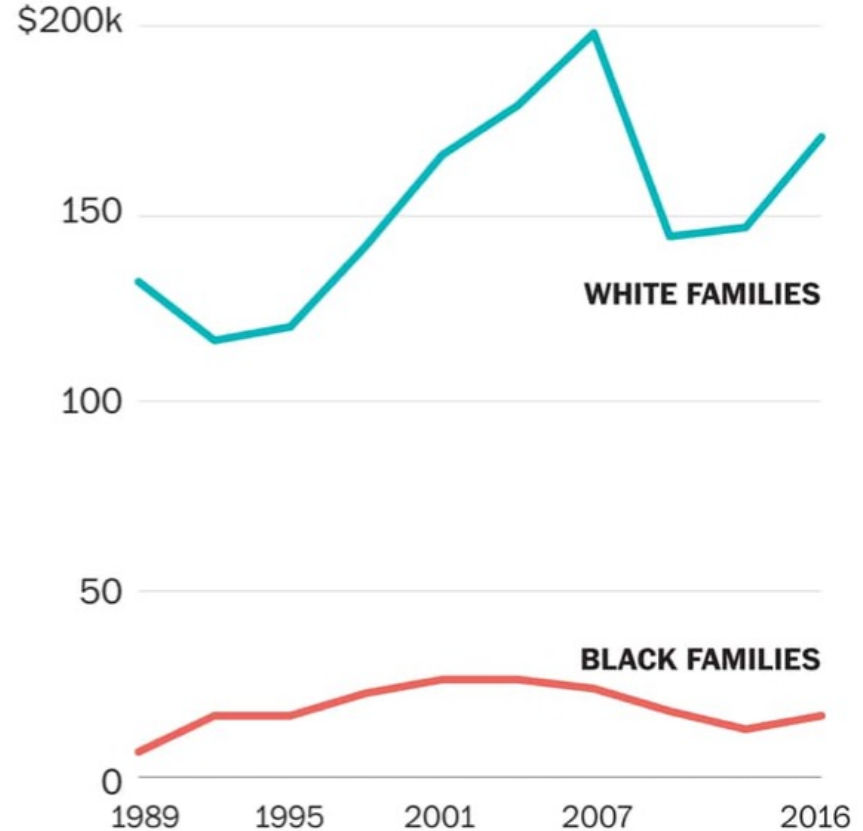
Racial income and wealth gaps

Median income and wealth of black and white families over time, in 2016 dollars

INCOME



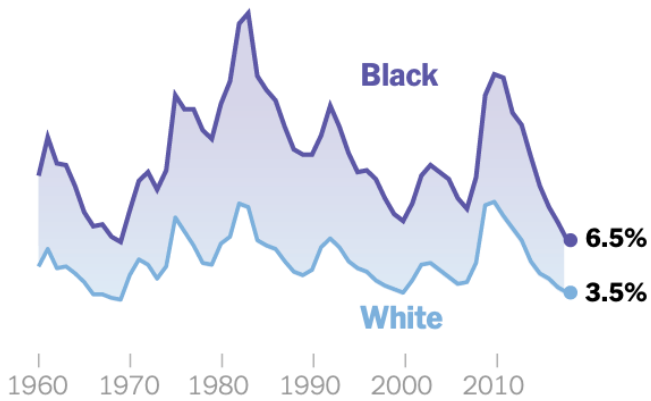
WEALTH



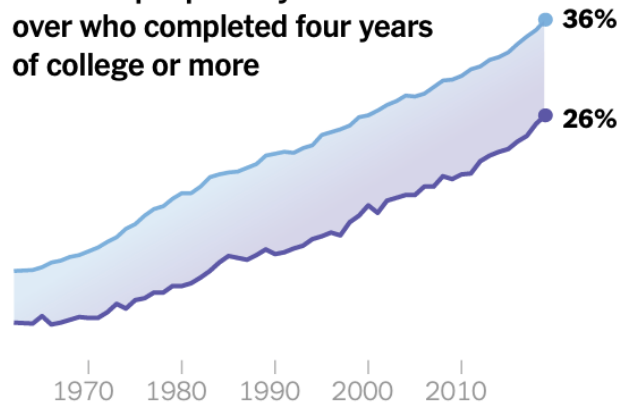
Sources: Survey of Consumer Finances

THE WASHINGTON POST

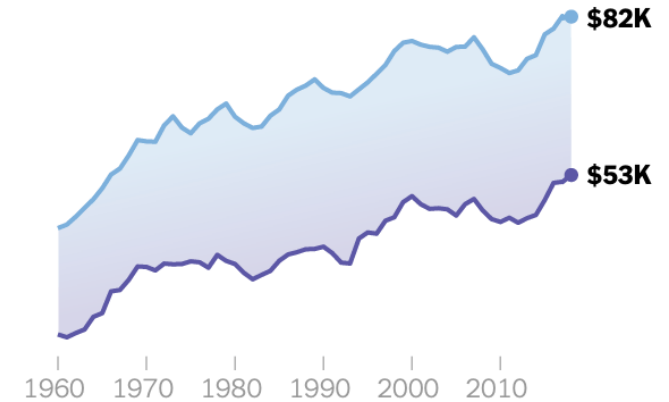
Unemployment rate, age 16 years and over



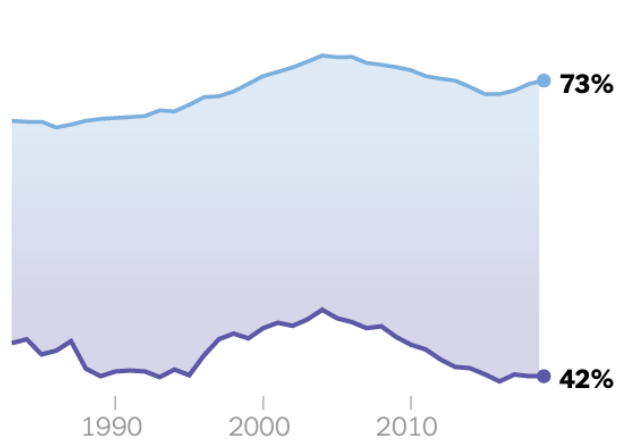
Share of people 25 years and over who completed four years of college or more



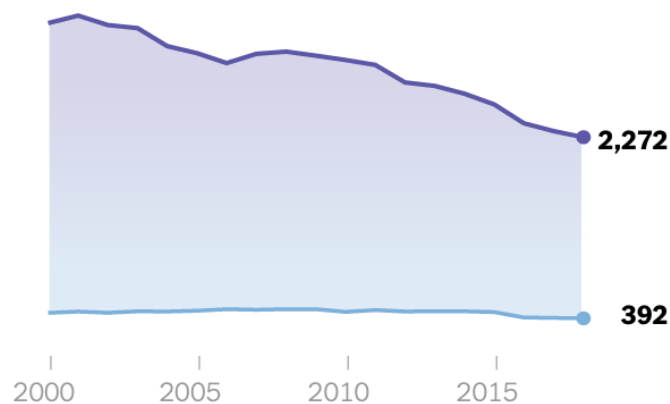
Median household income



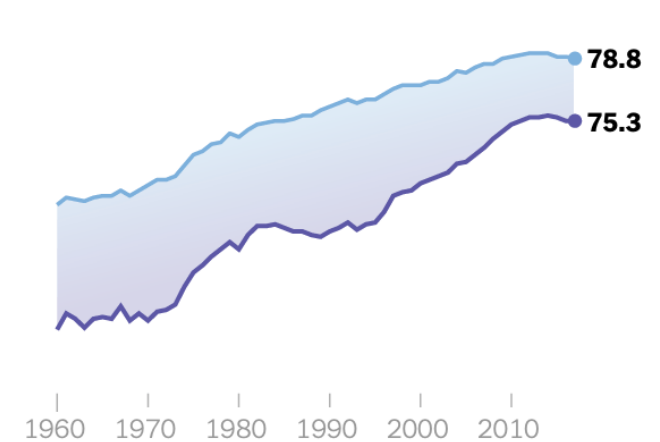
Homeownership rate



Sentenced male prisoners per 100,000 residents of the corresponding group

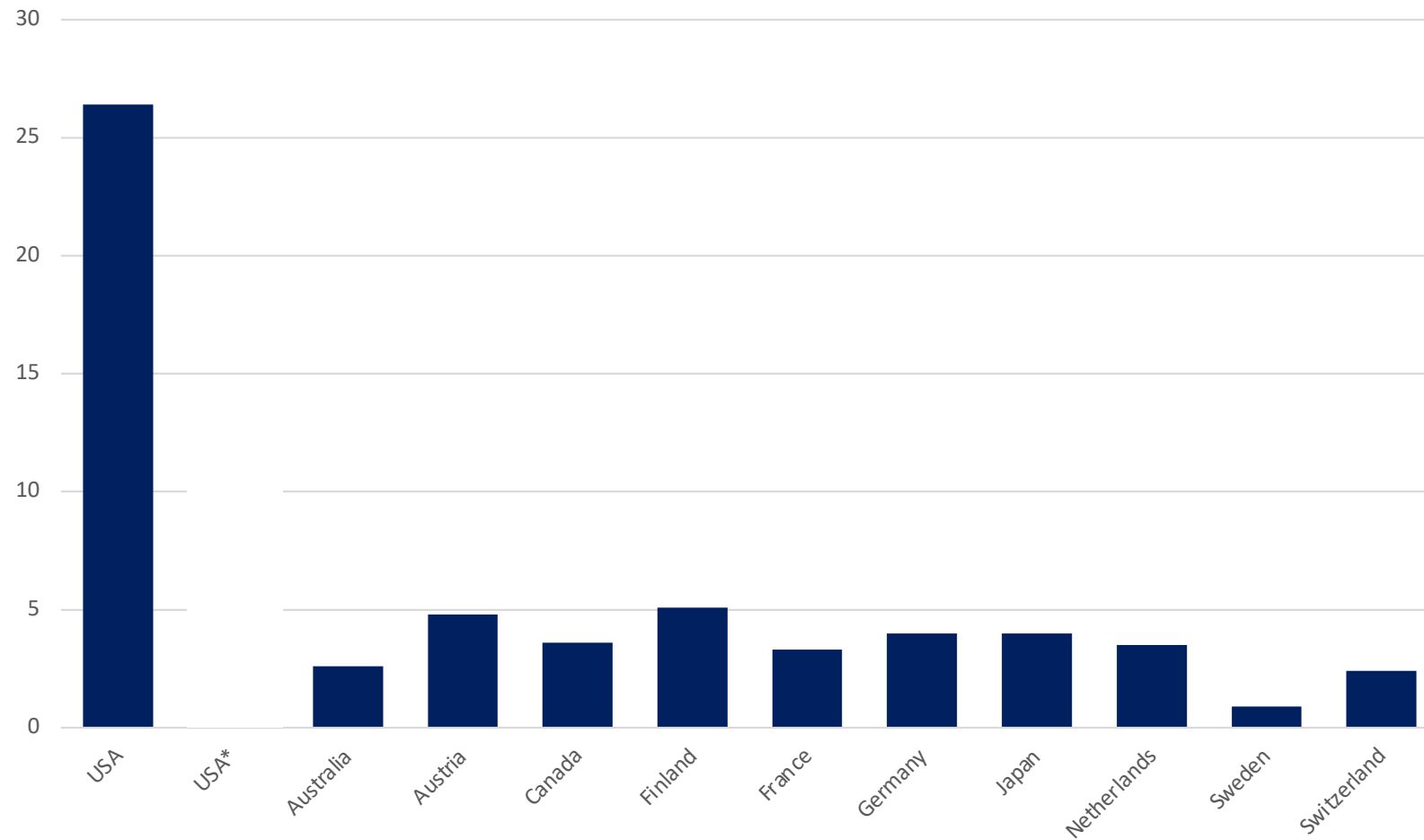


Life expectancy at birth

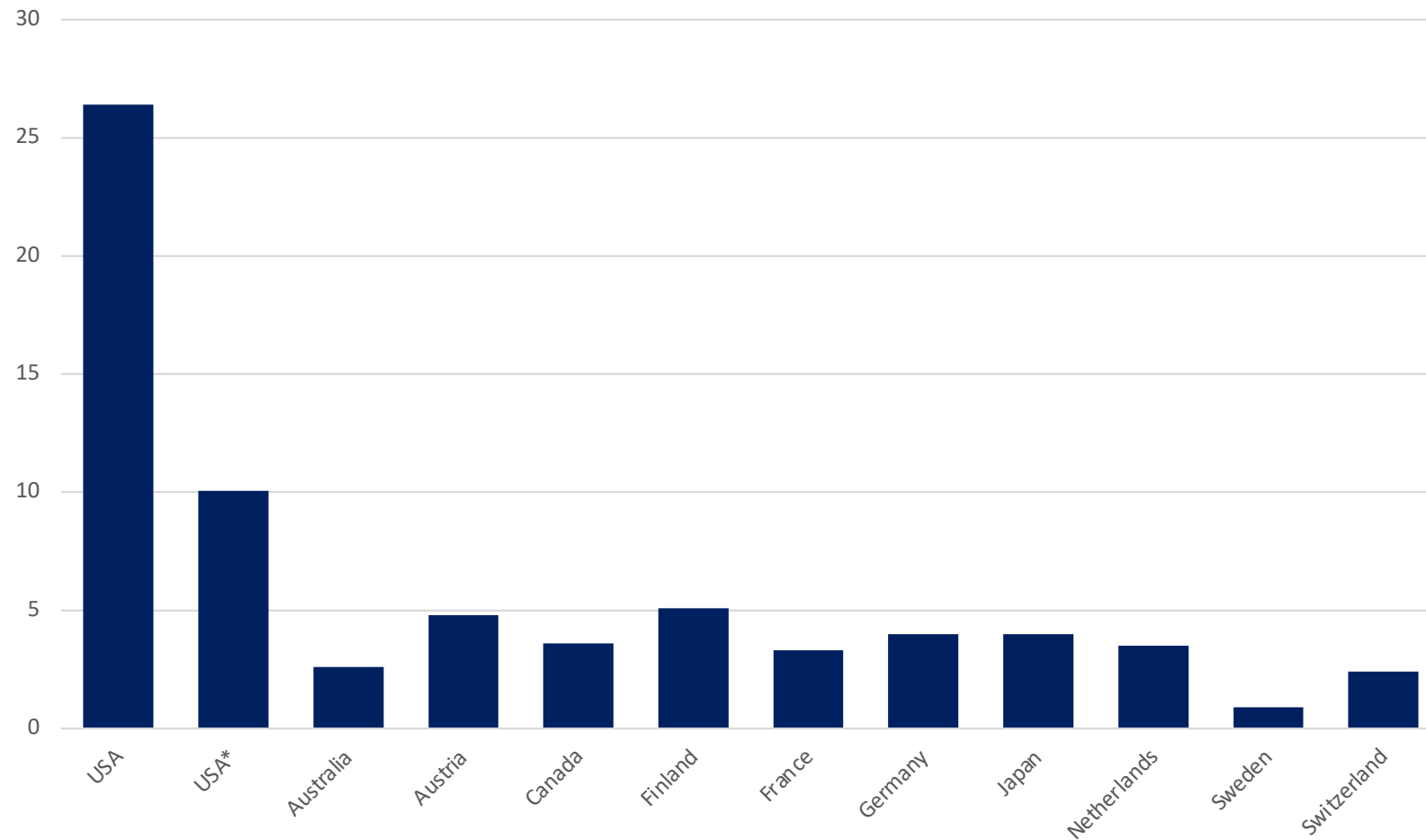


“ ..the problems of any of us are the problems of all of us... ”

Maternal mortality, per 100,000 births

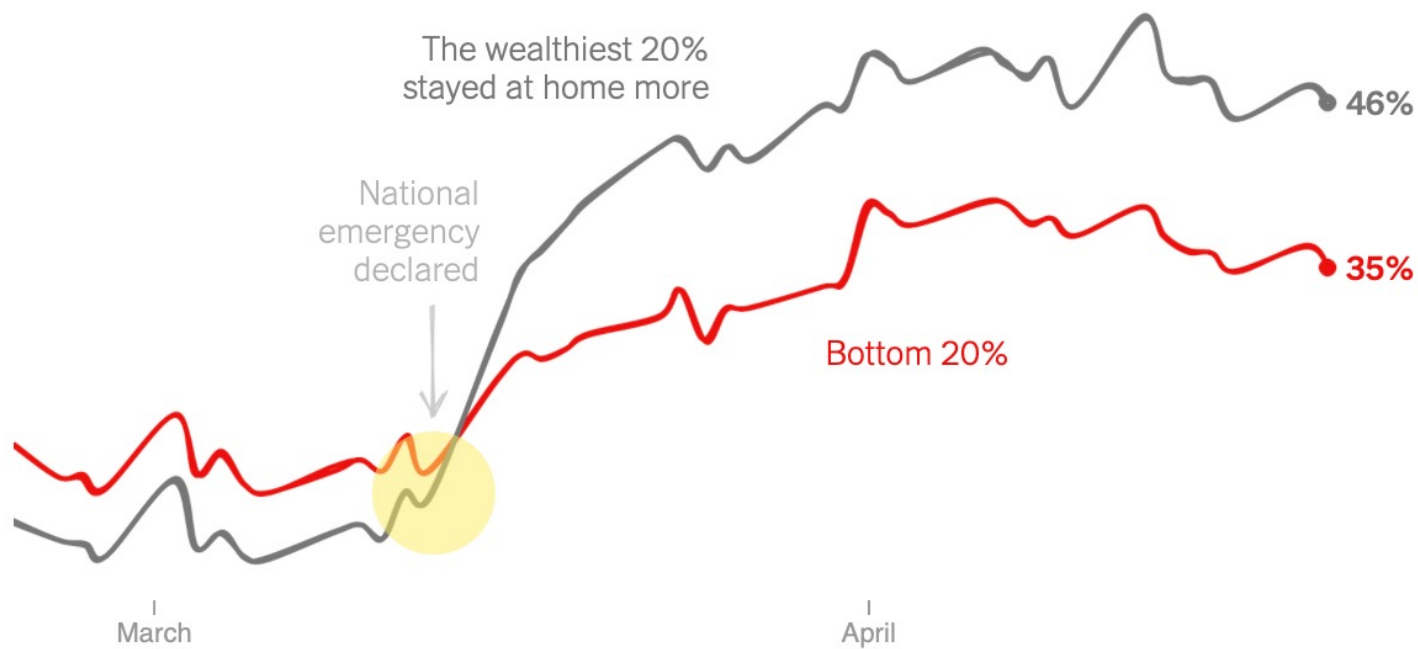


Maternal mortality, per 100,000 births, including white Americans in 1% richest counties

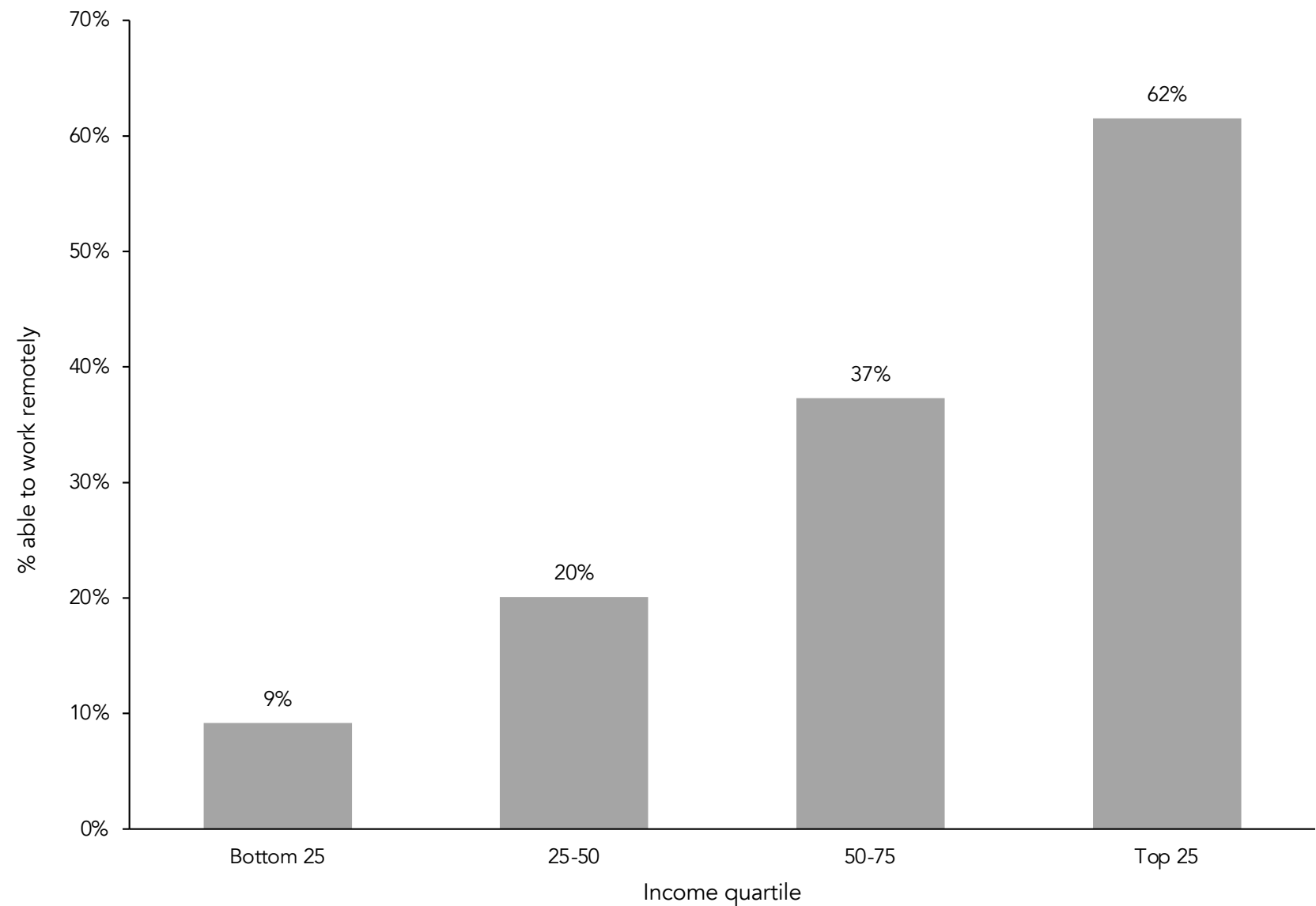


5. Covid-19 was all of this

Share of population staying at home, by income group



Ability to work remotely



Black workers are more likely than other workers to be in front-line jobs

Black workers as a share of all workers in a given industry

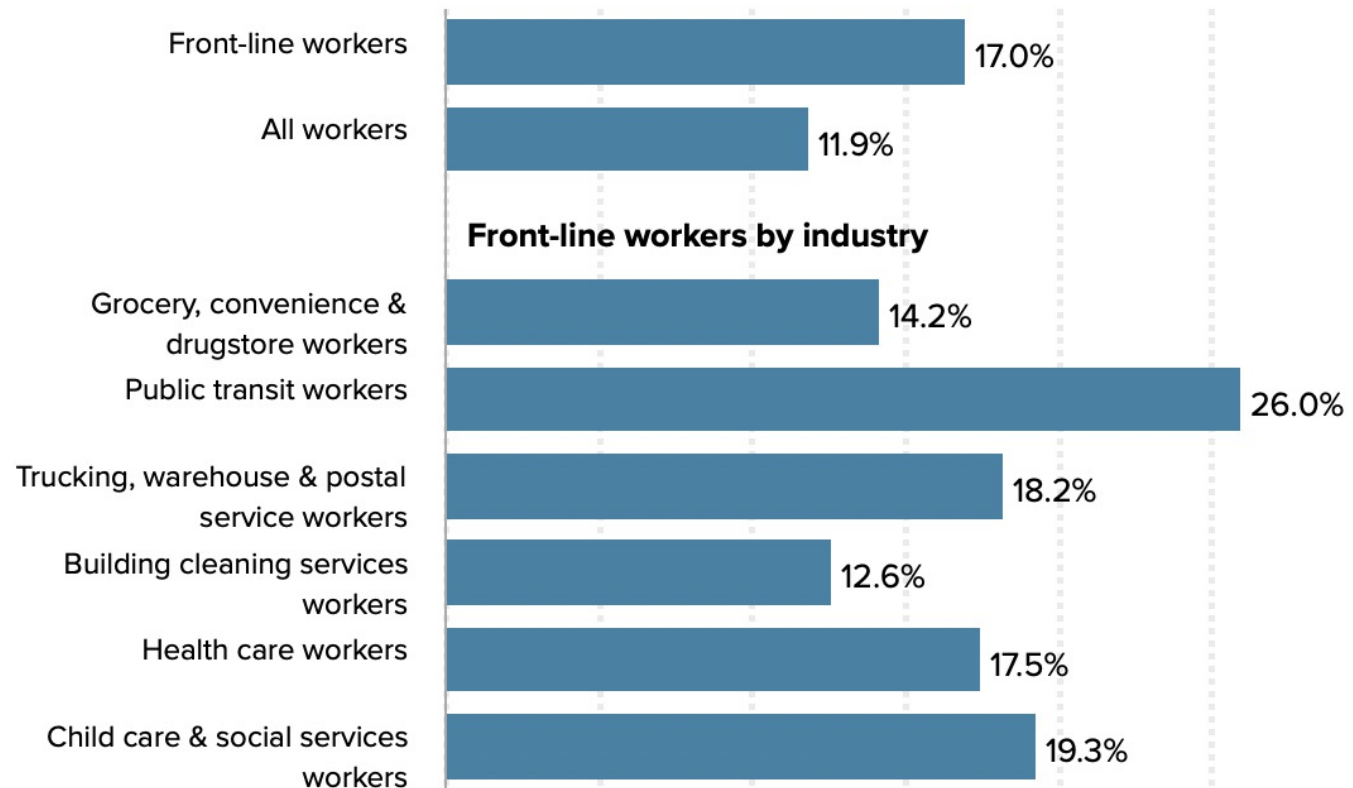


Chart Data

Notes: The front-line industry categories used here are the categories used in the CEPR report (see Source below for more information). Sample is a 2014–2018 five-year estimate.

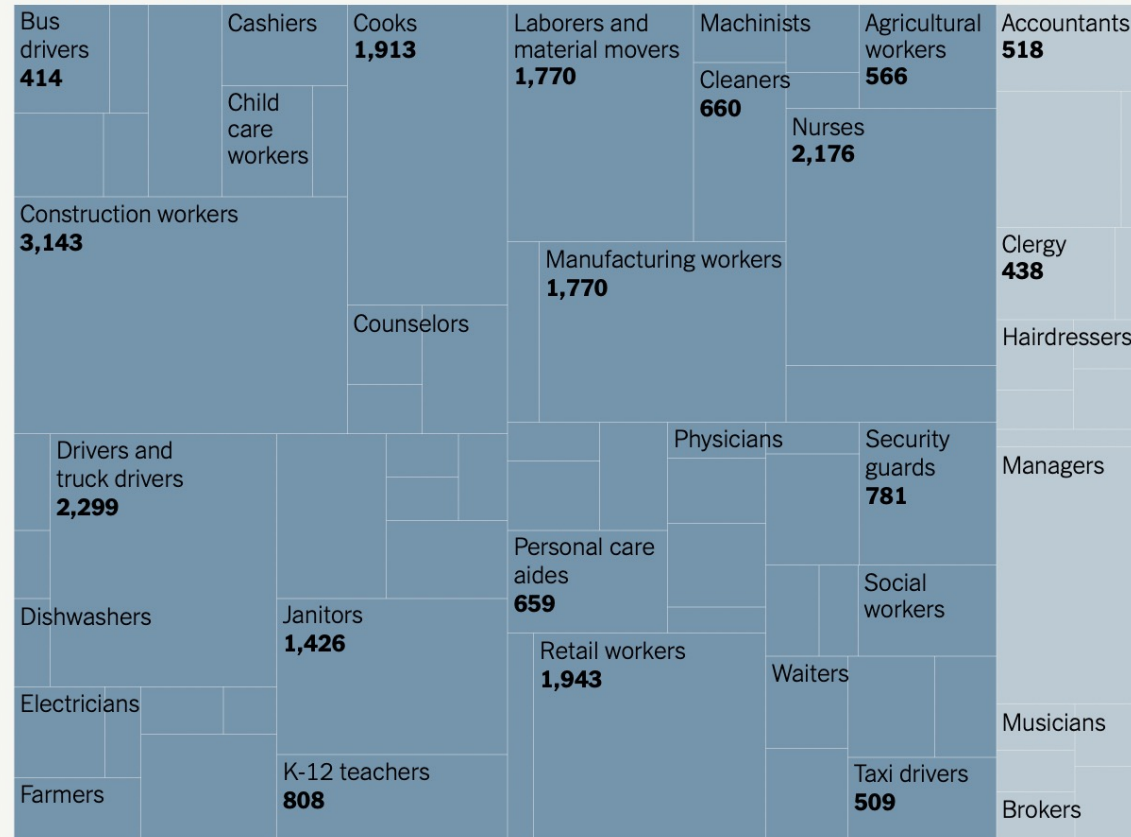
Source: EPI analysis of data from the Center for Economic Policy Research (CEPR) report *A Basic Demographic Profile of Workers in Frontline Industries* (April 2020).

Economic Policy Institute

Covid-19 deaths by occupation in 2020

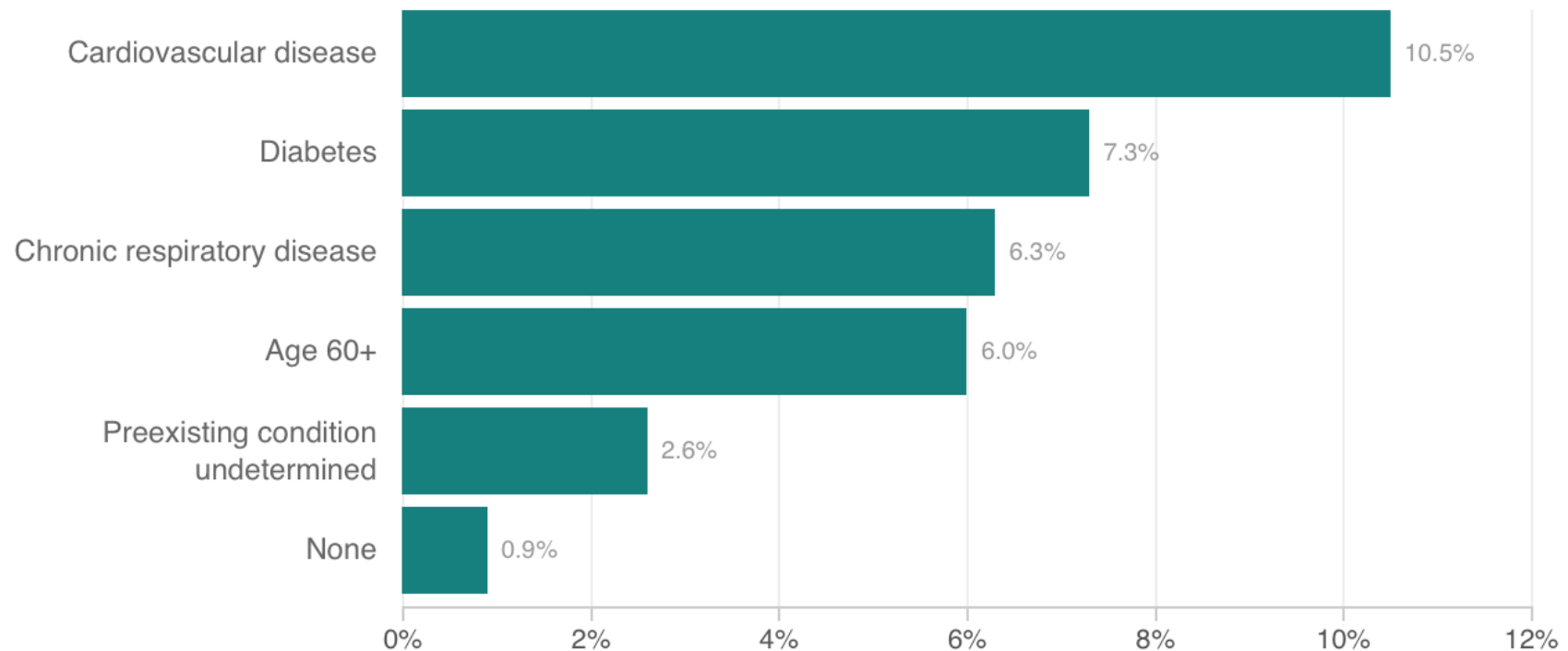
Essential workers

Other workers



Note: Chart shows 37,905 deaths among workers age 64 and under in 46 states. Some similar occupational categories have been collapsed into larger representative categories. In some cases, similar occupations from different industries are grouped together. Not all occupations are labeled. | Source: Yea-Hung Chen et al., [preprint via medRxiv](https://www.medrxiv.org/content/10.1101/2022.05.13.22270000v1)

Death Rate For COVID-19 Patients In China Higher For Those With Underlying Conditions

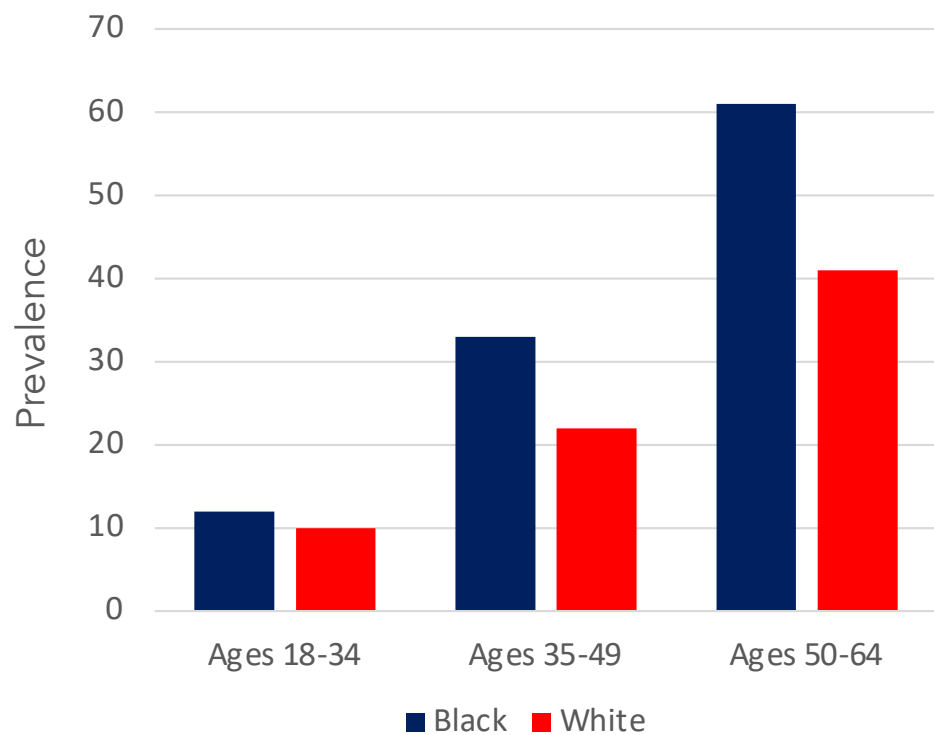


Notes: Preexisting condition death rates based on 504 deaths out of 20,812 cases.

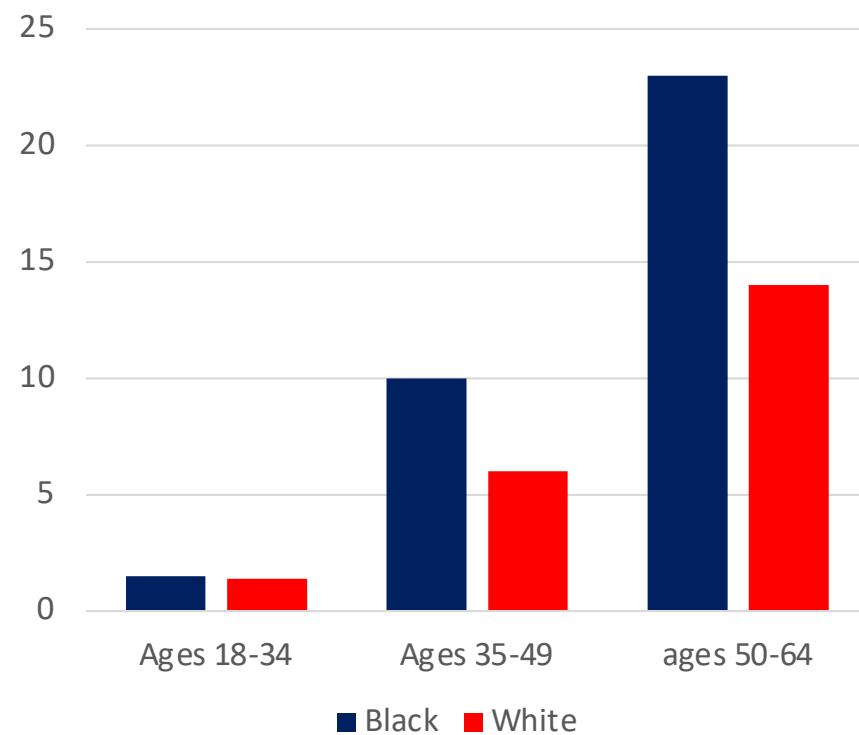
Source: Chinese CDC

Credit: Ruth Talbot/NPR and Chris Zubak-Skees/Center for Public Integrity

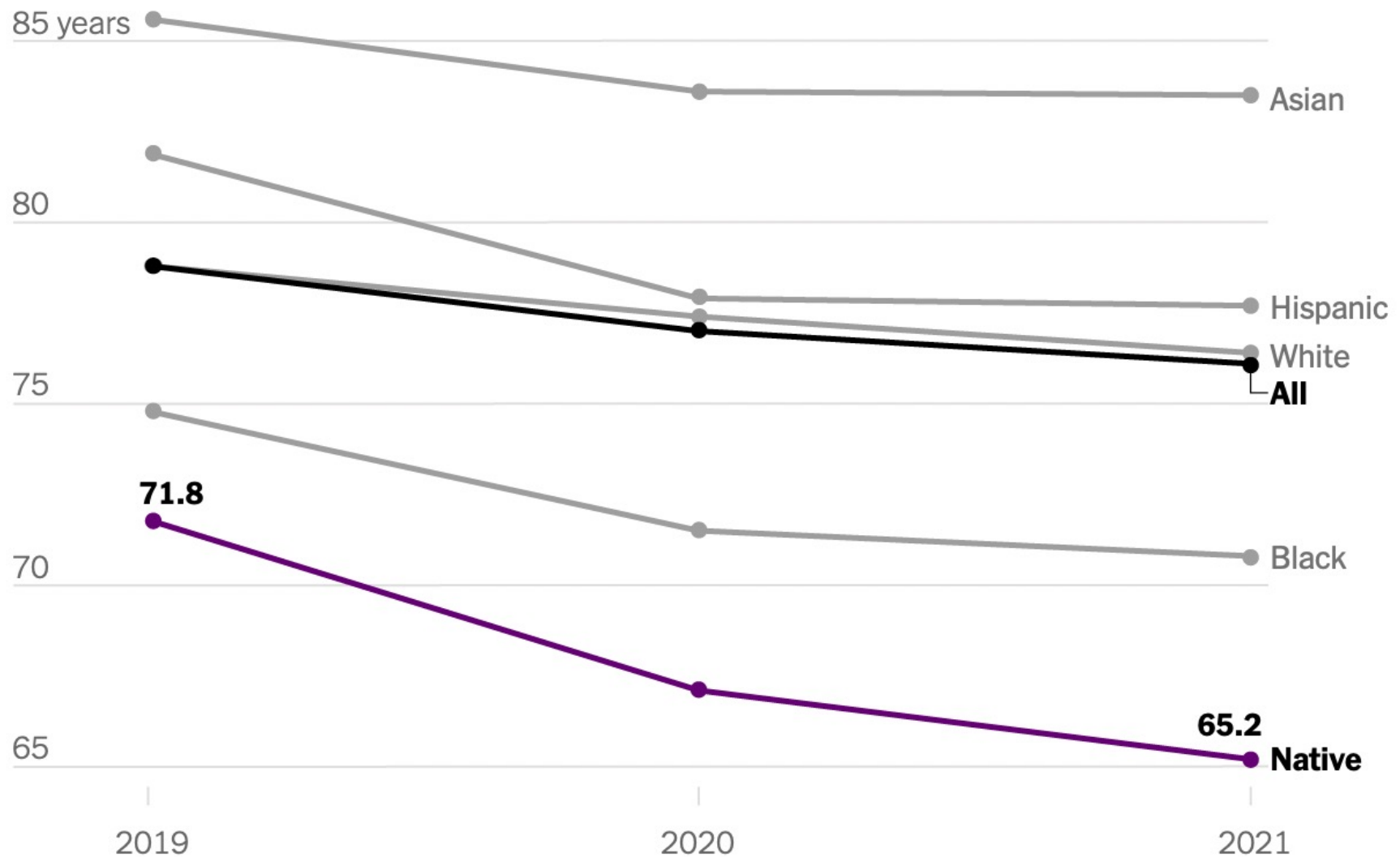
High blood pressure



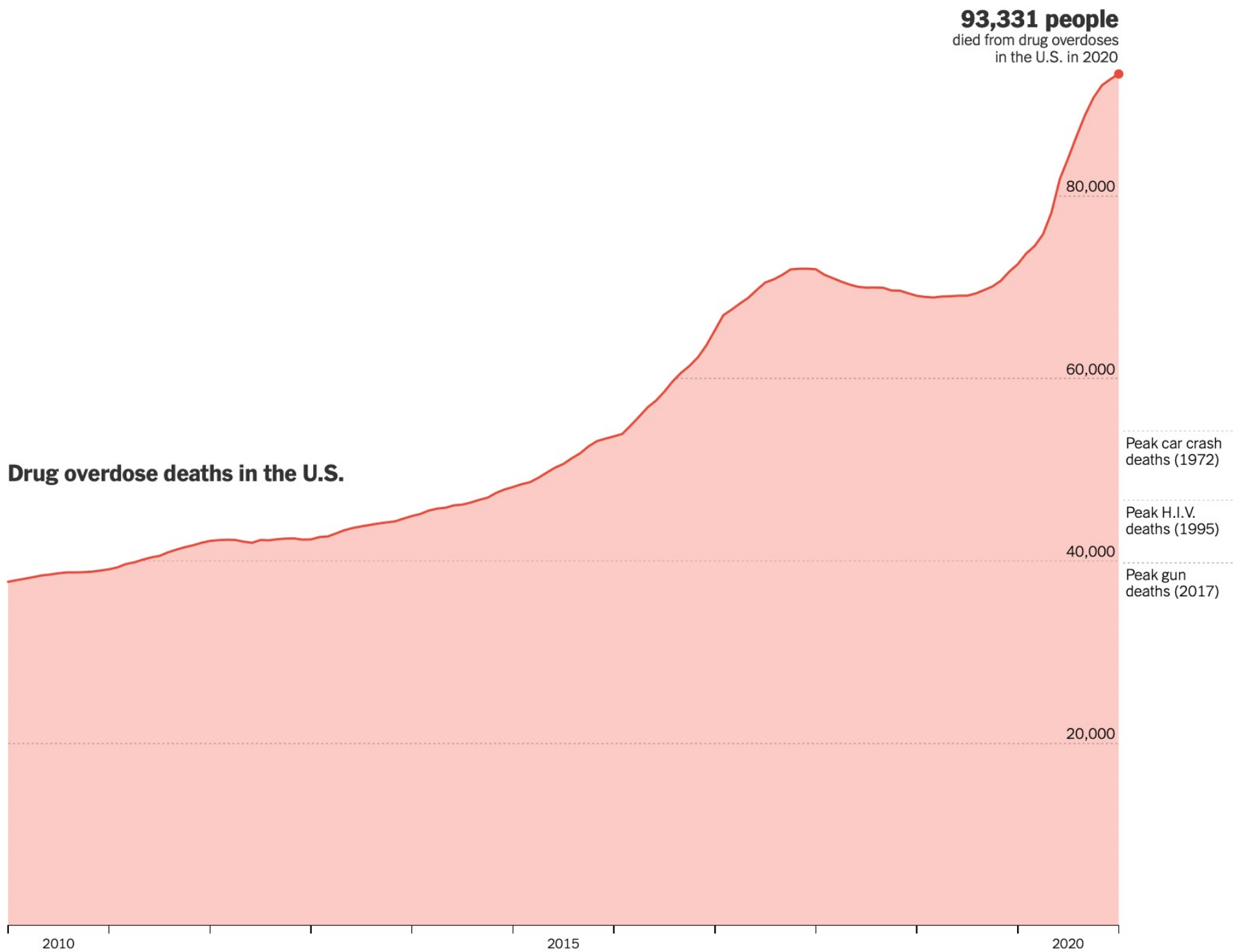
Diabetes



U.S. life expectancy



Note: Figures for white, Black, Asian and Native people exclude Hispanic people. • Source: The National Center for Health Statistics



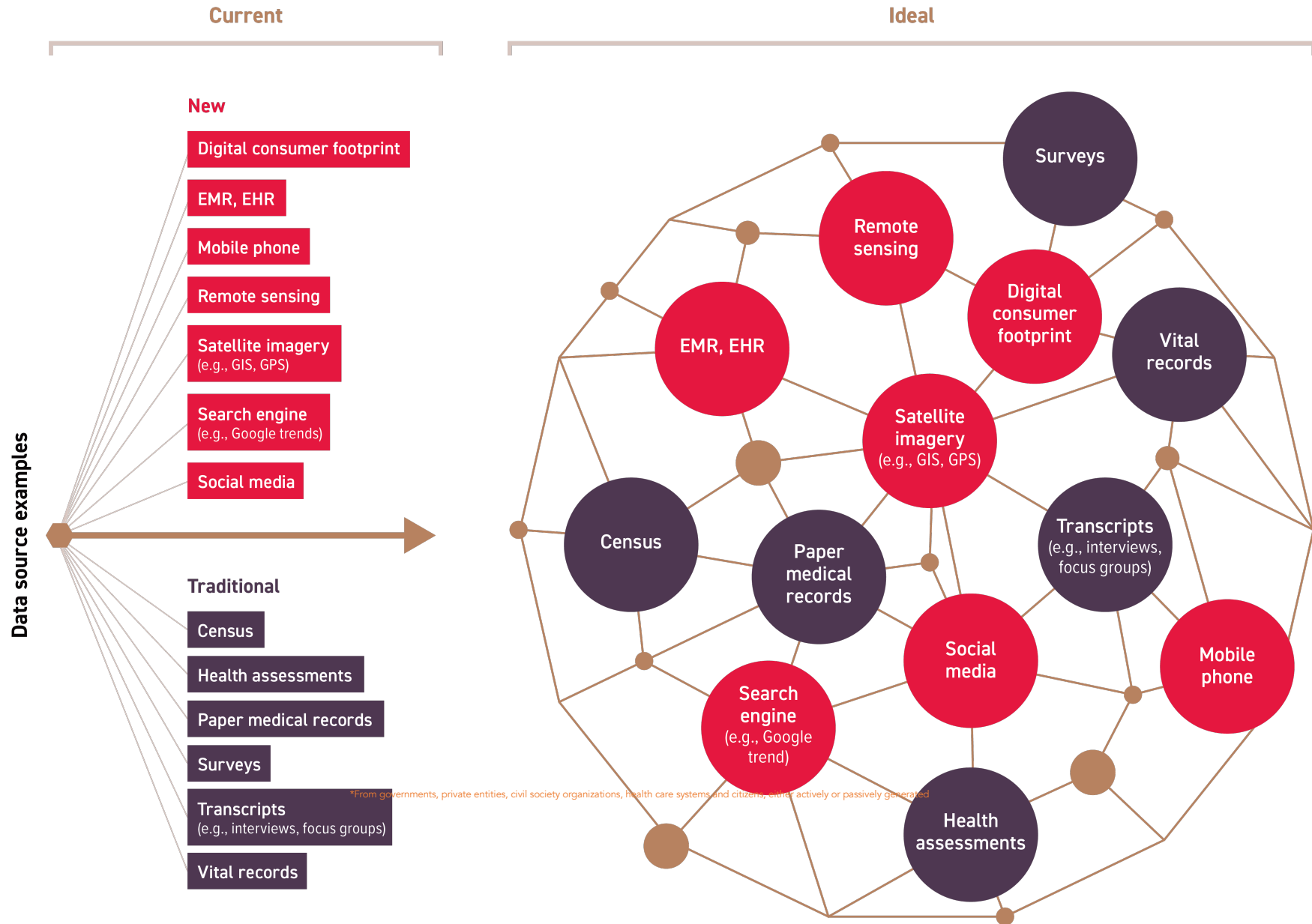
Source: Centers for Disease Control and Prevention

6. Better data for more better, more equitable health

The report of the 3-D Commission

Data, social determinants, and better decision-making for health

Better approaches to data to promote health equity



Determinants, data, and decision-making for health

Current decision-making process

COMPETING PRIORITIES

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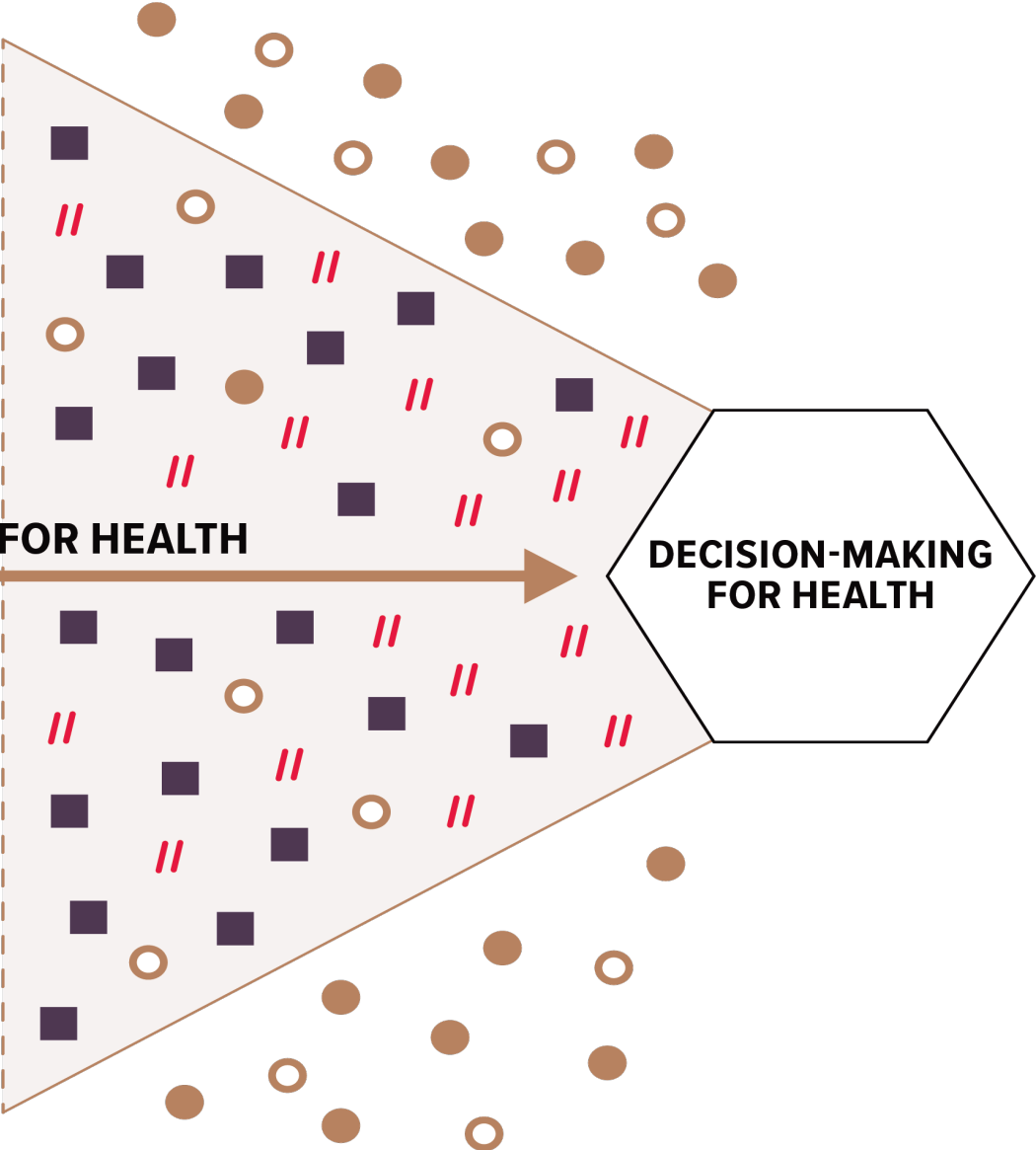
DECISION-MAKING PROCESS FOR HEALTH

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NEW DATA SOURCES

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TRADITIONAL DATA SOURCES



Determinants, data, and decision-making for health

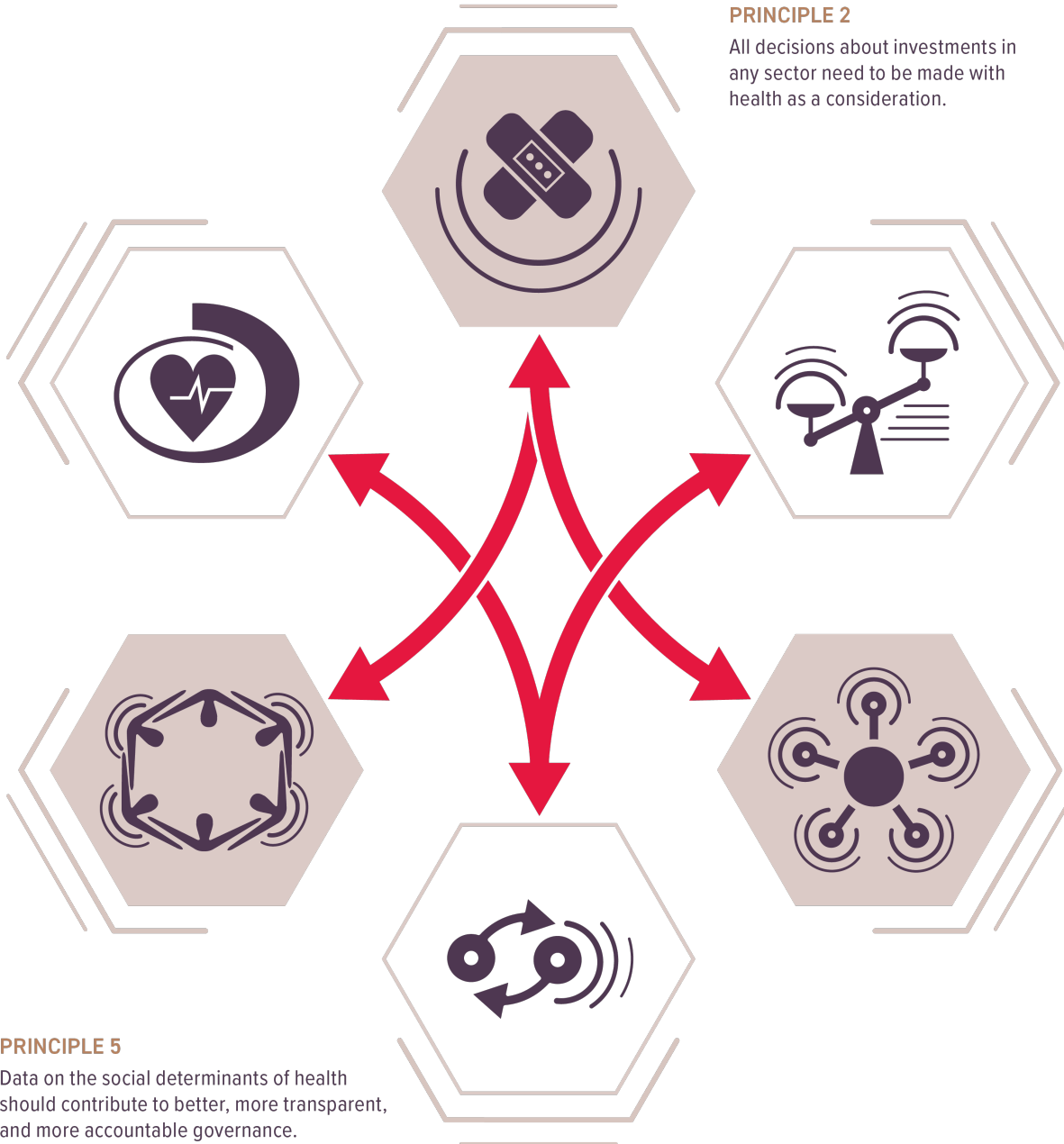
Ideal decision-making process



3-D Commission principles

PRINCIPLE 1

Evidence-informed decision-making to promote healthy societies needs to go beyond health care and incorporate data on the broader determinants of health.



PRINCIPLE 2

All decisions about investments in any sector need to be made with health as a consideration.

PRINCIPLE 3

Decision-making that affects the health of populations needs to embrace health equity, while also acknowledging potential trade-offs between short- and long-term costs and benefits.

PRINCIPLE 6

Evidence-informed decision-making to promote healthy societies needs to be participatory and inclusive of multiple and diverse perspectives.

PRINCIPLE 4

All available data resources on the determinants of health should be used to inform decision-making about health.

PRINCIPLE 5

Data on the social determinants of health should contribute to better, more transparent, and more accountable governance.

3-D Commission recommendations

- Relevant international, regional, national, and local entities, including funders, should systematically collect and make available, in real time, quality data characterizing the full range of determinants of health—including for example, education, housing, economics—to decision-makers and communities locally and nationally.
- National governments should develop transparent systems that collect data about the social determinants of health, and explicitly use these data in decision-making processes.
- Relevant international, regional, national, and local entities, including funders, should embed follow-through monitoring processes to ensure accountability for data-informed decision-making around health.
- Relevant international, regional, national, and local entities, including funders, should center community engagement in acquisition and interpretation of data and make such data widely available to relevant communities.

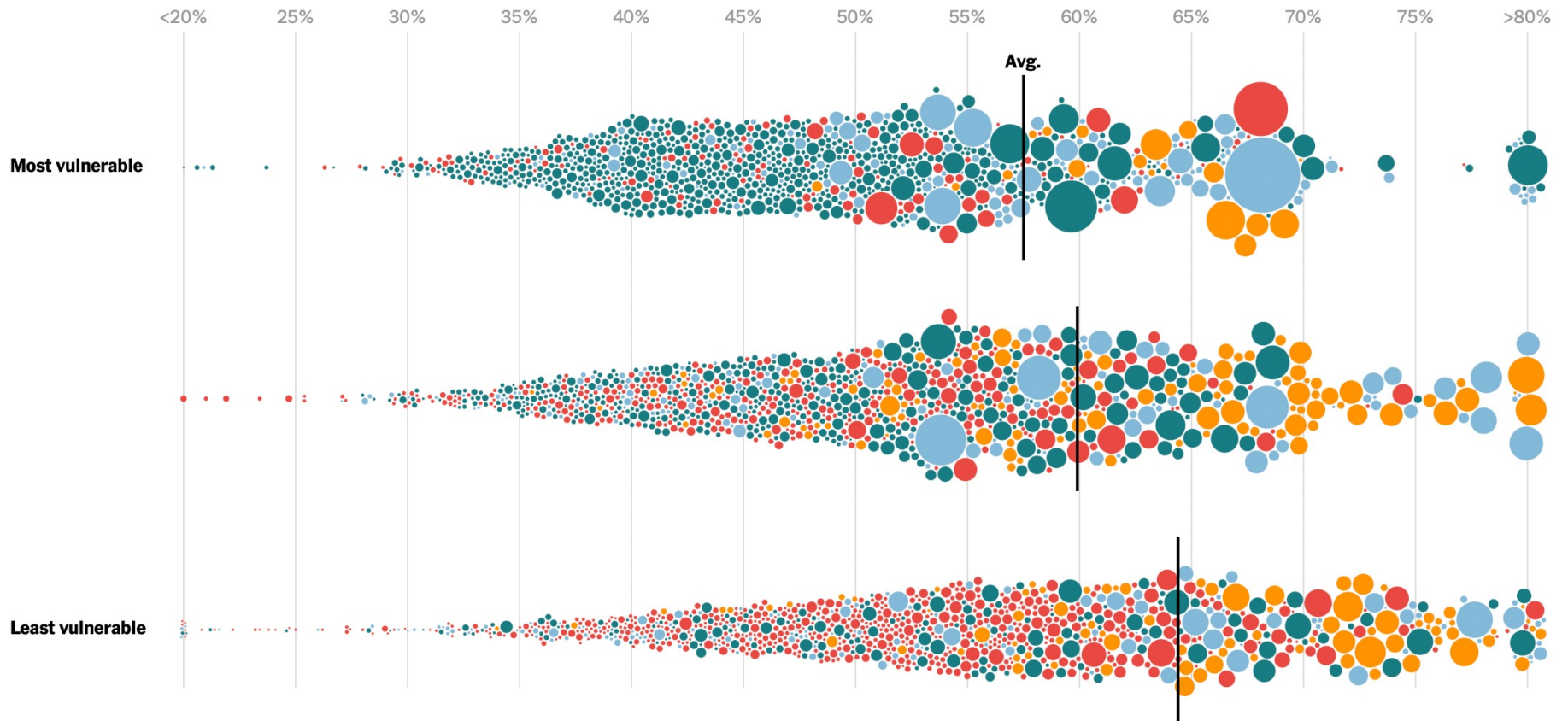
7. Improving health, narrowing health gaps

“ The availability of medical care tends to vary inversely with the need for it in the population served ”

Vaccination rates by county social vulnerability

Share of total population fully vaccinated. Circles sized by county population.

Region ● Midwest ● Northeast ● South ● West



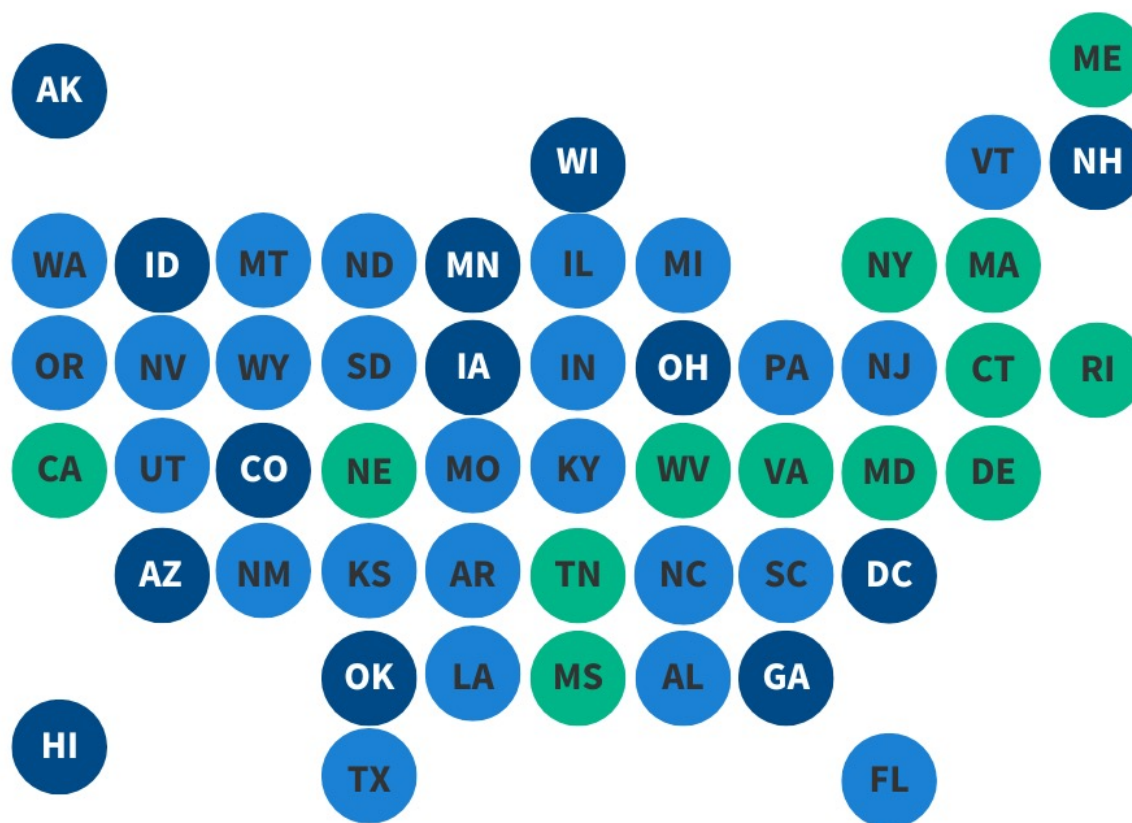
Sources: [Centers for Disease Control and Prevention](#); [Texas Department of State Health Services](#); [Colorado Department of Public Health & Environment](#); [Massachusetts Department of Public Health](#); U.S. Census Bureau | Note: No C.D.C. data available for some counties. Georgia and Vermont were excluded because more than a quarter of data is missing.

Vaccination Coverage Rates For Measles, Mumps, and Rubella

Nearly three-quarters of states fell *below* the Healthy People Target of 95% last year.

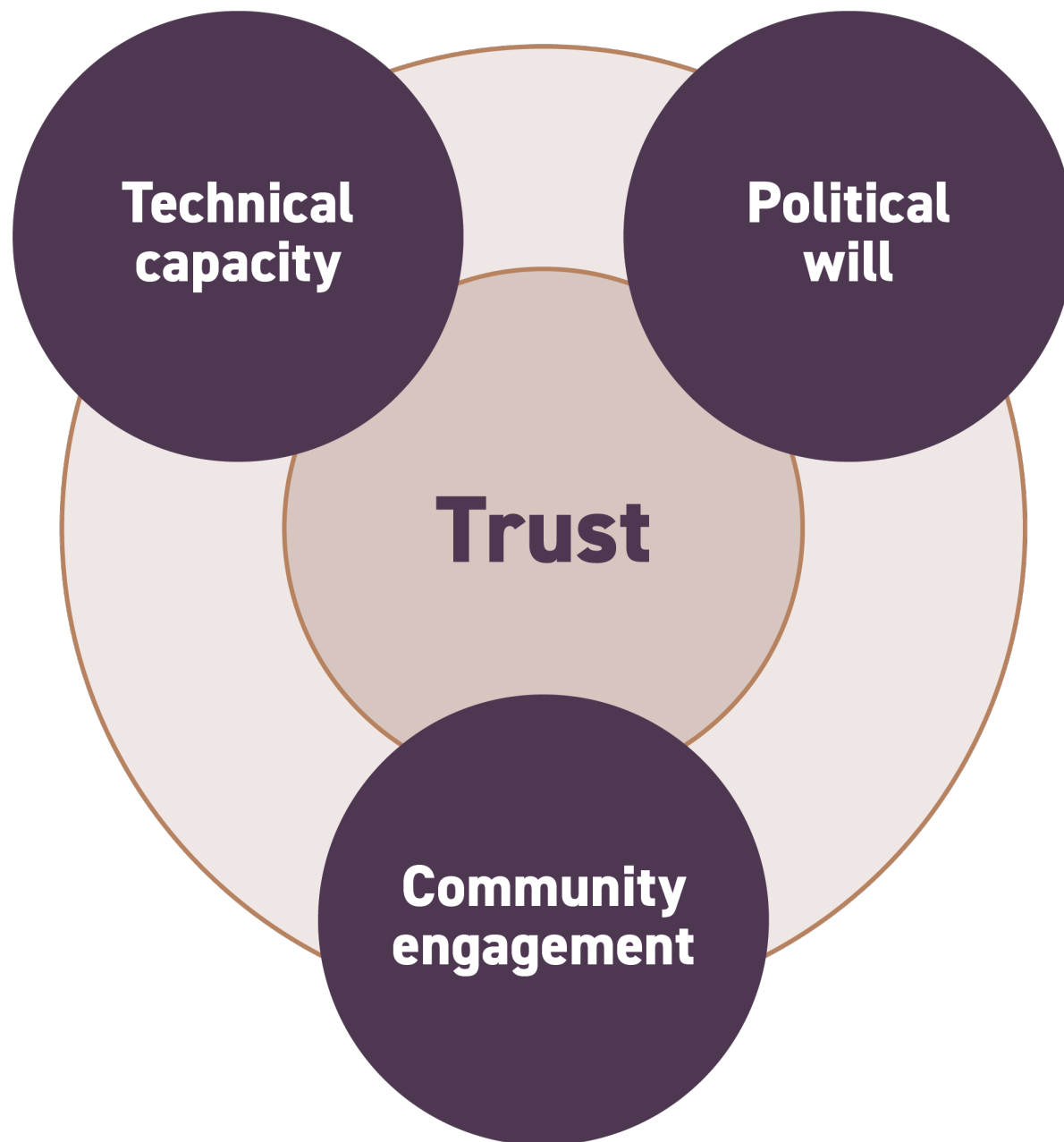
MMR vaccine rates for kindergarteners in the 2022-2023 school year:

- Below 90% (12 states and DC)
- 90% - 94.9% (24 states)
- 95% or higher (13 states)



Source: Vaccination Coverage and Exemptions among Kindergartners, Centers for Disease Control and Prevention (U.S.)

Key elements for decision making



8. Telling the story of health

Trump begins mass layoffs at FDA, CDC, other US health agencies

By Leah Douglas, Marisa Taylor and Julie Steenhuisen

April 1, 2025 4:44 PM CDT · Updated 5 days ago



Summary

POLITICS • DONALD TRUMP

Federal Webpages Go Dark as Trump Administration Removes Public Data

2 MINUTE READ



A

Capita
3.70
As of 2/10/2025 | H

Capita
Earn a \$250 bonus
Checking. No fees
minimums. Terms

EXTRA
commission
Open and fund a
brokerage account
to \$1,000. Terms

WA
Western Alliance
4.21
FIDC

What primarily causes your health?

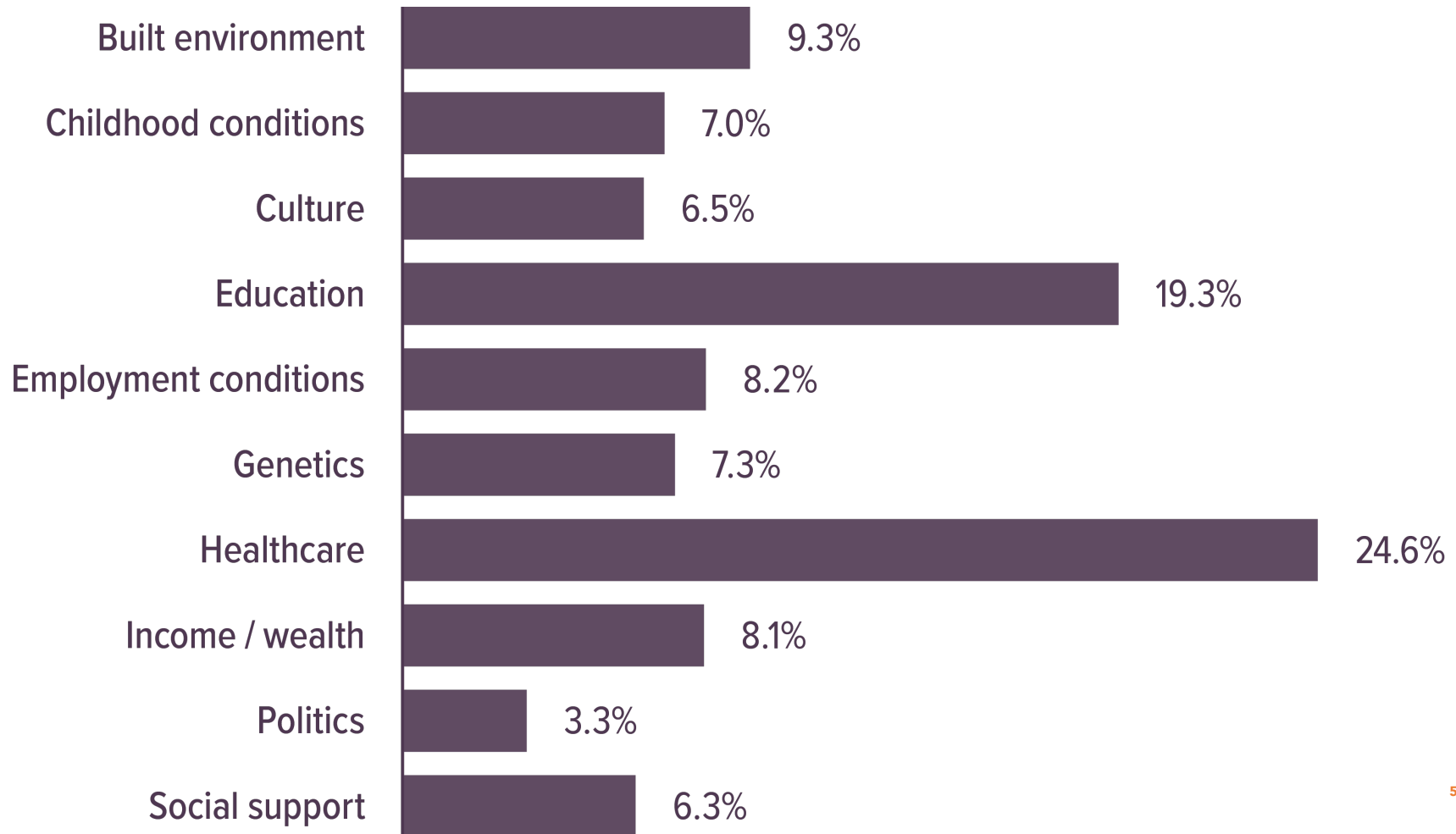
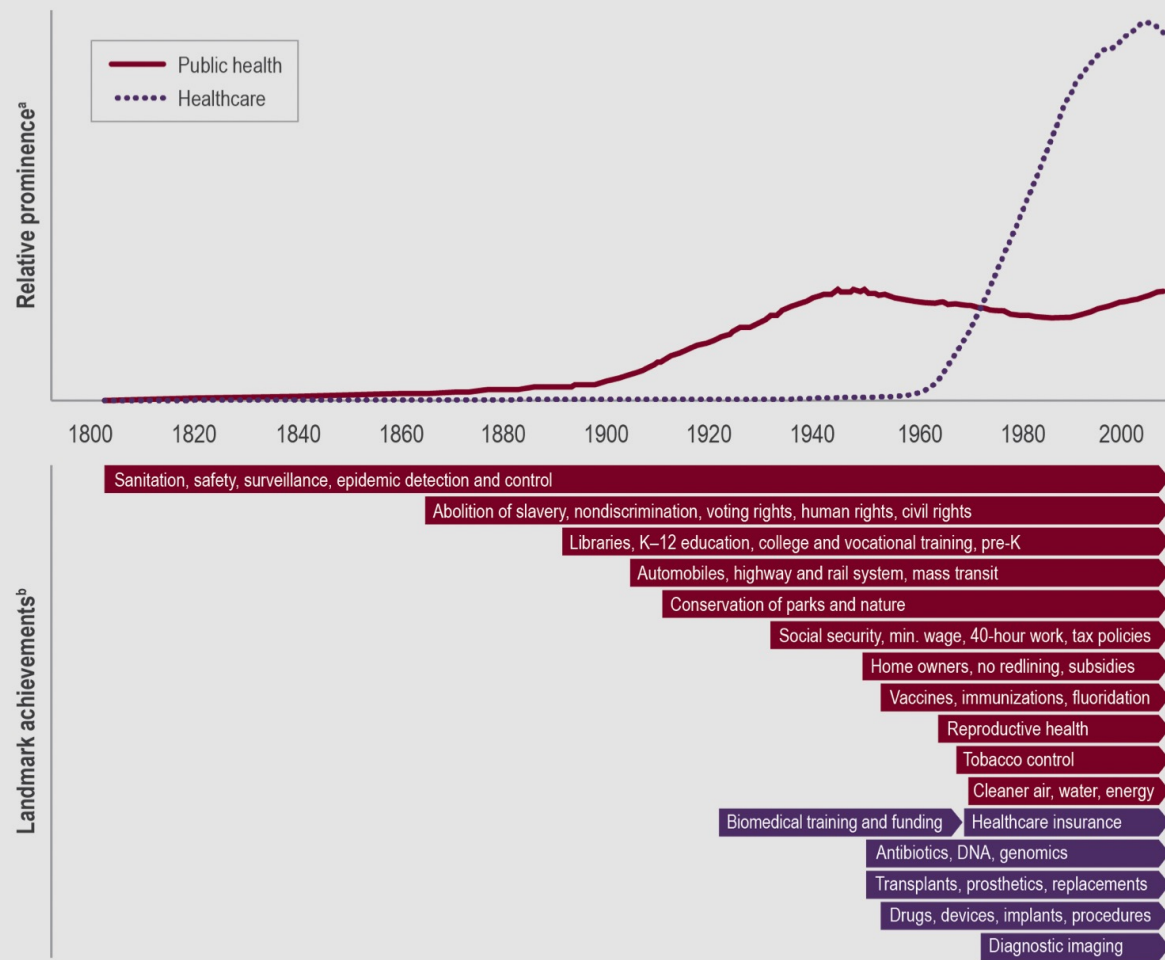


Figure 7.1 Shifting prominence and landmark achievements in public health and healthcare, 1800–2008

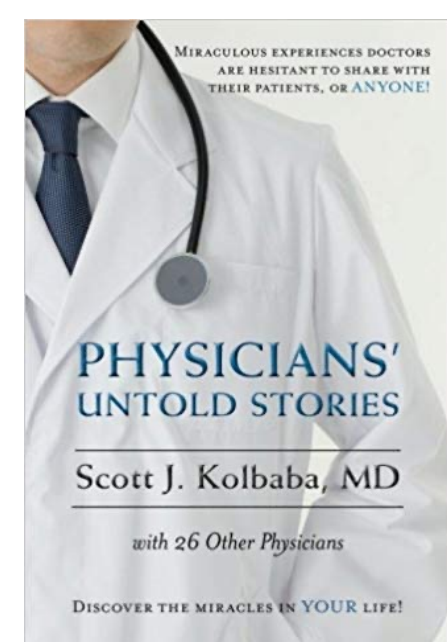
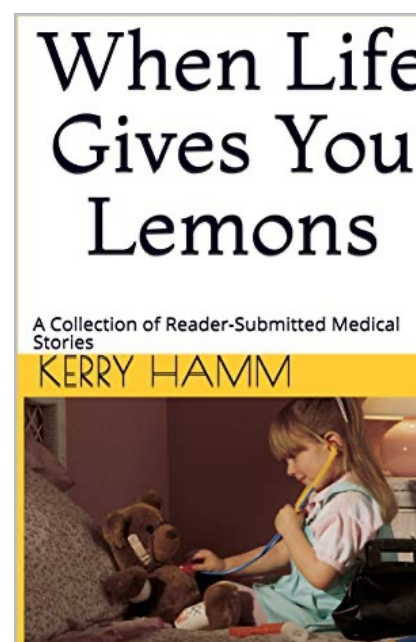
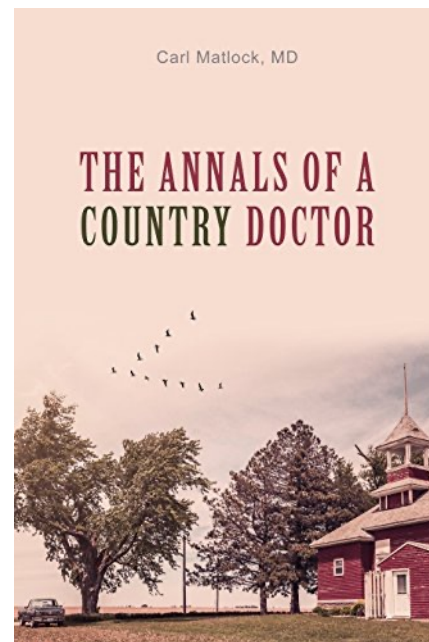
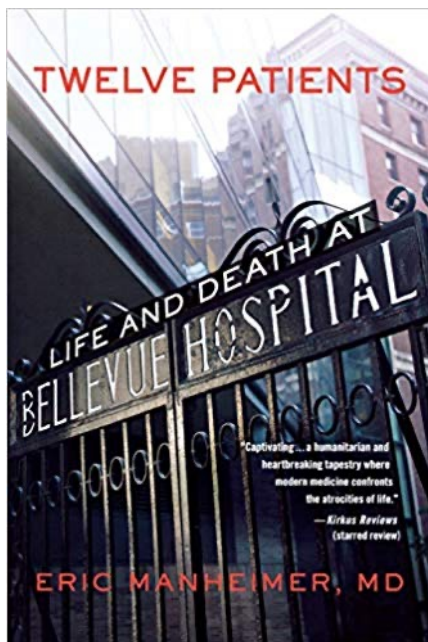
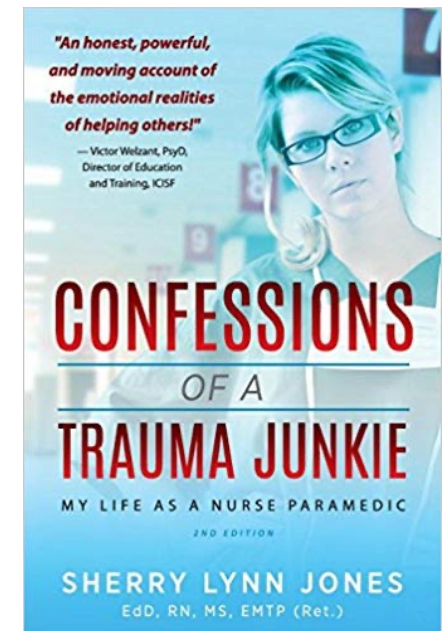
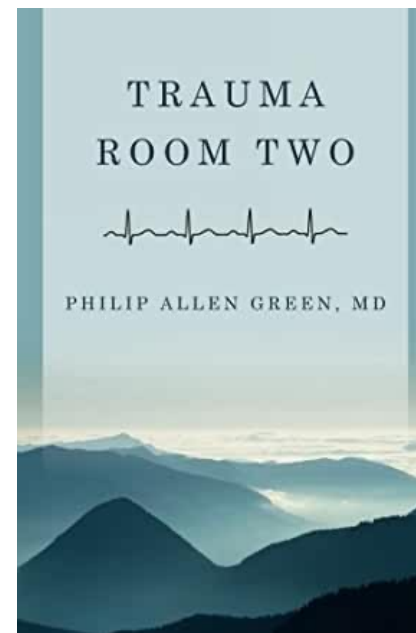
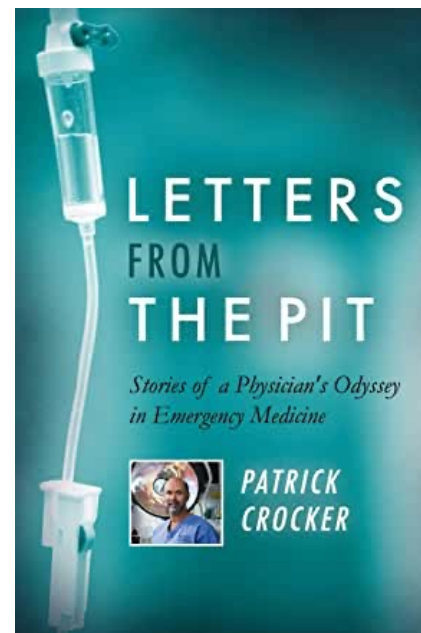
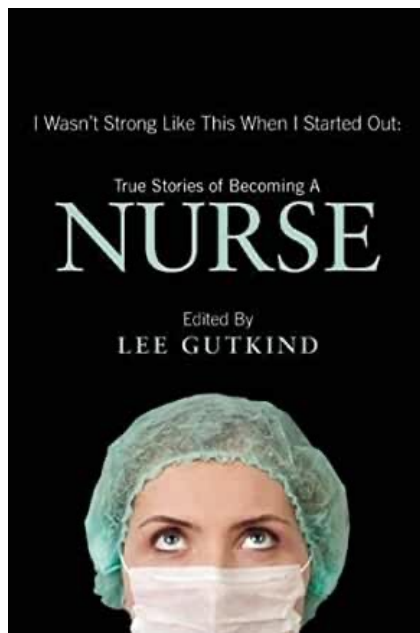


^a Relative prominence reflects the frequency that each term appears in writing over time.

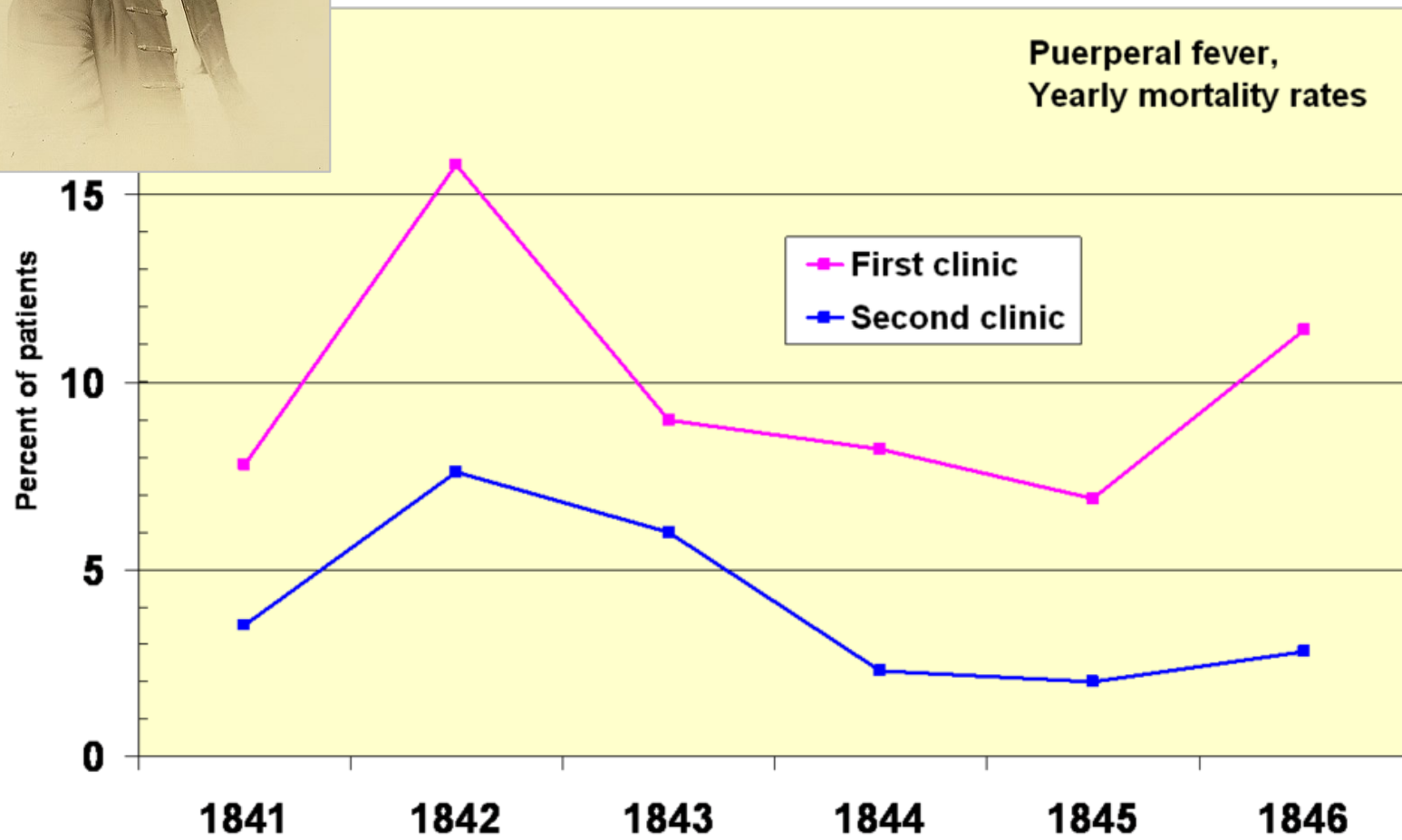
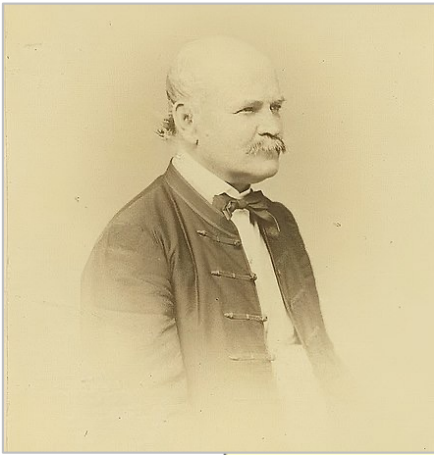
^b Many of the landmark achievements are not unqualified goods but entail risks or tradeoffs of their own.

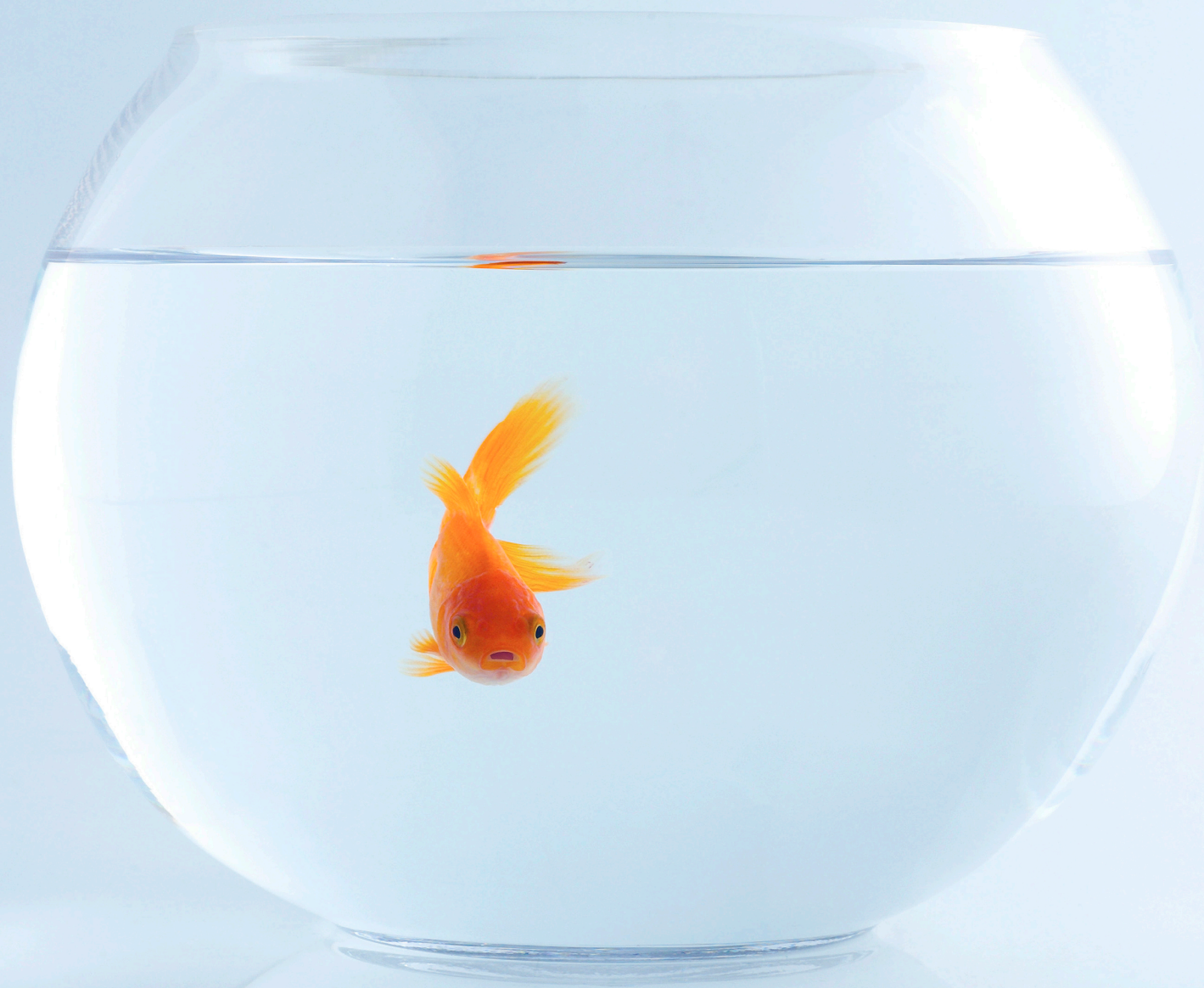
U.S. Department of Health and Human Services, Office of Surgeon General. (2021). Community Health and Economic Prosperity Engaging Businesses as Stewards and Stakeholders—A Report of the Surgeon General. Retrieved from <https://www.hhs.gov/sites/default/files/chep-sgr-full-report.pdf>

Relative prominence: Google Books Ngram Viewer. (2020). Health care, public health between 1800 and 2008 in English with smoothing of 10. Retrieved from <https://books.google.com/ngrams/>. Landmark achievements adapted from: Centers for Disease Control and Prevention. (1999). Ten great public health achievements—United States, 1900–1999. *Morbidity and Mortality Weekly Report*, 48(12), 241–243; Centers for Disease Control and Prevention. (2011). Ten Great Public Health Achievements—United States, 2001–2010. *Morbidity and Mortality Weekly Report*, 60(19), 619–623; Kristof, N. (2019). Why 2018 was the best year in human history! Retrieved from <https://www.nytimes.com/2019/01/05/opinion/sunday/2018-progress-poverty-health.html>; and Light, P. C. (2002). *Government's greatest achievements: From civil rights to homeland defense*. Washington, DC: Brookings Institution Press.



9. Learning from, improving on the past





“ Initially it seems silly, then it seems controversial, then it seems progressive, then it seems obvious. ”

