

Beyond Average Mortality Improvement

The Implication of Geographic and Socioeconomic Gaps

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The Average Hides the Risk For US Mortality and Improvement

US mortality improvement varies as much by neighborhood and income as by age and sex

79 years

US life expectancy at birth in 2024

10 years

Life expectancy gap between the 10th and 90th percentile of US census tracts

In this presentation, we will discuss

Where the gaps are
life expectancy and recent mortality improvement by state, county and more.

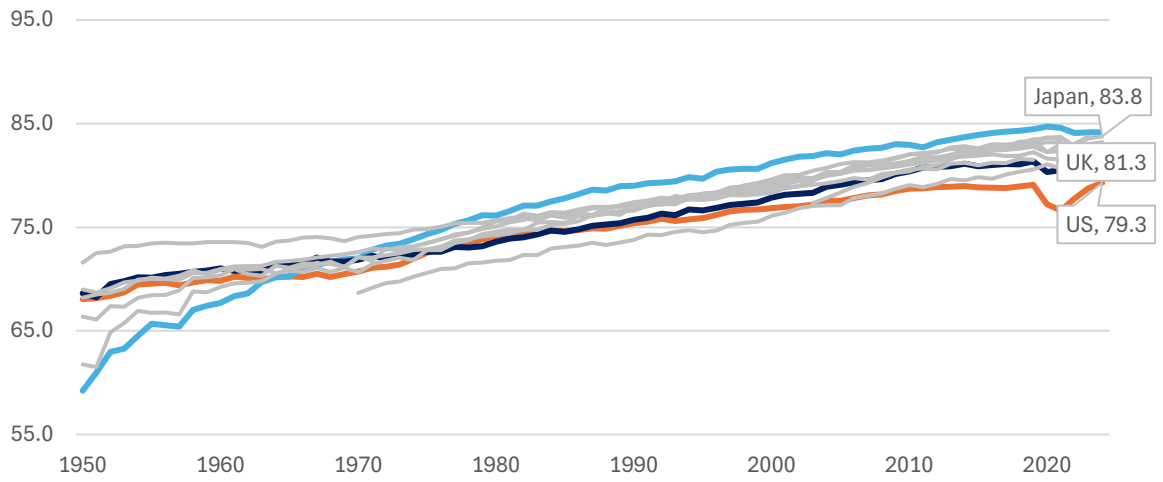
What drives them
16 behavioral, metabolic, access and medical-advance indicators, and whether each gap is widening or narrowing.

What it means for actuaries and risk managers
Test your block against the national average and which tail you actually hold.

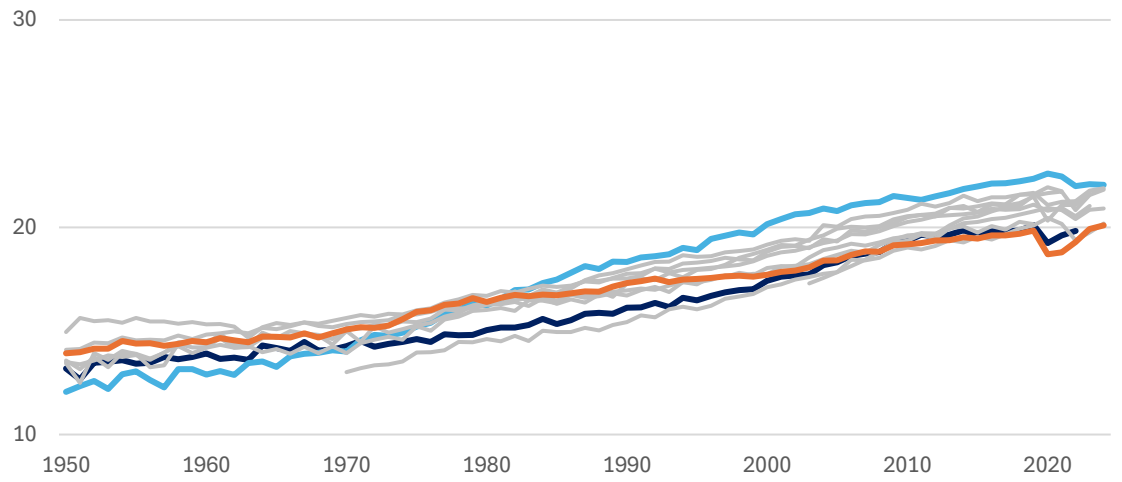
US Longevity Gains Have Slowed Versus Peer Countries

Life expectancy rose across developed markets for decades, but US gains slowed and the gap to peers widened

Life expectancy at birth (years)



Life expectancy at age 65 (years)



79.3 years

US life expectancy at birth, 2024

Trails most OECD peers by 2–5 years; Japan leads at ~84.

Why US gains slowed

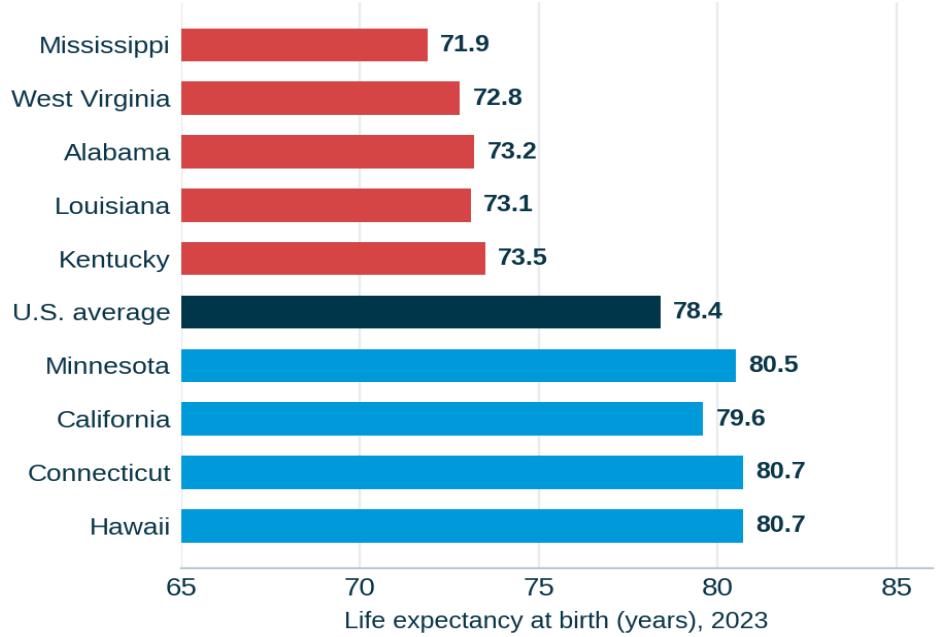
- **Cardiometabolic disease:** heart disease and diabetes/kidney/metabolic conditions drive ~52% of US excess deaths vs. 17 peers (2022); obesity is a likely factor.
- **Deaths at younger ages:** overdoses, firearms and crashes; US overdose mortality was ~7.5x peers in 2022.
- **Access and inequality:** wide income gaps and uneven coverage lower the average, but explain only part of the gap.

Sources: CDC/NCHS; Human Mortality Database; Bor et al., JAMA Netw Open (2026); Myrskylä et al., J Gerontol B (2022).

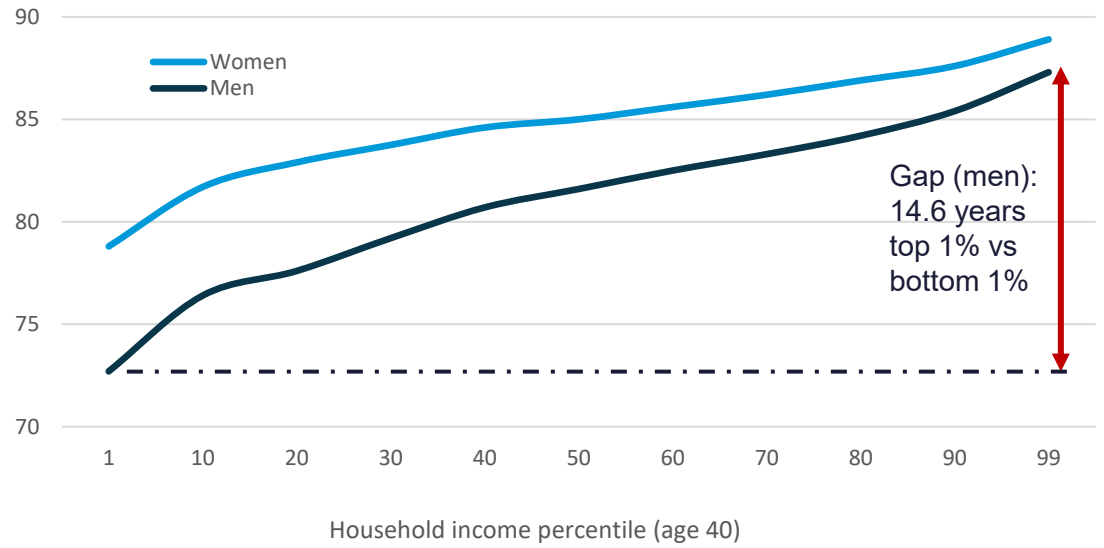
Large Gaps By State Within the US

A ~9-year spread across states and ~15 years across income exceed the 2–5 year shortfall versus peers

Life expectancy at birth: lowest and highest states, 2023



LE by income percentile (age 40)

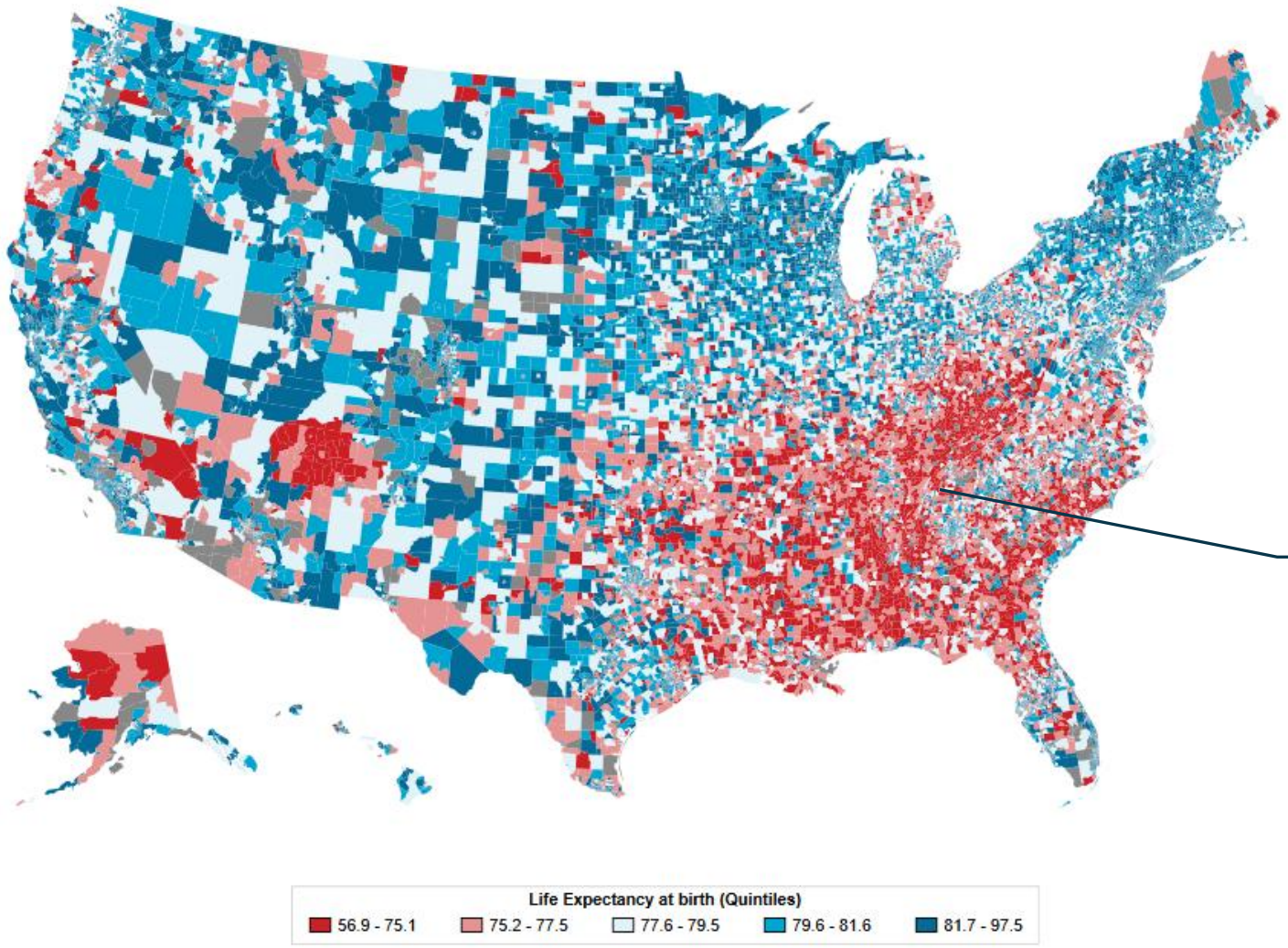


Sources: CDC/NCHS (US states, 2023); Chetty et al., JAMA (2016) (income, men and women aged 40).

- **Within the US:** a ~9-year gap separates the top states from the lowest.
- **Income is the largest differentiator:** men in the top 1% of the income distribution live 14.6 years longer than men in the bottom 1%.
- **Implication:** geography and socioeconomic mix are material, underwritable drivers of longevity risk, not just age and sex.

Life Expectancy Varies Widely by Neighborhood, Not Just by State

Census-tract life expectancy at birth (2010–2015) exposes variation that state and county averages hide



Sources: CDC/NCHS, US Small-Area Life Expectancy Estimates Project (USALEEP), 2010–2015.

What is a census tract?

A small, stable statistical area defined by the US Census Bureau: typically 1,200–8,000 residents (about 4,000 on average), roughly a neighborhood.

Why use tract-level data?

- Counties and states average over very different neighborhoods; tracts expose the pockets that drive real experience.
- Pooling six years of deaths (2010–15) makes small-area life tables usable. Limits: some tracts are modeled, and the data pre-date COVID.

Chattanooga: life expectancy ~76

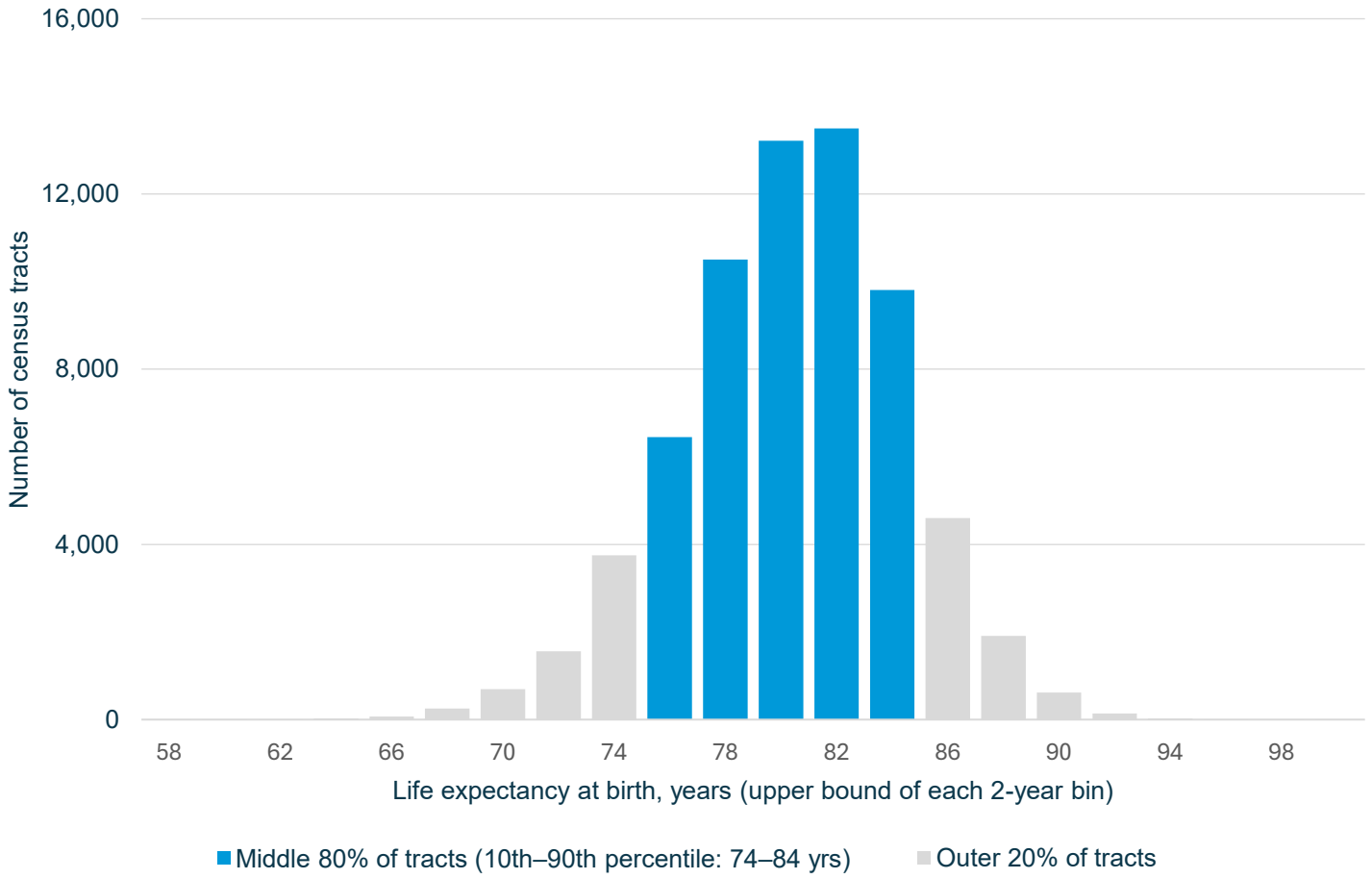
What the map shows

- Lowest-quintile tracts (red, under 75.1 years) cluster in the Southeast and Appalachia, with pockets in the Southwest, Plains and Alaska.
- The top quintile starts at 81.7 years: a 6.6+ year gap between the quintile cut points.

Tract Life Expectancy Spans 10 Years Across the Middle 80%

Life expectancy at birth for ~67,000 US census tracts, 2010–2015: 74 years at the 10th percentile, 84 at the 90th

Distribution of census tracts by life expectancy at birth



74
10th percentile

78.5
Median tract

84
90th percentile

- A typical tract has a life expectancy of 78.5 years, similar to the 2010–15 national average of 78.8.
- The middle 80% of tracts span 10 years (74 to 84); the extreme tracts differ by about 40 years.
- The ten highest-life-expectancy tracts are concentrated in NC, MD, MA, NY and CA.

Takeaway

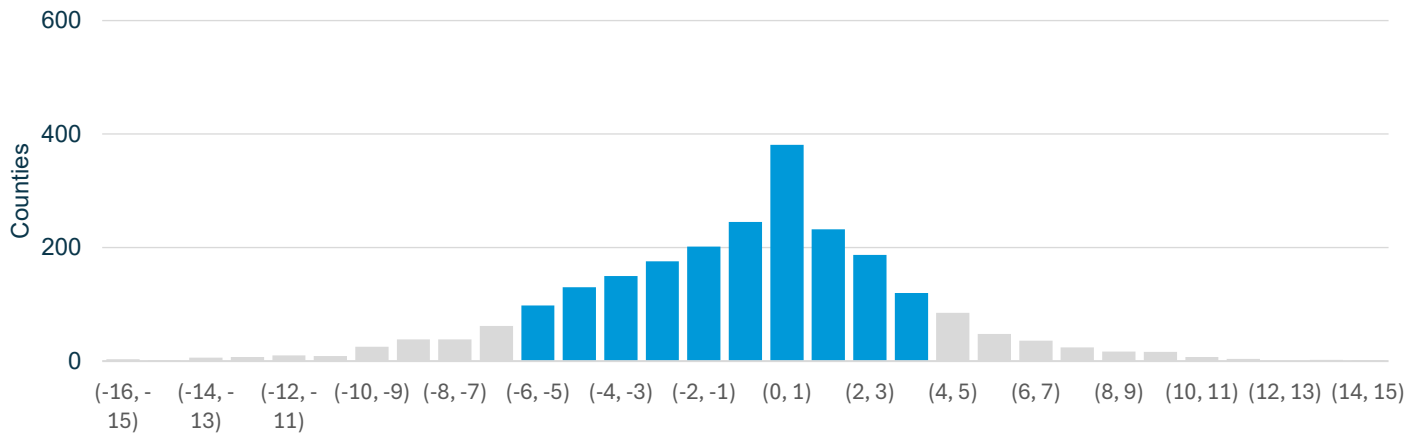
Where someone lives is a strong, observable predictor of longevity with the middle-80% LE spread at around 10 years.

Source: CDC/NCHS, USALEEP (2010–2015); 67,148 tracts. Some tract estimates are modeled.

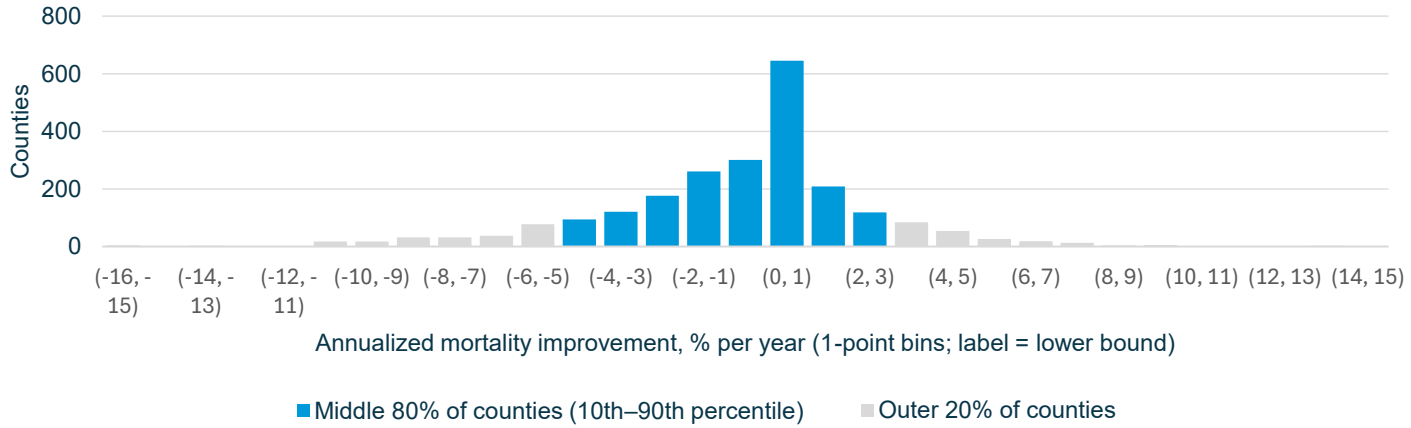
Recent Mortality Improvement Varies Widely Across US Counties

Annualized improvement, 2018–2024: the middle 80% of counties span about −5.5% to +4.0% at ages 60–64

Age 60–64 2,360 counties



Age 80–84 2,359 counties



Age 60–64: annualized MI by county

−5.5%	~0%	+4.0%
10th percentile	Median	90th percentile

Age 80–84: annualized MI by county

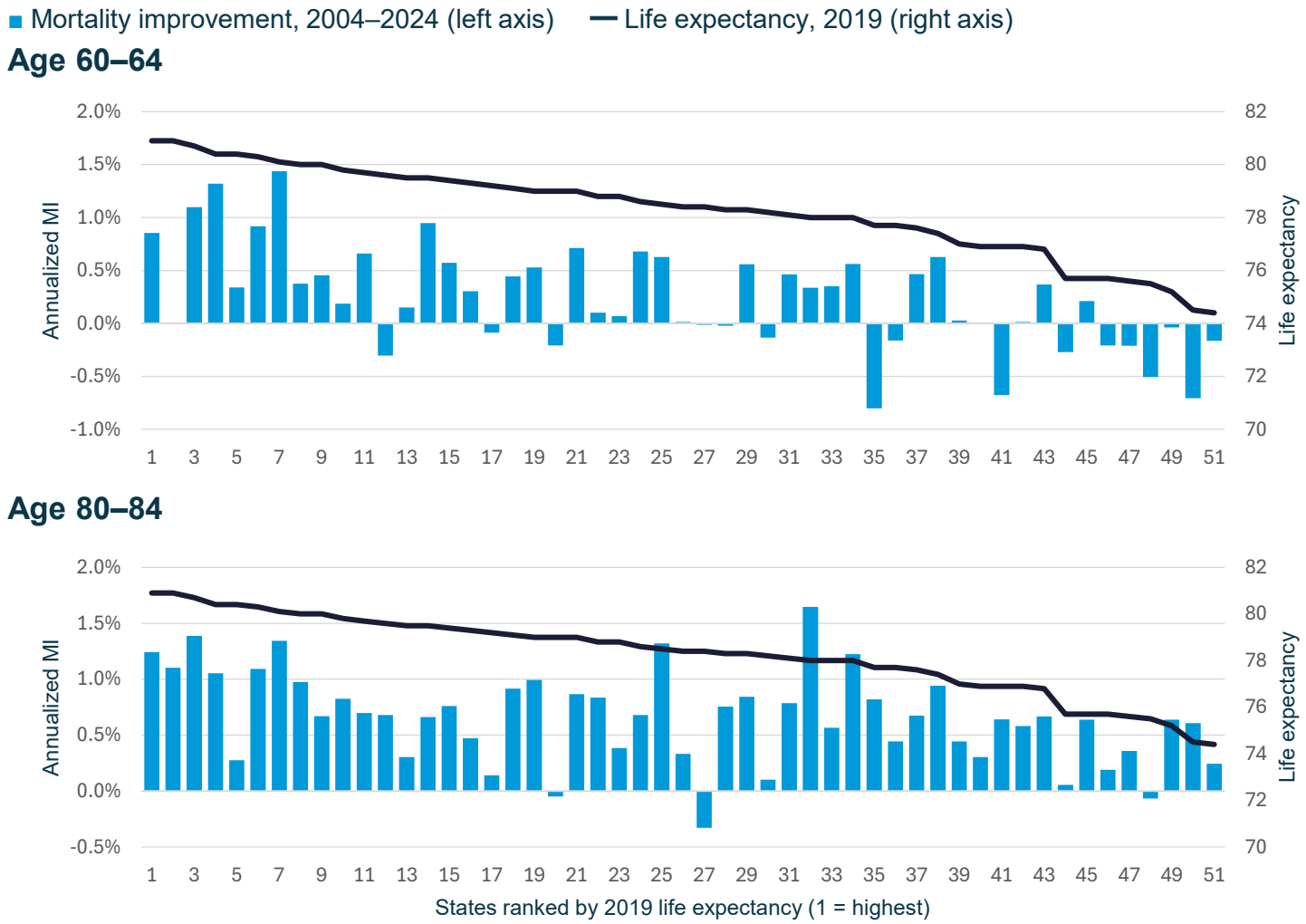
−4.8%	~0%	+2.8%
10th percentile	Median	90th percentile

- The most common outcome is 0–1% a year (16% of counties at ages 60–64, 27% at 80–84), but the median county shows little improvement.
- Dispersion is the story: the middle 80% of counties span 9.5 points at ages 60–64 and 7.6 points at 80–84. Some of these are because of volatility.
- Top-10 counties come from varied states: age 80 in CA, GA, OR, AL, AR, IL and TX; age 60 in OK, AR, TN, NV, TX, SC, KY and NY.

Source: CDC. Crude county death rates by age group, so age-adjusted MI may be higher; small-county rates are noisy, so the true spread is narrower than shown. Counties with data only.

Higher-LE States Improved Faster Over The Last 20 Years

State-level correlation between 2019 life expectancy and 2004–2024 mortality improvement is high



60%
Correlation, ages 60–64

42%
Correlation, ages 80–84

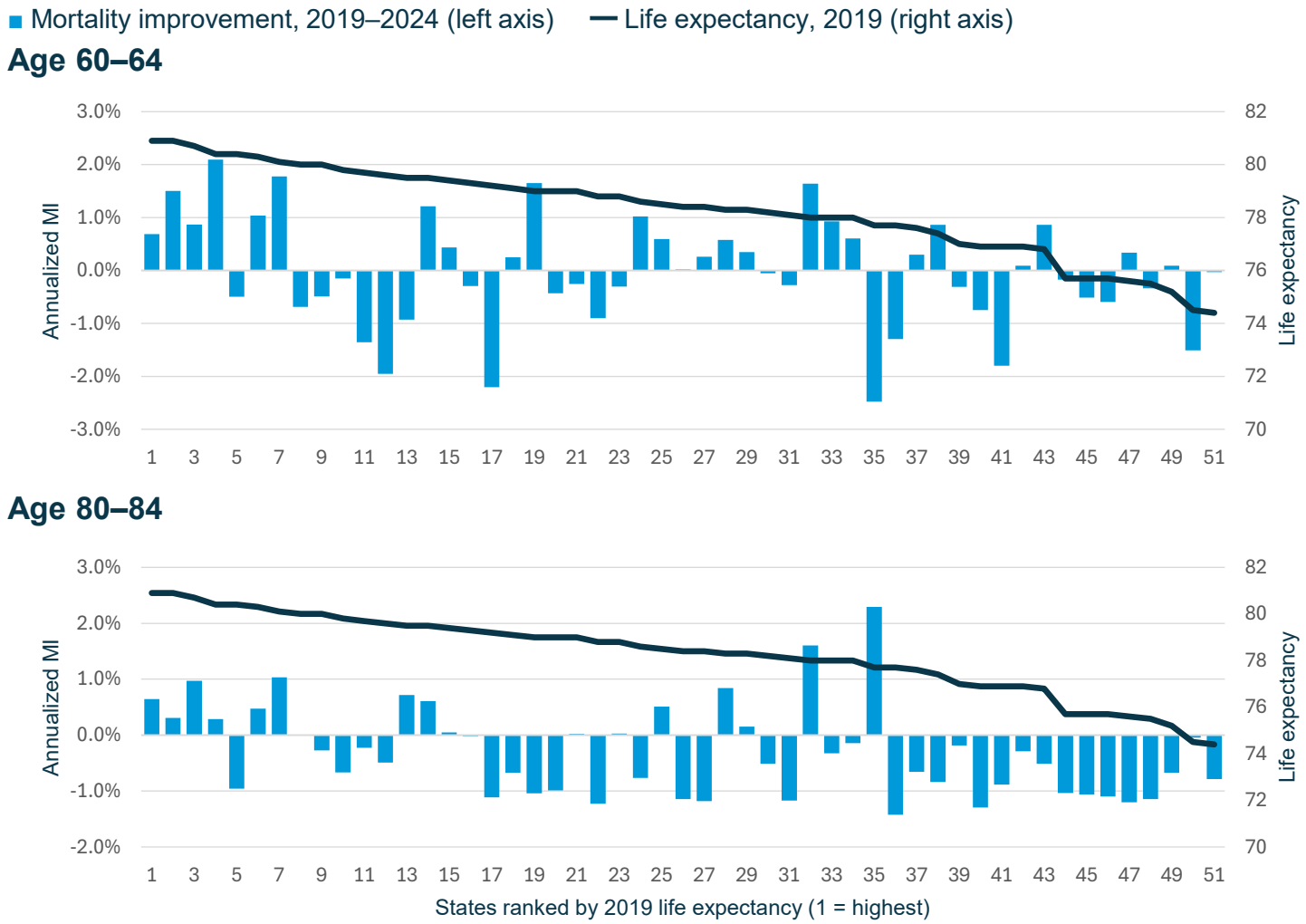
- States with higher life expectancy have improved faster, so the LE gap has been widening at the state level.
- The link is strong at pre-retirement age, but also significant at the old age.
- The link between LE and the past MI is weaker in the middle of the LE distribution.

- Method: MI is built from crude 5-year age-band death rates; aging within age band makes it lower than age-adjusted MI.

Source: CDC. MI = annualized change in crude mortality, 2004–2024; states ordered by 2019 life expectancy.

Higher-LE States Continued Faster Improvement In Recent Five Years

State-level correlation is positive but more modest



24%
Correlation, ages 60–64

37%
Correlation, ages 80–84

- States with higher life expectancy continued improving faster.
- The short 5-year window resulted in a more volatile comparison, but the link appears strong at the two ends, in states where LE is very high or very low.
- The disconnect is more obvious among states in the middle of the LE distribution.

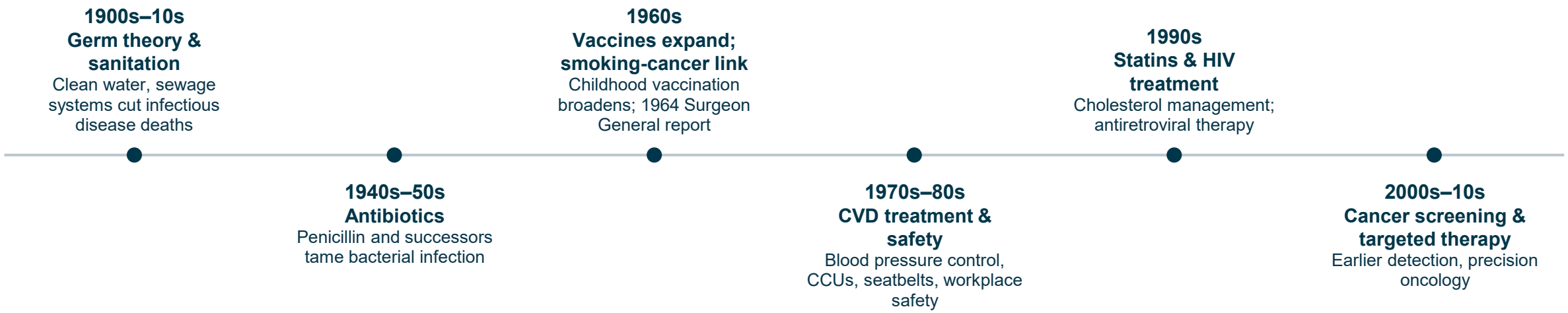
- Method: MI is built from crude 5-year age-band death rates; aging within each band makes it lower than age-adjusted MI.

Source: CDC. MI = annualized change in crude mortality, 2019–2024; states ordered by 2019 life expectancy.

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Each Major Mortality Advance Reached Lower-SES Groups Later

A century of advances, each reaching lower-SES groups with a lag; GLP-1 may or may not repeat the pattern



Established drivers: higher-SES adopts first, lower-SES follows

- **Smoking:** lower-SES groups quit later and the gap never closed.
- **Statins and vaccines:** same sequence, with earlier uptake in higher-SES groups and delayed diffusion to lower-SES groups.
- **Cancer screening:** same sequence, and the gap is still widening (colon screening gap, some HS vs. college: −9.9 pts in 1999, −22.6 pts in 2023).
- **Implication:** assume new advances reach lower-SES groups later and less fully; this supports segment-specific improvement assumptions.

GLP-1: too early to call

- Uptake may not follow the usual gradient: The October BTIG survey found that about half users have household income under $50K, a trend of catching up to higher earners.
- Persistence is the swing factor: more than half stop within a year (US studies: up to ~65%), and low-income-area users were 14% more likely to stop.
- Benefit also depends on medical supervision, side effects and cost, so equal uptake can still mean unequal outcomes.

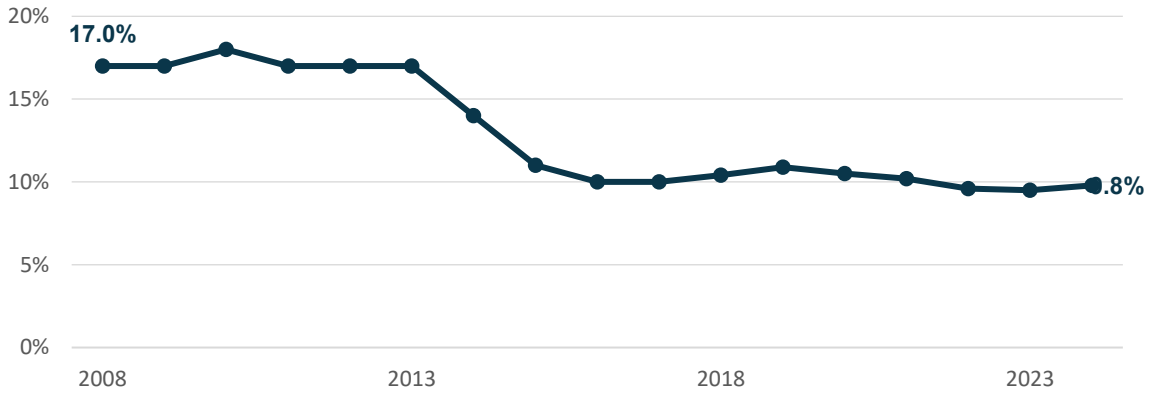
Sources: CDC; BTIG survey (2025)

Coverage Gains Have Stalled While Income and Screening Gaps Widen

Insurance coverage is flat since 2016, while income concentration and screening gaps keep growing

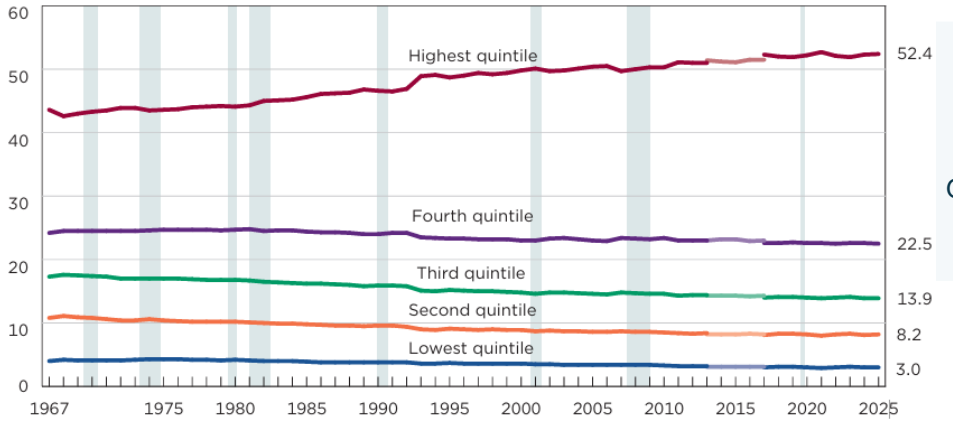
Uninsured rate, ages 0–64 (%)

Sideways



Share of aggregate income by quintile (%)

Widening

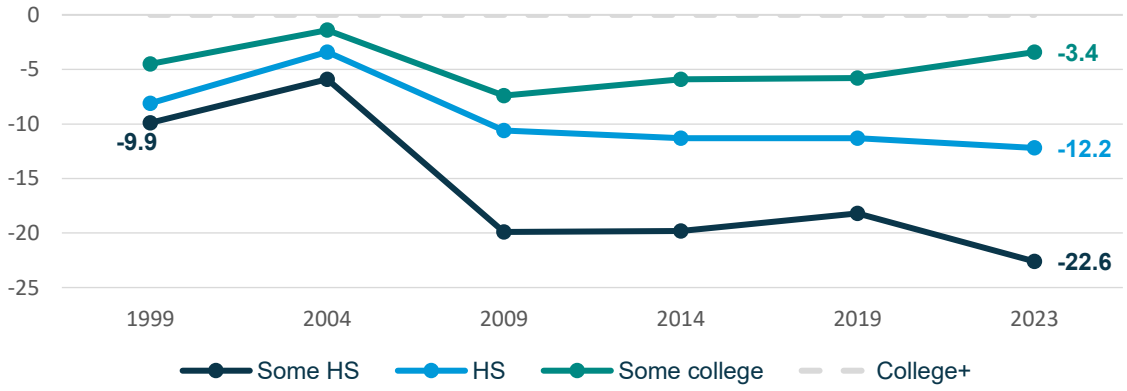


0.49

Gini index, 2025 (0.40 in 1975; 0.46 in 2000)

Colon cancer screening gap vs. college graduates (pct. pts)

Widening



- **Coverage:** ACA and Medicaid expansion reduced mortality, most for low-income adults, but gains appear to level off about 7 years after enrollment. Lack of insurance explains an estimated 5–20% of the high-/low-income mortality gap.
- **Income:** wealth grew across SES, yet inequality is rising and inflation adds affordability pressure.
- **Screening:** insurance drives gaps in routine checks, but the larger gap is in cancer screening.
- **Social isolation** (not shown): the gap ticked up again after falling from its 2020 peak.

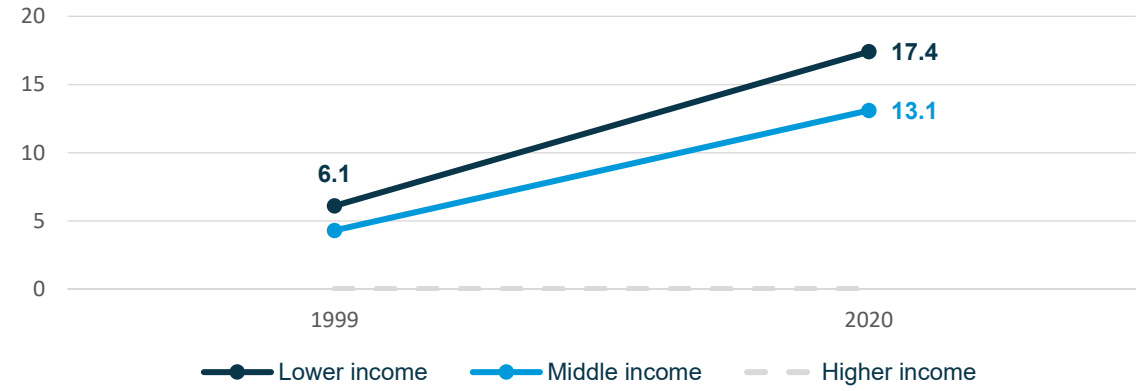
Sources: CDC; US Census Bureau

Lifestyle & Weight Gaps Are Mixed: Two Narrowing, Two Widening

Smoking and physical inactivity gaps are narrowing; diet and obesity gaps are widening

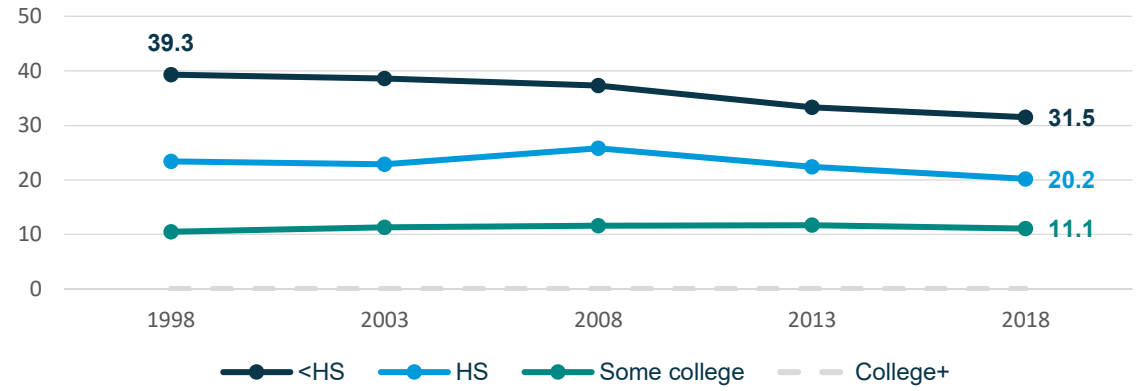
Poor diet gap vs. higher-income group (pct. pts)

Widening



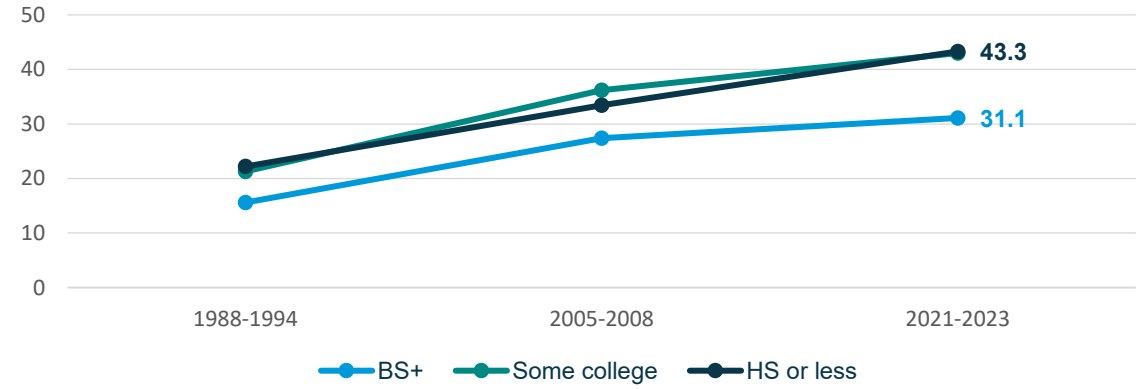
Physical inactivity gap vs. college graduates (pct. pts)

Narrowing



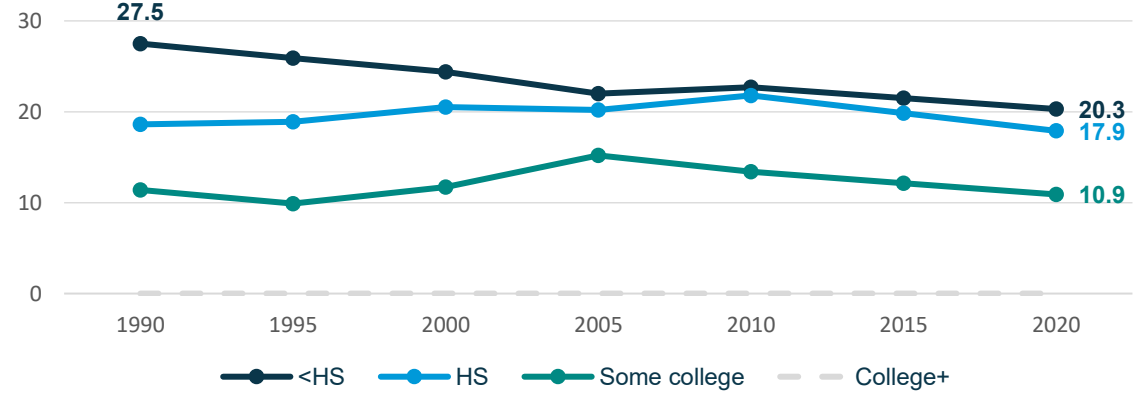
Obesity rate among men, by education (%)

Widening



Smoking gap vs. college graduates (pct. pts)

Narrowing



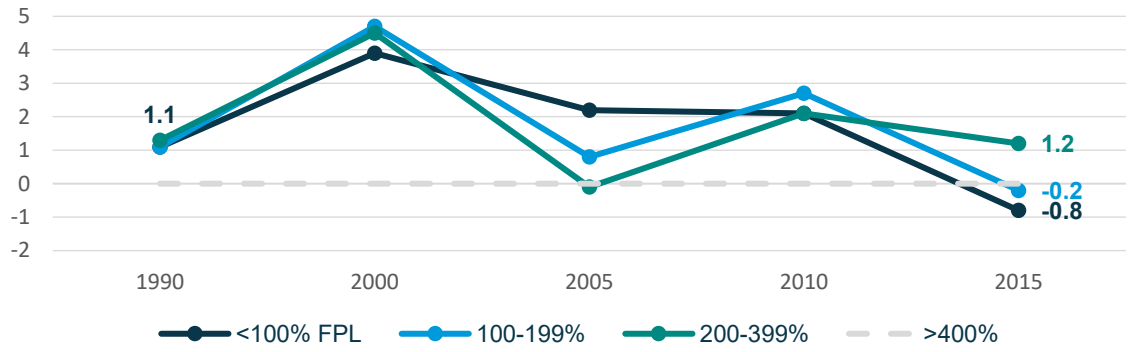
Source: CDC. Gap charts show the percentage-point difference from the higher-SES reference group (dashed line at zero).

Most Metabolic Gaps Are Widening or Flat; Cholesterol Narrows

Gap versus the higher-SES reference group (percentage points)

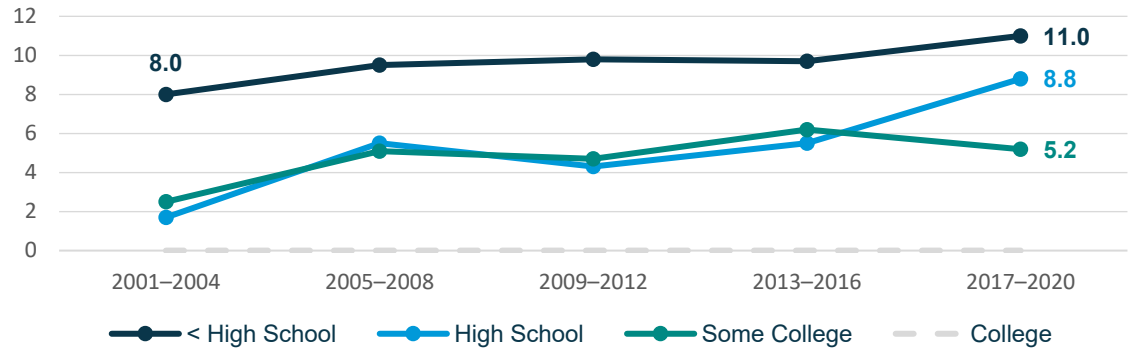
High cholesterol gap vs. higher-income group (pct. pts)

Narrowing



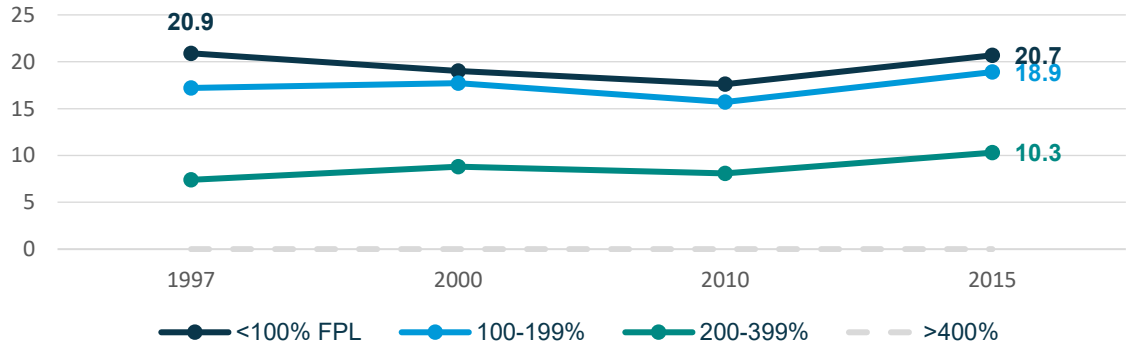
Diabetes gap vs. college graduates (pct. pts)

Widening



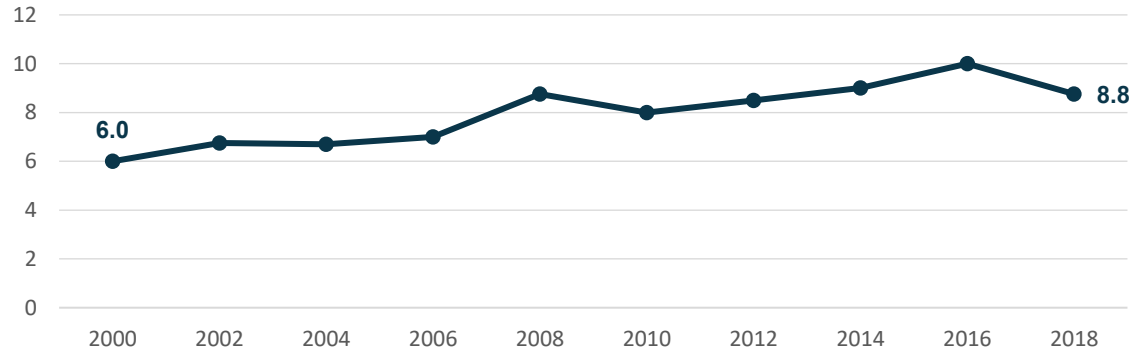
Disability gap vs. higher-income group (pct. pts)

Sideways



Multi-morbidity gap, low vs. mid/high income (pct. pts)

Widening



Read the cholesterol gap with caution: it covers only people who were screened. High LDL is asymptomatic, so it is found only if someone looks. People with less continuous primary care, higher uninsured and underinsured rates and fewer routine screenings, are more likely to go undiagnosed. Source: CDC.

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Five Near-Term Forces Shape US Mortality, and Who Benefits

Direction and mechanism of each force, and how it plays out across income groups

GLP-1 & obesity

Prescriptions up ~600% (2019–24); ~12% of US adults now use GLP-1 for weight loss, easing a major cardiometabolic risk factor.

Across income groups

Diabetes use shows no significant income gap; obesity use does. Lower-income adults carry more of the obesity burden but a smaller share of GLP-1 use.

Drug overdose

Overdose deaths declined in 2023–24 for the first time in years, after two decades of increases — a reversal of a major headwind.

Across income groups

The gap widened sharply through 2021 and has likely narrowed with the recent decline, but the narrowing may not be durable.

Cancer therapy

Immunotherapy, cancer vaccines, and earlier detection continue to lower cancer mortality across most tumor types.

Across income groups

A consistent gap in immunotherapy use (about 5%) separates high- and low-SES groups.

Smoking cessation

Cessation rate slowed from 0.6%/yr (1970–90) to 0.3%/yr (1990–2010); benefit follows with a ~20-year lag.

Across income groups

Smoking has been a driver narrowing the SES gap in recent decades; with cessation slowing, that tailwind is likely to fade.

Climate / El Niño

Uncertain

2026–27 El Niño forecast to be the strongest in decades; 1997–98 event cut US life expectancy ~0.4 yr, young ages hit hardest.

Across income groups

Climate risk falls disproportionately on lower-income and blue-collar workers and varies by region.

Mortality Improvement Gaps Are Likely to Persist Near Term

Of 16 mortality gap indicators, 8 are widening, 4 are narrowing and 4 are sideways

Lifestyle & Weight	**Smoking**	**Physical activity**	**Diet**	**Obesity**
	Narrowing	Narrowing	Widening	Widening
Metabolic	**Cholesterol**	**Diabetes**	**Disability**	**Multi-morbidity**
	Narrowing	Widening	Sideways	Widening
Healthcare & support	**Uninsured**	**Income gap**	**Cancer screening**	**Social isolation**
	Sideways	Widening	Widening	Sideways
Medical advances & external	**GLP-1**	**Cancer therapy**	**Drug overdose**	**Climate risk**
	Sideways	Widening	Narrowing	Widening

Status shows the direction of the gap between lower- and higher-SES groups.

Why gaps are likely to persist

- **Breadth:** half the indicators are widening, concentrated in cardiometabolic and access drivers that feed mortality with long lags.
- **Fragile offsets:** smoking cessation slowed from 0.6% to 0.3% a year, the overdose decline may not last, and the cholesterol read covers only screened people.
- **Top-down diffusion:** cancer therapy and GLP-1 follow the historical pattern of higher-SES groups adopting first.

Conclusions

What the SES and geographic gaps mean for pricing, reserving and risk management

What the data shows

1. **Dispersion is large.** Tract life expectancy spans 10 years across the middle 80%, more than the 2–5 year US-vs-peer gap; recent 5-year MI by county spans about 9.5 points at ages 60–64.
2. **The gaps are structural.** Differences in mortality drivers did not show obvious signs of narrowing, indicating continued mortality improvement gap over the short term.
3. **New advances diffuse top-down.** Major advance reached lower-SES groups later; cancer therapy likely lift the average while widening the gap before access broadens; GLP-1 has the potential to narrow the gap but sideways in the short term

What it means for actuaries

1. **Test your mix.** Check whether your block's SES and geographic mix resembles the national population to understand the basis risk of applying population-based improvement.
2. **Test improvement as well as mortality.** The link between a state's LE and its mortality improvement is positive but not a reliable bet, especially for states in the middle of the LE distribution.
3. **Segment and monitor.** Test geography-aware risk scenarios, not one central path, and track GLP-1 persistence, overdose deaths, cancer improvement, and other uncertainties.