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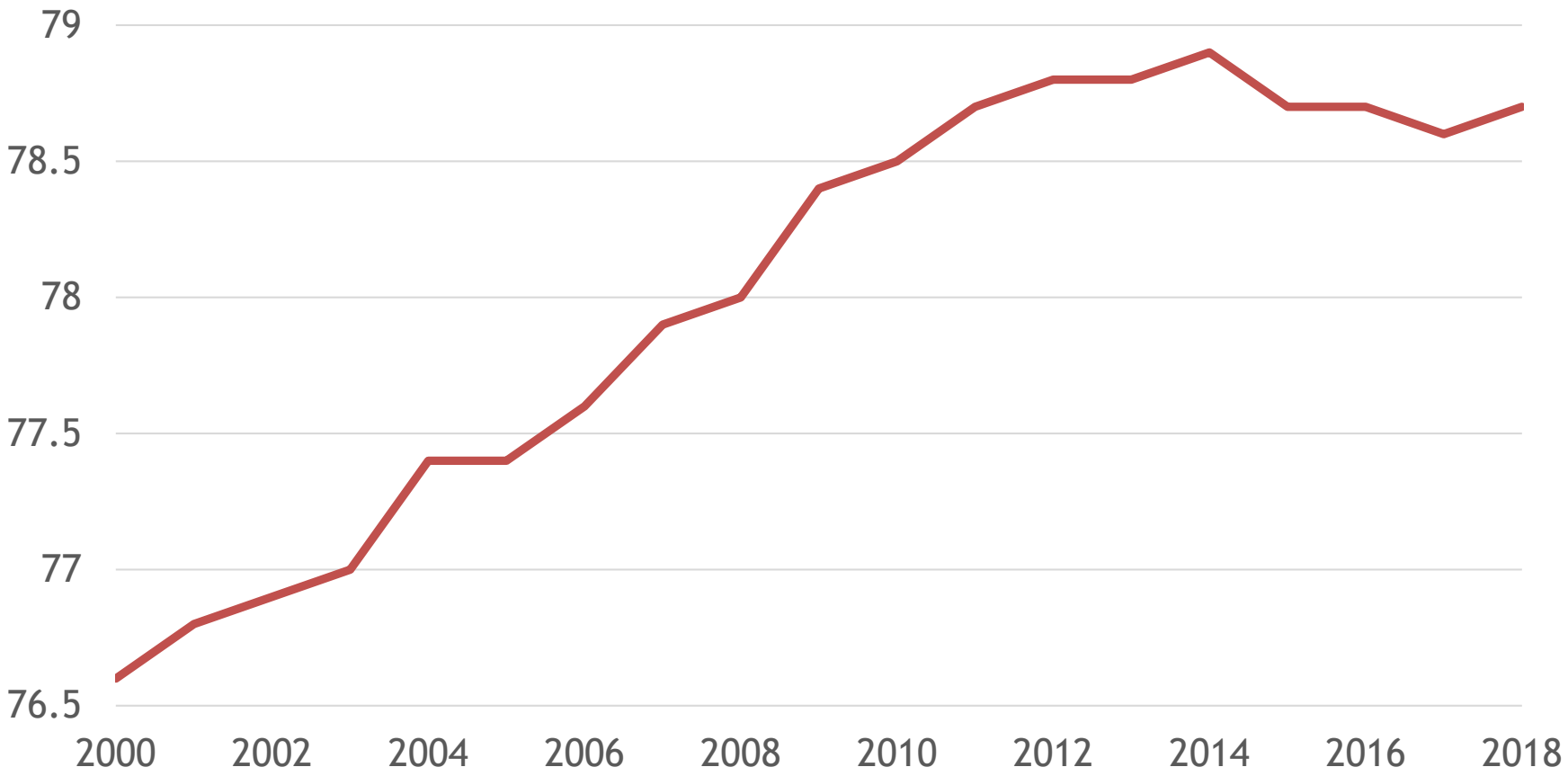
COMMITTEE ON POPULATION (CPOP) & COMMITTEE ON NATIONAL STATISTICS (CNSTAT)

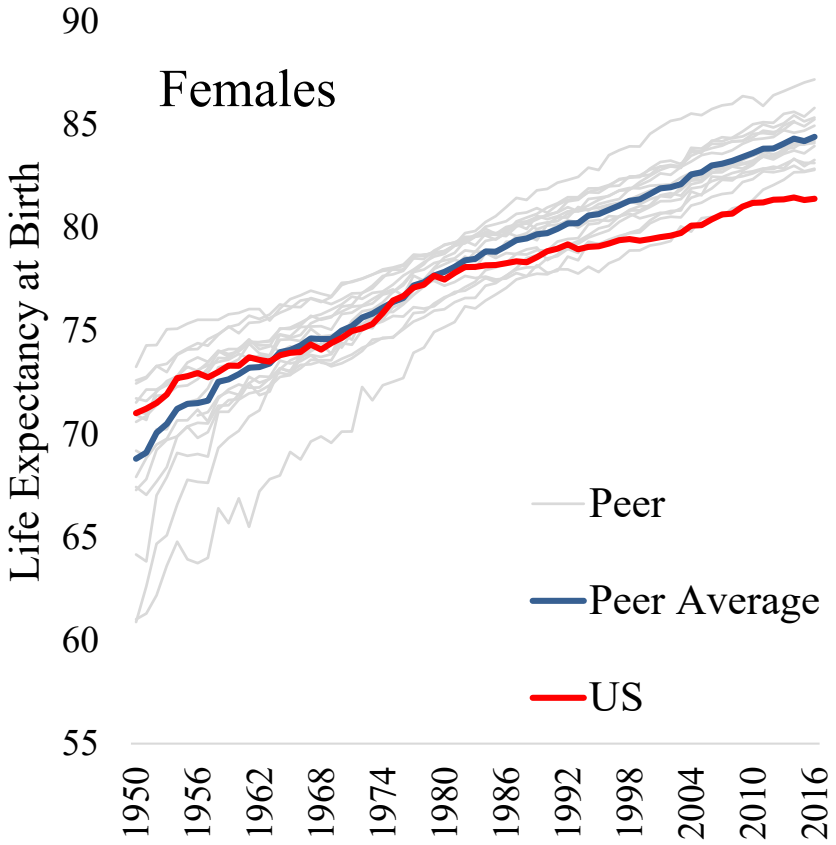
High and Rising Mortality Rates Among Working-Age Adults: Cardiometabolic Diseases and Obesity

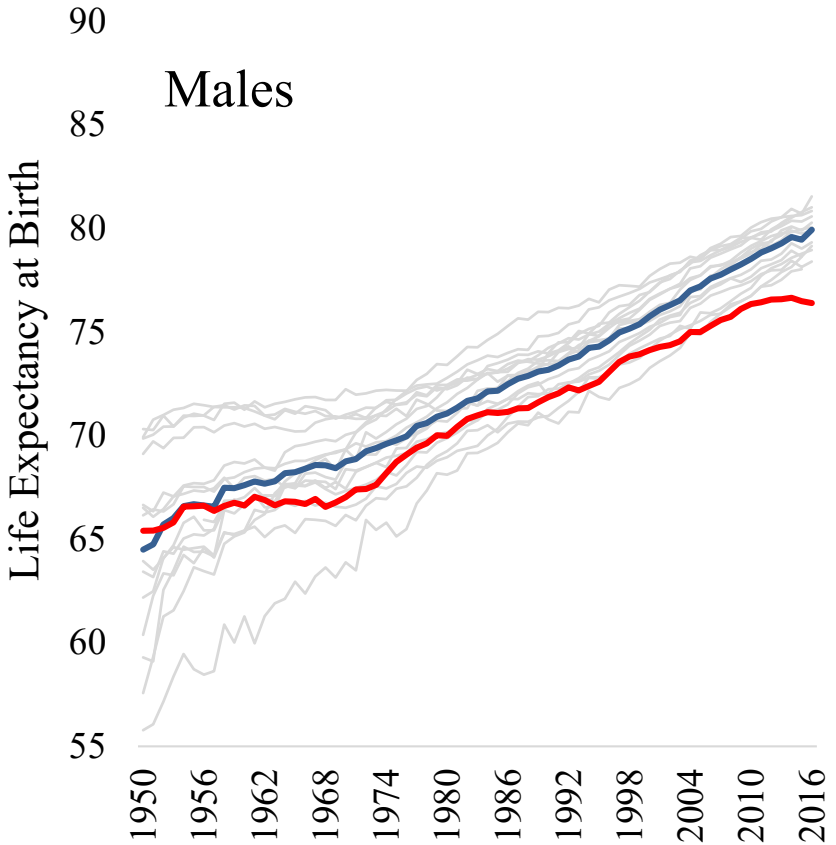
Committee on Rising Midlife Mortality Rates and Socioeconomic Disparities

The Problem: U.S. Life Expectancy Fell Between 2014 and 2017



The Problem: U.S. Life Expectancy has Been Diverging from Peer Countries





Study Background

- Sponsors:
  - National Institute on Aging
  - Robert Wood Johnson Foundation
- Task
  - Identify the key drivers of increasing mortality and concomitant widening social differentials
  - Identify modifiable risk factors to reduce mortality and health disparities
  - Make recommendations for future research and explore potential policy implications

Committee Members

- **KATHLEEN MULLAN HARRIS** *(Chair)*, Department of Sociology, Carolina Population Center, University of North Carolina at Chapel Hill
- **MICHAEL E. CHERNEW**, Department of Health Care Policy, Harvard Medical School
- **DAVID M. CUTLER**, Department of Economics, Harvard University
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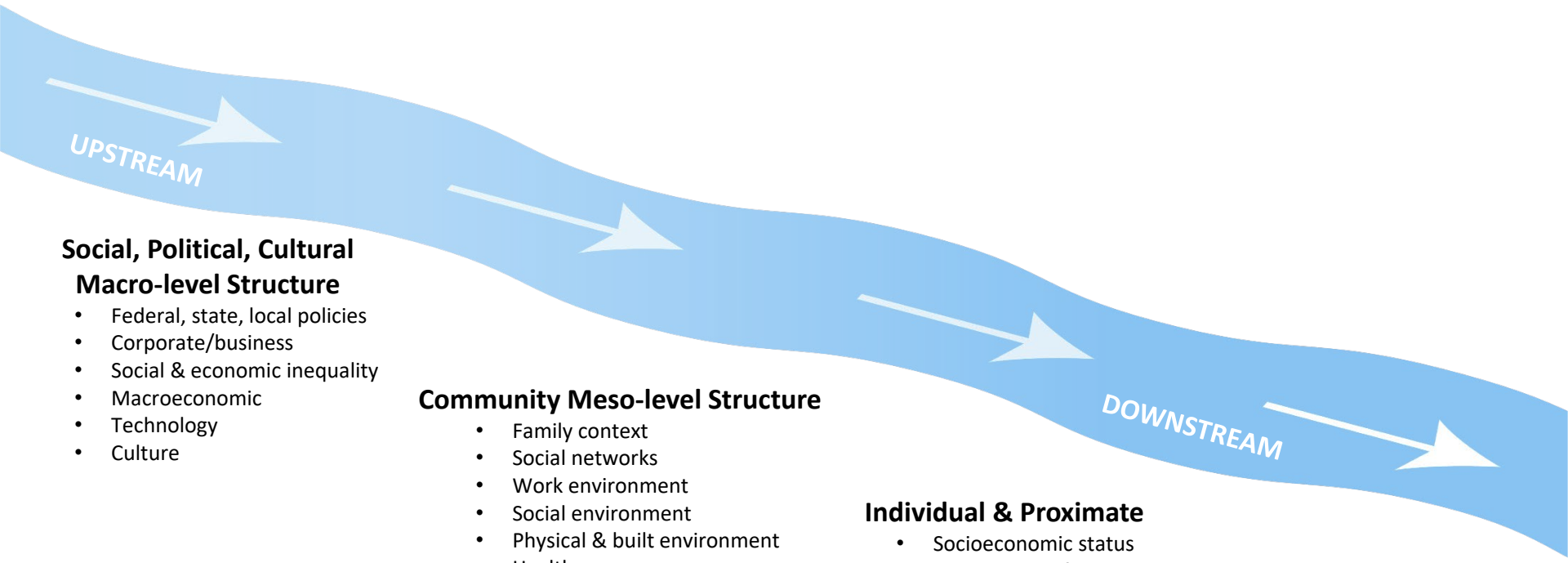
- **ALBERT L. SIU**, Mount Sinai Medical Center
- **FRANK A. SLOAN**, Economics Department and Center for Health Policy, Law and Management, Duke University.

Scope of Report

- Examined mortality trends for working age adults (ages 25-64) by age-group, sex, race/ethnicity, geography
- Conducted independent data analysis using restricted-access National Vital Statistics death certificate data (1990-2017)
- Conducted robust review of the literature to identify explanations and implications for policy and research

Conceptual Framework: A life course multilevel model of factors involved in high and rising mortality among working-age adults



Social, Political, Cultural Macro-level Structure

- Federal, state, local policies
- Corporate/business
- Social & economic inequality
- Macroeconomic
- Technology
- Culture

Community Meso-level Structure

- Family context
- Social networks
- Work environment
- Social environment
- Physical & built environment
- Health care

Individual & Proximate

- Socioeconomic status
- Psychological factors
- Behavior
- Health care utilization
- Biology

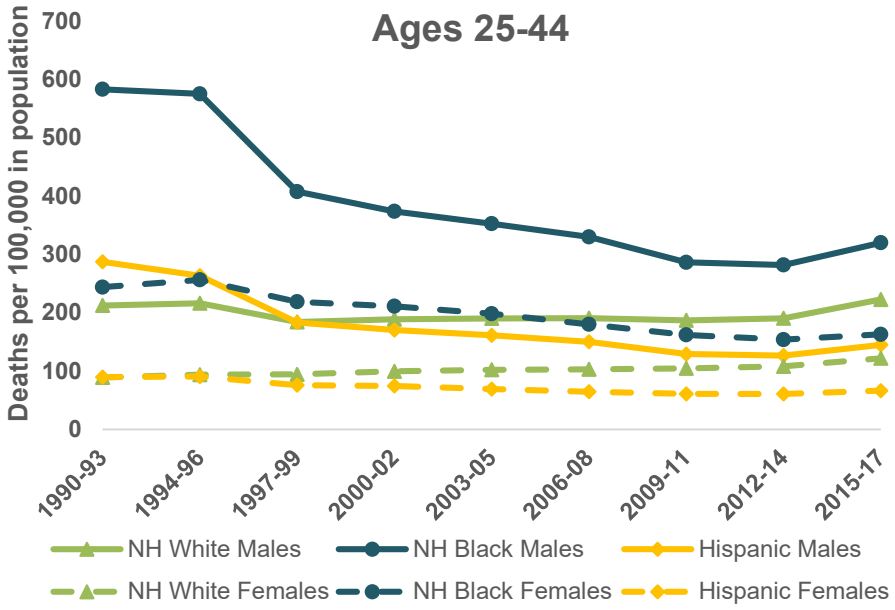
Morbidity

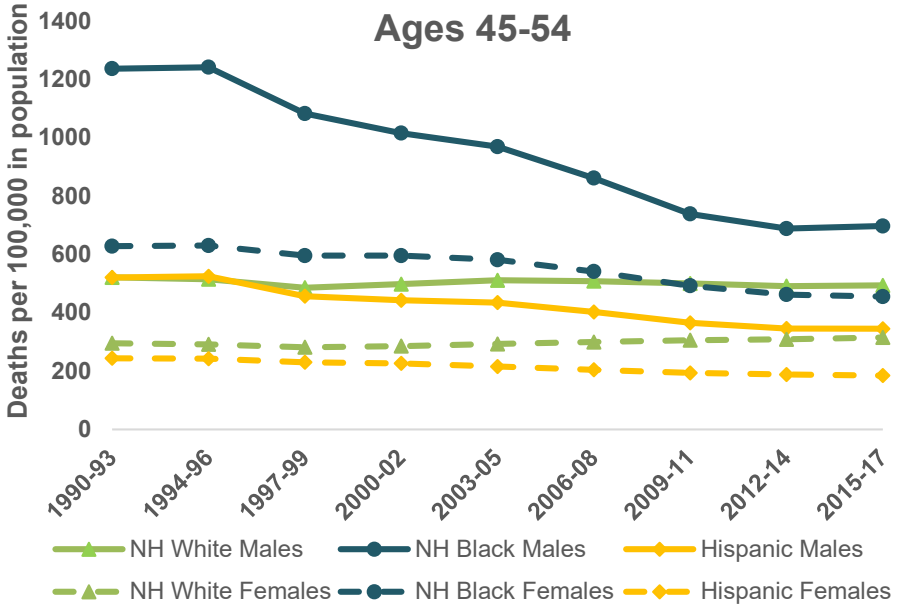
Death

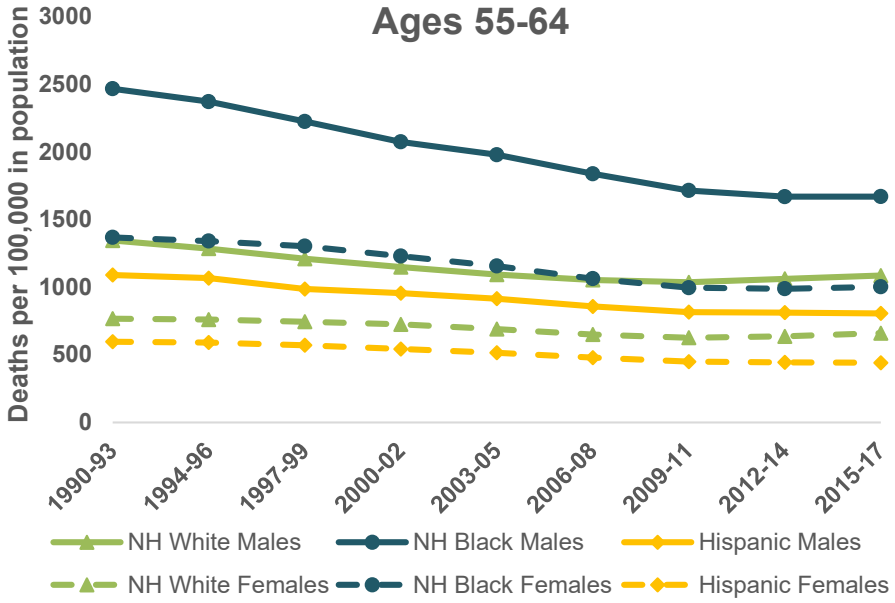
Age

Within or across stages of the life course: gestation, birth, childhood, adolescence, young adulthood, middle adulthood

Trends and Differentials in Working-Age Mortality in the U.S.,1990-2017







Mortality Trends: 1990-2017 by Age Group, Sex, and Race-Ethnicity

Disparities in All-Cause Mortality

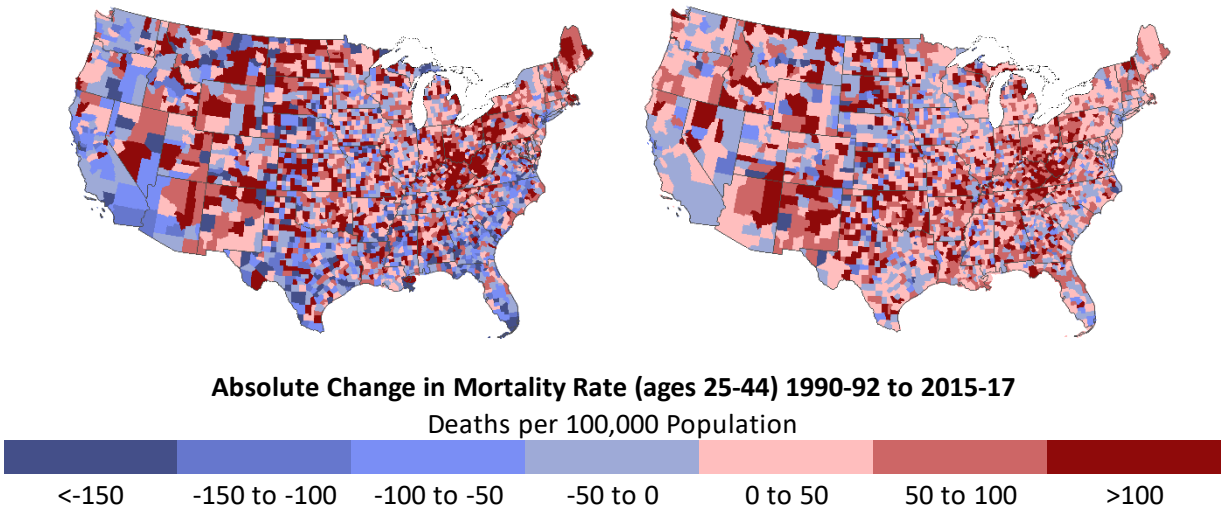
- Blacks and American Indians have consistently experienced much higher mortality
- Disparities in mortality by SES have widened substantially among working-age Whites, and there is a stable but persistent gap in mortality among Black adults that favors those with higher SES

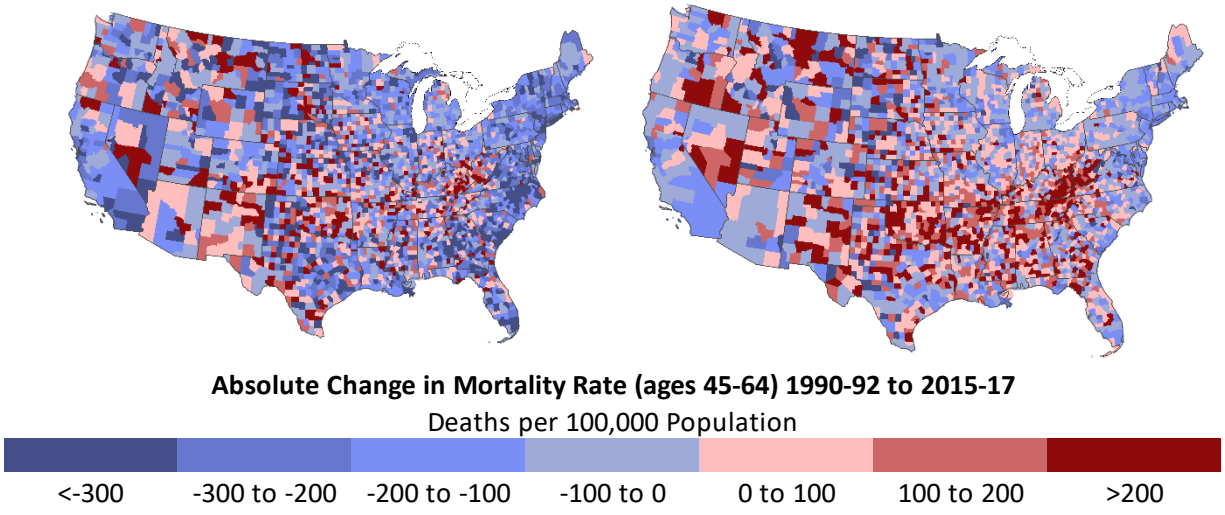
Trends in All-Cause Mortality

(Change in mortality, males and females)

Males

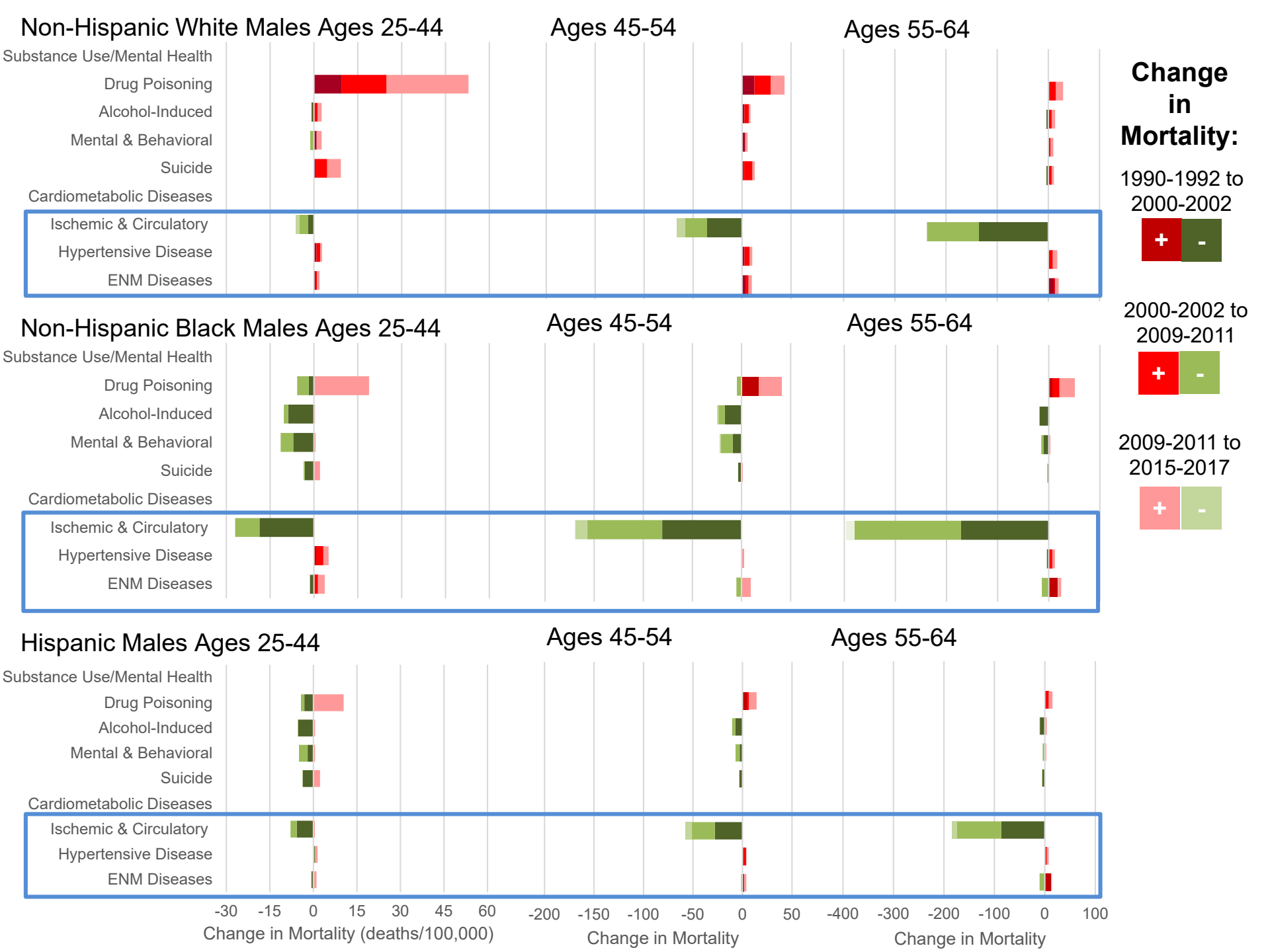
Females

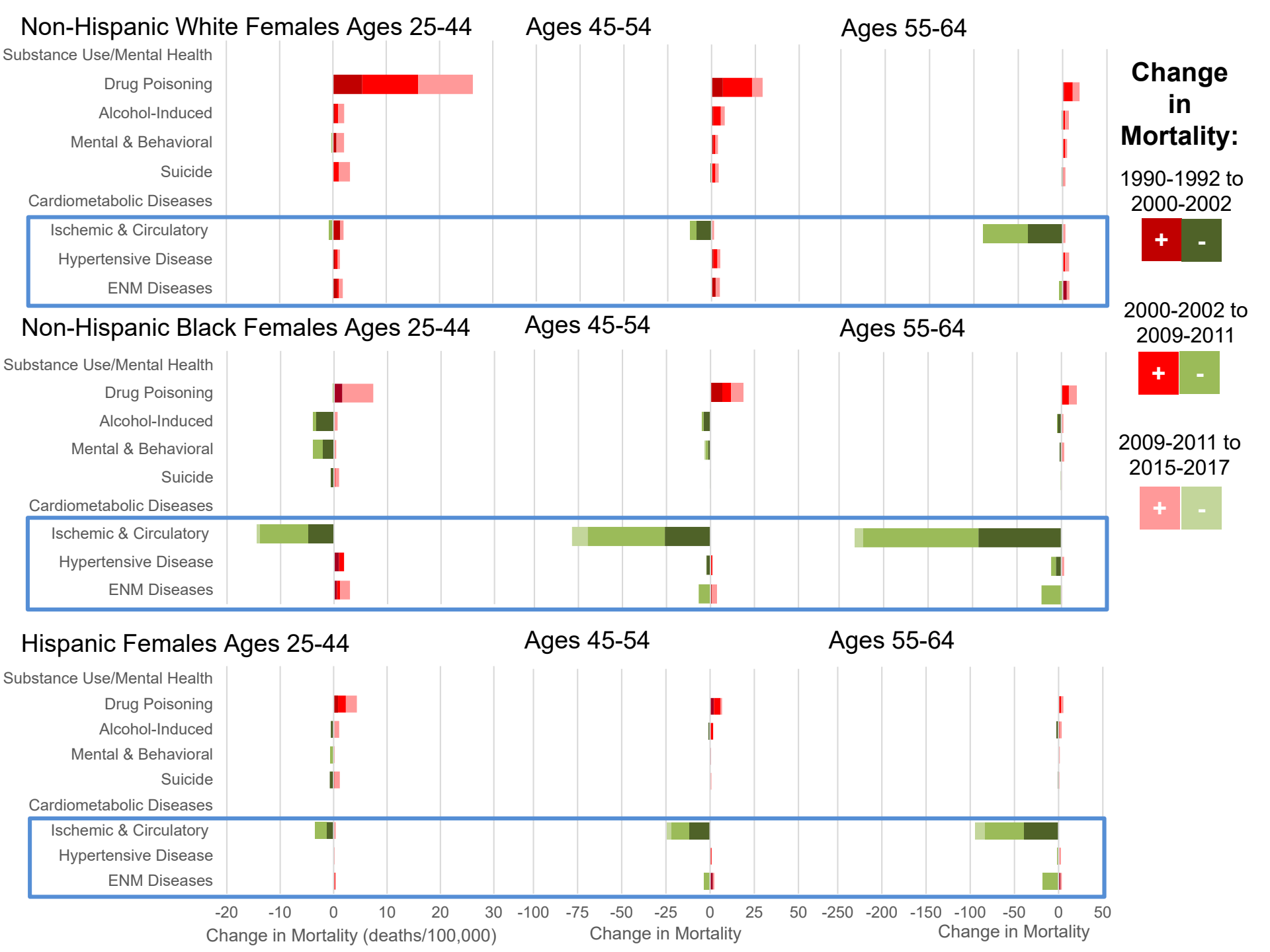




Main Drivers of the Rise in Working-age Mortality:

1. Drug poisonings and alcohol-induced causes
2. Suicide
3. Cardiometabolic diseases


Non-Hispanic White Males Ages 25-44
Ages 45-54
Ages 55-64
Substance Use/Mental Health
Drug Poisoning
Alcohol-Induced
Mental & Behavioral
Suicide
Cardiometabolic Diseases
Ischemic & Circulatory
Hypertensive Disease
ENM Diseases
Non-Hispanic Black Males Ages 25-44
Ages 45-54
Ages 55-64
Hispanic Males Ages 25-44
Ages 45-54
Ages 55-64
-30 -15 0 15 30 45 60
Change in Mortality (deaths/100,000)
-200 -150 -100 -50 0 50
Change in Mortality
-400 -300 -200 -100 0 100
Change in Mortality
Change in Mortality:
1990-1992 to 2000-2002
+
-
2000-2002 to 2009-2011
+
-
2009-2011 to 2015-2017
+
-


Non-Hispanic White Females Ages 25-44
Ages 45-54
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Substance Use/Mental Health
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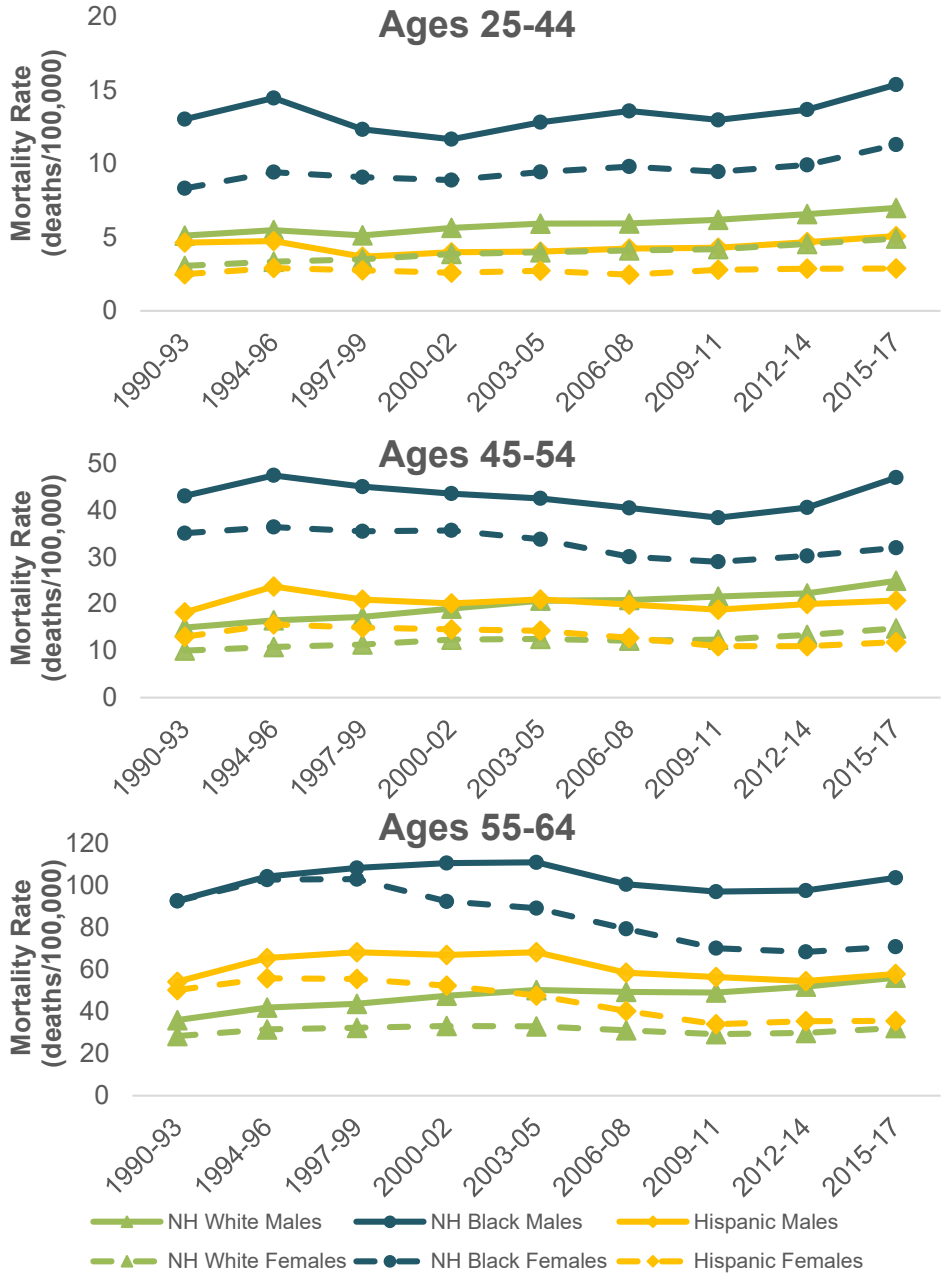
-20 -10 0 10 20 30
Change in Mortality (deaths/100,000)
-100 -75 -50 -25 0 25 50
Change in Mortality
-250 -200 -150 -100 -50 0 50
Change in Mortality
Change in Mortality:
1990-1992 to 2000-2002
+
-
2000-2002 to 2009-2011
+
-
2009-2011 to 2015-2017
+
-

The Role of Cardiometabolic Diseases in Shaping Mortality Trends

1. Endocrine, nutritional, and metabolic diseases (ENM)
2. Hypertensive heart disease
3. Ischemic heart disease and other diseases of the circulatory system

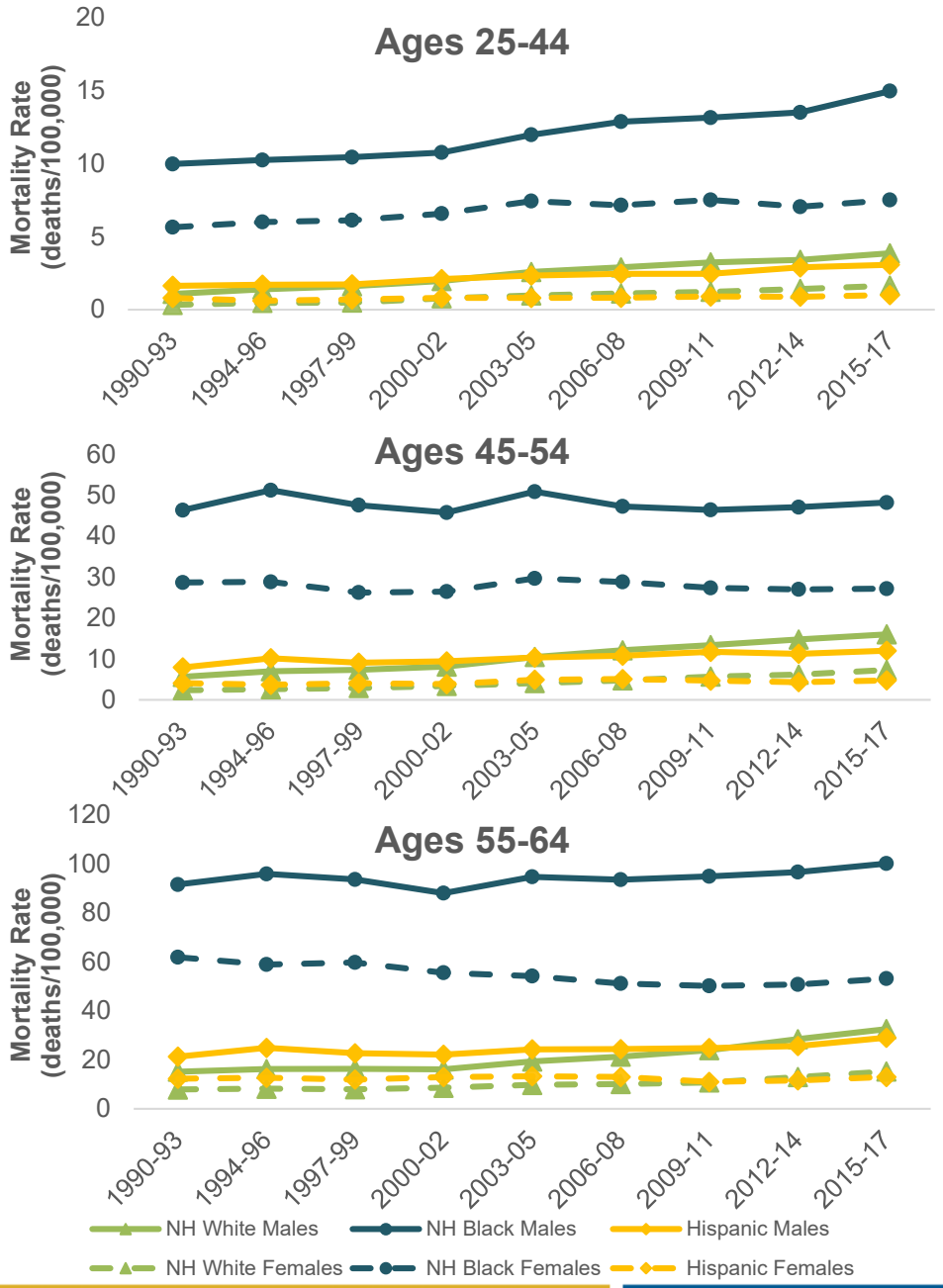


ENM Diseases

- Rates are highest in Black population
- Rates are higher for men than for women

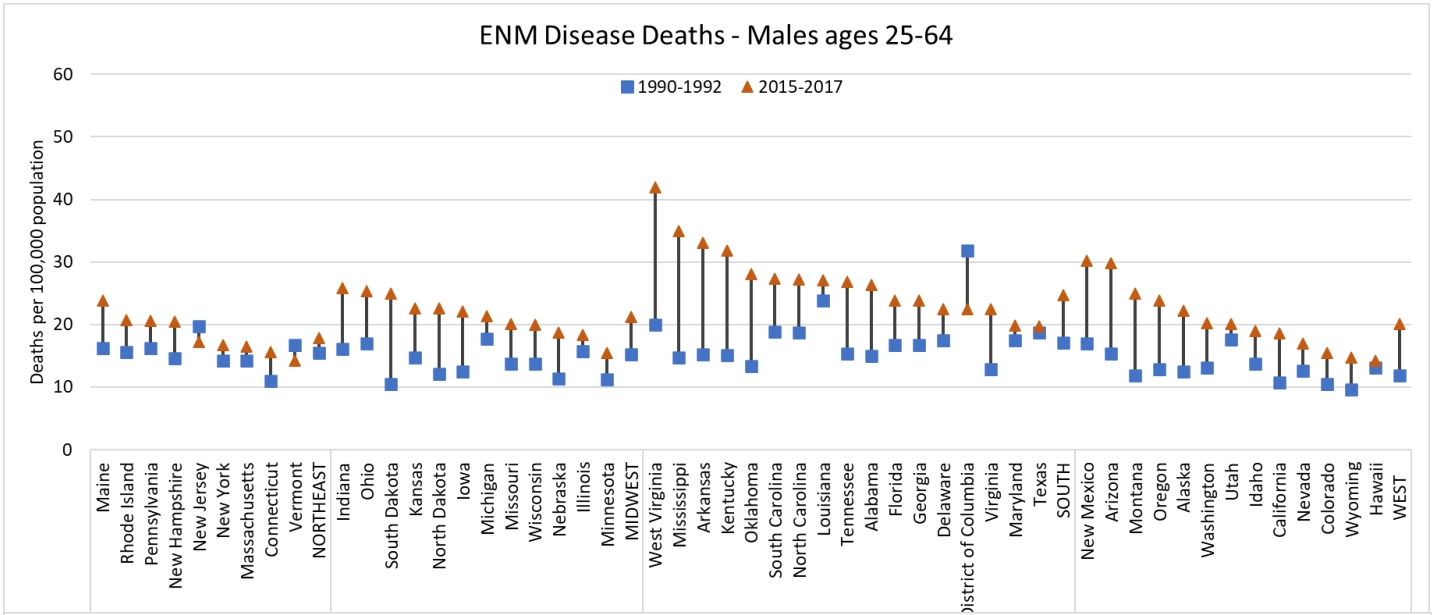
- Decreases among all women 55-64
- Rates increased in all populations after 2010

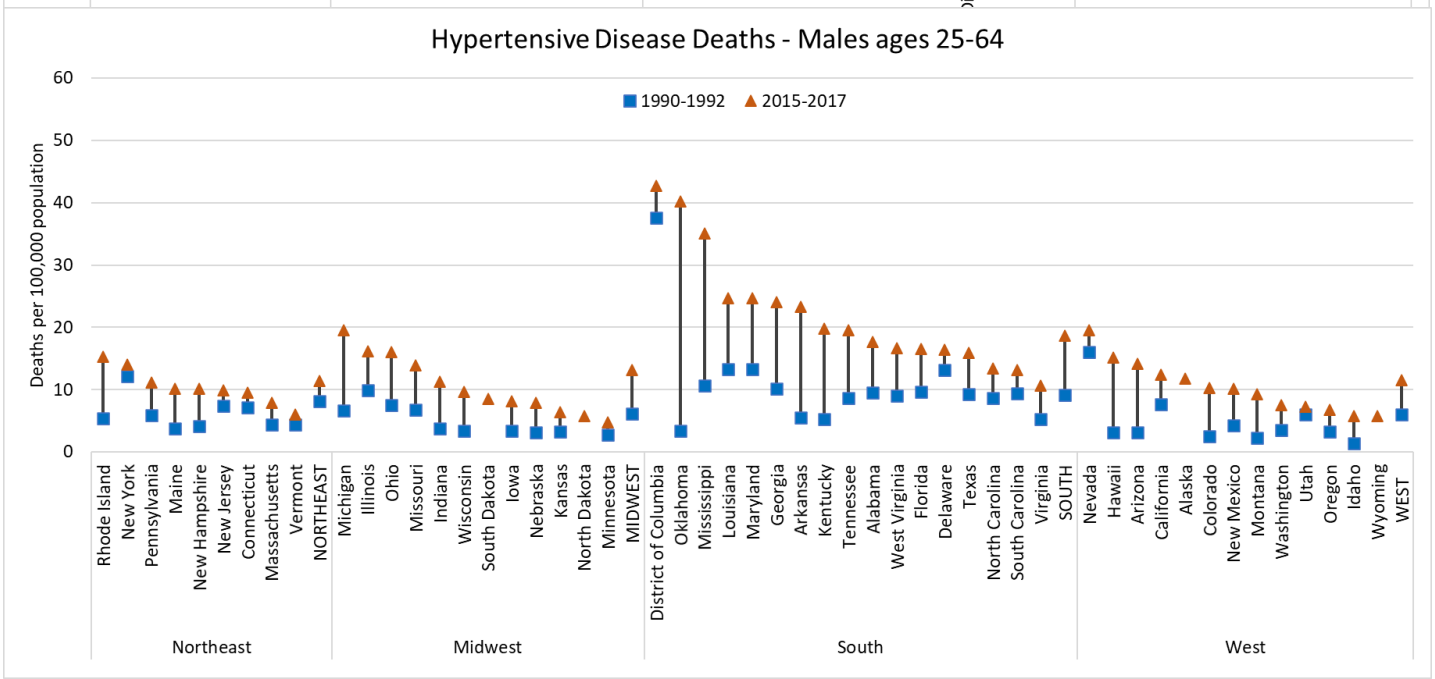
Hypertensive Heart Disease

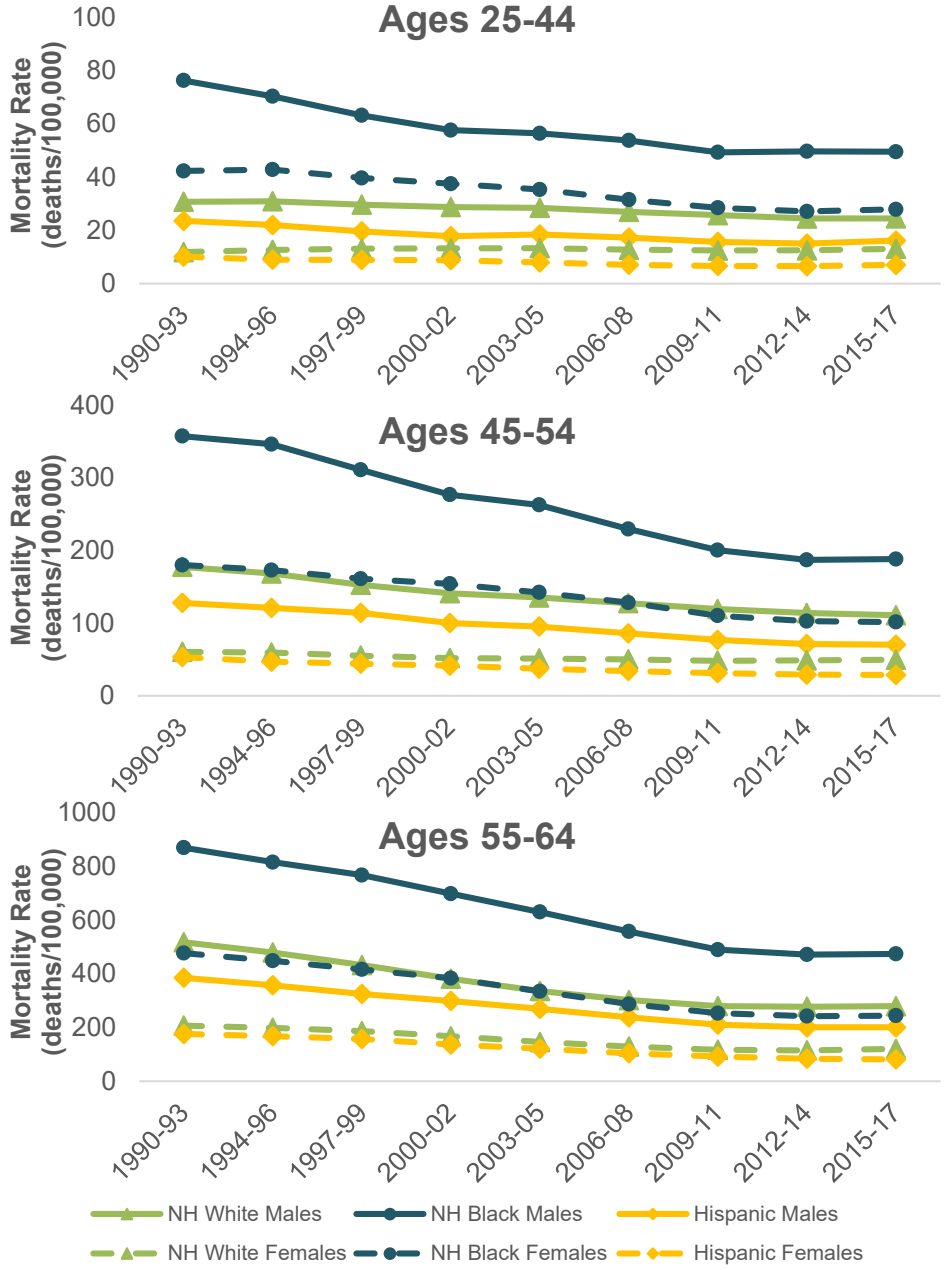


- Rates substantially higher in Black population
- Rates are higher for men than for women
- Increases among white and Hispanic populations throughout the entire period, and increases among Black men

ENM and Hypertensive Disease Mortality by State



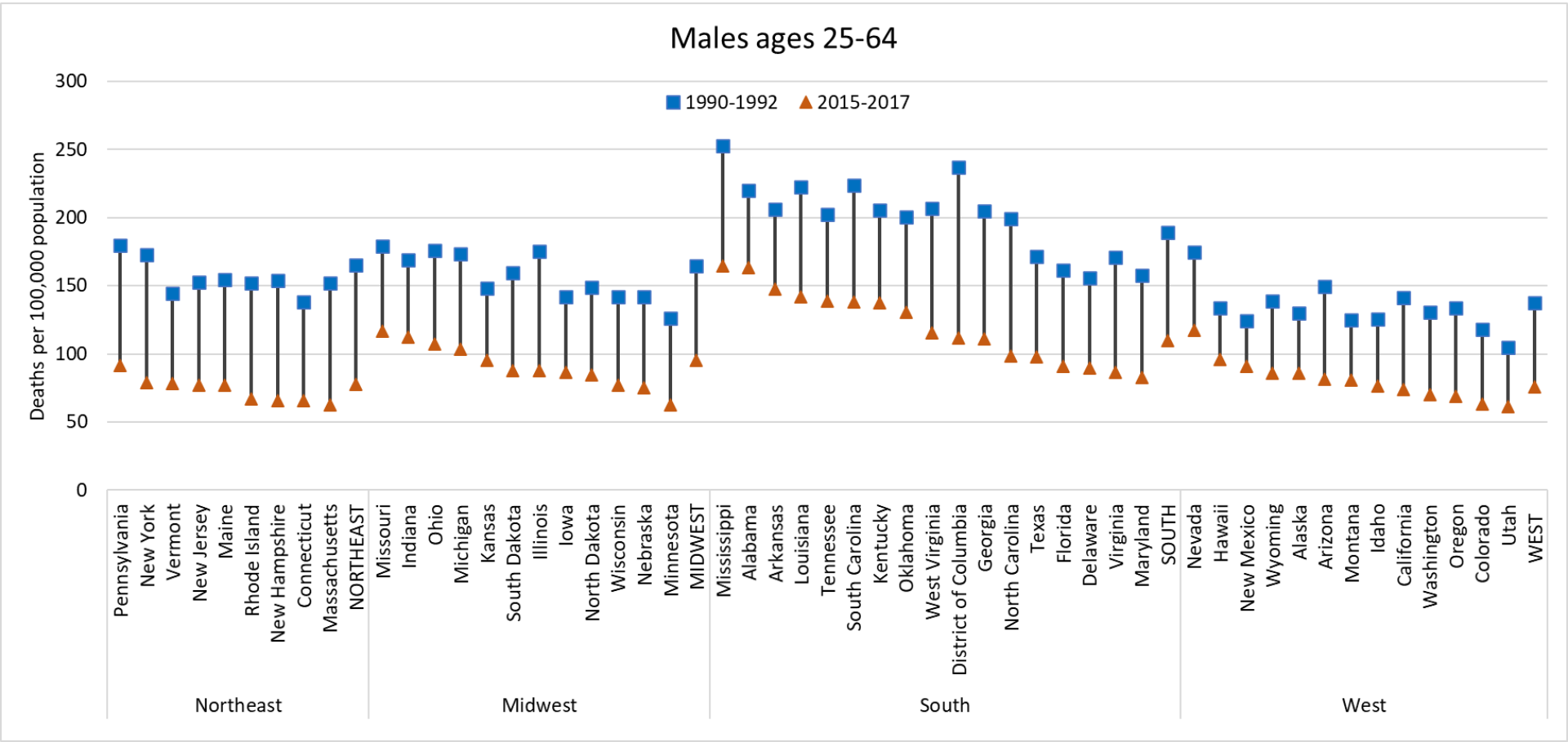




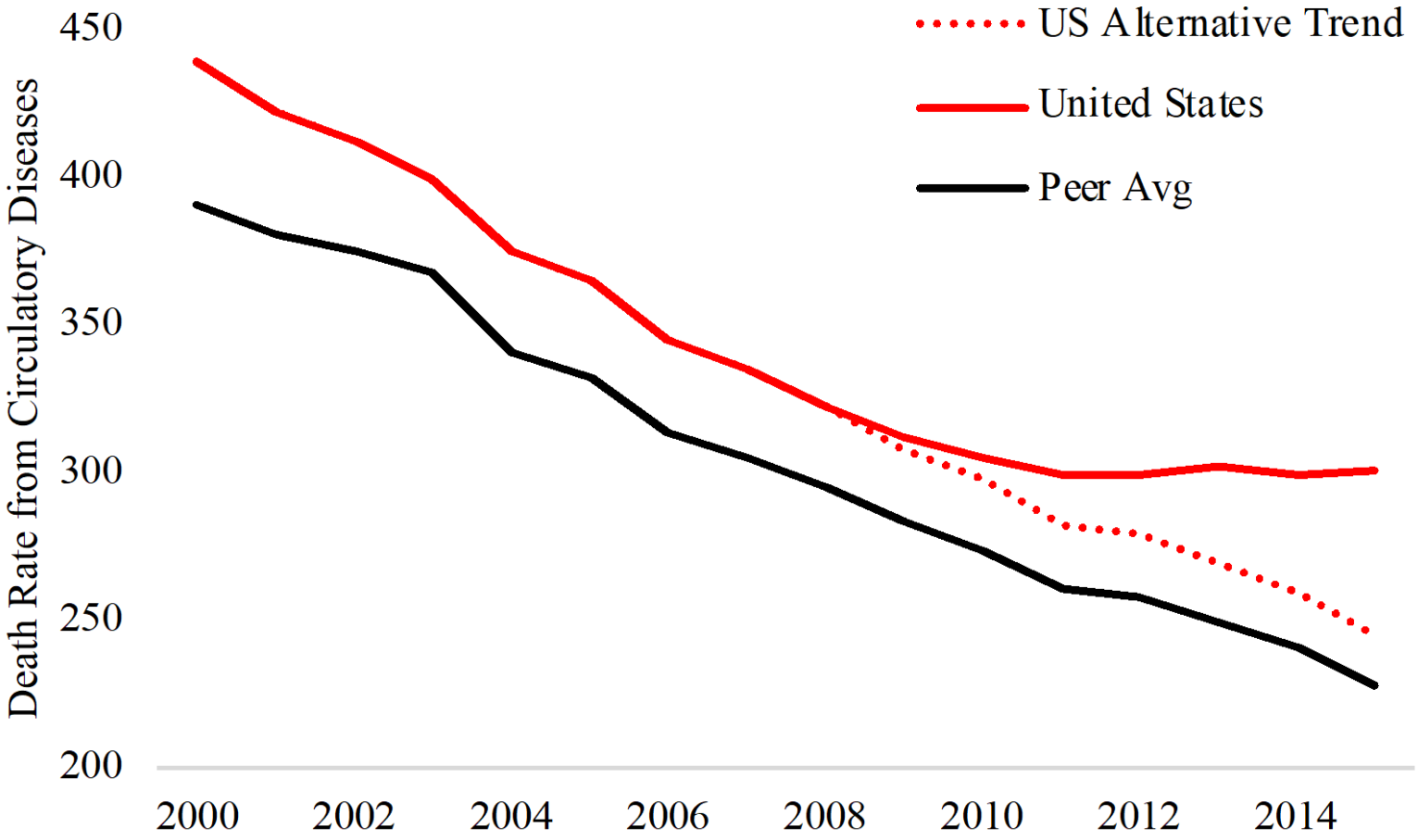
Ischemic & Other Circulatory System Diseases

- Rates substantially higher in Black population
- Long-term mortality decline slowed after 2010
- Declines offset rising mortality from ENM and hypertensive heart diseases until 2010

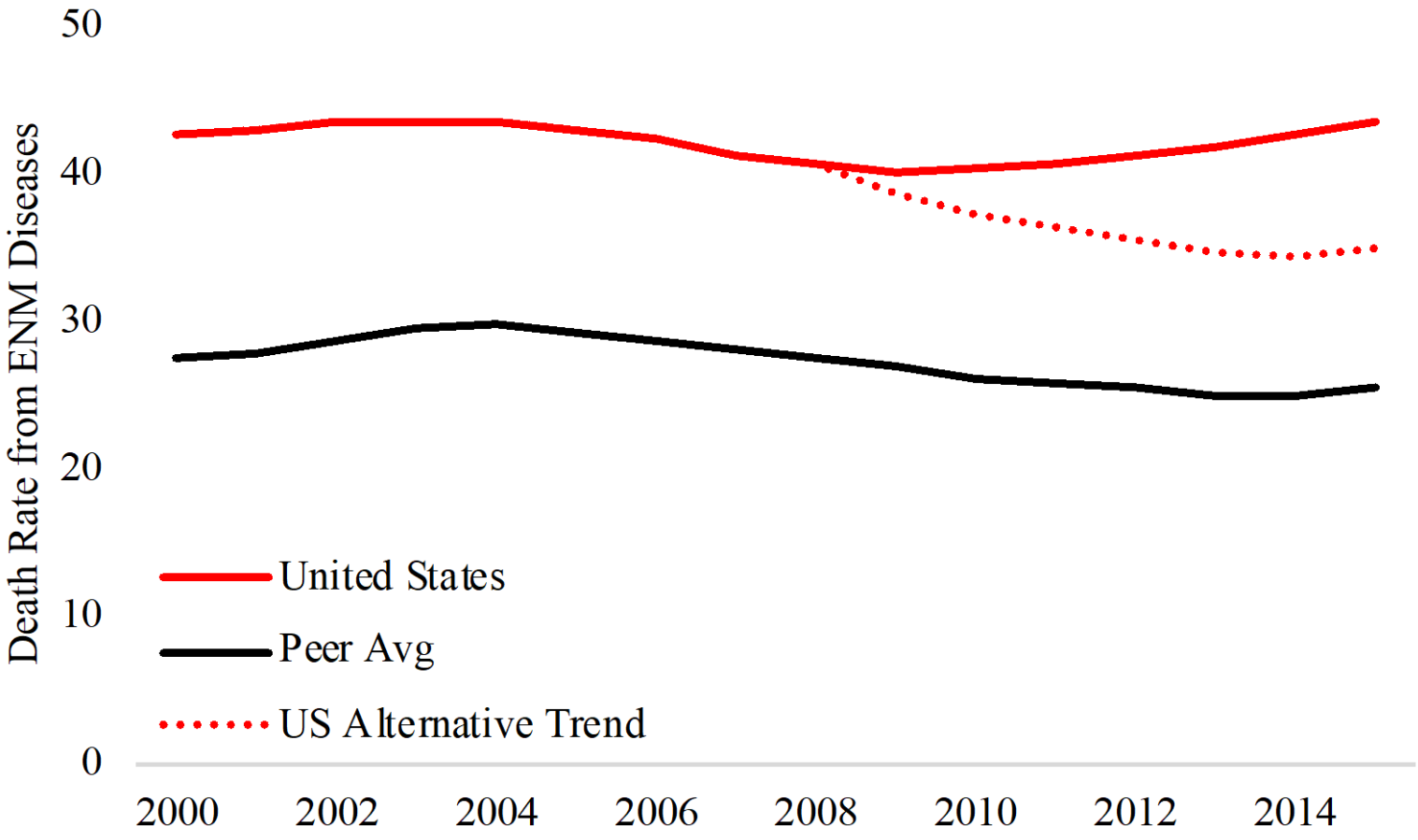
Ischemic and other Circulatory System Disease Mortality by State



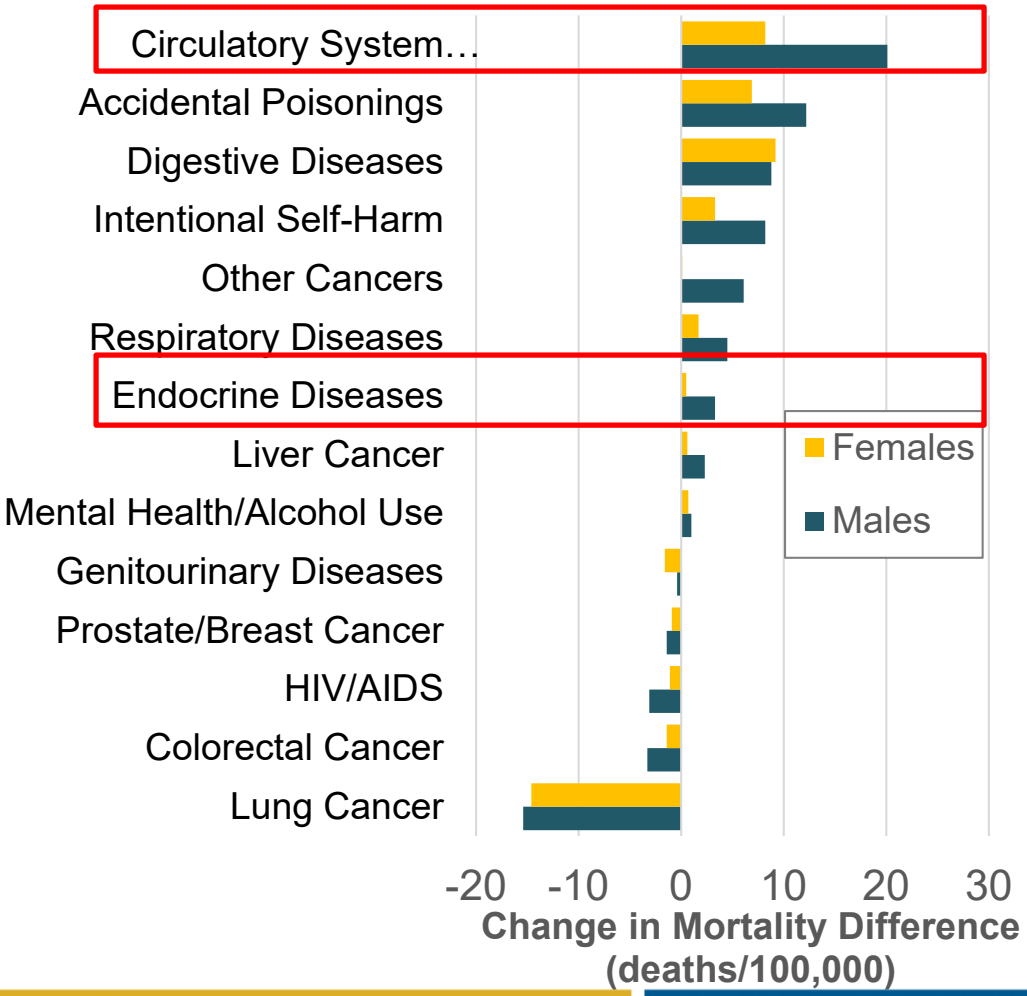
Men's Mortality Trends from Ischemic and other Circulatory System Diseases, US vs. Peer Countries



Men's Mortality Trends from ENM Diseases, US vs. Peer Countries

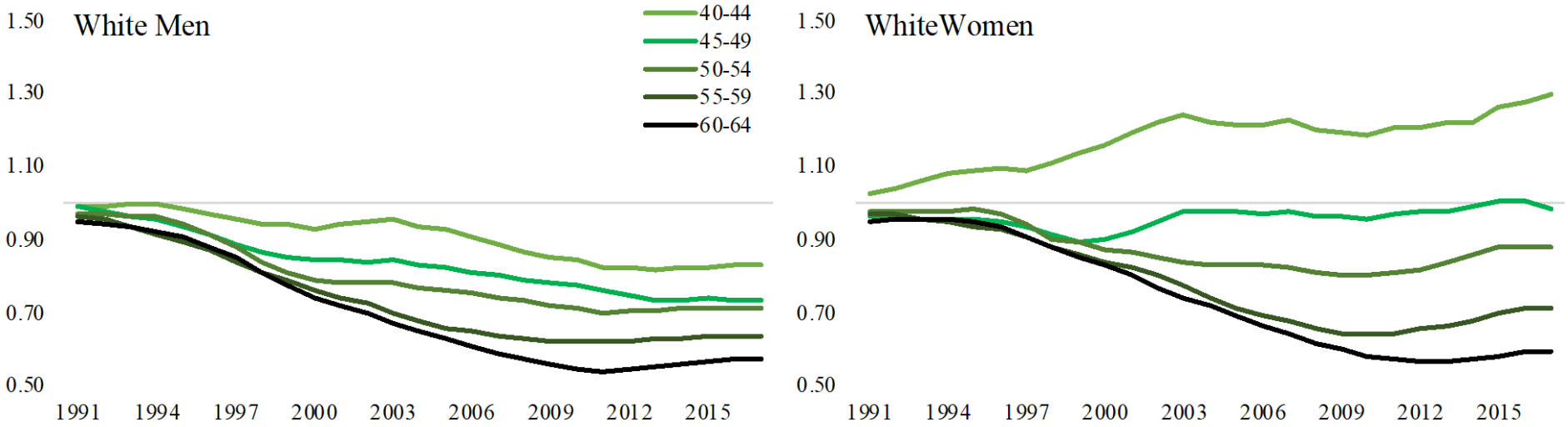


2000-2015 Change in the Difference in Mortality: U.S. vs Peers



- Gap between U.S. and peers growing for many causes of death

Mortality Trends from All Cardiometabolic Diseases among US White Population, by Age Group



Explanations for Cardiometabolic Mortality Trends

1) Obesity epidemic
2) Diminishing returns of medical advancements
3) Social, economic, and cultural changes

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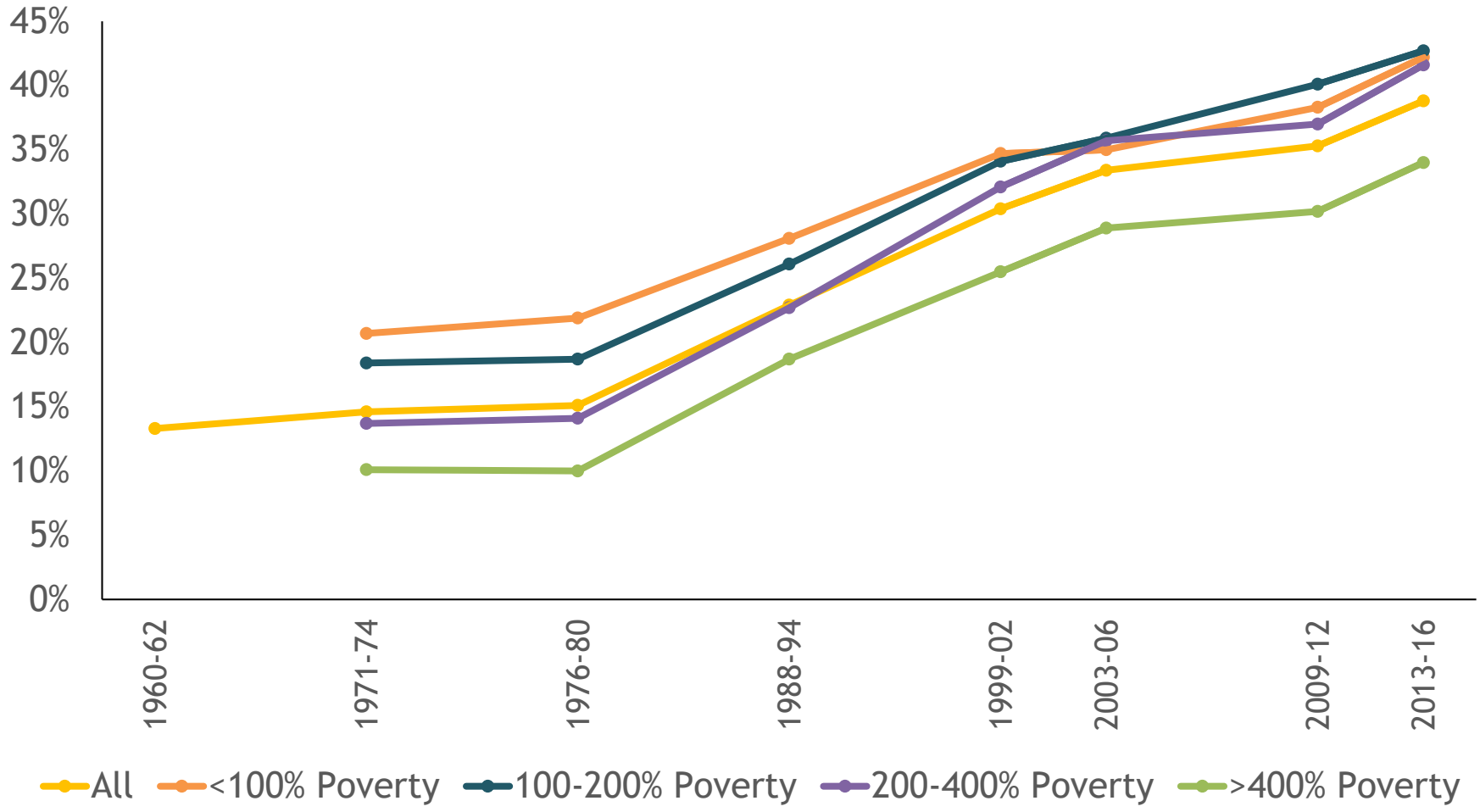
Increased Prevalence of Obesity



Obesity

- Obesity-related mortality
  - Period versus cohort effects
- Explaining the increase in obesity
  - Proximate determinants (health behavior, genetics)
  - Environmental determinants
  - Macrostructural determinants

Obesogenic Environments

- Environments that promote weight gain and are not conducive to weight loss within the home or workplace
- Changes in built environment
  - Automobile-dependent design, decreased walkability, limited access to green space, etc.
- Changes in food environment
  - Ubiquitous availability and promotion of low-cost, high-calorie foods and drinks

Macrostructural Factors

- Technological change
  - Altered the way people produce, obtain, and consume food
- Food industry
  - Used advertising and marketing to boost consumption of calorie-dense foods
  - Aided by legislation and budget decisions by lobbyists and politicians from agricultural states

Prevention and Treatment of Obesity

- Treatment programs show short-term weight loss but limited long-term success
- Challenge to maintain health lifestyle changes in context of obesogenic environments
- Prevention of obesity is paramount
  - Earlier life exposure and longer durations of obesogenic environments result in higher morbidity and mortality risks
  - Target children and adolescents most at risk to obesity

Explanations for Cardiometabolic Mortality Trends

1) Obesity epidemic
2) Diminishing returns of medical advancements
3) Social, economic, and cultural changes

Diminishing Returns of Medical Advances

- Cardiovascular mortality declined by 70% from 1970-2010 largely due to medical advances and reduced health behavior risks (smoking)
- Impact of medical innovations plateaued after 2010
- Benefits of medical science may be offset by lagged cardiometabolic consequences of obesity
- Persistent disparities in access to care for cardiovascular diseases and adherence to treatments

Explanations for Cardiometabolic Mortality Trends

1) Obesity epidemic
2) Diminishing returns of medical advancements
3) Social, economic, and cultural changes

Social, Economic, and Cultural Change

- Changes in family structure (divorce, cohabitation, nonmarital childbearing); rise in family instability
- Macroeconomic changes (loss of manufacturing jobs, growth of service sector); increasing job skills mismatch
- Cascading and multiplicative social, economic, and cultural changes have led to increasing levels of chronic stress

Implications for Data and Research

- Research on causes and solutions for increasing working-age mortality and disparities across populations and geography is complex, multilayered, and sparse
- The committee's research recommendations are extensive

Research Recommendations

- Evaluate effectiveness of interventions to improve cardiometabolic health [9-1]
- Exploit experimental designs to study causal influences of obesogenic environments [9-2]
- Better understand barriers to uptake of cardiovascular preventive and treatment interventions [9-4]

Research Recommendations (Cross-Cutting)

- Better track physical pain and psychosocial indicators (stress, distress, despair, hopelessness, coping, resilience, grit), their sources, and their relationships to morbidity/mortality [11-2]
- Use multiple causes of death codes [11-3]
- Identify macrostructural factors (e.g., social, economic, policy) affecting mortality [11-4]
- Mixed-methods, interdisciplinary, multilevel designs [11-6]
- Cross-national research to identify why trends have unfolded differently in the U.S. [11-7]

Policy Implications

Like the phenomena driving the crisis, policy responses need to be multilevel, focusing on both:

- Proximal causes of death (e.g., drugs, obesity)
- Upstream "causes of the causes" (e.g., living conditions that increase vulnerability of communities, families, and individuals)

Policy Conclusions and Recommendations

- Balance rights of food industry and public health imperatives to limit foods/beverages that contribute to obesity [9-1]
- Obesity prevention programs should start early in life and focus on most vulnerable [9-3]
- Medicaid expansion [11-1]
- Dismantle structural racism and discriminatory policies of exclusion [11-1]

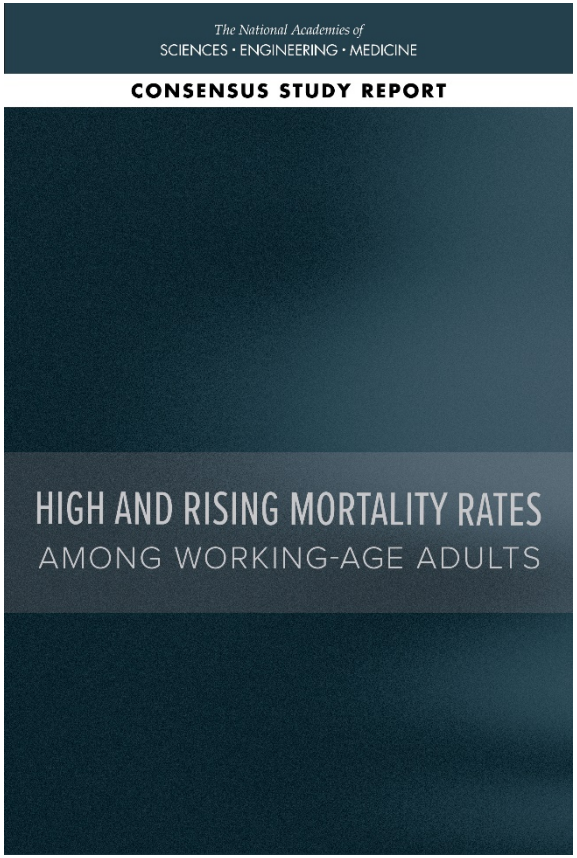
Lessons from the COVID-19 Pandemic

- Increased prevalence of cardiometabolic diseases among working-age population a COVID-19 risk factor
- COVID-19 pandemic has exacerbated disparities in working-age mortality
- Racial disparities in working-age mortality are reflected in disproportionately high rates of COVID-19 infection, hospitalization, and death among Blacks and Hispanics

Summary

- All-cause working-age mortality has been increasing since 2010, cause-specific death rates increasing since 1990s
- Not happening in peer countries
- Working-age mortality increased across all racial/ethnic groups, in rural and urban areas
- Proximal causes: drug overdoses, alcohol-related disease, suicides, and cardiometabolic diseases
- Multiple drivers at multiple levels (no single factor)
- Disproportionate Black mortality persists
- COVID likely to exacerbate existing trends and disparities

Thank you!



For more information, please visit:

www.nationalacademies.org/RisingMortality

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