

Environmental and Social Determinants of Cardiovascular Health and Wellbeing

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Social Determinants of Obesity and Cardiovascular Risk

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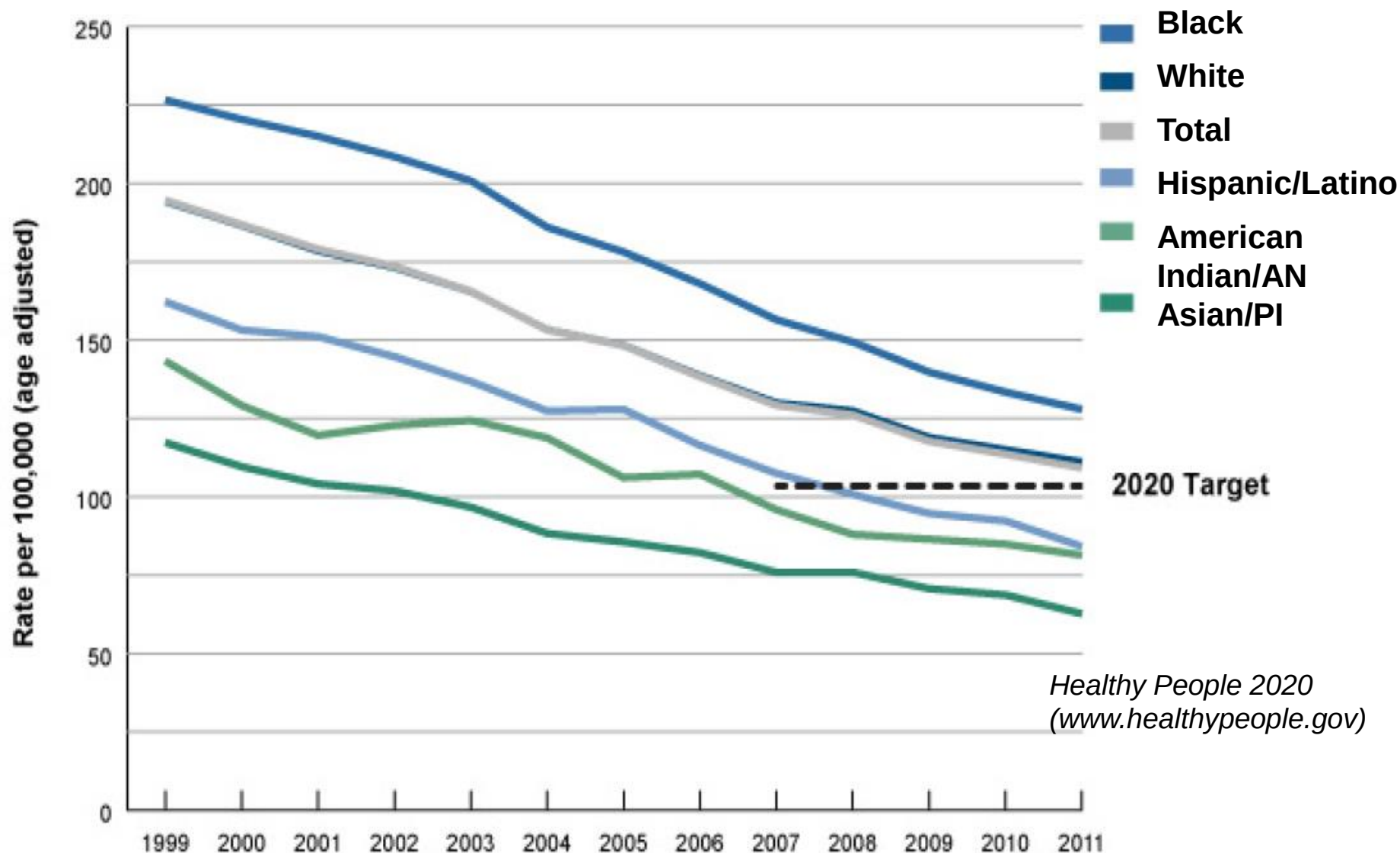
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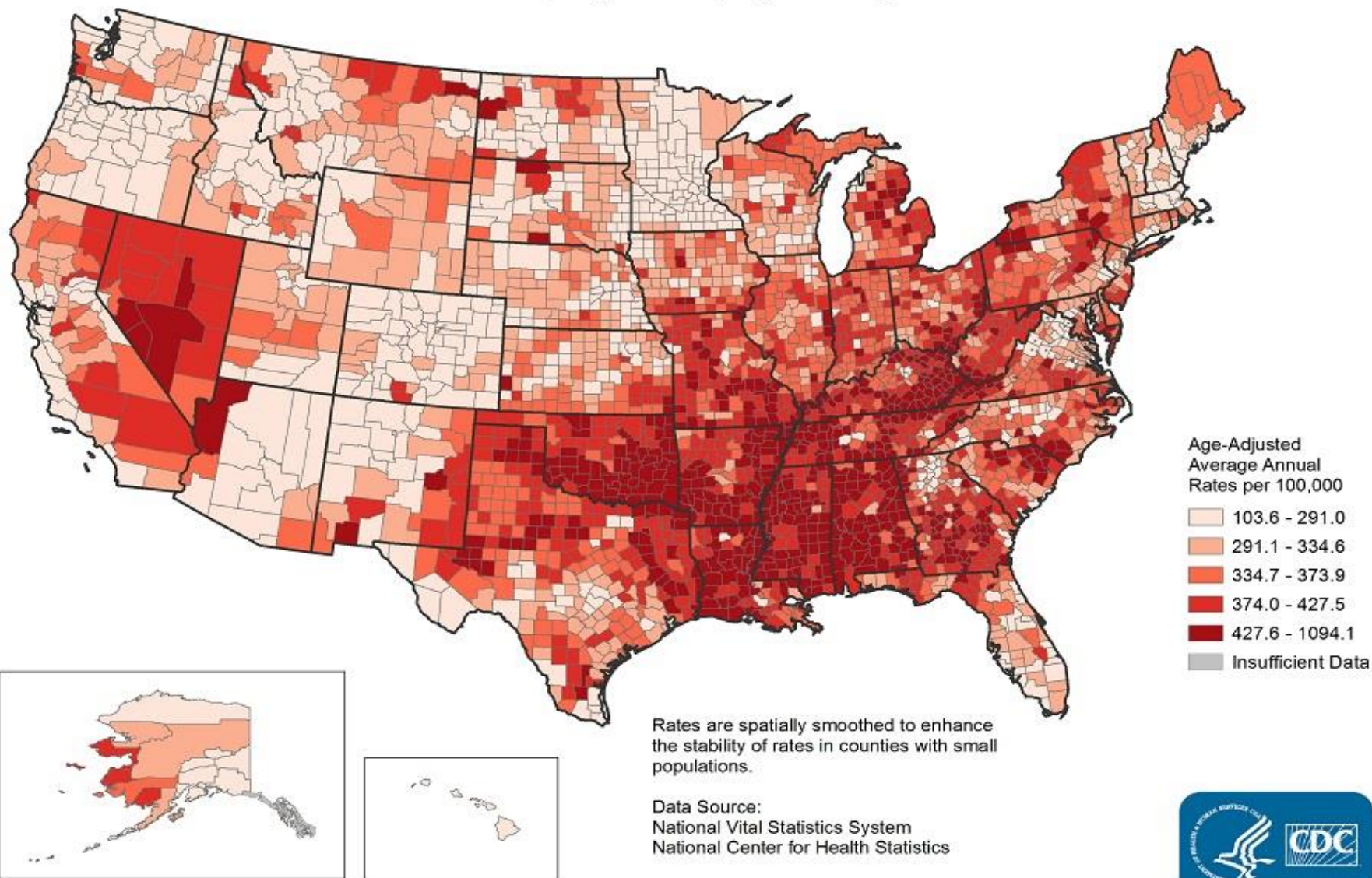
Disclosures

- Relevant Financial Disclosures
 - None
- Non-FDA Approved Uses
 - None
- The views expressed in this presentation are my own and do not necessarily represent the views of the National Heart, Lung, and Blood Institute; the National Institutes of Health; or the U.S. Department of Health and Human Services.

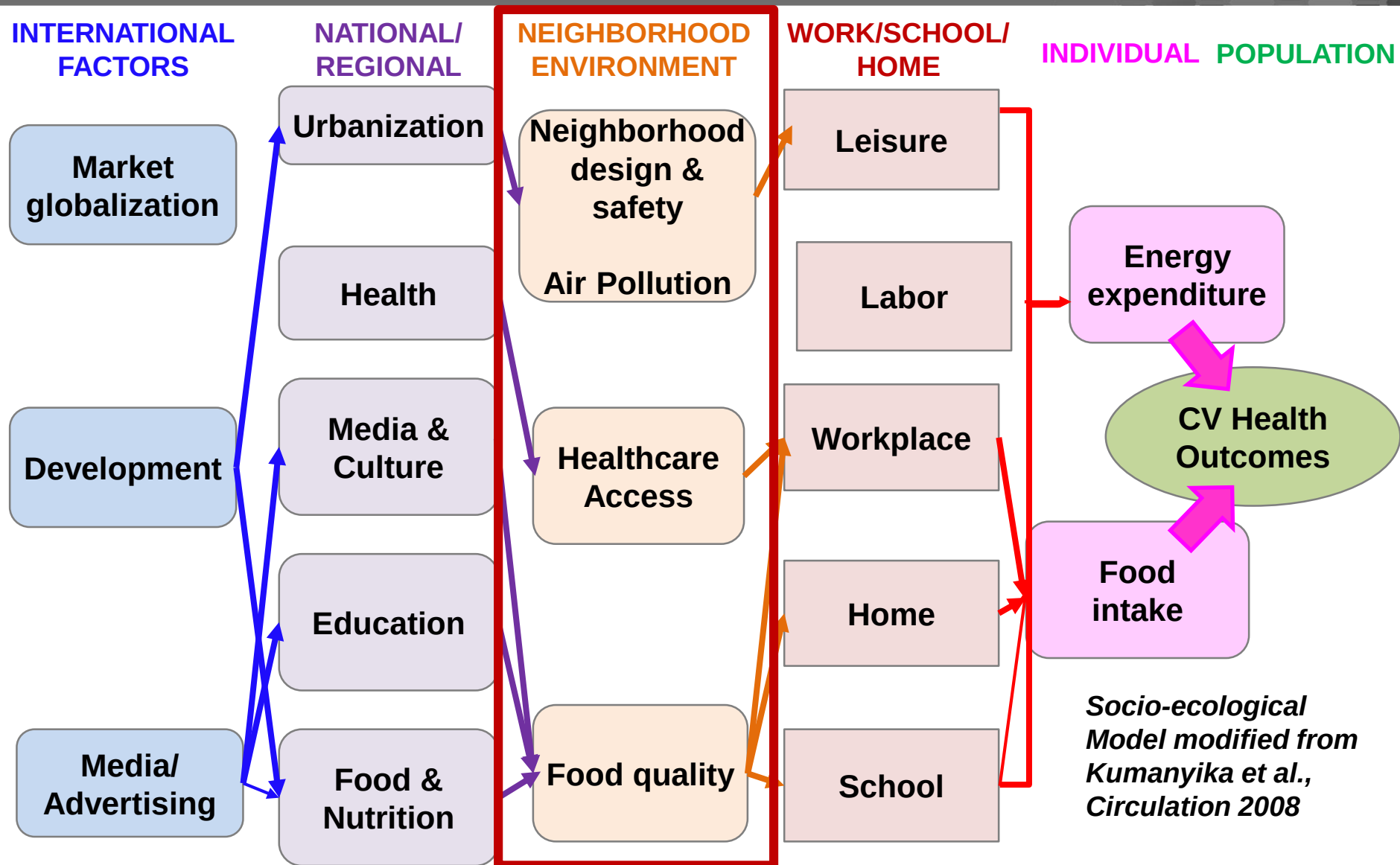
Racial/Ethnic Disparities in Coronary Heart Disease Deaths



Heart Disease Death Rates, 2011-2013 Adults, Ages 35+, by County



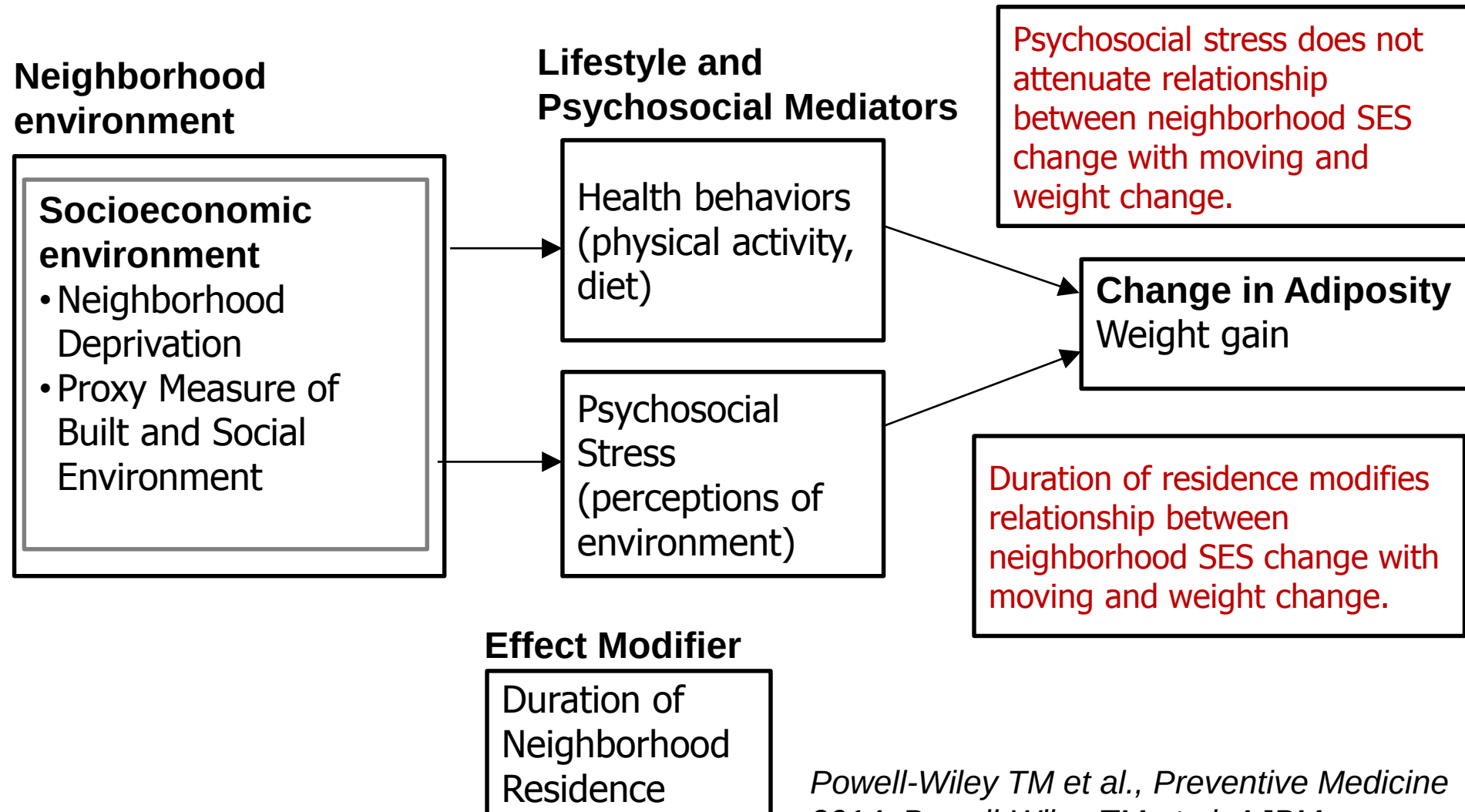
Neighborhood Environment as a Component of the Socio-Ecological Model



Neighborhood Environment and Cardiometabolic Risk in Epidemiologic Studies

- Ethnically diverse adult populations
- Natural experiment allows evaluation of effect of change in neighborhood environment on risk
- Dallas Heart Study (DHS) – based at UT Southwestern Med Center in Dallas, Texas
- Multi-ethnic Study of Atherosclerosis (MESA)
 - NHLBI-sponsored
 - Six sites (focus on Chicago, IL)

Socioeconomic Environment and Development of Cardiometabolic Risk in Dallas Heart Study



Powell-Wiley TM et al., Preventive Medicine 2014; Powell-Wiley TM et al. AJPM

Social Environment and Development of Cardiometabolic Risk in MESA

Neighborhood environment

Social Environment

- Police-reported Crime
- Safety
 - Neighborhood-level
 - Individual-level

Lifestyle and Psychosocial Mediators

Health behaviors
(physical activity,
caloric intake)

Psychosocial
Stress

Change in Adiposity

- Body Mass Index
- Waist Circumference

Effect Modifiers

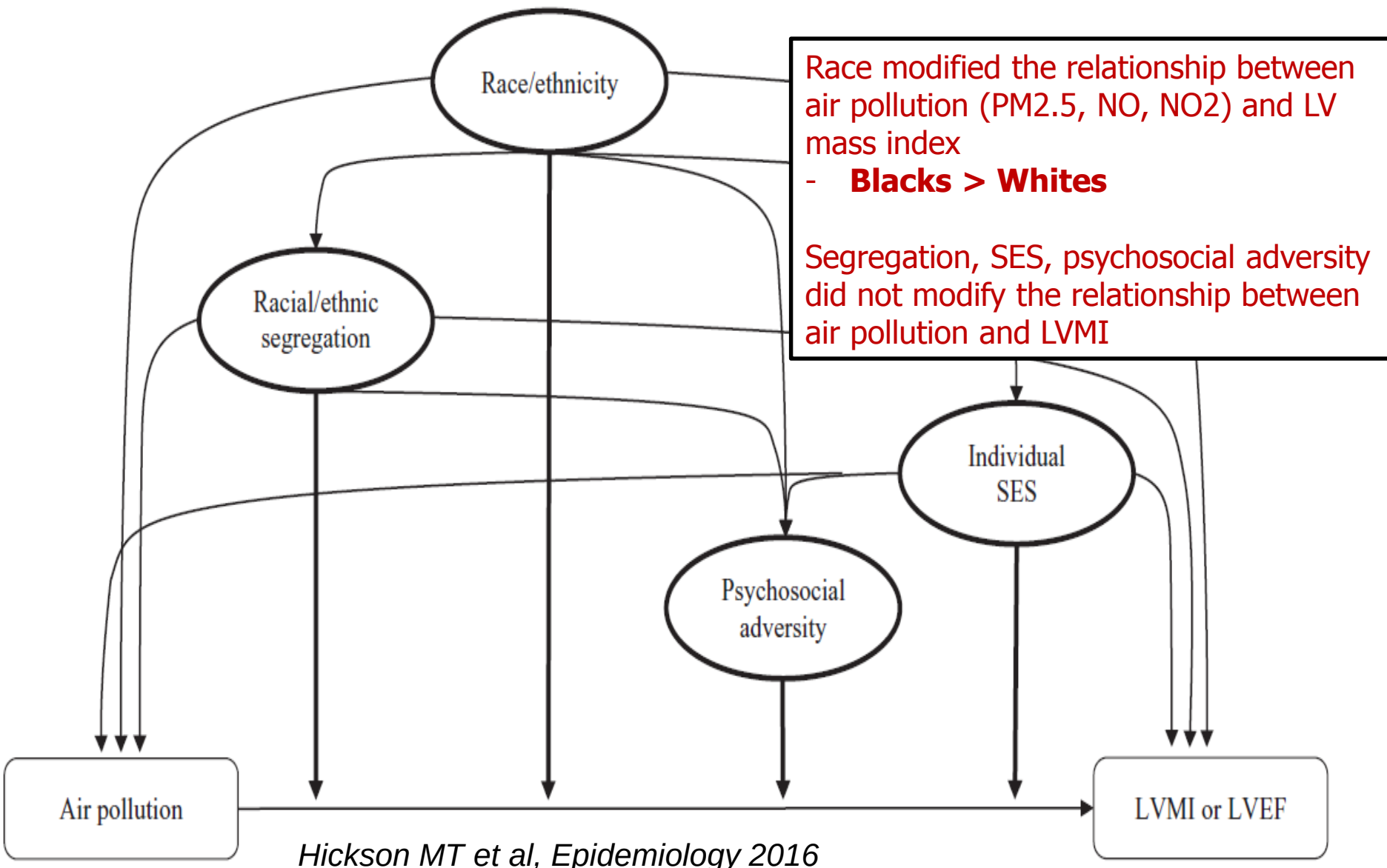
- Duration of Residence
- Neighborhood SES

Greater ↓ in safety over time
associated with greater ↑ in BMI
and waist circumference

- Women: individual-level safety
- Men: neighborhood-level safety

No association between ↑ in crime
and change in BMI or waist
circumference.

Air Pollution and Cardiovascular Health Disparities in MESA



Synergistic Effects of Air Pollution and Social Determinants of Health in Early Life-Course

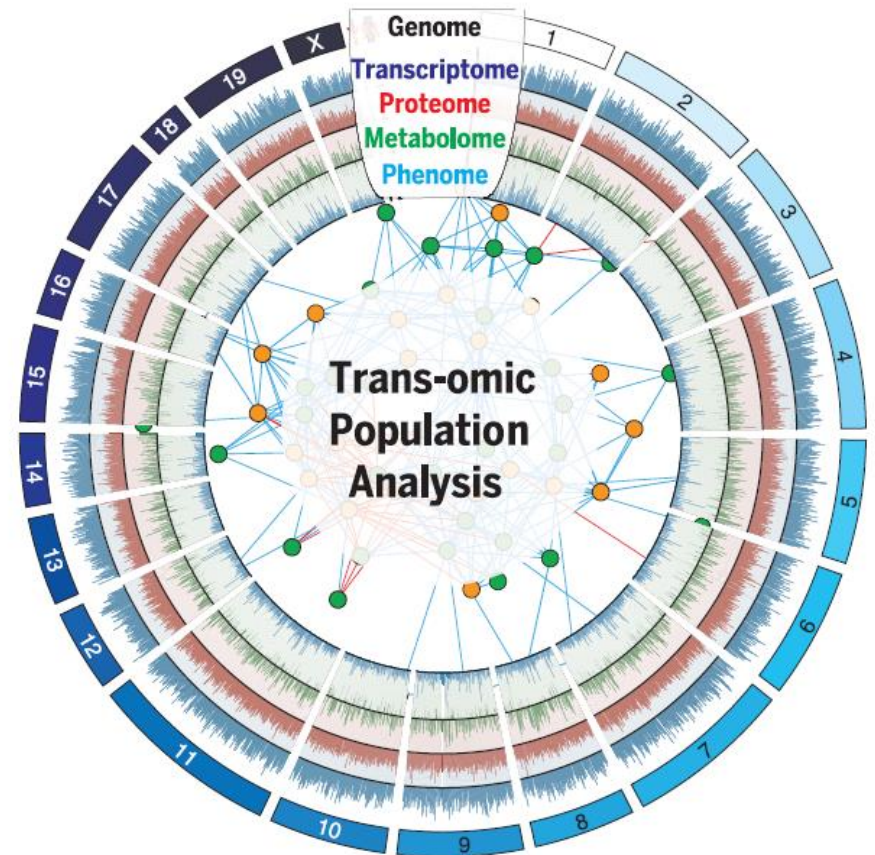
- Systematic review focused on obesity, asthma, perinatal outcomes, cognition/behavior
- 72% of studies founds significant synergistic associations
- Paucity of data on social and environmental risk related to childhood obesity
- Reliance on SES as measure of early-life social environment
- Air pollution most common environmental exposure

Challenges to Understanding Relationship between Environment and CV Health Disparities

- What potentially synergistic relationships with social determinants of health are important to study?
- What constitutes a person's environment? How do we measure activity space?
- Latency of effect of environmental exposures on CV outcomes
- How do we account for changes in environmental exposures across the life-course?

Future Research Directions in Environment and Cardiovascular Health Disparities

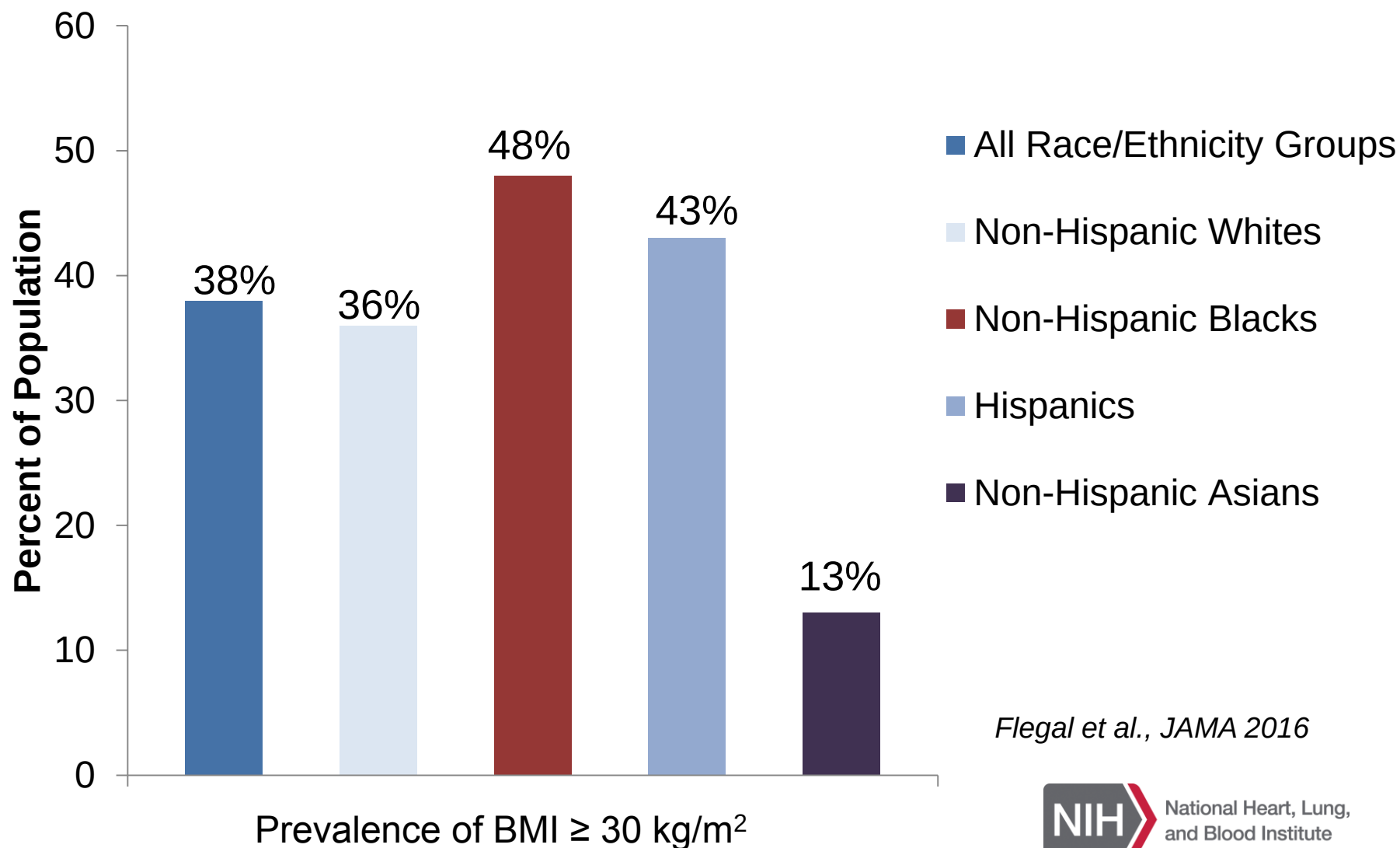
- Life-course and multi-level approaches
 - Environment and genetics/epigenetics
 - Gene X environment interactions
- ‘-Omics’ approaches (genomics, metabolomics, exposomics) to characterize impact of environment on CV health
- New data modeling
 - Systems science modeling
- Findings that translate into interventions





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Blacks and Hispanics Have Higher Obesity Prevalence than Other Racial/Ethnic Groups

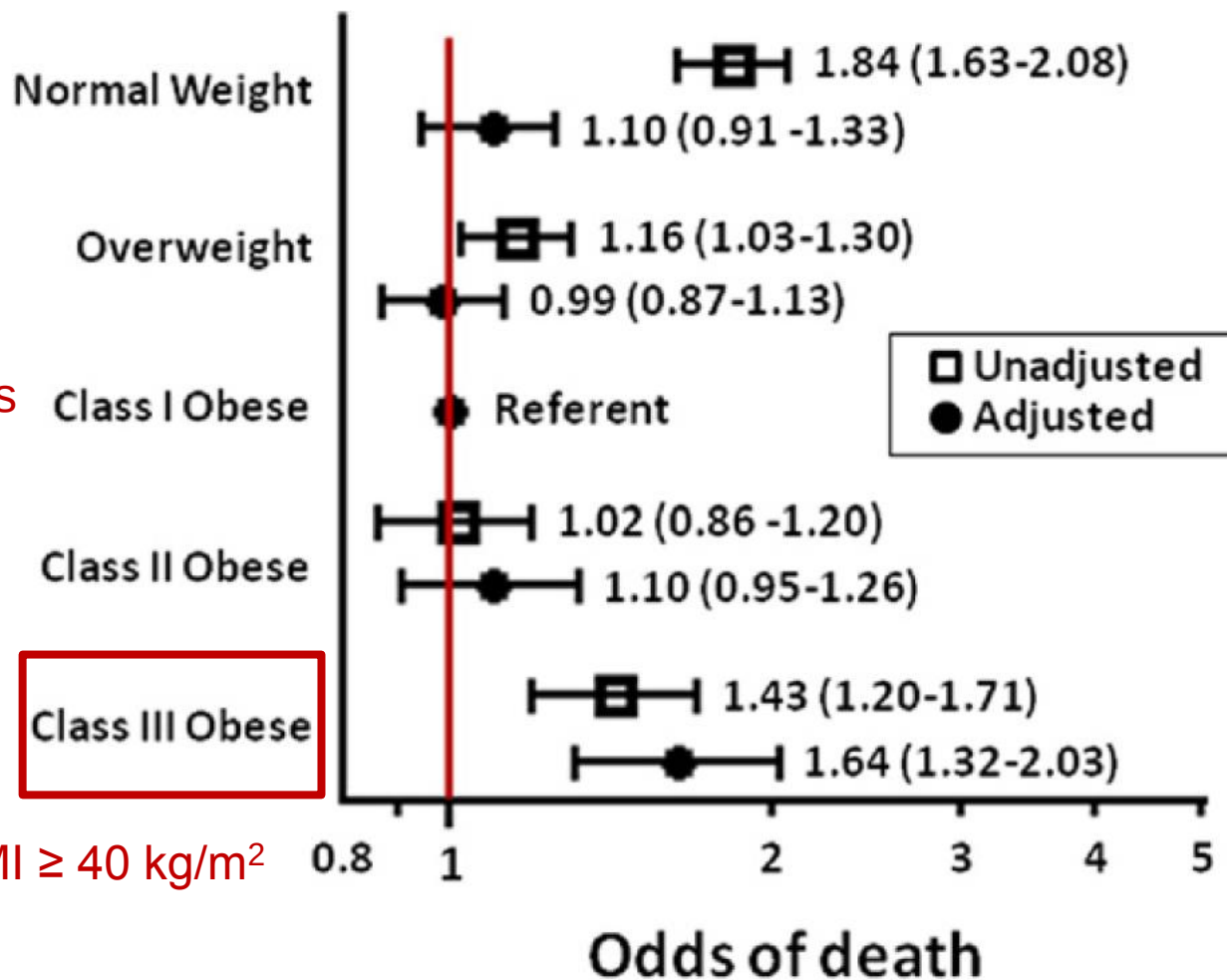


Class III Obesity Associated with Greater 30-Day Mortality after STEMI in National Registry

*Class III Obese:

- Younger
- Less extensive CAD
- Greater # Risk factors

*Disproportionate # of women with Class III obesity are Black



*Class III Obesity: BMI ≥ 40 kg/m²

Evaluating Neighborhood Environment and Cardiometabolic Risk in the Dallas Heart Study

- Probability-based population sample of Dallas County residents (N=6,101)
- 50% African-American, 30% White, 20% Hispanic
- 1835 participants included in analyses
- Longitudinal data available from 2000 to 2009