Cardi-OH ECHO

Weight Management and Behavior Change: Cases and Discussions

February 24, 2022

Cardi-OH ECHO Team and Presenters

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Structure of ECHO Clinics

Duration	Item
5 minutes	Introductions and announcements
10 minutes	Didactic presentation, followed by Q&A
40 minutes (20 minutes per case)	Patient case study presentations and discussions
5 minutes	Reminders and Post-Clinic Survey

Disclosure Statements

- The following planners, speakers, and/or content experts of the CME activity have financial relationships with commercial interests to disclose:
  - Marilee Clemons reports advising at Novo Nordisk.
  - Kathleen Dungan, MD, MPH reports receiving consulting fees from Eli Lilly, Boehringer Ingelheim, and Dexcom, research support from Sanofi, Dexcom, Abbott and Viacyte and presentation honoraria from Medscape, UpToDate, and Elsevier.
  - Adam T. Perzynski, PhD reports being co-founder of Global Health Metrics LLC, a Cleveland-based software company and royalty agreements for book authorship with Springer Nature publishing and Taylor Francis publishing.
  - Goutham Rao, MD serves on the Scientific Advisory Board of Dannon-WhiteWave (White Plains, NY), a division of Groupe Danone, S.A., Paris, France.
  - Christopher A. Taylor, PhD, RDN, LD, FAND reports funding for his role as a researcher and presenter for Abbott Nutrition and funding for research studies with the National Cattleman's Beef Association and the American Dairy Association Mideast.
  - These financial relationships are outside the presented work.
- All other planners, speakers, and/or content experts of the CME activity have no financial relationships with commercial interests to disclose.

Person-Centered Language Recommendations

The ADA and the APA recommend language that emphasizes inclusivity and respect:

- **Gender**: Gender is a social construct and social identity; use term "gender" when referring to people as a social group. Sex refers to biological sex assignment; use term "sex" when referring to the biological distinction.

- **Race**: Race is a social construct that is broadly used to categorize people based on physical characteristics, behavioral patterns, and geographic location. Race is not a proxy for biology or genetics. Examining health access, quality, and outcome data by race and ethnicity allows the healthcare system to assist in addressing the factors contributing to inequity and ensure that the health system serves the needs of all individuals.

- **Sexual Orientation**: Use the term "sexual orientation" rather than "sexual preference" or "sexual identity." People choose partners regardless of their sexual orientation; however, sexual orientation is not a choice.

- **Disability**: The nature of a disability should be indicated when it is relevant. Disability language should maintain the integrity of the individual. Language should convey the expressed preference of the person with the disability.

- **Socioeconomic Status**: When reporting SES, provide detailed information about a person's income, education, and occupation/employment. Avoid using pejorative and generalizing terms, such as "the homeless" or "inner-city."

Flanagin A et al., 2021, JAMA; Dickinson JK et al., Diabetes Care, 2017; American Psychological Association, 2021; ODM, 2021.

Social, Environmental and Cultural Impacts Upon Body Weight

Joshua Joseph, MD, MPH, FAHA

Assistant Professor of Medicine

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Learning Objectives

1. Explain how social and environmental context influences body weight.

2. Explain why specific subpopulations suffer disproportionately from obesity from a social, environmental and cultural context.

3. Describe stark neighborhood and regional differences in environments which influence body weight.

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JACC FOCUS SEMINAR: RACE, ETHNICITY, AND HEART DISEASE

JACC FOCUS SEMINAR

Cardiovascular Impact of Race and Ethnicity in Patients With Diabetes and Obesity

JACC Focus Seminar 2/9

Joshua J. Joseph, MD, MPH,[a] Robin Ortiz, MD,[b] Tushar Acharya, MD, MPH,[c] Sherita H. Golden, MD, MHS,[d] Lenny López, MD, MPH, MDw,[e] Prakash Deedwania, MD[f]
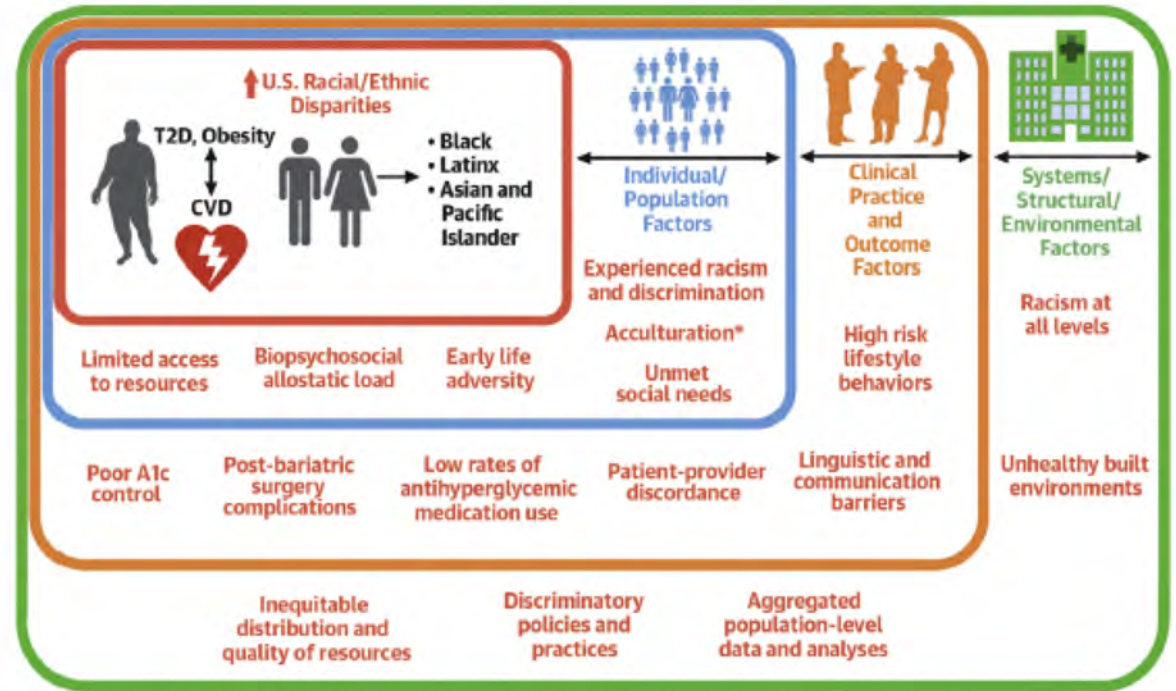
ABSTRACT

Obesity and type 2 diabetes mellitus are highly prevalent and increasing in the United States among racial/ethnic minority groups. Type 2 diabetes mellitus, which is driven by many factors including elevated levels of adiposity, is an exemplar health disparities disease. Pervasive disparities exist at every level from risk factors through outcomes for U.S. racial/ethnic minority groups, including African American, Hispanic/LatinX American, and Asian American populations. Disparities in clinical care exist including hemoglobin A1c control, lower prescription rates of newer antihyperglycemic medications, along with greater rates of complications postbariatric surgery. Underpinning these disparities are the social determinants of health affecting provider-patient interactions, access to resources, and healthy built environments. We review the best practices to address cardiometabolic disparities in the current cardiovascular guidelines and describe recommendations for cross-cutting strategies to advance equity in obesity and type 2 diabetes across U.S. racial/ethnic groups. (J Am Coll Cardiol 2021;78:2471-2482) © 2021 by the American College of Cardiology Foundation.
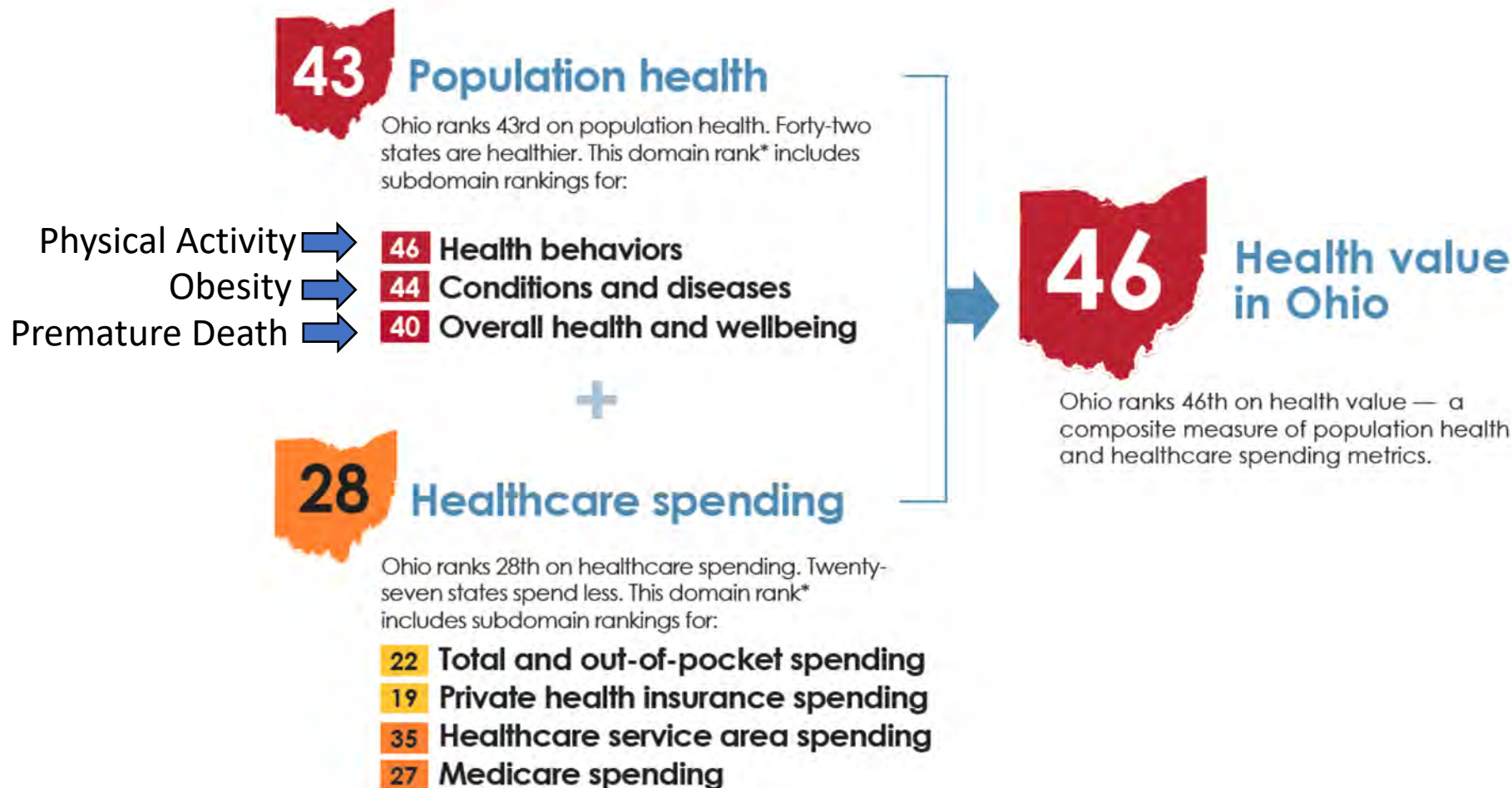
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

CENTRAL ILLUSTRATION Diabetes, Obesity, and Cardiovascular Disease: Health Equity

Factors Contributing to Disparities

↑ U.S. Racial/Ethnic Disparities

T2D, Obesity
CVD

• Black
• Latinx
• Asian and Pacific Islander

Individual/ Population Factors

Clinical Practice and Outcome Factors

Systems/ Structural/ Environmental Factors

Experienced racism and discrimination

Racism at all levels

Limited access to resources | Biopsychosocial allostatic load | Early life adversity | Acculturation* | High risk lifestyle behaviors

Unmet social needs

Poor A1c control | Post-bariatric surgery complications | Low rates of antihyperglycemic medication use | Patient-provider discordance | Linguistic and communication barriers | Unhealthy built environments

Inequitable distribution and quality of resources | Discriminatory policies and practices | Aggregated population-level data and analyses

Health Policy Institute of Ohio: Population Health and Value in Ohio

43 Population health

Ohio ranks 43rd on population health. Forty-two states are healthier. This domain rank* includes subdomain rankings for:

Physical Activity ⟹
Obesity ⟹
Premature Death ⟹

- 46 Health behaviors
- 44 Conditions and diseases
- 40 Overall health and wellbeing

+

28 Healthcare spending

Ohio ranks 28th on healthcare spending. Twenty-seven states spend less. This domain rank* includes subdomain rankings for:

- 22 Total and out-of-pocket spending
- 19 Private health insurance spending
- 35 Healthcare service area spending
- 27 Medicare spending

46 Health value in Ohio

Ohio ranks 46th on health value — a composite measure of population health and healthcare spending metrics.

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

https://www.healthpolicyohio.org/wp-content/uploads/2019/04/2019__HealthValueDashboard.pdf

Major Causes of Weight Gain

- Increased Caloric Intake
- Decreased Physical Expenditure (Work & Leisure Time)
- Allostatic Load/Stress/Depression/Psychiatric Illness
- Poor Sleep Quality & Length/Sleep Deprivation/Obstructive Sleep Apnea
- Genetics (FTO Gene, Leptin Deficiency, Nature vs Nurture, 2 Hit Hypothesis)
- Medical (Hypothyroidism, Cushing's Disease or Syndrome, Prader-Willi Syndrome)

Lifestyle Modification

- Weight loss and weight optimization

- ↑ physical activity

- Healthy diet

- (Mediterranean or DASH)

  - ↓ saturated fat intake
  - ↑ monounsaturated fat
  - 5 servings of fruits and vegetables daily
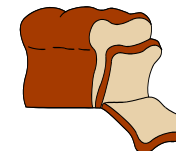
Causes & Modifications are Influenced by Environment Factors

- PM 2.5
- Endocrine Disrupting Chemicals
- Food Swamps
- Food Deserts
- Lack of Greenspace
- Violence

Columbus mayor declares gun violence a public health crisis amid rising homicides

The mayor said lawmakers have failed to act on gun violence.

By **Nadine El-Bawab**
February 16, 2022, 6:10 PM • 5 min read

Structural Racism

- **Structural racism - racial bias among institutions & across society**
  - This involves the cumulative and compounding effects of an array of societal factors, including the history, culture, ideology and interactions of institutions and policies that systematically privilege White populations and disadvantage non-White populations.

Race Forward, David R. Williams, PhD

Poverty | Racism | Discrimination

Environment • Behavior • Biology

Upstream determinants

Midstream determinants

Food insecurity

Poor access to high-quality healthcare

Unsafe and overcrowded housing

Exposure to toxins   Income inequality   Unemployment   Education

Downstream health outcomes

Type 2 Diabetes

Asthma

Poor mental health

Heart disease

Obesity

Cancer

@DMGrayMD

HISTORICAL DISCRIMINATION AND RACISM DURING SLAVERY AND POST-CIVIL WAR

Medical and Scientific Contributors
- Eugenics Theory defining certain races and ethnicities as biologically inferior
- Closure of medical schools training black physicians in 1910s
- Experimentation on vulnerable groups without their consent

Social Conditions and Policies
- Redlining and predatory lending leading to racial residential segregation and housing insecurity
- Inadequate investment to maintain public works and school systems in minority neighborhoods
- Discrimination in access to high quality jobs with adequate health insurance

↓ Trust in medical establishment

Healthcare provider bias toward minority patients

Structural and institutional racism

Language and communication barriers

Physical Context
↓ neighborhood stability, cleanliness, sidewalks, open space, parks
↓ access to healthy food
↓ affordable housing

Healthcare Context
Poor access to care, ↓ quality of care, ↓ participatory decision-making in patient-provider relationships, ↓ health literacy

↑ Stress, Blood Pressure, Obesity, Cholesterol, Blood Glucose

DISPARATE HEALTH OUTCOMES
Obesity and Obesity Related Conditions

Casting a Health Equity Lens on Endocrinology and Diabetes. Golden, Joseph, Briggs, JCEM, 2021

Sometimes the AHA's *Life's Simple 7* isn't so Simple

Informing Policy for Reducing Stroke Health Disparities from the Experience of African-American Male Stroke Survivors

Adam Perzynski, Carol Blixen, Jamie Cage, Kari Colón-Zimmermann & Martha Sajatovic

Volume 3 · Number 3   September 2016

JOURNAL OF
RACIAL AND ETHNIC
HEALTH DISPARITIES

An Official Journal of the Cobb-NMA Health Institute

Life's Simple 7

STOP SMOKING

MANAGE BLOOD PRESSURE

EAT BETTER

REDUCE BLOOD SUGAR

LOSE WEIGHT

GET ACTIVE

CONTROL CHOLESTEROL

Table 1 Psychological and social constraints on risk factor reduction

Recommendation and odds of continued risk[a] (INTERSTROKE)	Psychological and social constraints (TEAM study)	Example
A. Control hypertension with medication (OR = 2.6) and B. Control lipids with medication (OR = 1.9)	• Poor access to care prevents effective use of medication and health services • Non-adherence due to mistrust or negative attitudes • Tailoring of medication (skipping doses, bargaining) • Racial discrimination and a lifetime of distress can make hypertension more difficult to treat • Expensive medication	"Man their scheduling… I'm almost at the end of my medication. I'm like oh God I need a refill." (participant P1) "Sometimes I think of the doctors as just using us as a paycheck. If you get sick who you gonna go see, your doctor, who gets paid, your doctor. If they write a prescription for you they get kickbacks." (participant P2)
C. Salt restriction and consumption of a diet rich in fruits, vegetables, and low-fat dairy products (OR = 1.4)	• Cultural traditions including high salt/high fat foods • Difficulty/costs in obtaining low-salt/low-fat foods • Pressure from family and friends to eat "traditional" foods • Knowledge and literacy barriers to reading labels and selecting healthy foods	"I grew up on soul food all my life and it's kind of hard for me to change." (participant P5)
D. Regular aerobic physical activity (OR = 1.4)	• Inadequate access to safe and affordable exercise programs/facilities • Competing demands (stroke survivors are often themselves caregivers for spouses, children, older parents, or siblings)	"I have a hard time walking… Because a house is not big enough to just get up and walk around any damn place you want. I mean you can do that, but where are you going to go?" (participant P3)
E. Limit alcohol consumption (OR = 1.5) and F. Quit smoking (OR = 2.1)	• Family, peer, and social network pressures to continue past behaviors • Poor mood, negative affect, and psychosocial stress may contribute to increased smoking and/or alcohol use	"The things that get in the way of staying healthy and preventing another stroke? Okay. We put drinking alcohol." (participant P9)
G. Weight loss (OR = 1.7)	• Inadequate access to safe and affordable exercise programs/facilities • Depression and psychosocial stress can make weight loss difficult • Mobility limitations make exercise difficult • Lack of access to healthy foods	"My left side is pretty much paralyzed, so I have a hard time getting around or using the whole left side of my body." (participant P4)
H. Control depression (OR = 1.4) and I. Psychosocial stress (OR = 1.3)	• Current and historical discrimination against African-American men • Stigma of mental illness • Depression symptoms may be "normalized" or go unrecognized or unreported • Changes in social roles after stroke may increase depression and distress • Persistent financial difficulties for low socioeconomic status African-Americans contribute to distress and depression. • Constrained ability to reduce risks (through blood pressure, exercise, eating right, etc.) can create even more distress	"I was in a lot of stress the day before I had the stroke." (participant P1) "The top concern is handling stress level, and I heard it mentioned here over and over. When you're down on yourself, and you just can't get up and go." (participant P2) "I would uhm come home some nights and he would be so depressed." (participant CP3)

Total potential increase in risk, OR = 15.3

[a] Odds of continued risk represent 90 % of the risk of stroke [22]

Participants in the focus group sessions emphasized the overriding influence of psychosocial stress, both daily and cumulative, on their ability to engage in effective self-management practices.

I focus on what's going on with African American men, and one of the reasons why we are having so, so much stress I think a lot of stuff is deal, dealing with stress and social issues… When you start talking about it towards African American men you got to be, the stress got to be at least 75 to 80 percent of why we even had a stroke. (participant 6)

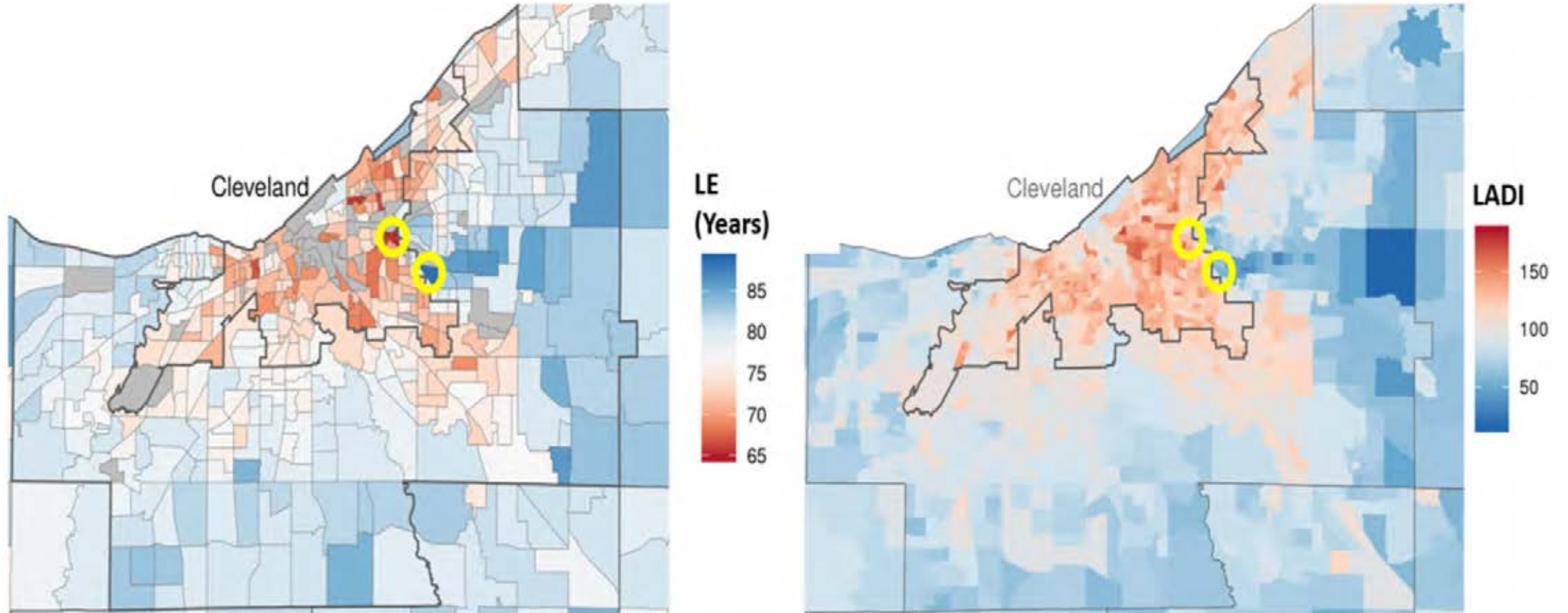# The Power of Neighborhood Factors on Health

Figure 2. Census tract-level life expectancy (LE, 2010-2015) and localized area deprivation index (LADI, 2017) estimates for Cuyahoga County, Ohio. The tracts with the shortest and longest LE are circled in both panels.

The Power of Neighborhood Factors on Health

- Populations made vulnerable live in inferior neighborhoods with respect to food stores, places to exercise, aesthetic challenges (vacant houses), and traffic or crime-related safety

Factors associated with obesity:

- Poor access to supermarkets

- Less neighborhood walkability

- Less access to recreational facilities

Golden et al, *JCEM*, 2012

Redlining and Historical Discrimination

- 1936 Residential Security Maps developed and utilized by federal agencies (Home Owners Loan Corp. and then the Federal Housing Administration and then adopted by the Veterans Administration)

- Color to designate the **"suitability of neighborhoods for lending"**

- *Best – green, still desirable – blue, yellow – declining, red – hazardous*

- The FHA subsidized builders mass produced subdivisions for White Americans — with the requirement that none of the homes be sold to African Americans

- Areas where African-Americans lived were colored red to indicate to appraisers that these neighborhoods were too risky to insure mortgages, "AKA" Redlining

- Analysis of Ohio data found that **neighborhoods with any black residents had 45 times higher odds of being redlined**
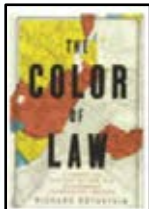
➤ **Richard Rothstein – The Color of Law**

➤ https://www.segregatedbydesign.com (17 min)

➤ NPR Link (35 min)

Berg KA, Coulton CJ & Perzynski AT. (Accepted). Racism and the Racialization of U.S. Neighborhoods: Impacts on Child Maltreatment and Child Maltreatment Reporting. Chapter in *It Takes a Village: The Evolution of Neighborhoods and Implications for Child Maltreatment,* Katz C & Maguire-Jack K Eds. Springer, NY.

Maguire-Jack K, Korbin JE, Perzynski A, Coulton C, Font SA & Spilsbury JC. (2021). How Place Matters in Child Maltreatment Disparities: Geographical Context as an Explanatory Factor for Racial Disproportionality and Disparities. Chapter in Racial Disproportionality and Disparities in the Child Welfare System Detlaff AJ Editor. Springer Nature, NY.

Perzynski AT, Berg KA, Thomas C, Cemballi A, Smith T, Shick S, Gunzler D & Sehgal AR. (Under Review). Racial Discrimination and Redlining of Neighborhoods. *Dubois Review.*

Redlining and Historical Discrimination

Figure 1A. Home Owners Loan Corporation Map of Redlined Areas in Greater Cleveland from 1940 Map reprinted from a National Archives collection whose access and use is "Unrestricted," according to the Archival Research Catalog for ARC Identifiers 720357 and 3620183 (NARA website: http://www.archives.gov/research/catalog/)
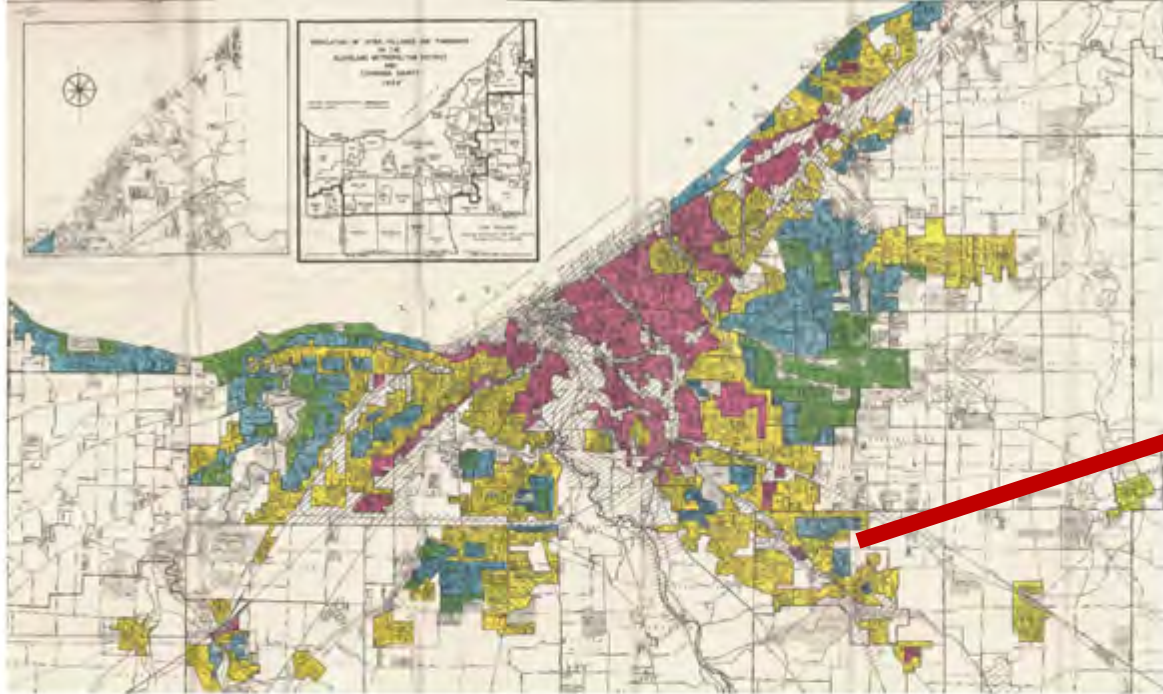
"About two years ago strong effort began to decrease the colored occupancy of this area and has resulted in the moving of 33 families (only 50 remaining) some of whom were moved at the city's expense. In each case the removal of a colored family caused the occupancy of a white family in this neighborhood. There is also a tendency towards improvement in the physical appearance of the community during this same period." 1939, Area D8, Maple Heights

1936 Residential Security Map

Present Day Vulnerability
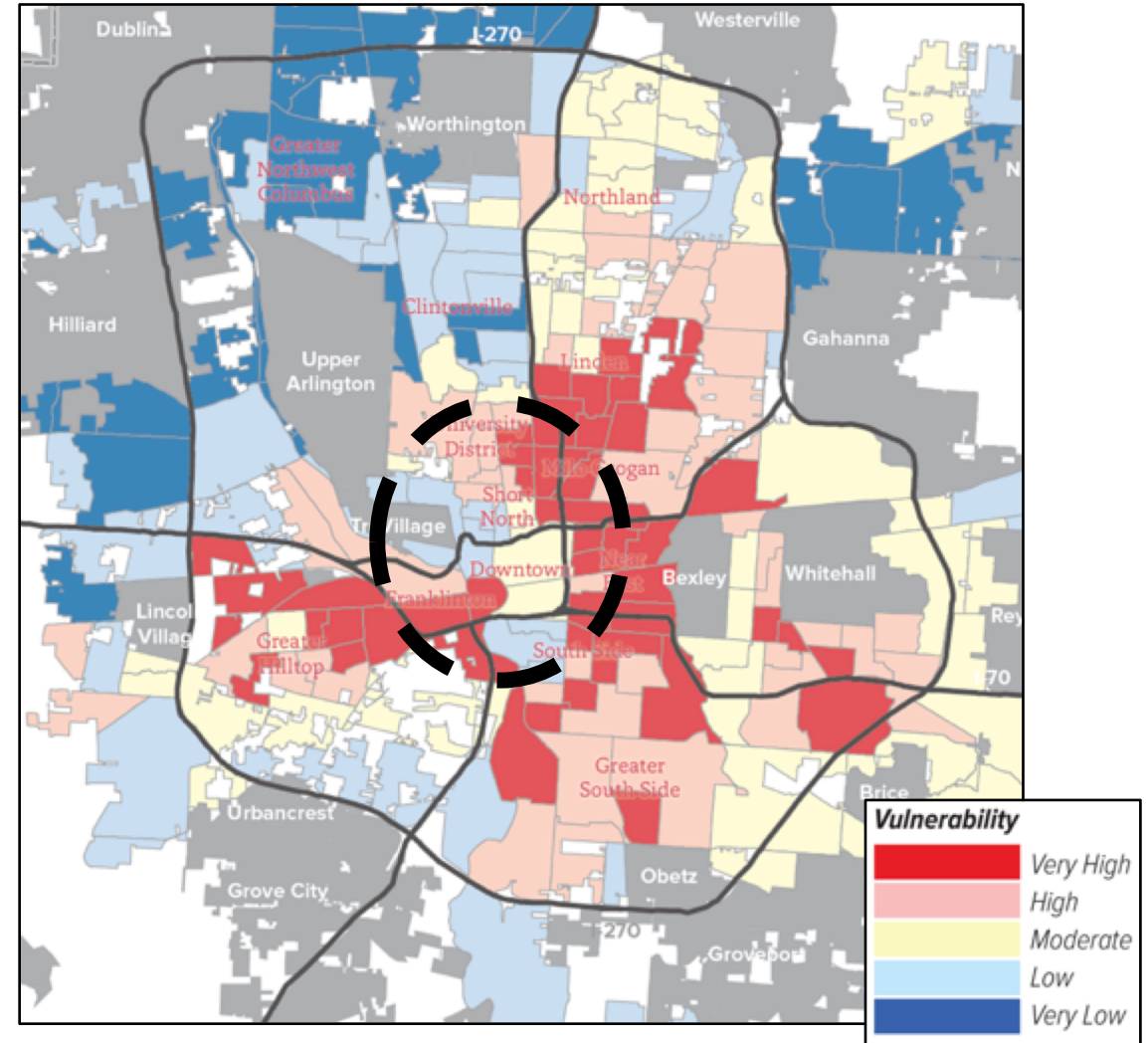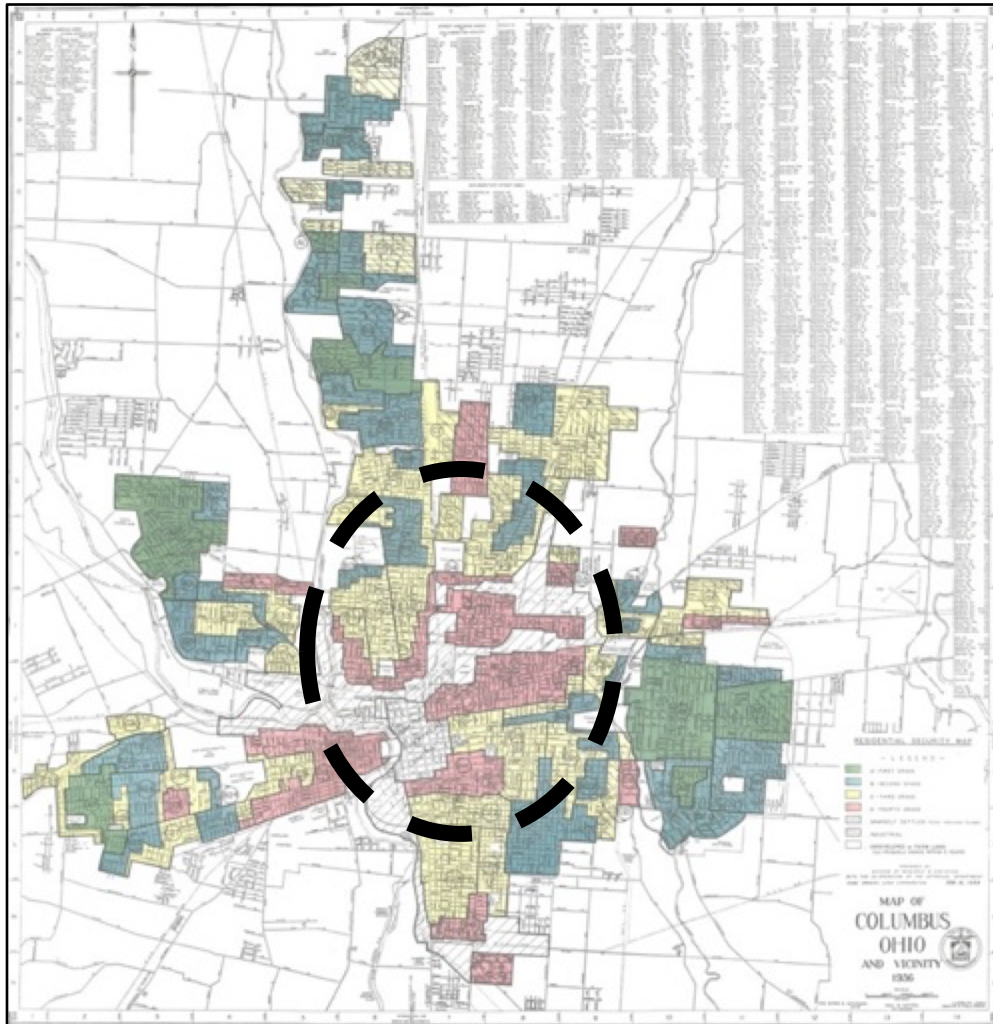
Columbus: Social Determinants of Health

Obesity

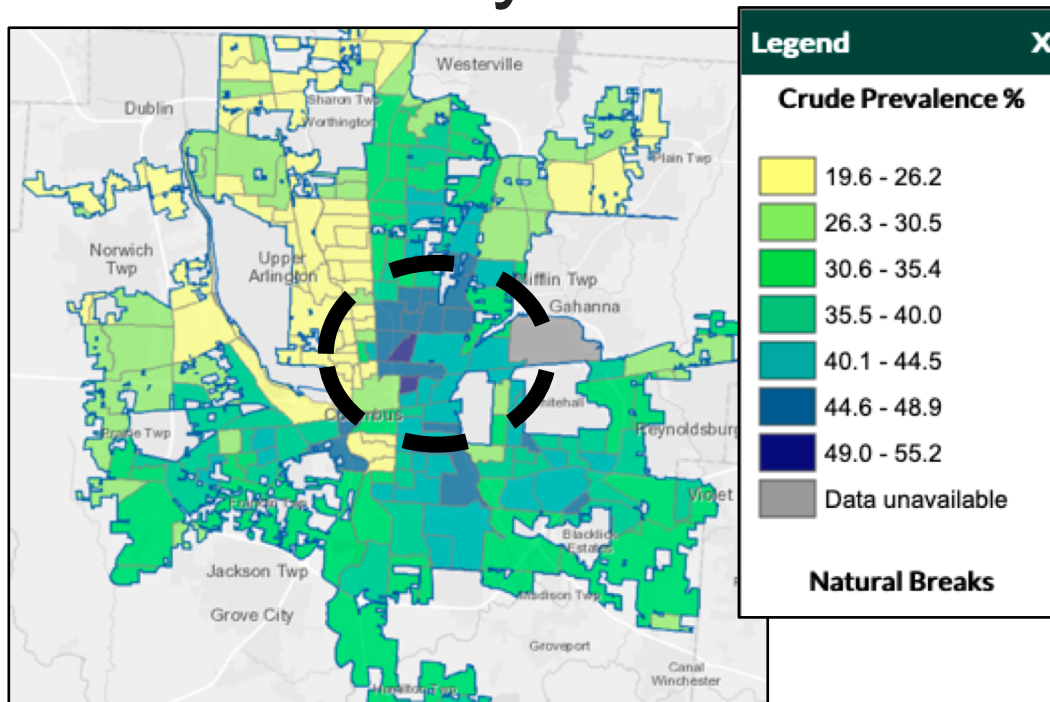## Social Determinants of Health
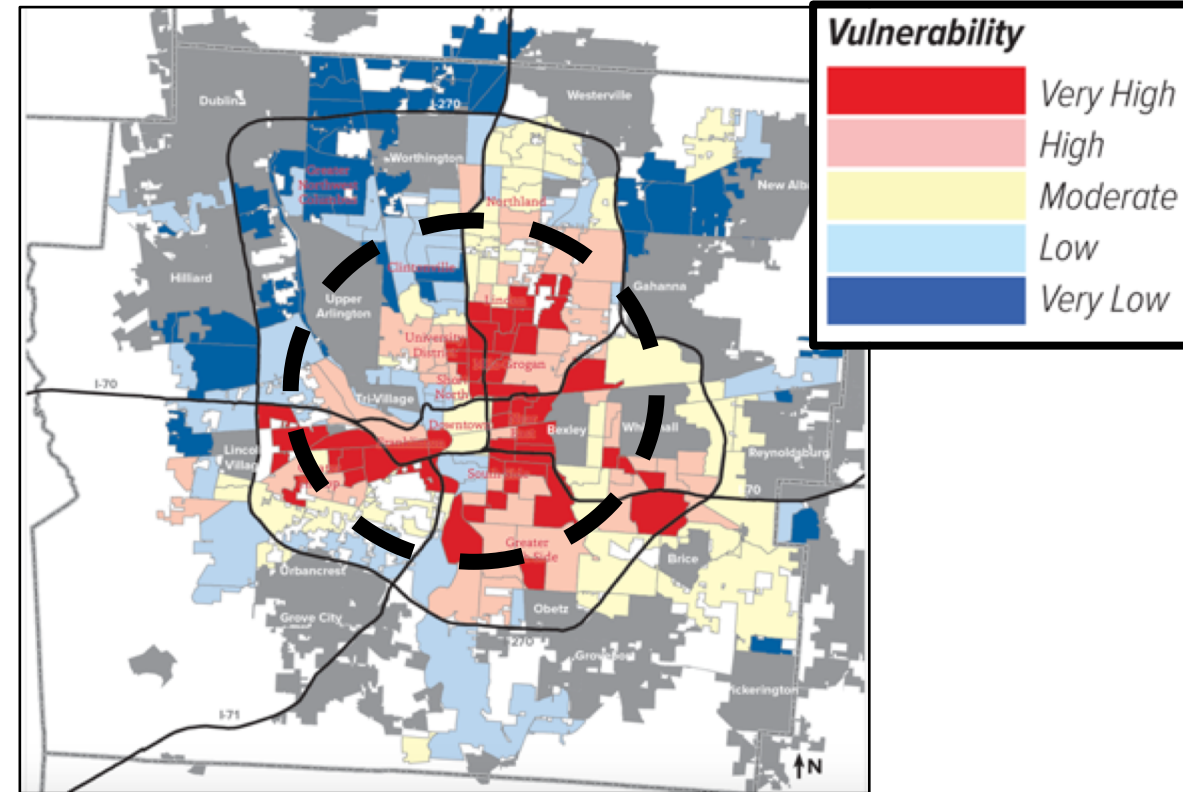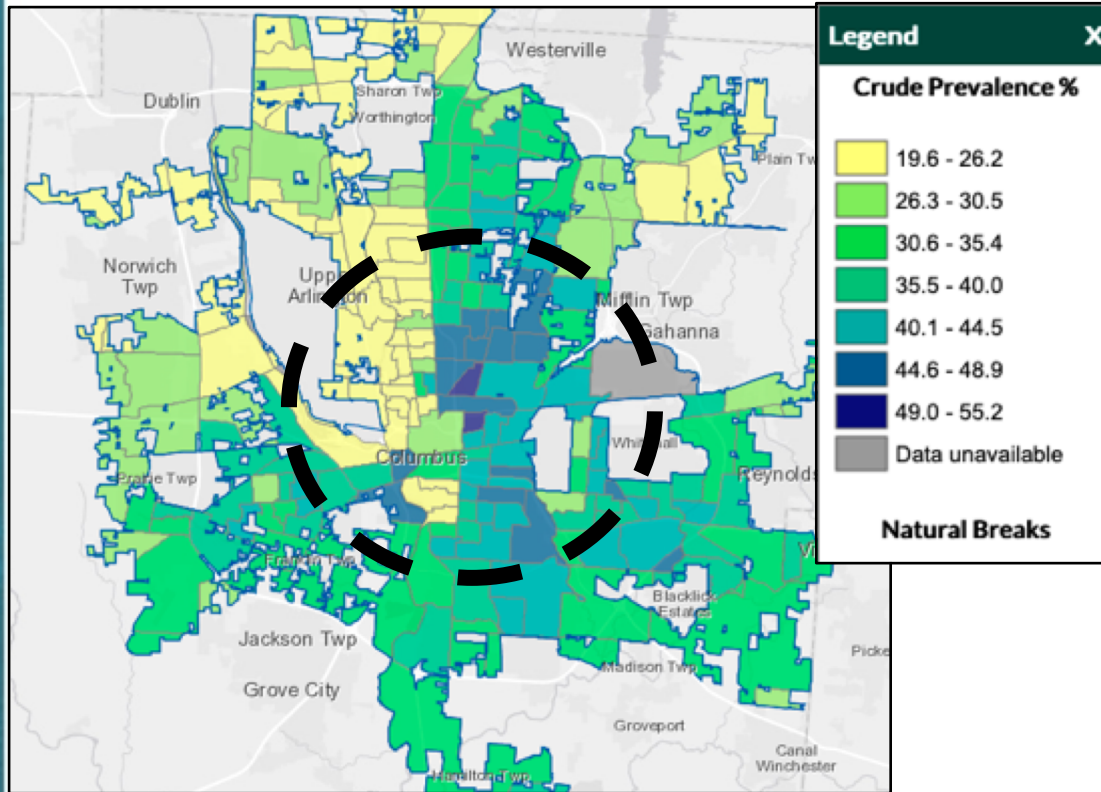
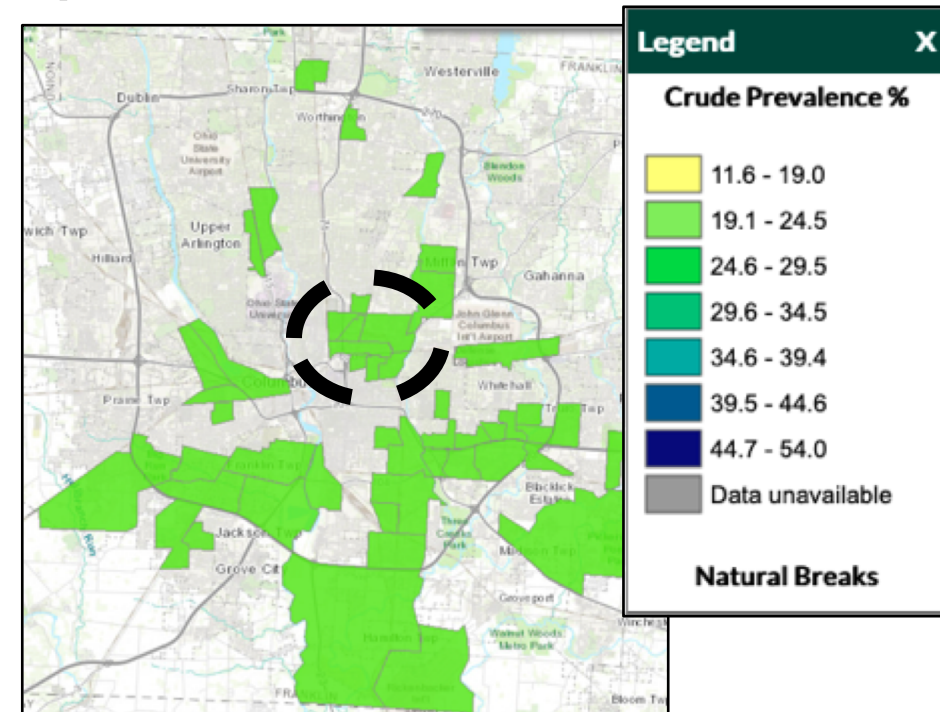500 Cities Project - https://nccd.cdc.gov/500_Cities/

OSU Kirwan Institute

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Columbus: Supermarket Access

Obesity

Supermarket Access

Low-income census tracts where a significant number or share of residents is more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket.

https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/

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A stream depicting the chronological order from upstream determinants to downstream diseases

Lakerveld J, Mackenbach J: The Upstream Determinants of Adult Obesity. Obes Facts 2017;10:216-222.
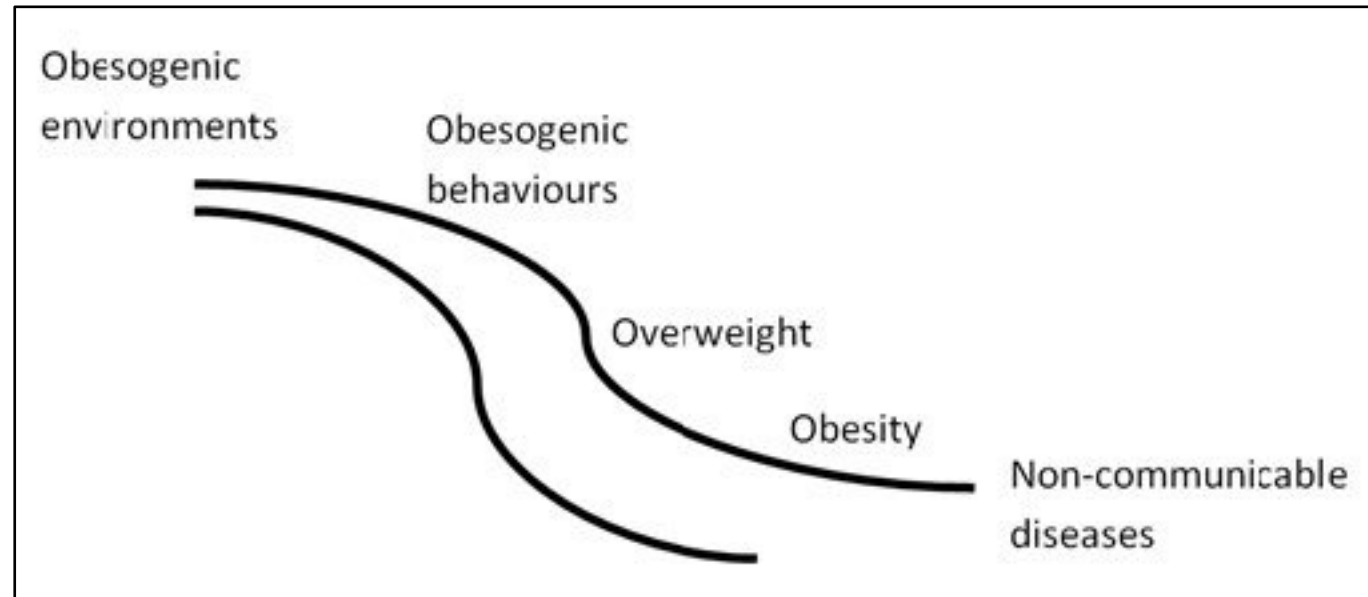
The Built Environment and Obesity

- For food and physical activity environments, associations were generally very small or absent, although some characteristics within these domains were consistently associated with weight status such as fast-food exposure, urbanisation, land use mix and urban sprawl

International Journal of
Health Geographics

REVIEW   **Open Access**

Associations between the built environment and obesity: an umbrella review

Thao Minh Lam[1,3,4*] , Ilonca Vaartjes[1,3,5], Diederick E. Grobbee[1,6], Derek Karssenberg[2,3] and Jeroen Lakerveld[1,3,4]

Structural Racism and Obesity

- Racial inequality at the county level in poverty, unemployment, and homeownership were associated with higher obesity rates
- Racial inequality in median income, college graduates, and unemployment were associated with fewer grocery stores and more fast food restaurants

Caryn N. Bell [1,*], Jordan Kerr [2] and Jessica L. Young [3]

1   Department of African American Studies, University of Maryland, College Park, MD 20724, USA
2   School of Public Health, University of Maryland, College Park, MD 20724, USA; kerr_jordan2319@yahoo.com
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Structural Racism and Obesity
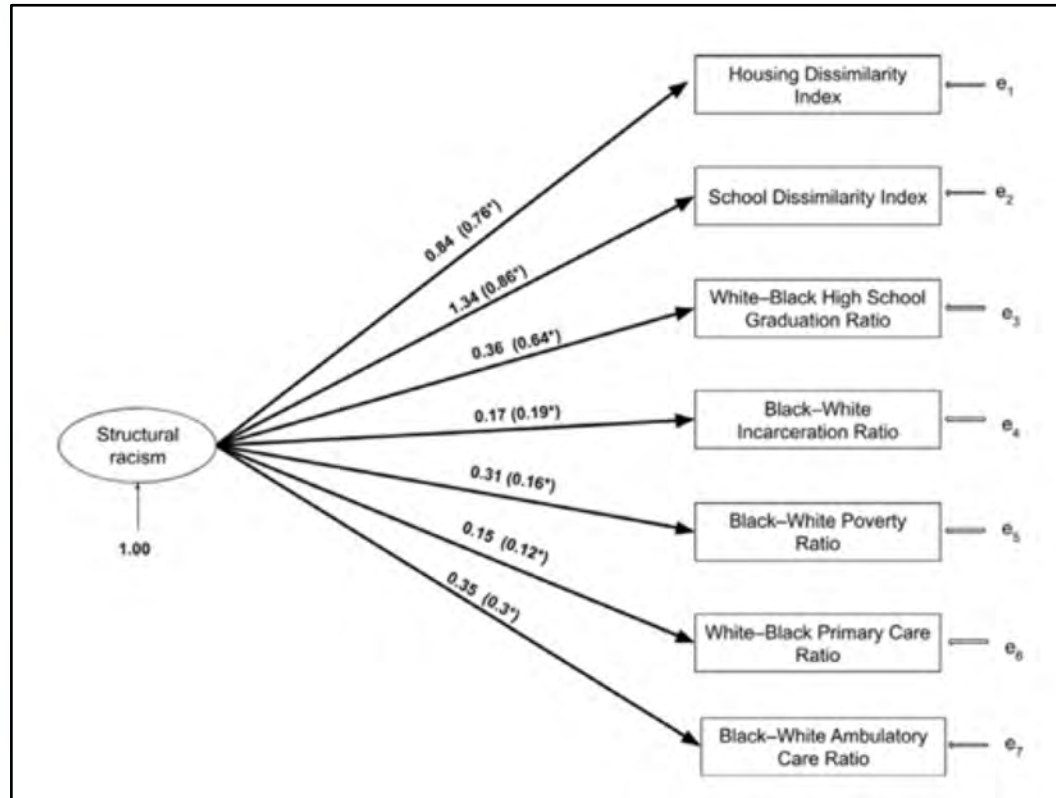
County Structural Racism

- County structural racism was associated with lower BMI in White populations and higher BMI in Blacks populations
- In a further interaction analysis, county structural racism was associated with larger increases in BMI among Black men than black women
- County structural racism was associated with reduced BMI for white men and no change for white women
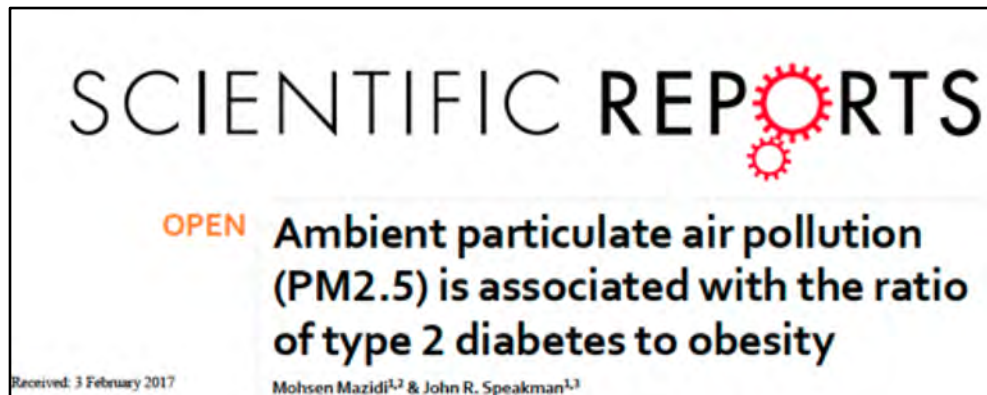
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Social Determinants of Health and Obesity

- A total of 38 SDOH were aggregated to create a cumulative SDOH score, which was divided into quartiles (Q1-Q4) to denote levels of SDOH burden
- SDOH Kaiser Family Foundation Domains of 1) economic stability; 2) neighborhood, physical environment, and social cohesion; 3) community and social context; 4) food insecurity; 5) education; and 6) health care system

	Overweight (25 ≤ BMI < 30)* RPR (95% CI)	Obesity classes 1-2 (30 ≤ BMI < 40)* RPR (95% CI)	Obesity class 3 (BMI ≥ 40)* RPR (95% CI)
SDOH quartiles	Model 3		
Q1	Reference	Reference	Reference
Q2	1.04 (0.99-1.09)	1.11 (1.05-1.17)	0.99 (0.90-1.08)
Q3	1.13 (1.08-1.19)	1.35 (1.27-1.42)	1.34 (1.22-1.46)
Q4	1.16 (1.09-1.22)	1.47 (1.38-1.56)	1.70 (1.54-1.87)

PMI 2.5, Endocrine Disrupting Chemicals and Obesity

- Airborne particulate matter (particles with diameters of 2.5 µm or less, known as a PM2.5) are associated with higher rates of obesity across studies even when taking into account community context
- Endocrine Disrupting Chemicals: two classes of substances incorporated into plastic products are widely shown to migrate into food and the environment (phthalates and bisphenols) and increase risk of obesity

SCIENTIFIC REPORTS

OPEN Ambient particulate air pollution (PM2.5) is associated with the ratio of type 2 diabetes to obesity

Received: 3 February 2017   Mohsen Mazidi[1,2] & John R. Speakman[1,3]

Received: 6 May 2021 | Revised: 23 July 2021 | Accepted: 23 July 2021
DOI: 10.1111/obr.13332

OBESITY/ETIOLOGY AND PATHOPHYSIOLOGY

OBESITY   WILEY

Endocrine-disrupting chemicals and obesity risk: A review of recommendations for obesity prevention policies

Tim Lobstein[1,2] | Kelly D. Brownell[3]

Moving to Opportunity

- In 1994-1998, 4,498 women with children living in public housing in high poverty urban census tracts (in which ≥40% of residents had incomes below the federal poverty threshold) assigned to one of three groups:
  - 1,788 were assigned to receive housing vouchers, which were redeemable only if they moved to a low-poverty census tract (where <10% of residents were poor), and counseling on moving;
  - 1,312 were assigned to receive unrestricted, traditional vouchers, with no special counseling on moving;
  - 1,398 were assigned to a control group that was offered neither of these opportunities.

Ludwig et al, NEJM, 2011

Moving to Opportunity

- 1994-1998 through 2008-2010

Table 3. Body-Mass Index (BMI) and Glycated Hemoglobin Level at Follow-up, According to Study Group.*

Variable	Control	Low-Poverty Voucher			Traditional Voucher		
	Prevalence (%)	Intention-to-Treat Estimate (95% CI)†	P Value	Prevalence (%)	Intention-to-Treat Estimate (95% CI)†	P Value	Prevalence (%)
BMI‡							
≥30	58.6	−1.19 (−5.41 to 3.02)	0.58	57.5	−0.14 (−6.27 to 5.98)	0.96	58.4
≥35	35.5	−4.61 (−8.54 to −0.69)	0.02	31.1	−5.34 (−11.02 to 0.34)	0.07	30.8
≥40	17.7	−3.38 (−6.39 to −0.36)	0.03	14.4	−3.58 (−7.95 to 0.80)	0.11	15.4
Glycated hemoglobin§							
≥6.5%	20.0	−4.31 (−7.82 to −0.80)	0.02	16.3	−0.08 (−5.18 to 5.02)	0.98	20.6

Ludwig et al, NEJM, 2011

Thank you!

Questions/Discussion