THE CONTRIBUTION OF SOCIAL AND ECONOMIC PREDICTORS AND RELATED POLICY ISSUES T PRE-PREGNANCY BMI AND GESTATIONAL WEIGHT GAIN IN THE UNITED STATES

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OUTLINE

- Background: Social Stratification in the United States
- Measures, Metrics, and Mechanisms
- Relationship Between Social and Economic Disadvantage/Advantage, Pre-pregnancy Weight, Gestational Weight Gain, and Maternal Health Outcomes
- Impact of Social and Economic Interventions on Pre-pregnancy Weight, Gestational Weight Gain, and Maternal Health Outcomes
- Gaps in the Literature and Future Recommendations

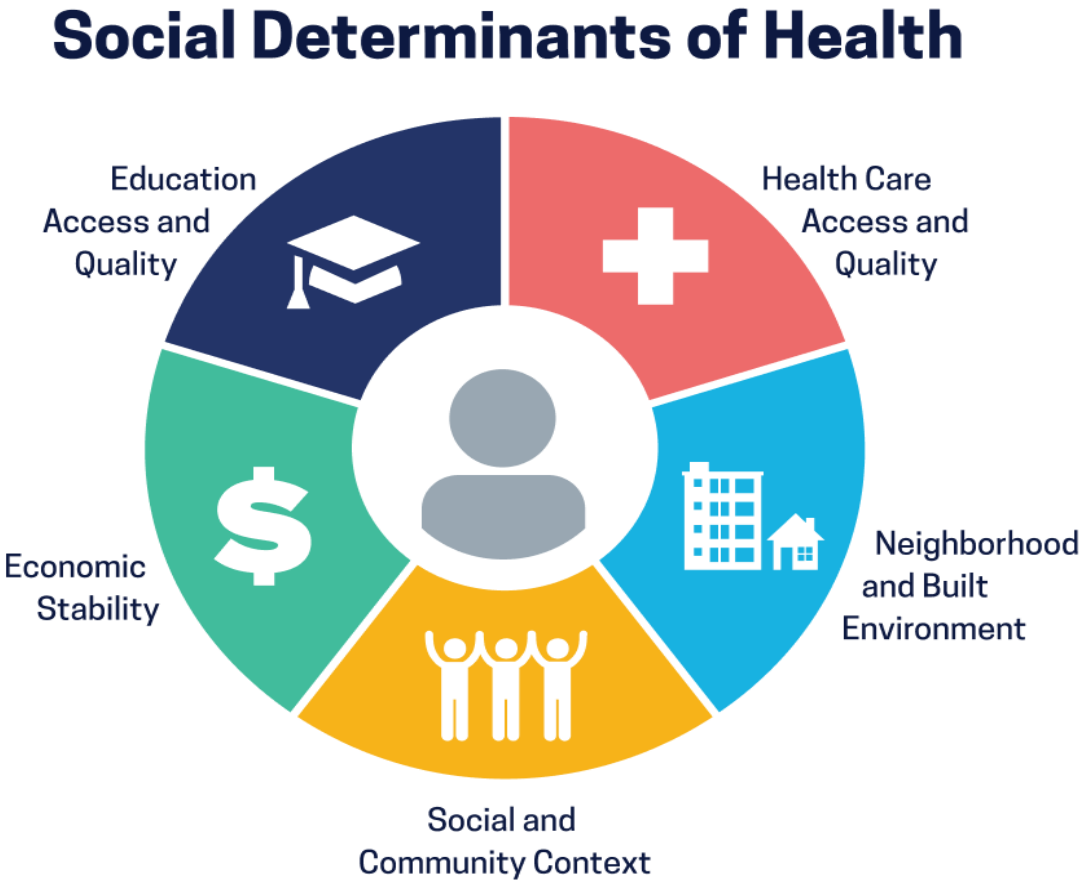
SOCIAL AND STRUCTURAL DETERMINANTS, MEASURED AT INDIVIDUAL AND/OR AGGREGATED LEVEL(S), PLAY A CRUCIAL ROLE IN MATERNAL, FETAL, AND NEWBORN HEALTH, PRE-PREGNANCY BMI, AS WELL AS BOTH INADEQUATE AND EXCESSIVE GESTATIONAL WEIGHT GAIN

BUT THE DETAILED PATHWAYS LINKING SOCIAL DETERMINANTS TO PRE-PREGNANCY BMI AND GESTATIONAL WEIGHT GAIN ARE MULTIFACTORIAL AND COMPLEX

INDIVIDUAL PREDICTORS DO NOT ADEQUATELY EXPLAIN DIFFERENCES IN PRE-PREGNANCY WEIGHT AND GESTATIONAL WEIGHT GAIN

SOCIAL DISADVANTAGE IS ASSOCIATED WITH STRUCTURAL OPPRESSION AND IS HIGHER IN GROUPS WITH THAT HISTORIC/CONTEMPORARY EXPERIENCE

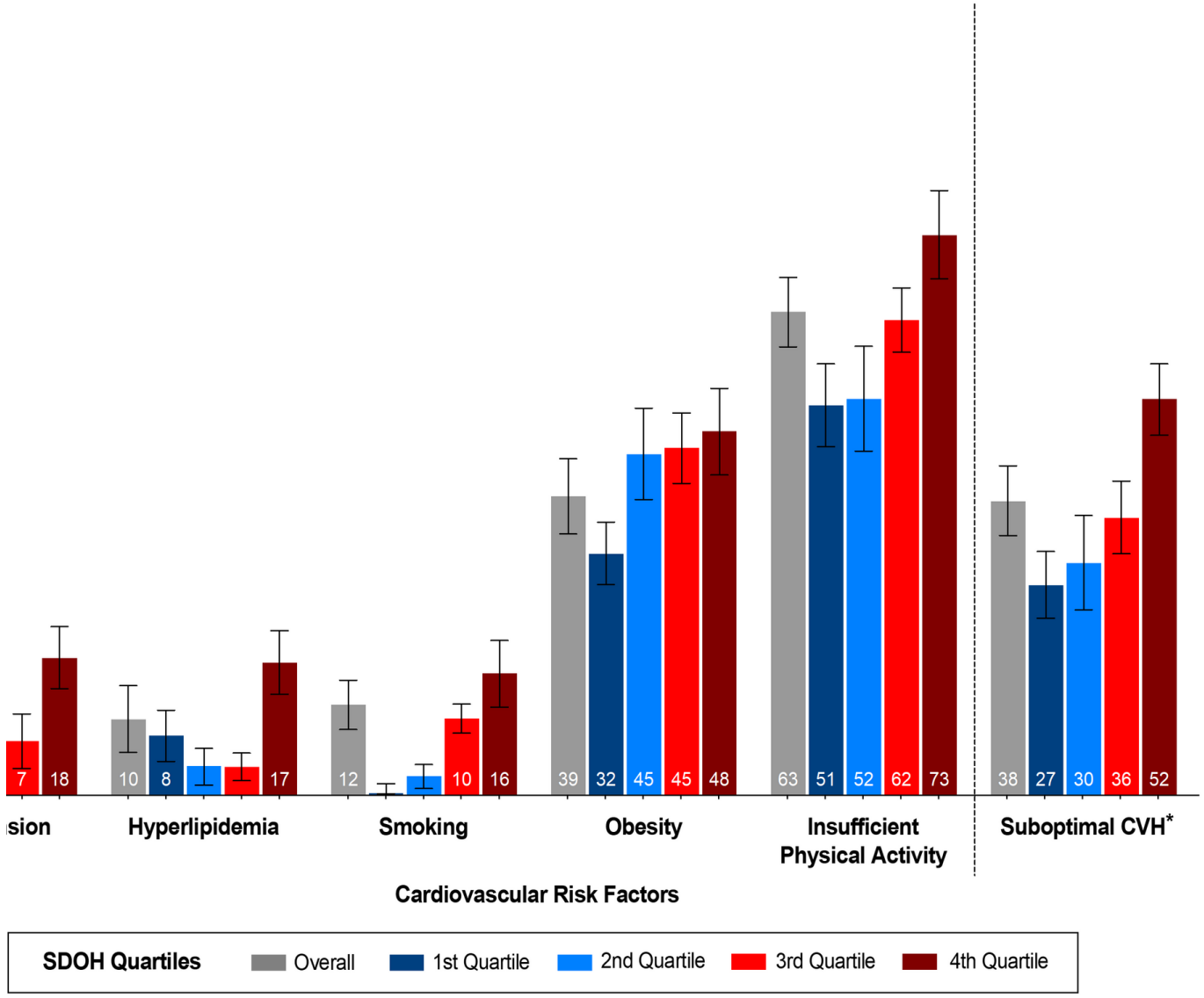
DURING, BEFORE, AND AFTER PREGNANCY, BLACK WOMEN LIVE IN NEIGHBORHOODS THAT WERE MORE LIKELY TO BE SOCIOECONOMICALLY DISADVANTAGED COMPARED TO WHITE WOMEN



Social determinants of health (SDOH) are the non-medical conditions where people are born, grow, live, work, and age, shaped by broader forces and systems like economic policies and social norms. **Structural determinants of health are the underlying systems and mechanisms**—such as political structures, social policies, and economic systems—that create and maintain social inequalities, which then shape the SDOH and lead to unfair differences in health outcomes

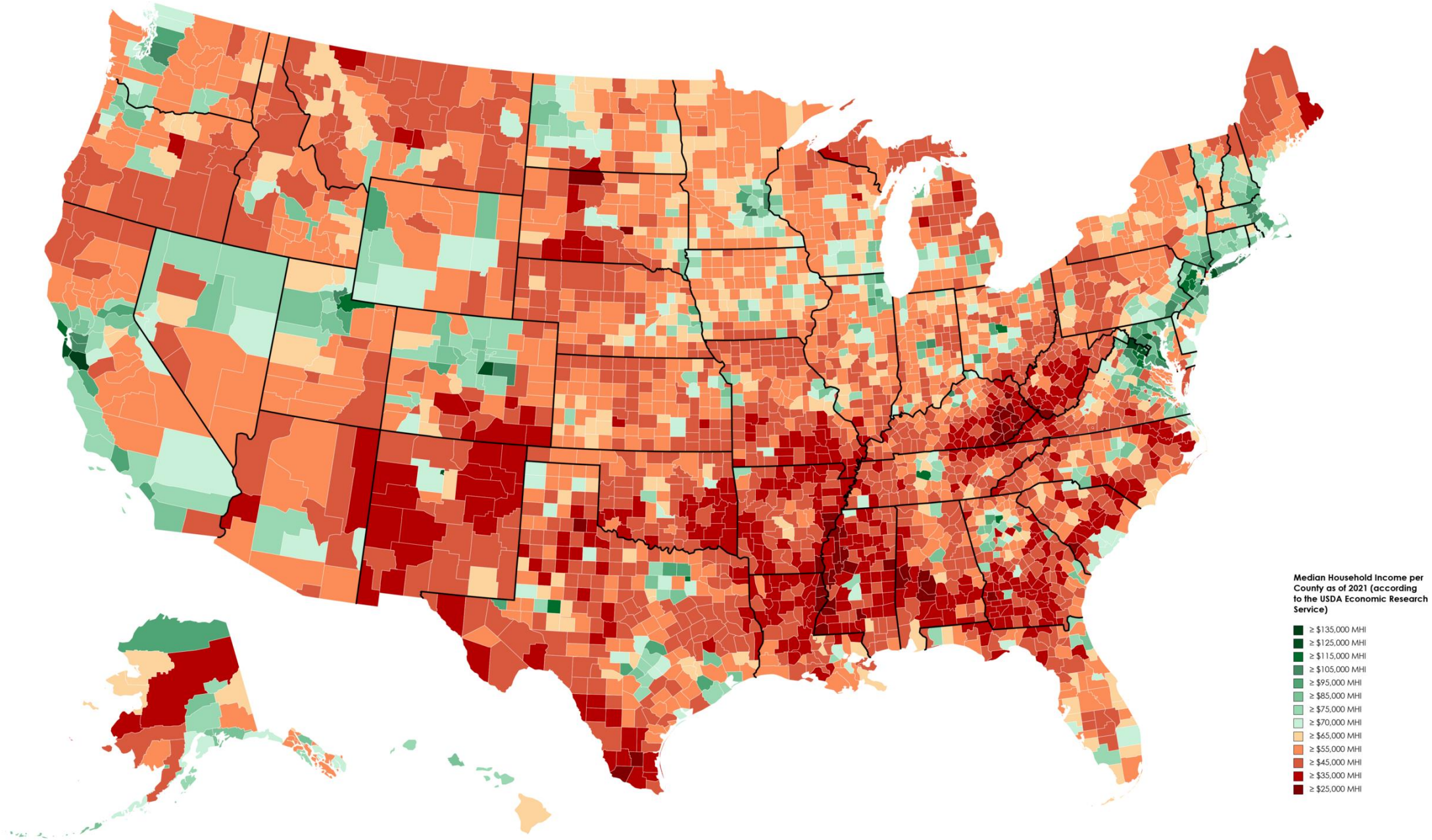
Social Determinants of Suboptimal Cardiovascular Health (CVH) Among Pregnant Women in the United States (Sharma et al., 2022)

- Overall, 38.4% (95% CI, 33.9–43.0) had suboptimal CVH versus 51.7% (95% CI, 47.0–56.3) among those in the fourth SDOH quartile.
- "Over 50% of pregnant women with the highest SDOH burden had suboptimal CVH, highlighting the public health urgency for interventions in socially disadvantaged pregnant women with renewed strategies toward improving modifiable risk factors, especially smoking and insufficient physical activity."



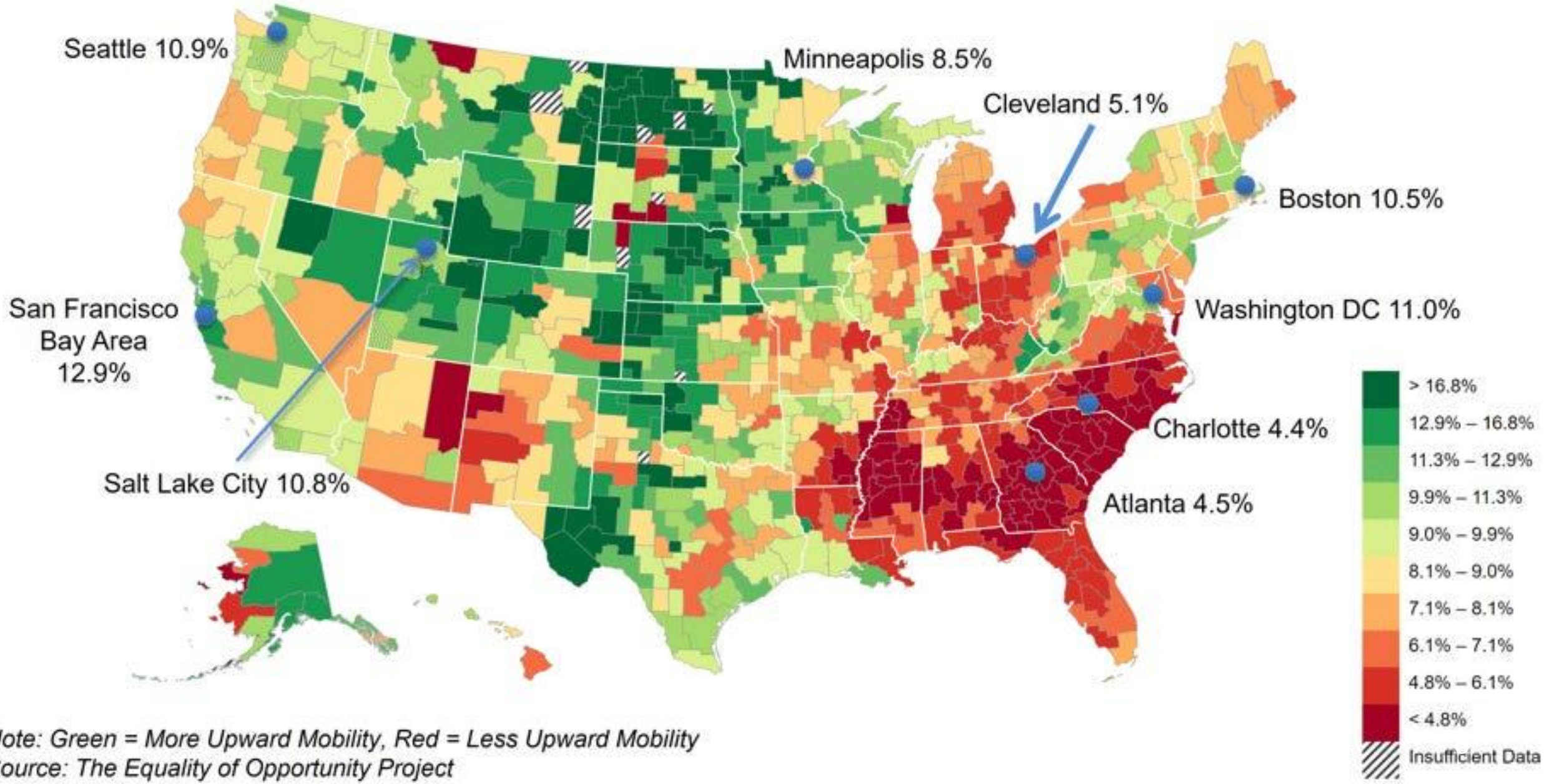
- Sharma, G., Grandhi, G. R., Acquah, I., Mszar, R., Mahajan, S., Khan, S. U., ... & Nasir, K. (2022). Social determinants of suboptimal cardiovascular health among pregnant women in the United States. *Journal of the American Heart Association*, *11*(2), e022837

Median U.S. household income per County in 2021



The Geography of Upward Mobility in the United States

Chances of Reaching the Top Fifth Starting from the Bottom Fifth by Metro Area



Note: Green = More Upward Mobility, Red = Less Upward Mobility
Source: The Equality of Opportunity Project

METRICS AND MEASURES OF SOCIAL DISADVANTAGE

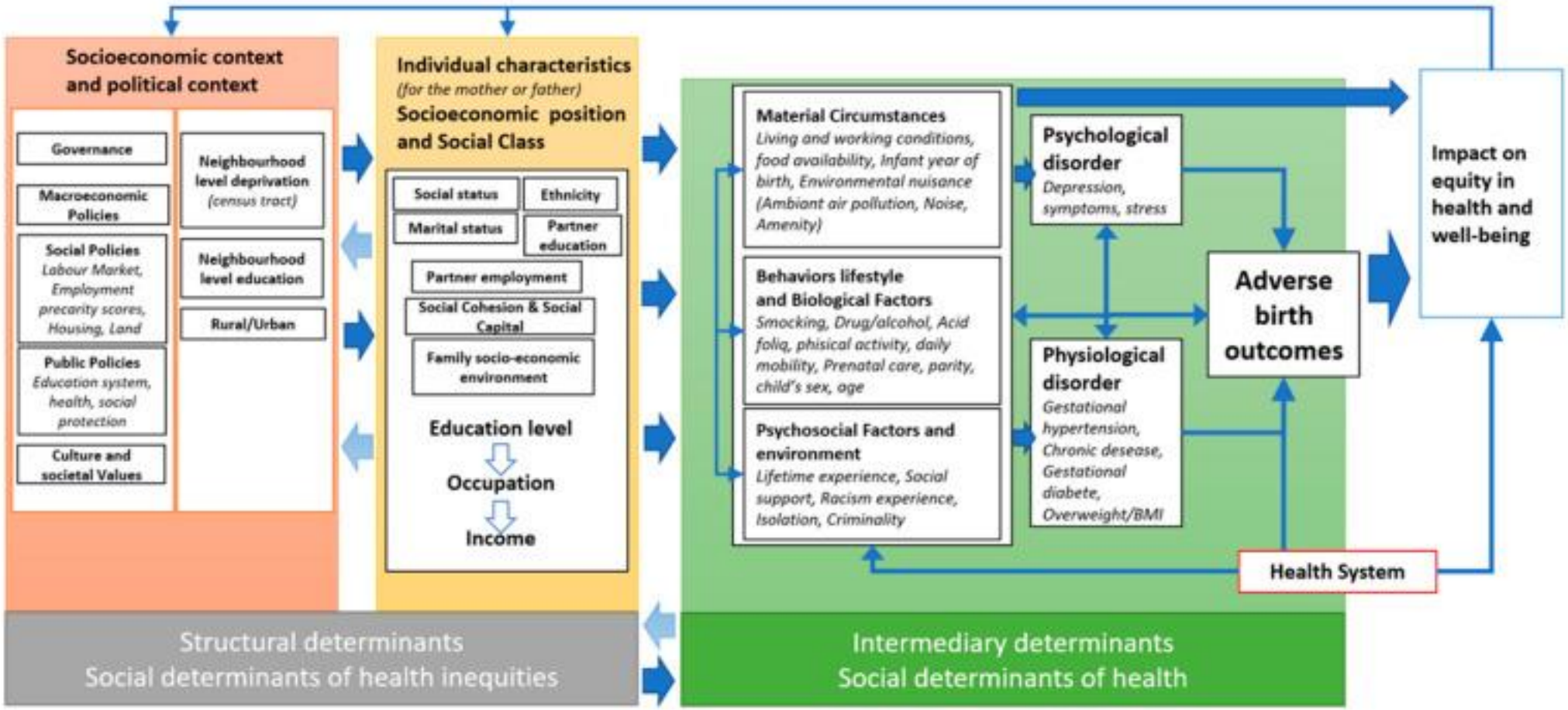
- Area-based disadvantage is considered to be when an area is characterized by adverse economic and social conditions and is measured either using individual variables or composite indices, which combine multiple individual variables into a single summary score since many social conditions influence outcomes in tandem and through multiple pathways (Lou et. al., 2023).
    - Poverty as an indicator of material disadvantage (Wang et al., 2017; Krieger et al., 1997).
    - Maternal Vulnerability Index (MVI) is a county-level tool that identifies maternal health risks (Surgo Venture, 2021; Salazar et al., 2023)
    - One time point, cumulative-over the life course, or across generations (Keller et al., 2023)

METRICS AND MEASURES OF SOCIAL DISADVANTAGE

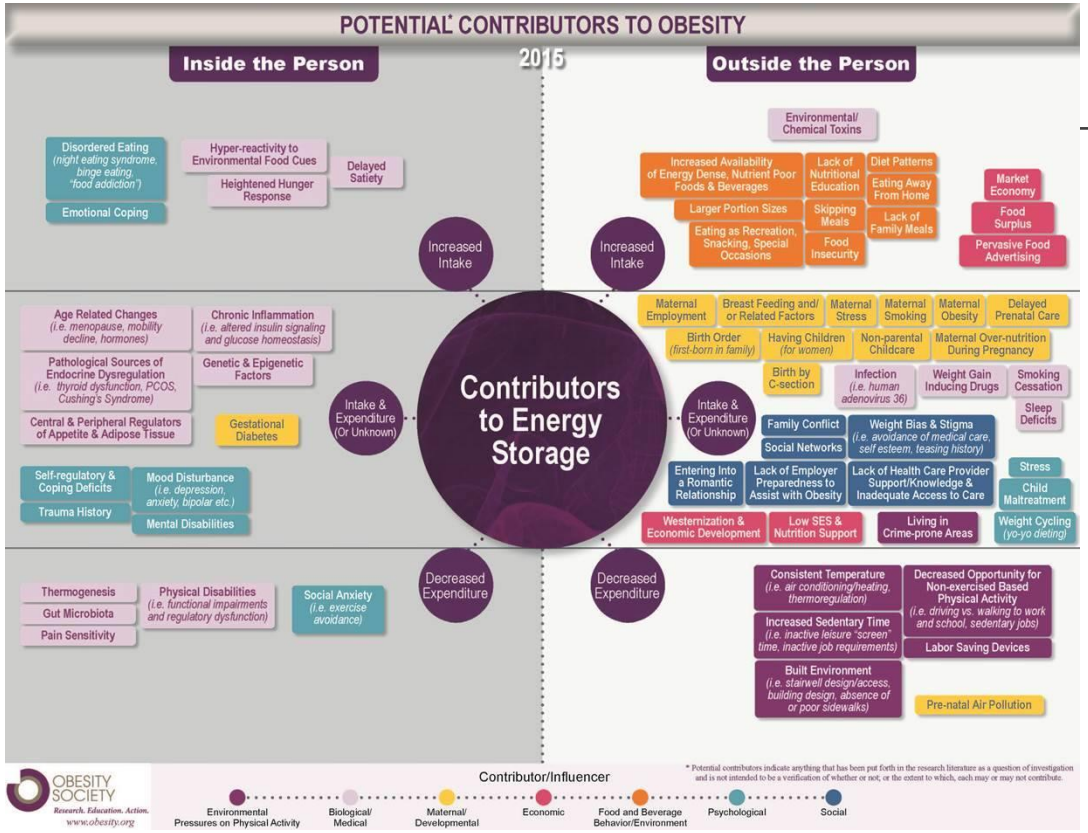
- Individual or household disadvantage-specific indicators or validated scales to capture a person's socioeconomic position and lived experiences. Objective measures like income and education. Many methods also incorporate subjective assessments to capture a person's perceptions of their social standing.
- Measures of Social Class (APA, 2015)
    - SES: Measures of occupational prestige, which can be assessed at the individual or household level. These measures generally ask participants to indicate their most recent occupation, which is then classified into occupational categories.
    - SES: Resource-based measures including measures of educational attainment, total family income, labor market earnings, wealth, and SES composite scores. These measures may ask participants to indicate the highest grade or year of school they completed, the combined total income of all members of their family in a given year, or their accumulated assets minus debts owed.
    - SES: Absolute poverty measures including Federal Poverty Thresholds or Federal Poverty Levels, the Supplemental Poverty Measure, family budget measures and school or neighborhood level indicators of poverty.
    - SES: Relative poverty measures including measures of material hardship and deprivation, food insecurity, economic pressure or an income-to-needs ratio. These measures may ask participants to indicate their unmet needs, whether they have insufficient food for all family members during a specific time period, or whether they endured any psychological distress due to financial difficulties.
    - SSS: Subjective Social Status measures include perceptions of one's social standing using categories such as "working class" or "middle class," or perceptions of one's social position relative to others based on income, educational attainment and occupational prestige.

INDIVIDUAL AND AREA MEASURES ASSOCIATED WITH HIGH AND LOW PRE-PREGNANCY WEIGHT, INADEQUATE GESTATIONAL WEIGHT GAIN, EXCESSIVE GESTATIONAL WEIGHT GAIN

Measure of Social Disadvantage	Sample References
Neighborhood Socioeconomic Disadvantage	Mendez et al., 2015; Nealy et al., 2025
Neighborhood Structural Racism	Avorgbedor et al., 2022
Neighborhood Deprivation (e.g. crime, healthy food availability, unemployment)	Headen et al., 2018; Kinsey et al., 2023; Sassin et al., 2025
Education, Income, Income to Needs Ratio, Marital Status	Cheng et al, 2021; O'Brien et al., 2018; Nunnery et al., 2017



SIMONCIC, V., DEGUEN, S., ENAUX, C., VANDENTORREN, S., & KIHAL-TALANTIKITE, W. (2022). A COMPREHENSIVE REVIEW ON SOCIAL INEQUALITIES AND PREGNANCY OUTCOME-IDENTIFICATION OF RELEVANT PATHWAYS AND MECHANISMS. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH*, *19*(24), 16592.



SOCIAL AND STRUCTURAL DETERMINANTS OF HEALTH

Contributors: Factors influencing energy intake and expenditure

Women report higher levels of psychological stress than White women and carry a disproportionate burden of chronic conditions associated with psychological stress.

Research indicates that in addition to generic stressors, Black women also experience race- and gender-related stress

Socioeconomic disadvantage and gendered racism and are associated with higher poorer mental health, which includes higher levels of anxiety and depression.

Social stress has an impact on dietary preference, food consumption, sleep, and the regional distribution of adipose tissue

Chronically elevated glucocorticoids can lead to chronically stimulated eating behavior and excessive weight gain.

Emerging research related to stress and the gut microbiome.

Sources: Bear T, Dalziel J, Coad J, Roy N, Butts C, Gopal P. The Microbiome-Gut-Brain Axis and Resilience to Developing Anxiety or Depression under Stress. Microorganisms. 2021 Mar 31;9(4):723; Michels N. Biological underpinnings from psychosocial stress towards appetite and obesity during youth: research implications towards metagenomics, epigenomics and metabolomics. Nutr Res Rev. 2019; Tipre M, Carson TL. A Qualitative Assessment of Gender- and Race-Related Stress Among Black Women. Womens Health Rep (New Rochelle). 2022 Feb 14;3(1):222-227.

Gap		Measures to implement
Education	Limited access to quality education	Improve educational opportunities for women by investing in girls' education, promoting gender equality in schools and colleges, and providing scholarships and mentorship programs.
Economic empowerment	Women often face gender-based discrimination in the workplace, leading to lower pay, limited job opportunities, and financial insecurity.	Implement policies that ensure equal pay for equal work, promote women's entrepreneurship and leadership, provide affordable childcare facilities, and support vocational training and skill development programs
Healthcare access	Limited access to affordable and quality preconception and prenatal care. Limited acces to mental health services Limited access to treatment for substance	Expand healthcare coverage and reduce financial barriers through policies like universal healthcare, increase the number of healthcare facilities in underserved areas, improve women's access to reproductive health services, and enhance cultural competency and sensitivity in healthcare provision
Housing access	Housing insecurity Homelessness	Inproving housing quality, stability and affordability Improving neighborhood conditions
Violence Prevention	High rates of violence against women, including domestic violence, sexual assault, and gender-based violence	Strengthen laws and enforcement mechanisms to protect women from violence, raise awareness about gender-based violence and its consequences, provide support services for survivors, and promote community-based prevention programs
Social Support Networks	Inadequate social support networks and community resources for women, particularly those facing multiple vulnerabilities	Develop and strengthen community-based organizations and support networks that address the specific needs of women, including immigrant women, women of color, and marginalized groups. This can include peer support groups, counseling services, and community outreach programs
Policy and Advocacy	Insufficient attention to gender-sensitive policies and lack of representation of women in decision-making processes	Develop and implement policies that address gender inequalities, promote gender mainstreaming in all sectors, ensure equal representation of women in leadership positions, and support women's participation in policymaking and advocacy efforts
–Research and Data	Limited research and data on women's health issues, particularly those related to social determinants of health	Invest in research that explores the intersectionality of gender, race, and socioeconomic factors in health outcomes, collect gender-disaggregated data, and use evidence-based research to inform policy and program development

TARGETED UNIVERSALISM AND WIC

Targeted universalism in the context of the WIC program suggests a framework where the overall goal is to ensure all families, particularly those with young children, have access to healthy food and nutrition support (WIC) to achieve optimal health and development.

However, recognizing that different groups may face varying barriers, the program uses targeted strategies to address those specific needs.

WIC, in this context, becomes a mechanism to reach a universal goal (healthy children) by providing targeted resources and support to families who need them most.

- **Universal Goal:** All children have access to essential nutrients for healthy development.
- **Targeted Strategies:** WIC provides food assistance and nutrition education, specifically tailored to address the needs of low-income pregnant women, breastfeeding mothers, and young children.
- **Evidence:** Decrease risk for low gestational weight gain and slow gestational weight gain rate (Matias and French, 2025)

EXAMPLE: SUPPLEMENTAL PROGRAM FOR WOMEN, INFANTS, AND CHILDREN

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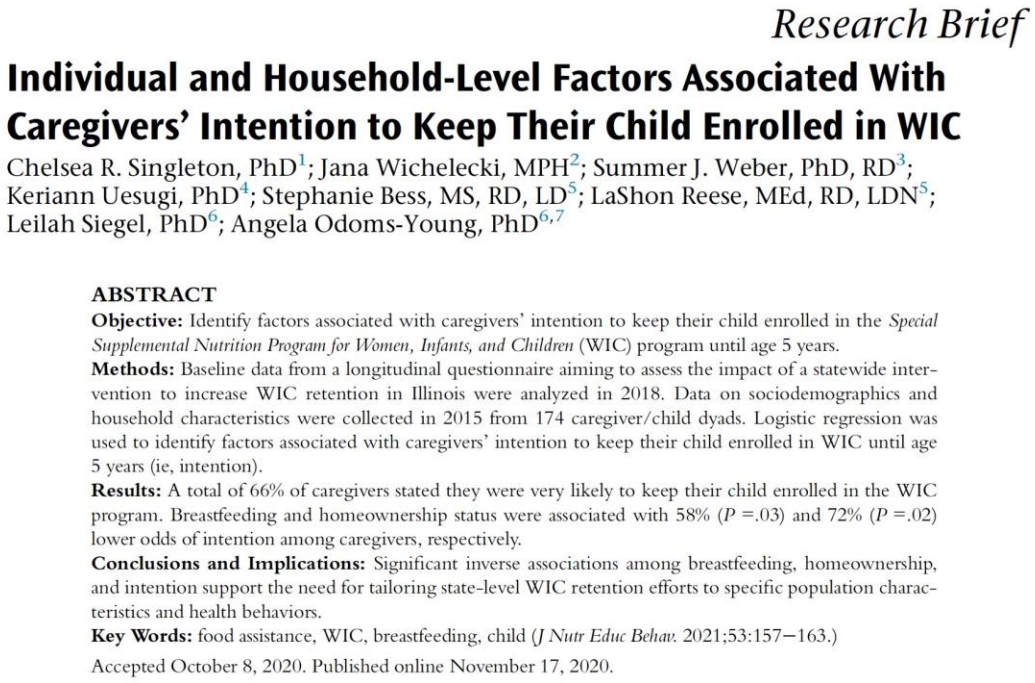
EXAMPLE 1: WIC RETENTION



Research Brief

Individual and Household-Level Factors Associated With Caregivers' Intention to Keep Their Child Enrolled in WIC

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ABSTRACT

Objective: Identify factors associated with caregivers' intention to keep their child enrolled in the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC) program until age 5 years.

Methods: Baseline data from a longitudinal questionnaire aiming to assess the impact of a statewide intervention to increase WIC retention in Illinois were analyzed in 2018. Data on sociodemographics and household characteristics were collected in 2015 from 174 caregiver/child dyads. Logistic regression was used to identify factors associated with caregivers' intention to keep their child enrolled in WIC until age 5 years (ie, intention).

Results: A total of 66% of caregivers stated they were very likely to keep their child enrolled in the WIC program. Breastfeeding and homeownership status were associated with 58% ($P = .03$) and 72% ($P = .02$) lower odds of intention among caregivers, respectively.

Conclusions and Implications: Significant inverse associations among breastfeeding, homeownership, and intention support the need for tailoring state-level WIC retention efforts to specific population characteristics and health behaviors.

Key Words: food assistance, WIC, breastfeeding, child (*J Nutr Educ Behav.* 2021;53:157–163.)

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Singleton CR, Wichelecki J, Weber SJ, Uesugi K, Bess S, Reese L, Siegel L, Odoms-Young A. Individual and Household-Level Factors Associated With Caregivers' Intention to Keep Their Child Enrolled in WIC. J Nutr Educ Behav. 2021 Feb;53(2):157-163.

EXAMPLE 1: WIC RETENTION

Characteristic	All Participants, n = 174	Likely to Stay Enrolled, n = 115 (66.1%)	Other Participants, n = 59 (33.9%)	P[a]
Maternal characteristics				
Age, y	27.1 (± 6.2)	27.5 (± 6.3)	26.2 (± 6.0)	0.21
Race/ethnicity				0.09
Non-Hispanic White	56 (32.8)	36 (31.9)	20 (34.5)	
Non-Hispanic Black	97 (56.7)	69 (61.1)	28 (48.3)	
Other	18 (10.5)	8 (7.1)	10 (17.2)	
Education level				0.59
Less than high school	30 (17.2)	21 (18.3)	9 (15.3)	
High school of GED	62 (35.6)	43 (37.4)	19 (32.2)	
Greater than high school	82 (47.1)	51 (44.4)	31 (52.5)	
Marital status				0.81
Married	39 (23.5)	25 (22.9)	14 (24.6)	
Other	127 (76.5)	84 (77.1)	43 (75.4)	
Employment status				0.88
Employed full-time	27 (15.6)	19 (16.5)	8 (13.8)	
Employed part-time	42 (24.3)	28 (24.4)	14 (24.1)	
Unemployed	104 (60.1)	68 (59.1)	36 (62.1)	
Number of children				0.13
1	67 (38.7)	38 (33.3)	29 (49.2)	
2	46 (26.6)	33 (29.0)	13 (22.0)	
≥ 3	60 (34.7)	43 (37.7)	17 (28.8)	
Prenatal BMI, kg/m^2	30.4 (± 9.7)	30.3 (± 9.6)	30.8 (± 10.03)	0.80
WIC enrollment date				0.29
Early pregnancy	65 (27.6)	47 (41.2)	18 (30.5)	
Later pregnancy	61 (35.3)	36 (31.6)	25 (42.4)	
After childbirth	47 (27.2)	31 (27.2)	16 (27.1)	
Currently breastfeeding				0.02[b]
Yes	38 (22.0)	19 (16.7)	19 (32.2)	
No	135 (78.0)	95 (83.3)	40 (67.8)	
Perceived stress score	13.1 (± 7.0)	13.6 (± 7.4)	12.3 (± 6.2)	0.24
CRISYS score	3.9 (± 3.0)	3.9 (± 2.9)	4.0 (± 3.1)	0.74
Child characteristics				
Sex				0.31
Male	82 (47.1)	51 (44.4)	31 (52.5)	
Female	92 (52.9)	64 (55.7)	28 (47.5)	
Race/ethnicity				0.72
Non-Hispanic White	41 (26.3)	26 (25.7)	15 (27.3)	
Non-Hispanic Black	90 (57.7)	61 (60.4)	29 (52.7)	
Hispanic	15 (9.6)	8 (7.9)	7 (12.7)	
Other	10 (6.4)	6 (5.9)	4 (7.3)	
Birth weight, g	3,133.7 (± 585.7)	3,074.4 (± 579.2)	3,253.6 (± 586.6)	0.08
Household characteristics				
SNAP participant				0.30
Yes	132 (75.9)	90 (78.3)	42 (71.2)	
No	42 (24.1)	25 (21.7)	17 (28.8)	
Annual income				0.17
< $10,000	98 (57.3)	69 (61.1)	29 (50.0)	
$10,000–$19,999	29 (17.0)	20 (17.7)	9 (15.5)	
≥ $20,000	44 (25.7)	24 (21.2)	20 (34.5)	
Homeownership status				0.05[b]
Own	16 (9.6)	7 (6.4)	9 (15.8)	
Rent	106 (63.5)	76 (69.1)	30 (52.6)	
Rent-free	45 (27.0)	27 (24.6)	18 (31.6)	
Car access				0.47
Yes	123 (71.1)	79 (69.3)	44 (74.6)	
No	50 (28.9)	35 (30.7)	15 (25.4)	
Household food security status				0.50
Food secure	52 (29.9)	36 (31.3)	16 (27.1)	
Marginal food security	42 (24.1)	25 (21.7)	17 (28.8)	
Low food security	53 (30.5)	38 (33.0)	15 (25.4)	
Very low food security	27 (15.5)	16 (13.9)	11 (18.6)	
CHAOS score	26.1 (± 6.3)	26.0 (± 6.8)	26.3 (± 5.3)	0.81

BMI indicates body mass index; CHAOS, Confusion, Hubbub, and Order Scale; CRISYS, Crisis in Family Systems; GED, general equivalency diploma; SNAP, *Supplemental Nutrition Assistance Program*; WIC, *Special Supplemental Nutrition Program for Women, Infants, and Children*.

[a]*P* calculated using chi-square test of independence or 2-sample t test; [b]Statistically significant at $\alpha < .05$.

Note: Values are given as n (%) or mean (± SD) for continuous variables. Cell counts may not total the sample size owing to missing information.

Caregivers who reported they were likely to keep their child enrolled in WIC until age 5 years were similar to other caregivers concerning all characteristics assessed except breastfeeding status and homeownership status. A greater percentage of caregivers who were likely to stay enrolled self-identified as non-Hispanic Black, had 3 or more children, had a higher PSS score, and had a household income <$10,000 per year. However, these measures did not reach statistical significance.

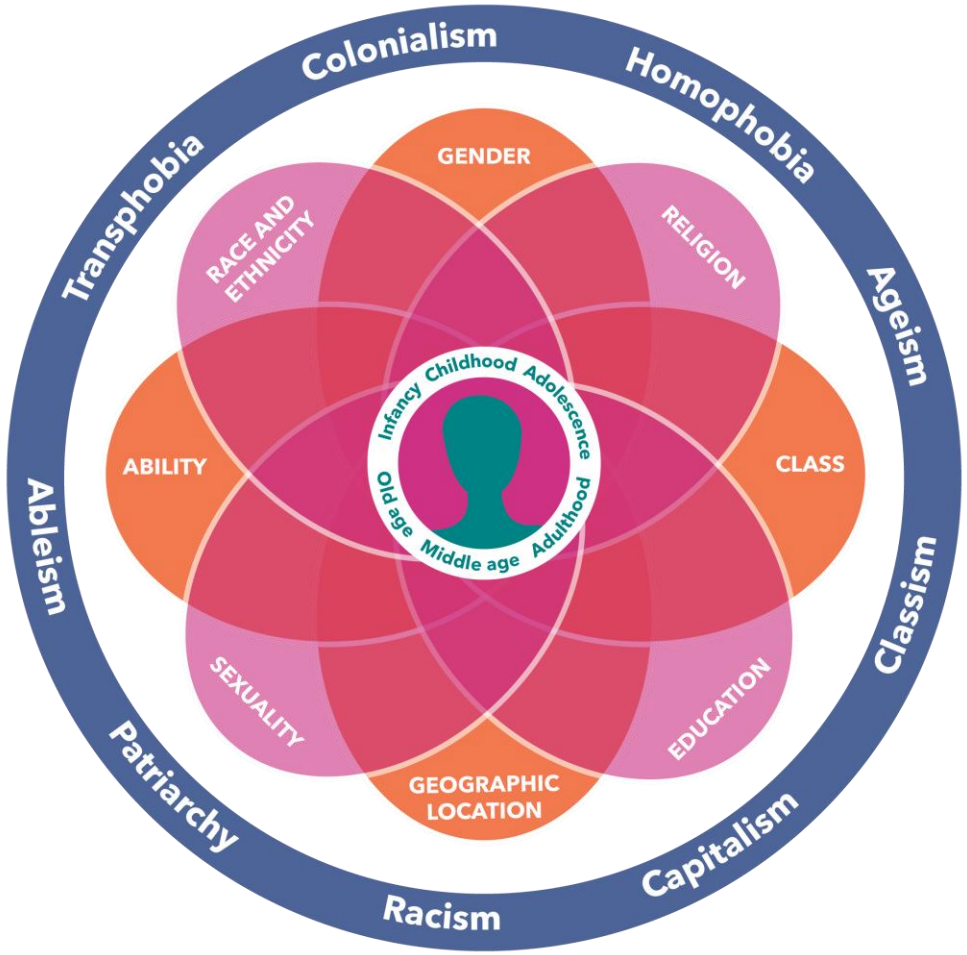
AREA-LEVEL INCOME INCREASES AND INCOME SUPPORT PROGRAMS

Earned Income Tax Credit (Karasek et al., 2023; Markowitz et al., 2017)

Cash Transfer/Guaranteed Income (Duncan et al., 2025)

Area-Level Income Increase based on Economic Development (e.g. Marcellus Shale Boom Economy) (Martin et al., 2024)

INTERSECTIONALITY



- One size does not fit all
- Intersectionality (Collins and Blige, 2016)
  - A way of understanding and analyzing complexity in the world, in people, and in human experiences. The events and conditions of social and political life and the self can seldom be understood as shaped by one factor. They are shaped by many factors in diverse and mutually influencing ways. When it comes to social inequality, people's lives and the organization of power in a given society are better understood as being shaped not by a single axis of social division, be it race or gender or class, but by many axes that work together and influence each other.
- Intersectionality, Diet, and Health (López and Gadsden, 2016)
  - Intersecting systems of oppression, including race/structural racism, class/capitalism, ethnicity/ethnocentrism, color/colorism, sex and gender/patriarchy, and sexual orientation/heterosexism, nationality and citizenship/nativism, disability/ableism and other systemic oppressions intersect and interact to produce major differences in embodied, lived race-gender that shape the social determinants of health.

THANK YOU!

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