Health Disparities in Obesity

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Learning Objectives

- Describe the role of obesity in the development of chronic disease, including cancer, diabetes, cardiovascular and renal disorders and mental and neurological illnesses.
- Identify the prevalence of obesity among different populations and the multiple factors that influence its development.
- Recognize the effects of bias, discrimination, and adverse childhood experiences (ACEs) on the development and treatment of obesity.
- Discuss the contributing factors to health disparities in treatment and access to care and the increased burden of disease among certain communities.

The impact of obesity

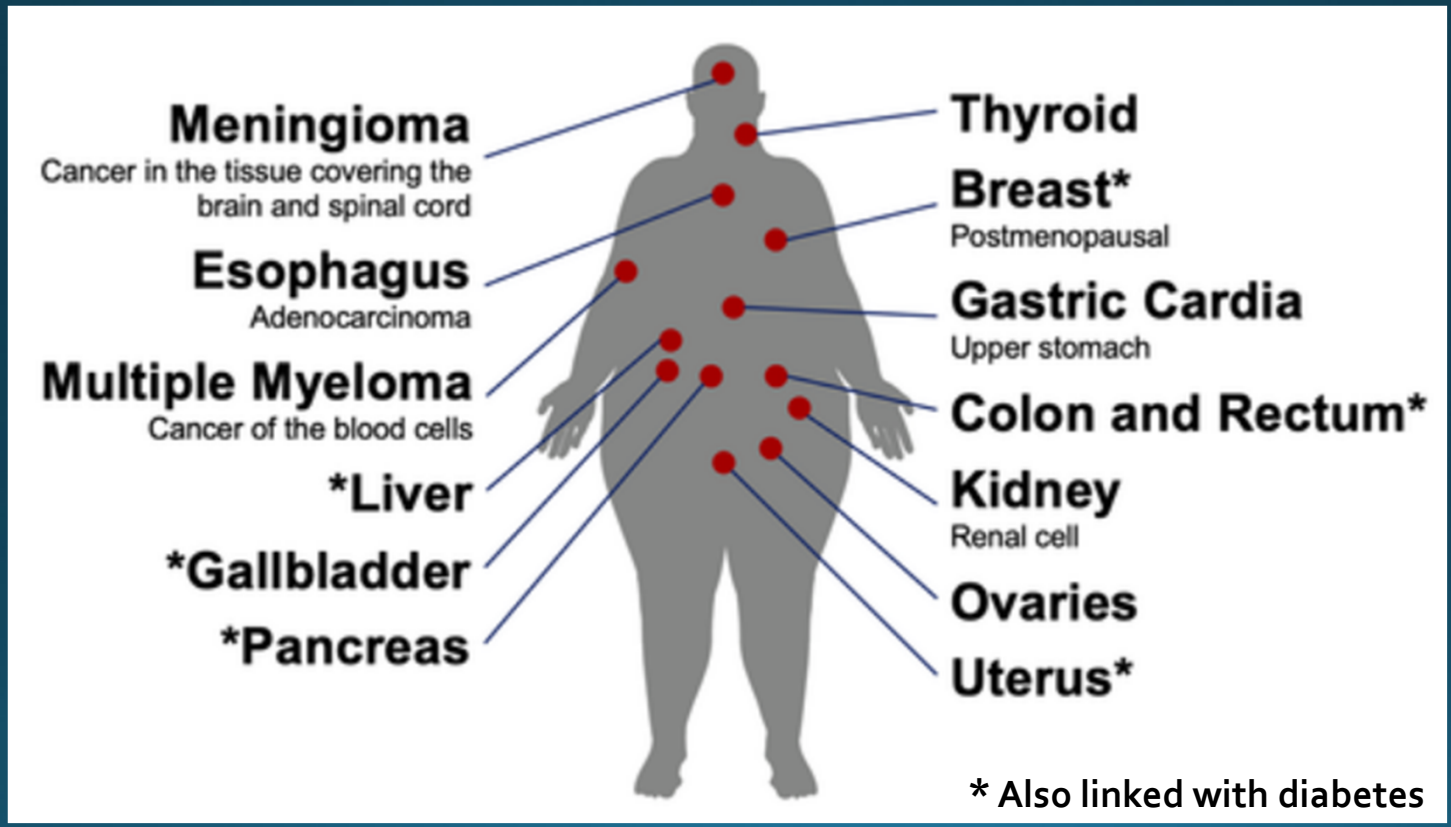
- Obesity is a complex, chronic, and relapsing disease that affects every aspect of a person's life, health and physiology
  - It is associated with over 250 diseases
- Its complexity and multifactorial nature necessitate a longitudinal, multi-modal, evolving and collaborative treatment approach that is person-focused and led
- Although the prevalence of obesity has ↑ worldwide, health disparities contribute to a disproportionate burden of disease in marginalized communities
  - Our experience with COVID-19 has highlighted many of the health disparities that are closely linked with obesity

The unprecedented consequences of obesity in the US

- By the year 2030, it is projected that 1 in 2 adults in the US will have obesity
  - 1 in 7 will have diabetes
  - Obesity is associated with > 200 other conditions

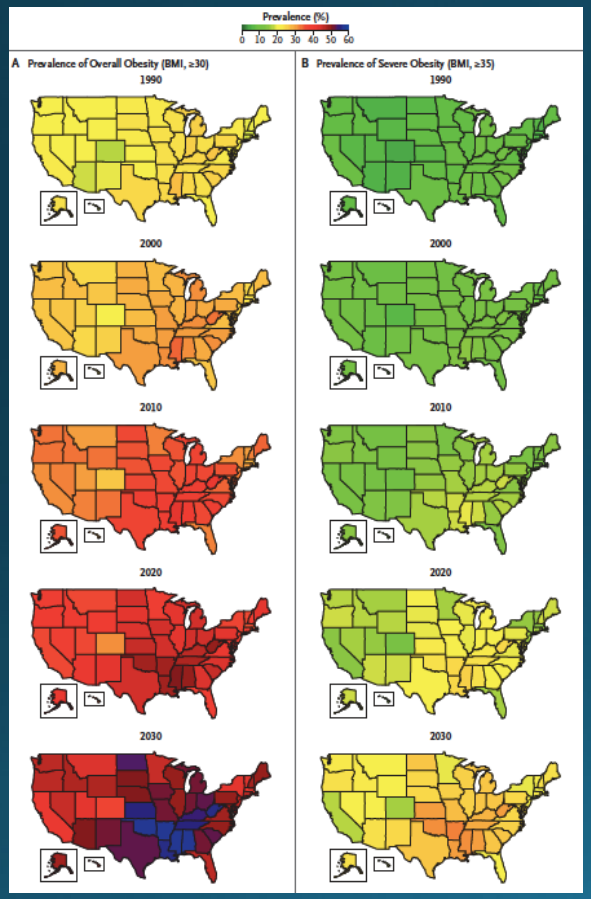
Ward ZJ et al. NEJM. 2019;381(25):2440-2450. https://doi: 10.1056/NEJMsa1909301
Brown JC, et al. *Obesity*. 2021;29: 954-959. https://doi.org/10.1002/oby.23161

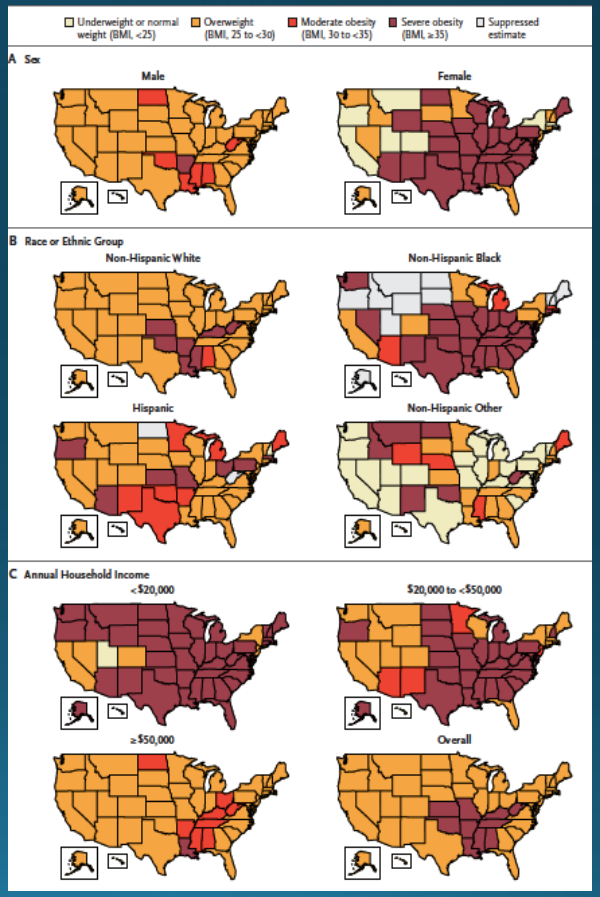
Obesity and diabetes ↑ a person's risk for many cancers



Source: Brown JC, et al. *Obesity*. 2021;29: 954-959. https://doi.org/10.1002/oby.23161

By 2030, 1 in 2 people in the US will have obesity…

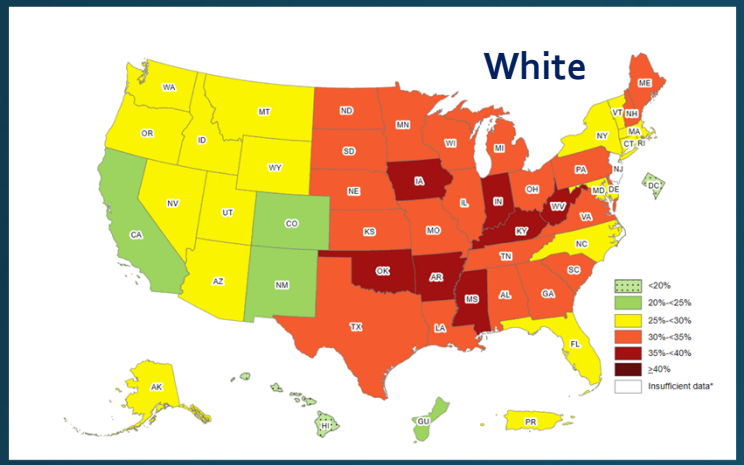


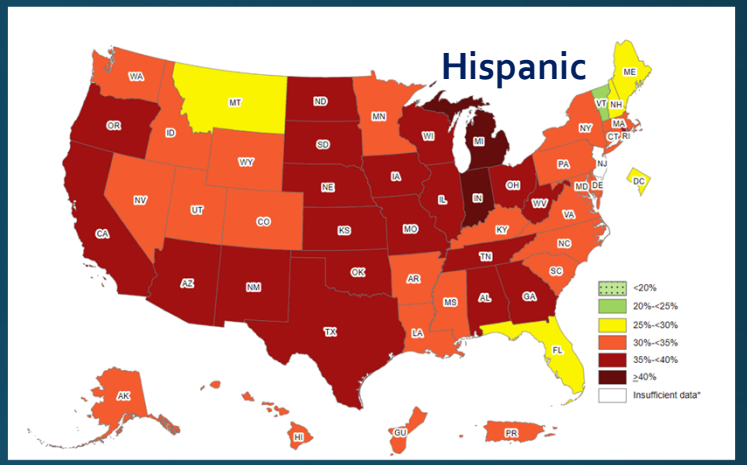


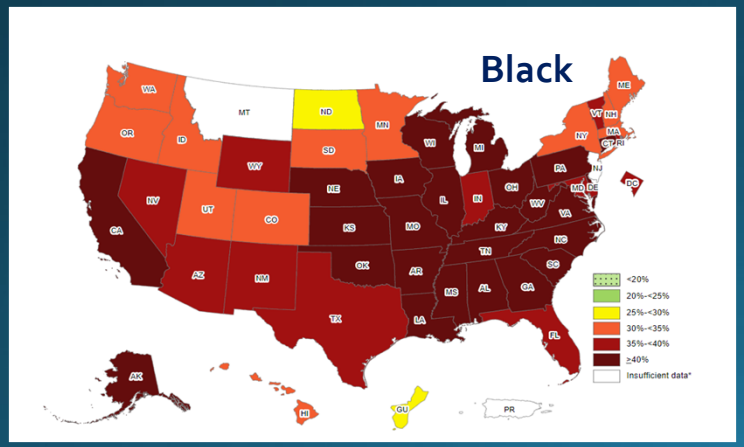
Source: Ward ZJ et al. NEJM. 2019;381(25):2440-2450. https://doi: 10.1056/NEJMsa1909301

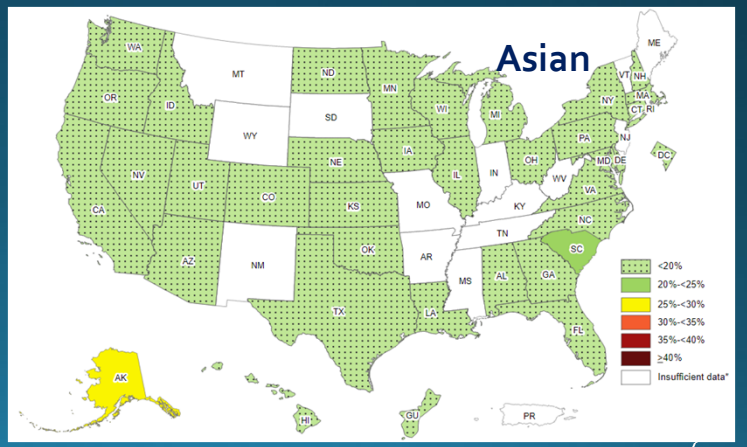
People of color have a disproportionately high burden of obesity

Prevalence of Self-Reported Obesity Among, by State and Territory, BRFSS, 2018–2020









Adult Obesity Prevalence Maps | Overweight & Obesity | CDC

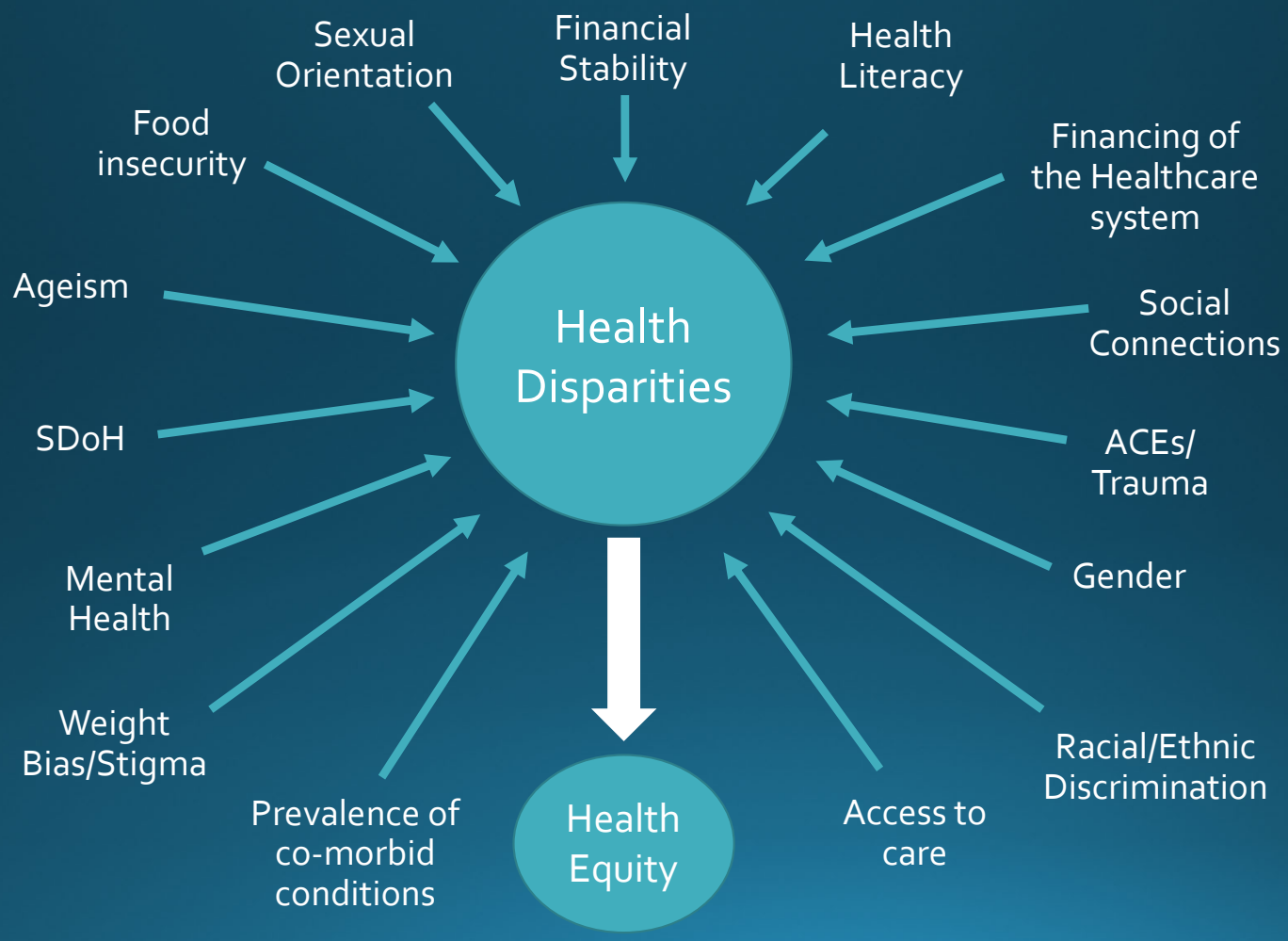
Health disparities & obesity

- **Obesity is more prevalent among middle-aged, rural, economically disadvantaged, and racial and ethnic minority populations**
  - Limited access to quality obesity medicine and bariatric surgery
  - Rural location
  - Medicare/Medicaid policies
- The most at risk groups are:
  - Women: African American (54.8%) > Hispanic (50.6%)
  - Men: Hispanic (43.1%) > African Americans (36.9%)
- Childhood obesity rates are rising at an alarming rate
  - Precipitous increase in class 3 obesity
    - Hispanic > African American

Access and utilization of obesity care

- Racial and ethnic differences influence an individual's perception of need and of healthcare professional's recommendation for obesity treatment (medical and surgical)
  - Less likely to consider surgery:
    - Men < women
    - African Americans < Whites
  - At higher BMIs, men and African Americans generally report higher quality of life scores
  - Relative to their BMI, African Americans are less likely to be diagnosed with obesity → ↓ referral to weight loss surgery centers

Factors contributing to health disparities in obesity

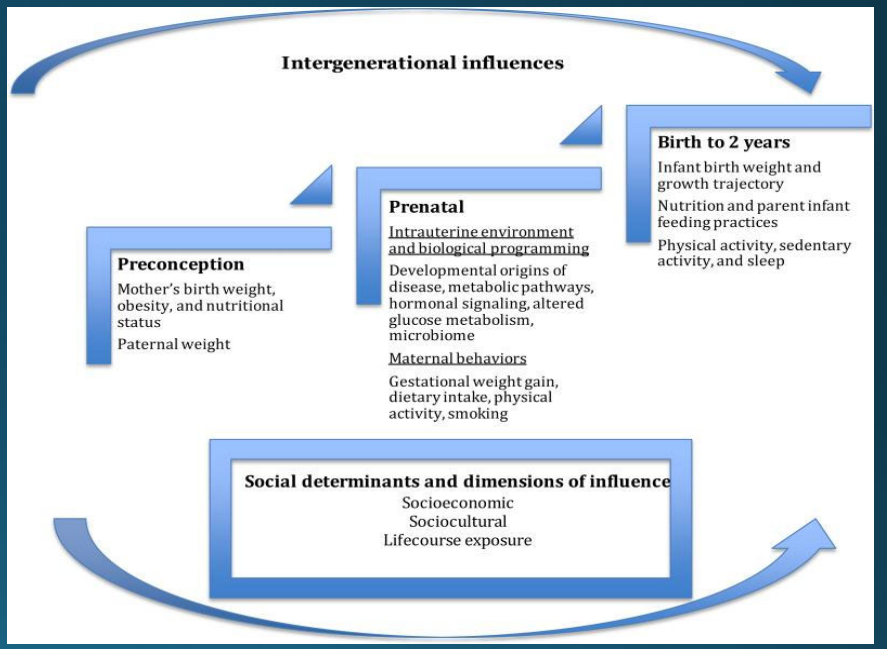


Maternal obesity at conception can adversely affect the mother and unborn child

- Maternal obesity →
  - ↑ risks for severe maternal morbidity: ↑ rate of miscarriage, pre-eclampsia, pre-term birth, gestational diabetes, and thromboembolism
  - ↑ risks to unborn child: Compromised placental health, embryonic and fetal health
- Effects on child persist after birth (***"gestational programming"***)
  - ↑ BMI in childhood → adolescence → adulthood
    - **Pre-gravid obesity is the strongest risk factor for childhood obesity and metabolic dysregulation**
  - ↑ risk of cardiovascular disease, diabetes, stroke, asthma, metabolic syndrome
  - Altered neurodevelopment (disrupted DNA methylation) → ↑ risk of depression, mental illness and schizophrenia
  - ↑ risk for poor cognitive performance
  - Greater tendency for internalization problems
  - ↑ risks for self-regulation issues (e.g., ADHD), autism

Maternal obesity at conception can adversely affect the mother and unborn child *(continued)*

- Racial/ethnic groups that have high levels of pre-pregnancy obesity:
  - Blacks
  - Hispanic
  - Asian/Pacific Islander
  - American Indian/Alaska Native
- Unless obesity is addressed in these populations, the groundwork is set up for transgenerational obesity in communities at greatest risk for health disparities.



Source: Haire-Joshu D, et al. *Ann Rev Public Hlth*. 2016;37:253-271.

Weight Stigma/Bias & Obesity

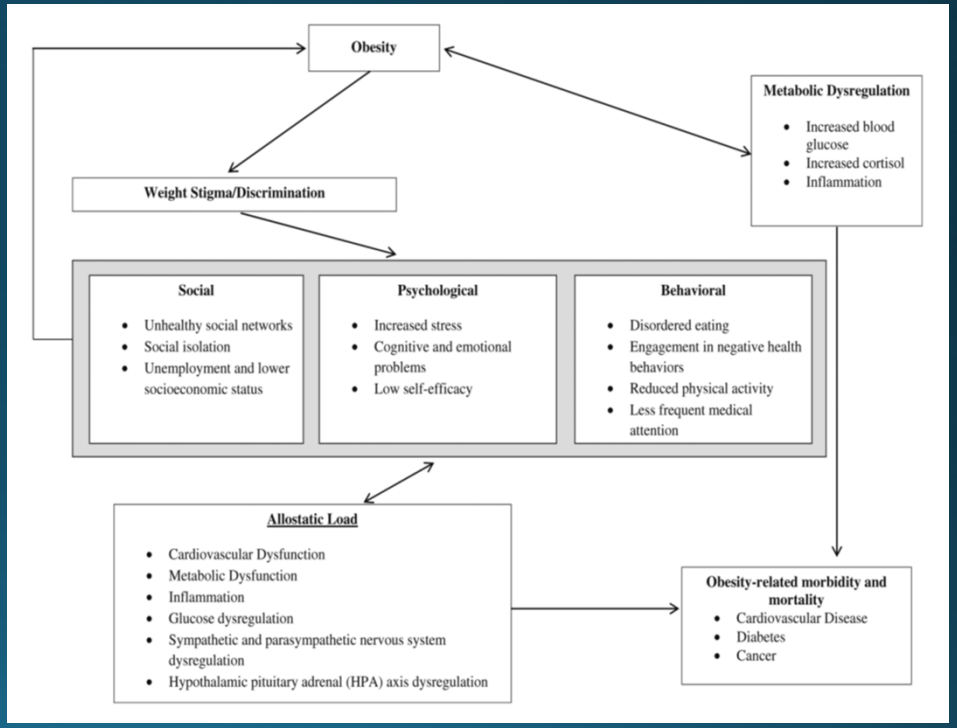
- Weight stigma = Social rejection and devaluation that occurs to those who do not comply with prevailing social norms of adequate body weight and shape
- Common sources of weight bias:
  - Family members
  - Classmates/Peers
  - Physicians, nurses, medical students and dieticians
- ***These experiences were most frequent and distressing during childhood and adolescence***
- **Women** — particularly stigmatized due to their weight across multiple sectors, including employment, education, media, and romantic relationships, etc.
- **Weight stigma ↑ all-cause mortality**
  - People who reported experiencing weight discrimination had a 60% ↑ risk of dying, independent of BMI
- *Nationally representative US data shows that people who perceived that they have experienced weight bias are ~ 2.5x as likely to experience mood or anxiety disorders*

Weight Stigma/Bias & Consequences

- Weight bias affects the quality of care that people with obesity receive:
  - Less time is spent with the person
  - Avoidance of delivery health care and preventive services, e.g., pap smears
  - Clinicians may not offer the full array of options due to implicit bias
    - ***"They won't do it anyway …"***
- Weight stigma may promote further weight gain and make mental health conditions worse
  - Use food to cope with stress
  - Avoid going to the gym
  - Have an unhealthy body image
  - Report higher stress

Allostatic Load & Weight Bias

- **Allostatic load:**
  - Cumulative **adverse** adaptation of multiple physiological systems in response to chronic stressors
  - Strongly linked to morbidity and mortality 2/2 chronic disease.
- ***Perceived weight discrimination → ↑ allostatic load most strongly affecting:***
  - Lipid/metabolic dysregulation
  - Glucose metabolism
  - Markers of inflammation



Source: Vadiveloo M, Mattei J. *Ann Behav Med*. 2017;51(1):94-104.

Race, ethnicity & sex influence distribution of adipose tissue

- Body fat, especially visceral adipose tissue (VAT) deposition, is associated with CVD, hypertension, diabetes mellitus, glucose intolerance, and insulin resistance in both men and women.
  - Leg fat has consistently been found to be negatively associated with CVD risk factors.
- CVD is a leading cause of death among women, surpassing cancer
  - While rates of CVD have ↓ for men, but this has not been the same in women.
- Important differences also exist amongst women of different races/ethnicities:
  - Black women have lower VAT for a given BMI, waist circumference, or waist-to-hip ratio than white women
  - Hispanic women have greater VAT than black women and greater percentage body fat than white and black women for a given BMI

The impact of obesity on breast cancer risk and survival

- In the US, there are large differences in both breast cancer rates and the prevalence of obesity across racial/ethnic groups.
  - Breast cancer incidence is higher in non-Hispanic whites, but:
    - 5-year breast cancer–specific survival rates are lowest amongst African Americans, followed by Hispanics
- Obesity and weight gain during adulthood are associated with ↑ postmenopausal breast cancer risk
  - VAT/central obesity is associated with ↑ breast cancer risk in postmenopausal women

The role of diet in the risk of developing obesity

- What a person starts eating from birth, infant breast feeding and the age of introduction of solid foods, the intake of sugar-sweetened beverages, and fast-food consumption all impact a person's risk for obesity.
- African American and Hispanic children:
  - Much more likely to be exposed to lower quality diets.
  - More likely to consume sugar-sweetened beverages and fast food by the age of 2 years compared to other racial/ethnic groups

Food insecurity & obesity

- The prevalence of food insecurity is higher among African American and Hispanic households
  - 2x greater than non-Hispanic white households
- Lower-income households (those below 185% of the poverty threshold) vs. higher-income households.
- There is a correlation between food insecurity and obesity
- Studies have shown a strong association between food insecurity and poor cardiovascular health
- Food insecurity is associated with:
  - 57 % higher odds of being diagnosed with CHD
  - 81 % higher odds of angina pectoris
  - 2x odds of heart attack

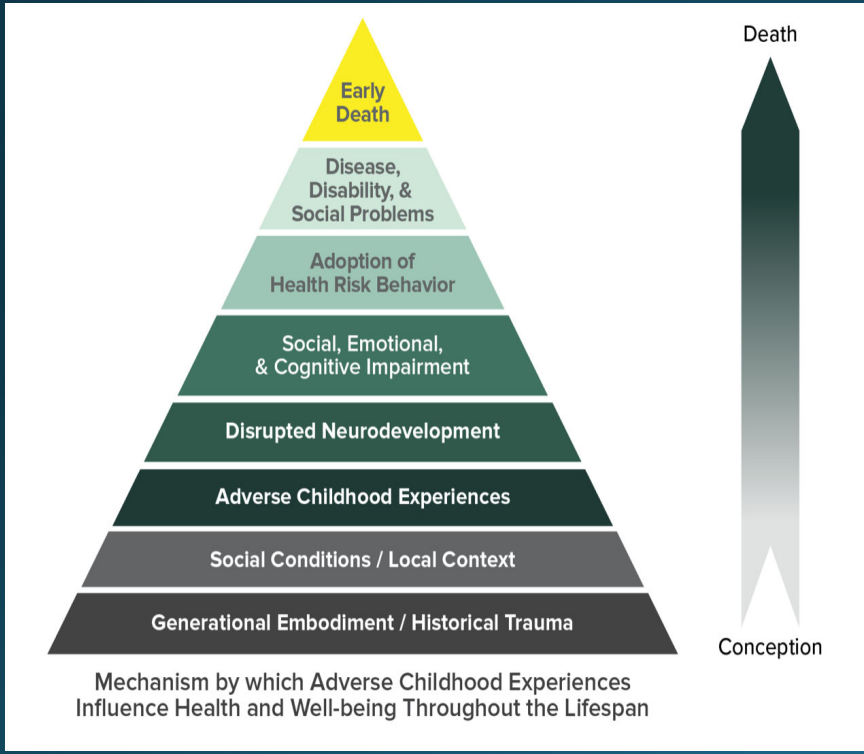
Disparities in physical activity

- Adherence to the physical activity guideline among US adults is low
  - Nationally representative data from 2015: only 18% of the obese population met the physical activity guidelines
  - 8.3% of deaths amongst non-disabled adults >25 years can be attributed to physical inactivity
- The prevalence of physical **in**activity among adults is **higher** in:
  - Females vs. males
  - Hispanic, Black and American Indian/Alaska Native adults vs. white, multiracial & Asian adults
  - Adults $\geq$ 65 years – prevalence of physical inactivity ↑ with ↑ age
  - Adults $\geq$ 25 years with less than a high school education – 3x greater than those with a college degree
  - Adults ages $\geq$ 25 w/an annual household income < $25,000
- Prevalence of physical inactivity ↓ with each ↑ in education level
  - Prevalence ~3x greater than those with an income of $\geq$ $75,000
  - Prevalence of physical inactivity ↓ with each ↑ in income level

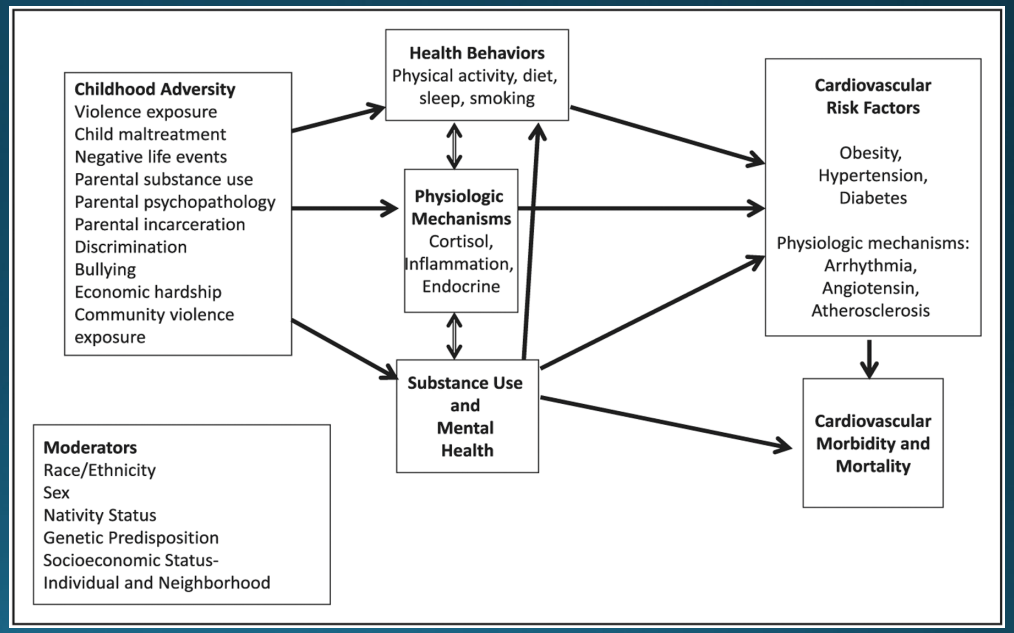
ACEs & Obesity

- Adverse childhood experiences (ACEs) are associated with obesity throughout a child's life, as well as well as poor neurocognitive health
  - ↑ ACEs are associated with > obesity (**especially abdominal adiposity**) and poorer neurocognitive effects (especially ≥ 4 ACEs)
    - May impairs one's ability to self-regulate
    - May affect a person's weight loss efforts
    - **Obesity ↑ risk for 250+ comorbidities, including mild cognitive impairment and neurodegenerative disease.**
- **The effects of ACEs may not be immediate, but are enduring**
  - The effect of ACEs on development of childhood obesity may take 2–5 years to manifest
- LGBTQ adolescents are at ↑ risk for victimization and substance abuse
  - Also, at ↑ risk for weight victimization from family and peers

Conceptual model of the relation between ACEs & cardiometabolic health



Source: CDC Kaiser-ACE Study. https://www.cdc.gov/violenceprevention/aces/about.html



Source: Suglia SF et al. *Circulation*. 2018 Jan 30;137(5):e15-e28.

Acculturation & obesity in the US

- Greater length of time (> 15 years) in the US → ↑ the risk for obesity
  - ↑ length of time in the US is significantly associated with both self-rated poor health and obesity
  - Includes men and women
- Time in the US and obesity:
  - Female immigrants in the US for ≥ 15 years are more likely to be obese than those in the US ≤ 5 years
  - Male immigrants in the US for ≥ 10 years are more likely to be obese than immigrants in the US ≤ 5 years

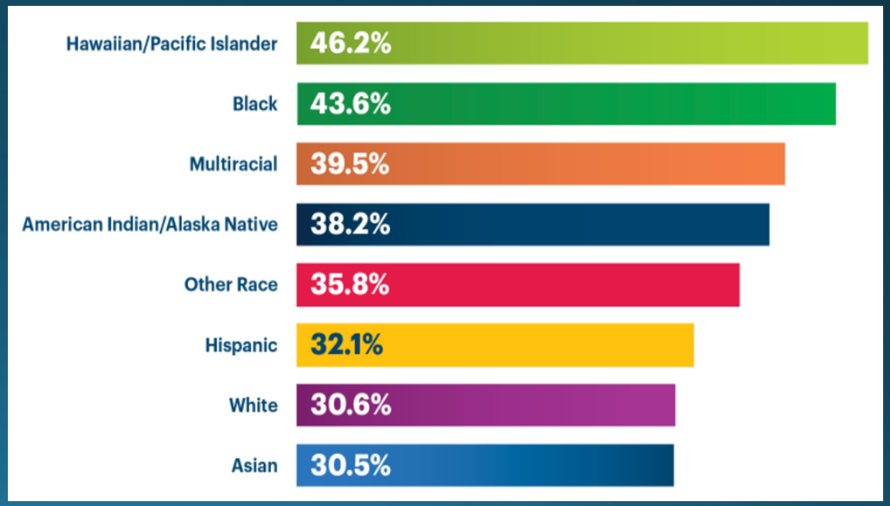
The LGBTQ community & obesity

- Members of the LGBTQ community, especially those of color, experience important health disparities related to obesity
  - LGBTQ women may be at ↑ risk of developing type 2 diabetes vs. their heterosexual counterparts (likely mediated by obesity)
  - Bisexual men also appear to have greater rates of obesity → ↑ risk for type 2 diabetes than heterosexual men
- The long-term effects of stigma and discrimination are likely important contributors to the increased rates of obesity and type 2 diabetes in this community.

Disparities in sleep health

- Sleep deficiency, which includes insufficient sleep duration, irregular timing of sleep, poor sleep quality, and sleep/circadian disorders is highly prevalent in modern society.
- ~ 30% of men and women and 60% of adolescents fail to get enough sleep
- 20% of adults experience excessive daytime sleepiness
- 5–25% of adults meet objective criteria for sleep disordered breathing (SDB)
- 20–30% report insomnia symptoms
- ~ 1/3 of the US workforce is engaged in shift work
- Disordered sleep is associated with ↑ risk for:
  - Obesity
  - Cardiovascular
  - Metabolic disease
  - Psychiatric illness
  - Substance abuse
  - Pregnancy complications
  - Impaired neurobehavioral and cognitive impairment

- Racial/ethnic differences are associated between sleep duration and self-reported hypertension, hyperlipidemia, and diabetes, and inflammation
- Strong association between short and long sleep duration and diabetes, found in African American adults



Source: 2021 Health Disparities Report. American's Health Report.

Mrs. Sanchez

- Now let's discuss the case of Mrs. Sanchez, a 45-year-old Hispanic female
- Pertinent vitals: BMI of 43.5kg/m^2
- PMHx: Type 2 diabetes, metabolic syndrome, NAFLD and insomnia
- Pertinent ROS: depressed mood, low energy, 6/10 pain in B/L knees
- Relevant SHx: Married, has three children ages 14, 10, and 8. Works two jobs: Call center and Amazon warehouse. Migrated from Colombia 15 years ago.

Image Source: https://www.niddk.nih.gov/health-information/diabetes/overview/what-is-diabetes/prediabetes-insulin-resistance

Call to Action

- Obesity is a complex, chronic, and relapsing disease that requires a comprehensive, multidisciplinary and longitudinal treatment approach
- People in marginalized communities have a disproportionately high burden of obesity and its associated conditions
- More needs to be done to increase access to care and to address the SDoHs that drive and contribute to obesity

Thank you and questions

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