UNIVERSITY of DELAWARE

Obesity in Underserved Populations: Untangling the Web of Causation

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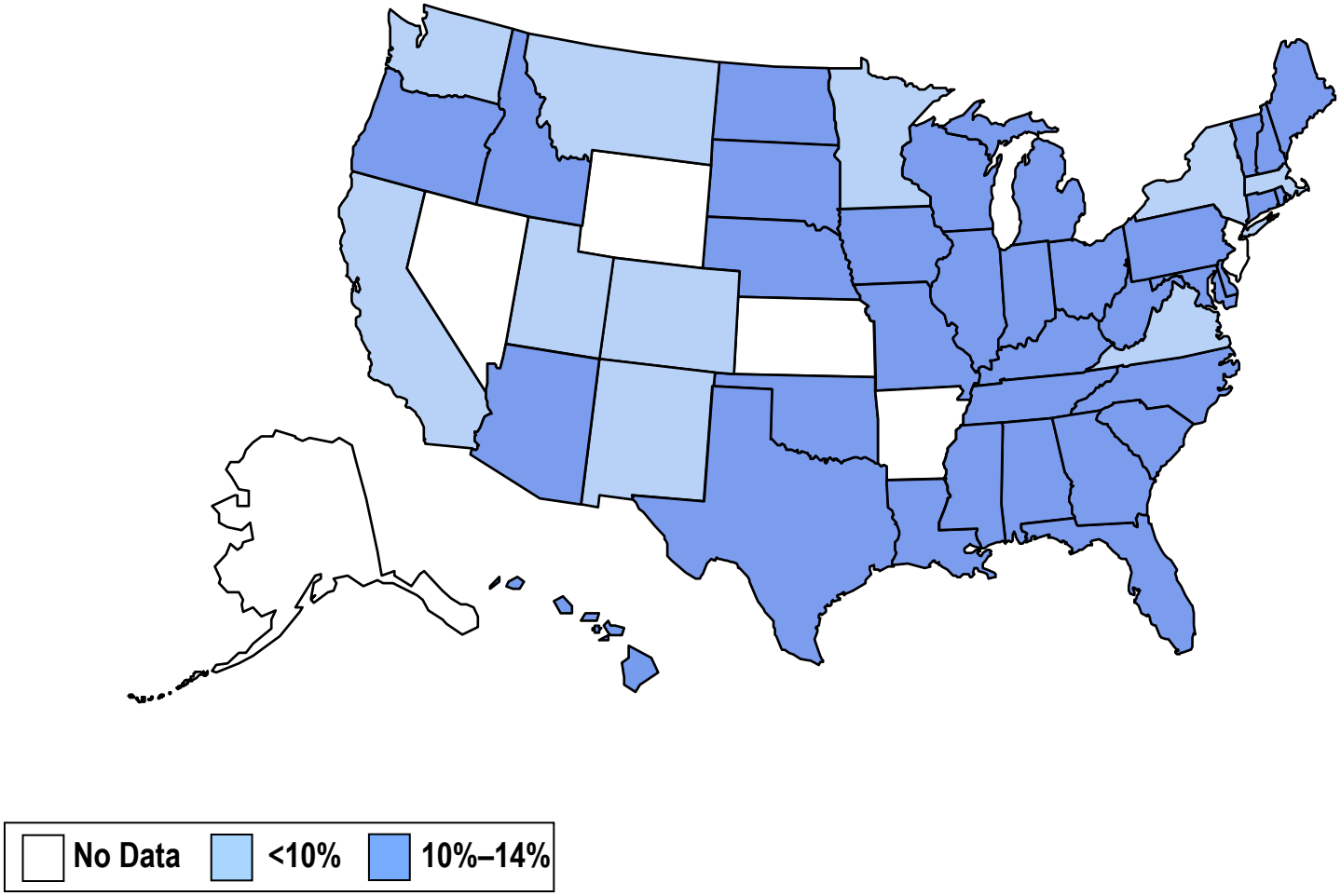
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)



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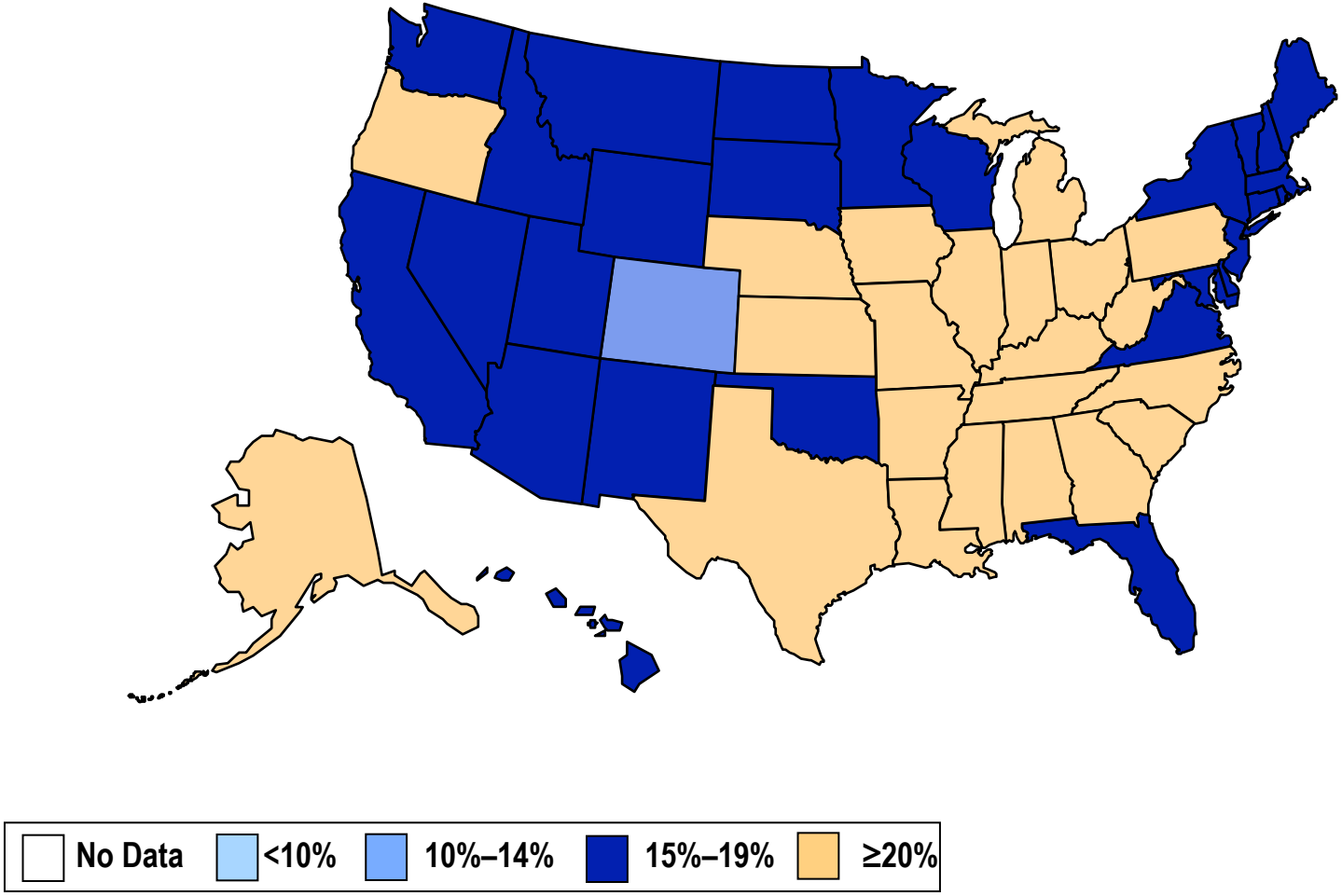

Obesity Trends* Among U.S. Adults

BRFSS, 2010

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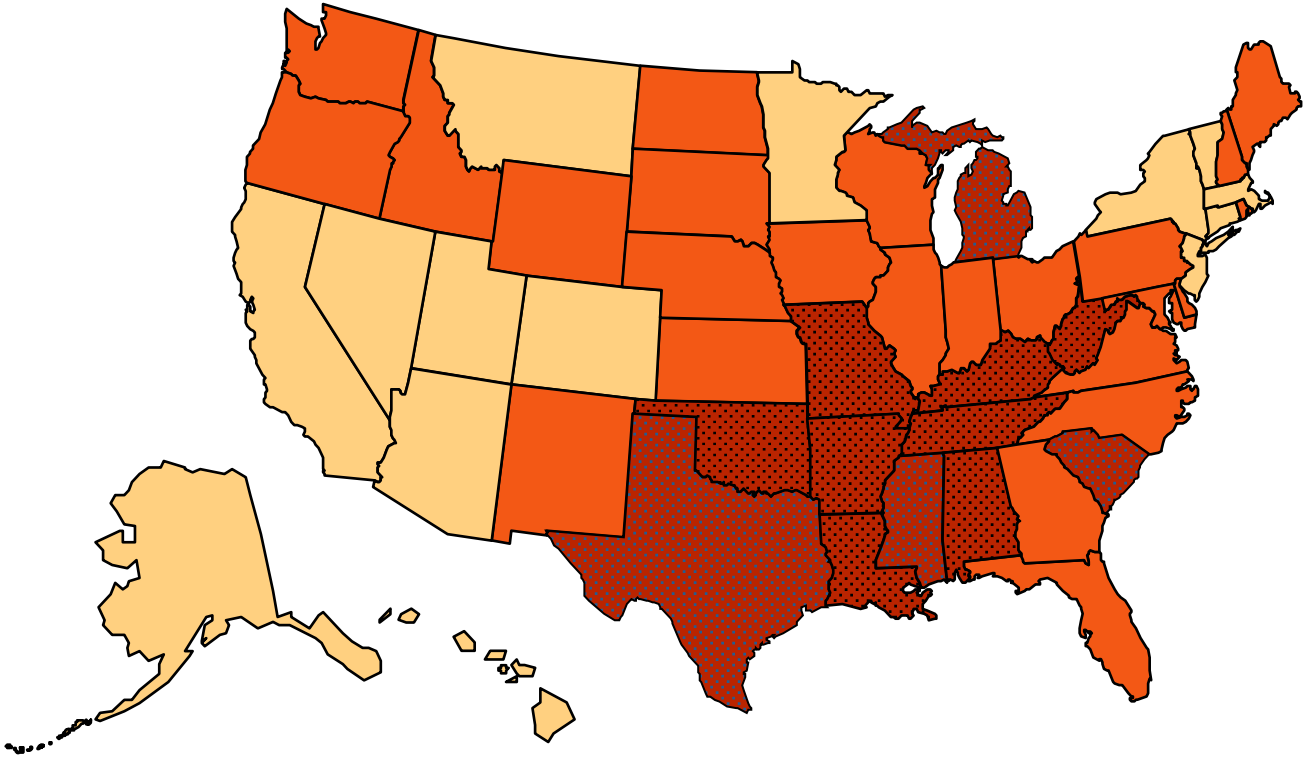
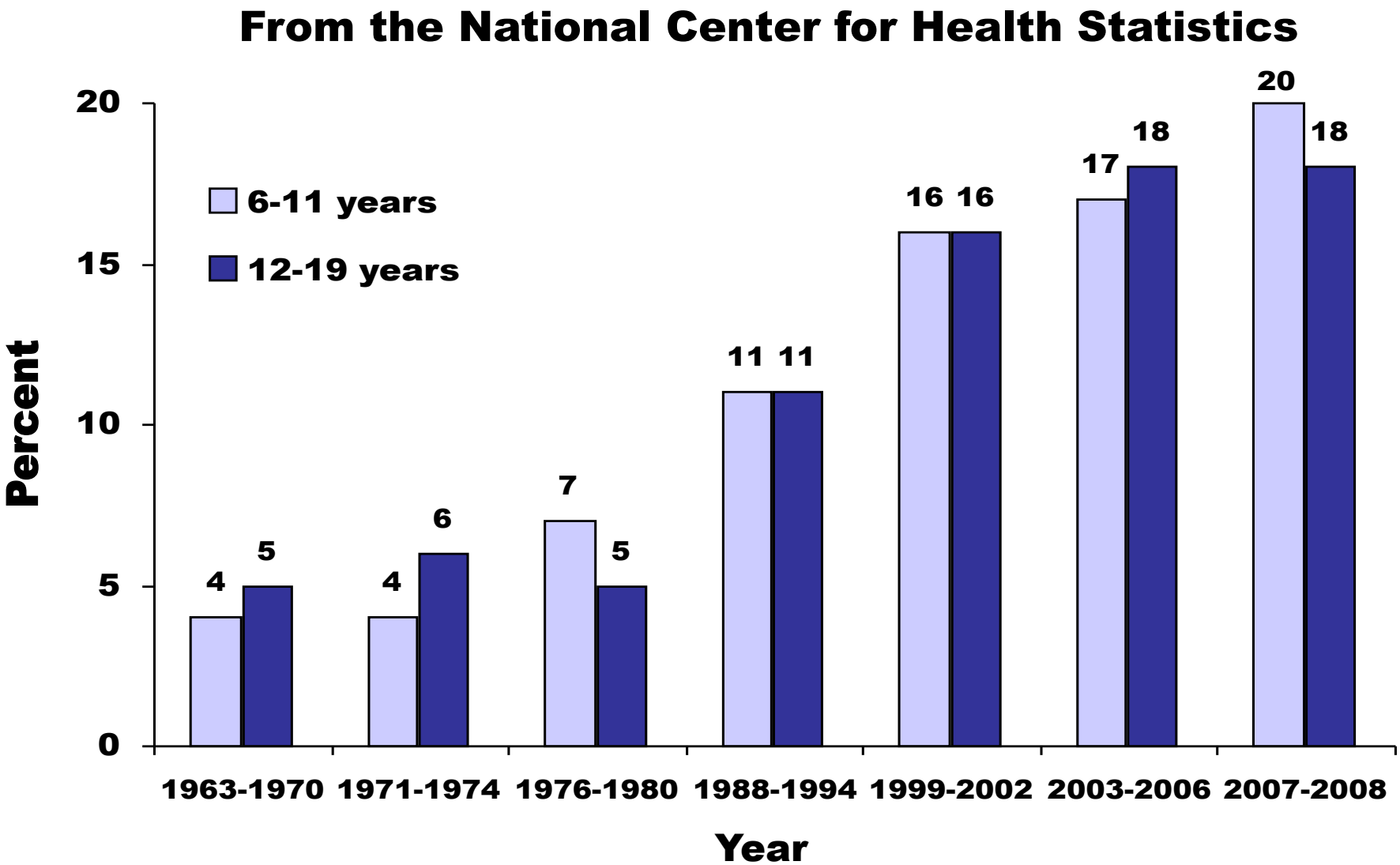
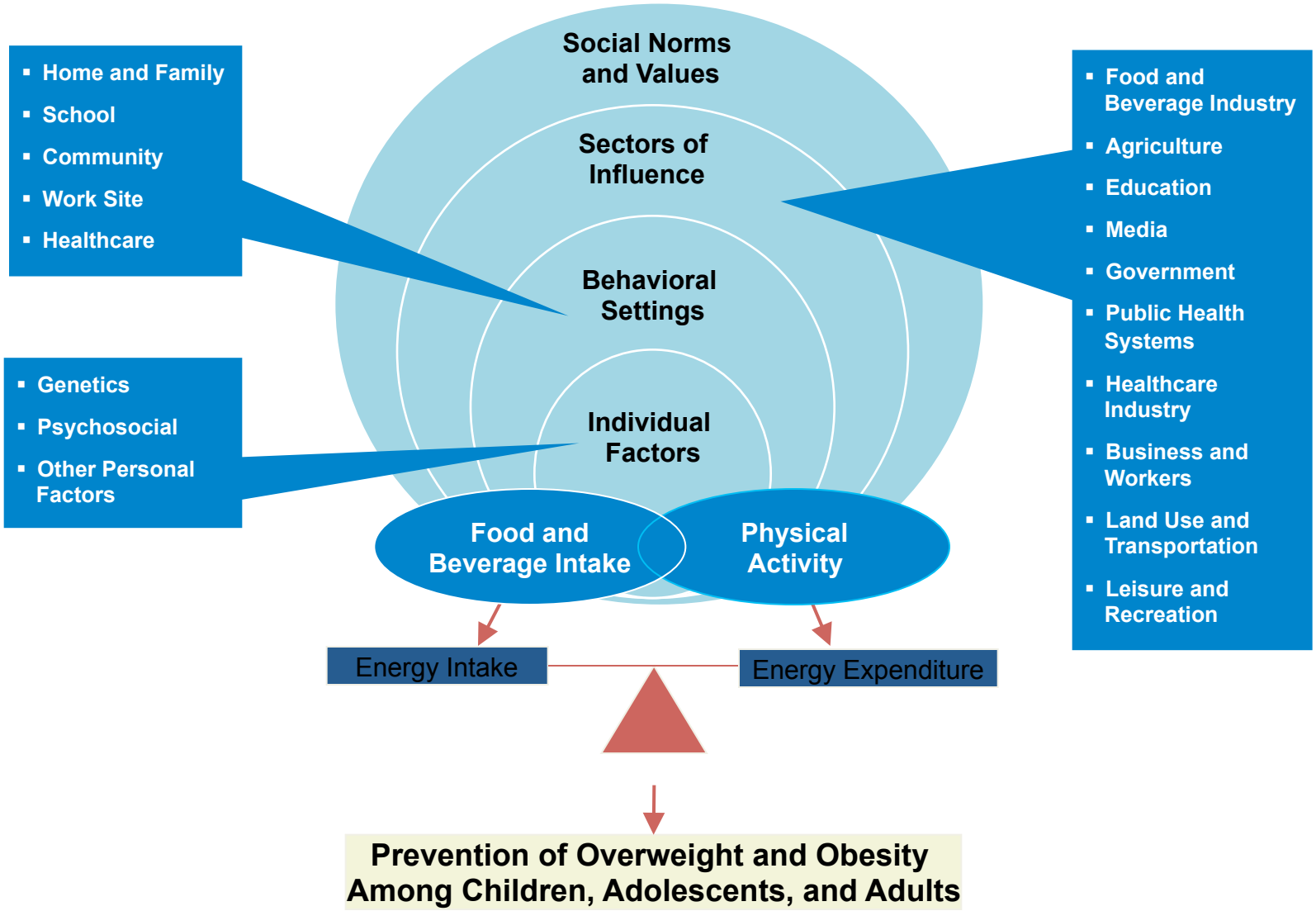


No Data	<10%	10%–14%	15%–19%	20%–24%	25%–29%	≥30%

Prevalence of obesity by age and time



CDC Framework for Preventing Obesity (adapted from IOM 2005)



Environment and Obesity

- Environmental factors associated with increased risks of obesity
  - Food availability
  - ***Walkability***
  - Neighborhood safety
  - Proximity to health care providers
  - Social norms
  - Racial segregation
  - Socioeconomic status/poverty

Paradox for disadvantaged populations: the example of walkability

- Walkability is …..

"Extent to which characteristics of the built environment and land use may or may not be conducive to residents walking for leisure, exercise, or transport (work or services).

Leslie et. al, 2007

Example: New York City

- BMI is lower in areas with higher walkability, that is higher population density, more mixed land use, more commercial space and more access to transit (Rundle et. al, 2007)

- How does neighborhood walkability play a role in explaining obesity related health disparities?

Paradox

- Density, land use mix, transit use and transit access are high in disadvantaged areas

- No consistent association among these factors and obesity (Papas et. al., 2007)

Explaining the Paradox

- Other factors may play a greater role in influencing obesity in disadvantaged areas
  - After controlling for walkability, disadvantaged neighborhoods had worse aesthetic features and less safe areas (Neckerman et al., 2009)

- Disadvantaged populations may respond differently to their environment

Individual, Societal and Environmental Influences on Obesity

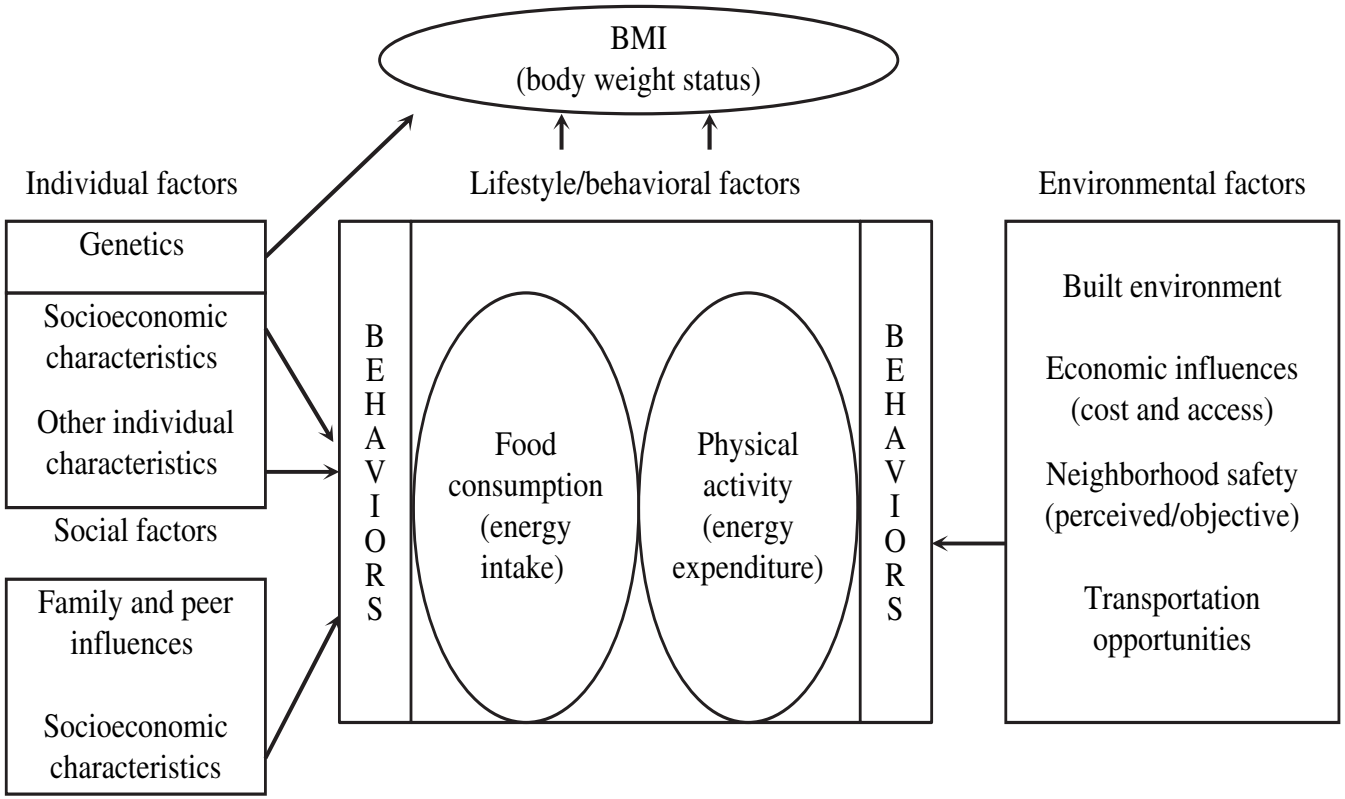


FIGURE 1. Ecologic model relating the built environment to physical activity, diet, and body weight. BMI, body mass index. Reproduced with the permission of Lisa Powell et al., ImpacTeen Program Office, Institute for Health Research and Policy, University of Illinois at Chicago, Chicago, Illinois (www.impacteen.org).

Papas et. al, 2007

Ongoing Population Based Observational Studies

Washington County, Maryland (1989-Present)

↓

812 rural, low-income non-Hispanic White adolescents

"CLUE II" Study

Baltimore City, Maryland (1997-Present)

↓

181 urban, low-income African American adolescent mothers

"3-Generation Project"

CLUE II in Washington County, Maryland

- 812 adolescent study participants were recruited in 1989:
  - 41% male
  - 90% non-smokers
  - 33% middle school (6th - 8th grade)
  - 67% high school (9th - 12th grade)
  - 9% of adolescents were obese (BMI $\geq$ 95th%)

Adolescent mothers in the "3-Generation Project"

- 181 adolescent African American mothers were interviewed at and one year after delivery (1999):
  - 93% single
  - 62% in high school
  - 87% lived with mother
  - 18% initiated breastfeeding
  - 33% were obese (BMI $\geq$ 95th percentile)

Summary inferences from two studies

- Poor dietary habits evident in both child and adolescent populations
- Frequent fast food consumption was associated with poor dietary habits and risk of obesity among adolescents from 2 disparate communities
- Adolescence may provide a critical window for interventions that promote healthy dietary habits and lower risk of obesity and other chronic diseases

Future research strategy for prevention of childhood obesity

- Development and evaluation of multifactorial interventions
  - Community
  - Schools
  - Home
  - Individuals

  } Contextual designs

- Include measures of energy intake AND expenditure

Building Partnerships

- State Division of Public Health
- State Department of Education
- Advisor on a Governor's Council
- Nemours Health and Prevention Services
  - Combat Childhood Obesity and Make Delaware Kids the healthiest in the Nation
- External Institutions
  - Drexel University School of Public Health
  - University of Maryland, Baltimore
  - Johns Hopkins School of Public Health

Funding Avenues

- National Institute of Health
- National Cancer Institute
- Centers for Disease Control and Prevention
  - Maternal and Child Health Bureau
- United States Department of Agriculture
- Department of Transportation
- Robert Wood Johnson Foundation
- Pew Health Impact Project

Reversing the obesity epidemic is a shared responsibility. Social and environmental changes are influenced by the efforts of many…