

Childhood Obesity: Strategies to Prevent Future Chronic Diseases (Cancer, Heart Disease, Diabetes)

Monica L. Baskin, PhD

Associate Professor

University of Alabama at Birmingham

Division of Preventive Medicine

Health Outcomes Among Children and Families Living
in Rural Communities: A Trans-Agency Conference
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Presentation Objectives

1. Review the current state of childhood obesity
2. Describe a comprehensive model for understanding and addressing childhood obesity in rural communities
3. Discuss promising strategies for rural communities to reduce children's risk of future chronic disease

Child and Adolescent Weight Status

Among youth, weight status is defined using sex- and age-specific BMI. Cutoffs are based on 2000 CDC growth charts for the US.

Overweight $85^{\text{th}} \text{ percentile} \leq \text{BMI} < 95^{\text{th}} \text{ percentile}$

Obese $\text{BMI} \geq 95^{\text{th}} \text{ percentile}$



Childhood Obesity: A Public Health Problem

- Rates of childhood obesity have more than triples over the past 30 years. ¹
- Today, about 1 in 3 children in the United States are overweight or obese.²
- Further, 17% of US youth are obese. ²

¹ Centers for Disease Control and Prevention, www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.pdf

² Ogden et al., 2010, JAMA, 303(3), 242-249.

Risk of High BMI

- Racial/ethnic minority youth are increased risk for higher BMI (97th %ile or higher).
- Relative to non-Hispanic boys, odd ratios for Non-Hispanic black boys is 1.27 and Hispanic boys is 1.72.²
- Relative to non-Hispanic girls, odd ratios for Non-Hispanic black girls is 1.77 and Hispanic girls is 1.37.²

² Ogden et al., 2010, JAMA, 303(3), 242-249

Geographic Disparities

- Significantly higher rates of childhood obesity in the southern US including Arkansas, Georgia, Kentucky, Mississippi, and Tennessee.⁴
- Residents of rural vs. urban communities have an increased burden of obesity and chronic diseases such as hypertension, heart disease, cancer, and stroke.^{5,6,7}
- Adult rural residents also have higher rates of premature mortality.⁸

⁴Bethell, et al. (2010). *Health Affairs*, 29(3), 347-356; ⁵Jackson et al. (2005), *Journal of Rural Health*, 21(2), 140-148;

⁶Joens-Matre, et al. (2008). *Journal of Rural Health*, 24(1), 49-54; ⁷Krishna, et al. (2010). *Journal of Rural Health*, 26(1), 3-11; ⁸Jones et al. (2009) Economic Research Service, www.ers.usda.gov/publications/eib57/

Short-term Health Consequences

Cardiovascular Health⁹

- ☐ High Cholesterol
- ☐ High Blood Pressure

The Endocrine System¹⁰

- ☐ Type 2 Diabetes
- ☐ Insulin Resistance
- ☐ Impaired Glucose Tolerance
- ☐ Menstrual Irregularities

Mental Health¹¹

- ☐ Depression
- ☐ Low Self-Esteem

Pulmonary Complications^{12,13}

- ☐ Asthma
- ☐ Sleep Apnea

Orthopedic Complications^{12,14}

- ☐ Bowed Legs
- ☐ Hip Disorders

Social/Interpersonal^{15,16}

- ☐ Discrimination
- ☐ Teasing
- ☐ Stigmatization

⁹Freedman et al. (2007), *Am J Clin Nutr*, 86(1), 33-40; ¹⁰Whitlock et al. (2003), *Pediatrics*, 116(1), e-125-144; ¹¹Young-Hyman et al. (2006), *Obesity*, 14(12) 2249-2258; ¹²Han et al. (2010) *Lancet*, 375(9727), 1737-1748; ¹³Sutherland (2008), *Immunol Allergy Clin North Am*, 28(3), 589-602 ; ¹⁴Taylor et al. (2006), *Pediatrics*, 117(6), 2167-2174; ¹⁵Robinson (2006), *J Sch Nurs*, 22(4), 201-206; ¹⁶Schwartz and Puhl (2003), *Obesity Reviews*, 4(1), 57-71

He/She Will Grow Out of It

- 10% of overweight toddlers,
- 24% of overweight preschool children,
- 50% of overweight school-age children,
- 70% of overweight teenagers

...will become obese adults.^{17, 18, 19}

¹⁷Serdula, M.K. et al. (1993), *Prev Med*, 22, 167-177; ¹⁸Whitaker, R.C. et al. (1997), *NEJM*, 337, 869-873; ¹⁹US Department of Health and Human Services (2001), www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf

Long-term Health Consequences

- **Type 2 Diabetes**²⁰
- **Cardiovascular Disease**²¹
- **Numerous Cancers**²²
 - breast, colon, kidney, pancreas, gall bladder, thyroid, ovary, cervix, and prostate
- **Osteoarthritis**²³
- **Stroke**²⁴

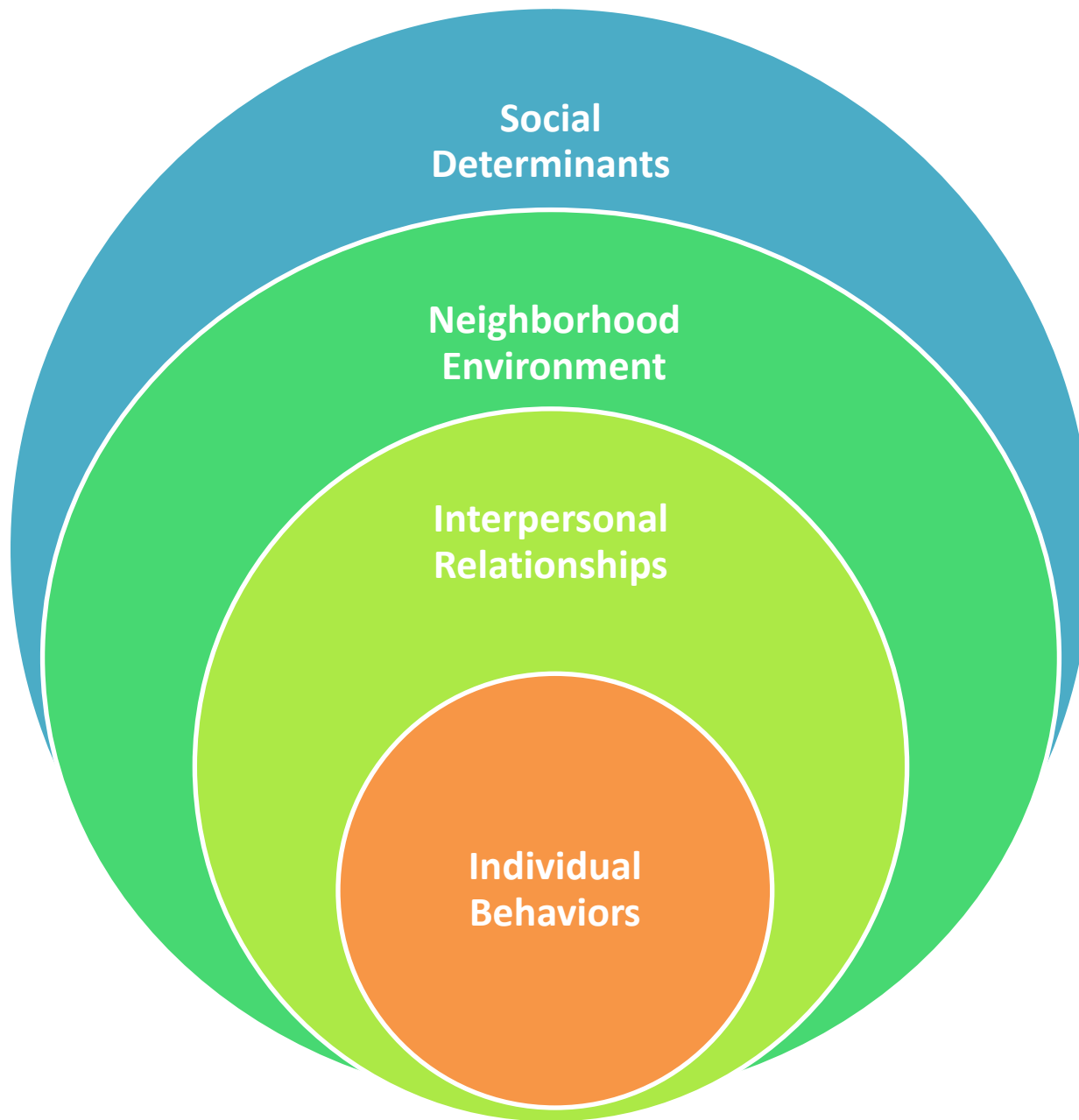
²⁰US Department of Health and Human Services (1998), www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf ;

²¹Freedman et al. (2001), *Pediatrics*, 108(3) 712-8; ²²Kushi et al. (2006), *CA: A Cancer Journal for Clinicians*, 56, 254–281; ²³Bijlsma et al. (2011), *Lancet*, 377(9783), 2115-26; ²⁴Must et al. (1992), *N Engl J Med* 1992; 327:1350-1355

MULTIPLE INFLUENCES ON OBESITY AND CHRONIC DISEASE RISK

A Socioecological Approach To Understanding And Addressing Childhood Obesity In Rural Communities

- An ecological approach assumes that health is a function of multiple environmental subsystems including family, community, workplace, cultural factors (beliefs, traditions), economics, physical environment, and social relationships.
- Interventions must be comprehensive in addressing the subsystems that negatively impact an individual's ability to lead a health lifestyle.



Individual Behaviors

- A recent systematic review the literature suggests no differences in physical activity levels among youth living in rural vs. urban areas; however, younger children may be more physically active. The difference is likely associated with the greater duration to time spent outside in unstructured play.²⁵
- Youth in rural areas tend to have a greater acceptance of larger body types.²⁶

²⁵Sandercock et al. (2010), *Prev Med*, 50, 193-198; ²⁶Williams et al., (2008), *Rural Remote Health*, 8(2), 932.

Interpersonal Factors

- Perceived limited social support for healthy eating and regular physical activity
- Desire to maintain cultural traditions (e.g., Southern cooking)
- Physical activity seen as “work”



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Neighborhood Environment

- Rural communities typically have fewer large-size food stores.^{27,28}
- Limited availability of fruits and vegetables and other healthier options in rural convenience stores vs. grocery stores.²⁹
- Often residents must travel long distances to a supermarket and public transportation is limited (if it exists).²⁹

²⁷Ford et al. (2010), *J Hunger Environ Nutr*, 5(2), 216-233; ²⁸Kaufman (1998), *Rural Devel Perspect*, 13(3) 19-26;

²⁹Sharkey et al. (2009), *Am J Prev Med*, 36(4, Supp 1), S151.

PhotoVoice: Food Access



Deep South
Network for
Cancer Control

U54 CA1537191 (Partridge)

Neighborhood Environment

- Limited public recreational facilities and parks
- School facilities not accessible for community use
- Limited street lights, posted speed limits, sidewalks/buffers/shoulders
- Poor connectivity to other places in town



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PhotoVoice: Physical Activity Opportunities and Access



Deep South
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Social Determinants



	Alabama	Dallas County	Shelby County
High school graduation	67%	55%	80%
Some college	55%	45%	75%
Unemployment	10.1%	19.7%	7.1%
Single-parent households	36%	56%	19%
Median household income	\$42,586	\$27,992	\$71,785

Source: *County Health Rankings: Mobilizing Action Toward Community Health: Snapshot 2011*. The Robert Wood Johnson Foundation and The University of Wisconsin Population Health Institute. Available at: <http://www.countyhealthrankings.org/alabama>

Social Determinants



	Alabama	Dallas County	Shelby County
Children in poverty	22%	44%	8%
Eligible for free or reduced lunch	51%	76%	19%
Access to healthy foods	60%	50%	67%
Access to recreational facilities	8	0	14
Physical inactivity	31%	35%	24%

Source: *County Health Rankings: Mobilizing Action Toward Community Health: Snapshot 2011*. The Robert Wood Johnson Foundation and The University of Wisconsin Population Health Institute. Available at: <http://www.countyhealthrankings.org/alabama>

PROMISING STRATEGIES TO ADDRESS CHILDHOOD OBESITY AND REDUCE CHRONIC DISEASE RISK

Community Engaged Research and Interventions

- Include community members as partners in developing, implementing, and evaluating programs and policies
- Build on existing traditions with respect to food, music, and types of activities rather than “force-fit”
- Embed programs within an existing community institutions or organization (e.g., church, social/civic group, 4-H club)
- Program content (e.g., terminology, language, symbolism, role models, choice of incentives) should respect and match the target population

Community Engaged Research and Interventions

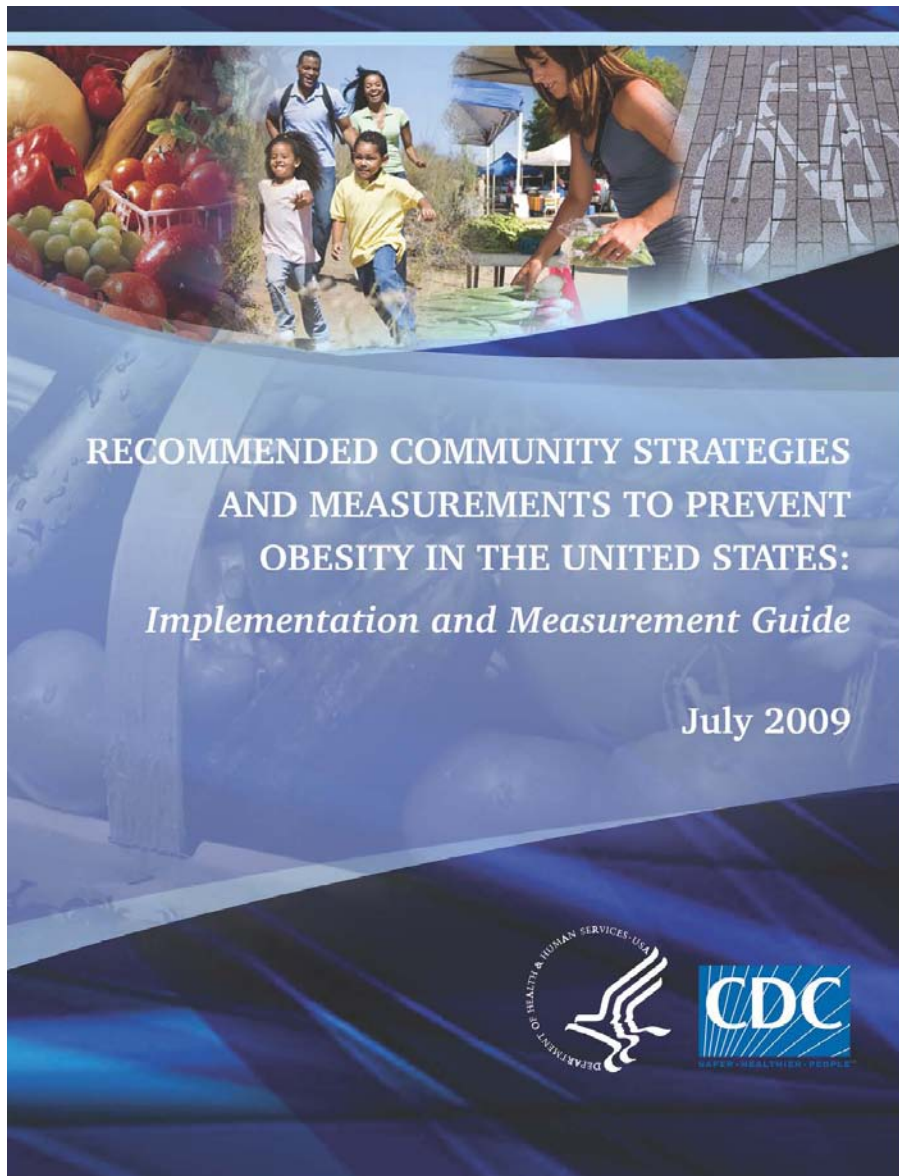
- Collect formative data to identify important cultural variables and understand there may be culturally-driven concerns (e.g., body image; perceived need for weight control; parenting styles)
- Select recruitment strategies and venues for programs appropriate for the target population (e.g., use community members to recruit participants; chose locations target groups most likely frequent)
- Engage policymakers in program development and/or share success stories

Individual and Interpersonal

- Offer culturally and developmentally appropriate literature on diet, physical activity and weight management
- Review benefits of healthy eating and regular physical activity for child and family
- Identify and promote activities that are fun and less structures to reduce feeling of work
- Help organize exercise and cooking classes in community settings (e.g., civic clubs, 4-H, schools)
- Work with local farmers and merchants to donate food/activity products and/or offer discounts
- Organize focus groups of community members to identify other strategies

Neighborhood Environment

- Work with local government officials to improve recreational options in the community
- Bring attention to community leaders of lack of availability of healthy food options in the community
- Lobby for more physical education and health education in local schools
- Develop community gardening programs
- Participate on school wellness teams designed to monitor school nutrition environments
- Organize community
- Conduct regular community assessments and share the results with community leaders



RECOMMENDED COMMUNITY STRATEGIES
AND MEASUREMENTS TO PREVENT
OBESITY IN THE UNITED STATES:
Implementation and Measurement Guide

July 2009



Menu of Potential Community Strategies in Rural Areas

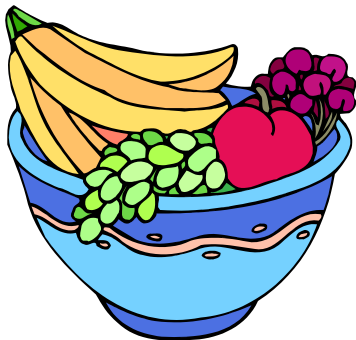
Strategies to Promote Availability of Affordable Healthy Food and Beverages

Increase availability of healthier food and beverage choices at public service venues (e.g., healthier vending machine options)

Improve availability of grocery or supermarkets in underserved areas

Provide incentives to retailers to locate in/offer healthier food choices in underserved areas

Improve opportunities to purchase from farms, farmers market



Menu of Potential Community Strategies in Rural Areas

Strategies to Create Safe Communities that Support Physical Activity

Improve access to outdoor recreational facilities

Enhance personal safety in areas where persons are or could be physically active

Enhance infrastructure supporting walking

Enhance traffic safety in areas where persons are or could be physically active



FUTURE DIRECTIONS

Future Research Needs

- Studies that use a clear (and standard) definition of rural. Preferably, distinguishing between levels of rurality.
- Assessment tools for rural nutrition and physical activity environments.
- Identify creative methods to reach a population that is often physically and socially isolated.

Future Research Needs

- Increase the pipeline of investigators from rural communities
- Funding priorities for this vulnerable population
- Collaborative partnerships

Thank you!

Monica L. Baskin, PhD
mbaskin@uab.edu