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PREPARED BY LI ZHU, PH.D., ARIZONA STATE UNIVERSITY

Influence of Community, the Built Environment and Individual Behavior on Weight and Obesity among Arizona Adults



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THIS REPORT WAS PREPARED BY
LI ZHU, PH.D., ARIZONA STATE UNIVERSITY

ARIZONA STATE UNIVERSITY
CENTER FOR POPULATION DYNAMICS

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2929 NORTH CENTRAL AVENUE, SUITE 1550, PHOENIX, AZ 85012
PH 602.385.6500 | FX 602.385.6510 | WWW.SLHI.ORG

Table of Contents

Introduction	4
Overview	4
The Arizona Health Survey	4
Findings from the Survey: Neighborhoods, Health Behaviors and Obesity	5
Relationship Between Neighborhood Characteristics and Healthy Weight	5
Overweight/Obesity Prevalence by Individual Exercise, Diets, Smoking, and Drinking Behavior	6
Overweight/Obesity Prevalence by Race, Education, Age, and Income	7
Residential Mobility and Duration in a Community	7
Putting it All Together: The Influence of Community and Behavior on Overweight/Obesity	8
Policy Implication	9
References	9

List of Tables

Table 1: Relationship among Social Factors, Built Environment, and Individual Behaviors on Body Weight (Body Mass Index) and the Risk of Overweight and Obesity for Arizona Adults, 2008	8
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List of Figures

Figure 1: Overweight/Obesity by Race	7
Figure 2: Overweight/Obesity by Education Level	7
Figure 3: Overweight and Obesity by Age	7
Figure 4: Overweight and Obesity by Income Level	7

Introduction

Overview

Who are you? How did you come to be that person? These questions are often asked in the social context of personality. But new research has raised similar questions in the physical context of environment and body-morphology. These studies question how perceived neighborhood/community characteristics such as social cohesion, neighborhood safety, the built environment, and retail food stores directly or indirectly shape our bodies as well as our minds. Further complicating the question are the complex relationships between individual behaviors – diet, exercise, smoking, and drinking – which can mitigate or exacerbate environmental influences.

Physical amenities such as parks and open spaces do not dictate the body weight of individuals within a community. However, they are an important – if largely overlooked – influence. While access to community centers and parks alone are not enough to promote social interaction and physical exercise, use of these amenities do facilitate and advance physical and psychological well-being.

The positive effects of physical activity and social engagement do not materialize overnight. It takes time for relevant neighborhood factors to exert an impact on individual and community health outcomes. Their effect is complicated by the fact that Arizona residents are highly mobile, with a large and growing international immigrant community, an influx of part-time and full-time residents from other states, and a substantial number of upwardly mobile, long-time residents.

In this issue brief, we explore how neighborhood cohesion, safety, retail food stores, parks and playgrounds influence the body weight of Arizona adults. In addition, we investigate whether those neighborhood effects are mediated by individual physical exercise, smoking, drinking, and dietary behavior.

The Arizona Health Survey

This study draws upon data from the 2008 Arizona Health Survey, funded by St Luke's Health Initiatives (SLHI), in which more than 4,000 Arizona adults were interviewed. Abundant information was collected related to various health outcomes, neighborhood level characteristics, and individual activities, informing the analysis contained in this brief report.

The Arizona Health Survey takes an asset-based approach to asking about individual indicators of health status, insurance coverage, access to care, health-related behaviors and various demographic and social/environmental factors related to health. The results serve to inform and improve public policy and community health program planning decisions at the local, regional and state levels.

Survey respondents were asked their demographic background on a variety of questions. Weighted values were computed based on population statistics in order to be representative and generalizable for the Arizona household population.

To produce population estimates from Arizona Health Survey data, weights are applied to the sample data to compensate for the probability of selection and a variety of other factors, some directly resulting from the design and administration of the survey. The sample is weighted to represent the non-institutionalized population for each sampling stratum and statewide. Weighting accomplished the following objectives:

- Compensates for differential probabilities of selection for households and persons;
- Reduces biases occurring because nonrespondents may have different characteristics than respondents;
- Adjusts, to the extent possible, for undercoverage in the sampling frame and in the conduct of the survey; and
- Reduces the variance of the estimates by using auxiliary information.

The Arizona Health Survey sample was weighted to be 65 percent White, 25 percent Hispanic, 3 percent African American, 4 percent American Indian and 3 percent other race. Fifty-one percent of the sample was female. People were grouped by age with approximately 20 percent in the categories 18-29, 30-39, 40-49, 50-64, and approximately 10 percent in the categories 65-74 and 75 years or older.

Findings from the Survey: Neighborhoods, Health Behaviors and Obesity

The 2008 Arizona Health Survey revealed the following information on Arizona adults' perceptions of their neighborhoods:

- Seventy-one percent of Arizona adults think they are living in a supportive neighborhood.
- Sixty-four percent of Arizona adults feel safe in their neighborhood/community all the time.

Arizonans reported a number of physical amenities in their neighborhood that can play a role in fostering (or hindering) physical activity and social connectedness.

- More than three quarters of Arizona adults have a park, playground, or open space within walking distance of their home.
- Arizona adults report the existence of an average (mean) of 3.1 grocery stores and 2.8 convenience stores in their neighborhood.

The Arizona Health Survey also revealed the following information on the health status and health behavior of Arizona adults:

- Sixty-three percent of Arizona adults are either overweight or obese.
- The mean value of BMI (Body Mass Index) of Arizona adults is 27.16 Kg/m² which is defined as overweight.
- Forty-two percent of Arizona adults do vigorous physical activities more than twice or two days per week. Fifty-six percent of them do moderate physical activities more than 3 times or days a week.
- Nearly 16 percent of Arizona adults smoke every day. Another 4.6 percent are current some-days smokers; and 24.8 percent are former smokers. Nearly 55 percent are non smokers.
- Approximately two-thirds of Arizona adults had some kind of alcoholic drink in the past 12 months.
- Sixty-two percent of Arizona adults ate fast foods in the past week.
- More than half ate french fries, home fries or hash browns in the past week.
- Eighty-four percent of Arizona adults drank a soda (excluding diet soda) in the past week.
- More than 66 percent of Arizona adults had fruits and veggies more than 14 times (2 times per day) in the past week.

Relationship between Neighborhood Characteristics and Healthy Weight

Analysis of data from the 2008 Arizona Health Survey revealed a variety of information about the relationship between overweight/obesity and community characteristics:

- Sixty-two percent of people living in supportive neighborhoods are overweight or obese. Sixty-six percent of people living in a non-supportive neighborhood are overweight or obese.
- Sixty-one percent of people who went to the park in the past month are overweight or obese. Almost 67 percent of people who did not go to the park are overweight or obese.
- The mean value of neighborhood safety for the overweight or obese population is 1.45 which is significantly higher than the non overweight or obese group, indicating that the overweight or obesity population perceived their neighborhood more dangerous than those for their healthy-weight counterparts.
- There is no significant difference in the perceived number of grocery stores for overweight/obesity and under/normal weight groups. However, the perceived mean number of convenience stores for overweight/obese group is 3.04, which is significantly higher than the number (2.70) for under/normal weight group.

Overweight/Obesity Prevalence by Individual Exercise, Diets, Smoking, and Drinking Behavior

Analysis of data contained in the 2008 Arizona Health Survey also revealed information about the relationship between overweight/obesity and individual health behaviors:

- Fifty-eight percent of people who perform two or more vigorous physical activities weekly are overweight or obese. Sixty-seven percent of those who performed one or less such vigorous, physical activities weekly are overweight or obese.
- Around 60 percent of people who perform three or more moderate physical activities are overweight or obese. Sixty-six percent of those who do not perform such activity are overweight or obese.
- More than 76 percent of some-days smokers are overweight or obese, followed by 71 percent of former daily smokers, 60 percent of non smokers, and 55 percent of current daily smokers.
- Sixty-four percent of Arizona adults who drank alcohol in the last month are overweight or obese. Sixty-one percent of people who did not drink alcohol in the past 12 months are overweight or obese.
- Fifty-seven percent of people who did not have any fast foods in the past week are overweight or obese. In contrast, 66 percent of their peers who eat fast food are overweight or obese. Fifty-six percent of people who did not eat french fries in the past week are overweight or obese. Almost 70 percent of their peers who ate french fries are overweight or obese.

The above part of the report illustrates the bivariate relationships between neighborhood safety, social cohesion, individual characteristics and body weight of Arizona adults. However, simple percentages and proportions do not tell us the complex mechanism and pathway through which those factors influence body weight. In addition, people might argue that individual social and economic background also influences one's body weight. For example, previous research found disparities in obesity between different racial/ethnic groups (Wang & Beydoun, 2007¹; Freedman, et al., 2005²). Again, differences exist among various age groups for body weight and the risk of being overweight or obese. Moreover, for the effects of neighborhood, the duration in a same neighborhood plays a role because it usually takes time for either amenities or toxic neighborhood factors to exert a significant effect on its members. Therefore, it is important to take all these dimensions into considerations.

Overweight/Obesity Prevalence by Race, Education, Age, and Income

The Arizona Health Survey revealed the following overweight/obesity characteristics among Arizonans by race, education, age and income:

- More than 78 percent of American Indians are either overweight or obese, followed by 70 percent of multiracial, other race, or unknowns, 68 percent of Hispanics, 65 percent of Blacks, and 60 percent of Whites.
- Two-thirds of Arizona adults with a high school degree or some college are either overweight or obese. Fifty-eight percent of adults who do not have a high school degree and 62 percent of people with a college or above degree are overweight or obese.
- The percentage of obesity by age groups shows an inverse bell-shaped distribution with both young (18-29 years old) and elderly (above 80 years old) having lower prevalence of obesity whereas age groups of 30-39, 40-49, 50- 64, 65-79 have higher prevalence of obesity. The highest prevalence (33 percent) is among people aged 50-64. A similar pattern occurs for overweight prevalence of different age groups.
- For income, both very low and high annual income groups have low proportion of obese adults. The group with income of \$40,000-60,000 has the highest obesity rate.

Figure 1: Overweight or Obesity by Race

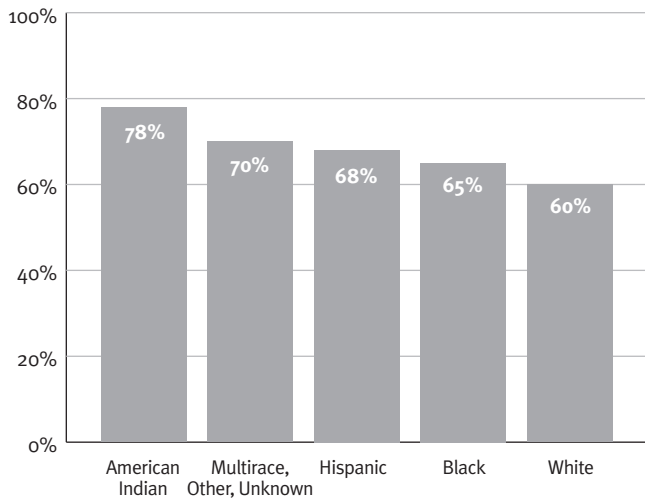
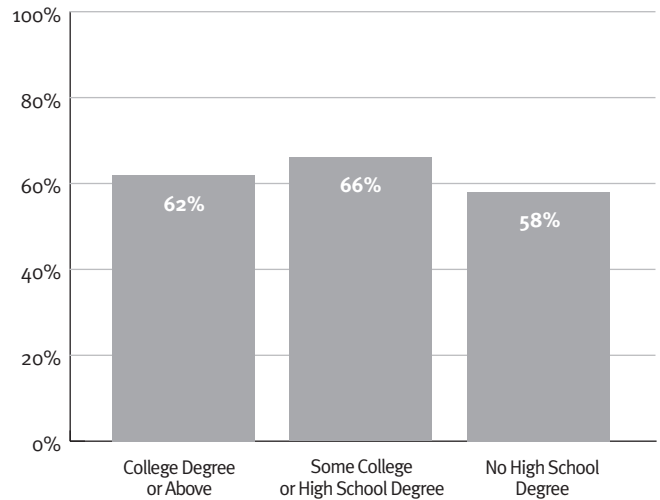
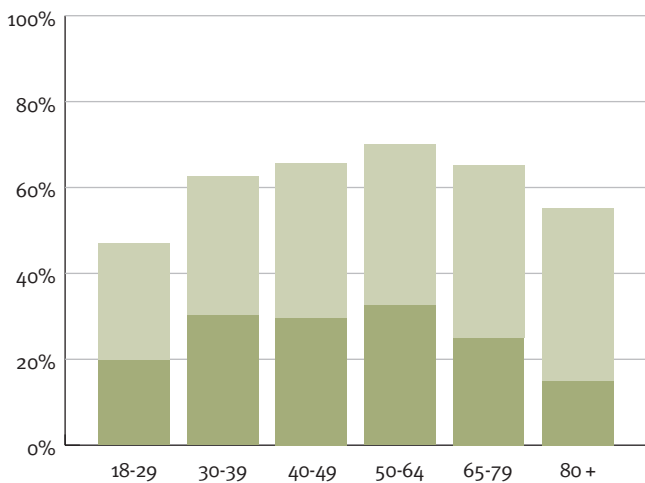


Figure 2: Overweight or Obesity by Education Level



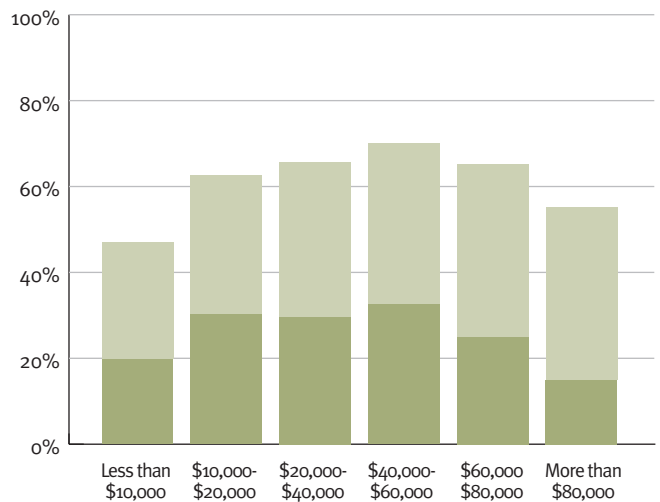
Overweight or Obesity

Figure 3: Overweight and Obesity by Age



Overweight Obesity

Figure 4: Overweight and Obesity by Income Level



Residential Mobility and Duration in a Community

Another fact that ultimately needs to be considered when determining the influence of community on healthy weight is the mobility of Arizona residents. Community may potentially play a smaller role in influencing overweight and obesity if a person has not been living in a neighborhood very long. Again, the Arizona Health Survey provides relevant information:

- On average, Arizona adults have lived in their current neighborhood 1.7 years (or around 21 months).
- More than 30 percent of respondents lived in the same neighborhood for less than six months.

Putting it All Together: The Influence of Community and Behavior on Overweight/Obesity

To determine the overall effect of community and individual behavior on overweight and obesity, two sets of multivariate analyses were conducted on body weight index and the risk of overweight or obesity. The results show that even after considering individual education, income, race/ethnicity, age, gender, and the duration in the neighborhood, many neighborhood features are still significantly influencing Arizona adult’s body weight and the risk of obesity or overweight. The following table presents the results from the multivariate analyses.

Table 1. Relationship among social factors, built environment, and individual behaviors on body weight (Body Mass Index) and the risk of overweight and obesity for Arizona adults, 2008				
	Risk on Body Mass Index (BMI)		Risk of Overweight or Obesity	
	Increased Risk	Decreased Risk	Increased Risk	Decreased Risk
Social Factors				
Supportive Neighborhood	–	–	–	Low
Neighborhood Safety	–	–	–	Low
Built-in Environment in the Neighborhood				
Park, Playground, Open Space Within Walking Distance of Home	–	–	–	–
Number of Convenience Stores in Neighborhood	Medium	–	Medium	–
Number of Grocery Stores in Neighborhood	–	–	–	–
Individual Characteristics – Physical Activities				
Two or More Vigorous Activities Performed in a Week (vs. one or less)	–	Very High	–	Very High
Three or More Moderate Activities Performed in a Week (vs. less than 3 times)	–	Very High	–	Medium
Visited a Park in the Last Month (vs. not at all)	–	Medium	–	–
Individual Characteristics – Smoking				
Daily Smoker	–	High	–	Medium
Smoke Some Days in a Week	–	–	–	–
Former Smoker	–	–	Medium	–
Individual Characteristics – Drinking				
	–	–	–	–
Individual Characteristics – Eating				
Ate Fast Food in a Week	Very High	–	Medium	–
Ate French Fries in a Last Week	Very High	–	Very High	–
Drank Soda More Than Once a Day	–	–	–	–
Ate Fruits and Vegetables More Than 14 Times in a Week (vs. less than)	–	–	–	–

– No significant effects.

Note: Overweight: 25 ≤ BMI < 29.0. Obesity: BMI ≥ 30.0 (CDC 2009).

Policy Implications

Both social and physical characteristics of neighborhood play important roles in influencing the chance of being overweight and obese for Arizonan adults. For example, supportive and/or safe neighborhoods decrease the chance of overweight and obesity whereas more convenience stores in the neighborhood increase the risk. However, findings from this study also indicate that it is not the mere existence of a park that promotes health. Instead, it matters whether the individual went to the park in the past 30 days. Built environment amenities in a community only serve as a premise for a healthy outcome. The health promoting effect of neighborhood amenities only occur through individual participation. Therefore, individuals are also responsible for their weight status.

Nonetheless, local governments can implement a number of policies that support and encourage individuals to engage in healthy eating and physical activity. For example, the Institute of Medicine had identified a number of recommendations for reducing childhood obesity, which include:

- Community policing strategies that improve safety and security for park use, especially in high crime neighborhoods. Such strategies can improve perceived neighborhood safety, an important predictor of the body weight of Arizona adults. Efforts to ensure parks are safe, attractive, and in close proximity to residential areas can help encourage their use.
- Incentive programs to encourage small food store and convenience store owners in underserved communities to carry healthy, affordable food items. Such incentive programs could include grants or loans to purchase refrigeration equipment to store fruits and vegetables; free publicity; a city awards program; or linkages to wholesale distributors.
- Adoption of zoning regulations to enable healthy food providers to locate in underserved neighborhoods (e.g. “as of right” and “conditional use permits”).
- Efforts to enhance accessibility to existing grocery stores through public safety efforts, such as outdoor lighting and police patrolling.
- Efforts to encourage healthy behavior by individuals through media campaigns, utilizing multiple channels (print, radio, internet, television, social networking, and other promotional materials) to promote healthy eating (and active living) using consistent messages.
- Design of media campaigns that establish community access to healthy foods as a health equity issue, reframing obesity as not only a personal choice, but also an environmental equity issue.
- Encouragement of personal responsibility for healthy eating through counter-advertising warnings and healthy food labeling.
- Creation of after-school activity programs, e.g. dance classes, city-sponsored sports, supervised play, and other publicly or privately supported active recreation, supporting both physical activity and neighborhood social cohesion.

References

- 1 Wang, Y. & Beydoun, M. A. (2007). The obesity epidemic in the United States – gender, age, socioeconomic, racial/ethnic and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiological Reviews*, 29, 6-28.
- 2 Freedman D.S., Khan, L.K., Serdula, M.K. et al. (2005). Racial differences in the tracking of childhood BMI to adulthood. *Obesity Research* 13: 928-935.