

Assessing Healthy Food Access: Network Walkability in Alameda County, California

Purpose

Obesity and related illnesses are an increasing problem in the country today. Obesity-related health issues include heart disease, stroke, high blood pressure, diabetes, and cancer among others.¹ Approximately 64% of American adults² and 32% of youth (10-17 years-old)³ are overweight or obese. In Alameda County, approximately 53% of adults and 22% of youth (0-17 years-old) are overweight or obese.⁴

Investigating this epidemic, research has pointed to the relationship between obesity and poverty as well as to ethnic background, while other research considers the influence of the built environment on obesity. To illustrate and examine healthy food access in Alameda County based on household income and race, this project uses network walkability based upon density and walking distance to healthy, intermediate and unhealthy food retailers.

¹ WebMD. Weight Loss: Health Risks Associated With Obesity. <http://www.webmd.com/cholesterol-management/obesity-health-risks>.

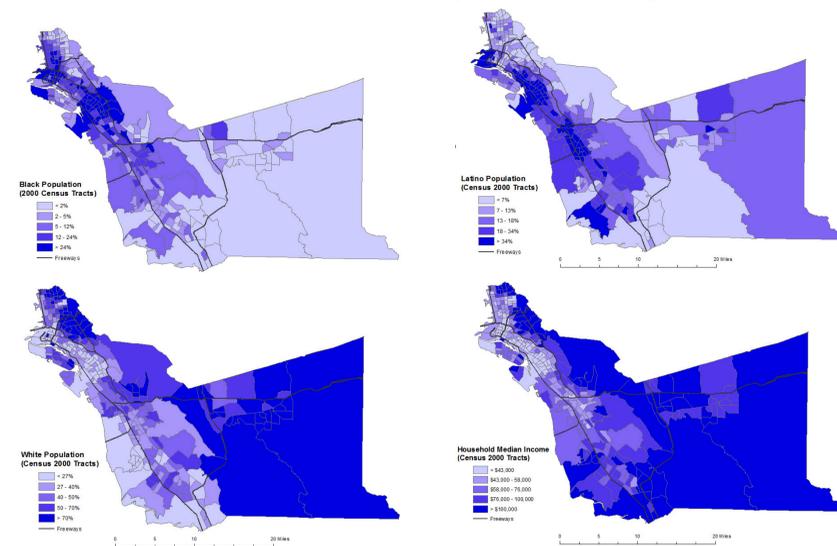
² The Henry J. Kaiser Family Foundation. California: Percent of Adults Who are Overweight or Obese, 2010. <http://www.statehealthfacts.org/profileind.jsp?cat=2&rgn=6&ind=89>.

³ The Henry J. Kaiser Family Foundation. California: Percent of

Children (10-17) who are Overweight or Obese, 2007. <http://www.statehealthfacts.org/profileind.jsp?ind=51&cat=2&rgn=6>.

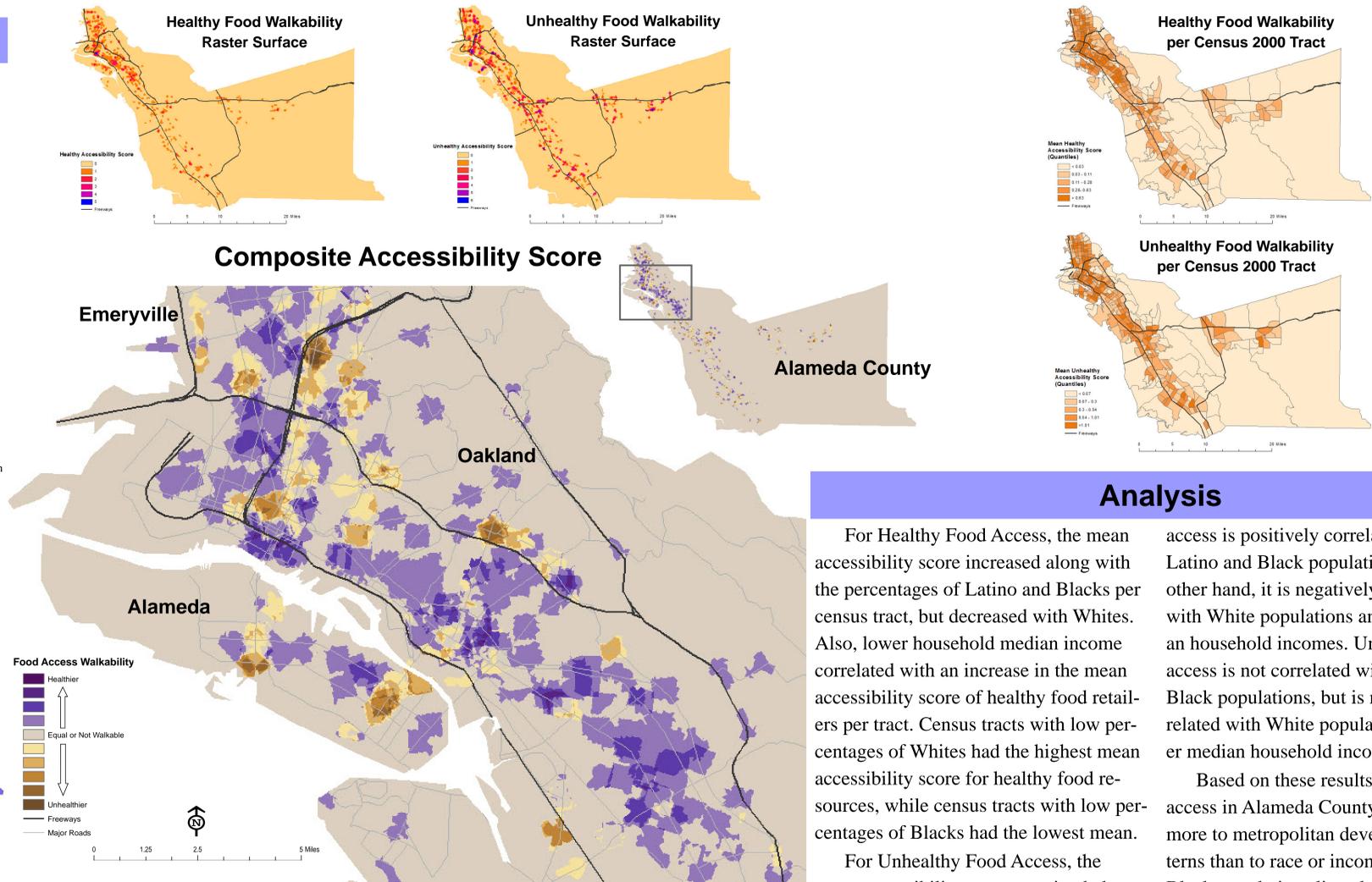
⁴ Alameda County Public Health Department. The Health of Alameda County Cities and Places: A Report for the Hospital Council of Northern and Central California, 2010. <http://www.acphd.org/media/52883/ac2010.pdf>

Alameda County Socioeconomic Demographics



Food Retailer Categories

Healthy	Intermediate	Unhealthy
Ethnic Food Stores	Cafes	Baked Goods Shops
Farmers Markets	Restaurants	Coffee Shops
Food Markets	Sandwich Shops	Convenience Stores
Fruit and Vegetable Stands	Variety Stores	Ice Cream Shops
Grocers		Fast Food Restaurants
		Pizza Parlors



Method

Street networks and service areas are used to map and analyze walkability to local food retailers. Walkable streets were determined and food retailers were organized into three categories: Healthy, Intermediate, and Unhealthy. Street-based service areas were created for each retailer using a distance of a quarter mile as the definition of walkable for this project. These service areas were then rasterized into 10x10 meter rasters and combined to create an accessibility score map for each of the three food resource categories. This information was aggregated to census tracts to examine any correlations between socioeconomic variables and walkable access to the various types of food resources.

The Composite Accessibility Score Map was created by subtracting the unhealthy accessibility score from the healthy accessibility score for each raster cell to clearly identify walkable areas of healthy and unhealthy food access.

Limitations

The grouping of various food retailers and categorizing into healthy, intermediate and unhealthy were based on my own discretion, which will make replication difficult for others. Also, the selection of certain roadlines included some unwalkable highways and excluded some walkable streets. In Alameda County, certain state routes are walkable in particular areas, but some sections were excluded due to Tiger Roadline classifications.

Analysis

For Healthy Food Access, the mean accessibility score increased along with the percentages of Latino and Blacks per census tract, but decreased with Whites. Also, lower household median income correlated with an increase in the mean accessibility score of healthy food retailers per tract. Census tracts with low percentages of Whites had the highest mean accessibility score for healthy food resources, while census tracts with low percentages of Blacks had the lowest mean.

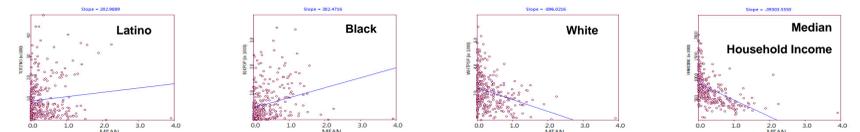
For Unhealthy Food Access, the mean accessibility score remained almost constant within the ranges of Latino and Whites populations. However, tracts with a 20-50% Black population have the highest mean. Also, the lowest average household median income was in tracts that are 50% or more Black, but have the lowest mean accessibility score.

The scatter plots below reinforce these results and reveal that healthy food

access is positively correlated with Latino and Black populations. On the other hand, it is negatively correlated with White populations and higher median household incomes. Unhealthy food access is not correlated with Latino and Black populations, but is negatively correlated with White populations and higher median household incomes.

Based on these results I think food access in Alameda County is related more to metropolitan development patterns than to race or income. Latino and Black populations live closer to major roads and freeways, where many walkable food retailers are located. This is in contrast with White populations or those with higher household median incomes who live in the foothills or in more suburban locations away from major roads and freeways and thus further from many food retailers.

Walkable Access to Healthy Food (Mean healthy accessibility score by demographic per census tract)



Walkable Access to Unhealthy Food (Mean unhealthy accessibility score by demographic per census tract)

