

HEALTHY COMMUNITIES DATA AND INDICATORS PROJECT

Short Title: Retail food environment

Full Title: Modified retail food environment index

1. **Healthy Community Framework:** Meets basic needs of all
2. **What is our aspirational goal:** Affordable, accessible and nutritious foods
3. **Why is this important to health?**

Description of significance and health connection

An adequate, nutritious diet is a necessity at all stages of life. Pregnant women and their developing babies, children, adolescents, adults, and older adults depend on adequate nutrition for optimum development and maintenance of health and functioning. Inadequate diets in children can impair intellectual performance and have been linked to frequent school absence and poorer educational achievement. Nutrition also plays a significant role in causing or preventing a number of illnesses, such as cardiovascular disease, some cancers, obesity, type-2 diabetes, and anemia. These weight-associated illnesses are no longer restricted to adults as the prevalence of obesity has more than doubled in children in the last 40 years. Obese children have an increased risk of heart disease and of becoming obese adults.

Lower income families are less likely to have a nutritious diet than those with higher incomes. Peoples' food choices and their likelihood of being overweight or obese are also influenced by their food environment: the foods available in their neighborhoods including stores, restaurants, schools, and worksites. There is a strong association between consumption of calorie-dense foods with low nutritional value and being overweight or obese when one or more calorie-dense meals are consumed per week. High-fat and high-sugar foods are available at most elementary and middle schools. Since the 1970s, the number of fast food restaurants has more than doubled and the proportion of daily calorie intake from foods eaten away from home has increased.

Summary of evidence

Measures of food availability in the environment include distance to food retailers, cost of foods, or density of food outlets. Due to the lack of standardization of food environment metrics and differences among populations studied, it is difficult to generalize the evidence on the relationship between the food environment and health. Nevertheless, various cross-sectional and longitudinal studies show a positive association between the density of fast-food restaurants and/or convenience stores with Body Mass Index (BMI), obesity and overweight rates; and a negative association with fruit and vegetable intake. The size of this relationship can vary with race/ethnicity. In California, adults living in cities or counties with 16.7% healthy food retailers or less had a 20 percent higher prevalence of obesity and a 23 percent higher prevalence of diabetes than adults living in areas with 25.0% healthy food retailers or more; this relationship held true regardless of household income, race/ethnicity, age, gender, or the physical activity levels of respondents.

Key References

- California Center for Public Health Advocacy. [Searching for Healthy Food: The Food Landscape in California Cities and Counties](#). 2007. Accessed November 8th, 2013.
- Robert Wood Johnson Foundation Commission to Build a Healthier America. [Improving the Health of All Americans through Better Nutrition](#). 2009. Accessed November 8th, 2013.

- California Center for Public Health Advocacy, PolicyLink, UCLA Center for Health Policy Research. [Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes](#). 2008. Accessed November 8th, 2013.
- U.S. Department of Agriculture and U.S. Department of Health and Human Services. [Dietary Guidelines for Americans](#). 7th ed, Washington, DC: U.S. Government Printing Office; 2010. Accessed November 8th, 2013.
- Papas M A, Alberg, AJ, Ewing R, Helzlsouer KJ, Gary TL, Kalsen AC. The built environment and obesity. *Epidemiol Rev.* 2007; 29(1):129-143.
- Gibson DM. The neighborhood food environment and adult weight status: estimates from longitudinal data. *Am J Public Health.* 2011; 101(1): 71-78.
- Zenk SN, Lachance LL, Schulz AJ, Mentz G, Srimathi K, Ridella W. Neighborhood retail food environment and fruit and vegetable intake in a multiethnic urban population. *Am J Health Promot.* 2009(4); 23: 255-264.

4. What is the indicator?

Detailed Definition: Modified retail food environment index (mRFEI)

No. of healthy food retailers/(No. of healthy + No. of less healthy food retailers) *100

- Stratification: Race/ethnicity (8 groups)

Data Description

- Data sources: Division of Nutrition, Physical Activity, and Obesity from the Centers for Disease Control and Prevention (CDC): www.cdc.gov/obesity/downloads/2_16_mrfei_data_table.xls. U.S. Census Bureau, 2000 Census DP-1 population table (<http://factfinder2.census.gov>). All data accessed 8/2013.
- Years available: 2009.
- Updated: unknown.
- Geographies available: census tracts, cities/towns, counties, regions, and state.

Data on the mRFEI or percentage of healthy food retailers for California census tracts (2000) was downloaded from the CDC. Healthy food retailers include supermarkets, larger grocery stores, supercenters, and produce stores within census tracts or ½ mile from the tract boundary. Less healthy food retailers include fast food restaurants, small grocery stores, and convenience stores within census tracts or ½ mile from the tract boundary. Population weighted mRFEI averages by race/ethnicity were calculated for cities/towns, counties, regions, and the state, from census tract data. Regions were based on counties of metropolitan transportation organizations (MPO) regions as reported in the [2010 California Regional Progress Report](#).

5. Limitations

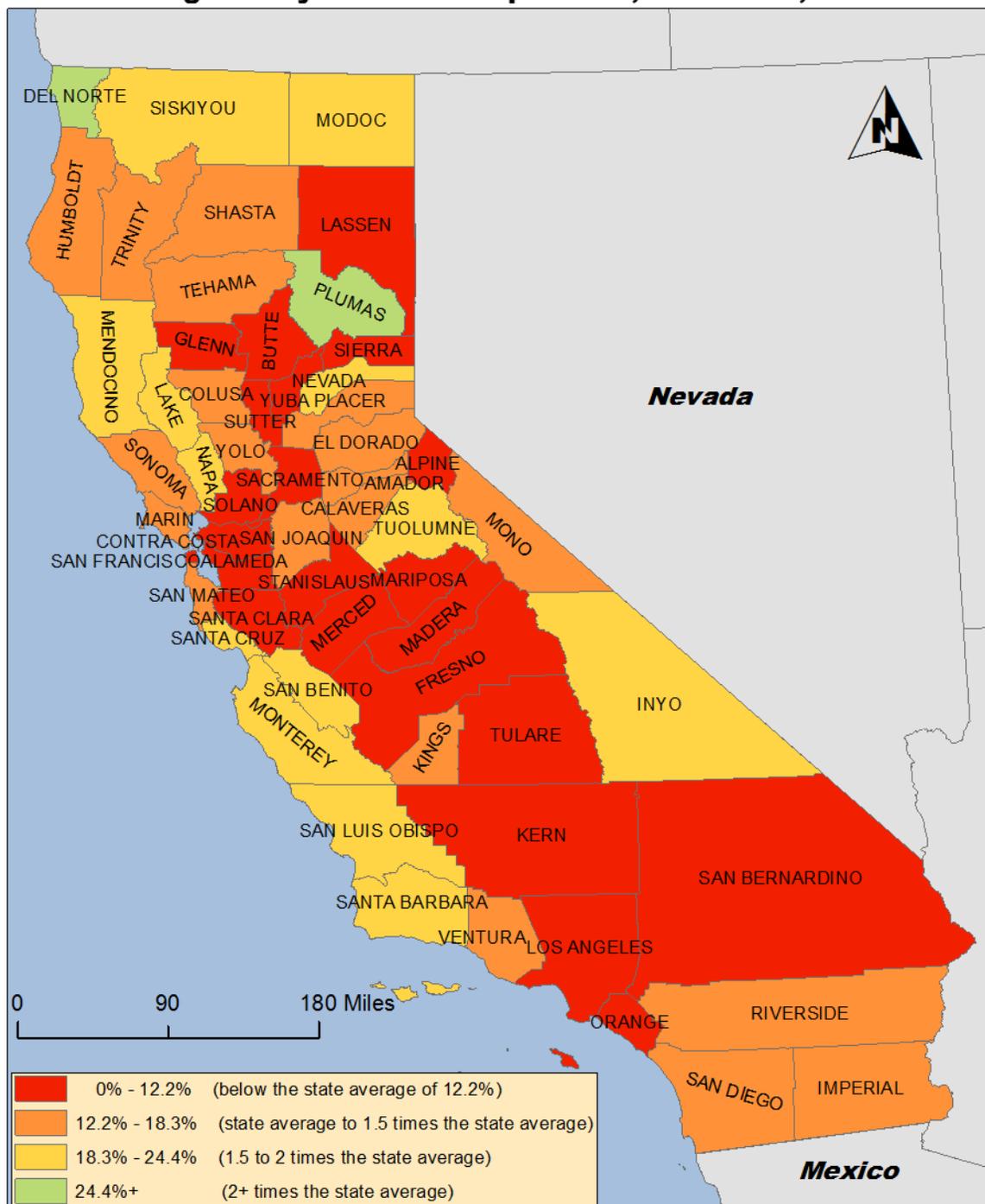
Travel distances to food retailers are not considered in this indicator. The number and type of food retailers by census tract is not available in the CDC dataset due to contractual agreements with private companies. Ground verification has shown that business lists from private companies can have poor performance when used to measure the food environment. There are no immediate plans to update this indicator. The mRFEIs for places were obtained after intersecting the 2000 census tract centroids with places; information loss might have occurred if a census tract was partially contained within a place, but its centroid was outside the place limits. An mRFEI of 11 was reported for California by the CDC, which is lower than the population weighted average of 12.2 obtained here for this indicator maybe suggesting slightly higher indexes in populous areas.

6. Projects using this indicator

1. Centers for Disease Control and Prevention. CDC's LEAN Works: A Workplace Obesity Prevention Program. Centers for Disease Control and Prevention; 2007. <http://www.cdc.gov/leanworks/>
2. San Francisco Department of Public Health. Sustainable Communities Index. San Francisco, CA: San Francisco Department of Public Health; 2013. <http://www.sustainablecommunitiesindex.org/>

7. Examples of Maps, Figures, and Tables

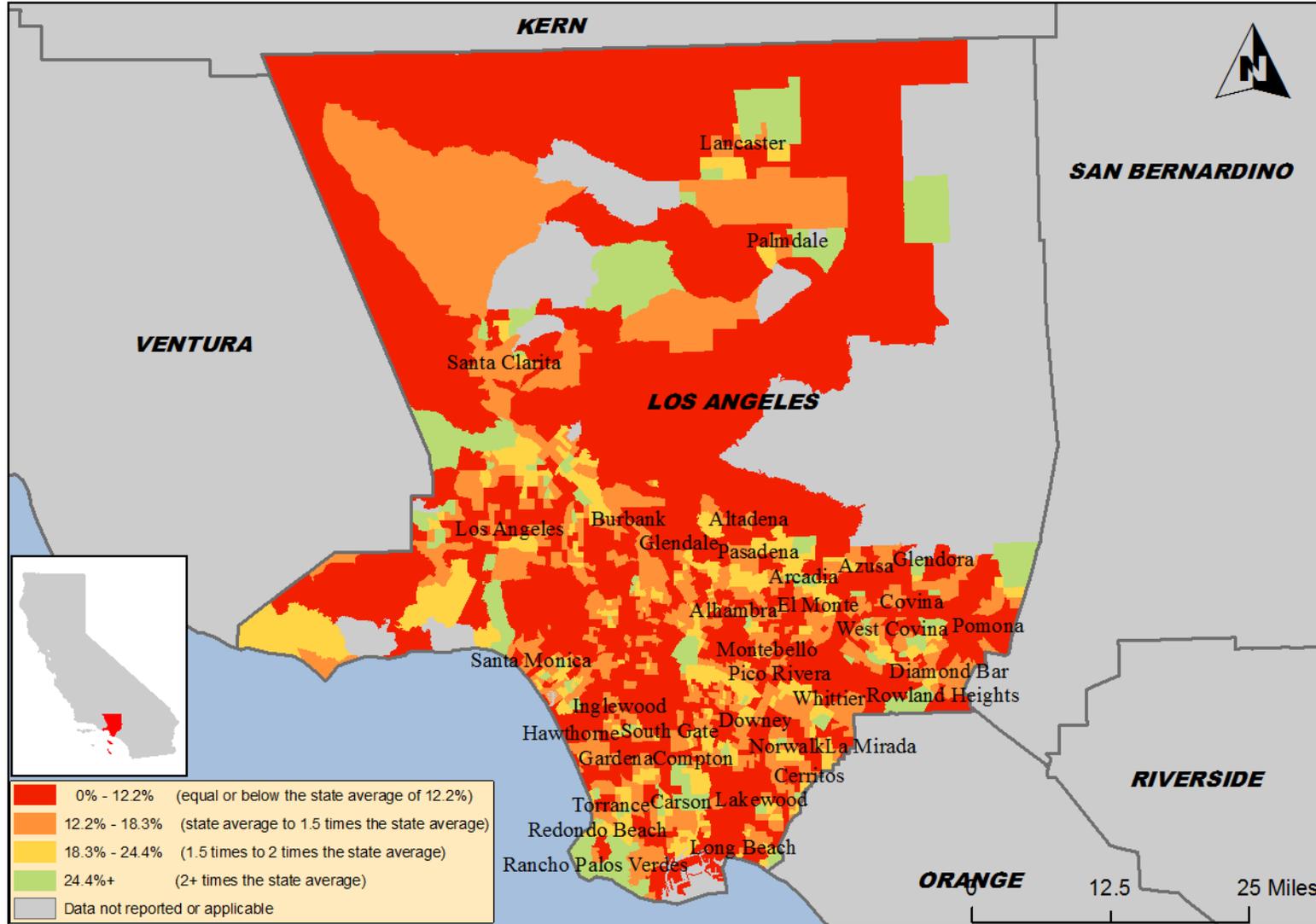
Map 1. Modified Retail Food Environment Index: County Averages of the Percentage of Healthy Food Retailers in Census Tracts, Weighted by the Total Population, California, 2009



Source: Centers for Disease Control and Prevention; Division of Nutrition, Physical Activity, and Obesity. U.S. Census Bureau, Decennial Census 2000.

Analysis by CDPH and UCSF

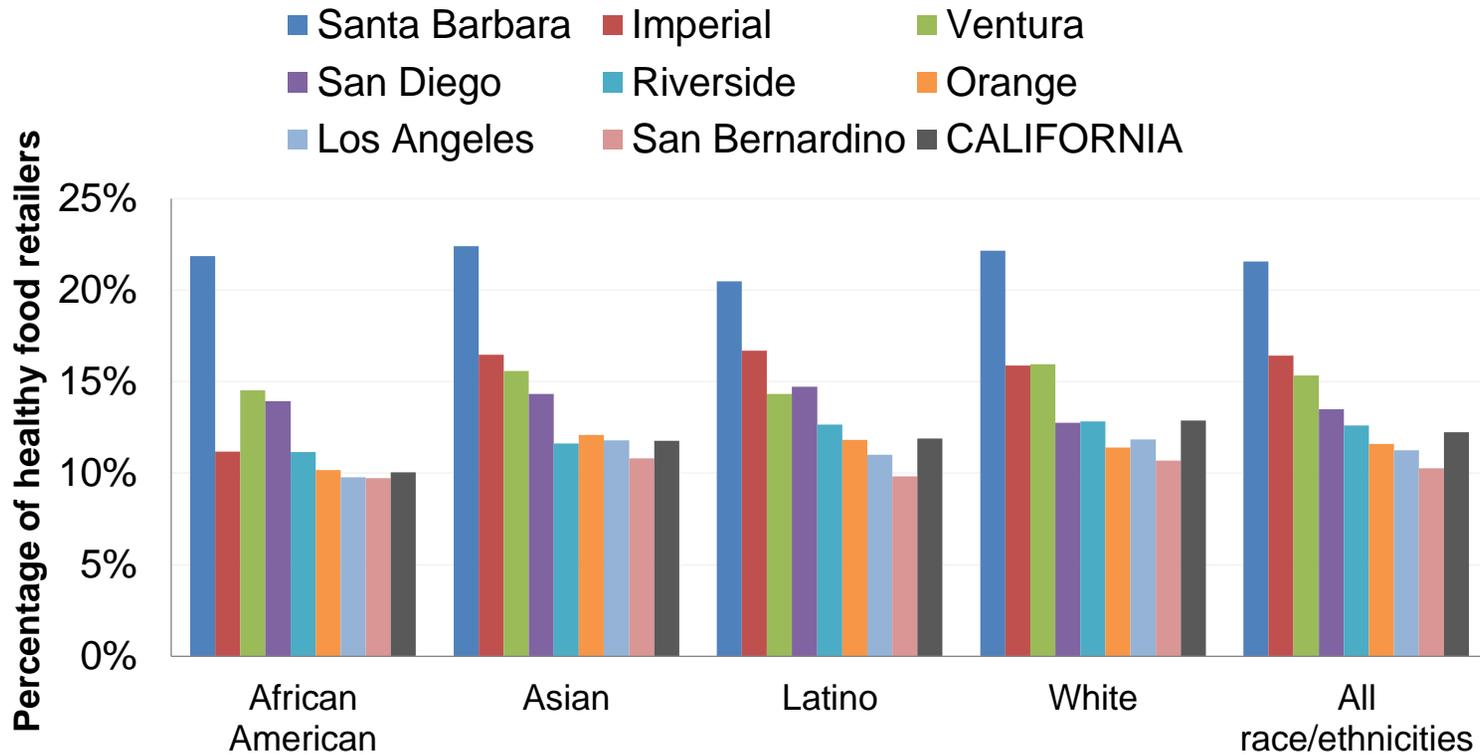
**Map 2. Modified Retail Food Environment Index: Percentage of Healthy Food Retailers
Census tracts, Los Angeles County, 2009**



Source: Centers for Disease Control and Prevention; Division of Nutrition, Physical Activity, and Obesity.

Analysis by CDPH and UCSF

Modified Retail Food Environment Index: County Averages of the Percentage of Healthy Food Retailers in Census Tracts, Weighted by African American, Asian, Latino, and White Populations, Southern California, 2009



Sources: Centers for Disease Control and Prevention; Division of Nutrition, Physical Activity, and Obesity.
U.S. Census Bureau, Decennial Census 2000.

Table 1. Modified Retail Food Environment Index: City/town Averages of the Percentage of Healthy Food Retailers in Census Tracts, Weighted by the African American, Asian, Latino, Multiple, and White Populations, Ventura County, 2009.

City/town	African American	Asian	Latino	Multiple	White	All race/eth.
Camarillo	16.3	11.4	10.0	14.4	10.8	10.8
Casa Conejo		16.7	16.7		16.7	16.7
Mira Monte			7.6	10.0	6.5	6.6
Moorpark	30.5	28.5	16.9	26.4	28.0	24.9
Oak Park		20.0	20.0	20.0	20.0	20.0
Oak View			0.0		0.0	0.0
Oxnard	12.8	14.0	14.2	16.1	17.4	14.8
Port Hueneme	14.0	13.1	12.8	12.9	14.1	13.4
San Buenaventura	16.6	17.9	13.0	15.0	13.9	13.7
Santa Paula			8.6		9.0	8.7
Simi Valley	11.1	15.3	15.9	14.9	15.2	15.3
Thousand Oaks	18.2	16.2	14.9	17.1	16.6	16.3
Ventura County	14.5	15.6	14.3	15.9	15.9	15.3
California	10.0	11.8	11.9	11.6	12.9	12.2

Sources: Centers for Disease Control and Prevention; Division of Nutrition, Physical Activity, and Obesity. U.S. Census Bureau, Decennial Census 2000.