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# The Food Environment is a Complex Social Network

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## **Commentary**

### **The Food Environment is a Complex Social Network**

#### **Keywords**

**Food; Environment; Social Network; Social Ecology; Poverty; Disparities; Urban; Policy**

In this issue of *Social Science & Medicine*, AUTHORS report their evaluation of the impact of the “South Los Angeles (LA) Fast-Food Ban” (AUTHORS, 2015) a zoning ordinance enacted in 2008 that restricts the opening and expanding of standalone fast-food stores. The Los Angeles City Council argued that the prevalence of fast-food restaurants in their area “creates serious public health problems” (Office of the City Clerk, City of Los Angeles, 2008, p. 1). AUTHORS’s study shows that the new regulation has not had any meaningful impact on the proliferation of fast-food restaurants in South LA nor has it had an impact on the obesity and diet-related health disparities in the area. Much to the LA policymakers’ disappointment, data from the California Health Interview Survey shows that fast-food consumption and overweight / obesity rates have increased since the new regulation. In fact, AUTHORS show that the increase in combined prevalence of overweight and obesity since the ban has been significantly larger in Los Angeles than elsewhere (AUTHORS, 2015, p. 5-7). These findings not only contradict expectations based on studies that link obesity with fast food consumption (Stark et al., 2013) and the reduction of obesity with increased penetration of grocery stores (Morland et al., 2006; Larson et al., 2009), but demand new conversations about policy, healthy food access, and health disparities.

AUTHORS begin such a discussion by pointing to two reasons why the policy failed to impact obesity levels and/or diets despite expectations. The first is that, although freestanding “fast-food” establishments are appealing targets for policies (Fleishhacker et al., 2013), the ban was so narrowly defined that it did not affect the rate of new fast-food retailers, only preventing these new fast food restaurants from being established separately from other structures. The second is that the policy likely has the wrong target. AUTHORS confirm an analysis conducted a year after the ban was implemented which found that South LA did not have an increase in concentration of fast food restaurants compared to other areas of LA, but did have an increased concentration of corner stores and an increased consumption of snack foods, compared to other areas (Sturm and Cohen, 2009; AUTHORS, 2015, p. 5-7). Their findings, rather than support some recent studies that cast doubt on the association between the food environment and obesity and other diet related disparities (An and Sturm, 2012; Hattori et al., 2013), actually confirms that the food environment remains a significant problem; but redirects the conversation towards the prevalence of convenience stores and population behavior analysis, in all of its socio-economic complexities, rather than fast-food restaurants alone.

As found by AUTHORS, lower-income urban areas, such as South LA, tend to have a much higher penetration of convenience stores than seen in wealthier areas. Recent studies have related the higher prevalence of obesity and diet-related health disparities among low-income and minority communities to their limited access to healthy foods and to a higher density of fast-food outlets and convenience stores in those areas (An and Sturm, 2012; Hattori et al., 2013). The Center for Disease Control (CDC) reports that “low-income and underserved communities often have limited access to stores that sell healthy food, especially high-quality fruits and vegetables” (CDC, Healthy Food Environment). Convenience stores commonly stock packaged

and processed foods that do not require refrigeration and have a long shelf life (Sean et al., 2010; Brewster et al., 2015). For many corner stores, carrying fresh fruits and vegetables is not economically viable (Brewster et al., 2015).

The proliferation of convenience stores has important implications for how we perceive the category of “food deserts,” which has received much attention in recent literature (Beaulac et al., 2009; USDA, Creating Access to Healthy, Affordable Food). “Food deserts” have been defined as “areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet, because of the paucity of supermarkets or other healthy food sources” (Beaulac et al., 2009). This definition means that food deserts--- that is, areas lacking healthy food access---can simultaneously be “food swamps,” consisting in a saturation of access to unhealthy food (e.g., fast-food, convenience stores) and nonfood (e.g., gas stations) venues, characterized by calorie-dense and high-sugared food items (Fielding and Simon, 2011).

The food in these venues is manufactured and processed with a high content of processed carbohydrates, saturated and trans fats, sugar, and salt. The result of such a modern food process is that the foods are more appealing to the palate, have long shelf lives, and inevitably result in a variety of negative health consequences. There is evidence that these foods stimulate the pleasure centers of the brain in much the same way as nicotine and other drugs, resulting in addictive behaviors (Adam and Epel, 2007; Davis et al., 2004). Evidence convincingly links sedentary lifestyle and reliance on processed foods with obesity, metabolic syndrome, cancer, arthritis, and a variety of other health conditions.

The complex realities of food availability tell us that food deserts do not exist in a vacuum. Not only do food deserts of healthy foods commonly coincide with food swamp of

unhealthy foods, but they oftentimes also coincide with education deserts, employment deserts, recreation deserts, and safety deserts. Healthy food access in urban areas is comprised by the complex topology of social landscapes, market forces, transportation systems, and food manufacturing and processing systems (Yamada and Palafox, 2001; Stuckler et al., 2012). The simple presence of one type of food store or another (such as grocery markets) does not guarantee that the food will be of high quality, affordable, or meet the needs of consumers. Studies show that healthier foods are more expensive (Aggarwal et al., 2012; Rao et al., 2013) and that grocery stores in low-income areas carry produce of lower quality (Andreyeva et al., 2008). In areas where the median income is near the poverty threshold many households are faced with the problems of food insecurity and limited access to transportation. People living with food insecurity must rely on nonperishable goods more than those with a greater degree of economic security. Unfortunately, for those with limited access to transportation, corner stores are significantly more expensive than grocery stores, further exacerbating the challenge of food insecurity (Andreyeva et al., 2008). Areas facing food insecurity are associated with additional health disparities, such as increased rates of allostatic load, depression, obesity, and chronic disease (Gowda et al., 2012; Bronte-Tinkew et al., 2007; Carter et al., 2012).

AUTHORS's study adds to the body of literature that suggests that the "food environment" is a much more complex phenomenon than was imagined when policymakers enacted the South LA fast food ban (Stark et al., 2013; Caspi et al., 2012). Studies that count the number and types of food outlets are unlikely to capture the complexity of the food landscape. Similarly, narrowly targeted policy interventions, such as the South LA fast food ban, are unlikely to significantly change something as complex as human behavior and the full topology of social and economic realities. In order to begin addressing this complex topology, analyses of

food availability, population behavior, and health disparities in low-income communities should include discussions on the role poverty plays in this topology's origin and perpetuation.

For example, one approach that may address the role of poverty more directly is considering policies that would increase wages for fast food and other low-wage workers. It is estimated that more than half (52 percent) of families of fast food workers are receiving one or more type of public assistance. Specifically this translates to an annual average of \$1.04 billion in food stamp benefits provided to the families of fast food workers (Allegretto et al., 2013). Fast food workers are more likely to live in or near poverty. One in five families live below the poverty line and 43 percent have incomes two times the federal poverty line or less. These low wages continue, despite the fact that we know that Americans who live in the most poverty dense areas are most prone to obesity. In fact, counties with poverty rates of greater than 35 percent have obesity rates 145 percent greater than wealthier counties (Levine 2011). This example serves to underscore that the problem is rooted in intergenerational poverty and the impact of "market forces," and as such, it must be addressed in those terms. Solutions to the problem of obesity and diet-related disparities are likely to require a much more comprehensive approach that looks not only at the built environment, but also at the social landscape and macroeconomic policies.

## **References**

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiol Behav*, 91(4), 449-458.

Aggarwal, A., Monsivais, P., & Drewnowski, A. (2012). Nutrient intakes linked to better health outcomes are associated with higher diet costs in the US. *PLoS One*, 7(5), e37533.

Allegretto, S.A., Doussard, M., Graham-Squire, D., Jacobs, K., Thompson, D., and Thompson, J. (2013). *Fast Food, Poverty Wages: The Public Cost of Low-Wage Jobs in the Fast-Food Industry*. Berkeley Center for Labor Research and Education (Berkeley, CA).

An R., & Sturm, R. (2012). School and residential neighborhood food environment and diet among California youth. *American Journal of Preventive Medicine*, 42(2), 129-135

Anderson, B., Rafferty, A. P., Lyon-Callo, S., Fussman, C., & Imes, G. (2011). Fast-food consumption and obesity among Michigan adults. *Prev Chronic Dis*, 8(4), A71.

Andreyeva, T., Blumenthal, D. M., Schwartz, M. B., Long, M. W., & Brownell, K. D. (2008). Availability And Prices Of Foods Across Stores And Neighborhoods: The Case Of New Haven, Connecticut. *Health Affairs*, 27(5): 1381–1388.

AUTHORS. (2015). Diet and Obesity in Los Angeles County 2007-2012: Is there a measurable effect of the 2008 "Fast-Food Ban"?. *Social Science and Medicine* (in press).

Beaulac, J., Kristjansson, E., Cummins, S. (2009). A systematic review of food deserts, 1966-2007. *Prev Chronic Dis*, 6(3): A105.

Boone-Heinonen, J., Gordon-Larsen, P., Kiefe, C.I., Shikany, J.M., Lewis, C.E., & Popkin, B. M. (2011). Fast food restaurants and food stores: Longitudinal associations with diet in young to middle-aged adults: The CARDIA study. *Archives of Internal Medicine*, 171(13), 1162-1170.

Brewster, L., Weller, A.-K., Smith, B., Ramos, M., Hamilton, K. D., Ogburn, R., Dennison, W. (2015). Healthy Food Access and Public Policy: the Case of Targeted Areas in Miami-Dade County, FL. Unpublished Manuscript.

Bronte-Tinkew, J., Zaslow, M., Capps, R., Horowitz, A., & McNamara, M. (2007). Food Insecurity Works through Depression, Parenting, and Infant Feeding to Influence Overweight and Health in Toddlers. *J. Nutr*, 137(9): 2160-2165.

Carter, M. A., Dubois, L., Tremblay, M. S., & Taljaard, M. (2012). Local social environmental factors are associated with household food insecurity in a longitudinal study of children. *BMC Public Health* 12, 1038.

Caspi, C. E., Sorensen, G., Subramanian, S. V., & Kawachi, I. (2012) The local food environment and diet: A systematic review. *Health & Place*, 18(5):1172-1187.

Center for Disease Control (CDC). Healthy Food Environment. Retrieved 03/14/2015 from [http://www.cdc.gov/healthyplaces/healthtopics/healthyfood\\_environment.htm](http://www.cdc.gov/healthyplaces/healthtopics/healthyfood_environment.htm).

Council File no 07-1658 (2008). Fast Food restaurants/interim Control ordinance/West-Adams-Baldwinhills-Leimert, South and Southeast Los Angeles, from <http://cityclerk.lacity.org/lacityclerkconnect/index.cfm?fa=ccfi.viewrecord&cfnumber=07-1658> .

Davis, C., Strachan, S., & Berkson, M. (2004). Sensitivity to reward: implications for overeating and overweight. *Appetite*, 42:131–138.

Farley, T. A., Rice, J., Bodor, J.N., Cohen, D.A., Bluthenthal, R.N., & Rose, D. (2009). Measuring the Food Environment: Shelf Space of Fruits, Vegetables, and Snack Foods in Stores. *J Urban Health*, 86(5), 672-682.

Fielding, J. E., Simon, P. A. (2011). Food Deserts or Food Swamps?: Comment on “Fast Food Restaurants and Food Stores”. *Arch Intern Med*. 171(13): 1171-1172.

Fleischhacker S. E., Evenson, K. R., Sharkey, J., Pitts, S. B. J., & Rodriguez, D. A. (2013). Validity of Secondary Retail Food Outlet Data: A Systematic Review. *Am J Prev Med*, 45(4), 462–473.

Gowda, C., Hadley, C., Aiello, A. E. (2012). The Association Between Food Insecurity and Inflammation in the US Adult Population. *Am J Public Health*, 102(8) 1579-1586.

Hattori, A., An, R., & Sturm, R. (2013). Neighborhood Food Outlets, Diet, and Obesity Among California Adults, 2007 and 2009. *Prev Chronic Dis*, 10: 120123.

Larson N. I., Story, M. T., Nelson, M. C. (2009). Neighborhood Environments: Disparities in Access to Healthy Foods in the U.S. *Am J Prev Med*, 36(1): 74–81.

Levine, J. A. (2011). Poverty and Obesity in the US. *Diabetes* 60(11): 2667-2668.

Morland, K., Diez Roux, A. V., Wing, S. (2006). Supermarkets, other food stores, and obesity: the atherosclerosis risk in communities study. *Am J Prev Med.* 30(4): 333-9.

Rao, M., Afshin, A., Singh, G., & Mozaffarian, D. (2013). Do healthier foods and diet patterns cost more than less healthy options? A systematic review and meta-analysis. *BMJ Open*, 3(12), e004277.

Sean, C., Lucan, A. K., & Sherman, S. (2010). Storing Empty Calories and Chronic Disease Risk: Snack-Food Products, Nutritive Content, and Manufacturers in Philadelphia Corner Stores. *J Urban Health*, 87(3): 394-409.

Stark, J. H., Neckerman, K. M., Lovasi, G. S., Konty, K., Quinn, J., Arno, P., et al. (2013). Neighbourhood food environments and body mass index among New York City adults. *J Epidemiol Community Health*, 67:736-42.

Stuckler, D., McKee, M., Ebrahim, S., & Basu, S. (2012). Manufacturing Epidemics: The Role of Global Producers in Increased Consumption of Unhealthy Commodities Including Processed Foods, Alcohol, and Tobacco. *PLoS Med*, 9(6): e1001235.

Sturm, R., & Cohen, D. A. (2009). Zoning for health? The year-old ban on new fast-food restaurants in south LA: The ordinance isn't a promising approach to attacking obesity. *Health Affairs (Millwood)*, 28(6), w1088-w1097.

United States Department of Agriculture (USDA). Creating Access to Healthy, Affordable Food. Retrieved 03/14/2015, from: <http://apps.ams.usda.gov/fooddeserts/>.

Yamada, S. & Palafox, N. (2001). On the Biopsychosocial Model: The Example of Political Economic Causes of Diabetes in the Marshall Islands. *Fam Med*, 33(9): 702-4.