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Cross-sector analysis of socioeconomic, racial/ethnic, and urban/rural disparities in food policy enactment in the United States

Daniel R. Taber [a,*], Jamie F. Chriqui [b,c], Christopher M. Quinn [c], Leah M. Rimkus [c], Frank J. Chaloupka [c,d]

[a] Healthy Food America, 1200 12th Ave. S, Suite 710, Seattle, WA 98144, USA
[b] Division of Health Policy and Administration, University of Illinois at Chicago, 1603 W. Taylor St. (MC 923), Chicago, IL 60612, USA
[c] Institute for Health Research and Policy, University of Illinois at Chicago, 1747 W. Roosevelt Rd., Chicago, IL 60608, USA
[d] Department of Economics, University of Illinois at Chicago, 601 S. Morgan St., Chicago, IL 60607, USA

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ABSTRACT

We examined racial/ethnic, socioeconomic, and urban/rural disparities in food policy enactment across different sectors, as well as retail food access, throughout the United States. Policy and retail food store data were obtained from 443 communities as part of the Bridging the Gap Community Obesity Measures Project. Our results indicated that median household income was inversely associated with healthier retail food zoning policies in Hispanic communities, where competitive food policies for schools were also healthier and mean fruit/vegetable access in stores was higher. In contrast, income was positively associated with healthier retail food zoning in rural communities, where competitive food policies were weaker. Black communities had low scores across all policy domains. Overall, Hispanic communities had the strongest food policies across sectors. Barriers to policy adoption in both rural and Black communities must be explored further.

1. Introduction

Racial/ethnic, socioeconomic, and geographic disparities in childhood obesity have persisted in the United States (U.S.) for decades (Wang and Beydoun, 2007). The prevalence of childhood obesity rose substantially in all socio-demographic groups from 1980 to 2000 (Ogden et al., 2002) but has consistently been highest in racial/ethnic minority, low-income, and rural populations (Wang and Beydoun, 2007; Johnson and Johnson, 2015). Though overall prevalence has stabilized since 2000 (Ogden et al., 2016), some studies reported that disparities in childhood obesity have worsened in recent years (Datar and Chung, 2015; Frederick et al., 2014). Disparities in obesity-related diseases such as diabetes have also grown in recent years (Geiss et al., 2014).

These trends have taken place even as federal, state, and local policymakers in the U.S. have implemented several initiatives to target environmental determinants of obesity (Institute of Medicine, 2012). Schools, for example, were an early target of policy change due to the widespread prevalence of high-calorie 'competitive foods' – i.e., foods and beverages that are sold in school outside of federal school meal programs (Larson and Story, 2010). Other initiatives have been promoted to target environmental determinants outside of school, such as zoning codes (Holzman, 2010), menu labels (Swartz et al., 2011), and sweetened beverage taxes (Powell et al., 2013).

There is growing evidence that policies, particularly in schools (Chriqui et al., 2014), may improve the food environment, diet, or obesity in the general population, but evidence is more limited in disadvantaged communities. Several studies reported no evidence that individual policy initiatives in specific sectors improved diet or reduced obesity in disadvantaged communities. Studies in New York City (Elbel et al., 2015), Philadelphia (Cummins et al., 2014), Pittsburgh (Dubowitz et al., 2015), and Los Angeles (Sturm and Hattori, 2015), for example, each reported that policies to improve the neighborhood food environment had little, if any, impact on diet or obesity in disadvantaged communities. Another study reported that California's competitive food law changes were associated with declines in obesity prevalence in high-income areas but not low-income areas (Sanchez-Vaznaugh et al., 2015). It is impossible to generalize why policies have been ineffective in disadvantaged communities because the studies differed in many ways (e.g., location, study design, policy of interest, outcomes of interest.) However, the consistently null results raise questions as to why these patterns are occurring.

One potential explanation, which several authors suggested, is

* Corresponding author.
E-mail addresses: dtaber@hfamerica.org (D.R. Taber), jchriqui@uic.edu (J.F. Chriqui), cquinn5@uic.edu (C.M. Quinn), fjc@uic.edu (F.J. Chaloupka).

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that isolated policies have not been complemented by changes in other sectors. Obesity experts generally agree that so single policy or program is sufficient to reduce obesity (Hawkes et al., 2015; Institute of Medicine, 2012). Isolated changes in one sector (e.g., schools) may be ineffective if not reinforced by complementary changes in other sectors (e.g., neighborhood food environment). The World Cancer Research Fund International's NOURISHING framework identified a wide range of policies in different domains that are needed to reduce obesity (Hawkes et al., 2013). Public health experts have also advocated for a "Health in All Policies" approach in which various agencies and sectors must collaborate to address social and economic factors that cause health inequity (Rudolph et al., 2013).

In practice, coordinated change is complicated because different policies are designed and implemented by different agencies (e.g., education, housing) at different governing levels, and they face different political and logistical constraints. On a global level, obesity experts have characterized policy change as "patchy" because cross-sector change is rare (Roberto et al., 2015). European health researchers have also discussed the challenges of implementing a "Health in All Policies" approach (Koivusalo, 2010).

To achieve the goal of cross-sector policy change, public health researchers and practitioners must understand the extent to which such changes are currently taking place, and whether different types of communities face different barriers to change. If disadvantaged communities are less likely to enact changes across sectors, then isolated policies described earlier may be particularly ineffective in disadvantaged communities.

To our knowledge, no study has examined disparities in policy implementation across multiple sectors. Several studies have reported disparities in implementation, but only in specific sectors (Jilcott Pitts et al., 2015; Nanney et al., 2013; Taber et al., 2011, 2015). Thus, this study was designed to determine if enactment of food-related policy across sectors varied by racial/ethnic composition, SES, and urbanicity. We examined multiple sectors individually and in combination. We also compared patterns of disparity in policy enactment to patterns of disparity in other environmental food measures (e.g., fruit/vegetable access).

2. Methods

This repeated cross-sectional study utilized three years of data on competitive food policies, permitted use food zoning policies, and retail food stores, collected as part of the Bridging the Gap Community Obesity Measures Project (BTG-COMP). The study was a community-level analysis that did not include any human subject data. All data were objectively measured by BTG-COMP research staff. Specific measures are described in more detail below.

2.1. Data source – BTG-COMP

BTG-COMP investigators and research staff collected policy and environmental data from a national sample of communities across 46 states over a 3-year period, 2010–2012 (Bridging the Gap Community Obesity Measures Project, 2015). For the purpose of this study, analyses were restricted to 443 communities in which complete data on food policy and food store measures were obtained (from an original sample of 471 communities). Data collection was conducted in conjunction with Monitoring the Future (MTF), an annual, nationally representative study of 8th, 10th, and 12th grade students. A multi-stage sampling procedure was used to select schools at each grade level; for each school, a catchment area was defined as the area from which the school drew the majority of its student population. This study utilized the second-year half sample of traditional public schools (i.e., neighborhood schools) participating in MTF. Each policy measure that was used in this study represents either the respective school district or catchment area (hereafter referred to as "community") of a MTF school. Further details on the MTF sampling procedure are provided elsewhere (Johnston et al., 2014).

2.2. Policy data

This study focused on 3 indices of school or community food policies – the competitive food policy index (CFPI), the healthy food zoning index (HFZI), and the modified retail food zoning index (MRFZI). These measures were purposely selected to represent different initiatives that have been promoted to target different environmental determinants of obesity in different sectors. Each index was measured on a 0–100 scale, with higher scores indicative of healthier policies. The measures were developed using data collected as part of BTG-COMP.

The CFPI was a measure of the strength of district-level competitive food and beverage provisions included in the congressionally-mandated school district wellness policies. Strength was determined by assessing the proportion of competitive food and beverage-related items (out of 57) that were definitively required in a given district's policy. The measure built on the original strength score developed by Schwartz et al., who had assessed strength of a series of location restrictions and nutrient standards across locations of sale (Schwartz et al., 2009). Our measure assessed the strength of 12 overarching provisions as well as 15 nutrient-specific standards for each of 3 locations of sale where most competitive food items are purchased at the secondary school level (i.e., vending machines, school stores, and a la carte lines) (Chriqui et al., 2013; Terry-McElrath et al., 2012). Supplementary Table 1 lists the items that were included, and which focused on items sold or made available outside of the cafeteria (e.g., freely accessible water). Policy data were compiled from hard copies of written policies obtained from internet searches and direct communication with public school districts where the study communities were located. Policies were double-coded and analyzed by 2 trained researchers using an adapted version of a coding scheme developed by Schwartz et al. (2009), as described elsewhere (Chriqui et al., 2013).

The HFZI was a measure of the number of "healthy food outlets" (HFOs) that were permitted in the community based on municipal, township, and county-level zoning policies in jurisdictions that overlapped the community, including permitted, conditional, and accessory uses. Policies were collected and coded by trained policy analysts, who obtained the policies from government agencies either online or by mail from various offices (e.g., planning and zoning department). HFOs included supermarkets, farmers markets, fruit/vegetable stands, and fruit/vegetable carts. Because this study focused on policies aimed at childhood obesity, the number of permitted HFO types in each jurisdiction was weighted according to the proportion of the overall community population age 0–17 years located in that jurisdiction, and then summed to the community level. The weighted count was divided by 4, the maximum value, and multiplied by 100 to create a 0–100 scale.

The MRFZI represented the percentage of all food outlet permitted use zoning that was for HFOs, analogous to the modified retail food environment index (National Center for Chronic Disease Prevention and Health Promotion, 2011). The numerator for the MRFZI was the number of HFOs that were permitted by zoning; the denominator was the sum of HFOs and non-HFOs that were permitted through zoning. Non-HFOs included fast food restaurants, convenience stores, grocery stores, mobile food vendors, and general retail stores. Like the HFZI, the MRFZI was weighted according to the proportion of the overall community population age 0–17 years located in that jurisdiction, and then summed to the community level.