Health & Place 17 (2011) 961–970

Contents lists available at ScienceDirect

Health & Place

journal homepage: www.elsevier.com/locate/healthplace

Exploring the distribution of food stores in British Columbia: Associations with neighbourhood socio-demographic factors and urban form

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ARTICLE INFO

Article history:
Received 16 July 2010
Received in revised form
28 February 2011
Accepted 5 April 2011
Available online 29 April 2011

Keywords:
Food availability
Health disparities
Urban planning
Neighbourhoods
G.I.S

ABSTRACT

Several studies have identified disparities in access to food retailers among urban neighbourhoods with varied socio-demographic characteristics; but few studies have examined whether key zoning and siting mechanisms described in the urban planning literature explain differences in food store access. This study assessed associations between socio-demographic and urban planning variables with the availability of large supermarkets and stores selling fresh food within one kilometre buffers from residential addresses and the proximity to the closest food stores across 630 census tracts in British Columbia, Canada. Multivariate regression results indicated that neighbourhoods with higher median household income had significantly decreased access to food stores. Inclusion of urban planning factors in multivariate models, particularly housing and transportation considerations, explained much of the relation between area income and food store access, and were significant predictors of food store availability and proximity. Public health research and practice addressing food availability would benefit by incorporating theoretical perspectives from urban planning theory.

1. Introduction

Although the importance of a healthy diet has long been recognised, it is estimated that in excess of 70% of children and 50% of adults in Canada do not consume the recommended daily servings of fruits and vegetables (Garriguet, 2007). Moreover, the national prevalence of obesity has increased significantly in all age and gender groups in the past 30 years, contributing to increased risk of weight-related morbidity and mortality (Katzmarzyk, 2002a, b; Luo et al., 2007). Yet, dietary patterns and the distribution of obesity and nutrition-related health outcomes vary widely across Canada (Garriguet, 2007; Katzmarzyk and Ardern, 2004; Pouliou and Elliott, 2009; Willms et al., 2003).

Growing evidence suggests that characteristics of local residential environments significantly affect dietary behaviours and body mass index (BMI) (Black and Macinko, 2008; Laraia et al., 2004; Morland et al., 2006; Spence et al., 2009). Consequently, a significant amount of health research has focused on examining spatial disparities in the availability and quality of local food and accessibility of food stores.

Studies from high income countries including the United States, the United Kingdom, Canada, Australia, and New Zealand have examined differences in access to nutritious food and retail stores across socio-demographically varied geographic areas (Beaulac et al., 2009; Larson et al., 2009). Several U.S. studies posit that residents of lower income neighbourhoods and neighbourhoods with higher ethnic minority concentration experience reduced access to stores selling healthy foods, but higher exposure to vendors of poor quality foods, particularly fast food outlets (Beaulac et al., 2009; Morland et al., 2002; Powell et al., 2007). In such locations, nutritious foods (e.g., fresh fruits and vegetables) are often more expensive, more difficult to find and may be of lower quality compared to wealthier areas that house more grocers, particularly large retail supermarkets (Alwitt and Donley, 1997; Horowitz et al., 2004; Moore and Diez Roux, 2006; Powell et al., 2006).

However, studies conducted in high income countries outside of the U.S. have yielded mixed and sometimes contrary findings about the area-level predictors of food store availability. For example, studies from the United Kingdom have found that socioeconomically deprived areas housed more food stores overall and more large independent food stores than affluent areas (Cummins and Macintyre, 1999; Cummins and Macintyre, 2002; White et al., 2003). Findings were similar in New Zealand, where the distance to a large supermarket was substantially closer in the most versus least deprived areas (Pearce et al., 2007). Moreover, in Australia, few differences in food store availability were reported among demographically varied urban areas (Winkler et al., 2006).

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doi:10.1016/j.healthplace.2011.04.002

Cummins and Macintyre (2006) have previously commented on differences between North American countries and those elsewhere suggesting that "the picture from North America is thus reasonably consistent" (p. 101) (Cummins and Macintyre, 2006). However, since the publication of this commentary in 2006, a small but growing number of Canadian studies have found that the patterns of food store availability in Canada appear to deviate from those in the U.S. For example, Montreal- and Edmonton-based findings indicate that neighbourhood affluence is not a consistent predictor of access to supermarkets or fruit and vegetable vendors (Apparicio et al., 2007; Bertrand et al., 2008; Daniel et al., 2009; Smoyer-Tomic et al., 2006; Smoyer-Tomic et al., 2008). In Edmonton, inner-city and high-need neighbourhoods (i.e., those characterised by high proportions of elderly residents and low vehicle ownership rates) have better access to supermarkets than elsewhere in the city, and food stores are commonly housed in the city centre along major roads and intersections (Smoyer-Tomic et al., 2006).

The divergence in empirical findings on the associations between the economic and social marginalisation of neighbourhoods and the accessibility of fresh food within neighbourhoods suggests that more attention should be paid to the mechanisms producing the distribution of food stores. Strikingly, few studies in the health literature have explained why the distribution of food resources might vary among demographically diverse neighbourhoods. The majority of studies have focused on examining neighbourhood-based socio-demographic correlates, but few existing studies have explicitly described or tested the underlying processes that lead to or exacerbate disparities in food access. The present study aims to begin to address these gaps by investigating zoning and commercial siting processes as potential mechanisms contributing to spatial disparities in food store availability according to neighbourhood socio-demographic composition.

1.1. Potential Determinants of Food Store Location: Perspectives from Urban Planning and Retail Location Theory

A variety of processes together determine store location (Brown, 1993). Theoretical contributions from retail location theory point out that choices for store locations are shaped by a myriad of actors, including land use planners and legislators, developers, designers, owners, managers, and leasing agents, corporate site assessment and planning units, and smaller entrepreneurs—each exercising some agency in the process (Brown, 1993). Here, we distinguish between the actors involved in urban planning—that is, the *planners* who determine what locations might be suitable for commercial venues—and the actors involved in commercial development, especially the *commercial agents* who work within real estate markets to pick from the available locations set aside by planners.

Most North American urban planning operates through zoning, setting aside various parcels of land for separate and distinct uses. In particular, parcels tend to be segregated by residential, commercial, industrial, and agricultural uses (Sewell, 1994). Some of the literature suggests that zoning merely replicates or actually enacts market mechanisms governing land use, having few independent effects on distribution of stores or land values (Levine, 2006; Shlay and Rossi, 1981). Yet, a number of researchers have now demonstrated that there is an independent role for planning in shaping the distribution of commercial and other venues across urban spaces (Bates and Santerr, 1994; Flanagan, 2006; Levine, 2006; Shlay and Rossi, 1981). In particular, research provides evidence that zoning tends to serve the exclusionary interests of entrenched elites (Shlay and Rossi, 1981), tends to place a model of stable residential neighbourhoods above all other land uses (Sewell, 1994), and actually thwarts the market processes that might otherwise lead to more preferable mixed land uses (Flanagan, 2006; Levine, 2006). In this sense, zoning may be considered both a mechanism by which community mobilisation works, particularly favouring wealthy communities with the resources to organise, and an independent regulatory force that once enacted, reinforces neighbourhood inequality.

Health practitioners may view the occurrence of neighbourhoods with limited access to healthful, affordable foods, and grocers as a problem, particularly in disadvantaged neighbourhoods (USDA, 2009; White House Task Force, 2010). Yet evidence suggests that North American urban planning practices tend to value neighbourhoods dominated by detached, single family dwellings above other possible uses (Flanagan, 2006; Levine, 2006; Perrin, 1979). These practices consequently keep out multi-unit dwellings, commercial venues, and other uses from neighbourhoods where single-family homes dominate, ideally preserving home values in these areas (Shlay and Rossi, 1981). This sort of planning clearly has the potential to create communities with limited access to local food stores. However, this would seem more likely to undermine food access for more stable, residential neighbourhoods than for poorer, more marginalised neighbourhoods.

After the zoning process distinguishes the possible locations where agents might choose from in deciding where to site stores, the commercial decision-making process comes to the fore. This involves the assessment of various types of risk and reward by all the commercial actors mentioned above. While larger corporate chain supermarkets may employ elaborate quantitative models to determine best locations, Clark et al. (2000) argue that most retail decision makers pursue much less formal and more nonchalant, qualitative, intuitive assessments of retail sites (Clark et al., 2000). Through interviews, Smith and Sanchez (2003) provide specific insights into managers' decisions about locations of Tesco grocery stores in the UK and argue that qualitative components mirror those used in quantitative assessments anyway. They identify three primary nodes of decision-making, including the quality of the location's catchment area (incorporating factors such as the size of the nearby population, population density, housing stock, age distribution, housing prices, and employment rates), access to the store (e.g., available means of transportation, access to roads, and distance to population centres), and store characteristics (e.g., size of selling area, range of products, and nearby competitors). Black et al. (2006) consider the role of traffic in the location of food superstores, and argue that food superstores may avoid dense, traffic-prone inner cities because stores cater to drivers and those with large households where economies of scale kick into effect (Black et al., 2006). They note that this could create and exacerbate obstacles to adequate food access for inner city residents.

From the above literature, zoning and commercial siting are major processes determining how food outlets become distributed. Of note, the factors prominently mentioned in the health literature about food availability (area-level racial and socio-economic composition) seem fraught with more ambiguity when considered in the context of these processes. Racial considerations do not appear directly at all, although they may lie behind some of the exclusionary zoning practices (Jackson, 1985), and ideas about the quality of catchment areas discussed. In particular, food outlets targeting certain ethnic groups may site themselves near the places where these ethnic groups live. Income appears more directly, in that the interests of the wealthy and powerful tend to be most preserved by zoning practices, and the income of a catchment area may be an important consideration for commercial ventures. Noticeably, these forces may work at cross purposes as tight zoning laws may keep out stores that try to move into wealthier neighbourhoods. Similarly, residentially zoned wealthier areas are also likely to be less densely populated than other neighbourhoods, providing fewer (if wealthier) targets for commercial enterprises.