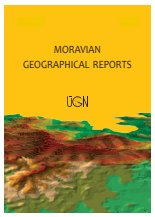

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Comparing two distance measures in the spatial mapping of food deserts: The case of Petržalka, Slovakia

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Abstract

Over the last twenty years or so, researchers' attention to the issue of food deserts has increased in the geographical literature. Accessibility to large-scale retail units is one of the essential and frequently-used indicators leading to the identification and mapping of food deserts. Numerous accessibility measures of various types are available for this purpose. Euclidean distance and street network distance rank among the most frequently-used approaches, although they may lead to slightly different results. The aim of this paper is to compare various approaches to the accessibility to food stores and to assess the differences in the results gained by these methods. Accessibility was measured for residential block centroids, with applications of various accessibility measures in a GIS environment. The results suggest a strong correspondence between Euclidean distance and a little more accurate street network distance approach, applied in the case of the urban environment of Bratislava-Petržalka, Slovakia.

Keywords: *food access, food deserts, distance measures, GIS, Bratislava-Petržalka, Slovakia*

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1. Introduction

Food is a core element of the basic economies and quality of life of individuals (Sadler et al., 2016). The "food environment" has recently become a focus in numerous scientific disciplines (Caspi et al., 2012; Glanz, 2009; Glanz et al., 2016; Charreire et al., 2010; Lytle et al., 2017; McKinnon et al., 2009; Pinard et al., 2016). The concept of a "food environment" can be interpreted in many different ways (McKinnon et al., 2009): in this paper, it is perceived as a retail environment where food retail is operated. Food retail covers both small-scale and large-scale retail units. Not surprisingly, the food environment influences consumer food selection and health outcomes (Gustafson et al., 2013). As noted by Glanz et al. (2009), research on the food environment has revealed that good access to supermarkets may be associated with greater fruit and vegetable consumption, more affordable prices and reduced BMI (Body Mass Index). Methodologies employed to assess the food environment include sales analysis, menu analysis, nutrient analysis and geographic analysis (McKinnon et al., 2009). Between 2007 and 2015, the most frequent methodology used to study the food environment was geographic analysis, utilised in 65% of all the articles (Lytle et al., 2017). Hence, geographical approaches, mostly based on the measurement of accessibility to food stores, still remain one of the most frequent (McKinnon et al., 2009), in spite of the criticism of some researchers (Caspi et al., 2012; Lytle, 2009, Minaker et al., 2013).

In the two last decades, attention has been increasingly paid to food access solutions (Shannon, 2014; Walker et al., 2010). According to Andreyeva et al. (2008, p. 1387): "… access to healthful food is a critical domain of securing high-quality nutrition". Not surprisingly, access to food is increasingly considered as one of the main attributes of life-quality research, as low food accessibility is frequently closely related to phenomena of social inequalities, marginality or transport disadvantages (see, e.g. Hendrickson et al., 2006, or Raja et al., 2008). For geographers, research on the spatial distribution of food sources (and food stores, specifically) is routinely applied, but this approach invites challenges concerning the methodology and data sources leading to proper results and correct interpretations. Similarly, the identification of food deserts is a relatively new phenomenon in geography. Especially in the transitive societies of post-communist Europe, this was not an issue

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