The Mirage of Food Deserts: Disparities between Stated and Revealed Results

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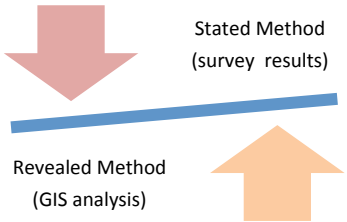
Introduction

Food Desert, typically a populated urban low-income area with limited access to full-service supermarkets, has frequently been used to characterize areas that lack good access to fresh food.

Smoyer-Tomic et al. (2006) and Wang et al. (2014) investigated supermarket accessibility in the City of Edmonton and found that there was a subset of the population who had limited resources to access supermarkets.



The objectives of this study are two-fold:

- ✓ compare respondents' perspective of the food desert issue relative to the GIS analysis;
- ✓ explore potential reasons for the disparity between stated (survey) and revealed (GIS analysis) results.

Data and Methods

Data Sources

- Statistics Canada, National Household Survey (2011)
- DMTI Spatial Inc. (2013)
- Internet-based survey targeting Edmonton Residents via *Qualtrics* (2013)

Methods

- Minimum distance to supermarkets based on road network
- High needs: more than 1km minimum distance as low accessibility, the bottom quartile ($31,235) for low median income and the top quartile (3493.49 per km^2) for high population density
- Logistic regression model

Empirical Model

$$\mathrm{Ln}\left(\frac{p(x)}{1-p(x)}\right) = \beta \cdot X_i$$

- $P(x)$: probability of considering living in food desert neighborhood
- X_i: neighborhood and individual characteristics

Results

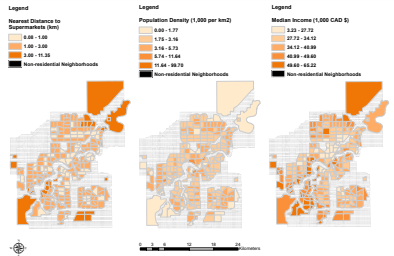


Figure 1 Distribution of Low Accessibility and Two High Needs at the Neighborhood Level

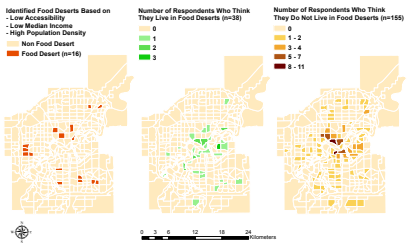


Figure 2 Food Desert Neighborhoods based on Stated and Revealed Methods

variables	Model 1	Model 2	Model 3	Model 4	Model 5
	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)	Coefficient (Std. Err.)
constant	-3.885*** (1.170)	0.640 (1.379)	-0.483 (1.536)	-4.177*** (1.183)	-4.177*** (1.183)
time	**0.084**** **(0.042)**	-	**0.081*** **(0.042)**	**0.083*** **(0.042)**	**0.066 (0.044)**
age	0.013 (0.014)	-	-	0.010 (0.014)	0.009 (0.015)
female	0.033 (0.484)	-	-	-0.020 (0.497)	-0.079 (0.521)
primary food purchaser	0.772 (0.822)	-	-	0.855 (0.843)	0.849 (0.853)
household number	0.159 (0.160)	-	-	0.062 (0.173)	-0.019 (0.193)
distance	-	**0.652***** **(0.252)**	**0.628**** **(0.256)**	**0.446**** **(0.196)**	**0.674**** **(0.273)**
population density		-0.063 (0.086)	-0.063 (0.088)		-0.055 (0.093)
median income		0.015 (0.026)	0.013 (0.026)		0.015 (0.029)
car access		**-8.519**** **(3.445)**	**-7.530**** **(3.492)**		**-7.980**** **(3.723)**
log likelihood	-86.091	-84.198	-82.404	-83.516	-81.030
pseudo R^2	0.042	0.068	0.087	0.071	0.098

Table 1 Summary of Logistic Regression Results (n=179)

Conclusions

- ✓ Regarding the responses to the key question "Do you consider your neighborhood to be a food desert?", approximately 20% consider that they live in food desert neighborhoods.
- ✓ The farther respondents live from a supermarket, the more likely they are to consider their neighborhoods to be food deserts.
- ✓ The longer the average time that respondents spend travelling to supermarkets is, the more likely they consider themselves living in food desert neighborhoods.
- ✓ Individual-specific characteristics, such as respondents' age, gender, household number and being the primary food purchaser in a household, do not statistically influence residents' perception of whether or not they live in food desert neighborhoods.
- ✓ Of the respondents who indicate that they live in food desert neighborhoods, only 8% of them have the same perception as the revealed results; For respondents who state they do not live in food desert neighborhoods, 93% of them are consistent with the revealed results shown by the GIS analysis.
- ✓ Access to private vehicles and income seem to contribute to the disparities between stated and revealed results about food deserts.

References

- ✓ Smoyer-Tomic, K.E., Spence, J.C., Amrhein C., 2006. Food deserts in the prairies? Supermarket accessibility and neighborhood need in Edmonton Canada. The Professional Geographer 58 (3), 307-326.
- ✓ Wang, H., Qiu, F., Swallow, B., 2014. Can community gardens and farmers' market relieve food desert problems? A study in Edmonton, Canada. Applied Geography 55, 127-137.

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