

FOOD ACCESS IN GUELPH, ON:

Evaluating potential relationships between marginality and healthy food access in Guelph, Ontario through network analysis



Poster Created by Thanuja Thavarasa

Project Completed by Rachael Fung & Thanuja Thavarasa

BACKGROUND

Human health and well-being are closely related to the foods people consume. Marginalized groups such as those with lower incomes or racial minorities are often restricted by food access in terms of wealth and transportation (Cooksey-Stowers et al., 2017; Charreire et al., 2010). Thus, they are prone to be in vicinity of cheap, fast-food dense areas, increasing risks to their health. Although studies have looked at marginalization and food access, no studies address affordable transportation modes while also considering the affordability and healthiness of food sources in study areas.

STUDY AREA

The City of Guelph is in southwestern Ontario, just outside the Greater Toronto Area. With a surplus of fast-food places, with a variety of marginalized groups, and with 1 in 6 families being food insecure, Guelph is ideal location to investigate these relationships in (City of Guelph, 2020; Statistics Canada, 2017; Guelph, 2018).

QUICK TERMS

Food Security – having access to enough nutritious food (Luan et al., 2015)

Food Desert – an area lacking access to healthy food due to a shortage of food outlets (Osorio et al., 2013)

Food Swamp – an area lacking access to healthy food due to a surplus of unhealthy food outlets (Osorio et al., 2013)

OBJECTIVES

1) To create food accessibility scores using a range of scenarios dictated by i) affordability of food, ii) healthiness of food, and iii) transportation mode to identify various levels of food deserts and food swamps

2) To see if marginality is related to food access using statistical analyses

METHODS

Identified & Geocoded all Guelph food outlets

Labelled each food outlet with a health class (healthy, moderately healthy, or unhealthy) and with an affordability class (free, affordable, or costly)

Created two network analyst models simulating walking or busing around the city

Used areas of service rings to compute a healthy, moderately healthy, and unhealthy accessibility score

Generated service areas around healthy, moderately healthy, and unhealthy food outlets using the times below:

Walking – 5 10 20 minutes

Busing – 10 20 40 minutes

Classified each census area as healthy, moderately healthy or as a food desert or swamp using accessibility scores

Ran Pearson's correlation tests and linear regressions to correlate marginal quintiles per Dissemination Area (DA) provided by Public Health Ontario's (2016) to food accessibility scores

Computed a geographically weighted regression to assess if relationships varied spatially

II) RESULTS

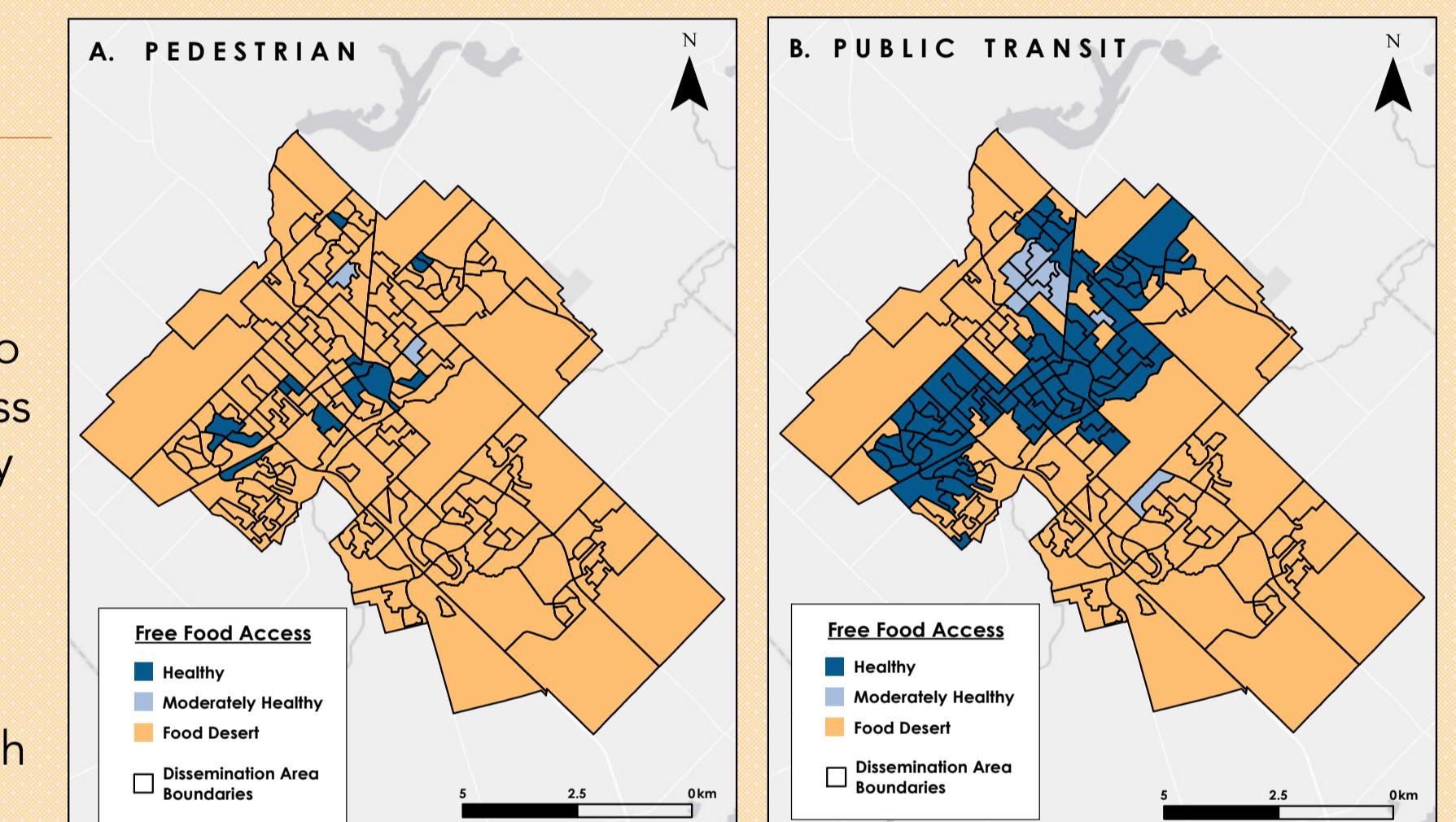
Statistical Analyses

Linear regression and Pearson's correlation test showed that regardless of affordability class, health class, or transportation mode, all scenarios showed weak, scattered relationships between marginality and food accessibility.

I) RESULTS

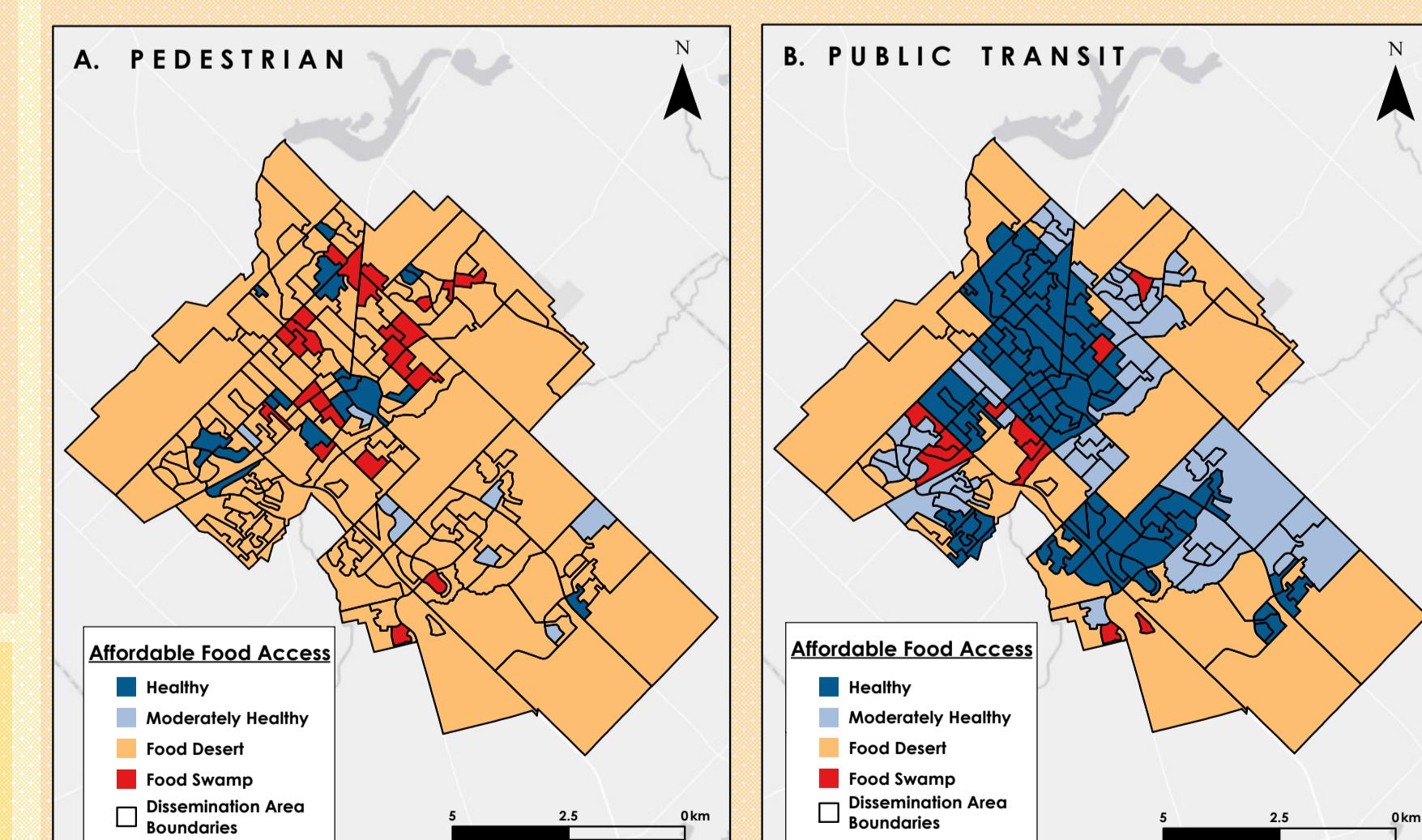
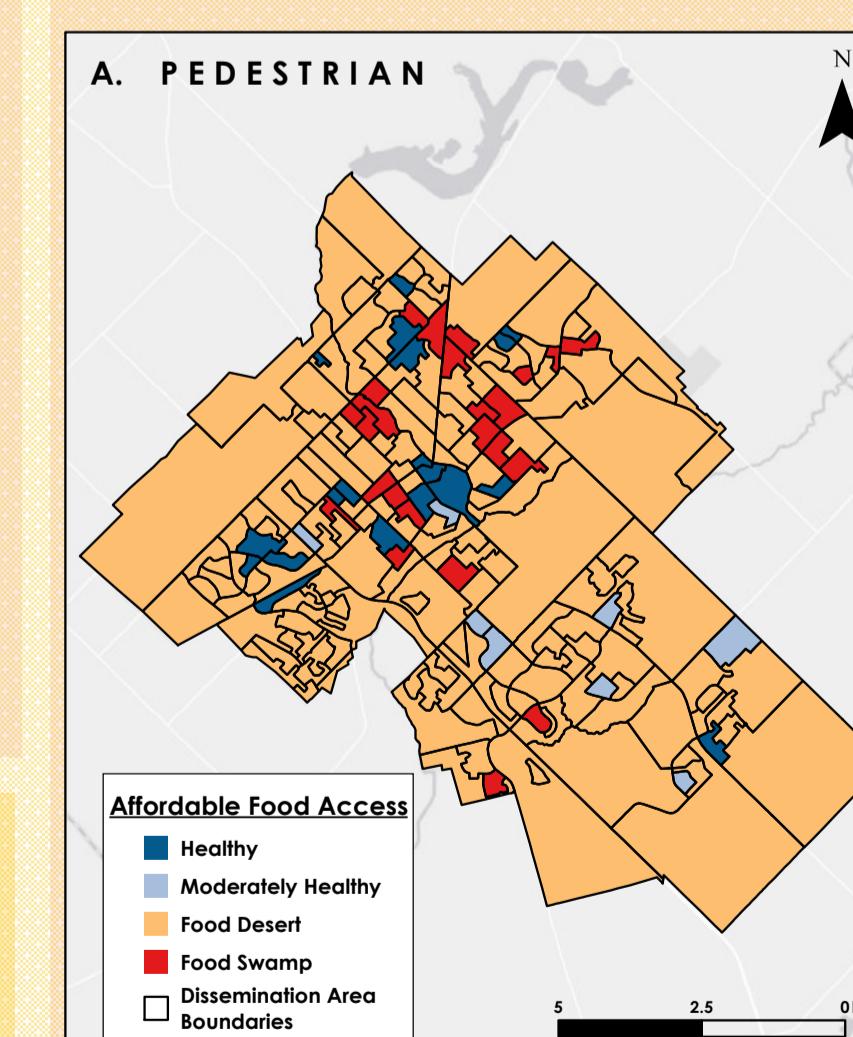
Free DA Classification

With the low number of Guelph emergency food providers, only 17/200 DAs had access to these food sources by walking. Although access to public transportation increased accessibility to these resources, these DAs are mainly located in the central northwestern end. The southeastern end remains as a food desert regardless of transportation, meaning individuals would need to travel much further and longer to obtain food necessities.



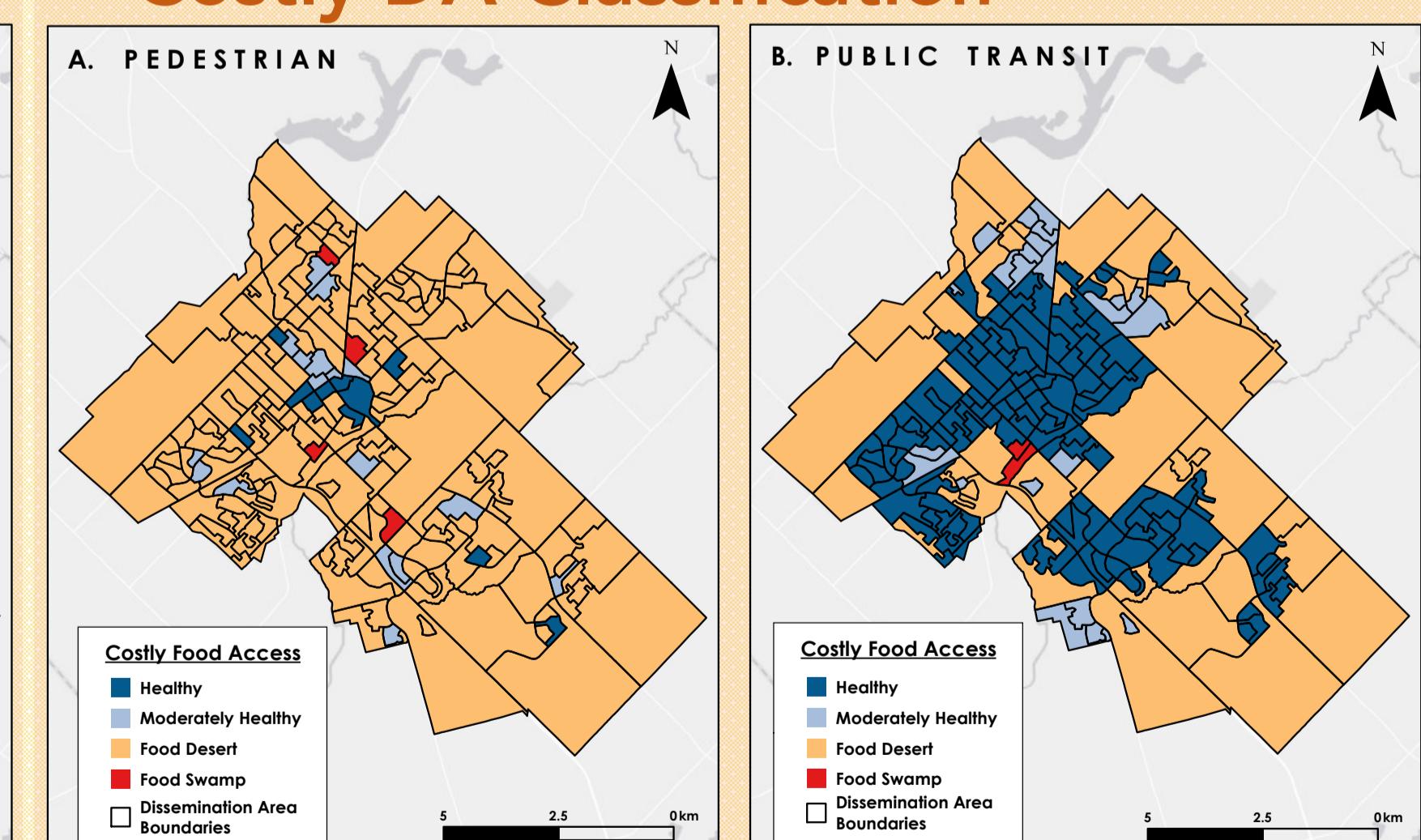
I) RESULTS

Affordable DA Classification



I) RESULTS

Costly DA Classification



II) RESULTS

Statistical Analyses

The GWR revealed that food access is affected by marginalization more strongly at the edges of Guelph regardless of transportation, depicting a positive relationship. The majority of Guelph does not have strong relationships across the city.

LIMITATIONS

- Since the marginality quintiles assumes individual indices (i.e. residential stability, deprivation of resources, dependency and ethnicity) as equal, could have masked indices that have a stronger relationship to food access

TW
The walking and bus data used were published in two different years (2016 & 2020) which could have changed the connectivity within our network models.

CONCLUSION

Our classification of the DAs access highlights northwestern and southeastern Guelph as food deserts regardless of affordability and health classes. These food deserts may be due to lack of FAPs being nearby or lack of transportation networks. Additionally, individuals who only have access to walking are more limited in their access to healthy foods. Through our statistical analyses, there were not any strong, prevalent trends associated with food accessibility and marginality, depicting that food access is not well explained by marginality.

REFERENCES

- City of Guelph (2018). Guelph-Wellington to create Canada's first food smart community. <https://guelph.ca/2018/10/guelph-wellington-create-canadas-first-food-smart-community/>
- City of Guelph. (2020a). Guelph Economic Monitor. <https://guelph.ca/business/economic-development-office/economic-monitor/>
- Charreire, H., Casey, R., Salze, P., Simon, C., Chaix, B., Banos, A., Badarott, D., Weber, C., & Oppert J.M. (2010). Measuring the food environment using geographical information systems: a methodological review. *Public Health Nutrition*, 13(11), 1773-1785. <https://doi.org/10.1017/S1368960010000753>
- Cooksey-Stowers, K., Schwartz, M. B., & Brownell, K. D. (2017). Food swamps predict obesity rates better than food deserts in the United States. *International Journal of Environmental Research and Public Health*, 14(1366), 1-20. <https://doi.org/10.3390/ijerph14111366>
- Luan, H., Law, J., & Quick, M. (2015). Identifying food deserts and swamps based on relative healthy food access: a spatio-temporal Bayesian approach. *International Journal of Health Geographics*, 14(37), 1-11. <https://doi.org/10.1186/s12942-015-0030-8>
- Osorio, A. E., Corradini, M. G., Williams, J. D. (2013). Remediating food deserts, food swamps and food brownfields: helping the poor access nutritious, safe and affordable food. *AMs Rev*, 3, 217-231. <https://doi.org/10.1007/s1362-013-0049-6>
- Public Health Ontario (2016). Ontario marginalization Index (ON-Marg) [digital resource: excel sheet]. Public Health Ontario. <https://www.publichealthontario.ca/en/data-and-analysis/health-equity/ontario-marginalization-index#quotidien/170215dq170215eng.htm>
- Statistics Canada. (2017a). Canadian business counts, December 2016. <https://www150.statcan.gc.ca/n1/daily-quotidien/170215dq170215eng.htm>