

# AVAILABILITY OF SUPERMARKETS IN MARION COUNTY

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## **Dedication**

I dedicate my thesis to my husband Chuck, without whose support and encouragement throughout this process I could not have accomplished this, to my children Zaki and Noor, for their patience in this process, and last but not least to my parents, other family members, and friends for the different ways in which they have supported me.

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## **Abstract**

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### AVAILABILITY OF SUPERMARKETS IN MARION COUNTY

Concern over significant increase in obesity has prompted interdisciplinary research to address the physical food environment in various regions. Empirical studies analyze units of geography independently of each other in studying the impact of the built environment in the health of a region. However, we know that geographical spaces have neighbors and these adjacent areas should be considered in analytical analysis that attempt to determine the effects present. This research incorporates the first neighbor influences by developing a refined hierarchical regression model that takes spatial autocorrelation and associated problems into account, based on Relative Risk of corporate supermarkets, to identify clustering of corporate supermarkets in Marion County. Using block groups as the unit of analysis, 3 models are run respectively incorporating population effect, environment effect, and interaction effects: interaction between population and environmental variables. Final model results indicate spatial random effect being significant, meaning space should be incorporated in studying Marion County block groups. Five variables namely: race (percent African American), mean distance to 3 closest corporate supermarkets, distance to the closest fast food outlet, NDVI, and spatial autocorrelation appear significant at different credible intervals of confidence in the combined model. The combined model incorporates all 3 effects stated above. Lastly, based on network distance to corporate supermarkets as a cost matrix, this

work provides a solution to increase supermarkets in an optimal way and reduce access issues associated with these facilities. Ten new sites are identified where policy should be directed towards subsidizing entry of corporate supermarkets. These new sites are over and above the existing block groups that house corporate supermarkets. This solution is implemented using TransCAD™.

Aniruddha Banerjee, Ph.D., Chair

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