

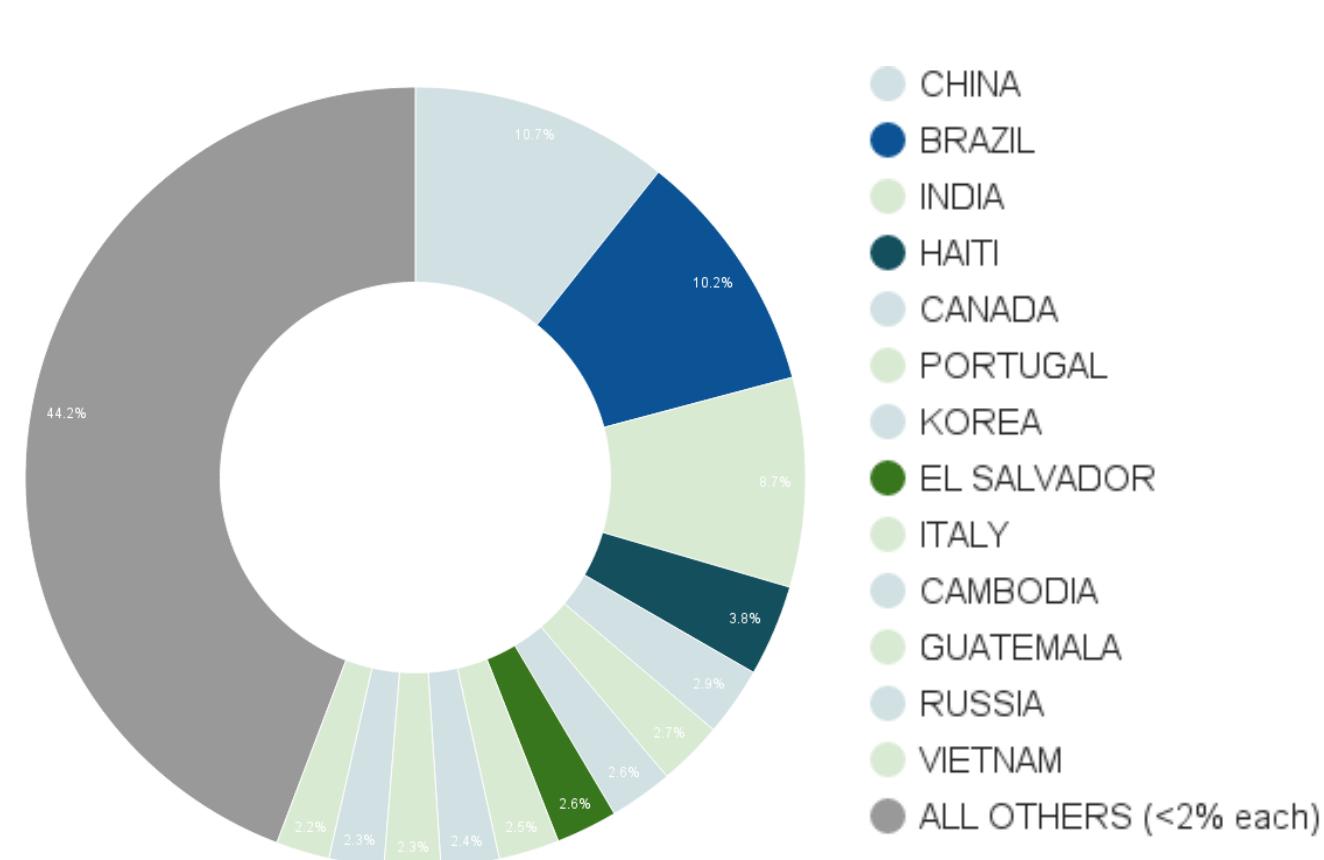
Clustering of Immigrant Populations in Urban Middlesex County

Introduction

This project examines the geographic distribution and clustering of immigrant residents in the cities of Cambridge, Somerville, Medford, Malden, and Everett, MA. After doing some work with nonprofits in Somerville, I was interested in discovering more about the distribution of immigrant populations throughout Somerville. In order to have enough data to show statistically significant results, I included four of Somerville's neighboring cities in my analysis. Primarily, I was interested to see where (if anywhere) immigrant populations were concentrated, and if areas of high immigrant concentration were in different areas of high overall population concentration.

For this analysis, I chose three ethnic groups that I knew to be well-represented in Somerville: immigrants from Brazil, El Salvador, and Haiti. I was not sure how well-represented these immigrant groups were in the other cities when I began my analysis. In the city of Somerville, these countries are three of the top 5 countries of origin for immigrants; in Middlesex County, they are in the top 10 countries of origin.

Place of Birth for Immigrant Residents of Middlesex County



Methods

For this analysis, I utilized data from the American Community Survey 5-year estimates. The most recent year for which all datasets were available was 2013, representing the most reliable, most current data. Five-year estimates are recommended when precision is a high priority; when the study area involves smaller geographies, such as census tracts; and when analyzing small populations, which are all conditions met by this project. The primary dataset utilized was "Place of Birth for the Foreign-Born Population in the United States."

Initially, I was interested in seeing how the density of immigrants differed from the density of the overall population. The maps above visualize that data, where population density is reported in people per square mile. From comparing the two maps, it is clear that the distribution of immigrants does not match the overall population distribution in these five cities. Though some of the areas are the same (downtown Cambridge, for example, features high population density as well as high immigrant density), the foreign-born population also shows pockets of density in East Somerville and Everett that are not present on the general population density map.

I was next interested to see if specific groups of immigrants (specifically, Brazilian, Haitian, and Salvadoran immigrants) followed the overall immigrant density pattern. The three maps to the left show, for each census tract, what percent of the immigrant population is comprised of Haitian, Salvadoran, and Brazilian immigrants, respectively. To confirm if the visible clustering was statistically significant, I performed the Anselin Local Moran's I test to identify clusters and outliers of immigrant groups. A "High-High" cluster indicates a census tract with an unusually high concentration of a certain ethnic group (statistically significant at the 95% confidence level), and a "Low-Low" cluster indicates an unusually low concentration

Methods, cont.

of that ethnic group. If immigrant residents were evenly distributed throughout the city, no clusters would be marked on the map - but instead, there are visible clusters marking high-immigrant communities. The Anselin Local Moran's I test also marks neighborhoods that are outliers—compared to their neighboring census tracts, they have a significantly different concentration.

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The map below represents the areas of overlap between these immigrant clusters, and can be seen as visualizing areas of high immigrant diversity.

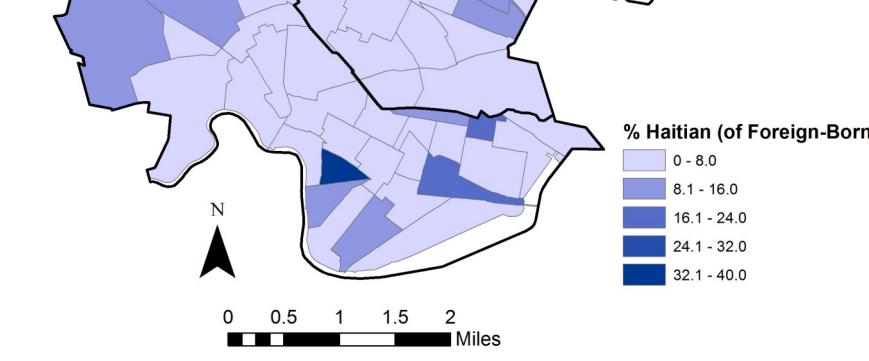
Results & Discussion

In visualizing population density and foreign-born population density, I discovered that there are several areas in these cities with high immigrant density that are not otherwise densely populated. To unpack that, the three maps on the left show the amount of immigrants from each of the three studied countries as a percentage of the foreign-born population. It is clear that not only are there immigrant clusters where there are no population clusters, there are also different clusters for each immigrant group. Finally, the bottom-most map was created to visualize where there were immigrant clusters, and how they related to each other. It clearly shows that there are two clusters of high immigrant density: one in East Somerville, and one in South Everett. Comparing these results to the overall population density map, these are not densely-populated areas. Based on my analysis, I concluded that immigrant groups tend to cluster together, and it is likely that those clusters will overlap. This means that social services targeted at many groups of immigrants could be centrally located in these cluster areas and be able to serve several populations. However, the percentage maps show that the clusters are not the only areas of high immigrant density. If social services are specifically focused on one immigrant population, it may not be best to simply place them in the area of high immigrant density and diversity.

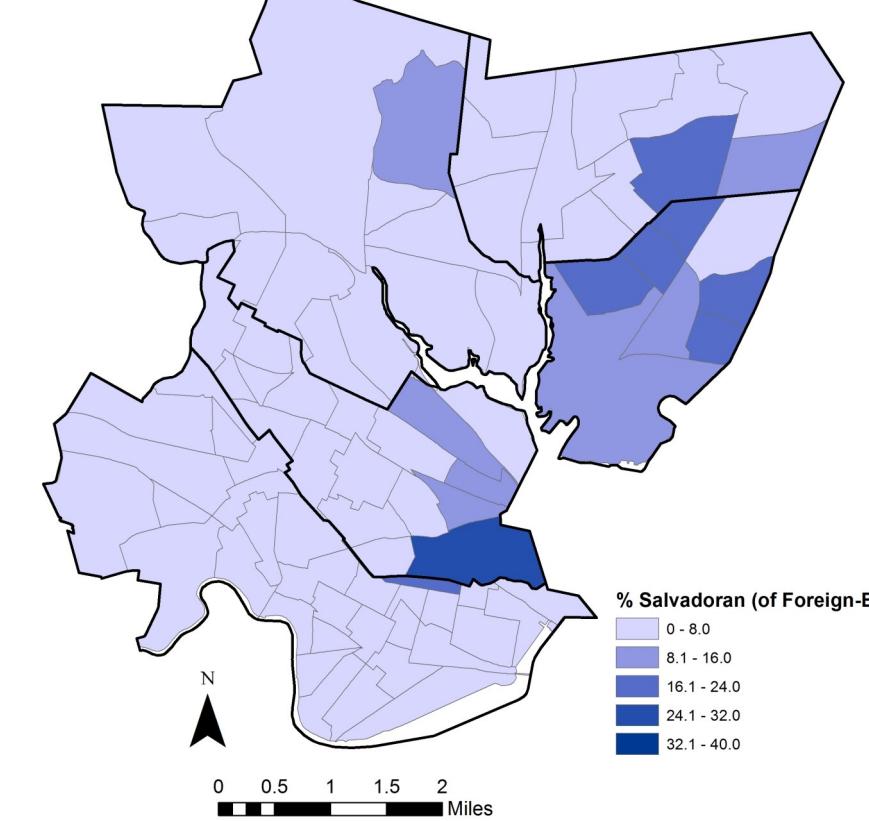
The immigrant clusters are also in close proximity to the planned MBTA Green Line Extension. With rents already rising in many parts of Somerville due to the new Orange Line station at Assembly Square, there is a great deal of backlash about forcing immigrants out of their homes. With these results showing that some of the densest immigrant communities are in the areas that will be directly affected by the Green Line Extension, the importance of combating displacement and gentrification cannot be overstated. Notably, there was only one census tract with high immigrant density in Cambridge - and it was an outlier. Cambridge has had rapid transit access for a long time now, and has become thoroughly gentrified. This has pushed immigrants out of Cambridge and into Somerville, Everett, and Malden, where they are again at risk of being displaced. Other GIS analyses have identified these very census tracts as having the highest risk of gentrification, so it is not surprising that they are also areas of high immigrant density and diversity.

% of Foreign-Born Population, by Country

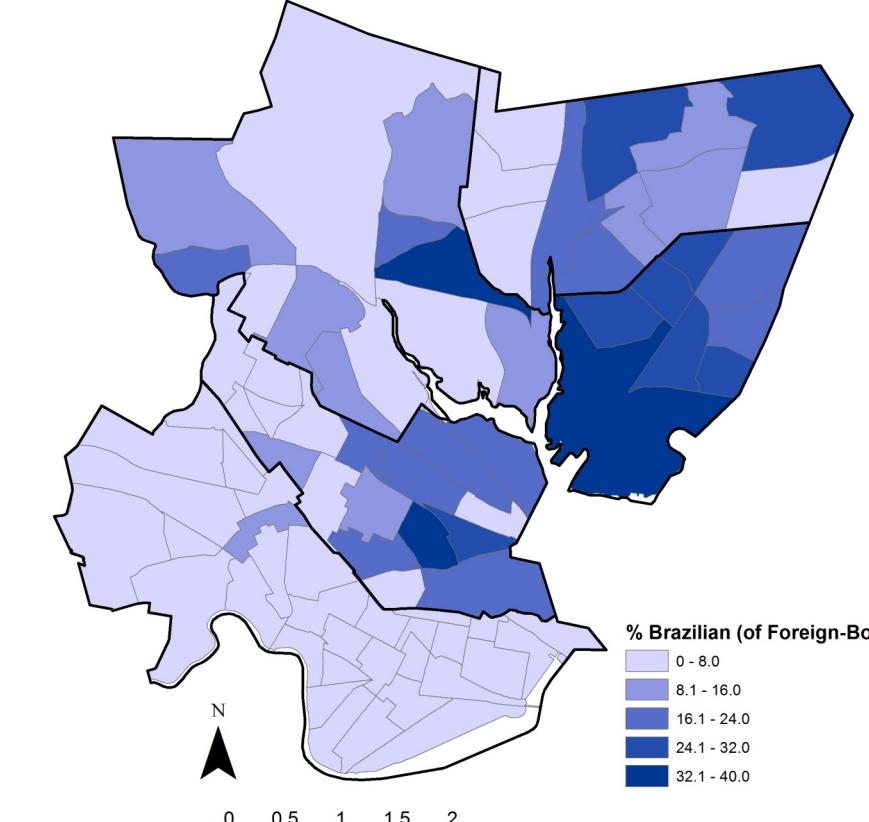
HAITI



EL SALVADOR



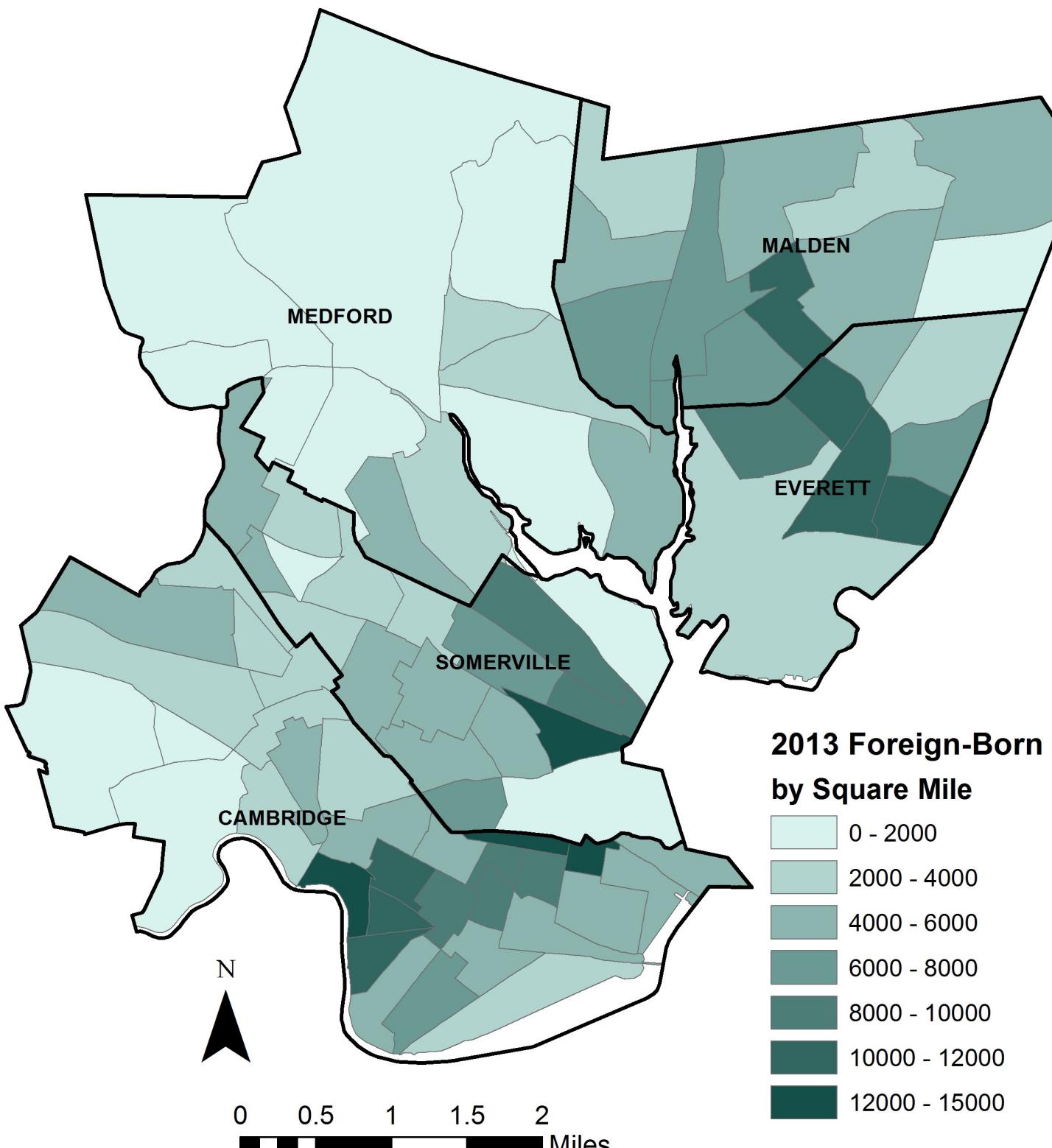
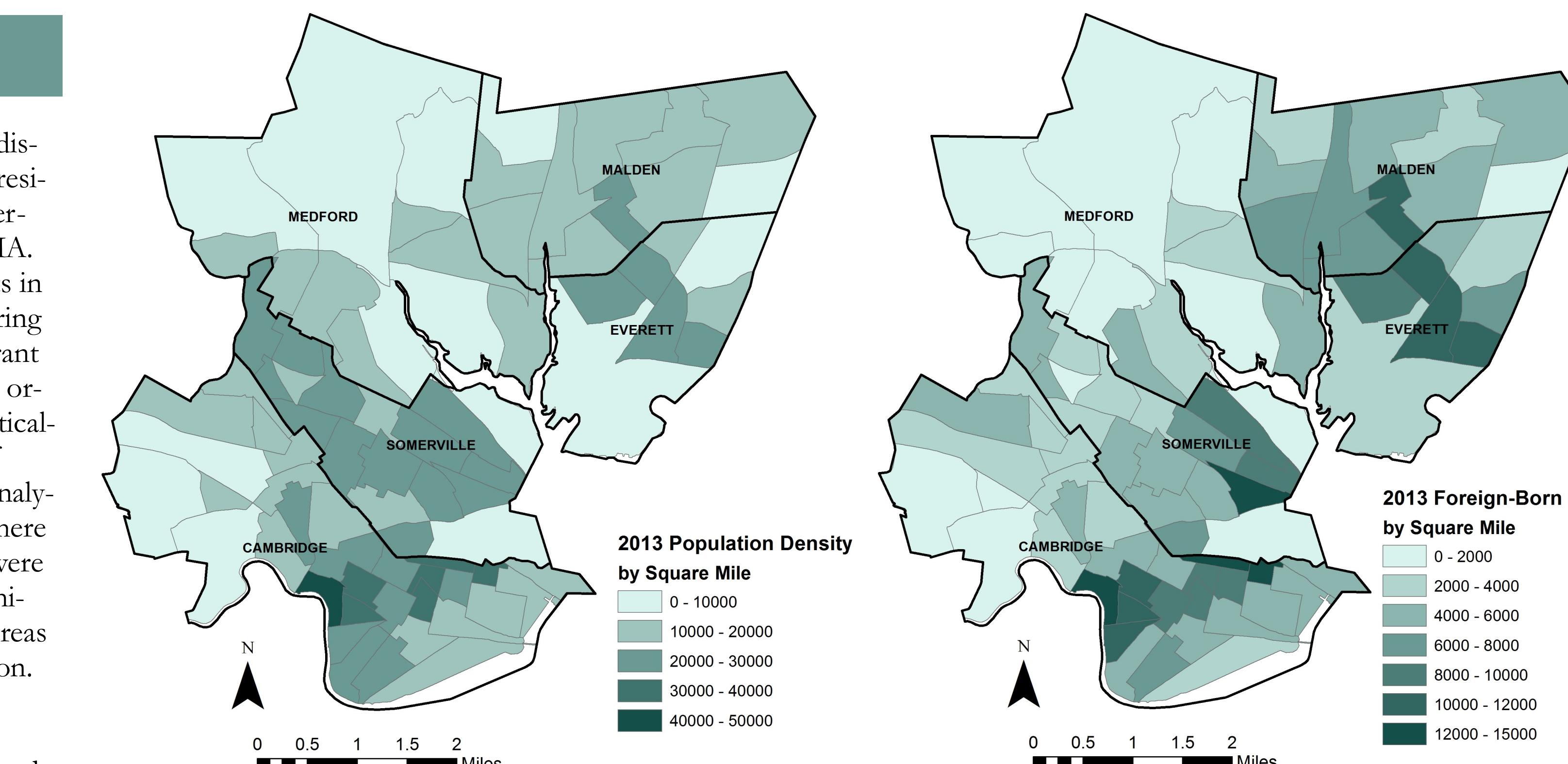
BRAZIL



Overlap of Immigrant Clusters

Overlap of Immigrant Clusters

No Clusters
1 Immigrant Cluster
2 Immigrant Clusters
3 Immigrant Clusters



Local Moran's I Test Results

