This project analyzes the extent of residential segregation of populations of Berlin residents with immigration background. First, I ask simply, where do immigrants live? In other words, which neighborhoods have the highest concentration of immigrant populations? Second, I approach the question of residential segregation by identifying clusters of residents of specific immigrant backgrounds. Do immigrant populations live disproportionately in some areas in the city and not others? Lastly, to look at a measure of how diverse these areas might be, I ask which of these neighborhoods have the greatest mix of immigrant populations. Exploring these three questions creates a foundation for further research to identify common socioeconomic characteristics of predominantly immigrant neighborhoods. Berlin residents with Turkish, former Soviet union, Polish, and Arab immigrant backgrounds are the focus of my analysis.

This indicates that other factors, whether structural or cultural, influence where residents with immigrant background live. Finally, in order to assess the diversity of certain neighborhoods in Berlin, I created a “diversity index” based on the results obtained from my cluster analysis. I define diversity as neighborhoods that have a statistically significant concentration of residents of a specific background compared to other neighborhoods in the same area. As the map shows, there are no neighborhoods with clusters of all four immigrant groups. By this diversity measure, neighborhoods in the center districts capture more diverse residents than those in the surrounding districts.

Important to note is that the term “immigrant” refers to residents who have a Migration Background. This is not a legal definition of immigration status; rather, it denotes both foreigners residing in Berlin either in a temporary or permanent basis as well as German citizens born outside of Germany who had cram at least one foreign-born or non-German parent.

This project was supported by the Fletcher School at Tufts University and the Brandenburg Bureau of Statistics.

The Fletcher School TUITUS UNIVERSITY

Methods

To determine which neighborhoods have high concentrations of immigrants, I refer to the data published by the Berlin Department for Urban Development. The maps below depict the percentage of residents that have immigrant backgrounds by Lebenswelteich orientierte Räume (LOR), an administrative boundary that directly translates to “living environment areas”, hereafter referred to as “neighborhoods.”

Though this map highlights regions of high concentrations of immigrant populations generally, it does not answer the question of whether certain immigrant communities live in certain areas. To address this, I created four separate maps that show the percentage of specific immigrant groups – Turkish, Arab, Russian and Polish – of the total population by neighborhood. This suggests that these groups tend to reside in different parts of the city, with neighborhoods in former East Berlin showing higher percentages of Russian immigrants while central neighborhoods have greater proportions of Arab and Turkish immigrants. I refer to the data published by the Berlin-Brandenburg Bureau of Statistics for information on specific immigrant groups.

To investigate this tendency further, I performed a cluster and outlier analysis to see whether specific immigrant groups live in clusters in certain parts of the city. The Anselin Local Moran’s I spatial statistics tool identifies statistically significant hot spots, cold spots, and spatial outliers in a dataset. I used this to assess where clusters of immigrant communities were occurring. A “High Cluster” is an area of the city with a high concentration of residents of a specific background (that is unusual statistically significantly different at the 95 percent confidence level) compared to other neighborhoods. In the rest of the city, these clusters could be interpreted as “immigrant communities” or “ethnic enclaves.” A “Low Cluster” is the opposite, an area with an unusually low concentration of residents of a specific background. Together these high and low clusters provide a measure of residential segregation, which I define as the extent to which individuals of different groups occupy or experience different social environments. These results show that residents with immigrant background groups together in a statistically significant way; such that the places of residence are not distributed normally throughout the city as would be expected. This indicates there is a significant structural or cultural influence where residents with immigrant backgrounds tend to live.

The Anselin Local Moran’s I test also identifies which neighborhoods are outliers. These outliers are the neighborhoods that are located near high or low clusters but are themselves an aberration, since they have a surprisingly different concentration of residents with that specific immigrant background compared to the surrounding neighborhoods. The “low-high outliers” are neighborhoods with surprisingly low concentrations of immigrant residents near neighborhoods with very high and statistically significant concentrations, while the “high-low” outliers are the opposite. Both may be an indicator of some kind of residential segregation that causes these neighborhoods to be unique.

Methods

To determine which neighborhoods have high concentrations of immigrants, I refer to the data published by the Berlin Department for Urban Development. The maps below depict the percentage of residents that have immigrant backgrounds by Lebenswelteich orientierte Räume (LOR), an administrative boundary that directly translates to “living environment areas”, hereafter referred to as “neighborhoods.”

Though this map highlights regions of high concentrations of immigrant populations generally, it does not answer the question of whether certain immigrant communities live in certain areas. To address this, I created four separate maps that show the percentage of specific immigrant groups – Turkish, Arab, Russian and Polish – of the total population by neighborhood. This suggests that these groups tend to reside in different parts of the city, with neighborhoods in former East Berlin showing higher percentages of Russian immigrants while central neighborhoods have greater proportions of Arab and Turkish immigrants. I refer to the data published by the Berlin-Brandenburg Bureau of Statistics for information on specific immigrant groups.

To investigate this tendency further, I performed a cluster and outlier analysis to see whether specific immigrant groups live in clusters in certain parts of the city. The Anselin Local Moran’s I spatial statistics tool identifies statistically significant hot spots, cold spots, and spatial outliers in a dataset. I used this to assess where clusters of immigrant communities were occurring. A “High Cluster” is an area of the city with a high concentration of residents of a specific background (that is unusual statistically significantly different at the 95 percent confidence level) compared to other neighborhoods. In the rest of the city, these clusters could be interpreted as “immigrant communities” or “ethnic enclaves.” A “Low Cluster” is the opposite, an area with an unusually low concentration of residents of a specific background. Together these high and low clusters provide a measure of residential segregation, which I define as the extent to which individuals of different groups occupy or experience different social environments. These results show that residents with immigrant background groups together in a statistically significant way; such that the places of residence are not distributed normally throughout the city as would be expected. This indicates there is a significant structural or cultural influence where residents with immigrant backgrounds tend to live.

The Anselin Local Moran’s I test also identifies which neighborhoods are outliers. These outliers are the neighborhoods that are located near high or low clusters but are themselves an aberration, since they have a surprisingly different concentration of residents with that specific immigrant background compared to the surrounding neighborhoods. The “low-high outliers” are neighborhoods with surprisingly low concentrations of immigrant residents near neighborhoods with very high and statistically significant concentrations, while the “high-low” outliers are the opposite. Both may be an indicator of some kind of residential segregation that causes these neighborhoods to be unique.

Finally, in order to assess the diversity of certain neighborhoods in Berlin, I created a “diversity index” based on the results obtained from my cluster analysis. I define diversity as neighborhoods that have a statistically significant concentration of more than one immigrant community. I overlaid the clusters of residents with Turkish, Arab, Russian and Polish backgrounds and assigned a 1 to each. Neighborhoods with clustering of 4 are the most diverse because several immigrant groups reside in the same area. At the map shows, there are no neighborhoods with clusters of all four immigrant groups. By this diversity measure, neighborhoods in the center districts capture more diverse residents than those in the surrounding districts.

By using a cluster and outlier analysis, I depict immigrant clusters in Berlin. This provides a measure of residential segregation because it highlights parts of the city with abnormally high concentrations of residents with certain backgrounds. The outliers also suggest that some neighborhoods may be especially inclusive of immigrant groups. Whether or not they are overtly exclusionary, however, remains unclear. The diversity index shows neighborhoods that contain a particularly diverse mix of residents because residents of more than one immigrant group are clustered there. The next step in this analysis would be to explore the relationship between awareness of immigrants and socioeconomic and structural factors to understand the underlying causes of residential segregation. The graph above, for example, shows a possible correlation between unemployment rates per neighborhood and neighborhoods with high concentrations of immigrants.

Data sources:
- Berlin-Brandenburg Bureau of Statistics. (Administrative boundaries; Social Urban Development Monitoring, dataset updated 2013)
- Berlin Department for Urban Development. (Abteilung Miet- und Wohnungsmarkt Berlin, updated Feb 2014)
- Map projection: ERIE UTM Zone 32N Local grid: ESP, HERE, Deloime, OpenStreetMap. GIS user community Photo credits: www.immigrants.org

Date Created: May 5, 2015

CoDesign and Cartography: Akisaka Watanabe

Acknowledgements: Thank you to Patrick Flannelle and Carolin Tschiedt for your guidance.

Measure of the Diversity of Berlin’s Neighborhoods

Relationship between Percent of Residents with Immigrant Backgrounds and Unemployment Rates