Using GIS to Analyze Immigrant Populations Service Needs in the Twin Cities Metropolitan Counties, Minnesota USA

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Abstract

Minnesota has always been welcoming for immigrants and it has hosted many immigrants over the years. However, in the last three decades, new waves of immigrants from Asia and Africa have made Minnesota their homes and most are refugees who fled from their native countries for reasons such as civil unrest and fear of persecution if they remain or go back. These new immigrants came to Minnesota for the same reason as immigrants came in the 20th century or before, looking for freedom, affordable housing, jobs, social services, and other resources. Almost all immigrants need some types of services and resources to help them adapt to their new country. With the surge of immigrants and their need for social services and assistance, service providers face challenges to deliver these services. To predict future waves of immigrants, to estimate current immigrant populations, and to identify where immigrants reside can help plan and prepare services from both governmental and non-governmental organizations. GIS tools along with tabular and spatial analyses were used to produce maps and tables. These were created to better understand where immigrants are living in the Seven County Metro area.

Introduction

History

The State of Minnesota has recently seen more immigrants than it has in many previous decades. Many of the immigrants arrived in the last two decades. According to Ronningen (2004), "There is a great deal of interest in how many people are here from other countries, where they live, and what sort of services they need." Though it is difficult to easily find information about immigrants, service providers from law enforcement agencies to health care providers need to know information about immigrants including where they live as well as information about the language they speak.

Ronningen (2000) explains Minnesota had immigrants from more countries in 2000 than ever before. The number of new immigrants coming to Minnesota is still increasing as many more come searching for jobs, housing and safety and joining others from their native country (Ronningen, 2000).

Immigrants have many reasons to immigrate. Most immigrants indicate that they escaped from dangerous situations and others left to change their living conditions and to have better lives (Bazile, 2003). Regardless of the reason that people migrate to the US, research

indicates, "The United States offers refugees new beginnings to those who claim it as their new home" (Bazile, 2003) and the US has become the destination for many.

Coming to a new country and making it home is tough and every newcomer faces many challenges. Some of the greatest are the cultural and linguistic barriers to finding and to getting their basic needs met such as housing, jobs, and safety. These new challenges can be difficult and overwhelming for many when they are trying to adjust a new country, adapt to a new life and culture, learn a new language, and understand values that sometimes clash with their own (Anonymous, 2004).

New immigrants come to Minnesota for the same reasons as immigrants came in the 20th century or before. They are looking for affordable housings, jobs, social services, and other resources. To have services and resources are extremely helpful as they often need substantial assistance to adjust to America life and reach self-sufficiency. "Our philosophy is we meet people where they are and help them on their path toward self-sufficiency says Rachele King, director of refugee services for the Minnesota Council of Churches" (Dillon, 2008).

With the surge of immigrants pouring into the state and their needs for social services and assistance, social service providers face challenges to deliver these services. As an agency supervisor described with frustration, "My staff was getting frustrated, too. We would have Spanish speaking and other limited English speaking immigrants come to the office, and it was real struggle to understand them and for them to understand us" (Anonymous, 2004). Because of misunderstandings, service

provider waste time and money, and services are not being efficiently delivered. According to Anonymous (2004), "We started to wonder where the next waves of refugees and immigrants would come from and how we would all cope."

Overview of Immigration

International migration imbalance between developing nations and industrial countries results in a "push-pull" migration phenomenon. People are pushed from their native countries by poor economies or civil unrest and they are pulled to others by economic opportunities, safety, and freedom (Darboe, 2003). In the last two centuries, many people migrated to the United States for different reasons but mostly to have better lives and freedom (Anonymous, 2004).

As described in the Immigration and Assimilation article (Darboe, 2003), there are four main types of aliens or non-citizens in the United States. The first are immigrants from other countries who are admitted either by re-uniting with family members who are already US residents or citizens or they have professional qualifications for certain jobs.

The second categories of immigrants are called refugees and they are people who left their country because of fear of persecution for political, religious or other reasons. Third, non-immigrants are persons granted a temporary entry for a specific purpose such as studying, working or visiting. Lastly, unauthorized migrants are foreigners with neither immigrant nor non-immigrant visas.

US Immigration Laws

Even though many immigration laws were enacted over the years at the state and federal levels, there were three major laws passed by the Congress of the United Sates in the past few decades. One of them is known as the Refugee Act of 1980, and it was enacted to create a systematic procedure for the admission and effective resettlement of refugees, especially those affected by humanitarian crisis.

The second law was passed during the Reagan administration and it is known as the Immigration Reform and Control Act. It was passed in 1986. Its purpose was to reduce illegal immigrants to the United States. The third law was passed in 1990's and was intended to increase the number of immigrants and their families under the employment-preference category (Darboe, 2003).

Methodology

Data Importance

The goal of this research was to analyze immigrant populations in Metro Counties within the areas of Minneapolis and St. Paul, Minnesota USA. The results of the analysis are intended to help service providers, local government and non-profit organizations better estimate immigrant populations and therefore to help them better prepare and plan the services immigrants need. The end results may also be helpful for governmental budgeting and resource distribution. To complete this research, data gathering was undertaken. Further, major processes for this work included data collection, conversion, joining, calculating, layer creation, analyzing, and graphing data.

Gathering Data

Multiple data sets were required. The main sources of data were the US Census and American Community Survey (ACS) data. Data from these sources were used to create maps and perform analysis of the immigrant populations.

The first step was to prepare data. ArcGIS's geo-processing tools were used to generate and manipulate data necessary for analysis in the study. Many of the tools utilized data manipulation included: clipping, merging, and joins data sets. Some of the data were obtained in the form of database files (.dbf) and were joined across variables with other database files. Once layers were manipulated and successfully joined, the layers were imported into a geo-database for analysis.

One of the difficulties encountered when performing data manipulation and geo-processing was that all data were not in the same format with similar keys to join or merge tables and features together. For example, race, ethnicity, and other demographic characteristics from the US census database files required table manipulation and spatial feature processing (clipping) to align with the metro counties from the Census Tract file. The tables required some editing to permit the correct information to be joined with the Census Tract layer. Careful manipulation was required as ethnicity and race alone do not separate immigrants from citizens of the same race or ethnicity.

Counties Base Data

Basemaps of the counties were obtained from the Minnesota Metropolitan Council. From the mid 1970s to mid 1990s, an estimated 60, 000 Hmong refugees were resettled into the US – many in the Twin Cities (Dillon, 2008). It is also estimated that more than 55,800 people moved to the United States from Somalia between 1991 and 2004, and more than half of them

settled in Minnesota (Lenz and Warner, 2011). Minnesota's immigrants are now 125,000 Chicanos/Latinos, 108,000 Asians and Pacific Islanders, 140,000 Africans and growing population from Russia and East Europe (Anonymous, 2004).

US Census Data

Census data are population data collected every ten years by the US government and it is the most accurate count of the population in the US. It is used for many purposes from political representation to allocating resources. However, indicators needed to differentiate immigrants' social and economic characteristics are very difficult to extract from the Census data.

Census Block Tract data were acquired to locate the immigrants and identify their demographic characteristics in the Twin Cities Metropolitan Counties. These data helped to identify which areas within the Metropolitan have more immigrants than others.

Census Block Group and Tract Data were obtained from Metropolitan Council and US Census Bureau website. The Census Bureau provides data on population count, demographics, and economics. For this study, Census Tract and Block Group data were utilized.

American Community Survey (ACS)

Because of the inability of the US Census data to separate the races by immigrants and non-immigrants, other supplemental data were obtained from the American Community Survey (ACS) which conducts yearly, biennial, triennial, and quinquennial surveys across communities in the United States.

ACS collects different information on many different variables including original nationality, country of birth, and language spoken at home. In this study, these latter variables facilitated separating those of the same race and ethnicity as they afforded distinction as to whether people were born in or immigrated to the US. The Minnesota Department of Education, the Department of Homeland Security's Immigration Statistics and the Minnesota Department of Health collected nationality origins and language indicators to track immigrants they serve (Ronningen, 2000) but these data were not used in this research because the data were collected only from immigrants they serve.

Data Preparation

The GIS data obtained from the Census Bureau and other agencies such as American Community Survey were manipulated to make attributes consistent. Maps and data were obtained from the Minnesota's Metropolitan Council website to acquire estimates of Metro's immigrant populations.

GIS data sets of important features were also obtained. These were comprised of shapefiles and database files. These shapefiles contained data representing (a) study areas (basemaps), (b) Census Block tracts, and (c) Population Census count data. The polygon layers were used to estimate, locate, and analyze where immigrants reside in the seven county metro area (Figure 1).

ArcGIS's Geoprocessing and Spatial Analyst tools were used to convert, import, merge, and clip these data. Database files were joined across section IDs. When done, all data layers were examined to make sure they were consistent and contained:

1. Across Section ID field to facilitate joining different features and tables
2. Area of study – basemaps

3. Demographic data attributes

Figure 1. Seven County Twin Cities Metropolitan area consisting of 2,975 square miles.

Results

Analysis of the immigrant population characteristics in the Seven Metro Counties provided general understanding of the people of foreign birth. The total numbers of immigrants in all Seven Metro Counties were combined here though they could be further analyzed by individual county or city.

Immigrants were identified two ways: by Language Spoken at Home other than English and by Country of Birth. The language spoken at home information gave a good estimate of immigrant populations but was likely an overestimate due to the large number of natives who speak other languages. The Country of Birth data were more accurate and produced a better estimate of the immigrant populations. Both methods were used to identify and compare immigrants in this study. According to the American Community Survey (n.d.), from data collected in 2006 and 2008, one in ten Twin Cities residents or approximately 12 percent are foreign-born. Roughly 500,000 of the Seven Metro counties residents were born outside of the United States and close to half of these are naturalized citizens. The other half are non-citizens. Nearly 45 percent of the foreign-born residents live in Minneapolis and St. Paul (Figures 2 and 3).
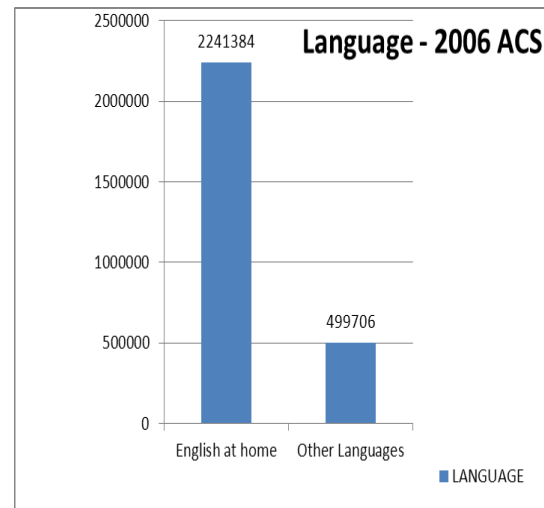

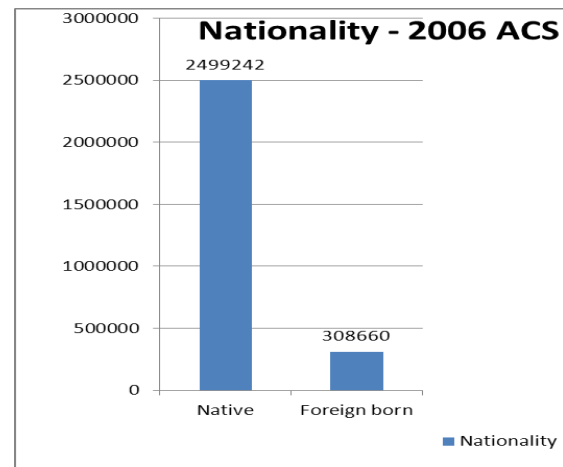Figure 2. Language spoken in Seven County Metro Area, 2006.

Figure 3. Seven County Metro area by Nationality Population, 2006.

From ACS data on the Language Spoken at Home, there is a large group of people speaking a language other than that of the country of their birth. This suggests there is a large number of US born people who speak language other than English.

Nearly 300,000 to 500,000 of the Metropolitan's population are immigrants born outside the US. These people migrated to the state and most have lived in the Seven Metro Counties for the past two decades (Figures 4 and 5). Figures 4 and 5 depict results of 2008 ACS with both language and foreign-born charactristics similar to those noted for 2006 but with increased numbers.
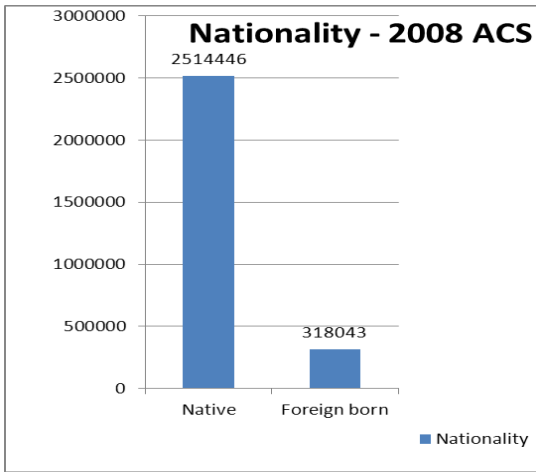

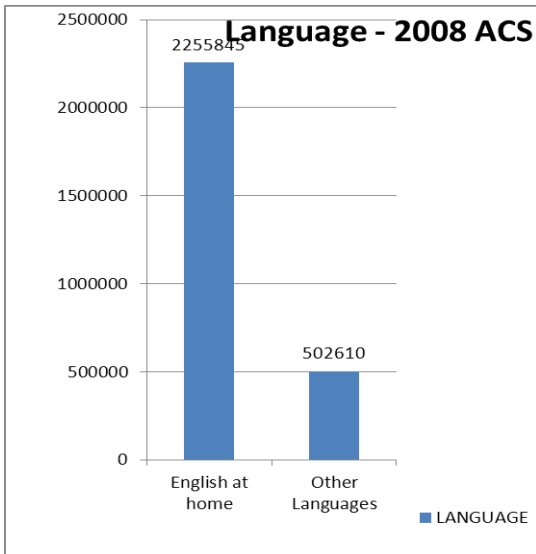Figure 4. Seven County Metro area by Nationality Population, 2008.

Figure 5. Language spoken in Seven County Metro Area, 2008.

The distribution of immigrant population was similar in 2008 as it was in 2006 with more than half living in Minneapolis and

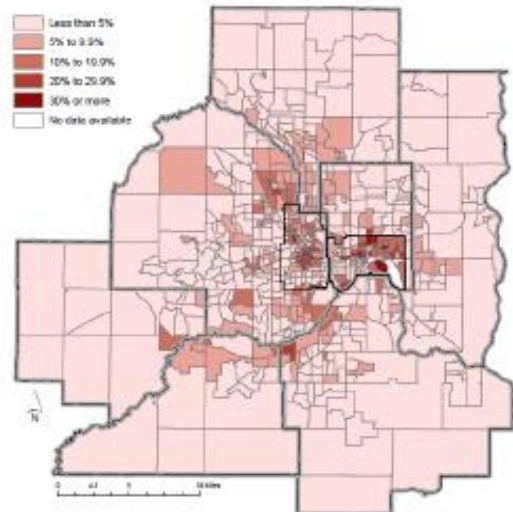St. Paul. Immigrants are not equally divided amongst the Seven Metro Counties (Figures 6 and 7).

Figure 6. Seven Metro Counties Nationality Population, 2006.
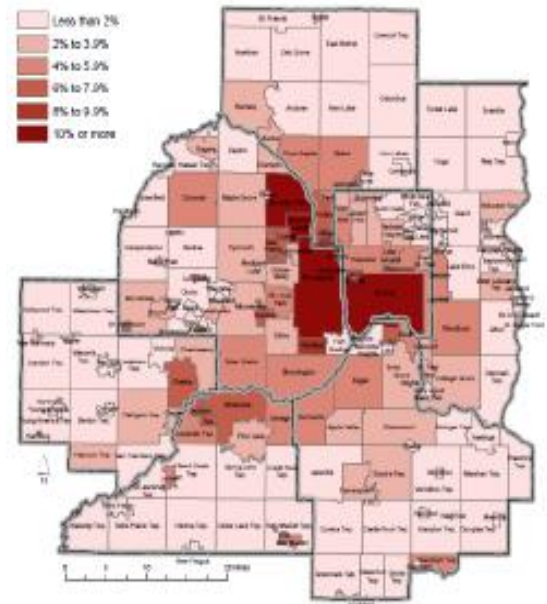

Figure 7. Seven Metro Counties Nationality Population, 2008.

Populations are concentrated in Minneapolis and St. Paul and the cities bordering these two cities. The bordering cities in northern Hennepin County are

Brooklyn Park and Brooklyn Center, respectively.

    Historically, the cities of Minneapolis and St. Paul had the highest density of immigrants with the surrounding suburban areas having lower densities. Today immigrants are more dispersed.

Conclusion

This study created basic maps to help understand the Seven County Metro area immigrant populations. Though it is difficult to obtain accurate data on immigrants because of barriers such as language, immigration laws, and residency, the estimated number of immigrants appears to be growing.

Limitations and Issues

Identifying immigrants and native populations were one major issue in this project. Many immigrants have the same race or ethnicity as native populations. Secondly, some of the data were collected in the form of database file (.dbf or .xls) formats and it was difficult to convert and create features and shapefiles from that data as well as to join or relate them.

Acknowledgements

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