

Spatial Distribution and Access to Healthcare in Greenville County

William Reed Sanchez

Earth and Environmental Sciences Department, Furman University, Greenville, SC 29613

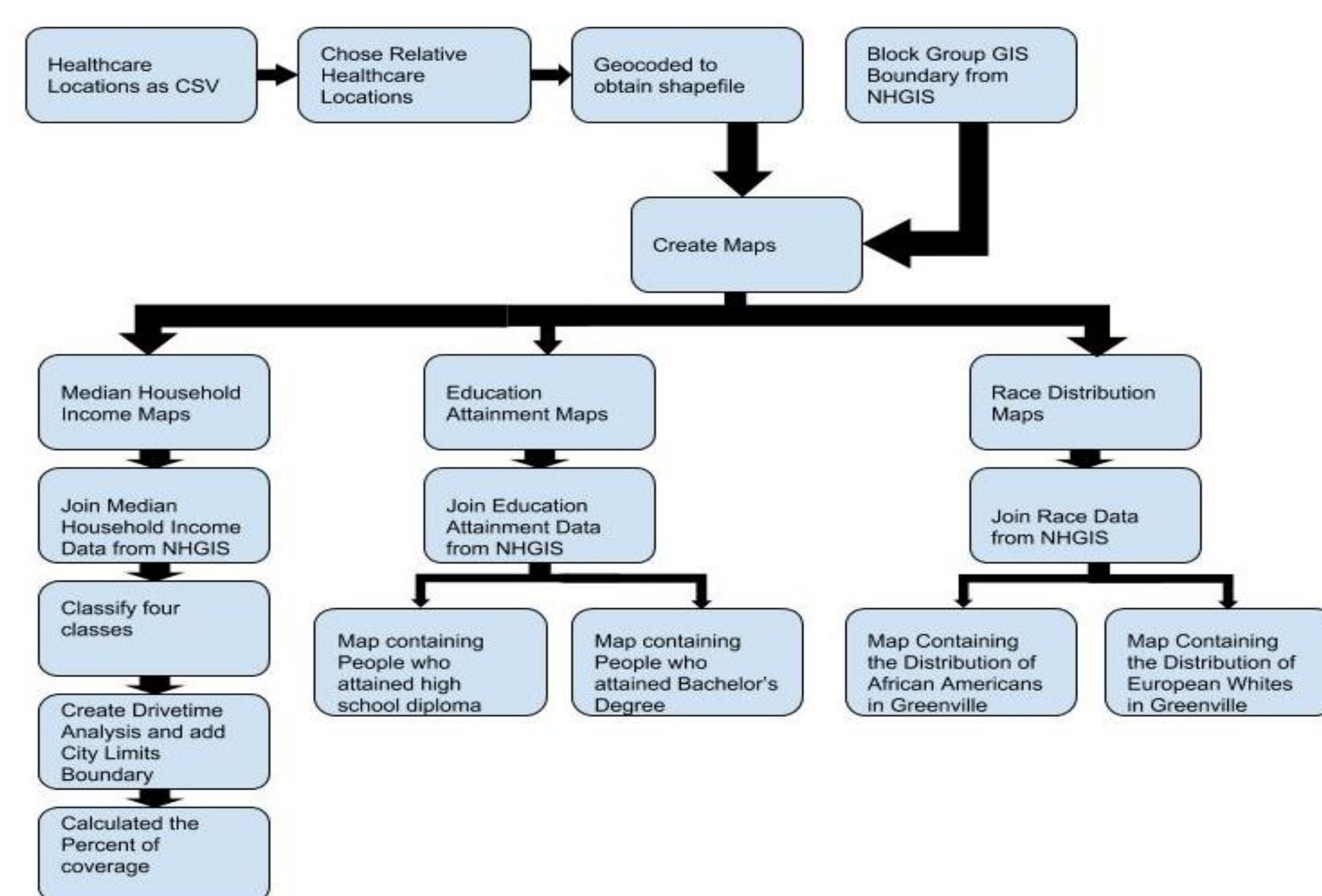
Abstract

The goal of this project is to gain a better understanding of spatial distribution and access to healthcare in Greenville County. The project will go over the area of study and give drive time analysis throughout the area using GIS. After establishing the drive time areas throughout Greenville we will examine the accessibility for several groups. This will give us the extent of spatial equality in terms of distribution throughout Greenville County.

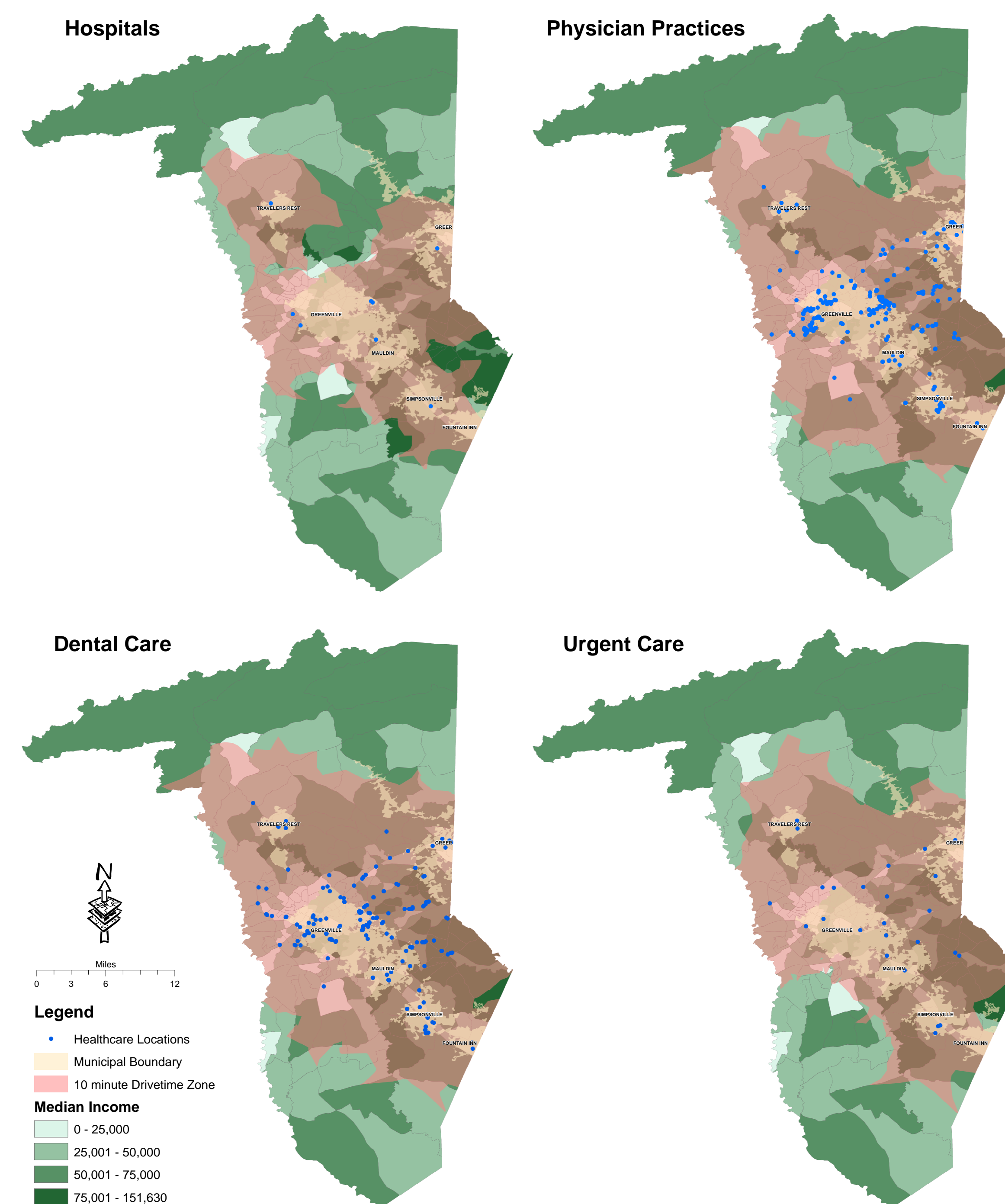
Introduction/Lit Review

As said by Dr. Ananya Mandal in an article for News Medical, "Health disparities are the inequalities that occur in the provision of healthcare and access to healthcare across different racial, ethnic and socioeconomic groups" (Mandal). From that definition of what healthcare disparities are it gives us an understanding of the kinds of groups that can experience inequalities. The goal of this project is to measure the accessibility and distribution of healthcare facilities. Accessibility will be measured through the use of spatial analysis of drive times and furthered by looking at demographic data. After viewing the drive time analysis and median household income, the project will then review education attainment and race distribution throughout Greenville County. "Differences in access to healthcare services and resulting adverse health outcomes when there is inadequate healthcare are major public health priorities" (Graves). This is from an article written by Dr. Ann Graves, it describes the need for a project that understands the accessibility of healthcare to different groups. We need to examine the accessibility to healthcare facilities because the areas that don't have proper healthcare access have adverse health outcomes as expressed in the quote.

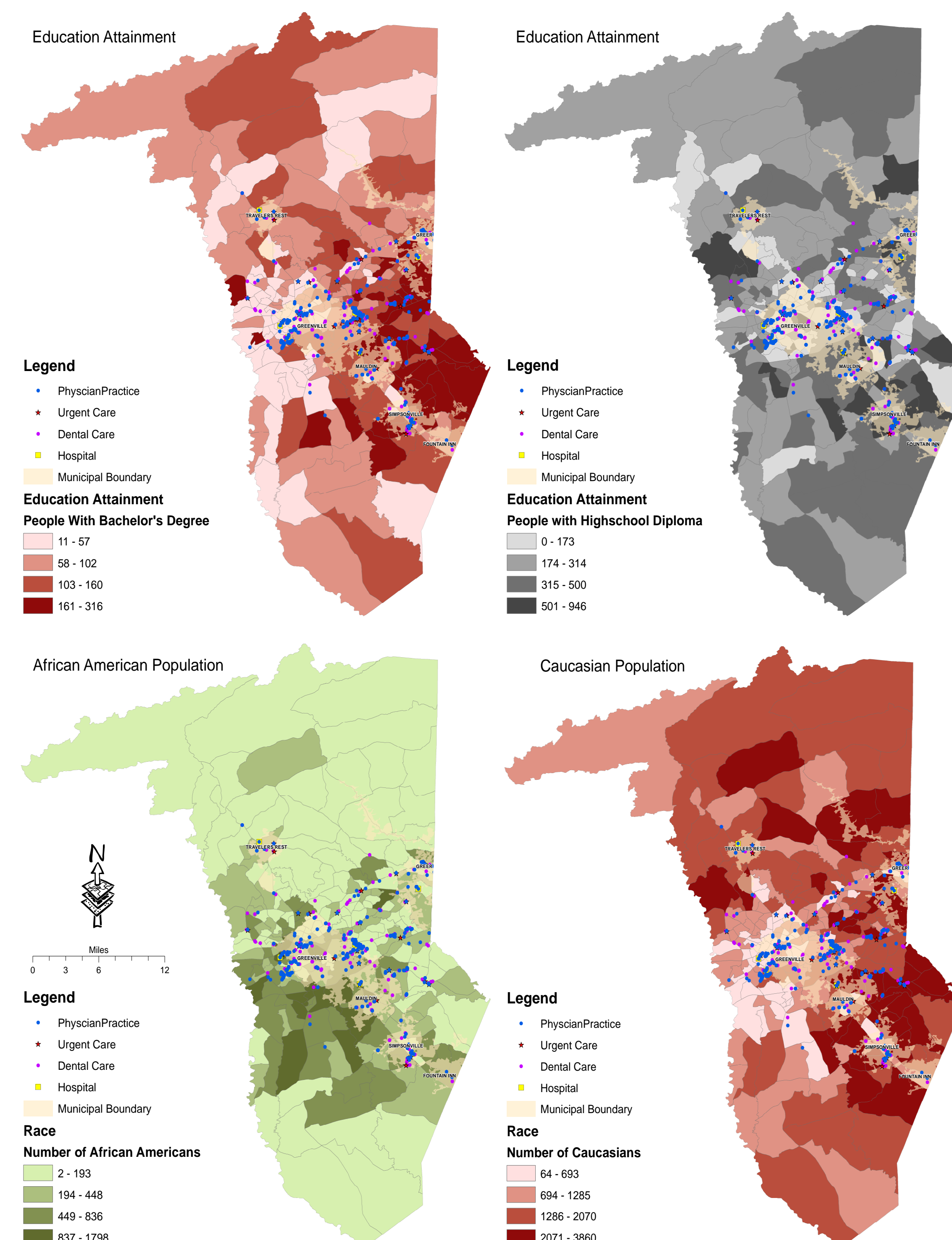
Methods



The first thing that was done during the project was identify the information that was needed. It was decided that the needed healthcare points were urgent care facilities, hospitals, dental care, and specific physician practices. After establishing the types of healthcare facilities that were needed we geocoded those specific healthcare facilities in ArcMap. Then after that the GIS boundary for block group was then added pertaining to Greenville county. Another shapefile that was added was the municipal boundary for Greenville county. Then after all of that was completed then median household income was joined to the block group data. The data was then classified into four different classes. The first class was low income. This was defined by examining the poverty level. The low-mid income was defined by the median income for Greenville. Then the remaining two classes were defined by the median for those two different income levels. In this project it will use distance as the main way to...



(Figure 1.) This map shows the median household income for Greenville County by block group. The map also shows the ten minute drive time buffer for its respective healthcare facilities. It also shows the municipal boundary for Greenville county.



(Figure 2.) The maps that are shown above are maps representing the demographics of Greenville County. Two of the maps show education attainment. One shows the distribution of people who attained a high school diploma while the other shows people who attained a bachelor's degree. The other maps show race distribution of Caucasians and African Americans. The map also shows the healthcare facilities and municipal boundaries for Greenville county.

to determine whether a facility is accessible or not to the surrounding area. The next step of the project was to conduct the drive time analysis. After conducting the analysis there was a 10 minute drive time buffer that was created that surrounded each of the respective healthcare facilities. This can be seen in (Figure 1.). After the drive time analysis was conducted there was a query done to see which of the healthcare facilities fell within the municipal boundary of Greenville County. Then four maps were created to get a better understanding of the demographics in the surrounding area. There was a map that was created to show the different education attainments for each block group. To create these maps, education attainment data was joined to the block group data. There were two different maps created one for people who have attained a high school diploma and one for people who had achieved a bachelor's degree. After that two were created in the same way for race. The two different maps that were created for race were African American distribution and Caucasian distribution. This map can be seen in (Figure 2.).

Results

	Urban Locations	Rural Locations	Percentages
Dental Care	112 out of 179	67 out of 179	Urban-63%, Rural-37%
Urgent Care	13 out of 25	12 out of 25	Urban-52%, Rural-48%
Physician Practices	277 out of 438	161 out of 438	Urban-63%, Rural-37%
Hospitals	8 out of 9	1 out of 9	Urban-89%, Rural-11%

After reviewing the drive time analysis it was somewhat inconclusive it did not give a strong correlation to any particular income level. Although low-mid and high-mid income ranges are the only income levels that are not fully covered by the drive time buffer. After reviewing this it was decided to analyze whether or not rural locations were being fully served in Greenville. The table above shows the percent of facilities that are within an urban area. After conducting this there was a strong correlation that all of the facilities were located in the urban areas. Then the project looked into demographic distribution. When reviewing the education data the less educated areas were being less represented in particular the rural areas that contained the people that fit these characteristics. When reviewing the race data in terms of spatial equality due to the fact that African Americans in Greenville tend to live in urban areas they are being basically fully covered spatially. The Caucasians that are living in the rural areas are the only areas that have a greater distance to the respective healthcare facilities.

Conclusion

In conclusion, people that are located in the low-mid, high-mid income ranges, that are Caucasians of average education, living in rural areas are being the least represented in terms of spatial distribution and accessibility. Some of the correlations made were not as strong as hoped. For further research one could look into whether or not all of these healthcare facilities would be accessible to the entire population in terms of whether certain groups could pay for all of the facilities. In all there could be more research done besides just spatial distribution and accessibility but it gives us a general understanding of the area.

References and Data Sources

- "NHGIS." *NHGIS*. Minnesota Population Center, n.d. Web. 07 Apr. 2017.
- Graves, Ann, PhD. "A MODEL FOR ASSESSMENT OF POTENTIAL GEOGRAPHICAL ACCESSIBILITY: A CASE FOR GIS." *Online Journal of Rural Nursing and Health Care* 9.1 (2009): 46-53. *Online Journal of Rural Nursing and Health Care*. Online Journal of Rural Nursing and Health Care, 2009. Web. 7 Apr. 2017.
- Mandal, MD Dr Ananya. "What Are Health Disparities?" *News-Medical.net*. N.p., 08 Oct. 2014. Web. 10 Apr. 2017.
- "Community Asset Viewer." *Community Asset Viewer*. N.p., n.d. Web. 10 Apr. 2017.