



# Spatial Analysis of Pharmacies in South Georgia



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## Abstract

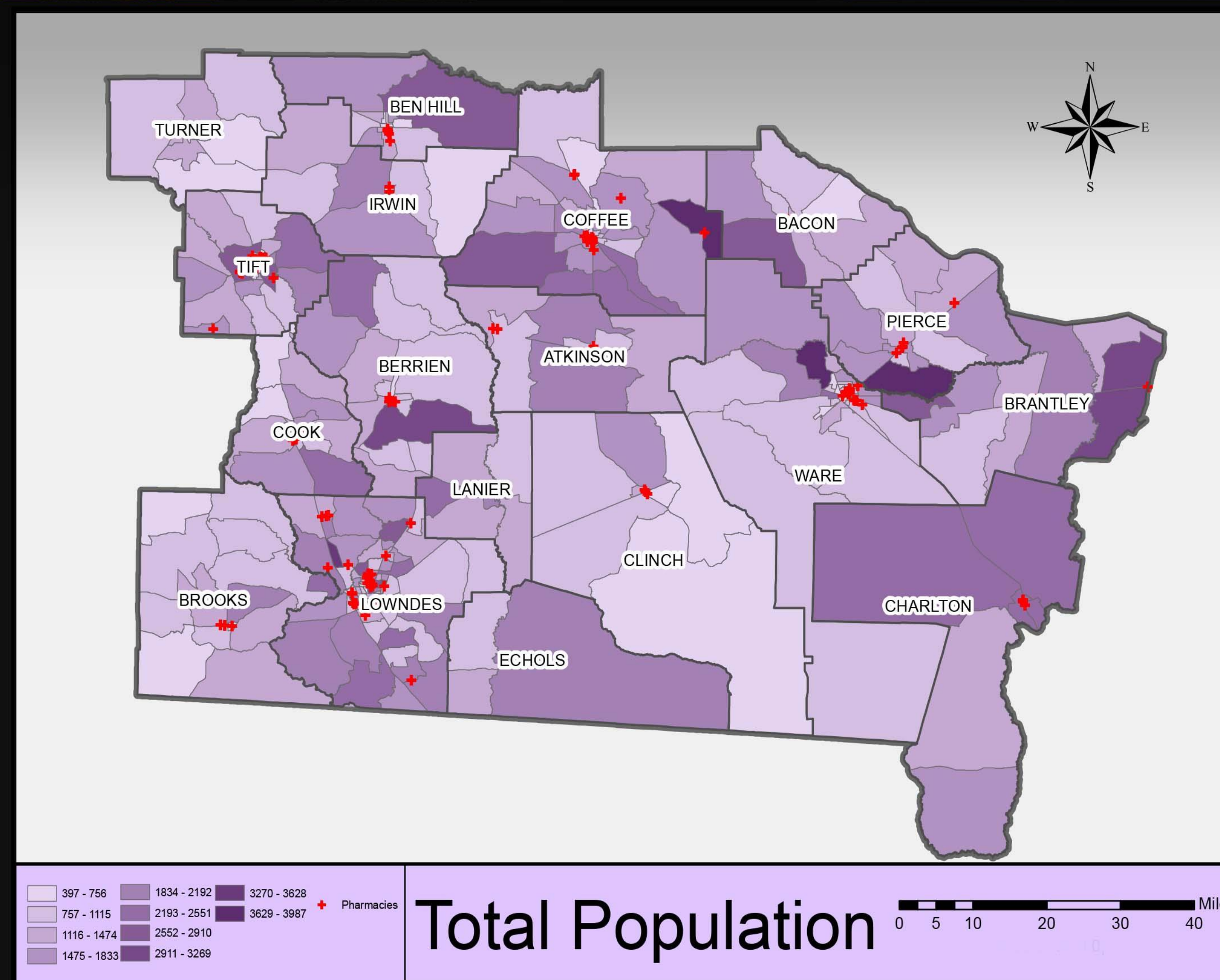
The objective of this project is to involve students in a spatial analysis of pharmacies and their accessibility within South Georgia. Pharmacy accessibility has not been previously researched within Georgia's southern region. With a large aging population present, who often rely on pharmacy services, this issue becomes a growing concern. Research Questions: How many pharmacies are within the 18-county research area? What percentage of each county's population are over the age of 65? Are the nursing homes concentrated in certain areas, such as cities and major highways? Is there a positive correlation between the concentration of pharmacies and population density? Do rural areas and small towns have lower accessibility to pharmacies than larger cities? Are minority groups more likely to have an accessibility issue?

## Introduction

The purpose of this research is to better understand the spatial locations of pharmacies in the United States, using the 18-county region in South Georgia as a case study. Pharmacies are essential for communities with a large low-income population because they provide lower cost services such as vaccinations, blood pressure checks, and gives access to professional healthcare opinion without visiting a doctor's office. Our class compiled literature, statistics, and spatial data on roads to better demonstrate the spatial relationship of pharmacies in South Georgia.

## Literature Review

Pharmacies across the nation have trouble meeting both rural and urban community needs. In the northeast region of the United States, rural regions of Pennsylvania are considered pharmacy deserts (Pednekar, 2018). Dima M. Qato, researcher, coined the phrase pharmacy desert in 2014 when discovering dense low-income areas with high racial diversity in Chicago have little access to pharmacies. The Census defines pharmacy deserts as more than one mile from a pharmacy in an urban area and more than 10 miles in a rural environment. Accessibility is not limited to geographic locations. The senior, uninsured and low-income population are the most vulnerable to accessibility strain (Kilinger, 2002).



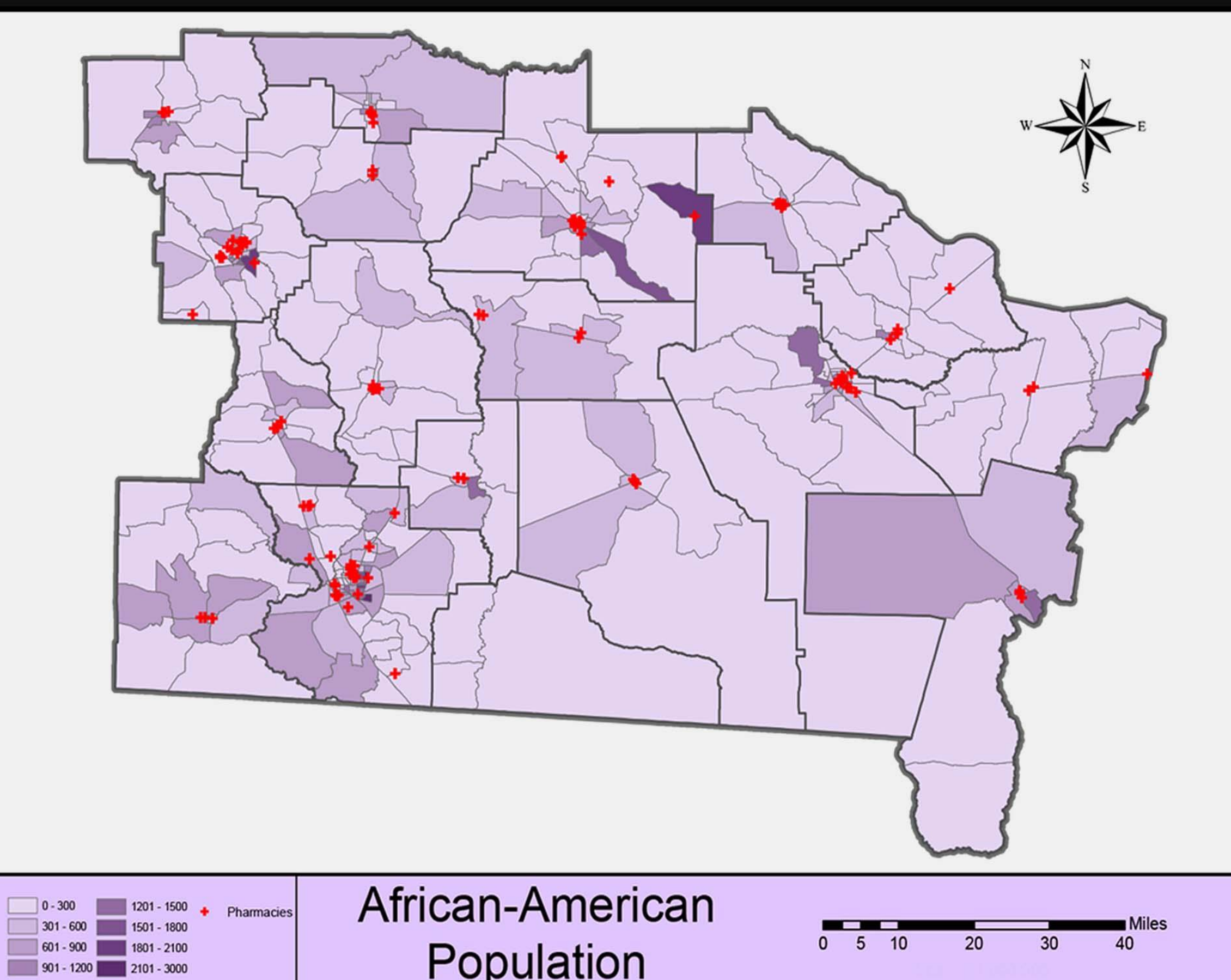
## Methodology

- We collected population, income and other statistical data from the 2010 census.
- Roads, counties, and county parcel blocks was provided by the South Georgia Regional Commission.
- The pharmacy locations were plotted manually once data collection was finished.
- With the use of ArcGIS the data was manipulated in order to display the numbers of different groups of people such as minority groups and income levels. Also, ArcGIS was used to create new fields of data to display the percentages of groups of people.
- Developed 14 choropleth maps displaying numerical values for different groups of people.
- Develop an additional 6 maps displaying the percentages for specific minority groups and population below the poverty level.

## Study Area

Consists of the main 18 counties in the South Georgia region  
 Most Populated Municipalities: Valdosta (Lowndes County), Tifton (Tift County) Douglas (Coffee County), Waycross (Ware County).  
 Major Highways: Interstate I-75, and Highway 84

- County/City, Populations, incomes, and pharmacies:
- 18 Counties, 27 Cities
  - Median County Income: \$36,692
  - Total Pop: 413,413
  - Number of pharmacies: 130
  - Median City Income: \$26,765
  - Pop located in cities: 163,009



## Results

In South Georgia, with the exception of Echols county, Charlton county, and Bacon county, the concentrations of people represent the placement of pharmacies. County population alone accounts for 90% of the variance in our dependent variable, pharmacy locations. Despite this significance, minority and low-income communities in rural areas throughout the region are underserved. This is especially the case in Echols, Charlton and Bacon county where there is high racial diversity, yet little to no pharmacies. Clusters of pharmacies are primarily in cities and along major highways such as 84, 221 and I-75

## Conclusion

Based on the data obtained throughout this study, we can conclude there is a lack of pharmacies to serve more rural areas throughout South Georgia. Minority groups and children living below the poverty line are most susceptible to accessibility strain due to the lack of pharmacies located in their respective concentrated area. Though there exists strong correlation to the pharmacy/population location and weak correlation to income, there appears to be a very real threshold to spur a pharmacy to serve a community in terms on wealth availability

## References

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