Aathira Chennat, March 2022

Funding Equity in Philadelphia:

Optimizing Institutional Funding of the City's Nonprofits

Abstract

The goal of this project is leverage EDA to help a private foundation optimize its equity-based giving strategy. Combining financial data on the city's nonprofits and zip code-level demographic data, I visualized and identified areas of the city that are *high-need* and *low-access* using excel and tableau. Specifically, exploratory analysis of the data suggests that West Philadelphia is underserved in educational programming and Northeast Philadelphia is underserved health care/clinic access. Further work includes developing ARIMA models to predict financial health outcomes for nonprofits, as well as trends in target demographic measures at the zip code level.

Design

This project will help foundation develop funding priorities that better target existing or emerging disparities in access to nonprofit services for communities living in different parts of the Greater Philadelphia Area. The project design makes the following assumptions:

- Need for educational programming can be measured by Median Adult Educational Attainment, as research shows that children's educational attainment is strongly correlated with parent educational attainment[1].
- Need for health care access can be measured by the Black share of the population, as Black Philadelphians face higher instances of death before age 75, heart disease, childhood asthma, and cancer than any other racial group[2].
- Access to services can be measured by the number of nonprofits within the same neighborhood of the city, as well as their median expenses and net asset growth.

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[1] Davis-Kean, Pamela. "The Role of Parent Educational Attainment in Parenting and Children's Development." December 2020. Retrieved March 11, 2022 from: https://www.researchgate.net/publication/347984467_The_Role_of_Parent_Educational_Attainment_in_Parenting_and_Children's_Development/link/6081b69c2fb9097c0c01d2e8/download

[2] "What harms health and wellness in Philadelphia's black communities? Local experts respond. *The Philadelphia Inquirer, 02/05/2020. Retrieved March 17th, 2022 from:* https://www.inquirer.com/opinion/commentary/philadelphia-health-disparities-black-residents-black-history-month-20200201.html

Larger expenses indicate larger influence or impact in the neighborhood, and larger net asset growth indicate stronger fiscal health[3].

Data & Algorithms

The data come from three sources: The National Center for Charitable Statistics 2013 Core Survey[4] (nonprofit financials), The American Community Survey 2013[5] (zip code level demographics), and Name Census[6] (web scraped, square mileage by zip code). Both datasets were originally very large, 15,000+ observations, but once cleaned the final demographic data has 48 zip code observations and the nonprofit data has 2,502 nonprofit observations.

The dashboards contain:

* heat maps for Education Organizations and Health Organizations that plot the target aforementioned demographic measure against the number of nonprofits, aggregated at the neighborhood level.
* Clustered scatterplots that plot total expenses the target demographic measure. I utilized Tableau's clustering feature.
* Geospatial maps that provide zip code level demographic information such as total population, poverty rate, educational attainment, and unemployment rate.

Tools

- Beautiful Soup for Data Scraping
- Pandas for Data Cleaning
- Excel for Data Cleaning and early-stage EDA
- Tableau for Data Visualizations and Dashboard

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[3]Nonprofit Repositioning Fund. *The Financial Health of Greater Philadelphia Nonprofits.* November 2020. Retrieved 03/18/2022 from: https://repositioningfund.org/wp-content/uploads/2020/12/Philadelphia-990-Report-11.23.20.pdf

[4] NCCS Data Archive: https://nccs-data.urban.org/data.php?ds=trend

[5] 2013 American Community Survey Five-Year Estimates https://data.census.gov/

[6] Name Census: https://namecensus.com/zip-codes/pennsylvania/