Aging NYC: The Challenge and Opportunity to Make an Age-Friendly City

Abstract

Populations in developed nations are growing older as people continue to flock to cities across the globe. As the population of older citizens increases, cities like New York will need infrastructure and services in place that can adequately accommodate the needs of older residents. The goal of this project is to assess NYC's current and projected ability to make the city hospitable to residents of all ages. We are currently working closely with Professor Daniela Hochfellner to construct a specific research question and methodology that will provide a sufficient measure of NYC's age-friendliness. Our current goal is to analyze the effectiveness of NYC DOT's Safe Streets for Seniors Program as a starting point for quality of life in NYC for older residents. Depending on our current research efforts and data availability, we may be forced to consider one of two alternative approaches: incorporating a collection of predictor variables to create an age-friendly index and compare its reliability to another, similar measure produced by the New York Academy of Medicine; or focusing on factors such as environmental and noise pollution to understand their effects on measures of the general health of older New Yorkers at the neighborhood level.

Introduction

In the majority of developed countries, aging is an important social issue: not only are people living much longer, but birth rates are also dropping. In the US, for example, those who are 65 years and older will increase by 37 million by 2040, a nearly 50 percent increase. Dealing with a larger demographic of seniors will therefore be a major issue here in the US and in other countries. At the same time, cities are growing and the demographic shift pertaining to seniors will also be reflected in highly urbanized areas as well. Because of this, annual spending on the elderly as a percentage of annual GDP is projected to increase. In America, for example, the cost of an older, more urban population is expected to rise two percent by 2050. The increase in spending on older US citizens includes costs associated with senior Medicaid, education services, transportation services, senior centers, and infrastructure. Improved transportation services, such as senior shuttles, easier access to buses and subways (elevator installation, benches near senior centers and bus stations, etc.), and better traffic laws along with safer crosswalks for seniors are also needed in order to cope with the rising population of seniors. And we can already see some cities making this shift in programs like the "Safe Streets for Seniors" project out of New York City's Department of Transportation.

There's still room for improvement, however, when catering to seniors, and many issues concerning aging need to be explored and analyzed through data. Based on research using transportation, public health, and other relevant data sources, along with discussions with relevant nonprofits in NYC, we will identify and confront issues associated with aging in NYC. In the section that follows, we describe the three potential approaches we are still considering for our project. Once we have finalized our specific research question, we will conduct a quantitative analysis that will be used to critique the relevant current policies and also to provide a suggested framework for improving those policies.

Problem statement

At present, we are considering three possible approaches to assess NYC's ability to cope with the demands of an aging population. Our mission is to focus our project through an analysis of the Safe Streets for Seniors Program. Due to constraints with data currently available online, we have yet to determine if our project is entirely feasible. We have conducted extensive research online and have contacted the relevant state and federal agencies. As we await their response, we will continue to research possible data sources and formulate a backup plan should our transportation-based analysis turn out to be an impossibility due to a lack of data. For more information on each potential approach, see the following:

1. Transportation Analysis

Senior citizens are particularly vulnerable to injuries due to collisions with motor vehicles on city streets. According to a NYC Department of Transportation study, the fatality rate of seniors involved in traffic accidents as pedestrians is four times higher than that of younger New Yorkers. In response, the city identified 41 "Senior Pedestrian Focus Areas" (SPFAs) with high rates of pedestrian accidents involving seniors as part of its Safe Streets For Seniors program. These SPFAs will be targeted by the city for safety improvements such as sidewalk extensions, countdown signals at street crossings, and additional time for pedestrian crossings.

Our goal is to focus our research on transportation safety as it relates to older pedestrians. We would analyze the effectiveness of the Safe Streets For Seniors program by examining pedestrian accident rates before and after the program's implementation, pedestrian accident rates in neighborhoods that have not been targeted by the program, and other factors. Based on our analysis, we would be able to assess the program's effectiveness and provide suggestions to policymakers for future additions or revisions to the program.

2. Age-Friendly Neighborhood

As the proportion of older residents in NYC gradually increases, the demand for neighborhoods to provide services for the elderly and to make them feel more engaged in their communities becomes a necessity. NYC's Age-Friendly Neighborhoods initiative aims to make neighborhoods in NYC more welcoming to older New Yorkers to ensure they can remain engaged and active in the city.

In this project, we will use data on the geospatial distribution of elderly residents and analyze different factors that influence this distribution. We would hone in on areas with high densities of seniors and assess factors such as the percentage of those residents who live alone, hospitalization data, access to public transportation, and more. The goal of the analysis would be to compose a metric for the age-friendliness of neighborhoods, which could be compared to other metrics already in existence, such as one used by the New York Academy of Medicine (NYAM), which has partnered with NYC on age-related issues. Our hope would be to determine the effectiveness of NYAM's measure and to improve upon that measure. An accurate measure of age-friendliness could also be used to help predict where older New Yorkers may migrate in the coming years as well as identify candidate locations for new services like health clinics.

3. Environmental Pollution and Public Health Trends

A clean and quiet environment is key to healthy living. Pollution in all forms, however, has a significant impact on the lives of NYC residents and especially older residents. According to the NYC Department of Environmental Protection, air pollution in New York City is a significant environmental threat that negatively affects the health and quality of life of New Yorkers. Fine particulate matter (PM2.5), nitrogen oxides, elemental carbon, sulfur dioxide, and ozone are the leading air pollutants of concern in NYC. Noise pollution, too, can have a significant impact on people's lives. The NYC Department of Health and Mental Hygiene has reported that people with hearing loss due to loud noise "often become socially isolated due to difficulty communicating and participating in social events, and it is significantly associated with mental diseases." And according to researchers at the Sounds of New York City project, New Yorkers are routinely exposed to excessive noise, with 90% of the city's residents experiencing noise levels far above the limit considered by the EPA to be harmful.

In this project, we will combine New York City Community Air Survey (NYCCAS) and 311 Noise Complaint data to analyze air and noise pollution and how they have affected senior citizens' health in recent years. We will also examine whether or not relevant air quality regulations have had a positive impact on air quality in NYC and on senior citizens' health. Ultimately, we hope to locate those parts of the city that are most suitable for aging people to live in and to provide policy recommendations concerning air quality and noise regulations as they relate to the age-friendliness of neighborhoods.

Data And Methods

For our project, we will use Community Health Survey data and American Community Survey data to establish a background understanding of older New Yorkers at the borough level. We will collect demographic data including race, education level, annual household income, commuting patterns, and health status. Additional data and methods will depend on which approach we choose to analyze aging issues in NYC (transportation vs. age-friendly neighborhoods vs. pollution and public health).

For the transportation analysis we are considering, we have identified the National Traffic Highway Safety Administration's (NHTSA) Fatality Analysis Reporting System data as the most appropriate data source for this analysis. As previously mentioned, we are still researching the completeness of this data source and are waiting for the NHTSA to respond to a formal inquiry we submitted to the agency for further clarification on their data. While we wait for their response, we will continue to search for other sources of the appropriate data. Should we succeed in locating relevant data, we would analyze the effectiveness of the Safe Streets For Seniors program by examining pedestrian accident rates before and after the program's implementation. This time series analysis would involve classification clustering of high-risk areas in NYC vs. low-risk areas.

For the age-friendly neighborhoods analysis we are considering, we would research the distribution of older New Yorkers in each borough of New York City and investigate which factors attract older New Yorkers to certain neighborhoods. For example, we would analyze data on housing costs, the number of older New Yorkers living alone, convenience in terms of transportation, etc. to create a new metric of age-friendliness and to propose various infrastructure improvements such as more public benches and health clinics. Our goal would also ultimately be to create an interactive visualization of our research that could be utilized by other researchers or city agencies.

Finally, for the analysis we are considering on the effects of environmental pollution on the health outcomes of older New Yorkers, we would incorporate NYC Community Air Survey (NYCCAS), traffic-related air pollution, and 311 Noise Complaints data to analyze how these factors impact the health of senior citizens over time. If we choose to study the public health effects of pollution on senior citizens, we could utilize linear regression and ANCOVA (with health status as the dependent variable and pollution factors as the independent variables) to model the relationship between pollution and health. We would also utilize time series analysis to measure the impact of pollution reduction measures (such as heating oil regulation) on health outcomes. Finally, we would classify neighborhoods based on their health outcomes.

Research Plan

Project risks

Due to the expansive nature of the general topic of aging in NYC, we will need to identify a very specific question that can be reasonably answered given limited time and resources. Maintaining focus on our specific research question will be vital to ensuring that we succeed in delivering a complete and informative end product. As previously described, we are currently devoting all our research and attention to this issue.

Another potential limitation of the study is the long-term nature of the relationship between policy changes and effects seen in the real world. In other words, although certain policies regarding aging in NYC may have been enacted within the past several years, the effects of those policies may not be seen for several more years. This constraint could lead to a lack of significant change within the timeframe that we will be analyzing in this project.

Other risks include properly handling personally identifiable information (PII) in the case that we interview domain experts or NYC residents. This is a particularly significant concern due to seniors' status as a vulnerable population.

Mitigation strategies

We are actively reaching out to NYC-based organizations to gather input from domain experts so that we can quickly get up to speed on the major issues and policies that affect seniors. We have already met with the UJA Federation and have established contact with several other organizations. Their feedback should help us refine our research question and identify the most relevant methods for our analysis.

And although the effects of certain policies may not be seen for some time, we will target our analysis on factors that are more likely to have some measurable change within the timeframe that we are investigating.

Finally, regarding the handling of PII, we will rely on guidance from Senior Research Scientist Daniela Hochfellner on best practices when collecting primary data.

Team roles

- Pengzi Li - Data searching, data cleaning, statistical analysis, group meeting organizer.
- Po-Yang Kang - Researching policies on the city, state, and country levels, and datasets corresponding to those policies.
- Sam Burns - Report writing, communications with outside organizations, project coordination, analysis.
- Asilayi Bahetibieke - Data searching, data cleaning, report writing.