Health, Assistance Programs, and Grocery Store Proximity by County in Virginia

The Foodies

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Problem and Vision

We propose to analyze the connection between Health and Physical Activity, Access and Proximity to Grocery Stores, and Local Government expenditures on Supplemental Nutrition Assistance Programs in the state of Virginia. Knowing that access to grocery stores is generally more limited for those with lower incomes, our group will be able to find potential correlations between overall citizen health and limited access to grocery stores. With data reported by each individual county, this relationship can be further examined to find whether government expenditures on resources such as welfare programs or healthcare have any noticeable effect on citizens' well being.

Analyzing this data is a valuable asset, both to local governments and private corporations. Local governments could utilize this data to determine where to target more investments in healthcare and welfare programs, guiding their financial decisions. Local governments can also assess, based off of other counties, whether further investments may make any difference in citizen health. At the same time, private corporations, such as grocery chains, may find a new area where there is a great demand for their services, allowing them to make smarter decisions on where to expand. Although these are our two primary use cases, more potential investments in the community by governments and corporations also benefits the average citizen, allowing them better access to fresh food and health services.

At a larger scale, data sets such as these have the ability to better the quality of life for those that are disproportionately affected by these issues. If undeniable connections are found between government spending on healthcare and the overall health of the population, governments will be more likely to act to fix these issues with solutions that are known to work.

Data and Questions

In our project, we will be using three separate data sets. The first is titled "USDA FoodEnvironmentAtlas - Access and Proximity to Grocery Store", published by the Virginia Open Data Portal. This data set includes information such as "Number of people in 2015 more than one mile from a supermarket or a grocery store if in an urban area, or more than ten miles from a supermarket

or large grocery store if in a rural area". The data set is divided up for every county in Virginia. This data set contains 42 separate subcategories for which Access and Proximity to grocery store is measured, including race, age, and poverty level.

Our second data set is titled "USDA FoodEnvironmentAtlas - Health and Physical Activity", and is also published on the Virginia Open Data Portal. This data set includes information such as "Adult obesity rate in 2017, as a percent". The data set is divided up for every county in Virginia. This data set contains 11 separate subcategories for which "Health and Physical Activity" is measured, including obesity rates, diabetes rates, and recreation/fitness facilities per 1000 residents.

Our final data set is titled "USDA FoodEnvironmentAtlas - Food Assistance" and is also published on the Virginia Open Data Portal. This data set includes information such as "The average SNAP (Supplemental Nutrition Assistance Program) redemption amount per SNAP-authorized store in a county in 2012". The data set is divided up for every county in Virginia. This data set contains 54 separate subcategories for which "Food Assistance" is measured, including average percentage of residents on SNAP per county, food banks per county, and food distribution on Indian reservations sites per county.

Here is an example of the data mentioned in the third example:

The average SNAP (Supplemental Nutrition Assistance Program) redemption amount per SNAP-authorized store in a county in 2012:
Bland- $20,825.154999999995
Page- $272,660.64502325584
Smyth- $277,128.23690721655
Lee- $239,448.99721925124

The first question our data will answer is "What is the correlation between overall health and physical activity and access to grocery stores in the counties of Virginia?". This question is interesting to any Virginia county resident, so they may see how well they are doing relative to the other counties of Virginia.

Secondly, our data will provide information about Food Stamp (now referred to as SNAP) funding in Virginia and its correlation with the subjects of the first question. Similarly, this interesting to any Virginia county resident, to see where their county stands relative to the others.

This information may persuade people to move to a higher scoring county or improve their own county's scores. It also may help identify under-served or struggling communities with regards to these fields. Currently, many real-estate websites include complementary statistics similar to these to improve property value. For example, an area with a higher proximity to grocery stores and a higher health index may be more valuable than an area with a poorer health index and proximity to grocery stores.

Users and Specs

All states besides Virginia will be excluded from the data, so the typical users of the application will be local governments of Virginia and corporations, both of which will use the data to analyze the data to discover good targets for investments. Since local governments and corporations are composed of many people with various skill sets, they would have people who have experience analyzing data.

They would want to use our project because it contains the data in an easier way to access and analyze. Instead of needing to look across numerous websites and searching through numerous files, our project will have it laid out for them on a single site. We will also analyze the data and show connections on the site, which removes some analysis work from the user. Lastly, the website will add functionality that allows the user to interact with the data in ways that aren't possible across the sources.

The completed application will show users significant correlations between attributes like access to healthcare, proximity of grocery stores, and government expenditure. The user could select two or more counties and see a visually appealing comparison of their attributes. Another function would be for the user to select certain attributes and see the highest and lowest ranking Virginia counties in those areas.

About the Team

Eric Anderson: Eric has experience working mostly with backend development, both alone and in groups, but has also worked with Apache Web Server, Node.js, and creating APIs. After taking the web development class, he is able to create basic front end applications to display data as well as creating SQL queries. He has an upcoming internship at Amazon Web Services and is working on familiarization with AWS solutions.

Kory Erdmann: Last semester Kory took Web Development which should be helpful for the project since we are making a web application. The class focused on front-end for the first couple months then went into REST API's, so this should make the group have an easier time adding functionality to the website and implementing the interface design. In addition, the Algorithms and Data Structures class that Kory has taken and the Applied Algorithms class in which he is currently enrolled will allow our group to analyze and improve the performance of the code.

Austin Steger: Austin took cloud computing last semester which gave him some experience querying databases and visualizing data. He has worked on multiple other semester long group projects in his computer science and statistics classes which gave him useful experience for future group projects. Last summer he worked as a software developer intern at a company called

Cvent. This gave him more experience working with a team as well as teaching him new skills like using JavaScript for web applications.

Arman Saadat: In Arman's previous semester at JMU, he worked in a team to engineer a software application using object-oriented programming and various GUI skills. He also has experience programming in languages such as C, X86-64, and Python. He is currently enrolled in Algorithms and Data structures, where he is learning to make highly efficient code, and Interaction Design, where he is learning how to design an aesthetically appeasing and functional product.