

**Assessing Community Strengths and Needs within Rural Municipalities in Allegheny
County, PA**

by

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University of Pittsburgh, 2022

Abstract

While the United States is home to some of the world's most famous cities, over 46 million people, or 1 in 5 people, live in a rural community in the United States. Rural residents often face more barriers to receiving quality and specialized healthcare due to a lack of rurally-located facilities and increased transportation burden, as compared to residents living in more urbanized areas. An estimated 12.99% of Allegheny County, PA residents live in a rural designated municipality. The overall goal of this study was to identify strengths and needs within rural communities in Allegheny County to elucidate ways in which the Allegheny County Health Department can support communities' health access, equity, and social determinants of health. To achieve this, we performed community strength and risk assessments of a representative sample of 17 of the 39 rural municipalities in Allegheny County, PA, including conducting windshield tours of each community for qualitative data collection and utilizing multiple open-source data resources for quantitative data collection. We utilized Microsoft Excel to conduct descriptive statistical analyses, comparing strength and risk assessment data between rural municipalities, as well as against Allegheny County, Pennsylvania state, and United States data, in order to contextualize municipality findings and to elucidate the public health significance of the trends that emerge from these strength and risk assessments. Each rural community in this study proved to have unique cultures, lifestyles, and community strengths, but also faces distinct challenges to community health and well-being. These findings will act as a roadmap for these communities and

the Allegheny County Health Department to create initiatives tailored to rural communities in the county.

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Preface

I would like to thank my mentor, Melanie Readal, for the opportunity to participate in an internship experience at the Allegheny County Health Department, working on their rural health improvement project. Through this opportunity I was able to not only gain first-hand experience in applied public health practice but was able to explore Allegheny County in a unique way while collecting data for this document. I'd especially like to thank Melanie for her professional guidance, kindness, and humor as we traversed the rural regions of the county.

I would also like to thank my essay reader committee, Dr. John Shaffer, and Jamie Sokol. Dr. Shaffer's instruction has been instrumental in my growth and development as a public health genetics student, and I want to thank him for his valuable insight throughout my essay-writing process. I would also like to thank Jamie Sokol for her remarkable instruction and her dedication to training the next generation of public health professionals, and for her expert feedback regarding the content of this document.

1.0 Introduction

The United States is a patchwork of bustling urban cities and remote rural communities, with many falling somewhere along the urban-rural continuum. To many Americans, rural living is as much a cultural identity as it is a federal classification. While each rural area has its own unique culture, they historically tend to share some commonalities in terms of personal identity, beliefs, and health trends. With over 46 million people, or 1 in 5 people, living rurally in the United States, it is crucial to understand the specific benefits and risks associated with rural living in order to help bridge gaps in health access, equity, and social determinants of health that rural communities may face (U.S. Food and Drug Administration, 2021).

1.1 USDA Rural Designation Criteria

The United States Department of Agriculture (USDA) sets the guidelines for and designates the classification of “rural” communities (U.S. Department of Agriculture, 2021). Rurality is generally assessed at the county level, in which counties are classified as “non-metropolitan” or “metropolitan”. Non-metropolitan counties generally have a combination of portions of open countryside, rural towns that consist of less than 2,500 people, and urban portions with populations of 2,500 to 49,999 that are not part of larger metropolitan areas.

The USDA has also developed several multi-level county-based classifications in order to more precisely measure rurality and to capture economic and social differences in rural communities within the county:

Rural-Urban Continuum Codes (RUC Codes) help to distinguish and classify metropolitan from non-metropolitan counties within the United States. *RUC Codes* classify metropolitan counties by population size of metropolitan area, and non-metropolitan counties by level of urbanization and proximity to a metropolitan area. *Urban Influence Codes* serve a similar function in analyzing metropolitan versus nonmetropolitan areas, and particularly in analysis of trends in non-metropolitan areas as they relate to population density and metropolitan influence. *The Natural Amenities Scale*, on the other hand, measures the characteristics of the land on which the communities are situated. This scale captures elements of the physical topography, climate, and water area in terms of desirable inhabitability. *County Typology Codes* capture a community's economic and social characteristics as they pertain to various public programs. These codes offer policy-relevant information that aids policymakers in the development and implementation of social programming.

In addition to the aforementioned methods of classification, the USDA has also designed several sub-county methods that help to further distinguish and assess rural areas within a county. *Rural-Urban Commuting Area Codes (RUCA)* use measures of population density, urbanization, and daily commuting that determine degree of rurality (on a scale of 1-10) based on primary commuting flows for U.S. Census tracts, which are then transposed to affiliated ZIP codes. Importantly, the most recent RUCA codes are based on 2010 decennial census and the 2006-10 American Community Survey data (United States Census Bureau, n.d.). Additionally, *Frontier and Remote Area Codes (FRAC)* elucidate policy-relevant information by capturing communities that have both a low population size and high geographic remoteness. These codes are meant to capture level of difficulty in reaching essential goods and services such as medical care and

groceries. FRACs also are currently calculated using urban-rural data from the 2010 decennial US census.

It is important to note that the U.S. Census Bureau uses population density and size as its means of classifying a community as rural. The 2010 decennial U.S. census, from which many of the calculations draw initial data, used the parameters of a rural area as a community of open country and with fewer than 2,500 residents.

1.2 Rural Health in the United States

Rural residents often face more barriers to receiving quality and specialized healthcare due to lack of rurally-located facilities and increased transportation burden as compared to residents living in urbanized areas (U.S. Food and Drug Administration, 2021). While some rural residents may have access to farm-grown produce depending on their location, many rural communities face increased rates of food deserts, which is further exacerbated by often-longer commutes coupled with fewer public transportation options. These barriers, along with increased rates of poverty and decreased community walkability and space for leisurely physical activity, have contributed to increased levels of chronic diseases such as heart disease, stroke, and obesity in rural populations (U.S. Food and Drug Administration, 2021). Overall, rural residents are more likely to have comorbid chronic health conditions as compared to people living in more urbanized areas, partially due to reduced access to preventative and primary healthcare. Additionally, racial/ethnic, tribal, and other diverse community members living rurally are at increased risk of having poorer health outcomes than their white rurally living counterparts (U.S. Food and Drug Administration, 2021).

1.3 Rural Health in Allegheny County, PA

Allegheny County, in southwestern Pennsylvania, is comprised of 130 municipalities, in which the city of Pittsburgh is perhaps the most well-known. The county is made up of a variety of urban and suburban municipalities, as well 39 rurally-designated municipalities (Table 2) (United States Census Bureau, n.d.) (U.S. Department of Agriculture, 2021). The county is best known as one of the nation's biggest hubs for industrial steel production and coal mining, housing several of the country's highest-producing industrial sites to this day, which have provided jobs for many of the county's residents for the past two centuries. The county's rugged working-class culture is evident in its economy, infrastructure, housing, and specific health challenges.

Allegheny County's large-scale industrial plants produce high levels of air contaminants and other toxic byproducts, and has been ranked in the 98th-percentile in the United States for highest cancer risk due to air pollution (University of Pittsburgh Graduate School of Public Health, 2012). Ten industrial facilities within Allegheny County contribute more than 60% of the total air pollution from all industrial facilities in the county, emitting upwards of 1 million pounds of toxic pollutants in 2019 (Penn Environment Research and Policy Center, 2019). In addition to being linked to respiratory ailments such as asthma and bronchitis, these industrial pollutants have been linked to other chronic health conditions such as cancer, reproductive complications, cardiovascular disease, and premature mortality (California Environmental Protection Agency Air Resources Board, n.d.). County residents, especially children, the elderly, pregnant individuals, and those with preexisting respiratory diseases are at the highest risk of adverse health effects from acute and chronic industrial pollutant exposure (California Environmental Protection Agency Air Resources Board, n.d.). Many of the areas that are most impacted by industrial toxicants in the

county disproportionately impact the health of rural, poor, and minority individuals (Figure 12) (Penn Environment Research and Policy Center, 2019).

An estimated 12.99% of Allegheny County residents live in a rural designated municipality (United States Census Bureau, n.d.). In addition to a history of subsistence and industrial farming that is typical of rural areas in the United States, many of Allegheny County's rural communities arose during the development of coal mining, steel production, and industrial plants, with major booms during the industrial revolution in the late 1800s and around World War II in the 1940s – 1950s, as evidenced by many of the stylistic home design trends seen in the rural municipalities throughout the county. Many working-class factory and mine workers, and their families, lived in rural areas directly surrounding the industrial plants and mines in which they worked, but following the collapse of the steel industry in the county in the early 1980s, many rural residents lost their jobs, leading rural families to leave their communities in search of new employment. This resident migration led to an exodus of needed resources such as medical facilities, grocery stores, and public transportation, which has left the remaining residents without these resources, a trend which is still evident in many of today's rural communities in Allegheny County (Visit Pittsburgh, n.d.).

1.4 Social Determinants of Health

The CDC defines social determinants of health (SDOH) as “conditions in the places where people live, learn, work, and play that affect a wide range of health and quality-of life-risks and outcomes” (Centers for Disease Control and Prevention, 2021). There are five domains that constitute the social determinants of health framework: health access and quality, neighborhood

and built environment, social and community context, education access and quality, and economic stability.

- *Health access and quality* refers to community members' accessibility of quality healthcare, including primary care as well as specialized care and telehealth services. *Health access and quality* also assesses health literacy and understanding of health information, which is assessed from both patient (receiving information) and institutional (delivering information) perspectives.
- *Neighborhood and built environment* refers to the characteristics of where a person lives, including housing quality, access to transportation and road conditions, environmental air and water quality, and accessibility to healthy foods.
- *Social and community context* refers to the social networks and cohesiveness within a community, and includes civic participation, prevalence of discrimination and incarceration, and workplace conditions.
- *Education access and quality* refers to community members' access to quality education, and can be measured by high school graduation rates, higher educational attainment, and literacy levels.
- *Economic stability* refers to financial resources community members have, and can be measured by analyzing poverty rates, cost of living, food and housing stability, and income.

1.4.1 Social Determinants of Health in Rural Communities

The social determinants of health framework has gained traction in public health research and practice in recent years as evidence grows regarding the impact that lived environments have

on wellbeing and health outcomes. While every community is nuanced, there are some commonalities between rural populations regarding social determinants of health. This study aims to build on major themes from previous work in rural settings to highlight the social determinants of health landscape for rural municipalities in Allegheny County.

1.4.1.1 Health Access and Quality in Rural Communities

While healthcare access in rural areas of the United States is one of the more studied social determinants of health, lack of quality and specialized healthcare in rural communities persists in much of the country. There are myriad reasons for the persistent lack of rurally-located medical infrastructure, including geographic and social remoteness, lack of medical resources necessary to carry out routine and specialized care, lack of transportation and supportive ambulatory resources, and lack of employment opportunities and incentives for medical professionals to practice in rural communities. Lack of continued access to routine care in rural communities plays a primary role in increased prevalence of chronic diseases in rural communities (Centers for Disease Control and Prevention, 2021).

Lack of specialized healthcare continues to be a barrier for many rural communities throughout the country, where specialized healthcare providers and equipment are not readily available outside of urban and suburban hubs. Access to services such as genetics care, mental health counseling, and physical therapy are often not available to rural communities. In recent years, especially in-part due to profound access-to-care barriers faced during the COVID-19 pandemic, telehealth services have grown in use and popularity (Benda, Veinot, Sieck, & Ancker, 2020). Rural community members have begun to benefit from telehealth appointments, which alleviates the travel burden to receive routine care for many individuals. This alternative, however,

requires stable broadband internet access, in which many rural communities in the United States still are lagging in access (Benda, Veinot, Sieck, & Ancker, 2020).

1.4.1.2 Neighborhood and Built Environment in Rural Communities

Rural communities, by definition, are more sparsely populated than metropolitan areas, meaning community members tend to live more spread out, often in single-family stand-alone dwellings as opposed to apartment or townhouse complexes. Further, land masses in rural areas tend to be privately-owned as opposed to publicly owned and maintained using tax dollars or other financial sources, with 81% of rural residents in the U.S. owning their home versus 60% of non-rural residents. (United States Census Bureau, n.d.). Because of this, housing quality and land maintenance tends to vary drastically between plots, which can affect their overall aesthetics and safety of the community environment. Rural communities also often face decreased access to public resources such as parks and sports fields, coupled with limited sidewalks and often-ill-maintained roads, which are all barriers to physical activity, contributing to many of the chronic diseases rural community members face.

Historically, Allegheny County's rural areas housed many workers who commuted into the city of Pittsburgh and various industrial sites for work. Prior to the industrial decline in the county in the 1980s, many of these commuters had drawn resources into their communities, including healthcare facilities, grocery stores, and pharmacies, but as workers began to leave their homes in rural communities in search of new work, many of these vital community resources shuttered their doors due to declining business. This trend is still evident in many of the rural communities in Allegheny County, where there is a stark vacancy of many of these resources where infrastructure remains.

1.4.1.3 Social and Community Context in Rural Communities

Rural communities in the United States, while they are all distinct, share a specific culture inherent to rural living in the U.S. Due to the remoteness of these communities, there are often fewer opportunities for large-scale social and community engagement. Simultaneously, rural communities tend to form tight-knit networks within their communities that help to facilitate socialization as well as community-based health practices. Rurality poses unique challenges in implementing public health initiatives, due not only to sparse population distribution and potential lack of community-based resources, but also in community acceptance and engagement with the initiatives.

A shared ethos within rural communities across the U.S. is “rugged independence”, in which one of the ideologies relates to limited governmental interference with community members’ lives (Hege, et al., 2018). This ideology can make public health initiatives stemming from health departments difficult to initiate and sustain in rural communities. This barrier underscores the importance of health agency presence and engagement within rural communities on a continued basis, in order to work within these community contexts to design community-based and community-backed public health initiatives.

1.4.1.4 Education Access and Quality in rural Communities

Many of the barriers to receiving quality healthcare in rural areas also impact access to quality education in rural communities, including barriers with transportation, especially due to remoteness of residences and poorer upkeep of roads, leading to increased school bus and public transportation barriers for students. Concurrently, remoteness coupled with often few, centralized schools lead to long daily commutes to get to school, which can affect attendance, especially during inclement weather events. While educational attainment in rural communities is trending

upward in the last few decades, overall rural educational attainment still lags compared to educational attainment in non-rural areas (United States Department of Agriculture, 2017). For many of the same reasons as with lack of healthcare providers in rural areas, lack of qualified teachers and job opportunities in rural communities contributes to diminished educational attainment in rural areas. Geography has also shown to play a role in education access and attainment in rural areas, where close proximity or easy travel to primary schools and universities or community colleges has shown to increase educational attainment in rural communities. Additionally, other demographic characteristics such as race and ethnicity, sex at birth, and socioeconomic status tend to play more significant roles in disparities in education in rural areas than in urban areas (United States Department of Agriculture, 2017).

1.4.1.5 Economic Stability in Rural Communities

Rural areas in the United States, and especially in Allegheny County, have benefited from industrialization of surrounding naturally occurring resources such as forestry, mining, and agriculture (U.S. Food and Drug Administration, 2021). However, many rural communities have faced a reduction in community size and labor force as employment trends continue to shift towards urbanized settings and markets. Furthermore, economic stability and growth is directly tied to other social determinants of health such as educational attainment, a determinant which has been shown to be lagging in rural communities overall compared to non-rural areas (U.S. Department of Agriculture, 2021). Additionally, lack of economic growth and infrastructural development in rural areas has been tied to both increased levels of poverty in rural communities as opposed to non-rural communities, as well as emigration trends of younger individuals from rural communities to non-rural settings in search for gainful employment, a trend that depletes

much of the rural labor force, which exacerbates the economic conditions in rural communities (U.S. Department of Agriculture, 2021) (Hege, et al., 2018).

These economic trends are evident in many of the rural communities in Allegheny County, where previous generations relied on industrial work, primarily in mines and steel production, and agricultural work to sustain their families. As these industries continue to decline, more rural residents are opting to move to more populous areas to obtain higher education or specialized training, or gainful employment in different fields of work. These trends are particularly true for Allegheny County's younger rural population, who are opting to live in more metropolitan parts of the county than previous generations. Further, Allegheny County as a whole has seen a gradual decline in population as younger residents migrate to more populated areas in search of work (United States Census Bureau, n.d.).

1.5 Study Aims

The aim of this study is to perform quantitative and qualitative strength and risk assessments, including conducting windshield tours to gather qualitative data, and utilizing open-source databases to gather quantitative data, of a representative sample of the 39 rural municipalities in Allegheny County, PA. Analysis included a comparison of findings among these rural municipalities, as well as against Allegheny County rural municipality averages, Allegheny County as a whole, Pennsylvania averages, and United States national averages of key determinants of community health. The overall goal of this study is to identify strengths and needs within rural communities in Allegheny County to elucidate ways in which the Allegheny County

Health Department can support communities' health access, equity, and social determinants of health.

There were several previously under-explored questions the Allegheny Health Department hoped to answer in conducting exploratory community strength and risk assessments. The first of which was to obtain a better understanding of the overall community landscape and health in rural municipalities in Allegheny County. This study aimed to assess how rural health in Allegheny County differs from the health of non-rural communities in the county, but also aimed to delineate if and how the community landscapes are different *between* rural municipalities.

The second question this study aimed to clarify was to identify strengths and needs within rural communities in Allegheny County, in terms of local medical infrastructure, presence of public works, community engagement, local government engagement, financial resources, community diversity, among other community characteristics. A key aspect of community strength and needs assessments is that they not only account for what aspects or resources a community may be lacking, but illuminate strengths that these communities have. Community strengths are often drawn upon in designing and implementing tailored community-based and community-engaged initiatives, a framework that has shown to improve community uptake and sustainability (Holden , et al., 2015) (Barker, et al., 2021). Additionally, while interpreting study findings for planning community-based initiatives that are equitable in their community reach, it is fundamental to avoid certain assumptions regarding a community's strengths and needs:

- “This community does not have “X” resource, so this community must need “X” resource”
- “This community has “X” resource, so it isn’t a barrier in this community”

- “Everyone in this community has access to “X” resource because it is in the community”

While these generalizations may sometimes be the case in a community, assuming that they are true in all communities leads to limited understanding of the complex community environment in which the initiatives will be operating. Further, these assumptions reinforce social and institutional inequities in these communities, a framework that this study actively aims to ameliorate.

The third question this study aimed to address was to use the information gained from the exploratory portion of this study to determine ways in which the Allegheny County Health Department can support communities’ health access, equity, and social determinants of health. It is important to note that before this study, the vast majority of the Allegheny County Health Department's public initiatives were based on data collected from urban and sub-urban communities, which intrinsically are not designed to address the health needs specific to rural communities. Through conducting this study, the Allegheny County Health Department will be able to utilize qualitative and quantitative data specific to the county’s rural communities in their planning and implementation of public health initiatives. Moreover, this project helped to establish community communication and engagement between the Allegheny County Health Department and the constituents these initiatives aim to serve. Strength and needs assessments conducted for this study instigated relationship-building between Allegheny County Health Department employees and municipality officials, allowing for crucial dialog between these stakeholders regarding community strengths and needs, which aided in the development of targeted intervention plans.

2.0 Methods

2.1 Sample

There are a total of 130 municipalities in Allegheny County of which 39 meet the USDA criteria for a rural community designation (Table 2) (U.S. Department of Agriculture, 2021). We collected U.S. Census data pertaining to basic community demographics for all 39 municipalities and it was included in county average and mode calculations (Table 2) (United States Census Bureau, n.d.). For the purposes of calculating rural municipality summary statistics in this study, we included municipalities that were visited in the windshield tours in the rural municipality (Table 3) (United States Census Bureau, n.d.).

Qualitative data was collected from a representative sample of 17 of the 39 total rural municipalities in Allegheny County, ensuring that each quadrant of the county was equally represented within the sample (Figure 20) (Table 2). For the purposes of this study, our sample of 17 rural municipalities with complete data were used for all analyses presented in this study. The University of Pittsburgh Institutional Review Board was consulted regarding the research designation of this study, and it was determined that this project includes no involvement of human subjects, according to the federal regulations [45 CFR 46.102(e)] (Appendix A).

2.2 Data Collection

2.2.1 Quantitative Data Collection

Quantitative data was collected using multiple open-source electronic databases. Quantitative data related to community demographics was collected for each municipality using the open-source United States Census database (Table 2) (United States Census Bureau, n.d.). Google Maps was utilized to determine distances of places of interest, using rural municipalities as the community center point (Table 2) (Google Maps, 2022). Municipality walkability scores were gathered from Western Pennsylvania Regional Data Center's website (University of Pittsburgh Center for Social and Urban Research, 2021) (Table 2). Social vulnerability indices for each rural municipality were collected from The Center for Disease Control (CDC) website (Center for Disease Control, 2022) (Table 2).

2.2.2 Qualitative Data Collection

Qualitative data was recorded by conducting windshield tours of a representative sample of 17 of the 39 total rural municipalities in the county (Table 2) (Table 3). A pre-determined questionnaire reflecting key indices of community health was utilized to help guide data collection for the windshield tours (Table 2). Windshield tours were conducted by driving through the municipality and recording observations. Brief interviews were conducted with municipality officials to determine self-reported strengths and needs within their respective communities. Municipality officials were also offered informational material and resources regarding programs within the Allegheny County Health Department and between partnering organizations. Rural

municipalities were individually assessed on the ACCESS, Heritage, Pittsburgh Regional Transit Services, Uber, and Lyft websites to identify levels of transportation accessibility within the community (Table 1) (Access, 2017) (Heritage Community Initiatives, 2022) (Port Authority of Allegheny County, 2022) (Uber, 2022) (Lyft, 2022).

2.3 Data Analysis

Data were recorded and analyzed using Microsoft Excel Version 2002. Descriptive statistical analyses included tabulating averages and sums of quantitative data using Microsoft Excel functions. Weighted averages were calculated for relevant variables to account for vast differences in population size by multiplying each municipality's variable value by the proportion of the total of the study's rural municipality population that live within the respective municipality and adding the values to reach weighted means. Graphs and charts included in the analysis were created in Microsoft Excel and Microsoft Word, respectively. The full dataset is available from authors upon request.

Qualitative data was coded for further analysis and visualization within Microsoft Excel. Binary responses to qualitative questions were coded as 1 for yes and 0 for no. This allowed for multi-response analysis amongst multiple municipalities. Open-ended qualitative answers were coded using a grading scale based on broad thematic trends and sub-themes, and to frame key social determinants of health. These data could then be quantifiably compared across municipalities (Appendix E). For the purposes of this preliminary descriptive investigation, we focused on analyzing quantitative variables collected for this study. Quantitative questions related to proximity of key services such as hospitals, libraries, and shopping centers were quantified using

Google Maps, where miles from municipality building to location of interest was captured in Microsoft Excel. All graphically represented data was presented from left to right based on geographic region within Allegheny County: southwest, southeast, northwest, and northeast.

3.0 Results

3.1 General Demographic Characteristics

An estimated total of 87,183 of Allegheny County's 1,218,380 total residents, or 7.16% of the overall 12.99% of the County's rural population, are represented in this study. The average population size for rural municipalities is 5,128, though population size varied widely between rural municipalities, with McDonald being the smallest with an estimated 638 people, and North Fayette being the largest with an estimated 14,770 people.

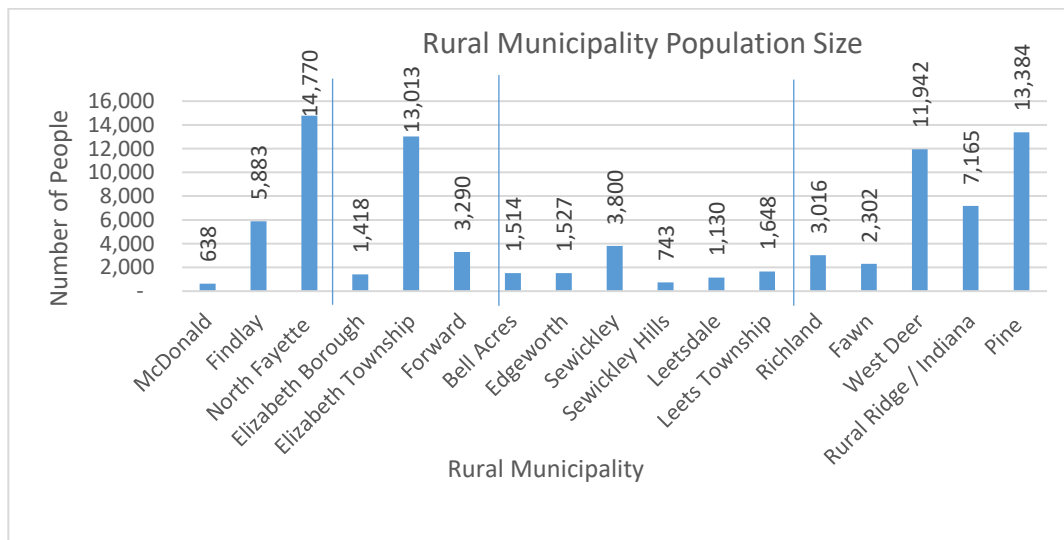


Figure 1 Rural Municipality Population Size

The unweighted average median age of the residents in the 17 rural municipalities is 44.60 years old, and the weighted average median age of the 17 rural municipalities is 44.47 years old,

as compared to a median age of 40.80 years old for Allegheny County residents overall. The oldest median age is 56.30 in Sewickley Hills, and the youngest median age is 35.10 in Leet Township.

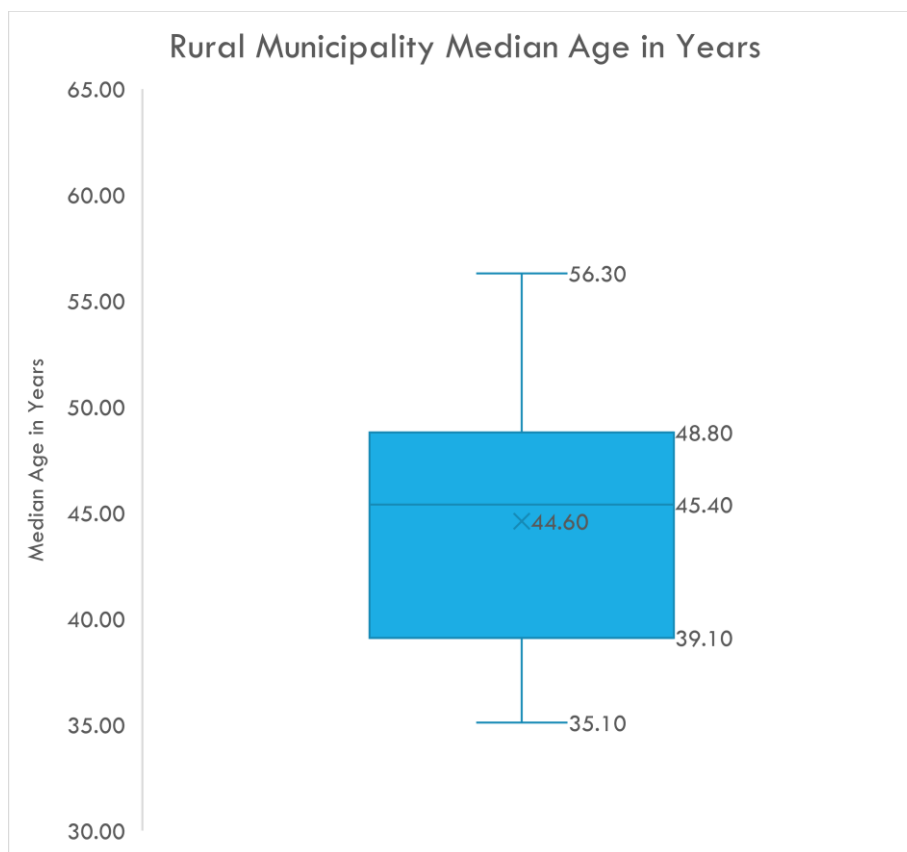


Figure 2 Rural Municipality Median Age in Years

U.S. Census-based veteran and disability rates are calculated based on percentage of the municipality's population that are classified as being a veteran or disabled. Overall, rural municipalities in this study tended to have similar veteran rates to the national average (7.10%), with an unweighted average veteran rate of 6.49% overall, and a weighted average of 7.08% veteran rate. Disability rates for the 17 rural municipalities in the study tended to be on-par with the national average (12.70%) and the overall county average (13.60%), with an overall unweighted average disability rate of 12.56% and weighted average of 11.94% disability rate. The

notable exceptions are Elizabeth Borough at 27.10%, and Richland Township at 19.20%. It should also be noted that West Deer had slightly above average for both veteran and disability rates, at 9.20% and 14.90%, respectively. Geographic region did not seem to be a major indicator for increased veteran or disability rates.

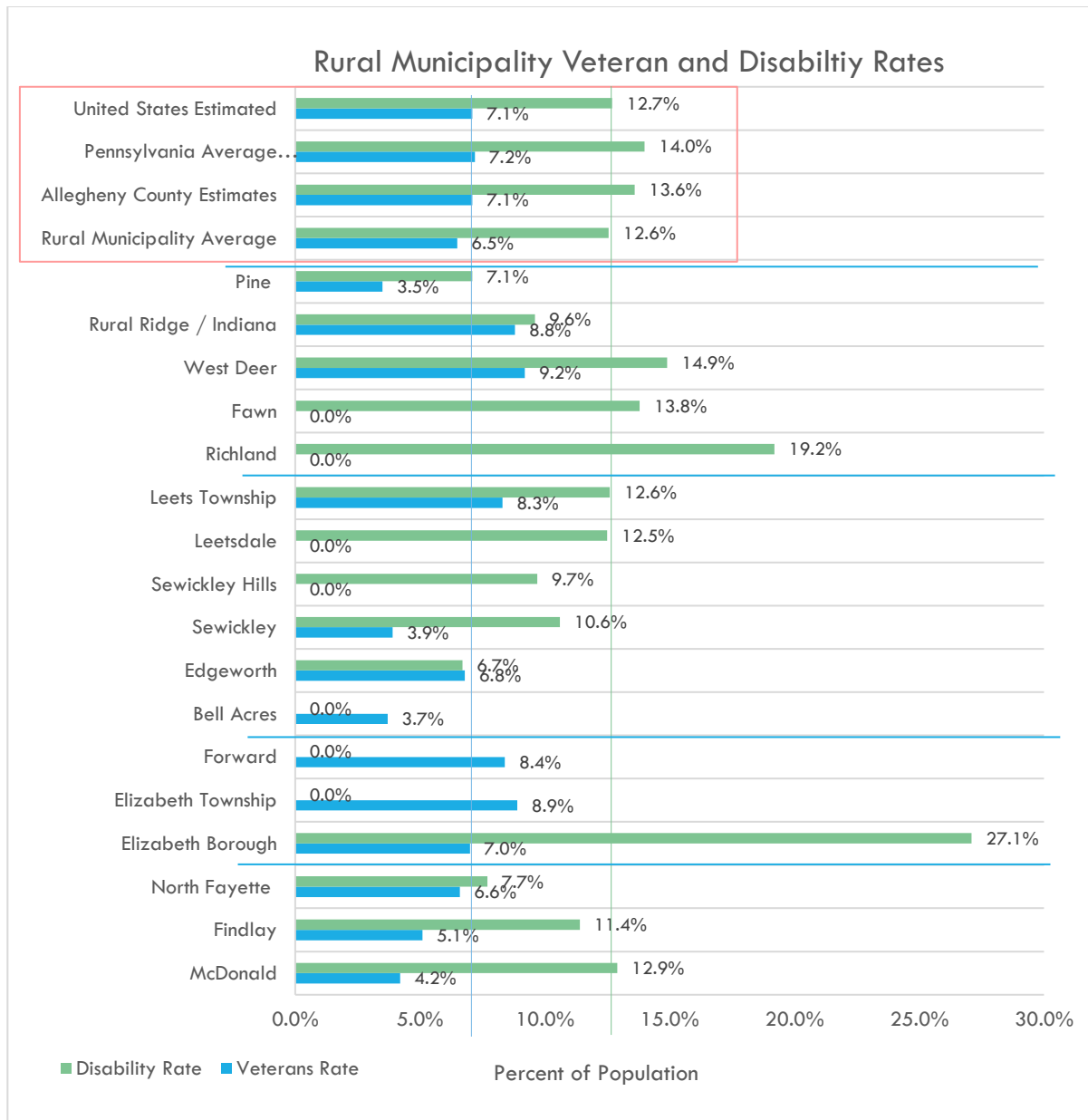


Figure 3 Rural Municipality Veteran and Disability Rates

Rural Municipalities in Allegheny County as a whole have a larger proportion of their population who identify as white as compared to the county overall. White individuals make up 87.67% of the total rural population in the county, as compared to Allegheny County overall, where 73.65% of the total county population identified as white only. Black/African American and Asian residents tended to live in more non-rural areas rather than rurally designated municipalities in the county. Hispanic/Latino residents tended to make up relatively equal proportions between rural municipalities versus Allegheny County overall, representing 2.19% and 2.57% of the total rural and overall Allegheny County populations, respectively.

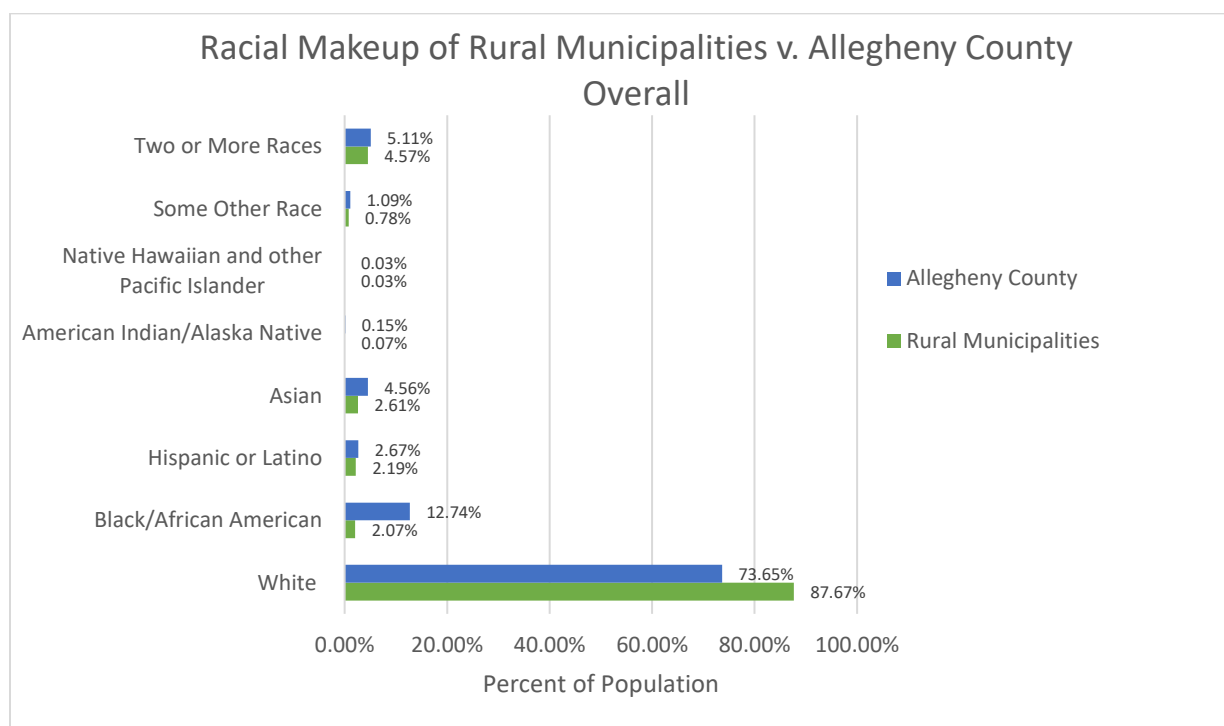


Figure 4 Racial Makeup of Rural Municipalities versus Allegheny County Overall

3.2 Financial Characteristics

Overall, rural municipalities in Allegheny County have an average median household income of \$92,454.47, that is 42.25% more than the national median household income, which is \$64,994.00. By comparison, Allegheny County as a whole, as well as the Commonwealth of Pennsylvania, have median household income values similar to the national median, at \$62,320.00 and \$63,627.00, respectively.

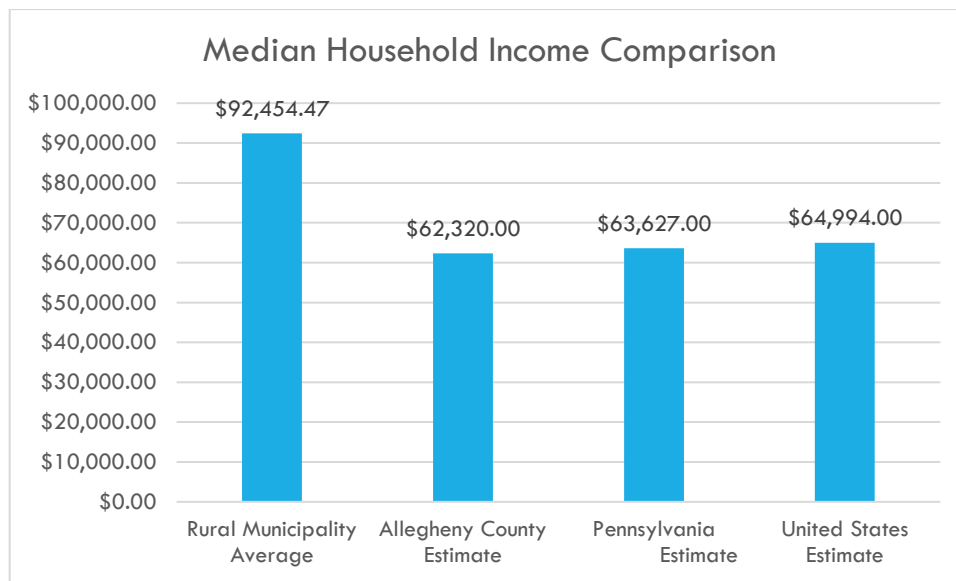


Figure 5 Median Household Income Comparison

A breakdown of median household income by rural municipality within Allegheny County shows a wide variation in incomes between municipalities. Allegheny County and Pennsylvania Commonwealth are on-par with national medians, but many rural municipalities have a median income that is greater than the nation median (as outlined in red). Notably, Edgeworth's median income is the maximum median income, at \$183,250.00, whereas Elizabeth Borough's median

household income is \$38,983.00. Leetsdale’s median household income, at \$47,212.00, is also significantly less than the national median household income. The southwest and southeast regions tended to have lower median household income rates overall than the northwest and northeast regions.

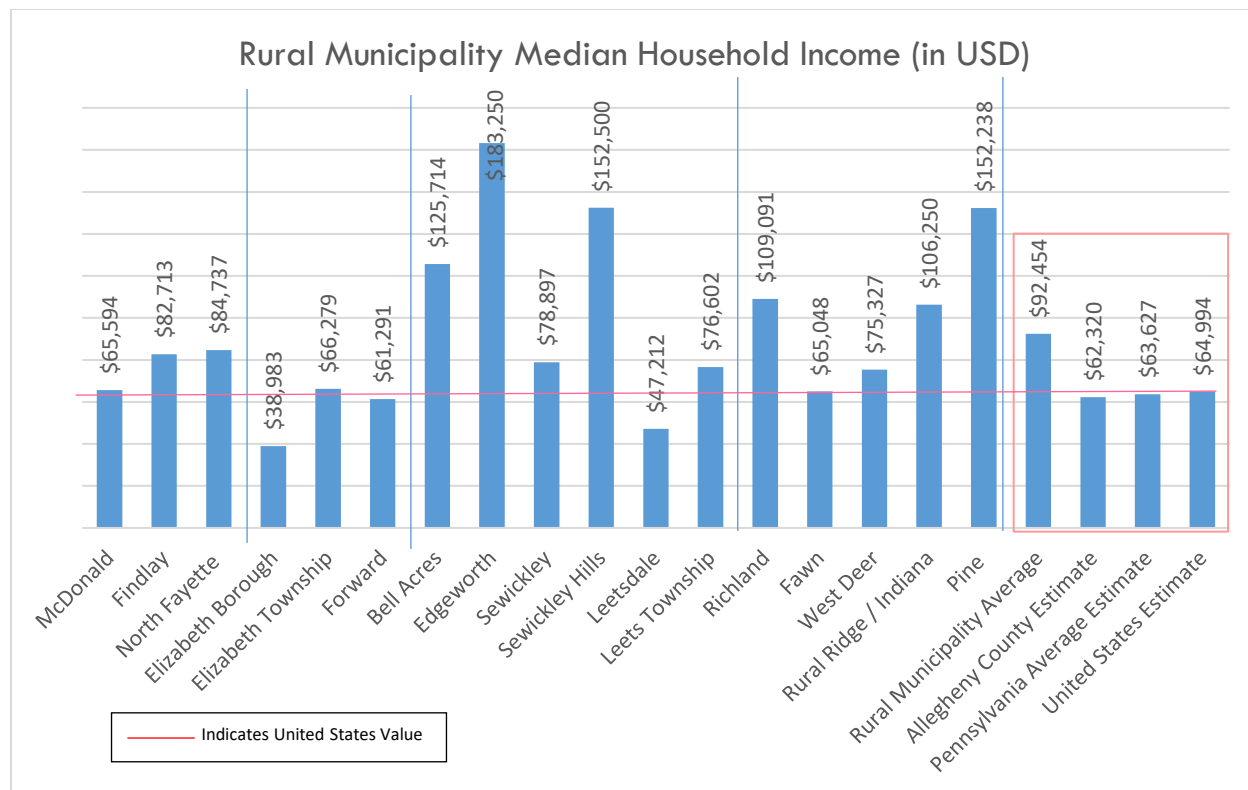


Figure 6 Rural Municipality Median Household Income in USD

Overall, rural municipalities in Allegheny County tended to have much lower rates of poverty, with an unweighted average poverty rate of 5.99% and a weighted average poverty rate of 5.43%, as compared to Allegheny County overall (11.30%) and Pennsylvania Commonwealth (12.00%), which were much closer to the United States overall poverty rate of 12.80%. Notably, Elizabeth Borough and Richland had poverty rates above the national average, and over twice the

rural municipality average, with 15.20% and 14.80%, respectively. Geographic region did not seem to be a major indicator for increased poverty rates.

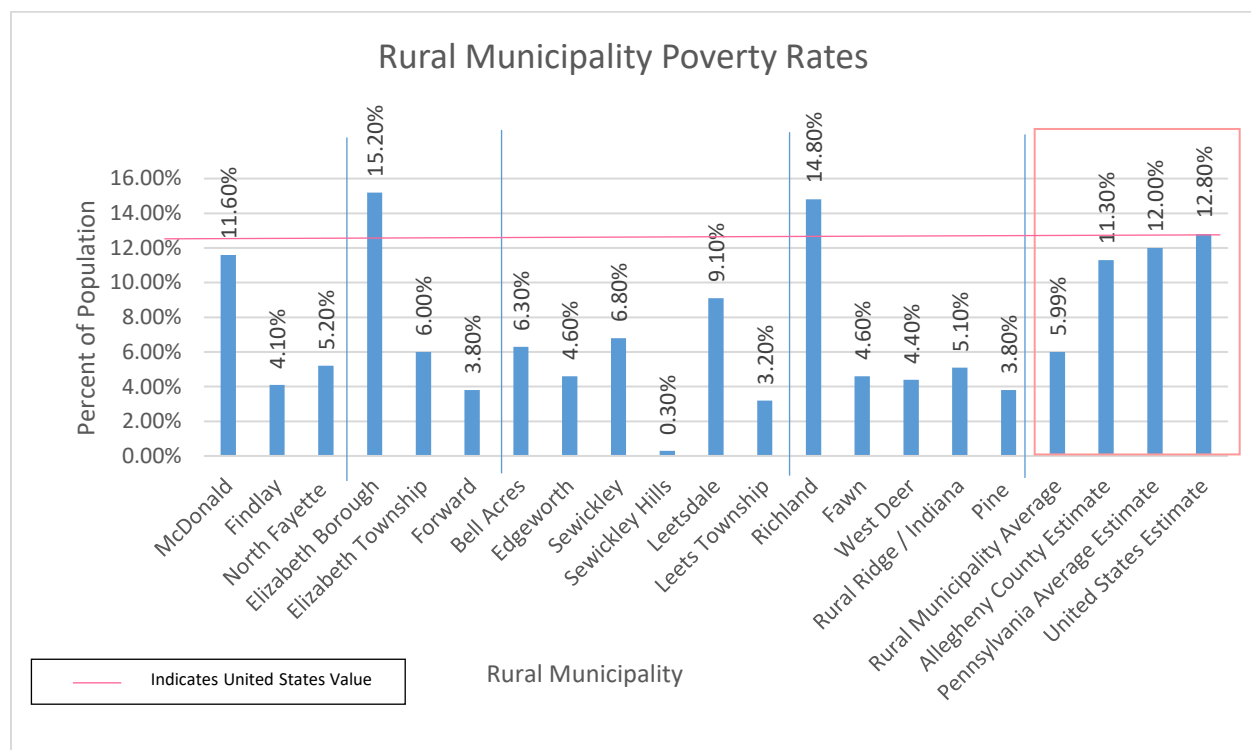


Figure 7 Rural Municipality Poverty Rates

3.3 Housing Characteristics

The average median property value in rural municipalities in Allegheny County, at \$261,547.06, is nearly \$100,000 more than Allegheny County's overall median property value, \$161,600.00. It is also greater than Pennsylvania Commonwealth and United States national median property values. Edgeworth's property value is 174.12% of the national median, at \$629,900, and is the highest median property value of the rural municipalities. Conversely,

Elizabeth Borough has the lowest median property value, at \$73,900, which is much less than the rural municipality, county, state, and national median values. The southwest and southeast regions tended to have lower median property value rates overall than the northwest and northeast regions.

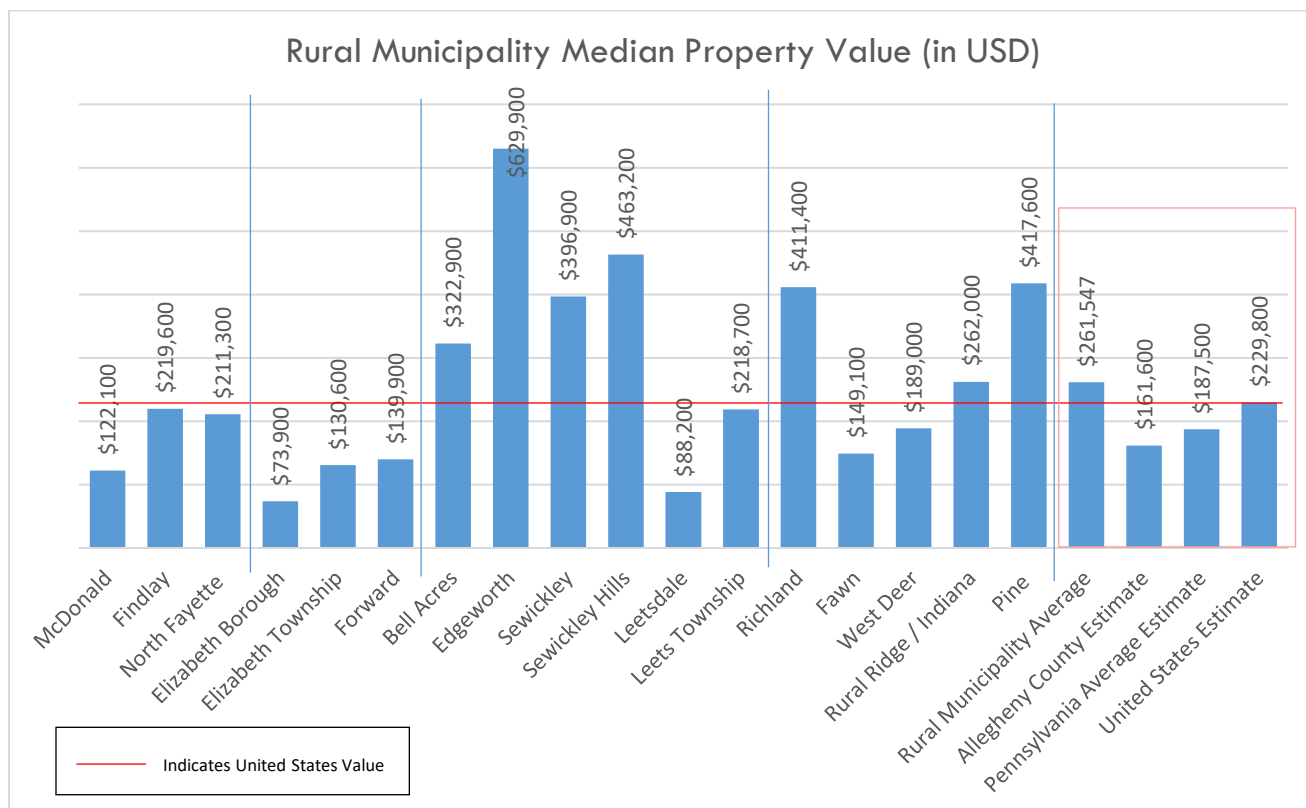


Figure 8 Rural Municipality Median Property Values in USD

3.4 Education Characteristics

Rural municipalities in Allegheny County have a higher overall educational attainment rate, at 95.43% of the population earning at least a high school diploma or equivalent, as compared to Allegheny County at 94.90%, Pennsylvania Commonwealth at 91.00%, and the United States overall at 88.50%. Notably, 20.11% of Allegheny County residents who are living in rural

municipalities have obtained a graduate or professional degree, which is higher than the county, state, and national averages (United States Census Bureau, n.d.).

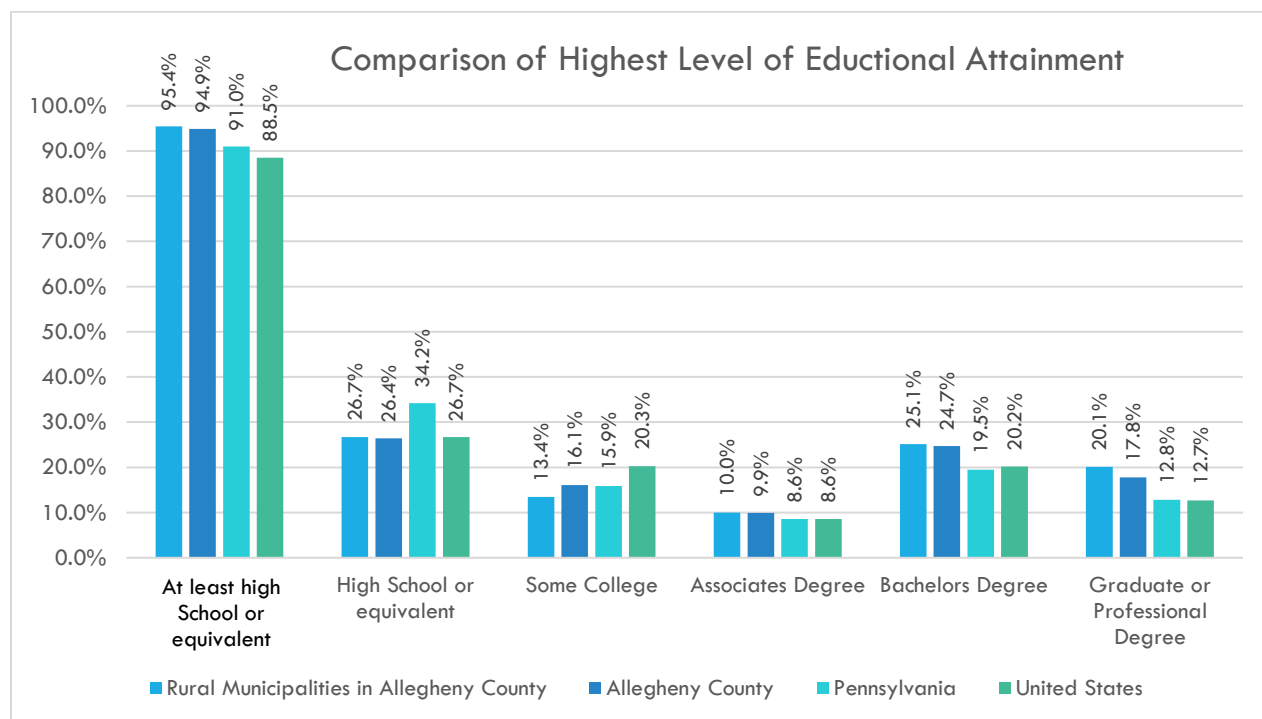


Figure 9 Comparison of Highest Level of Educational Attainment

Rural Municipalities in Allegheny County have a higher percentage of residents who have graduated with at least a high school diploma or equivalent, at 95.43% unweighted average and 96.90% weighted average, compared to the national average, which is 88.50%, as well as Pennsylvania averages which is 91.00%. Pine has the highest educational attainment rate, with 100.00% having at least high school or equivalent education, while McDonald has the lowest educational attainment, at 78.60%, which is considerably lower than rural municipality, county, state, and national values. Geographic region did not seem to be a major indicator for educational attainment rates.

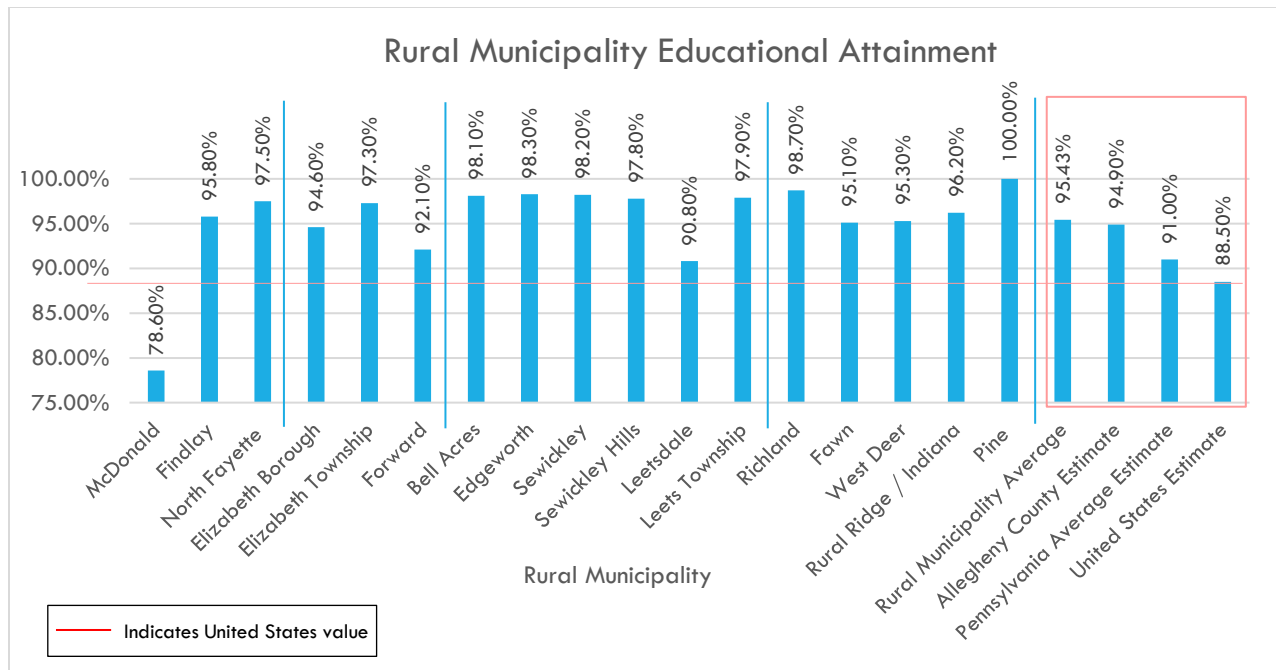


Figure 10 Rural Municipality Educational Attainment

Distance from rural municipality municipal building to the nearest public library was measured in miles. Pine, Richland, Sewickley, North Fayette, and McDonald all had public libraries less than one mile from their respective municipal buildings. Belle Acres had the furthest distance to travel from municipal building to a public library, at 8 miles away. The average distance from rural municipal building to public library was 3.46 miles. Geographic region did not seem to be a major indicator for proximity to nearest public library.

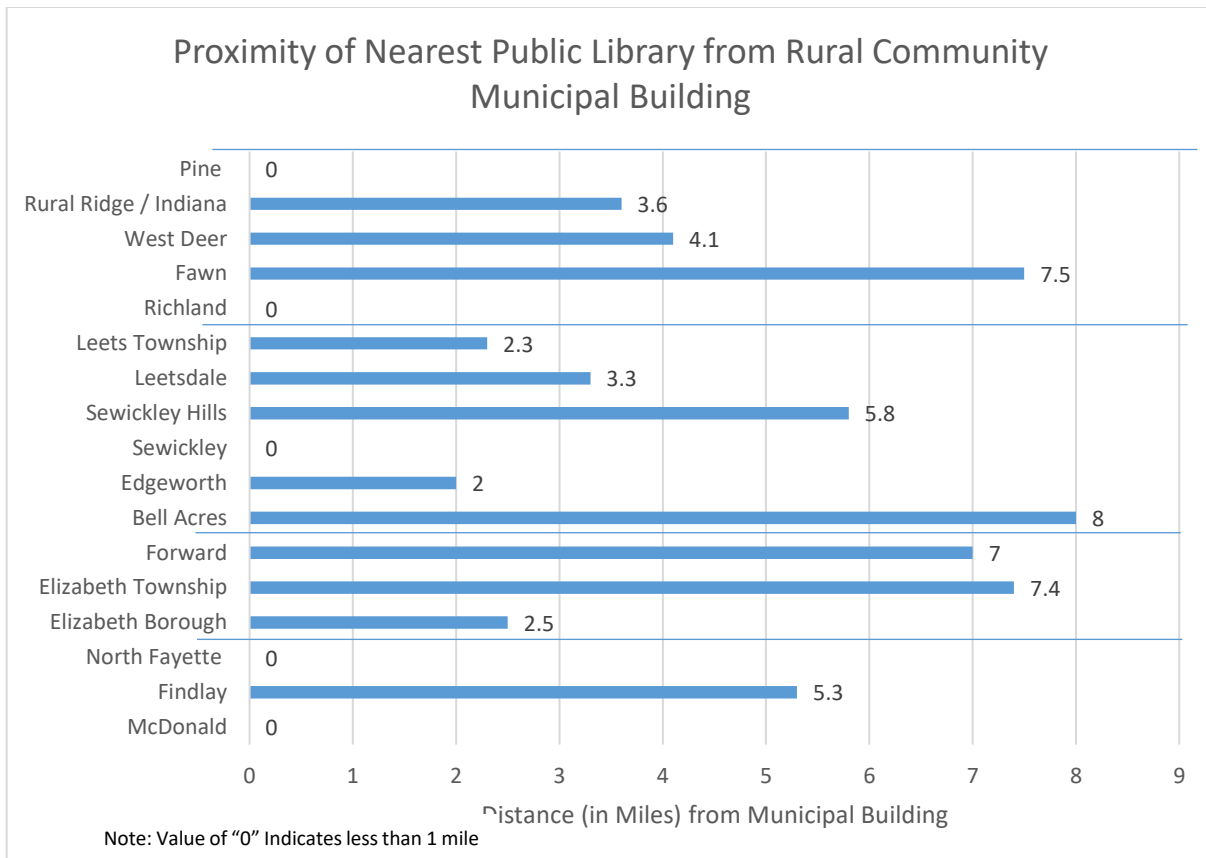


Figure 11 Proximity of Nearest Public Library from Rural Community Municipal Building

3.5 Social Determinants of Health Characteristics

Geographic location of rural municipalities was a primary consideration in selecting the sample of communities for this study. Rural municipalities from all four quadrants of the county were selected to help ensure an un-biased sample. The rural municipalities in this study were overlaid with Allegheny County Health Department's Environmental Justice Score Map to assess environmental health burden within the municipalities (Figure 12) (Shedlock & Brink, 2019). Environmental Justice score highlights potential for environmentally derived health burden, an issue that is particularly salient in Allegheny County. The majority of the rural communities in

this study are not classified as “high need” or “highest need” environmental justice (EJ) areas, with the exception of Leetsdale and Elizabeth Borough, which are both classified as “high need”.

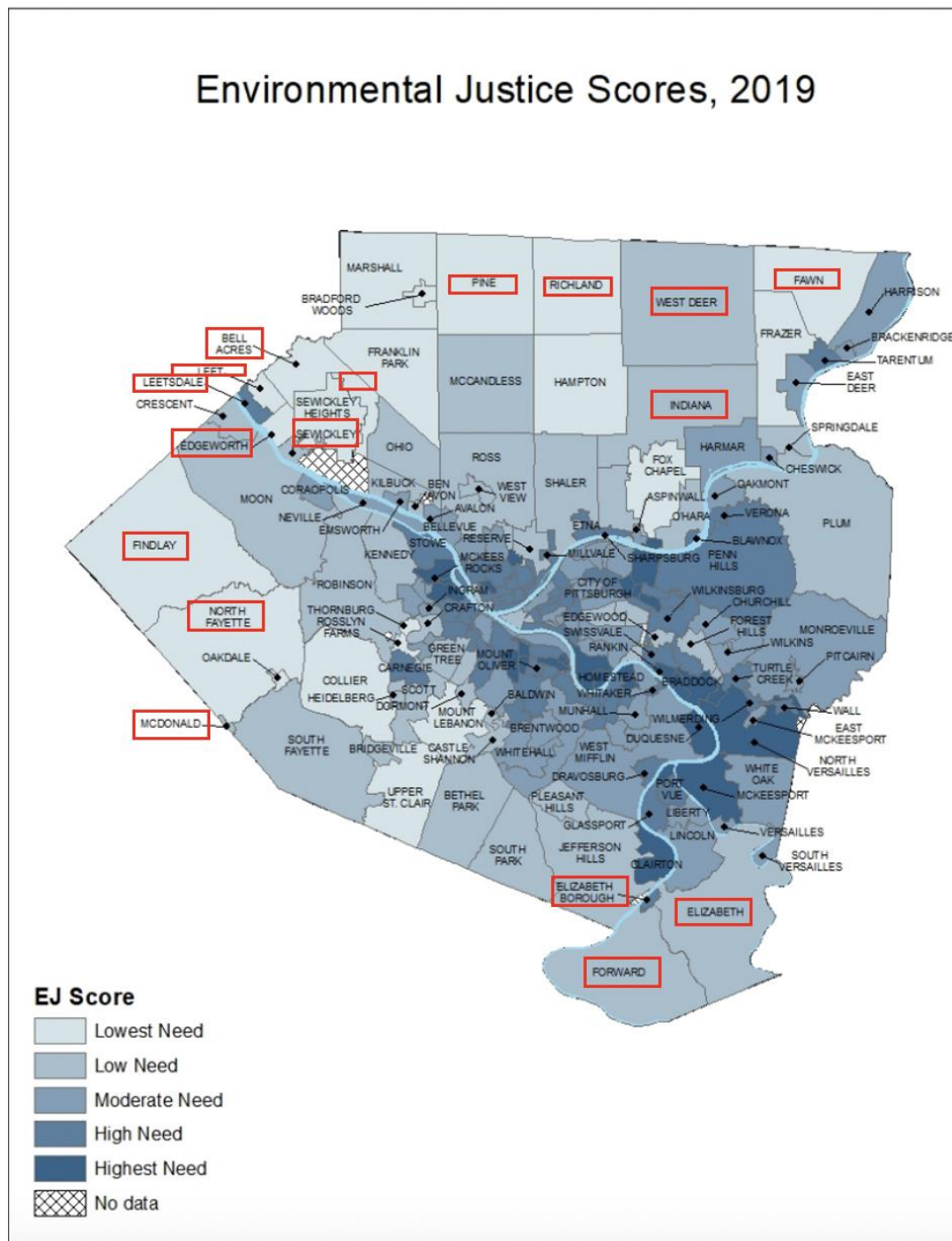


Figure 12 Rural Municipalities' Environmental Justice Scores, 2019 (Shedlock & Brink, 2019)

Overall, there is a high degree in variability of available grocery, pharmacy, ambulance service, and hospital access within each rural municipality. Distance was estimated from municipality building to nearest of building of interest. Distances less than one mile from the municipality building were coded as “0”. Notably, Sewickley has the easiest access to all resources, while residents from areas like Findlay must travel 13.8 miles from the municipal building to reach the nearest hospital. Likewise, the closest ambulance dispatch service is 11.3 miles from Fawn’s municipal building. The northwest region overall has easier access to grocery stores and hospitals than the other regions, while the northeast region has significantly less access to local ambulance services overall than the other regions.

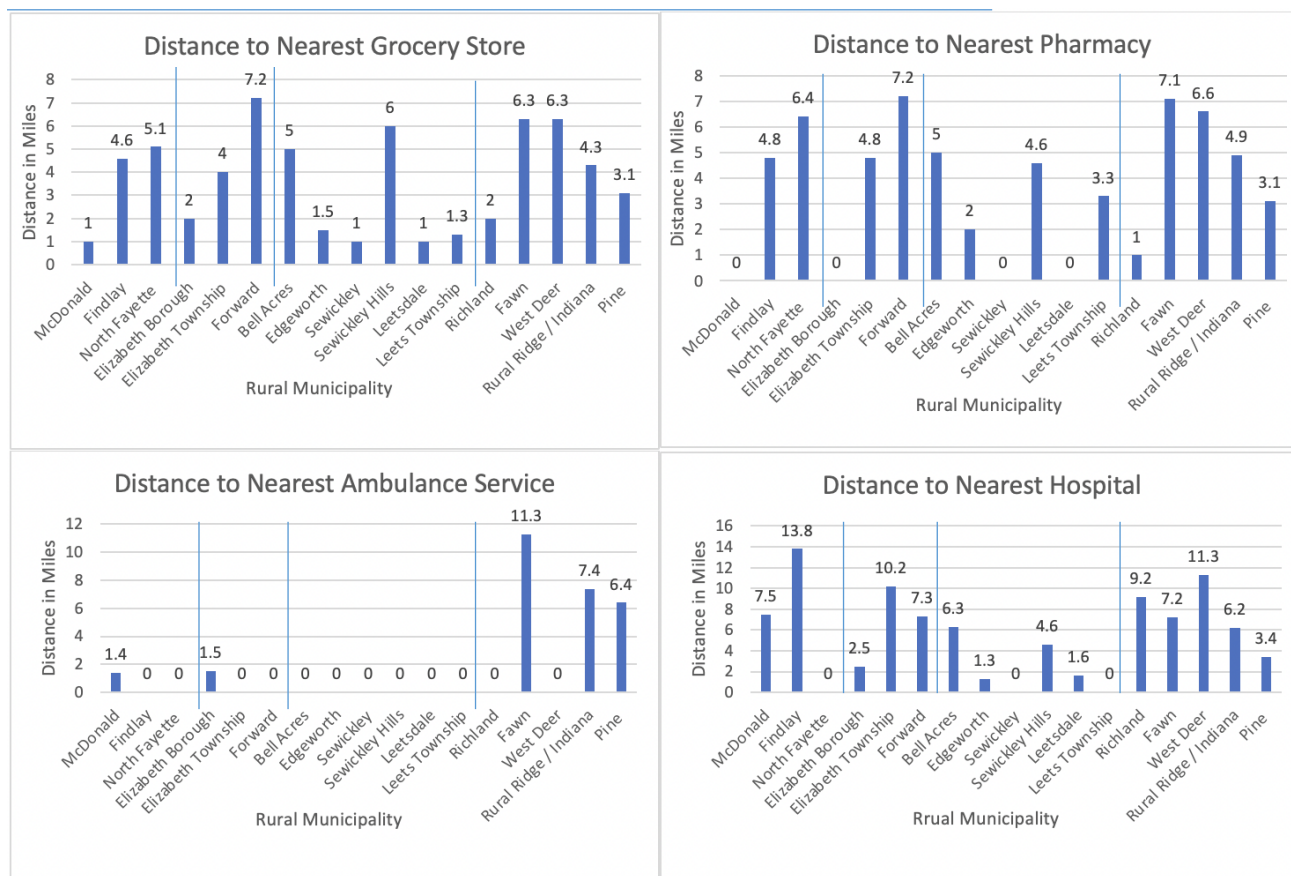


Figure 13 Distance from Rural Municipal Building to Critical Resources

Rural Municipalities in Allegheny County have a higher percentage of residents who have access to at least one electronic device with broadband internet in their home, at 88.46% unweighted overall average and 89.65 weighted overall average, compared to the national average, which is 85.20%, as well as Pennsylvania's average of 84.00%. Pine has the highest broadband access rate, with 98.00% of households, while McDonald has the lowest broadband access, at 77.50%, which is lower than rural municipality, county, state, and national values. Elizabeth Borough (84.30%), Elizabeth Township (83.50%), Sewickley (83.90%), Leetsdale (80.40%), and Richland (83.50%) all had lower proportions of broadband access than the national average. Geographic region did not seem to be a major indicator for broadband internet access.

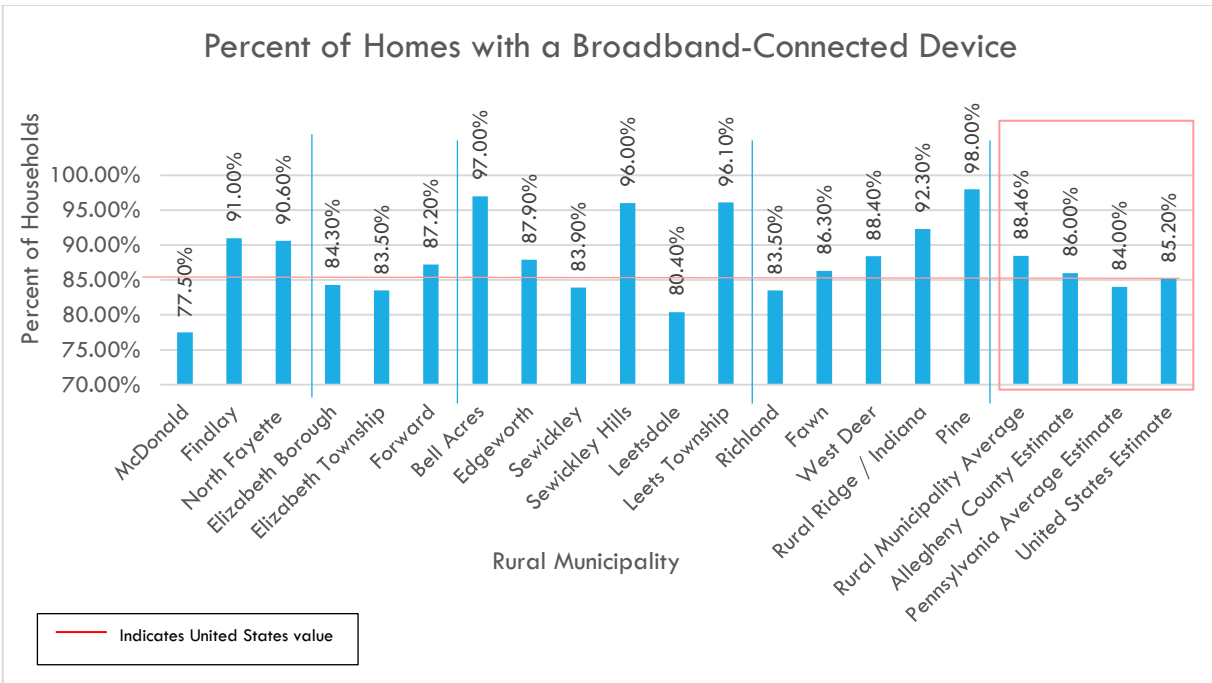


Figure 14 Percent of Homes with a Broadband-Connected Device

The U.S. Center for Disease Control’s (CDC) Social Vulnerability Index (SVI) is a tool for public health and emergency medical planners to help identify communities that will most likely need support before, during and after a hazardous event. 2018 scores are represented, where a score of 0 indicates lowest vulnerability and 1 indicates highest vulnerability. Note that SVI score was not available for Leet Township. Rural municipalities in Allegheny County had an average median SVI score that was less than Allegheny County as a whole (0.2506) and Pennsylvania Commonwealth average estimates (0.373), at 0.2125. McDonald had the highest SVI score at 0.6245, whereas Edgeworth and Belle Acres had the lowest SVI scores with 0.0072 and 0.0071, respectively. Geographic region did not seem to be a major indicator for Social Vulnerability, though there appears to be wide within-region variability of Social Vulnerability Index Scores.

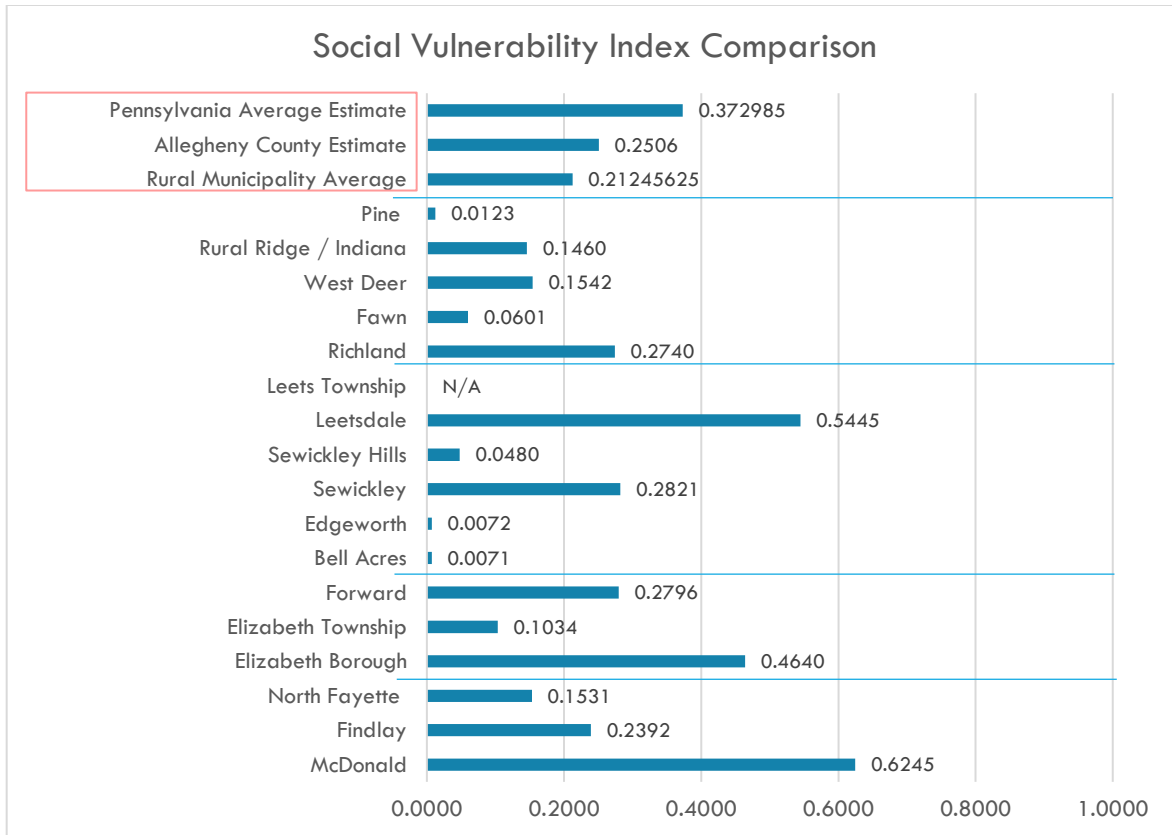


Figure 15 Social Vulnerability Index Comparison

Walkability Scores are scored on a scale from 0 to 100, 0 being highest rate of car dependency, 100 being lowest rate of car dependency / easiest walkability to essentials. Rural municipalities in Allegheny County had a lower average walkability score than Allegheny County as a whole, at 25.53 compared to 42.33. Sewickley had the highest walkability score by a large margin, at 97.00, whereas Fawn had the lowest walkability, at 0.00. Of the 17 rural municipalities, only 4 of them (McDonald at 63.00, Findlay at 51.00, Elizabeth Borough at 51.00, and Sewickley at 97.00) have walkability scores that are higher than the Allegheny County average score. While there is within-region variability in walkability score, the northeast region overall had the lowest walkability.

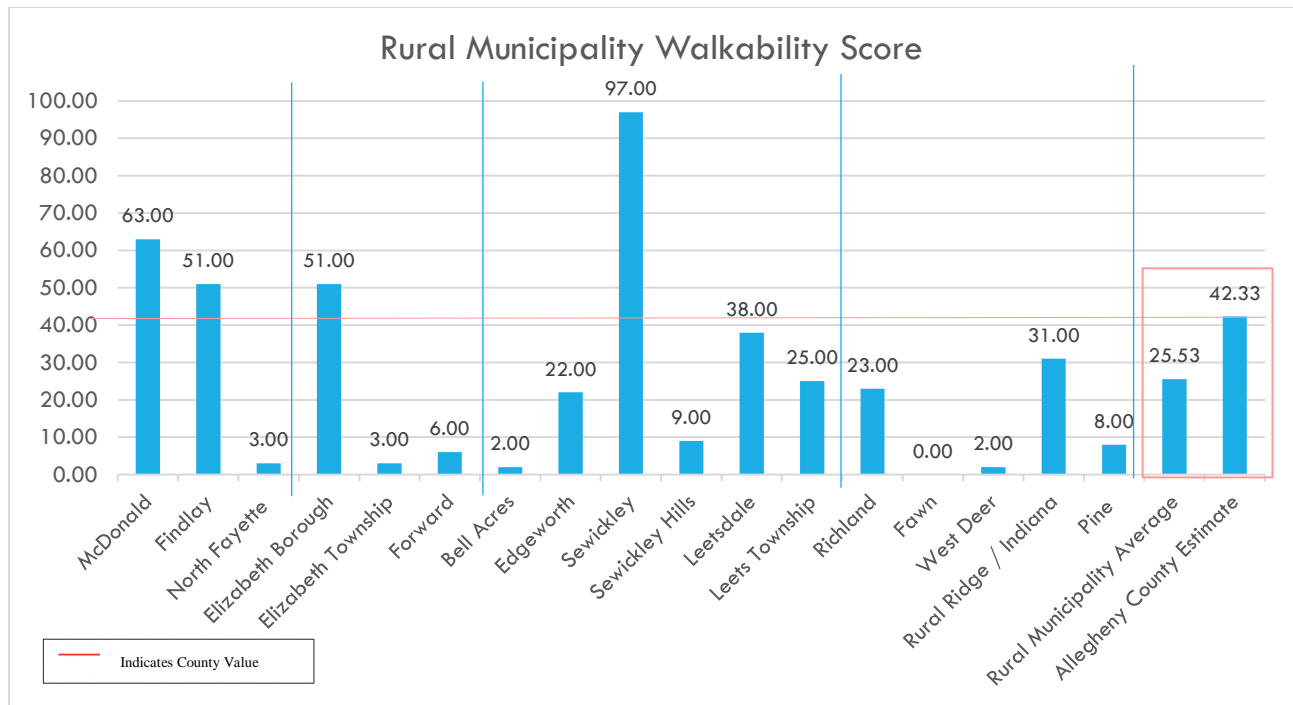


Figure 16 Rural Municipality Walkability Score

The number of different denominations of represented by a house of worship within each rural municipality in Allegheny County was tabulated during the windshield tour of the municipality as well as Google Maps. Leet Township did not contain any houses of worship, while Sewickley has 7 different denominations represented. The average number of denominations of worship in rural municipalities in Allegheny County was 3.29. The southwest region overall had the highest number of different denominations of worship.

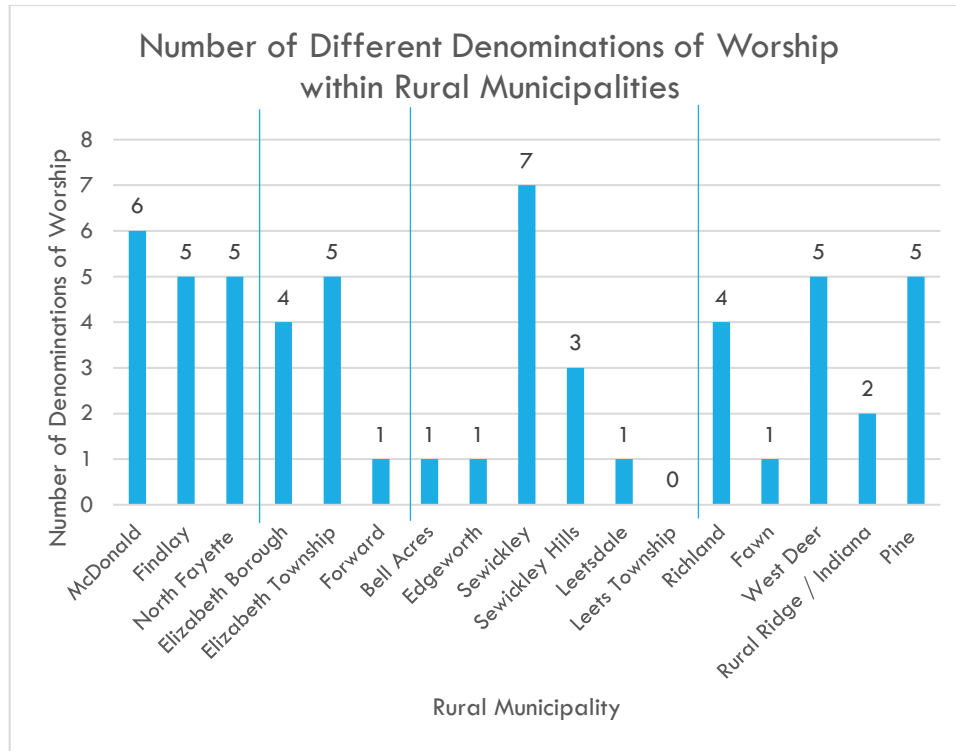


Figure 17 Number of Different Denominations of Worship within Rural Municipalities

3.6 Transportation Characteristics

Of the 17 rural municipalities surveyed in this study, 7 of the 17, or 41% of the rural municipalities in this study, had any access to Pittsburgh Regional Transit transportation services in the municipality. Notably, six of the seven rural municipalities that housed at least one bus route are in the northwest region of the county.

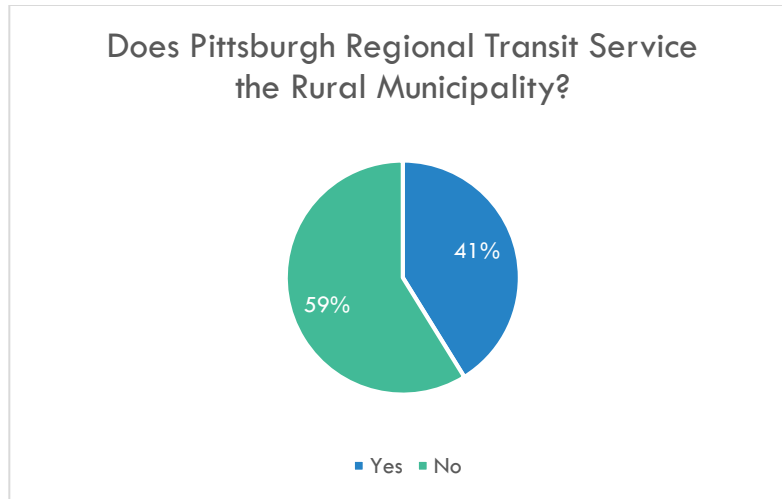


Figure 18 Rural Municipality Access to Pittsburgh Regional Transit

Table 1 Pittsburgh Regional Transit Services by Rural Municipality in Allegheny County, PA

County Region	#	Allegheny County Rural Municipality	Pittsburgh Regional Transit Services Municipality
Northwest	1	Bell Acres	X
	2	Edgeworth	X
	3	Leets Township	X
	4	Leetsdale	X
	5	Sewickley Hills	X
	6	Sewickley	X
Northeast	7	Allegheny Acres (within West Deer Township)	
	8	Bakerstown (within Richland Township)	
	9	Fawn Township	
	10	Pine Township	
	11	Rural Ridge (within Indiana Township)	
Southwest	12	Clinton (within Findlay Township)	
	13	McDonald	
	14	North Fayette Township	
Southeast	15	Elizabeth Borough	X
	16	Elizabeth Township	
	17	Forward Township	

4.0 Discussion

Overall, based on analyses of the quantitative and supportive qualitative data for the rural municipalities in this study, there seems to be wide and varied lifestyles and cultures both between and within the municipalities in this study. Lifestyles ranged from classic rural farming landscapes to middle-income “mine-towns” that are characteristic of Allegheny County, to large, new, burgeoning subdivisions in more rural areas, as well as older, turn-of-the-century housing communities, to large, multi-million-dollar homes set on acres of rural land. Each of these community settings offers benefits as well as potential barriers to healthy lifestyles. It is imperative to assess as many characteristics of these communities as possible to create meaningful initiatives to best support these unique communities.

4.1 General Demographic Characteristics

An estimated total of 158,257 of Allegheny County’s 1,218,380 total residents, or 12.99%, live in one of the county’s 39 rurally designated municipalities. Of that, an estimated total of 87,183, or 7.16 of the total 12.99 percentage points, live in one of the 17 rurally designated municipalities captured in this study. The average population size for rural municipalities in this study is 5,128, though population size varied widely between rural municipalities, with McDonald being the smallest with an estimated 638 people, and North Fayette being the largest with an estimated 14,770 people (Figure 1). In recent years, several townships, such as South Fayette

Township, have outgrown their rural municipality designation due to rapid suburban growth, which seems to be the case with several of the rural municipalities in this study.

The unweighted and weighted average median age of rural municipality residents in this study is 44.60 and 44.47 years old, respectively, as compared to an average age of 40.80 years old for Allegheny County residents overall. The oldest median age is 56.30 in Sewickley Hills, and the youngest median age is 35.10 in Leets Township (Figure 2). Overall, rural communities tend to have a higher population of older residents, which is generally the case for the communities in this study. It is crucial to consider aging rural populations when assessing specific community needs, as aging individuals have added transportation and healthcare needs in areas that tend to already have limited access to these resources. Further analysis into municipality-specific emigration may yield useful information regarding the economic and cultural history and makeup of the community.

Overall, this study's rural municipalities tended to have similar to the national average (7.10%) veteran rates, at 6.49% unweighted average, and 7.08% weighted average overall. Disability rates tended to be on-par with national averages (12.70%) and overall county averages (13.60%) with 12.56% unweighted average, and 11.94% weighted average overall disability rate, with the notable exception of Elizabeth Borough at 27.10%, and Richland Township at 19.20% (Figure 3). With over a quarter of the municipality's population having a disability, additional efforts may be necessary to ensure Elizabeth Borough's public areas and resources are available and accessible to its residents. Elizabeth Borough has the lowest median income, at \$38,983.00, highest poverty rate, at 15.20%, and third highest Social Vulnerability Index Score, 0.4640, of the 17 municipalities in the study, which indicates that this municipality may benefit from additional public resources to further research and address potential barriers to healthy living (Figure 6)

(Figure 7) (Figure 15). It should also be noted that West Deer had slightly above average rates of both veteran and disability rates, at 9.20% and 14.90%, respectively (Figure 3). West Deer also had the second furthest distance of any municipality in this study from its municipality building to the nearest hospital, at 11.3 miles (Figure 13). With a high rate of both veterans and disabled individuals, with potentially an intersection of the two demographics, Veteran Affairs (VA)-funded resources may be a good option to consider in addressing community needs.

Rural Municipalities in Allegheny County have a higher white population as compared to Allegheny County overall, with 87.67% as compared to 73.65%. Black/African American and Asian residents tended to live in more non-rural areas rather than rurally designated municipalities. Hispanic/Latino residents tended to live relatively equally between rural and non-rural municipalities, representing 2.19% and 2.57% of the total rural and overall Allegheny County populations, respectively (Figure 4). While these rural municipalities are comprised of predominantly white residents, an estimated 11,358 of the 92,121, of rural residents in this study, or 12.32%, identified on the 2010 U.S. Census as two or more races or a race other than white (United States Census Bureau, n.d.). Considering that specialized resources tend to be sparser in rural areas, resources specific to racial and ethnic minorities tend to be even more scarce in rural areas. It is essential to consider these minority populations living in rural communities when developing equitable community resources and action plans. These populations are already at higher risk for marginalization and poorer health outcomes than their white counterparts, and it can be argued that targeted resources are even more vital for rural minority groups.

4.2 Financial Characteristics

Overall, rural municipalities in Allegheny County have a median household income that is 42.25% more than the nation average. By comparison, Allegheny County as a whole, as well as the Commonwealth of Pennsylvania, have median household income values similar to the national average (Figure 5). These findings are contrary to the overall national income trends for rural versus urban areas, and surprising considering that Allegheny County houses the city of Pittsburgh, the second largest city in the Commonwealth of Pennsylvania, behind Philadelphia (U.S. Food and Drug Administration, 2021). It is also important to consider when disseminating public resources and funds the potential masking effect that wealthier municipalities, such as Edgeworth, Sewickley Hills, and Pine, are having over poorer municipalities, like Elizabeth Borough and Leetsdale, which are both below the average median household income of the United States and Pennsylvania (Figure 6). There is also a wide gap between wealthiest municipality (Edgeworth) and poorest municipality (Elizabeth Borough), in which Edgeworth's median household income is \$144,267.00, or 370.08%, greater than Elizabeth Borough's median household income, \$38,983.00. This statistic may be a useful component in weighing grant funding and federal, state, and local resource opportunities on a municipality-basis.

Relatedly, rural municipalities in Allegheny County tended to have much lower rates of poverty, at 5.99%, as compared to Allegheny County overall (11.30%), and Pennsylvania Commonwealth (12.00%), which were much closer to the United States overall poverty rate of 12.80% (Figure 7). Notably, Elizabeth Borough and Richland had poverty rates above the national average, and twice the rural municipality average, with 15.20% and 14.80%, respectively. Of note, Richland had the second highest poverty rate, at 14.80%, but the fourth highest median household income, at \$109,091.00, indicating that there are individuals in that community that could benefit

from additional resources that may not be available due to the municipality's income status (Figure 6) (Figure 7).

4.3 Housing Characteristics

The Median property value in rural municipalities in Allegheny County, at \$261,547.06, is nearly \$100,000 more than Allegheny County's overall median property value, \$161,600.00 (Figure 8). It is also greater than Pennsylvania Commonwealth and United States national median property values. In general, rural municipalities' median property values tended to track with rural municipality median income trends (Figure 6). Edgeworth's property value is 174.11% of the national median, at \$629,900, and is the highest median property value of the rural municipalities in this study. Conversely, Elizabeth Borough has the lowest median property value, at \$73,900, which is significantly less than the rural municipality, county, state, and national median values (Figure 8). Regionally, the southwestern, and southeastern municipalities in the Mon Valley, had both lower median household income as well as lower median property values as compared to the communities in the northwest and northeast regions.

Qualitative findings related to housing style, condition, and plot size tended to track overall with median property value trends (Figure 8) (supplemental data set). Notably, some rural municipalities had a marked dichotomy between modest 1950s – 1970s style single-family homes and very large, new builds in more remote areas, a trend that is not accurately captured solely with quantitative median census values – underlying the importance in conducting windshield tours in order to ascertain a more accurate and full representation of community life. Generally, municipalities with lower median property values tended to experience more blight and worse road

conditions. Overall, trends in rural gentrification were evident in many communities, though tightknit post- “mine town” communities and traditional farming areas were still present, as well as burgeoning housing developments.

4.4 Education Characteristics

Rural municipalities in Allegheny County had a higher overall educational attainment rate, at 95.43% of the population earning at least a high school diploma or equivalent, as compared to Allegheny County at 94.90%, Pennsylvania Commonwealth at 91.00%, and the United States overall at 88.50% (Figure 9). Notably, 20.11% of Allegheny County residents who are living in rural municipalities have obtained a graduate or professional degree, which is significantly higher than the county, state, and national averages (Figure 9). Generally, all 17 rural municipalities in this study have a high level of educational attainment, with high school graduation rates above the national average of 88.50% in all municipalities, with the notable exception of McDonald, with 78.60% of the municipality’s residents earning at least a high school diploma or equivalent (Figure 10). Considering the average age of residents in McDonald is 38.70 years old, it may be premature to assume that relatively low educational attainment is due to an aging population that may have historically had a more limited access to education, for geographic, financial, or social reasons. McDonald also had the lowest access to an electronic device with broadband internet access of any of the municipalities in the study, at 77.50% of homes having one or more device with broadband (Figure 14). Access to broadband internet plays a role in overall access to information, but with the growth of tele-medicine options as well as remote working and schooling, lack of

broadband access can have a major impact on residents' livelihood and health in the twenty-first century.

Overall, rural municipalities in Allegheny County have a higher educational attainment than the national and state averages, which is contrary to rural municipalities in general, that tend to face more difficulty traveling to schools, as the distances from home to school can be far, the road conditions may be more hazardous, and public-school bus options may be limited. Many of the rural municipalities in this study also had access to public libraries with an average travel time from rural municipal building to public library of 3.46 miles, which is a community strength that both bolsters education and sense of community (Figure 11).

4.5 Social Determinants of Health Characteristics

Overall, there is a high degree in variability in availability of vital resources like grocery stores, pharmacies, ambulance service, and hospital access within each rural municipality. Notably, Sewickley has the easiest access to all studied resources, while residents in areas like Findlay must travel 13.8 miles from its municipal building to reach the nearest hospital (Figure 13). Likewise, the closest ambulance dispatch service is 11.3 miles from Fawn's municipal building (Figure 13). However, it is important to consider other social components of community life in assessing needs based on these figures, as some communities have better access to transportation, both public and private, road conditions, broadband internet, and financial resources, all of which can lessen or exacerbate potential issues related to vital resource accessibility.

As mentioned previously, residential broadband internet access plays a vital role in access to many goods and services, from tele-health medical care to employment opportunities, grocery delivery services, and education. Though most of the rural communities in this study had at least the national average percent of households with broadband internet (85.20%), one-third of the municipalities in this study were estimated to not have at least 85.20% of its residents with broadband in their household (Figure 14). It should be noted that these estimates were drawn from the 2010 U.S. Census estimates and may have changed since then (United States Census Bureau, n.d.). The global COVID-19 pandemic in 2020 also highlighted the role that broadband internet plays in many aspects of peoples' lives, but not before the condition of the pandemic brought to light some of the drastic inequities in broadband access in the United States, especially in rural communities. New federal legislation, for the first time in U.S. history, guaranteed broadband access to those affected by the COVID-19 pandemic. While this marks a new precedent in ensuring widespread broadband access, it is expected that rural communities will likely be among the last to reach 100% residential broadband access due to both logistical and cultural considerations inherent in rural communities.

The U.S. Center for Disease Control's (CDC) Social Vulnerability Index (SVI) is a tool for public health and emergency medical planners to help identify communities that will most likely need support before, during and after a hazardous event, where a score of 0 indicates lowest vulnerability and 1 indicates highest vulnerability (Center for Disease Control, 2022). Rural municipalities in Allegheny County had an average SVI score that was less than Allegheny County as a whole (0.2506) and Pennsylvania Commonwealth average estimates (0.373), at 0.2125. McDonald had the highest SVI score at 0.6245, whereas Edgeworth and Belle Acres had the lowest

SVI scores with 0.0072 and 0.0071, respectively. These trends are on-par with other financial and resource trends discussed previously.

Another means of assessing community health is measuring residents' ease in ability to walk around their municipality. Communities are given Walkability Scores, which are scored on a scale from 0 to 100, 0 being highest rate of car dependency, 100 being lowest rate of car dependency / easiest walkability to essentials (Walk Score, 2022). Rural municipalities in Allegheny County had a lower average walkability score than Allegheny County as a whole, at 25.53 compared to 42.33 (Figure 16). Sewickley had the highest walkability score by a large margin, at 97.00, whereas Fawn had the lowest walkability, at 0.00 (Figure 16). Of the 17 rural municipalities, only 4 of them (McDonald at 63.00, Findlay at 51.00, Elizabeth Borough at 51.00, and Sewickley at 97.00) had walkability scores that are higher than the Allegheny County average score, which is unsurprising considering the nature and definition of rural living (Figure 16). It is important to consider Walkability Score and other community characteristics like distance to critical resources, like those presented in Figure 13, as many rural municipalities face both decreased walkability due to lack of sidewalks and roads amenable to traveling by foot, as well as lengthy distances to get to essentials such as grocery stores. These characteristics may play a role in overall community cohesiveness and should be further assessed in order to help drive public health initiatives within these municipalities.

This study also assessed the number of different denominations of worship within each rural municipality in Allegheny County, as places of worship tend to be not only communal environments for residents to gather but can also house public good and service initiatives within their communities. Overall, rural municipalities in the U.S. tend to be more conservative and religious, though there was a range in number of religious denominations present in the rural

municipalities in this study (U.S. Food and Drug Administration, 2021). Leet Township did not contain any houses of worship, while Sewickley has 7 different denominations of worship present within the municipality. The average number of denominations of worship in rural municipalities in Allegheny County was 3.29 different denominations (Figure 17). These data may prove to be useful in determining future partnerships when designing community initiatives.

4.6 Transportation Characteristics

Transportation access was a primary consideration when conducting windshield tours of the rural municipalities in this study, as transportation access, or lack thereof, affects many aspects of residents' lives and livelihoods. Like other components addressed in this discussion, qualitative assessments of the overall conditions of the municipality are an important facet in determining needs and strengths of the community, especially when it comes to transportation barriers. While rural populations by definition live in more remote areas of the county, lack of public transportation will affect residents differently based on many of the factors discussed in this study, such as median household income, disability status, poverty status, proximity to critical resources, and community walkability (Figure 6) (Figure 7) (Figure 13) (Figure 16). Further, barriers in transportation due to any of these varying components play a role in the overall health of community members, including education and income attainment and access to quality healthcare, to name a few. An analysis of access to Allegheny County Pittsburgh Regional Transit Services in the rural municipalities in this study concluded that only 41% of the municipalities had at least one bus route within the municipality (Figure 18). Importantly, most rural municipalities, if they did have public transportation access, only had one route available, leaving many residents without a

practical commute to public transportation access. Further, this analysis highlighted that Pittsburgh Regional Transit services are being unevenly distributed between the rural municipalities within the county. A majority of the six communities with Pittsburgh Regional Transit services present also ranked highest in terms of other socioeconomic and social determinants of health factors (Table 1).

5.0 Conclusion

Based on the data presented in this study, it is clear that while these communities each have their own strengths, there are specific challenges that residents face that are inherent to living rurally in Allegheny County, as well as unique challenges that are specific to each municipality. This study underlines the key point that each community is unique in its culture, demographics, and topography, each of which facing unique benefits and obstacles inherent to that municipality. That said, a blanket solution to “rural” health barriers is not a suitable solution to nuanced community needs. This study aimed to lay the groundwork for recognizing relative barriers between rural municipalities in the county in order to pave the way for communities to devise solutions to these barriers.

The CDC’s Social Determinants of Health framework is a tool that can be used to help assess a community’s well-being as it relates to key components that affect an individuals’ life, such as where they live, play, work, and learn (Centers for Disease Control and Prevention, 2021). Understanding the inner workings of these facets and how they affect individuals, and a community are key in creating meaningful interventions to barriers community members face. The five main components of the CDC’s Social Determinants of Health framework are addressed as they pertain to potential avenues for improving rural health in Allegheny County.

5.1 Recommendations for Health Access

Rural communities have historically been underserved in terms of access to and quality of healthcare due to their remoteness, and that, generally speaking, is no different for the communities assessed in this study. As mentioned, it is important to consider multiple factors when determining a community's overall health access needs, such as access to facilities and transportation, but also social factors such as income, poverty, age, and disability rates. These and other factors contribute to a community's overall access to healthcare.

Based on analyses of both the qualitative and quantitative data for these municipalities, increasing mobile services to all communities could prove to be beneficial for rural residents. Access to vital healthcare resources such as primary care, pediatric care, dentistry, OBGYN services, and geriatric-specific care are all becoming more widely available due to increased mobile clinic services, with multiple medical facilities offering these services within Allegheny County. Increasing the spread of mobile clinics in the rural municipalities in the county is an equitable way to ensure rural residents are maintaining a healthy lifestyle by both addressing some of the barriers to health access such as transportation barriers, while respecting rural lifestyles.

Considering most rural communities in Allegheny County have access to broadband internet services, increasing access to telehealth appointment availability to rural communities would decrease the rural-urban disparity in specialized health resources such as genetic testing and counseling services, cancer care, and mental health services. Specialized services such as genetics and cancer care tend to be located within large, urban-based hospital settings, making these resources out of reach for many rural residents (Rhoads & Rakes, 2020). Increasing telehealth options for rural communities would drastically improve access to care as well as increase health

literacy, and could mitigate the access barriers fueling chronic disease burden in rural communities (Benda, Veinot, Sieck, & Ancker, 2020).

5.2 Recommendations for Neighborhood and Built Environment

Rural communities in Allegheny County tend to benefit from increased levels of greenery and open space as compared to urbanized municipalities but improving designated parks and public spaces such as gardens available to rural residents may help to increase leisure exercise as well as build a tighter sense of community, especially for particularly sparse and remote municipalities. Incorporating smoke-free areas in areas of congregation would benefit the entire community but would also improve conditions for vulnerable community members such as (Varine, 2022) children, elderly, and those with health conditions that are exacerbated by smoke. Similarly, improving sidewalks and walking path conditions not only helps to ease the barrier in transportation many of these residents face, but also creates a safer environment for exercise as well as improved, safe access to otherwise walkable amenities. This too could improve community involvement and cohesiveness, and is particularly vital for disabled and elderly individuals living in these rural municipalities to ensure equitable community commuting and walkability.

Most municipalities in this study could greatly benefit from increased public transportation options, including extended bus lines to help alleviate distance from one's home to the nearest public transit stop. These improvements to public transportation would help mitigate some of the barriers to critical resources such as healthcare and healthy groceries that some rural residents face.

5.3 Recommendations for Social and Community Context

Although it was evident that many of the municipalities visited in this study were very tightknit communities, the Allegheny County Health Department (ACHD) may be a useful resource in helping connect these municipalities to grants to address some of the specific barriers to health and wellness they may be facing. ACHD is skilled at creating linkages between itself and municipalities, as well as helping to connect these municipalities with third parties such as non-governmental organizations (NGOs), non-profit organizations, faith-based organizations, and for-profit organizations that may offer support in addressing specific needs the community may be facing. ACHD has shifted its focus in recent years to better incorporate rural municipalities in its outreach and support, but continued effort to build meaningful relationships with residents and municipality officials may prove to bolster the success of rural community-based initiatives.

5.4 Recommendations for Education Access

The remote nature of rural living and distance from public schools tends to play a role in rural residents' access to education. ACHD's network of education-focused community partners may be a vital resource in improving access to and quality of education and services for rural community members. Equitable access to education is paramount to the health of a community, especially for residents of racial ethnic minorities and of other diverse groups. Community partners that focus on addressing the needs of non-English speakers in rural areas, such as providing mobile immunization clinics with translation capabilities to school-aged children could help improve equitable access to both essential healthcare as well as remove barriers to education access.

Another service that has proven to be popular in some communities is implementing mobile libraries to distribute books to rural residents. This service may be particularly meaningful in rural municipalities where there may be a barrier in access to both broadband internet and public libraries.

5.5 Recommendations for Economic Stability

While there is a wide range of economic conditions between the rural municipalities in this study, the data collected in this study may prove to be useful in pinpointing communities that could benefit from community-based programs that generate income from within the community through the utilization of existing community strengths and resources. Similar community-based income generating activities have been incredibly successful elsewhere within Allegheny County, such as the initiatives in Braddock that are using Japanese knotweed, a plant that is growing invasively in that community, to make paper to be sold for a profit (Varine, 2022). Rural municipalities in the county benefit from an abundance of space and natural resources, as well as talented and resourceful individuals, so they are poised to implement a similar framework as Braddock to help bolster economic stability in the community.

Rural communities in general tend to have higher rates of uninsured individuals (U.S. Food and Drug Administration, 2021). Initiatives to help rural residents understand and enroll in programs such as Medicaid, Medicare, Supplemental Nutrition Assistance Program (SNAP), and Youth Health Empowerment Projects (Y-HEP) may help to bridge the gap in equitable healthcare access for rural individuals, especially for rural municipalities with high poverty and disability rates.

5.6 Summary and Limitations

Allegheny County, PA is comprised of a myriad of communities, all with varying physical landscapes, histories, beliefs, and cultures. This study aims to lay the groundwork for further understanding of the unique attributes that constitute Allegheny County's rural municipalities, in hopes to help create more targeted and successful community-based initiatives to address barriers to equitable health in rural communities. Each rural community in this study proved to have unique strengths, but also faces specific challenges to community health and well-being that are characteristic of rural living. In developing strategies and allocating funding to address challenges each municipality faces, it is imperative to consider each community independently, as needs in each community are wide and variable. Additionally, community initiatives must start with the consent and enthusiasm from the community members and representatives in which the initiative is meant to serve, and an understanding of the community context in which these residents live, otherwise it is likely to have a negligible or potentially negative impact on the community, despite good intentions. Further, the findings in this study, while specific to rural communities in Allegheny County, PA, can aid other local health departments in designing and implementing their own strength and risk assessment studies of rural communities within their jurisdiction. However, this study proves that generalizing results from one rural community or rural municipalities within a county as a whole diminishes the understanding of specific community needs.

Appendix A University of Pittsburgh Institutional Review Board Memorandum



University of Pittsburgh *Institutional Review Board*

Human Research Protection
Office of Research Protections

Hieber Building, Suite 401
3500 Fifth Avenue
Pittsburgh, PA 15213
412-383-1480
www.hrpo.pitt.edu

MEMORANDUM

TO: Rhianna Ericson

FROM: Human Research Protection (HRP)

DATE: September 1, 2022

SUBJECT: IRB# 2209001: Assessing Community Strengths and Needs within Rural Municipalities in Allegheny County, PA

The above-referenced research study has been reviewed by the University of Pittsburgh Institutional Review Board. Based on the information provided to the IRB, this project includes no involvement of human subjects, according to the federal regulations [45 CFR 46.102(e)]. That is, the investigator conducting research will not obtain data through intervention or interaction with the individual, or will not obtain identifiable private information. Should that situation change, the investigator must notify the IRB immediately.

Figure 19 University of Pittsburgh Institutional Review Board Memorandum

This document indicates that this research study does not constitute human subjects research, and is therefore exempt from direct IRB oversight.

Appendix B Map of Allegheny County, PA

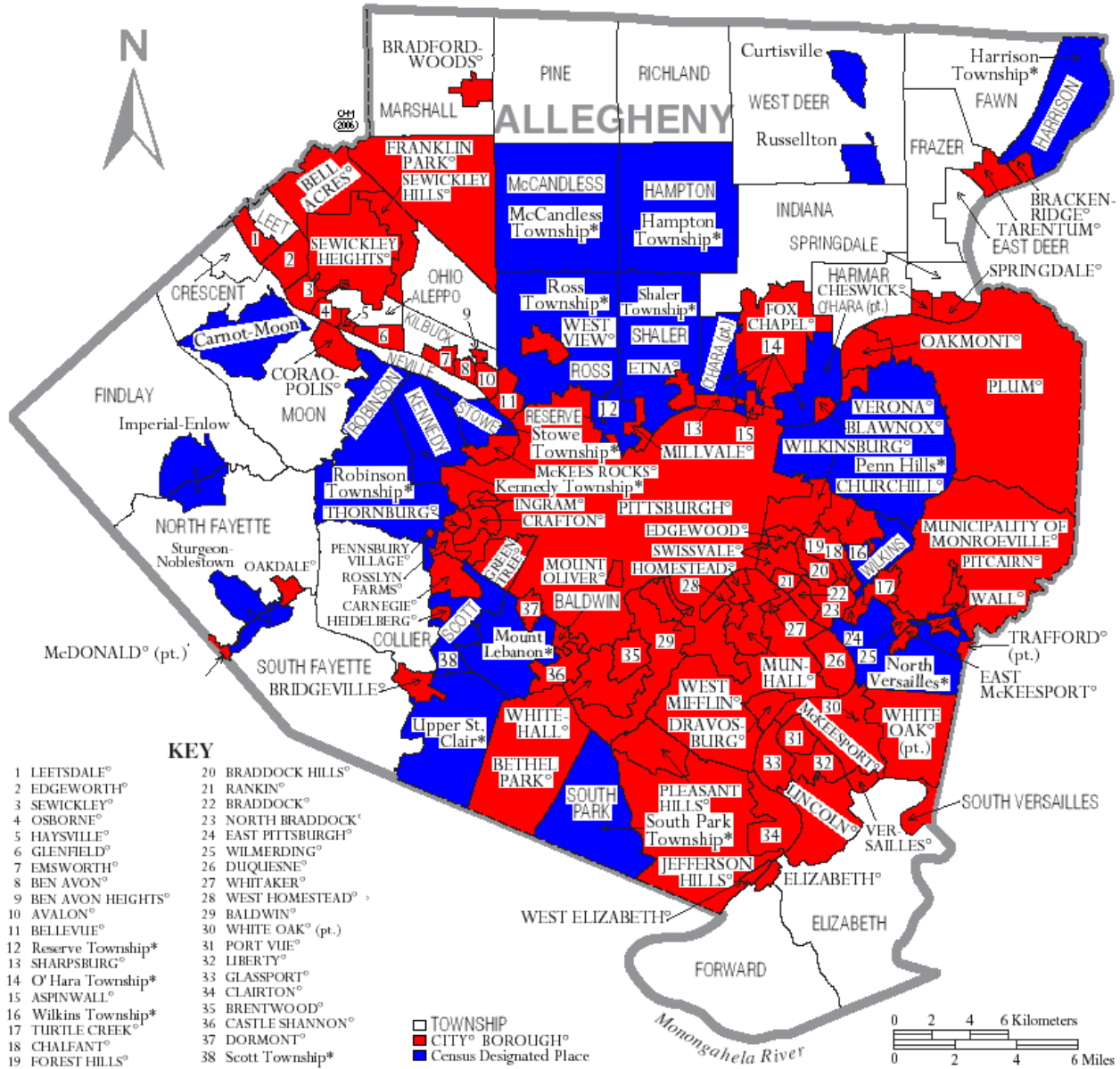


Figure 20 Map of Allegheny County, Pennsylvania, United States with Township and Municipal Boundaries

(US Census Bureau, 2006)

Appendix C Allegheny County Health Department Map of Allegheny County, PA

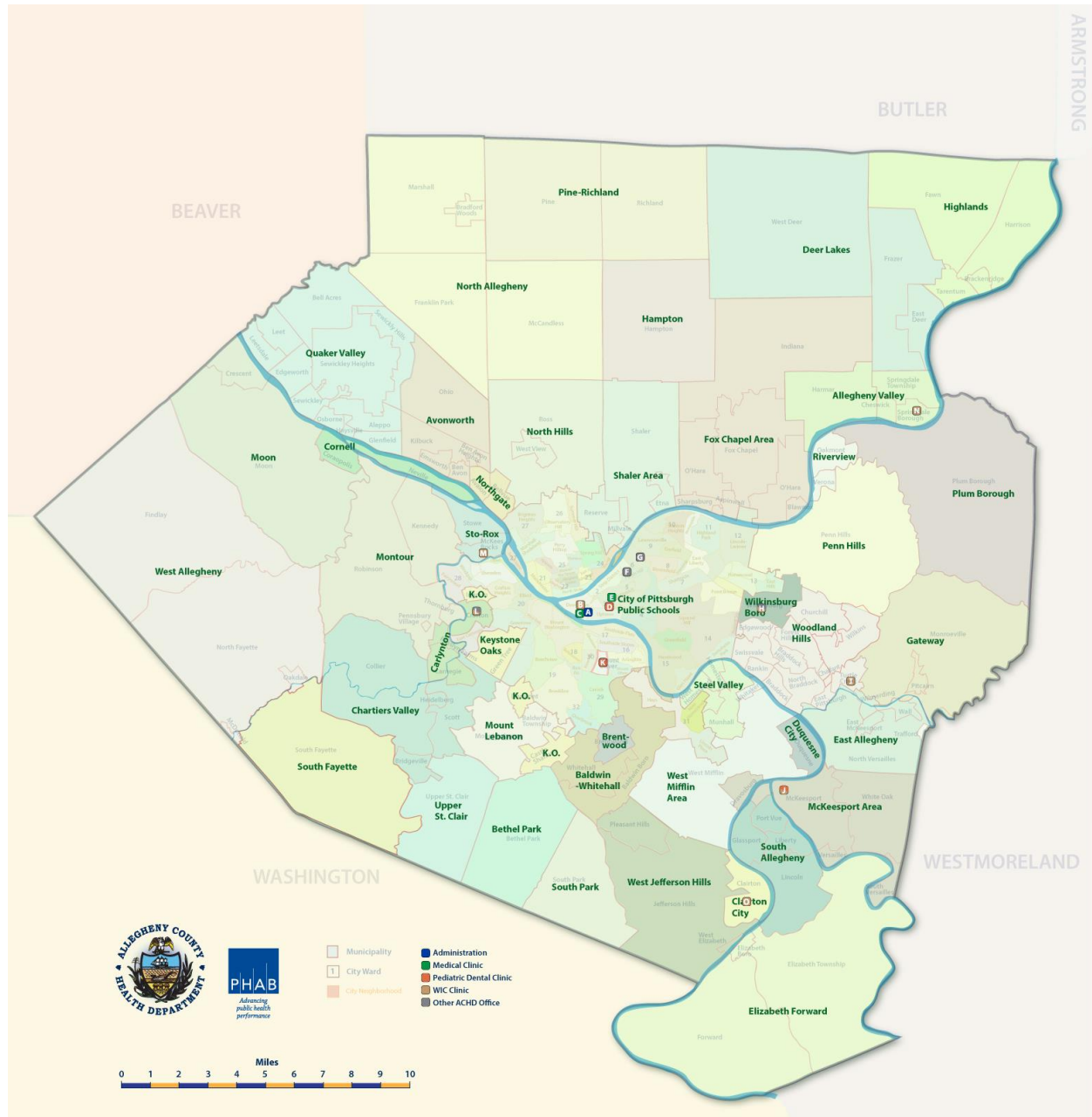


Figure 21 Map of Allegheny County, Pennsylvania, United States with Township, Municipal Boundaries, and Allegheny County Health Department Service Centers (Letzelter)

Appendix D List of Rural Municipalities in Allegheny County, PA

Complete list of the 39 USDA-classified rural municipalities in Allegheny County, with an “X” indicating the representative sample of 17 rural municipalities where qualitative data was collected and used for the purposes of this study (United States Census Bureau, n.d.) (Pennsylvania USDA Mortgage, 2019). Note that some rural municipalities have their census-driven area listed for data-collection purposes, as they did not have municipality-specific U.S. census data.

Table 2 List of Rural Municipalities in Allegheny County, PA

	Allegheny County Rural Municipality	Windshield Tour Conducted
Allegheny - Western area (west and just south of the Airport)		
1	Beechcliff	
2	Enlow	
3	Oakdale	
4	Noblestown	
5	McDonald	X
6	Morgan	
7	North Fayette Township	X
8	Clinton (Within Findlay Township)	X
Areas in the Southeast just south of Route 51 past Elizabeth		
9	Boston	
10	Bunola	
11	Douglass	
12	Elkhorn	
13	Forward Township	X
14	Greenock	
15	Hilldale	
16	Lincoln	
17	Elizabeth Borough	X
18	Mustard (Within Elizabeth Township)	X

19	Smithdale (Within Elizabeth Township)	
20	Vista (Within Elizabeth Township)	
Areas just North of Route 65 and the Ohio River and West of I-79		
21	Bell Acres	X
22	Duff City	
23	Edgeworth	X
24	Marshall Township	
25	Pinehurst	
26	Sewickley	X
27	Sewickley Hills	X
28	Leetsdale	X
29	Leets Township	X
Other areas North including areas North of the PA turnpike and West of Route 28		
30	Allegheny Acres	X
31	Bairdford	
32	Bakerstown (within Richland Township)	X
33	Curtisville	
34	Fawn Township	X
35	Frazer Township	
36	Harmar Heights	
37	Pine Township	X
38	Russelton	
39	Rural Ridge (Within Indiana Township)	X

Appendix E Summary Table of Data Collection Fields and Sources

Qualitative and quantitative data was collected pertaining to each question field in the table for the representative sample of 17 rural municipalities in Allegheny County (Table 2). Data sources are listed next to the question field. Qualitative data was captured in the form of windshield tours, and later coded in a separate Microsoft Excel Spreadsheet as binary responses or categorically based on common response themes. All other fields were open-source databases used for quantitative data gathering. Full data set is available from authors upon request.

Table 3 Summary Table of Data Collection Fields and Sources

	Question Field	Data Source
Demographics	Population	
	Total	United States Census database
	Median Age (years)	United States Census database
	Veterans Rate % (US Avg - 7.7%)	United States Census database
	Disability Rate % (US Avg - 12.6%)	United States Census database
	Gender Identified As	
	Male	United States Census database
	Female	United States Census database
	Race	
	White	United States Census database
	Black/African American	United States Census database
	Hispanic or Latino	United States Census database
	Asian	United States Census database

	American Indian/Alaska Native	United States Census database
	Native Hawaiian and other Pacific Islander	United States Census database
	Some Other Race	United States Census database
	Two or More Races	United States Census database
Financial	Employment Rate	
	Overall	United States Census database
	Median Income (\$2001)	
	Household	United States Census database
	Individual	United States Census database
	Males	United States Census database
	Females	United States Census database
	Difference in median income by sex (male -female)	United States Census database
	Poverty Rate	
	Overall	United States Census database
Housing	Median Property Value	
	Overall	United States Census database
	Total # of Households	
	Overall	United States Census database
	Total # of Housing Units	
	Overall	United States Census database
Education	Educational Attainment	
	Overall	United States Census database
	High School or equivalent	United States Census database
	Some College	United States Census database
	Associates Degree	United States Census database

	Bachelor's Degree	United States Census database
	Graduate or Professional Degree	United States Census database
Social Determinants	Computers and Internet Access (S2801)	
	Total Households	United States Census database
	with a computer %	United States Census database
	with a broadband internet subscription %	United States Census database
	<u>CDC Social Vulnerability Index (SVI)</u>	
	The SVI is a tool for PH and EMS planners to help identify communities that will most likely need support before, during and after a hazardous event. 2018 scores. 0= lowest vulnerability up to 1=highest vulnerability	The Center for Disease Control (CDC) website
	<u>Walkability Score</u>	
	Walkability Score (Walk Score) - Score from 0 - 100 (Lower scores demonstrate higher rate of car dependency)	Western Pennsylvania Regional Data Center website
Windshield Tour	Housing and Zoning	
	What is the general age of the houses?	Windshield Tour
	Are all neighborhood houses similar in age and architecture? If not, how would you characterize their differences?	Windshield Tour
	What is the general condition of the housing	Windshield Tour
	Open Spaces	
	How much open space is there?	Windshield Tour
	What is the quality of the open space--green parks or rubble-filled lots?	Windshield Tour
	What is the lot size of the houses?	Windshield Tour
	Boundaries	
	What signs are there to indicate where this neighborhood begins and ends?	Windshield Tour
	Are there industrial or commercial zones along with residential ones?	Windshield Tour / Google Maps

	Does the community have a clear name that is visually identifies? If so, where?	Windshield Tour
	Is there a neighborhood "hangout"? If so, where is it?	Windshield Tour
	Transportation	
	Pittsburgh Regional Transit - access and bus route #s	Google Maps
	<u>ACCESS Transportation</u>	ACCESS Transportation Website
	<u>Heritage</u>	Heritage Website
	Uber and Lyft services	Uber / Lyft mobile App
	How do people get into and out of the community?	Google Maps
	Are the streets and roads conducive to good transportation? To community life?	Windshield Tour
	Are there one or more major highways near the community? If so, please identify it or them.	Google Maps
	Service Centers / Schools	
	Describe the retail services that are available to residents, e.g., grocery stores, beer/liquor stores, clothing shops, bookstores, gas stations, repair shops, laundromats, and restaurants.	Windshield Tour / Google Maps
	How far must residents travel to get to the nearest major shopping district (e.g., mall or major downtown shopping area)?	Google Maps
	Are social agencies located within the community? If so, identify the agencies.	Google Maps
	Are there recreation/community centers? If so, where?	Windshield Tour / Google Maps
	Is there a community library? If not, how far away is the nearest library?	Google Maps
	How accessible are the schools to the residents? For instance, is this a walk-to-school community or must students and their families rely on school buses, public transportation, or their own cars?	Windshield Tour / Google Maps
	Are the schools in good repair?	Windshield Tour
	Are there signs of activity at the schools, both during and after school hours?	Windshield Tour
	People on the Street	

	Describe whom do you see on the street?	Windshield Tour
	How are the people dressed?	Windshield Tour
	Do you see pets, stray animals, or watchdogs? If so, please describe.	Windshield Tour
	Signs of decay or life	
	Is this community on the way up or down? Describe how "alive" it is and how can you tell.	Windshield Tour
	Are there abandoned houses or businesses? If so, please describe.	Windshield Tour
	Is there mixed zoning, e.g., residential and industrial? If so, please describe.	Windshield Tour / Google Maps
	Describe the community's public displays, such as billboard advertisements, political signs, community bulletin boards, fliers tacked onto telephone poles, etc.	Windshield Tour
	Race, Ethnicity, and Religion	
	Are signs in stores or announcements in the community posted in two or more languages? If so, what languages?	Windshield Tour
	Are there indices of ethnicity evident in food stores, churches, and private schools?	Windshield Tour
	What denominations inhabit the places of worship?	Windshield Tour / Google Maps
	Health and Morbidity	
	What health care services are available in this community?	Windshield Tour / Google Maps
	Are pharmacies easily accessible to residents? Please elaborate.	Windshield Tour / Google Maps
	Describe the availability of ambulance services	Windshield Tour / Google Maps
	How far is it to the nearest hospital?	Google Maps
	Politics	
	Do you notice evidence of a predominant political party affiliation?	Windshield Tour
	Media	
	Is there a local newspaper? If so, please identify it.	Google Maps

	Do you have reason to believe that most, if not all, residents of this community have access to TV and radio?	Windshield Tour / United States Census database
	General Safety Issues	
	Are there obvious safety hazards such as, dilapidated playgrounds, abandoned industrial sites, or empty lots and storefronts? If so, please describe.	Windshield Tour
	Is there evidence of police and fire protection in the area/	Windshield Tour
	Date Windshield Tour Performed	Windshield Tour

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