Anderson Campus
Community Health Needs Assessment

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Introduction

Background

As part of the Patient Protection and Affordable Care Act, all nonprofit hospitals are required to conduct a Community Health Needs Assessment (CHNA) every three years to remain a tax-exempt organization under section 501(c)(3) of the Internal Revenue Code. The goal of the assessment is to identify critical health disparities faced by residents within St. Luke's University Health Network (SLUHN) service areas. It is required to state every health priority addressed by community stakeholders, hospital professionals or public health experts. Additionally, regional implementation plans will be crafted to build collaborative partnerships to determine the allocation of resources to address the specified health needs. To view our previous CHNA reports, please refer to the following link:
http://www.slhn.org/Conditions-Services/Community-Health/Community-Health-Needs-Assessment/

If you have any questions regarding any of these reports, please contact the Department of Community Health & Preventive Medicine at (484) 526-2100.

Methodology

This CHNA is comprised of both primary and secondary data. The primary data were collected through three methods. First, key informant interviews were with stakeholders were conducted within each campus community. A list of interview questions can be found in Appendix A. Second, SLUHN convened community forums at each campus community. Dr. Christopher Borick of the Muhlenberg College Institute of Public Opinion moderated all the sessions. A list of organizations represented at each campus forum can be viewed in Appendix B. Third, approximately 10,234 voluntary community health surveys were administered in our eleven campus geographic regions, where the main priority health needs were identified for each entity. We used snowball sampling to reach respondents, especially those represented in our vulnerable populations. Surveys were completed in either paper or digital format. The survey data document, also posted online, lists questions and responses recorded from CHNA surveys conducted in 2012, 2016 and 2019. Secondary data included the use of hospital network data, as well as county, state and national level data obtained via the U.S. Census, the Robert Wood Johnson Foundation, Vital Statistics, Community Commons, the American Community Survey (ACS), U.S. Department of Labor, the Behavioral Risk Factor Surveillance System as well as other data sources, which can be found in Appendix C. The needs identified in the interviews and community forums were supplemented by the survey data and secondary data to provide a more comprehensive picture of the needs in the community and the factors impacting those needs.

The Anderson Campus Community

Community Profile

Opening its doors to the public in the fall of 2011, St. Luke's Anderson Campus is the second newest building in the SLUHN network. Located directly off Route 33, this 250,000-square foot hospital hosts 108 beds in its main hospital building and provides services out of its medical office building and cancer center. In 2013, the campus expanded its emergency department by

doubling its treatment rooms, tripling its staff, and incorporating a new CT scanner and diagnostic X-ray. Beyond its commitment to state-of-the-art cancer treatment, a bone and joint institute, heart and vascular services, women's healthcare, and primary care medicine, Anderson is dedicated to improving the health of its surrounding community. Its Community Gardens, located on a 20,000-square foot field behind the hospital, allows a platform for education on the importance of healthy eating. In tandem with this garden is the St. Luke's Rodale Institute Organic Farm, which provides locally-grown organic produce to the entire network. Key informants described the Anderson community as "cohesive, hardworking and proud." Its community members are "motivated to see positive changes for its residential living and business districts and is actively enthusiastic about arts and culture." Respondents viewed the community as a mostly positive atmosphere. "We have caring agencies that support a variety of our community's needs." The City of Easton and its department heads, as well as its police force, are committed to community engagement.

Population

For the purposes of the CHNA, we defined the top zip codes as those which make up at least 80% of the population served by St. Luke's Anderson (Figure 1). In discussing the health needs of the St. Luke's Anderson community, the term "service area" will be used to refer to patients in the top 80% of zip codes served.

FY17 SLRA - Zip Codes Comprising Top 80% of Facility Encounters

Zip Code	Zip Encounter Count	% SLRA Total (n = 216,289)	% Network Total
18045	21,299	10%	1.9%
18042	21,053	10%	1.8%
18064	17,003	8%	1.5%
18020	14,643	7%	1.3%
18360	12,991	6%	1.1%
18013	11,562	5%	1.0%
18017	11,347	5%	1.0%
18301	9,965	5%	0.9%
18040	8,777	4%	0.8%
18091	8,289	4%	0.7%
18353	8,229	4%	0.7%
18072	6,867	3%	0.6%
18302	5,117	2%	0.4%
18014	4,159	2%	0.4%
18018	3,798	2%	0.3%
18015	3,379	2%	0.3%
18055	3,103	1%	0.3%
18330	2,995	1%	0.3%
Total	**174,576**	**81%**	**15.3%**

Figure 1

A total of 382,008 people live in the 541.12 square mile report area defined for this assessment as per five-year estimates from the U.S. Census Bureau's American Community Survey[1]. The population density for this area, estimated at 705.96 persons per square mile, falls between the

[1] https://factfinder.census.gov

state population density of 285.62 persons and national population density of 89.61 persons per square mile (Figure 2).

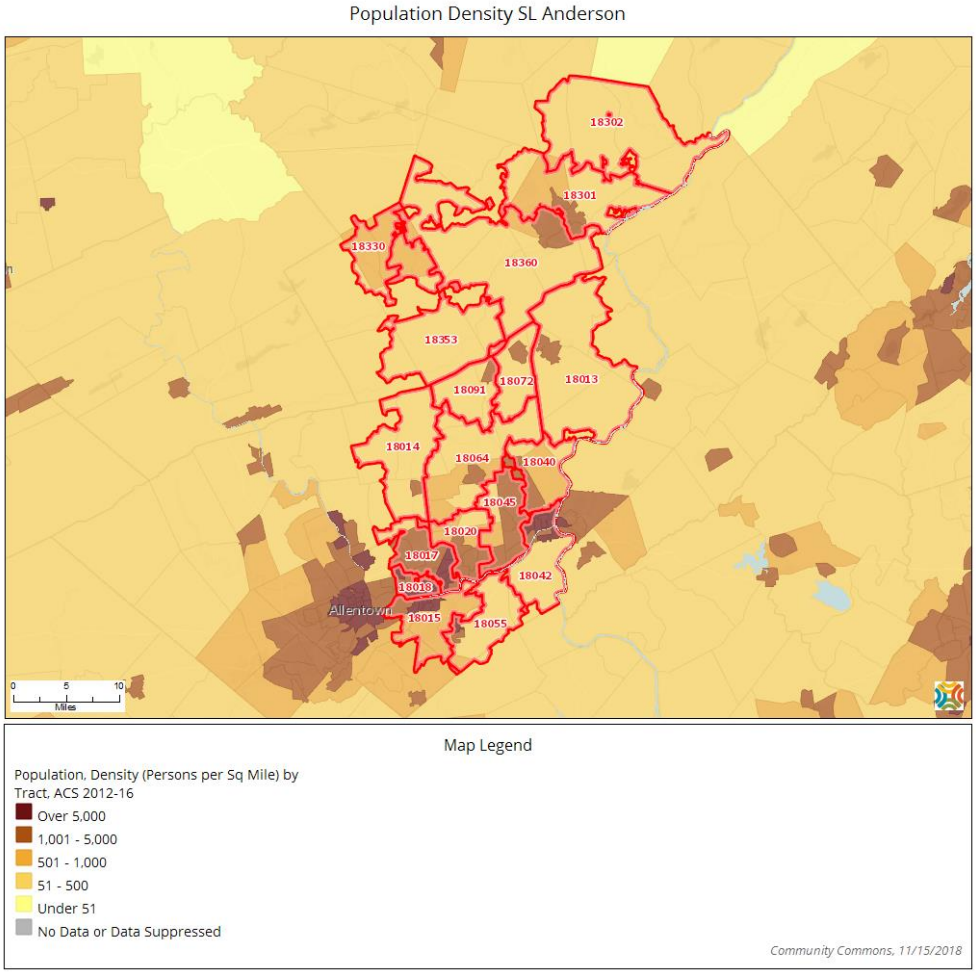


Figure 2

Analyzing the environment of the service area can indicate livability. The urban/rural population indicator reports the percentage of population living in urban and rural areas. According to the U.S. Census Bureau Decennial Census, 84.79% of the St. Luke's Anderson service area patients reside in urban areas, and the remaining 15.21% in rural locations (2010). These percentages are slightly more polarized than what is seen in the state and the country. The United States is 19.11% rural and 80.89% urban, and the state is 21.34% rural and 78.66% urban[2].

Demographics

The following sections give a brief overview of the populations which St. Luke's Anderson serves. Understanding the demographics of the service area is essential to address and improve upon the region's health needs.

[2] https://factfinder.census.gov

Age:

The ACS reports 20.4% of the service area's population falls under the age of 18, and 16.64% are 65 or older (Figure 3). This leaves 62.96% between the ages of 18 and 64[3]. When comparing these data to survey data, 62.6% of Anderson respondents were between the ages of 18 and 64 and 37.4% over the age of 65 (Figure 4).

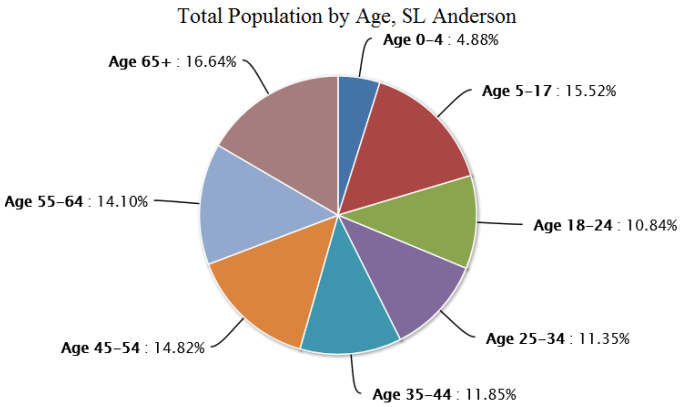


Figure 3

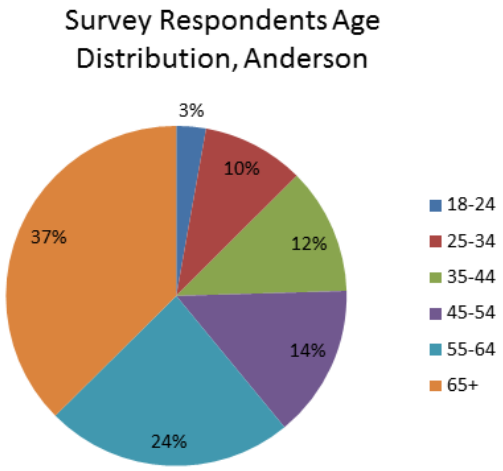


Figure 4

Sex:

According to the five-year estimates by the ACS, the percentage of females in the St. Luke's Anderson service area is roughly 50.89%, and 49.11% are male (Figure 5). This is very close to national trends, where 49.2% of the population is male, and 50.8% is female[4]. The majority of respondents to our 2019 community health survey were female. In the St. Luke's Anderson service area for the year 2017, 60.4% of respondents were female, and 39.6% were male Figure 6.

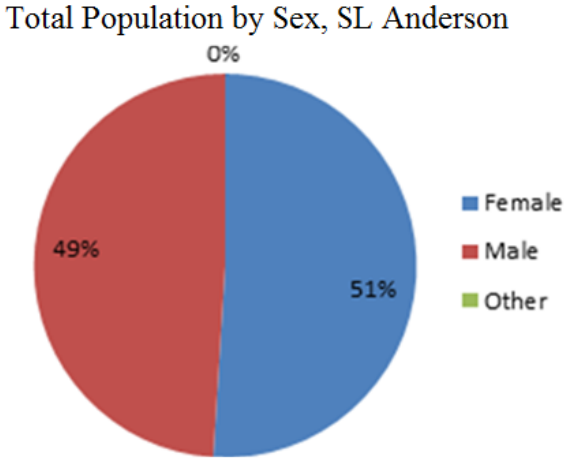


Figure 5

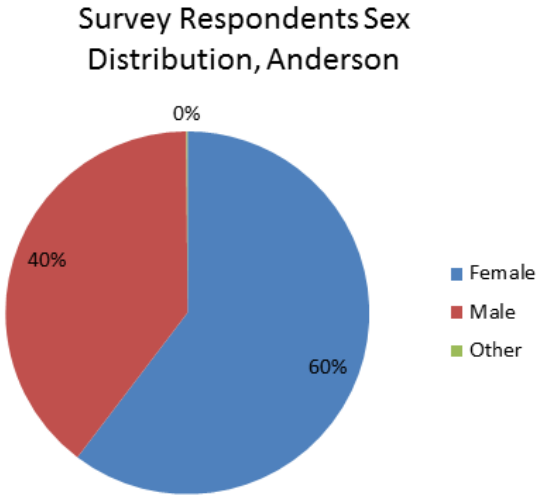


Figure 6

[3] https://factfinder.census.gov
[4] https://factfinder.census.gov

Race:

In breaking down the St. Luke's Anderson service area by race, we can see that most individuals identify as White, constituting 83.85% of the service area (Figure 7). The second largest population identify as Black, representing 6.91% of the population. About 22.73% identify as Asian, 0.35% as Native American or Alaskan Native, 0.03% as Native Hawaiian or Pacific Islander, 2.69% as some other race, and 3.44% as multiple races[5]. Our 2019 community health survey found a slightly different pattern in its respondents when broken down by race. As seen in Figure 8, 93.3% of respondents identified as White and 4.6% identified as Black. According to the same figure, 2.0% of respondents identified their race as Other.

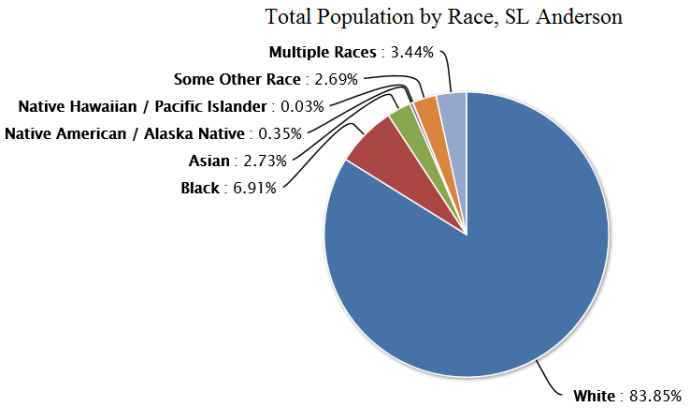


Figure 7

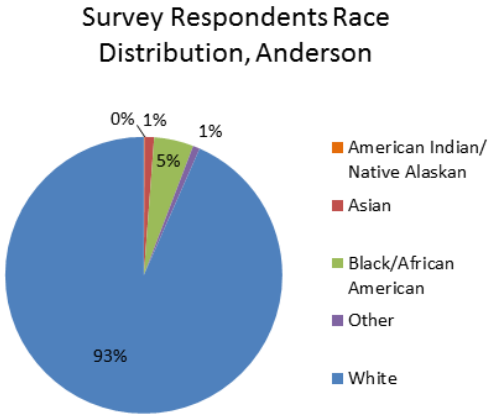


Figure 8

Ethnicity:

Recent data indicate 86.37% of the St. Luke's Anderson service area identifies their ethnicity as non-Hispanic, with the remaining 13.63% identifying as Hispanic/Latino (Figure 9). This breakdown falls between the 17.13% of individuals in the nation and 6.38% of the state identifying as Hispanic/Latino[6]. As it has in years prior, our survey data illustrated in Figure 10 captures this population in our data. There was a smaller proportion of Hispanic/Latino respondents – 10.0% – compared to the region.

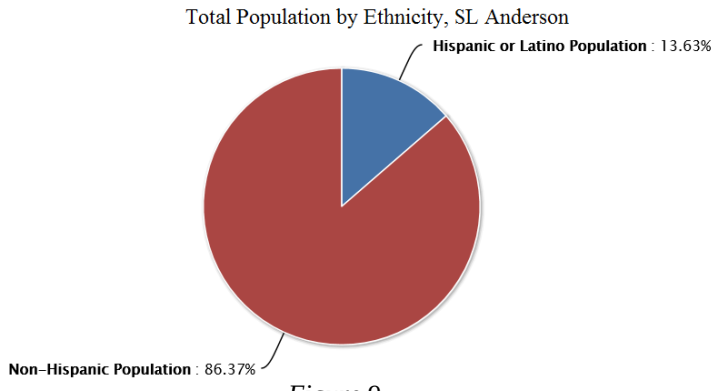


Figure 9

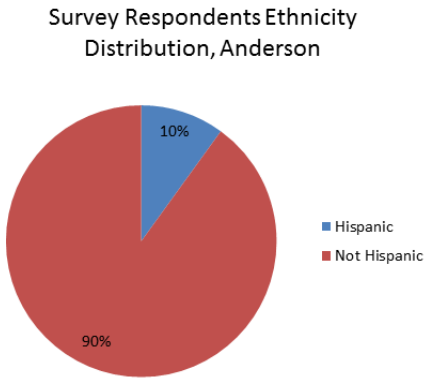


Figure 10

[5] https://factfinder.census.gov
[6] https://factfinder.census.gov

Vulnerable Populations

In addition to the aforementioned populations, there are groups within our service area with specific needs that must be considered.

Marmot's longitudinal Whitehall Study identified a relationship between income and health outcomes, where higher income is linked with better health outcomes. Similarly, 2019 CHNA survey response data indicate that there is a clear relationship between income and insurance status, where 42.4% of respondents in the $14,999 or less annual income category reported that their primary insurance was Medicaid, or that they were uninsured, compared to 0.7% of respondents in the $60,000 or above income category (Figure 11).

One population facing many disparities in our community is our Hispanic population, with high levels of inequity in access to social determinants of health (i.e.: income, insurance, employment, education, housing). This population is frequently identified as a disparate population in the community. Similarly, survey data showed a clear relationship between ethnicity and insurance status, where 31.8% of Hispanic respondents reported that their primary insurance was Medicaid, or were uninsured, compared to 6.1% of non-Hispanic respondents (Figure 12).

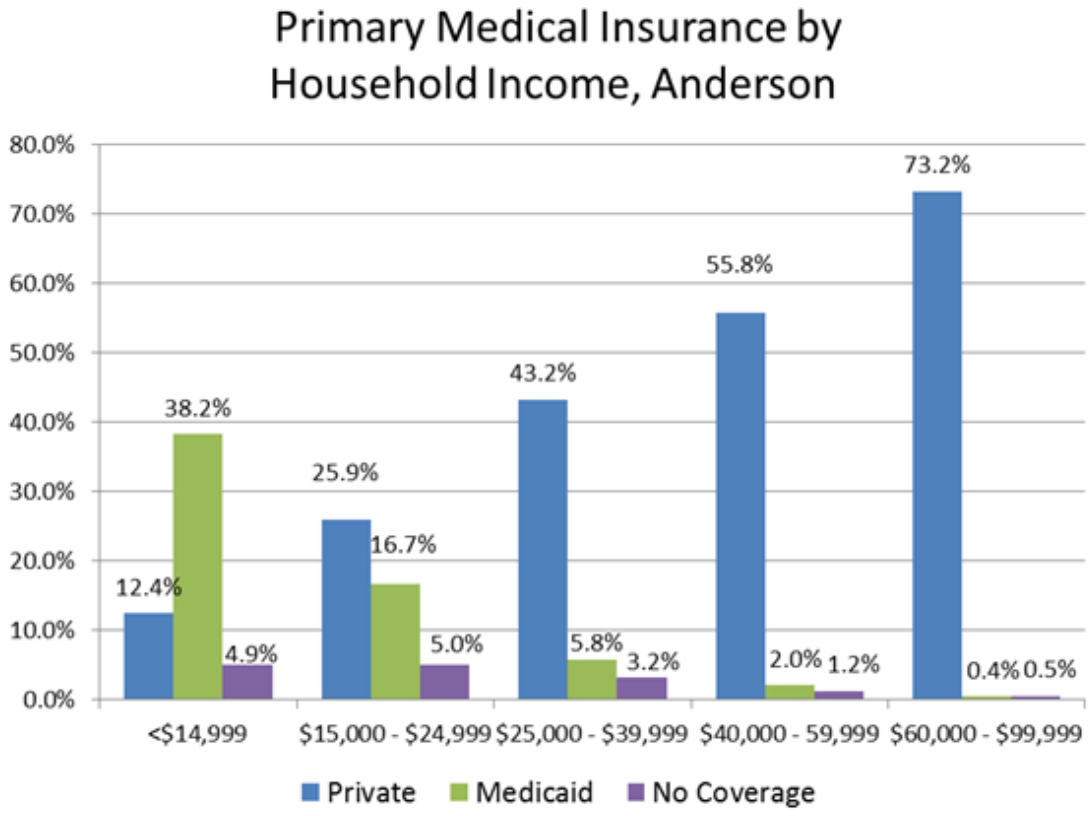


Figure 11

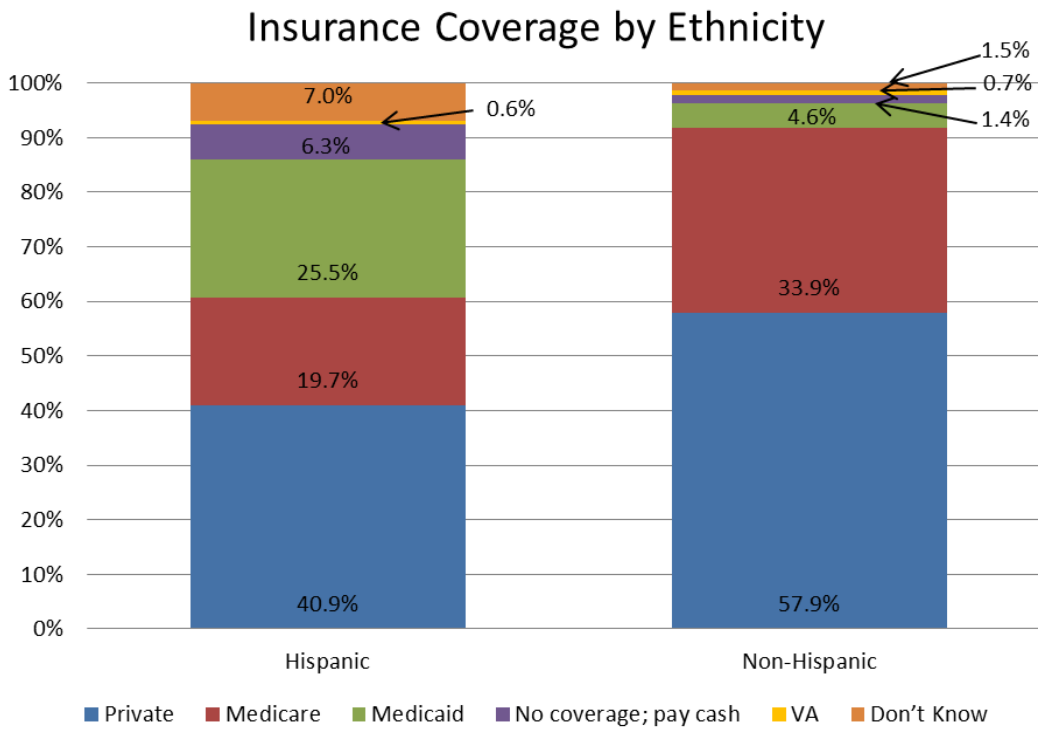


Figure 12

Another population that requires additional consideration in our community is the senior (age 65+) population. According to Data USA, the median age in the United States is 37.9, where the median age in Pennsylvania and New Jersey are 40.6 and 39.5, respectively. Furthermore, according to the Lehigh Valley Planning Commission, the senior population in Lehigh and Northampton Counties is projected to grow by approximately 100% in the 70-74 and 75+ age groups, and by approximately 60% in the 65-69 age group[7].

Similarly, there are growing Middle Eastern, Asian, and refugee populations within our Network service area, with diverse cultural backgrounds and needs.

The ACS five-year estimates indicate that 8.4% of residents in the SLUHN service area are veterans, compared to 8.78% in Northampton County, 8.66% in Pennsylvania, and 8.32% in the United States[8]. 0.7% of survey respondents identified that their primary source of medical insurance was Veteran's Administration.

According to the Williams Institute at UCLA School of Law data, approximately 3.3% of Pennsylvania residents and 3.8% of New Jersey residents identify as Lesbian, Gay, Bisexual, or Transgender (LGBT)[9]. In 2018, the Pennsylvania Department of Health partnered with Bradbury-Sullivan LGBT Community Center to conduct a statewide Community Health Needs Assessment focused specifically on LGBT health needs[10].

[7] http://lvpc.org/
[8] https://www.census.gov/topics/population.html
[9] https://williamsinstitute.law.ucla.edu/visualization/lgbt-stats/#density
[10] https://www.livehealthypa.com/docs/default-source/toolkits/lgbt/pennsylvania-2018.pdf?sfvrsn=0

According to the Pennsylvania 2018 LGBT Health Needs Assessment, 26.2% of respondents had not advised any provider that they are LGBT; furthermore, 56.8% of all respondents indicated that they sometimes, often, or always feared a negative reaction from a provider upon coming out as LGBT. This fear was especially prominent among the transgender and gender non-conforming respondents, where 75.1% of transgender and gender non-conforming respondents reported fear of a negative provider response. Additionally, 32.5% of all survey respondents reported that their providers are, on average, slightly or not at all competent in LGBT issues[11]. This lack of LGBT-competent care was also reflected in our SLUHN 2019 CHNA survey. Lack of LGBT-competent care was cited as a reason for missed medical appointments in the 2019 CHNA community survey, and that respondents travel to Philadelphia to access LGBT-competent care.

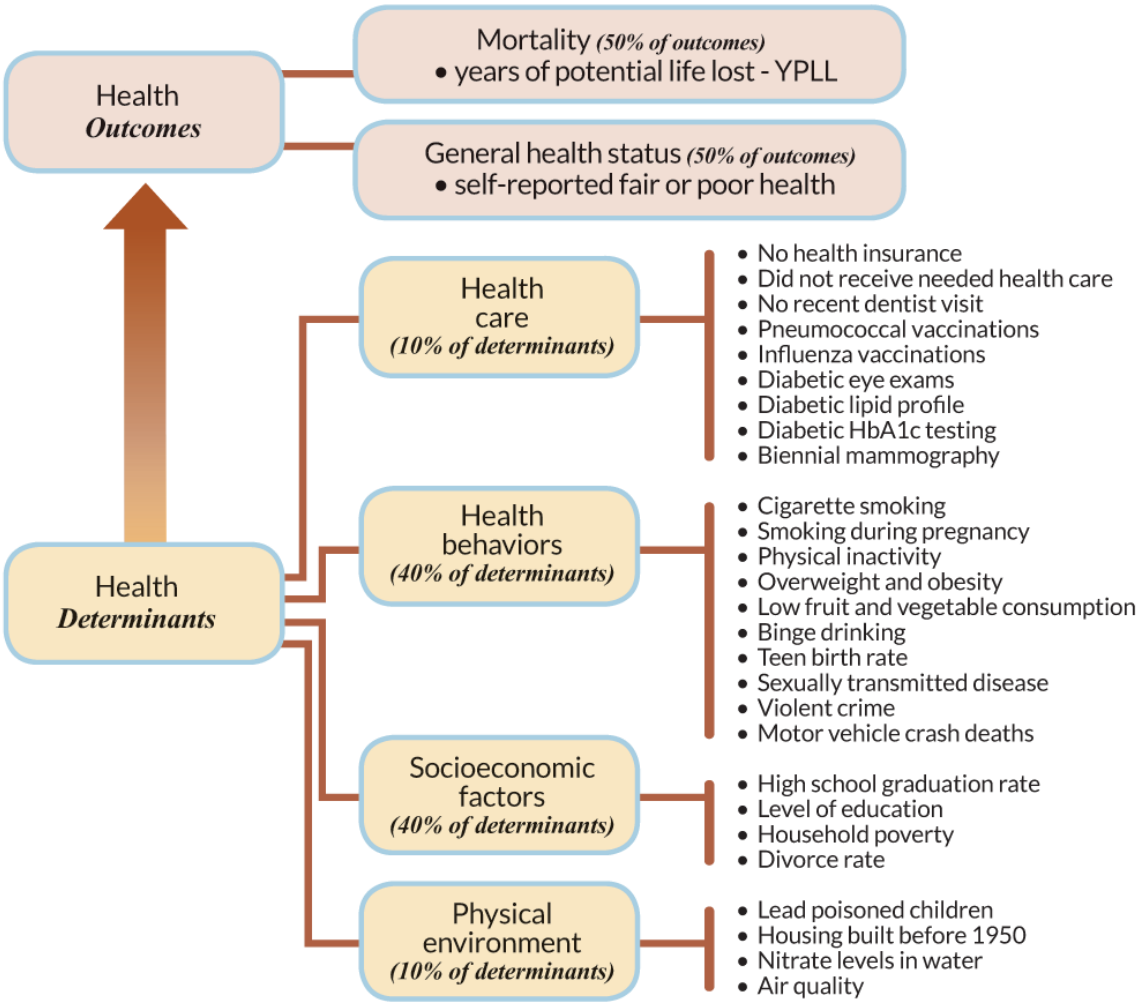
In addition to access to LGBT-competent care, overall health, mental health and substance use were identified as areas of need in the Pennsylvania 2018 LGBT Health Needs Assessment. 35.6% of all survey respondents reported their overall health status as fair, poor, or very poor. Additionally, when looking at overall life satisfaction, 27.4% of Pennsylvania LGBT survey respondents reported being dissatisfied or very dissatisfied, and 16.2% reported rarely or never getting the help that they need. Reported smoking rates were incredibly high among the LGBT survey respondents, with 30.2% of all survey respondents and 36.9% of transgender and gender non-conforming respondents reporting smoking. Both of these reported smoking rates are significantly higher than the Pennsylvania average of 18.0%. However, in the LGBT survey, about 24.3% of smokers reported that they were looking to quit within the next 6 months[12].

Findings

The findings suggest a focus on the social determinants of health and lifestyle medicine interventions in order to address the three priority areas related to improving access to care, preventing chronic disease and improving mental and behavioral health. This will be achieved using a network-wide framework of wellness and prevention, care transformation and research and partnerships to systemically approach the issues and trigger sustainable changes that influence health outcomes.

To analyze our findings in these areas, SLUHN has adopted the categorization system from the Robert Wood Johnson Foundation. The social determinants of health shape the status of a person's health. When addressing the priority health needs, it is crucial to consider the social determinants of health and lifestyle behaviors to effectively tackle the service area's health disparities. In instances where data are unavailable for the service area, we have chosen to default the measure to Northampton County, where the majority of St. Luke's Anderson service area patients reside.

[11] http://www.phmcresearch.org/work/data-and-publications
[12] http://www.phmcresearch.org/work/data-and-publications



Source: http://www.whatcountsforamerica.org/portfolio/chapter-4-the-county-health-rankings-a-treasure-trove-of-data/

Every year, the Robert Wood Johnson Foundation releases data that compare counties to state averages, as well as U.S. top performers. The table on the following page depicts select health indicators for 2018 for each of the counties in SLUHN's service area. The indicators are color-coded using a stoplight approach, in which green indicates that the value is better than both state and national levels, yellow indicates that the value is in between state and national levels, and red indicates that the value is worse than both state and national levels. In looking at the 2018 data table, only 9% of the values are green, and 49% are red. Additionally, Carbon and Schuylkill counties have no green values, indicating that there are opportunities for improvement across all counties, but especially our rural counties. When looking at overall health rankings, with 1 being the best and 50 being the worst, America's Health Rankings ranked New Jersey 12th and Pennsylvania 28th out of 50 in 2017.

2018	U.S. Top Performers*	Pennsylvania (PA)	Bucks (BU) County, PA	Carbon (CR) County, PA	Lehigh (LH) County, PA	Monroe (MO) County, PA	Northampton (NO) County, PA	Schuylkill (SC) County, PA	New Jersey (NJ)	Warren (WA) County, NJ
Unemployment	3.2%	5.4%	4.6%	6.0%	5.4%	6.3%	5.2%	6.2%	5.0%	4.6%
Uninsured	6%	8%	6%	7%	9%	9%	7%	8%	10%	8%
Primary care physicians	1,030:1	1,230:1	1,120:1	2,000:1	1,040:1	2,190:1	1,170:1	1,740:1	1,180:1	1,620:1
Dentists	1,280:1	1,480:1	1,210:1	2,360:1	1,180:1	2,600:1	1,850:1	2,280:1	1,190:1	1,420:1
Poor physical health days	3	3.9	3.2	3.5	3.5	4	3.3	3.6	3.5	3.7
Food environment index	8.6	8.2	8.8	8.5	8.6	8	8.6	8.3	9.2	8.5
Physical inactivity	20%	24%	21%	26%	25%	28%	26%	27%	23%	24%
Access to exercise opportunities	91%	68%	84%	59%	70%	43%	74%	50%	95%	98%
Adult obesity	26%	30%	27%	34%	31%	31%	29%	33%	26%	28%
Excessive drinking	13%	21%	21%	20%	20%	19%	20%	20%	17%	19%
Adult smoking	14%	18%	12%	17%	15%	17%	15%	18%	14%	16%
Poor mental health days	3.1	4.3	3.7	4	3.9	4	3.6	4.1	3.4	3.7
Mental health providers	330:1	560:1	450:1	2,190:1	600:1	1,070:1	530:1	1,480:1	530:1	610:1
Low birthweight	6%	8%	8%	8%	8%	9%	8%	7%	8%	7%
Teen births	15	21	9	23	26	13	16	26	15	11
Sexually transmitted infections	145.1	418.1	199.8	195.5	455.5	182.2	322.6	148.8	350.6	218.9
High school graduation	95%	85%	92%	81%	84%	89%	73%	89%	90%	92%
Children in poverty	12%	18%	8%	21%	20%	18%	14%	18%	15%	11%
Severe housing problems	9%	15%	15%	15%	17%	22%	16%	11%	23%	17%
Social associations	22.1	12.1	7.7	15	10.5	7.6	10.7	13.5	8.3	9

Key	Better than both state and national levels	Between state and national levels	Worse than both state and national levels

One way to identify community needs is to look at utilization of the United Way's 2-1-1 system. 2-1-1 is a free resource through which community members are able to be connected to community resources in their area. When examining 2-1-1 reports from Northampton County, 76% of inquiries in Fiscal Year 2018 were related to housing or housing assistance. Utility Assistance, Mental Health/Addictions, Food/Meals, Individual/Family/Community Support, Income Support, and Health Care were next most frequently utilized categories for inquiries. Additionally, the need for community shelters and transitional housing was the top potential gap identified through the 2-1-1 system, followed by electric service payment assistance, water services payment assistance, rent payment assistance, extreme cold weather shelters, and gas payment.

Social and Economic Environment

Employment

While health insurance is a tangible barrier to accessing healthcare, there are many "invisible" barriers patients also face. Income, poverty and unemployment factor heavily into an individual's ability to access care. In examining these demographics, we can see a correlation between income level and accessing or affording care. An unemployed person likely has limited income, which may potentially lead to being unable to pay for insurance, not to mention out-of-pocket fees for health care services. The unemployment rate for civilian, non-institutionalized adults in the St. Luke's Anderson service area is 5.6, and 5.3 for Northampton County. The rate is 5.2

statewide and 4.4 nationwide, making the St. Luke's Anderson service area's unemployment rate higher than average[13].

To take a deeper dive into this issue, we can observe the data pulled from our 2019 community survey. An estimated 7.7% of respondents were unemployed, higher than the state and country. Compared to other service areas (Figure 13), Anderson has a lower percentage of unemployment. While nearly half of respondents were employed or self-employed (49.6%), it is still imperative to remain cognizant of the high unemployment rate given by respondents, especially among our vulnerable populations.

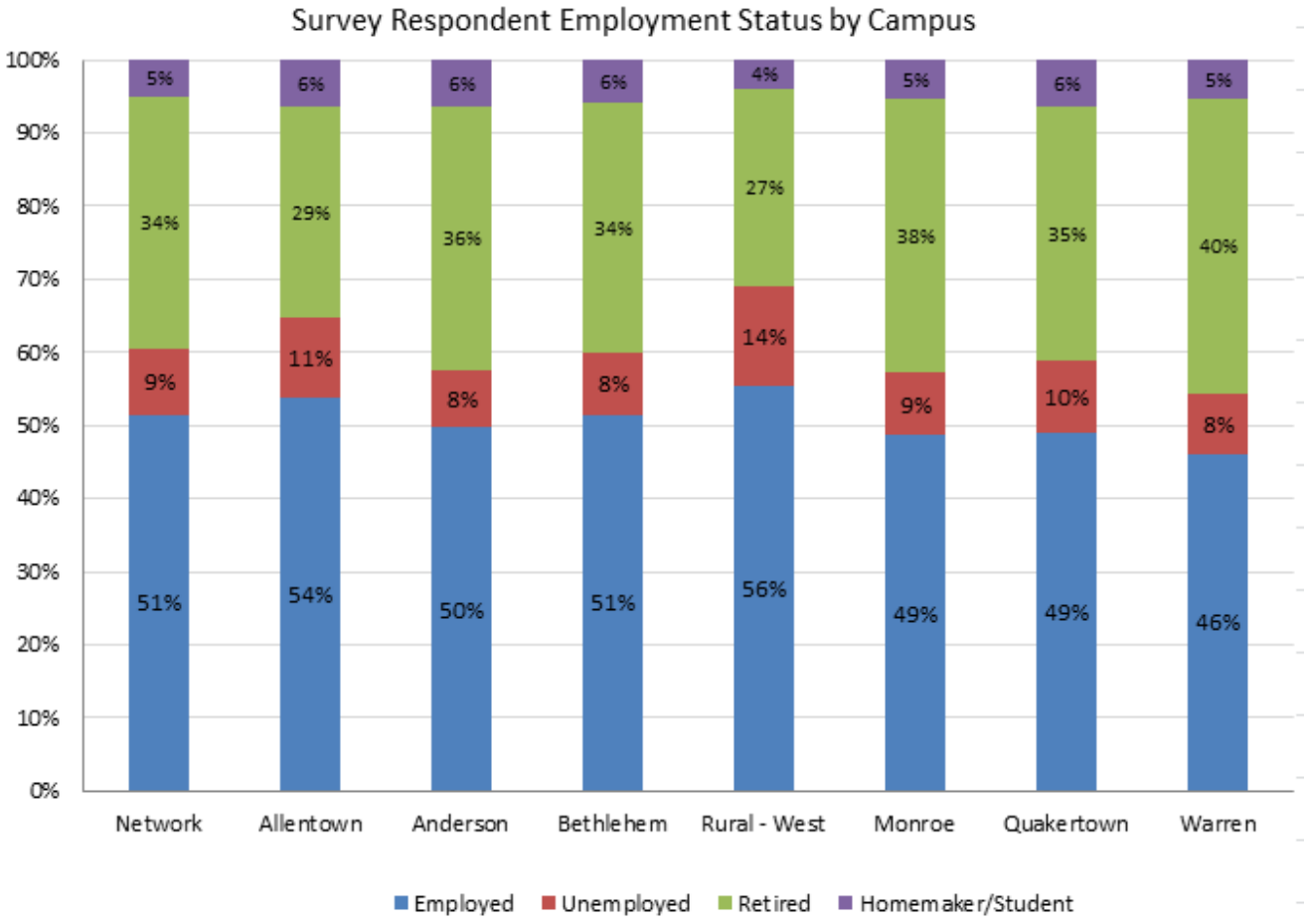


Figure 13

Household Income and Poverty

Poverty is inherently linked to unemployment, as those without jobs likely have limited incomes, and therefore may be unable to pay for healthcare services. Not only do unemployment and poverty levels affect one's ability to access care, but they influence mental health as well. Job instability, combined with the stress of providing for oneself and one's family, are risk factors

[13] https://www.bls.gov/eag/eag.pa

for poor mental health. The Federal Poverty Level (FPL) is $24,600 for a family of four[14]. Roughly 33.68% of the St. Luke's Anderson service area residents have incomes that fall at or below 200% of the FPL (Figure 15). This statistic falls between the 30.6% of the state and 34.26% of the nation that fall at or below 200% of the FPL[15].

Childhood and adolescence are formative and vulnerable years for growing children, where they must be cared for and nurtured. For a family in poverty, there is a significant strain on being able to provide youths with necessities. In the St. Luke's Anderson service area, 26.1% of children live in poverty, compared to 39.13% statewide and 43.29% nationwide[16].

We can also examine household income to better understand what poverty looks like in our service area, since those with lower incomes may be less likely to be able to pay for the costs of healthcare. Pulling from our 2019 community survey, we compared the income distribution for the service area to that of the network as a whole. About 17.5% of survey respondents had an income below the FPL ($25,000), 27.9 between $25,000 and $59,999, and 54.5% with an income of $60,000 or more. For the entire network, 18.7% had an income below the FPL ($25,000), 30.2 between $25,000 and $59,999, and 51.0% with an income of $60,000 or more. This potentially indicates that those in the St. Luke's Anderson service area are about equally able to pay for healthcare as those in the network.

Education

The Healthy People 2020 initiative sets benchmarks for health behaviors, health outcomes, and social and economic factors to reach by the year 2020. The organization suggests 87% of a region's high school cohort 89 graduate each year. The cohort graduation rate in Northampton County's public schools was 88%. This measure is above than the state rate of 86% for the 2016-2017 school year[17]. The Easton Area High School had a graduation rate of 90%, Bangor Area High School had a rate of 98%, and Wilson Area High School had a rate of 90%[18].

Research suggests there are correlations between education and earning capacity. Reports such as the renowned Whitehall Study have directly correlated socio-economic status with health outcomes. Our 2019 community survey revealed that the highest percentage of respondents in the service area reported education beyond high school (78.8%), followed by those with only a high school diploma or GED (18.0%), and those who did not complete high school (3.2%). These numbers demonstrate less educational attainment within the St. Luke's Anderson service area than in most other regions (Figure 14).

[14] https://aspe.hhs.gov/poverty-guidelines
[15] https://factfinder.census.gov
[16] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/
[17] https://www.education.pa.gov/Data-and-Statistics/Pages/Cohort-Graduation-Rate-.aspx
[18] https://futurereadypa.org/Performance/

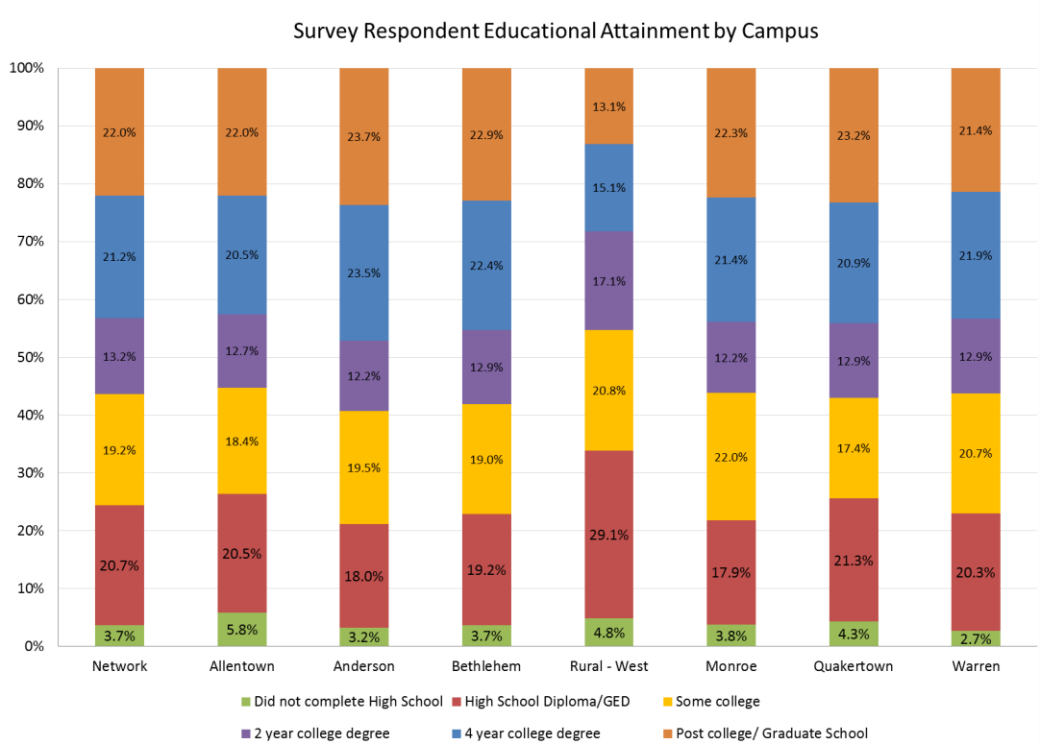


Figure 14

Language

In our 2016 CHNA cycle, focus group members identified language barriers as another prevalent source of health disparities. Without effective communication, access to health services and efforts to educate patients on health issues are significantly impaired. The population over the age of five with Limited English Proficiency (LEP) was roughly 4.82%, falling between the 8.57% nationally and the state percentage of 4.08%[19]. This percentage of individuals with limited English proficiency, combined with the 13.63% of the service area population identifying as Hispanic/Latino, indicates a need for doctors and nurses in the St. Luke's Anderson service area who are proficient in Spanish.

Safety

An individual's perception of safety in a community can affect one's physical health for better or worse. Individuals and families who perceive their neighborhood to be unsafe are less likely to pursue outdoor activities or engage in their communities, which may lead to becoming less physically active or isolated. The top-performing counties in the nation have a violent crime rate of 62 per 100,000 persons, compared to 333 in the state of Pennsylvania and 173 in Northampton County[20]. According to our 2019 community survey, 89.0% of survey respondents in the St. Luke's Anderson service area either agreed or strongly agreed that their community is a safe place to live. The majority of respondents network-wide conveyed they agree (54.2%) or strongly agree (32.4%) that their community is a safe place to live in (Figure 15).

[19] https://factfinder.census.gov

[20] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

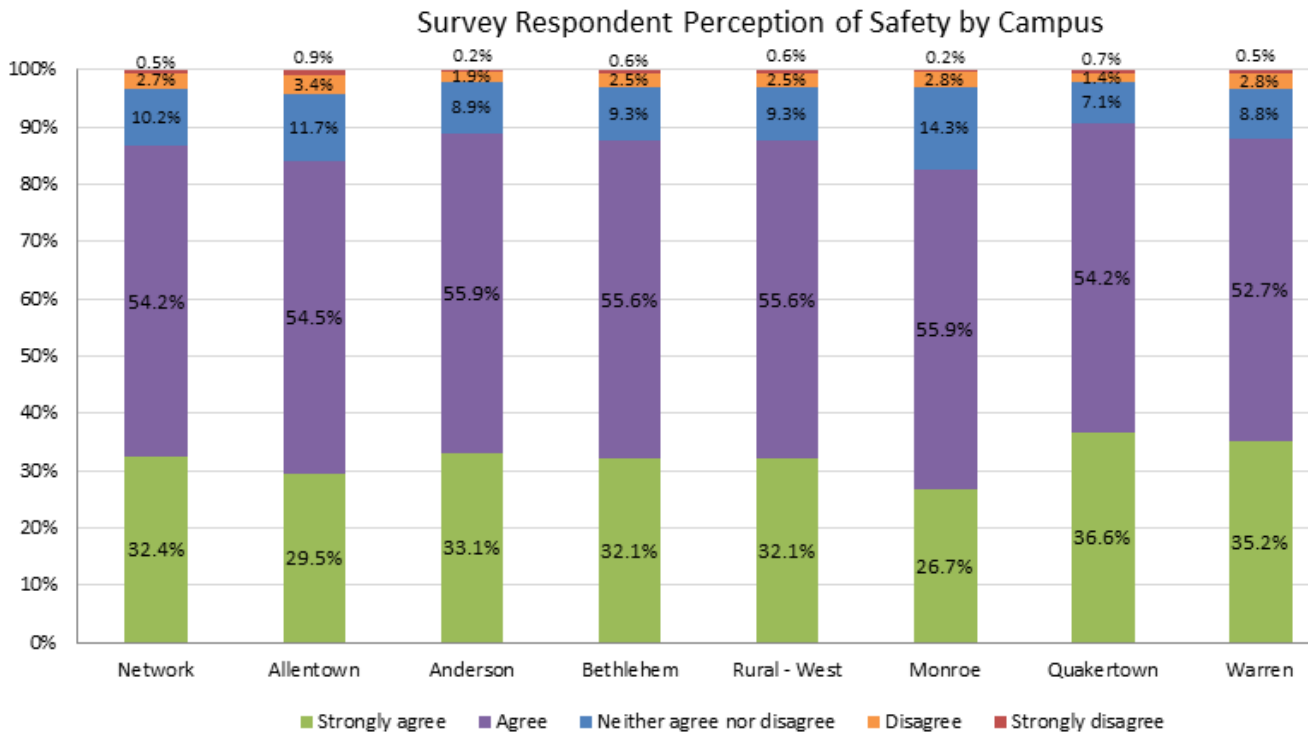


Figure 15

According to the 2016 Annual Child Protective Services Report, Pennsylvania received a total of 44,359 child abuse allegations in 2016 – a steep increase from 26,352 overall reports in 2012. While the number of total reports has spiked, the number of substantiated reports did not see as large of an increase, with 3,164 substantiated reports in 2012 and 4,597 in 2016. Northampton County received a total of 1,237 reports of child abuse allegations in 2016, with 56 of those ultimately substantiated[21].

Social Associations

Social and emotional support is vital to maintaining positive mental health and general confidence in getting through everyday barriers. If we are able to indicate whether certain counties are lacking in social associations, we can address these shortcomings by increasing mental health programming and care. The "social associations" indicator looks at a lack of social or emotional support in adults over the age of 18. We can look at the County Health Rankings "social associations" indicator, which measures the number of membership associations per 10,000 population. Northampton County's ranking averages out around 10.7, which is lower than both the state average of 12.1 associations and the top performers' measure of 22.1[22].

[21] http://www.dhs.pa.gov/cs/groups/webcontent/documents/report/c_260865.pdf
[22] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

Physical Environment

Housing and Blight

There is a well understood link between housing quality and public health. Poor living situations are connected to a number of different health conditions including, but not limited to, respiratory infection, lead poisoning, asthma, and poor mental health[23]. For well over a century public health officials have focused on factors like overcrowding, sanitation, and ventilation in the home to combat infectious diseases. Housing conditions are still a major point of focus for many health agencies due to their impact on the overall health status of the community.

In 2014, the LVPC published a report on housing in the Lehigh Valley. With over 1,000 surveys distributed over the phone, online and on paper, a few major trends were found. Neighborhood quality; safety; and convenience to work, leisure, or family were most cited as influencing housing choice. The most frequent reason for not owning a home was financial instability, from not being able to afford a down payment or qualify for a mortgage. Few reported issues with their current homes, and those that did cited concerns with bug infestation and broken doors or windows. Results imply those with disabilities are not able to easily access their current dwellings. In addition, most employed respondents traveled 16 to 30 minutes to work by car. Travel costs and traffic congestion were noted as transportation issues influencing job choice[24].

Housing instability can have detrimental effects on the health of individuals, families, and communities[25]. Eviction, or the legal process of a landlord removing a tenant from their property, is one form of housing instability that can seriously impact the wellbeing of the person or family being removed. Formal eviction, and even the threat or process of removal, has statistically significant negative consequences on both mental and physical health[26]. It is also intimately tied to other determinants of health like job security, schooling, and safety. Once a family has undergone eviction, the health side-effects can last for years[27]. As such, eviction rate, or the number of formal evictions as a factor of total occupied housing units, is an important metric of public health. We used the Eviction Lab's nation-wide database out of Princeton University to determine the eviction rate for each of the ten lowest income census tracts that our Anderson campus services. Nine of these ten tracts have higher eviction rates than the national average, and all ten are higher than Pennsylvania's. Four of those tracts have eviction rates more than double the national average of 2.34%. Lehigh County census tracts 18, 10, 20, and 8 have respective eviction rates of 5.99%, 5.90%, 5.94%, and 5.30% (Figure 16). Unofficial, and often extra-legal, methods of eviction are common place in low income neighborhoods[28], and thus these eviction rates might not fully encapsulate the actual housing instability of the census tracts reported.

[23] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447157/
[24] http://www.lvpc.org/comprehensive-plan.html
[25] http://www.npc.umich.edu/publications/policy_briefs/brief29/NPC%20Policy%20Brief%20-%2029.pdf
[26] https://www.ncbi.nlm.nih.gov/pubmed/28107704
[27] https://scholar.harvard.edu/files/mdesmond/files/desmondkimbro.evictions.fallout.sf2015_2.pdf
[28] https://www.jstor.org/stable/10.1086/666082?seq=1#page_scan_tab_contents

SLUHN Campus	Lowest Income Census Tracts (lowest first)	Median Family Income	Eviction Rate (2016)
Anderson	NC 105; Northeast Bethlehem	$22, 008	1.92%
	NC 112; South Side Bethlehem	$27,548	2.85%
	NC 111; South Side Bethlehem	$29,375	4.17%
	NC 143; Center City Easton	$33,929	0.65%
	NC 110; South Side Bethlehem	$36,354	0.68%
	MnC 3008; Stroudsburg	$39,769	1.20%
	NC 146; South Side Easton	$41,797	1.16%
	NC 109; South Side Bethlehem	$41,938	2.94%
	NC 113; South Side Bethlehem	$43,973	0.91%
	LC 94; West Bethlehem	$45,667	1.09%
	AVG of 10 Lowest Income Tract	**$37,817**	**1.76%**
National		$55,322	2.34%
PA		$54,895	1.77%

Figure 16

SLUHN Campus	Lowest Income Census Tracts (lowest first)	Median Family Income	Cost Burdened Households (30% or more of household income goes towards housing costs) 2012-2016
Anderson	NC 105; Northeast Bethlehem	$22, 008	45.51%
	NC 112; South Side Bethlehem	$27,548	59.22%
	NC 111; South Side Bethlehem	$29,375	46.00%
	NC 143; Center City Easton	$33,929	52.30%
	NC 110; South Side Bethlehem	$36,354	60.45%
	MnC 3008; Stroudsburg	$39,769	49.39%
	NC 146; South Side Easton	$41,797	48.96%
	NC 109; South Side Bethlehem	$41,938	49.96%
	NC 113; South Side Bethlehem	$43,973	46.01%
	LC 94; West Bethlehem	$45,667	41.89%
	AVG of 10 Lowest Income Tract	**$37,817**	**49.97%**
National		$55,322	34.20%
PA		$54,895	31.3%

Figure 17

Another metric we examined was the percentage of monthly income that goes towards housing costs. US Department of Housing and Urban Development (HUD) considers any household

paying more than 30% of their monthly income towards housing as "cost burdened". Being cost burdened means that these households "may have difficulty affording necessities such as food, clothing, transportation and medical care"[29]. Although little research exists linking the status of "cost burdened" to health outcomes, there is robust literature connecting lower incomes with worse health[30]. It would then follow that households that are struggling to afford housing would have limited disposable income to spend on healthier food, physical activities like a gym membership, and out of pocket health expenses. High housing cost burden is a problem across the nation and state, but it is particularly acute in the communities we serve. All of the ten lowest income census tracts in the Anderson campus area have a cost burdened rate higher than the national and state average. Northampton County tract 110 has a rate nearly double that of the state and national average with over three-fifths of all households in the tract being cost-burdened (Figure 17).

Cost Burdened Households SLRA

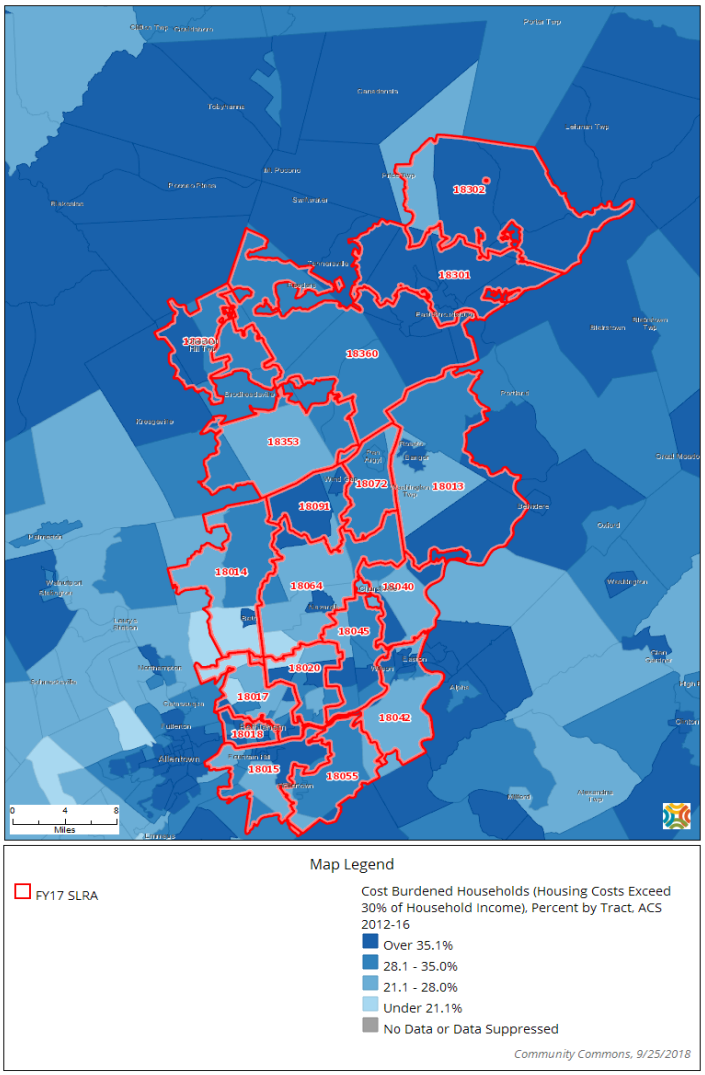


Figure 18

A final metric we looked at was units lacking complete kitchen facilities. [illegible]ete kitchen facilities, families have less of an ability to cook nutritious meals and thus rely more

[29] https://www.hud.gov/program_offices/comm_planning/affordablehousing/

[30] https://www.bls.gov/opub/mlr/2017/beyond-bls/income-and-health-outcomes.htm

heavily on processed and packaged foods or eating outside of the home. Households that cook more frequently are shown to consume lower amounts of calories, fat, and sugar[31]. Our Anderson campus services at least seven census tracts that have rates of housing units lacking complete kitchen facilities that are higher than both the state and national average. In Northampton County tract 111 nearly one in every five households lacks a complete kitchen facility. This would be an ideal neighborhood to provide targeted interventions around increasing the nutritional quality of processed and packaged food that is offered in local corner store (Figure 19).

SLUHN Campus	Lowest Income Census Tracts (lowest first)	Median Family Income	Housing Units Lacking Complete Kitchen Facilities,% by Tract, ACS 2012-16
Anderson	NC 105; Northeast Bethlehem	$22, 008	1.71%
	NC 112; South Side Bethlehem	$27,548	5.54%
	NC 111; South Side Bethlehem	$29,375	19.35%
	NC 143; Center City Easton	$33,929	6.74%
	NC 110; South Side Bethlehem	$36,354	10.79%
	MnC 3008; Stroudsburg	$39,769	4.43%
	NC 146; South Side Easton	$41,797	3.60%
	NC 109; South Side Bethlehem	$41,938	5.27%
	NC 113; South Side Bethlehem	$43,973	0.00%
	LC 94; West Bethlehem	$45,667	1.59%
	AVG of 10 Lowest Income Tract	**$37,817**	**5.90%**
National		$55,322	2.84%
PA		$54,895	3.41%

Figure 19

Key informant interview respondents called for more "financial resources for reducing blight," and overall assistance for local organizations providing services for at-risk students, the homeless, those in transitional-permanent housing, and other groups. In terms of policy, informants called for policy creation for affordable housing, neighborhood preservation and safety, and addressing aging infrastructure. Others noted the need for growth management in downtown and university areas, earning capacity increases for residents, and increased recreational opportunities in low- to moderate-income neighborhoods.

These sentiments were echoed at a recent community forum. During the forum a number of participants identified housing issues as a major challenge for the region. Affordability concerns are magnifying as the housing market has recovered from the Great Recession and as one participant noted prices "are squeezing many individuals and families out of adequate housing options." A city official noted "a majority of Easton's homes were built prior to 1930, and on average moderate-income families are spending 30% of their income on housing and there's no

[31] https://www.cambridge.org/core/journals/public-health-nutrition/article/is-cooking-at-home-associated-with-better-diet-quality-or-weightloss-intention/B2C8C168FFA377DD2880A217DB6AF26F

funding to fix up their homes, appliances, gutters, and roofs." She added "some of these homes require so much work even to get it up to code." Key informants identified a developing West Ward Neighborhood Plan with an advisory committee that meets each month, as well as other housing initiatives by the City of Easton. These efforts are emerging out of a vocalized need for permanent, affordable housing for low- and moderate-income families, as well as a general need for reducing blight.

Homelessness is another concern in the Easton area around the Anderson Campus. According to HUD's Point-In-Time Count, which due to methodology is almost certainly an underrepresentation of the true number, there were 302 homeless individuals in Northampton County in 2018. Of this count, 23 went unsheltered, which means they were spending the cold winter nights outdoors, or in other locations unfit for human habitation like a bus station. This count is limited because it only considers individuals in shelters, transitional housing, or sleeping in spaces defined as uninhabitable for humans. Someone who was doubled up in an overcrowded house temporarily, for example, would not be counted.

Another source to quantify the need for housing affordability comes from the Coordinated Entry System, a platform through which residents can be connected with social service providers. Between April and June of 2018, 940 residents of Northampton County used the CES to inquire about housing assistance. Nearly one third of all calls into this system came from the 18042 zip code (south and west Easton).

The Robert Wood Johnson Foundation produces County Health Rankings on several important social determinants of health. One that we looked at, percentage of population with severe housing problems, is defined by having one of the following four housing conditions: over-crowding, high housing costs, lack of complete kitchen facilities, or lack of complete plumbing facilities. Northampton County ranks 58 out of 67 counties in Pennsylvania, having 16% of all households have at least one of the four severe housing conditions. Throughout the state, 15% of all households are considered having severe problems.

Air and Water Quality

Air quality, especially in urban and industrial areas, is a significant public health concern. Poor air quality is associated with increased breathing stress for people with asthma and COPD, and increased risk of stroke or heart attacks for people dealing with heart disease[32]. One measurement of importance is the amount of ozone (O3) in the air. High levels of ozone can damage and inflame people's airways, make lungs more susceptible to infection, increase the frequency of asthma attacks, damage the lungs, and cause COPD[33]. According to the American Lung Association, Northampton County received a "F" grade for ozone last year with at least 11 days surpassing air quality thresholds for moderate air, meaning the ambient air was "unhealthy for sensitive populations". Northampton County also received a "C" grade for particulate matter with 6 days exceeding the moderate air threshold and becoming unhealthy for sensitive populations. Particulate matter is microscopic pollution in the air, typically caused by exhaust

[32] https://www.cdc.gov/air/air_health.htm
[33] https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution

from combustion, which can lacerate the lungs caused pulmonary developmental consequences, lung cancer, and heart disease[34].

Asthma rates are a related indicator when examining physical environment and air quality. 9.8% of survey respondents in the Anderson service area and 9.8% of survey respondents in the SLUHN service area indicated having an asthma diagnosis. However, among all SLUHN survey respondents, there are notable differences in reported asthma rates based on reported income levels. 18.6% of SLUHN respondents in the $14,999 or less income category reported having an asthma diagnosis, as compared to 7.7% of respondents in the $60,000 or greater income category (Figure 20). As previously discussed, there are identified issues in our region with access to adequate housing, and the increased asthma rates among lower income populations illustrate a direct health outcome of those housing issues.

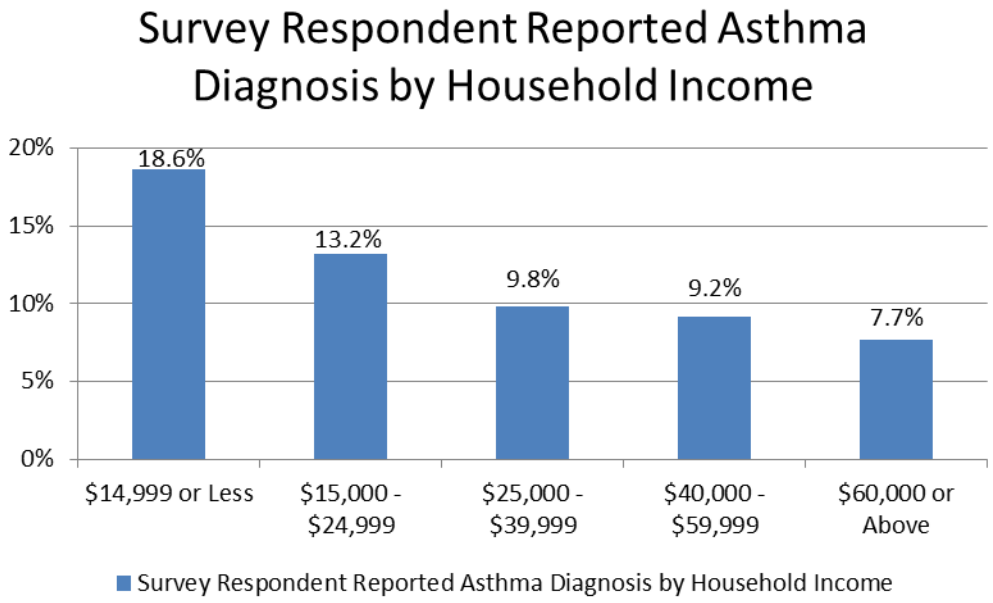


Figure 20

The Easton Suburban Water Authority is responsible for providing and treating up to 16 million gallons of water a day from the Delaware River and distributing it to Easton and surrounding suburbs like Forks, Palmer, Wilson, Lower Nazareth, Williams, Glendon, and parts of east Bethlehem. According to their 2017 report, the ESWA "passed" every criterion set forth by state and federal regulations. They had no water quality violations in 2017. While every contaminant was measured under maximum levels set by government regulators, a few categories did fall short of the Maximum Contaminant Level Goal. The distinction between the Maximum Contaminant Level (MCL) and the Maximum Contaminant Level Goal (MCLG) is that maximum levels are set according to calculated and reasonable risk. Under the MCL threshold, known risk may exist, but it is limited and reasonable. The MCLG threshold, however, is the level under which *there is no known or expected risk to health.* ESWA reports the following contaminants exceeded the MCLG threshold, while remaining under the MCL: Radium and turbidity (cloudiness due to runoff).

[34] https://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/particle-pollution.html

Clinical Care

Primary Care Providers

When medical issues arise, primary care providers (PCPs) are generally the first point of contact before a patient begins to move through a health network. PCPs are often the ones who initially identify major health problems, such as chronic disease or mental illness. When individuals lack a consistent primary care doctor, they may face disadvantages in terms of their present and future health, from delaying potential diagnoses to lacking proper health education.

To assess PCP accessibility, we can look at the "access to primary care" indicator, which denotes the ratio of primary care physicians per 100,000 individuals in the population. The lower the ratio is, the more manageable a PCP's caseload becomes. Top performers in the country who fall in the 90th%ile have a ratio of 1,030:1, and the state's ratio is 1,230:1. For Northampton County, the ratio of population to PCPs is 1,170:1. This is slightly higher than the top performer ratio, potentially indicating difficulty for individuals to access a primary care physician than in other areas. Social determinants of health such as poverty, education, and unemployment may all factor into an individual's ability to acquire care, even if it is available[35].

Across the St. Luke's network, we observed trends between the type of insurance used by a respondent and their last PCP visit. From our 2019 community survey, we found that most respondents in the St. Luke's Anderson service area had visited their PCP within the past year (82.9%) (Figure 21). Another 9.0% saw their PCP within the past two years, 3.5% within the last five years, and 2.1% more than five years ago. Some did not know or did not have a PCP (2.4%).

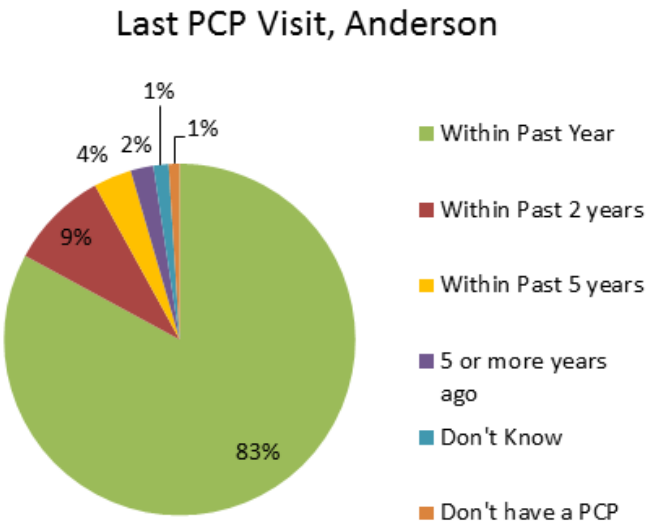


Figure 21

We then cross-referenced this information with SLUHN respondents' insurance type. About 77.5% of all Network respondents with private insurance saw their PCP within the last year, compared to 50.0% of respondents with no coverage. About 79.6% of those with Medicaid and

[35] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

92.3% with Medicare saw their PCP in the last year (Figure 22). Access to care was one of the most frequently cited issues for the Anderson community. While multiple local health networks contribute to improving access, key informants still observed an insufficient amount of clinical care services and resources.

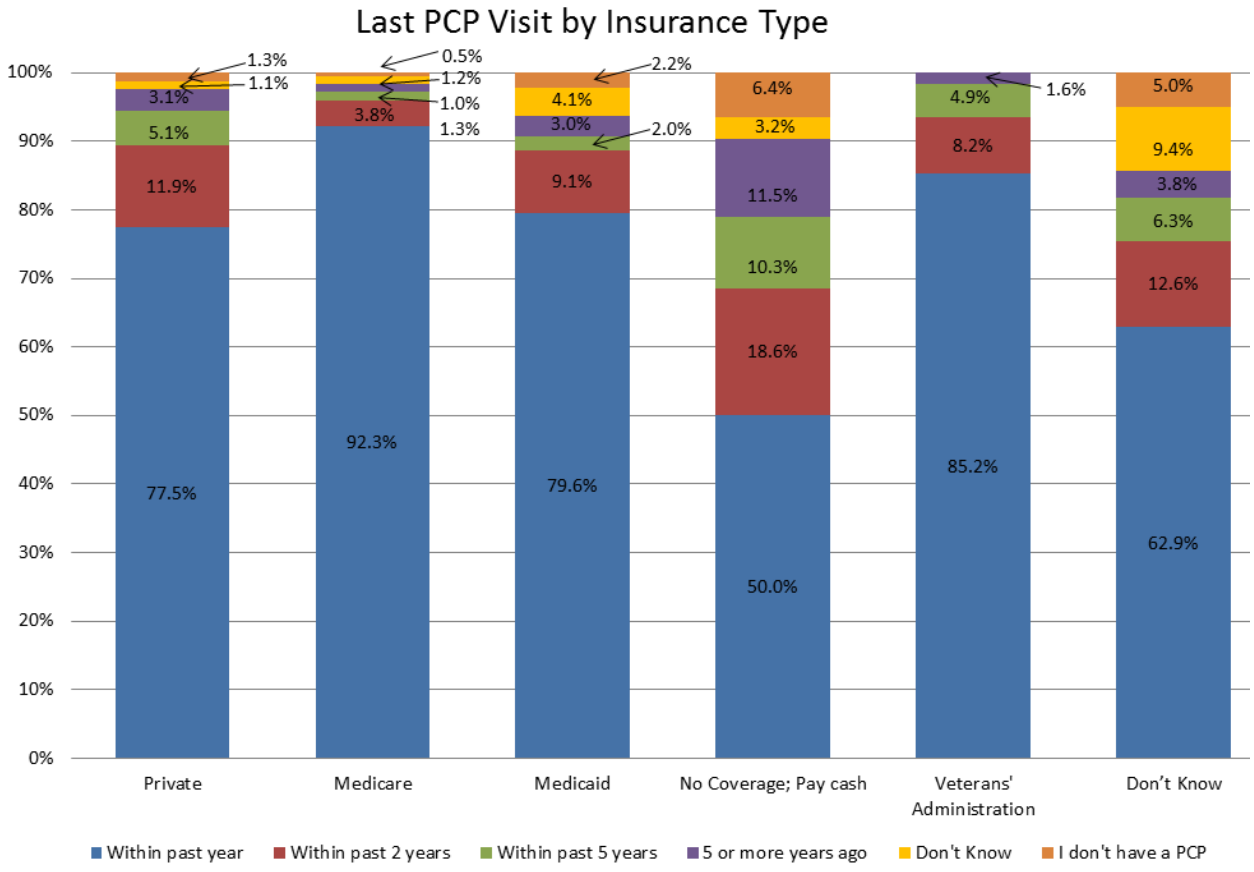


Figure 22

Emergency room (ER) utilization can also be used as an indicator to gauge lack of PCP coverage. According to community survey data, 67.6% of all SLUHN service area respondents had not visited the ER in the past year, and only 1.4% had visited 5 or more times. Similarly, among St. Luke's Anderson service area respondents, 67.3% had not visited the ER in the past year, and 1.1% had visited 5 or more times. It is important to note that many surveys were completed in clinics or sites where people are more likely to be connected to care, thereby underestimating the true number of folks who are not accessing care at all. However, survey data also indicate that there are differences in ER utilization based on income. Figure 23 depicts ER utilization by income category among all Network respondents, and clearly indicates that as income decreases, ER utilization increases. This inverse relationship between income and ER utilization suggests that there may be disparities in access to PCP among lower income populations in our service area community.

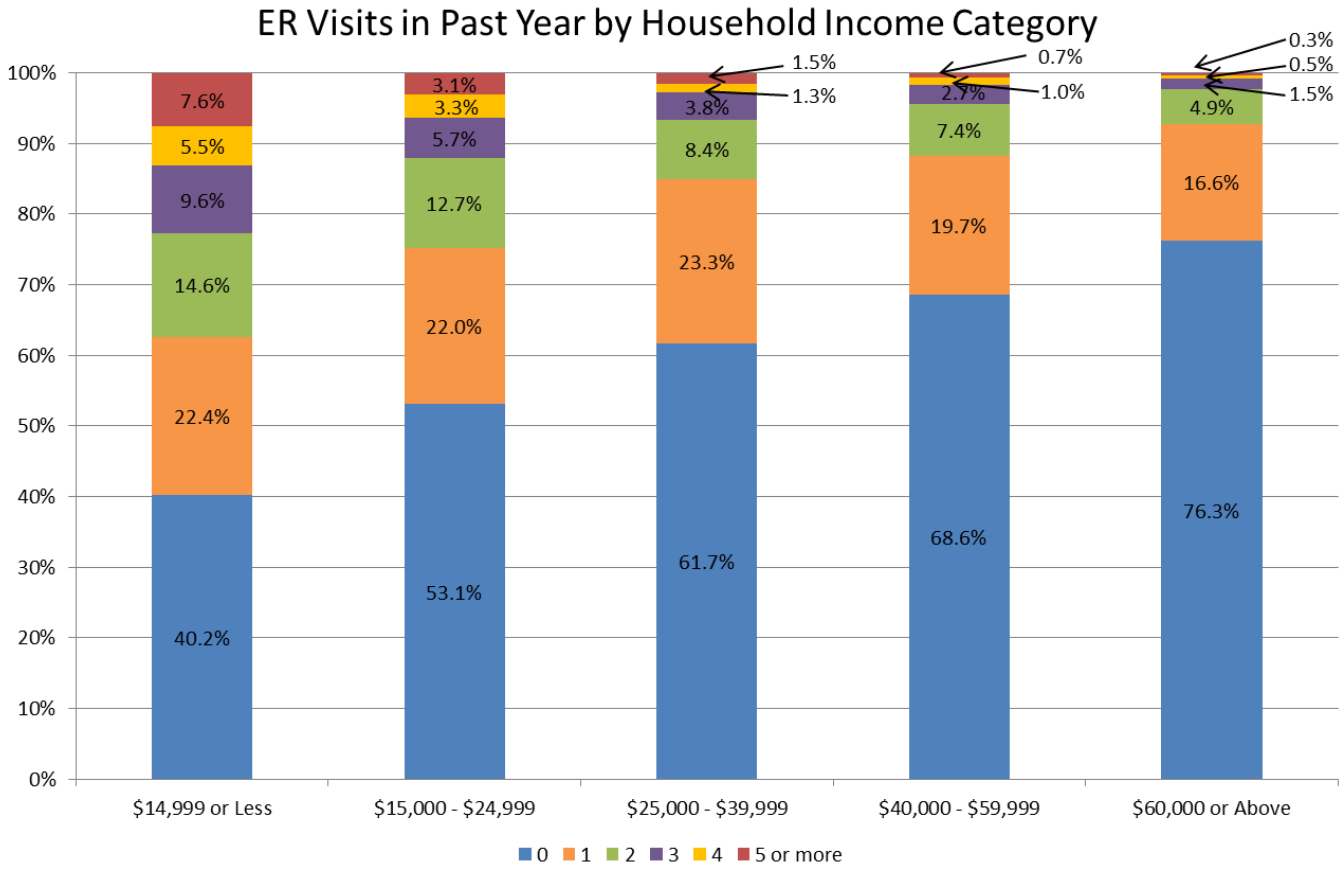


Figure 23

Dentists

Not only does oral healthcare affect dental health, but directly impacts an individual's overall health, from cardiovascular disease to one's ability to eat nutritious food. A lack of preventive and restorative dental services can result in higher risk for tooth decay, gum disease, heart disease or stroke, diabetes and some types of cancers. Measuring a community's access to dentists is one way to examine the ability for an area to receive quality dental care. Akin to the methodology for primary care providers, the "access to dentists" indicator denotes the ratio of dentists per 100,000 individuals in the population. The ratio of people to dentists is 1,850:1 in Northampton County. This number is higher than both the state average of 1,480:1 and the U.S. top performers' ratio of 1,280:1, indicating a lesser accessibility to dental care in the St. Luke's Anderson service area[36].

In our 2019 community survey, we assessed the last time respondents visited the dentist, as well as the type of dental insurance that they used, to gauge the limits of dentist availability and insurance coverage. As evidenced by Figure 24, most respondents in the St. Luke's Anderson service area – as well as throughout the network – had seen their dentist within the past year.

[36] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

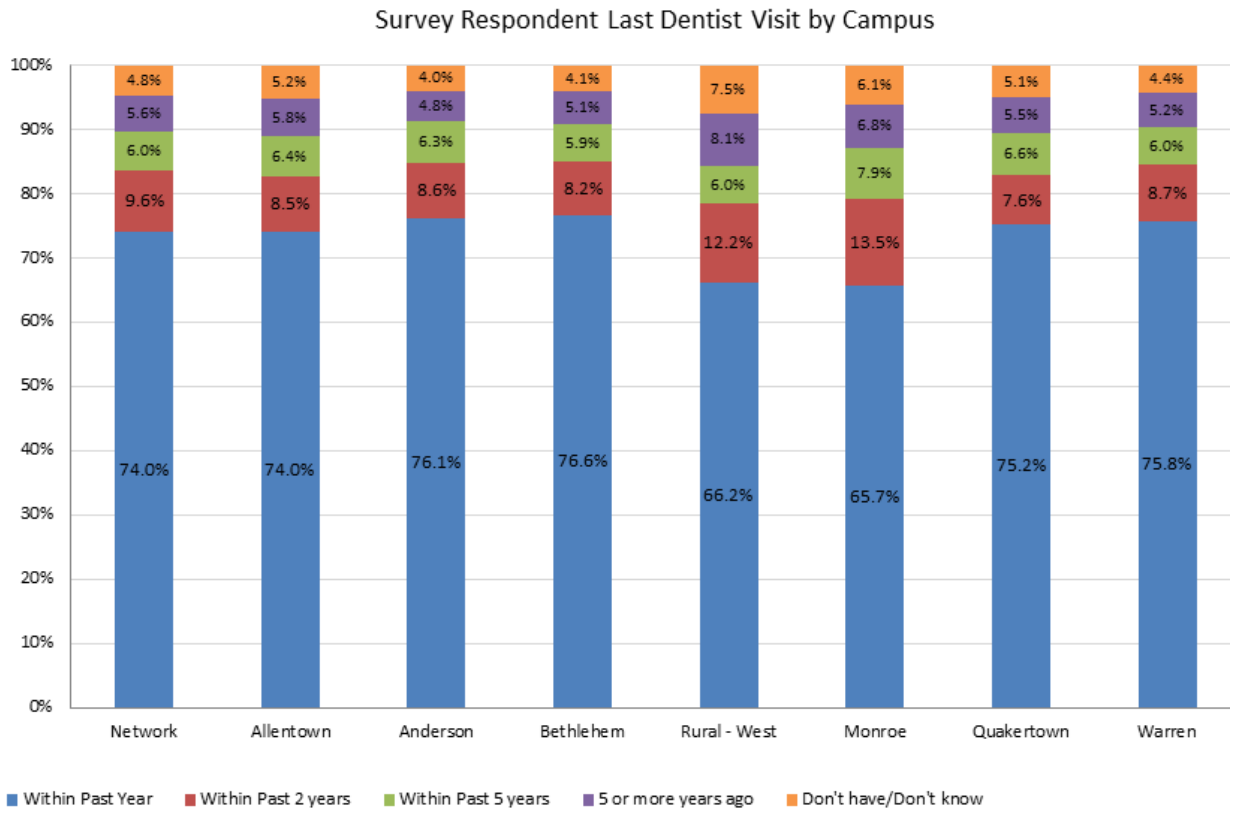


Figure 24

To further explore this topic, we examined the type of dental insurance used by respondents network-wide, comparing data gathered from our previous surveys conducted in 2012 and 2016. The percentage of respondents using private insurance for dental care was recorded at 51.0% in 2012, increased to 62.4% in 2016, and decreased to 59.6% in 2019. Those using Medicaid moved from 6.3% in 2012, to 14% in 2016, to 8.4% in 2019. The percentage of those who had no coverage or paid cash greatly decreased, from 39.9% in 2012, to 19.3% in 2016, then increased to 31.5% in 2019 (Figure 25). It is evident that less people are uninsured or having to pay with cash, which ultimately should help boost access to dental care.

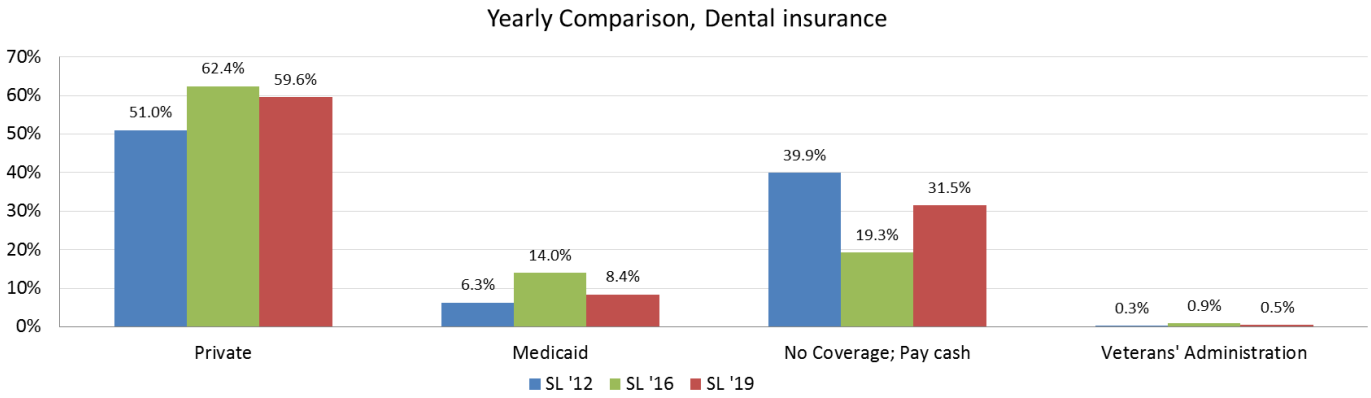


Figure 25

Mental Health Providers

Limited access to mental health professionals is a huge barrier to improving mental health. In the same way PCP and dentist availability impacts access to care, so too does a region's accessibility to mental health providers. To assess this accessibility, we can utilize the "mental health providers" indicator, which analyzes the ratio of the county population to the number of mental health professionals. In Northampton County, the ratio of residents to mental health providers is 530:1. This is lower than the state ratio of 560:1 but higher than the national top performer ratio of 330:1, indicating an average level of accessibility to mental health providers in the St. Luke's Bethlehem service area[37]. Mental health was rated the number one priority issue for key informants. Not only are there less providers than needed to adequately meet the region's demand, but most existing services are reportedly underfunded – particularly those tackling substance abuse recovery and rehabilitation.

Health Insurance

A major barrier to receiving health care is a lack of insurance – without it, services are costly and difficult to attain. Even if an individual has Medical Assistance, it can be hard to find primary care providers and dentists who accept their coverage. According to the ACS, 8.57% of the service area's population is without health insurance, falling below the state percentage of 8.85 and the nation's 13.21%. Statistics show Hispanic and Latino populations are roughly twice as likely to be uninsured than non-Hispanic populations[38].

The cost of medical services in the United States is high, making it difficult to pay out-of-pocket for care. If children are not covered by insurance, they are especially likely to have restricted access to healthcare services. According to the U.S. Census Bureau Small Area Health Insurance Estimates, roughly 4.17% of the St. Luke's Anderson service area population without medical insurance is under the age of 19. This rate is lower than the percentage statewide (4.25%) and the same measure nationwide (5.05%)[39].

Our patients utilize a variety of methods of payment to cover their healthcare needs. According to our internal reviews, the highest percentages of our patients use medical assistance plans or Medicare to cover their healthcare costs. This distribution of insurance plans mirrors the pattern seen throughout the network considering all types of care, with Medicare, Commercial (Private) and Medicaid as the three most popular forms of insurance used. Additionally, charity care is included in the self-pay category, which represents 2.9% of the coverage methods our patients utilize, which is lower than the 5.45% seen in the 2016 CHNA. An additional 16.7% of patients utilized Medicaid, which is lower than the 19.25% seen in the 2016 CHNA. Figure 26 looks at the primary insurance types used by Anderson respondents. Roughly 56.6% of respondents from the St. Luke's Anderson service area used private insurance, whereas 2.0% were uninsured and paid out-of-pocket for their medical expenses.

[37] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/
[38] https://www.census.gov/quickfacts/
[39] https://www.census.gov/quickfacts/

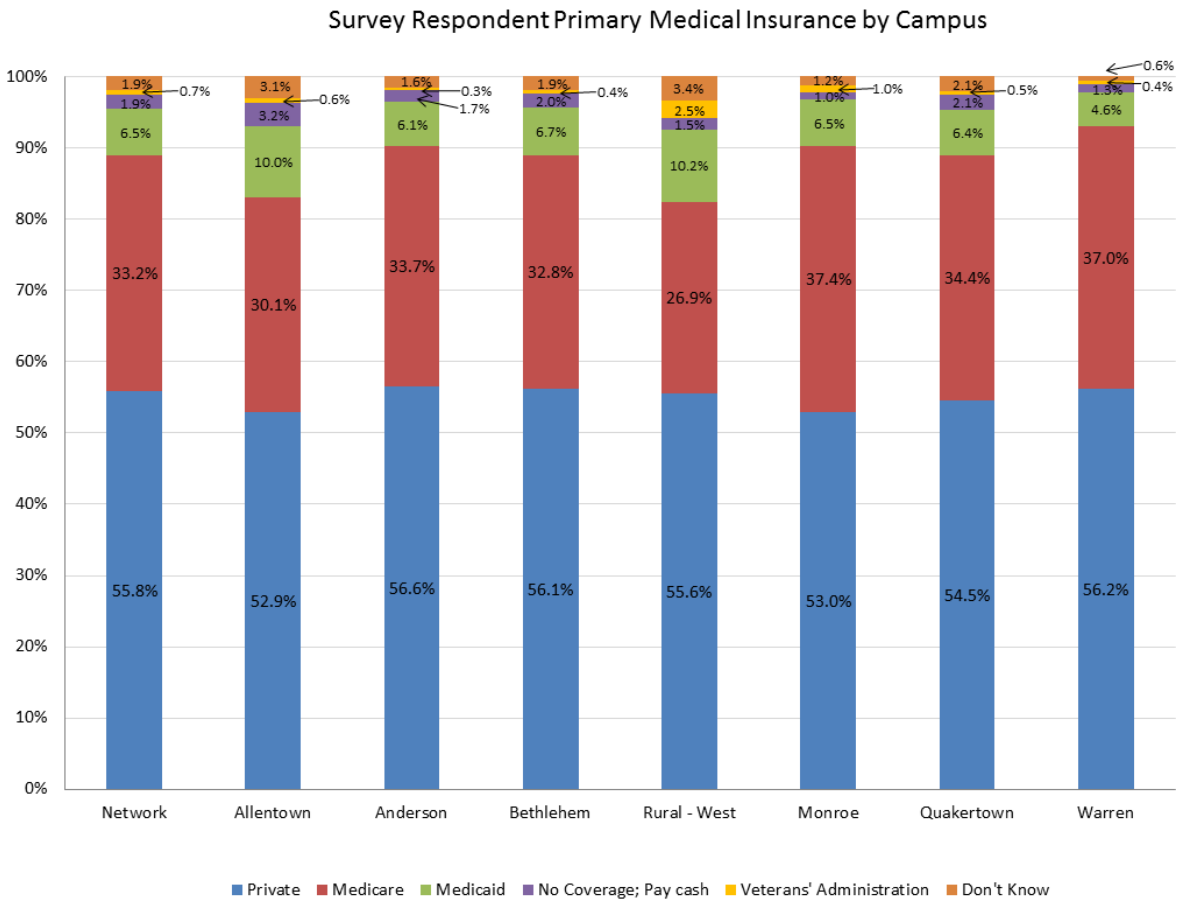


Figure 26

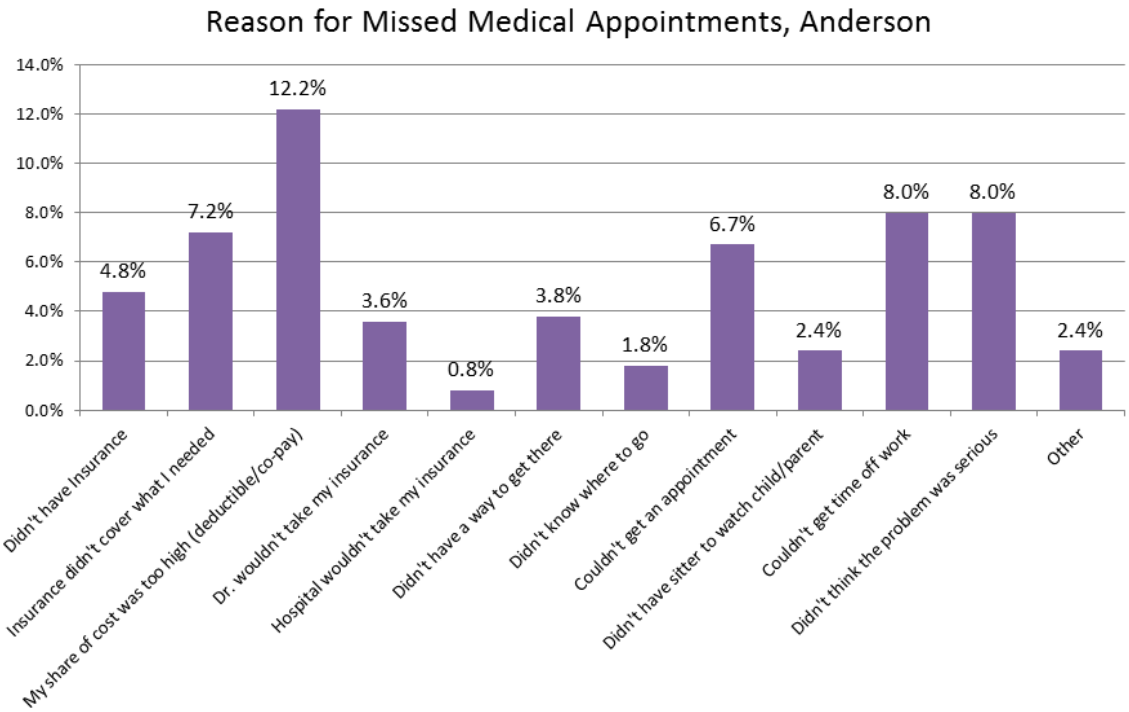


Figure 27

A lack of insurance or comprehensive coverage affects a patient's willingness to pursue getting medical treatment for their ailments. Our 2019 community survey clearly illustrated this: the top reason that St. Luke's Anderson service area respondents gave for postponing care was their share of the cost was too high (12.2%), they couldn't get time off from work (8.0%) as the second top reason, and they didn't think the problem was serious (8.0%) as the third (Figure 27). These findings echo what was shown in the 2016 survey, where the top three reasons for missed medical appointments among survey respondents were: they didn't think the problem was serious, their share of the cost was too high, and they didn't have health insurance. Access to quality health insurance is a social determinant that alters one's ability to receive care in a timely and efficient manner.

Health Behaviors

Access to Healthy Food and Transit

Access to nutritious food directly impacts one's ability to maintain a healthy lifestyle and prevent chronic disease. Nutritious foods are often less available at convenience stores than they are at full-service groceries and supermarkets[40]. By examining a community's access to supermarkets, both in terms of proximity and ease of commute, we can map out the availability of healthy foods in a service area. To explore some of the most under-resourced neighborhoods we serve, we examined the availability of supermarkets in the ten lowest income census-tracts that send patients to our Anderson campus. We found that the average rate of residents in these areas living more than half a mile from a supermarket *and* without a vehicle is 10.8% across the ten tracts. This means that they are left to either shop at corner-stores - which tend to provide less healthy options[41] -, navigate the public transit system, or walk over a mile round-trip with their purchases in-tow. While this 10.8% represents an average across the ten lowest income census tracts, there are neighborhoods in which up to 20% of residents live more than half a mile and do not have a vehicle. This is considerably higher than both the Pennsylvania (5.4%) and US (4.2%) averages (Figure 28).

These ten lowest income census tracts also rely heavily on the Supplemental Nutrition Assistance Program (SNAP). Administered by the USDA, SNAP is meant to bolster families' resources by providing additional funding for food purchases each month. Eligible households fall below 160% the federal poverty level. For a family of four in Pennsylvania this means a maximum gross monthly income of $3,280 – or $39,360 pre-tax annually[42]. The average monthly benefit a resident of Pennsylvania receives is $122.02[43]. For lower income families this benefit is the difference between eating and going without food. The ten tracts together average 33.71% usage, with our lowest income tract having 56.20% of residents on SNAP. This is much higher than the 12.9% usage rate in Pennsylvania and 13.2% nationally (Figure 28).

[40] http://thefoodtrust.org/uploads/media_items/grocerygap.original.pdf
[41] https://www.cdc.gov/nccdphp/dnpao/state-local-programs/pdf/Healthier-Food-Retail-guide-chapter-3.pdf
[42] http://www.dhs.pa.gov/citizens/supplementalnutritionassistanceprogram/snapincomelimits/index.htm
[43] https://www.kff.org/other/state-indicator/avg-monthly-snap-benefits/

SLUHN Campus	Lowest Income Census Tracts (lowest first)	Median Family Income	Share of tract housing units that are without vehicle and beyond 1/2 mile from supermarket (FARA 2015)	**percentage of Tract Households Using SNAP (2012-2016 ACS)**
Anderson	NC 105; Northeast Bethlehem	$22, 008	9.30%	56.20%
	NC 112; South Side Bethlehem	$27,548	20.5%	48.80%
	NC 111; South Side Bethlehem	$29,375	7.7%	27.00%
	NC 143; Center City Easton	$33,929	27.6%	38.30%
	NC 110; South Side Bethlehem	$36,354	0.50%	34.30%
	MnC 3008; Stroudsburg	$39,769	4.70%	27.90%
	NC 146; South Side Easton	$41,797	10.20%	24.10%
	NC 109; South Side Bethlehem	$41,938	5.60%	33.70%
	NC 113; South Side Bethlehem	$43,973	14.00%	26.00%
	LC 94; West Bethlehem	$45,667	7.50%	20.80%
	AVG of 10 Lowest Income Tract	**$37,817**	**10.8%**	**33.71%**
National		$55,322	4.2%	13.20%
PA		$54,895	5.4%	12.90%

Figure 28

We found that, in general, the census tracts with the highest SNAP usage rates are the same ones that have high rates of residents living over half a mile from a grocery store and lacking a vehicle. For example, Northampton County Census Tract 112, located in South Side Bethlehem, has 20.5% of residents living beyond half a mile from a grocery store without a vehicle, and a 48.8% SNAP utilization rate. This area would be ideal for targeted interventions. SNAP enrollment interventions in this census tract could help families who are entitled to this benefit actually receive it. Another intervention would be expanding the healthy options available at corner stores like La Favorita, located in the middle of the census tract. This area is far removed from grocery stores, and thus many residents without a car rely on these types of stores to purchase their food. Partnering with these stores through interventions like the Healthy Corner Store Initiative, which works to ensure corner stores are stocking and selling healthy foods, could have a demonstrable impact on the quality of food to which residents in this area have access[44]. A third intervention, most effectively implemented in conjunction with the former two, would be to enlist stores in this census tract to offer the Food Insecurity Nutrition Incentive (FINI), a program that incentivizes the purchase of healthy produce by giving a dollar-for-dollar match on produce purchased using SNAP. All three of these interventions would increase the access to healthy food in this census tract that is currently lacking it.

Furthermore, Figure 29 maps the regions of the St. Luke's service area and designates regions considered to be "food deserts." Areas shaded in red denote low-income census tracts where a large portion of the residents live one mile away (for urban areas) or 10 miles away (for rural

[44] http://thefoodtrust.org/uploads/media_items/healthy-corner-store-overview.original.pdf

areas) from a grocery store[45]. These food deserts are another ideal place to implement strategic interventions to increase the availability of healthy food. Of our ten lowest income census tracts, only Northampton County 113 is located in a food desert as defined by 1 mile from a grocery store. When that is narrowed to half a mile from a grocery store – another metric used by the USDA to show lack of access – seven of our ten census tracts become food deserts.

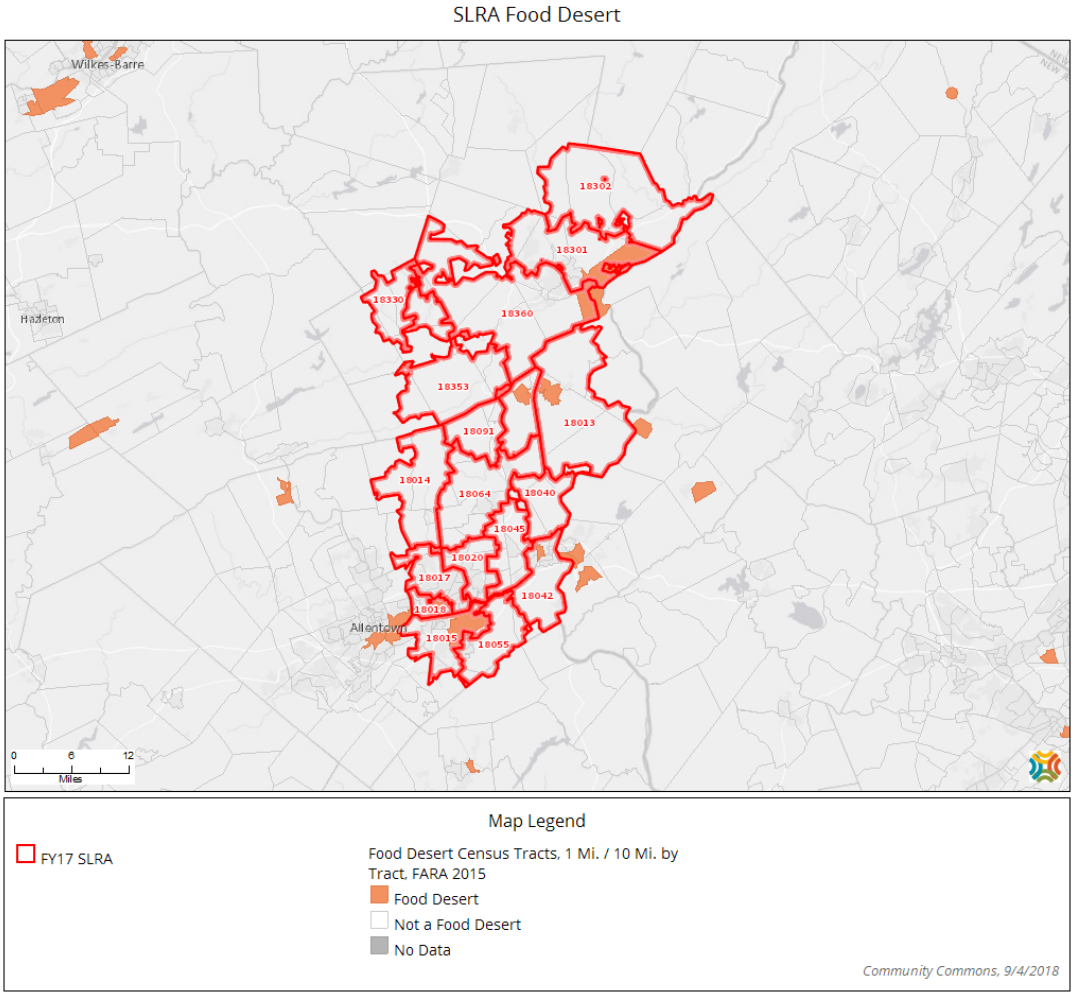


Figure 29

If a region is "food insecure," its residents have limited or inconsistent access to healthy food options. Identifying food insecure populations highlights an area's inability to provide all necessities for their families; therefore, individuals may have to resort to buying fast food instead of healthy options, such as fruits and vegetables. According to Feeding America, 13% of the nation's population is food insecure. In Northampton County, 9.4% are food insecure, and 12.5% are food insecure in the state[46]. And according to the CDC's 2018 State Indicator Report on Fruits and Vegetables, the state of Pennsylvania has 2.4 farmers markets per 100,000 residents.

[45] https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas.aspx
[46] http://www.feedingamerica.org/research/map-the-meal-gap/2016/2016-map-the-meal-gap-all-modules.pdf

Figure 30 depicts the neighborhoods of SLUHN's Anderson area that have limited food access. The darker shading of brown represents a higher percentage of low-income residents living beyond the USDA's distance thresholds for food accessibility. As evident by the figure, many neighborhoods in the area have over 50% of residents with limited access.

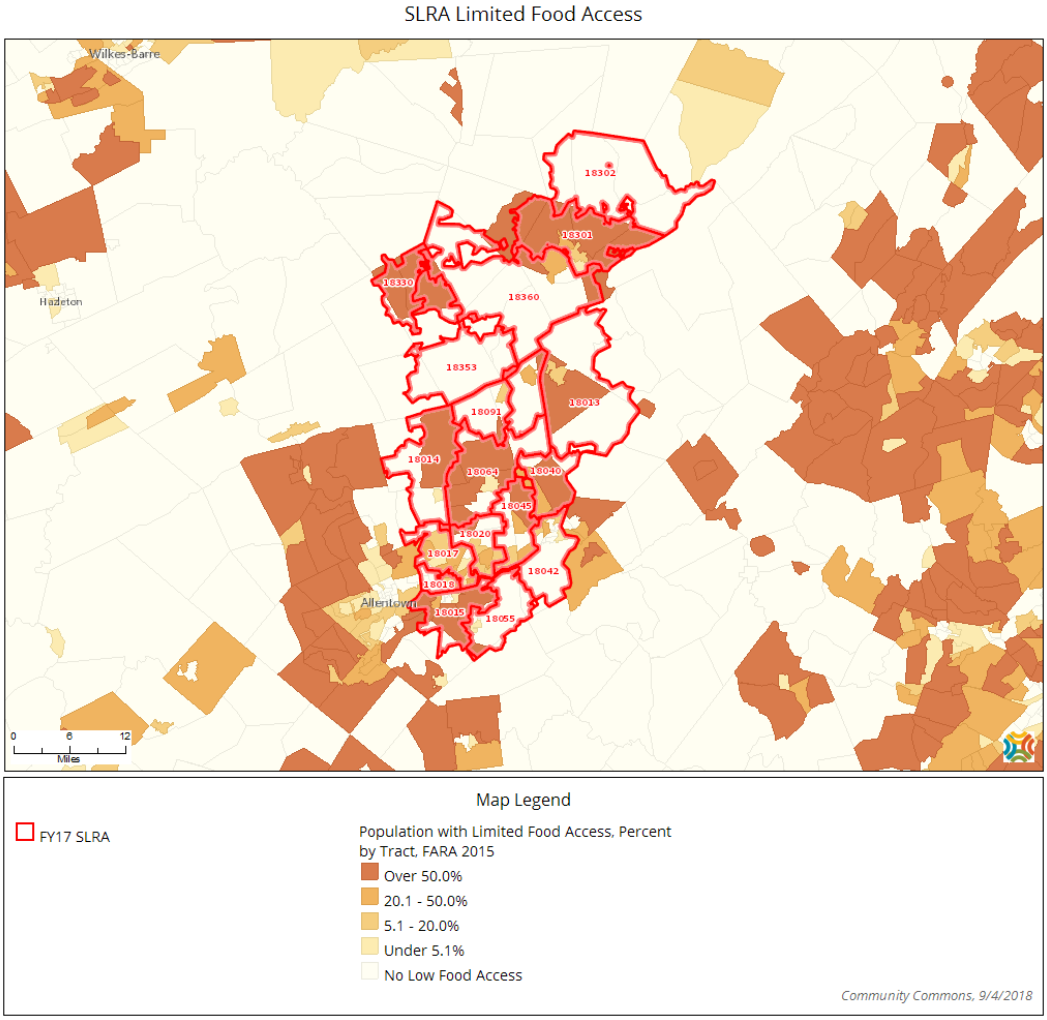


Figure 30

Key informant interviews identified the fairly large number of low-income and poverty-level families buying inexpensive, unhealthy food. Despite the local food pantries, there are high rates of food insecurity in the region. Students in Bangor and Pen Argyl, in particular, reported higher rates of food insecurity than the state average. As one respondent stated, "if our youth is reporting it, then it is affecting the entire family." However, they applauded local organizations' efforts in promoting healthy living, from creating community gardens to providing fresh produce to residents, to the increased number of local food pantries and free school lunches over the summer.

These sentiments were echoed at a recent community forum. Participants described food insecurity as one of the most significant challenges that is emerging in the region. Among the many aspects related to food insecurity a number of factors were noted: including food deserts;

limited information and stigma. A participant from a community organization stated, "When the USDA started looking at food deserts a number of years ago, there were originally four local deserts identified. Today there are nine and that's probably an undercount." He added that, "When you overlay transportation and other filters, you realize people can't get to local food. But even when you can give local food out for free, there's a stigma against that food." Another forum participant from a local non-profit added that "too much of the food given away is not healthy and induces more chronic diseases," and that "even when you can get healthy food options to target populations, they often have no idea how to cook it."

Food and nutrition concerns among children and adolescents were identified as part of the broader food insecurity challenges. A representative from a local school district said, "kids will only eat white bread and a can of peaches and aren't nearly getting enough nutrients to even function properly." The participant added. "These nutrition issues are certainly having an impact on the young people's mental health and learning capabilities."

Transportation concerns were also commonly mentioned as a challenge facing many residents of the Anderson area. A forum participant from a community organization said, "The lack of transportation is terrible with many people stuck where they are at." She added, "Taking a LANTA bus will take an entire day for one appointment and Uber rides are too expensive, so people just don't get to medical appointments or other important events." Another representative from a charitable organization described a scenario where, "We wanted to provide a local school district summer programming but because the school district is so large you have to provide transportation, which many parents can't afford and thus there is huge extra cost."

Public transit like LANTA is crucial for many of our low-income neighborhoods. Of the ten lowest income census tracts that we service with the Allentown campus, 22.1% of all households do not have a car, according to the USDA's FARA. Over one in five households in these neighborhoods need to rely on the public transportation system, ridesharing, or walking to meet daily needs like food.

Furthermore, for those who do have access to a car, 36% of workers in Northampton County report commuting solo more than 30 mins to work each day. This is the same as the state average. These numbers, from the Robert Wood Johnson Foundation's County Health Rankings, are important because prolonged commutes are associated with higher blood pressure, BMI, and physical inactivity[47]. Almost all key informants urged the need to improve the existing transportation system. Public transportation affects all aspects of day-to-day life, from being able to access grocery stores and exercise opportunities, to making it to work or medical appointments on time. However, respondents did clarify the region is committed to making pedestrian safety a priority and increasing accessibility throughout the city of Easton.

In the St. Luke's Anderson region, only 10.5% of respondents were meeting the national recommendation and consuming five or more servings of fruits and vegetables a day. SLUHN's service area reported 9.6% meeting the recommendation. The largest number of respondents reported consuming one or two servings in a day (48.2%), followed by 34.2% consuming three to four servings of fruits and vegetables (Figure 31).

[47] https://www.ajpmonline.org/article/S0749-3797%2812%2900167-5/abstract

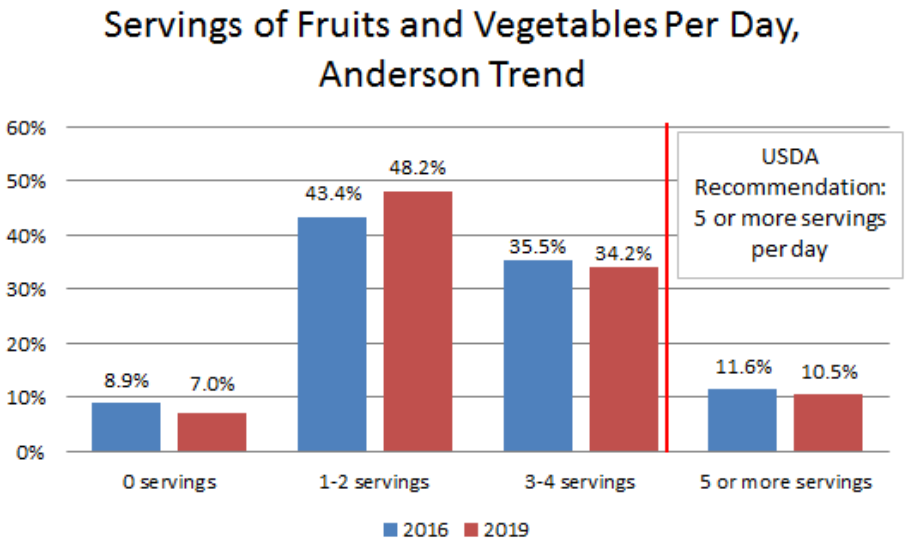


Figure 31

Furthermore, when looking at fruit and vegetable consumption by income category, 2019 CHNA survey data show that fruit and vegetable consumption increases with income. According to SLUHN service area survey respondents, approximately 15% of respondents in the $14,999 or less category and 13% of those in the $15,000 to $24,999 category reported consuming no servings of fruits and vegetables, compared to 5% of respondents in the $60,000 or greater category (Figure 32).

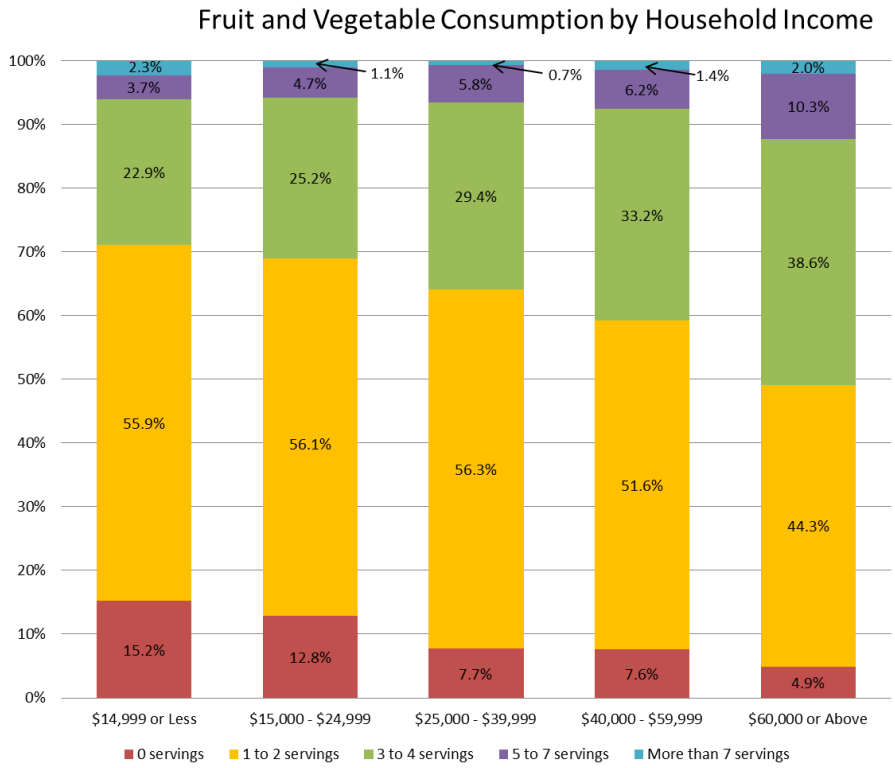


Figure 32

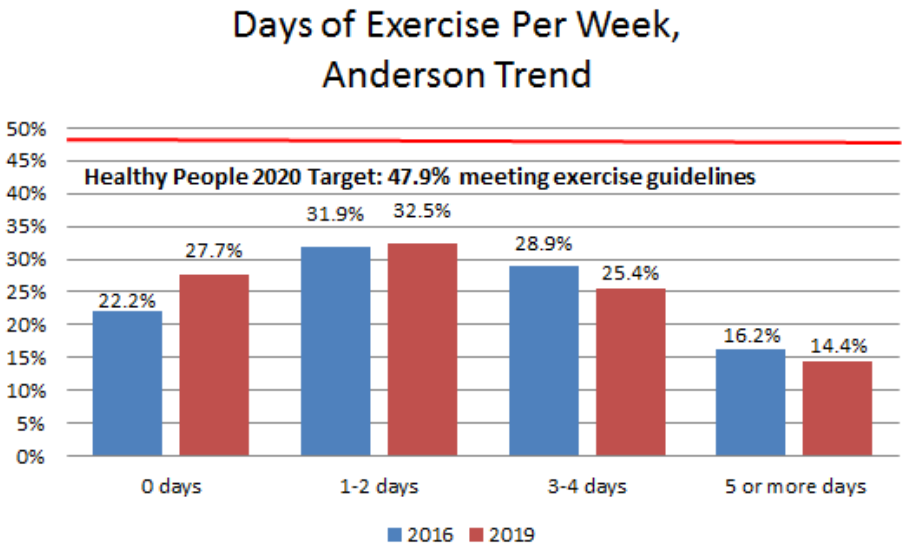
Free or Reduced Lunch

A consistent diet high in nutrients is pivotal to personal health, especially during childhood. For children living at or below the poverty level, access to healthy foods is more difficult. The National School Lunch Program (NSLP) operates in public and private schools to provide free or reduced-price lunches to children in poverty. Looking at populations eligible for this program may indicate children who are vulnerable to poor nutrition and other health-related issues. About 43.15% of children in the St. Luke's Anderson service area are eligible for free or reduced-price lunch. This number is lower than both the national average (52.61%) and the state (48.16%)[48]. Looking at these numbers may indicate a percentage of children who may not be able to receive the nutritional meals they need at home and may also indicate children who are vulnerable to health issues stemming from malnutrition. Some schools in the Anderson region provide free or reduced-price lunches throughout the summer months for children and adolescents who rely on school lunches throughout the academic year.

Days of Exercise per Week

Lack of physical activity among community members is a major barrier in promoting healthy lifestyles and preventing chronic disease. Consistent exercise has been shown to improve both physical and mental health and is vital to decreasing rates of obesity and cardiovascular problems. Healthy People 2020 advocates for 150 minutes of exercise per week for adults – an average of 30 minutes per day for five days a week. County Health Rankings reports 26% of Northampton County residents have no leisure time physical activity. State and national rates fall at 24% and 20% respectively, making Northampton County less active on average[49].

Figure 33



From our 2019 community survey data, we found 27.7% of respondents reported no days of exercise per week in the St. Luke's Anderson service area. Less than half (39.8%) of these survey respondents reported exercising more than three days per week (including three to four days and five or more days) (Figure 33). These data show that since there are few people who are exercising consistently, a higher percentage are not living an active lifestyle or participating in enough physical activity to stay healthy. Our survey data also indicate only 14.4% of respondents network-wide are exercising at least five times per week and meet the Healthy People 2020 recommendation.

[48] https://nces.ed.gov/pubs2018/2018466.pdf
[49] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

Access to Exercise Opportunities

In order to maintain an active lifestyle, a region must provide ample access to exercise opportunities within the built environment. One of the indicators from County Health Rankings extracts the percentage of individuals in a county who live reasonably close to a location which can be used for physical activity, such as outdoor parks or recreational facilities. According to 2017 data, 74% of Northampton County has access to exercise opportunities, compared to the state (68%) and the nation (91%)[50]. Despite the rankings for the county, key informants noted an adequate amount of access to exercise opportunities, from local parks and trails to gyms and other organizations.

Obesity

Obesity is a prevalent health issue in our community in particular. High poverty levels, physical inactivity and limited access to healthy foods result in increased levels of obesity. If an individual is obese, they are at a higher risk of developing diabetes, high blood pressure, heart disease, stroke, some cancers, and breathing problems. Rates of adult obesity in Pennsylvania are on the rise. With 51 being the least obese state and one being the most obese, the state is ranked at 25th[51]. Recent data show 30% of state residents and 26% of the nation are obese, compared to 29% in the county[52]. In calculating survey respondents' BMI using their weight and height, we found 40.8% of Anderson service area respondents were obese (Figure 34), and an additional 32.2% were overweight. This is greater than both state and national levels.

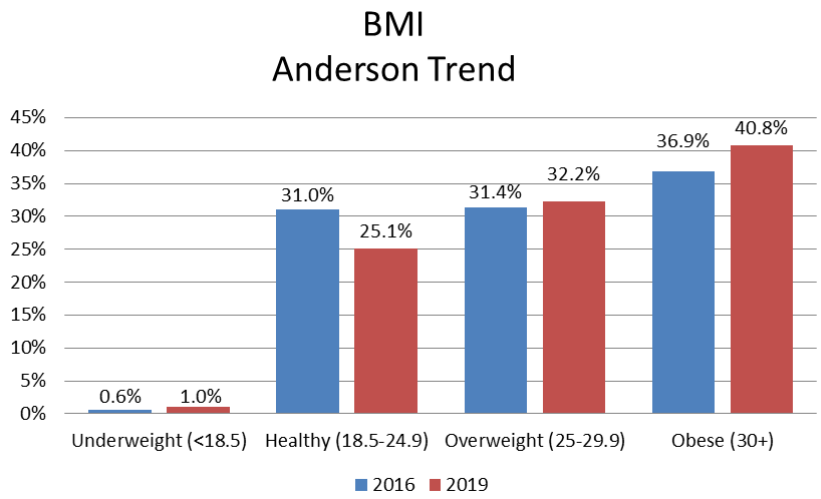


Figure 34

Results from our 2019 community survey identified several demographic characteristics network-wide that were correlated with a respondent's BMI. When looking at the relationship between income and BMI among all survey respondents, the income category with the highest percentage of respondents who were morbidly obese (having a BMI over 40) earned $15,000 to $24,999 per year (13.0%). Conversely, 6.9% respondents who reported having an annual income

[50] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/
[51] https://www.tfah.org/reports/stateofobesity2016
[52] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

of $60,000 or greater were morbidly obese. The income range with the highest percentage of obesity was those earning less than $25,000 at 47.8%, while the lowest percentage of obesity was 37.9% for those making $60,000 or more annually (Figure 35). These trends suggest a link between BMI and income level, giving example to how social determinants of health directly affect health outcomes. This connection emphasizes the importance of taking social determinants of health into consideration when making action plans to improve community health. Making connections between social determinants of health and obesity is necessary when developing initiatives to reduce rates of obesity in the region.

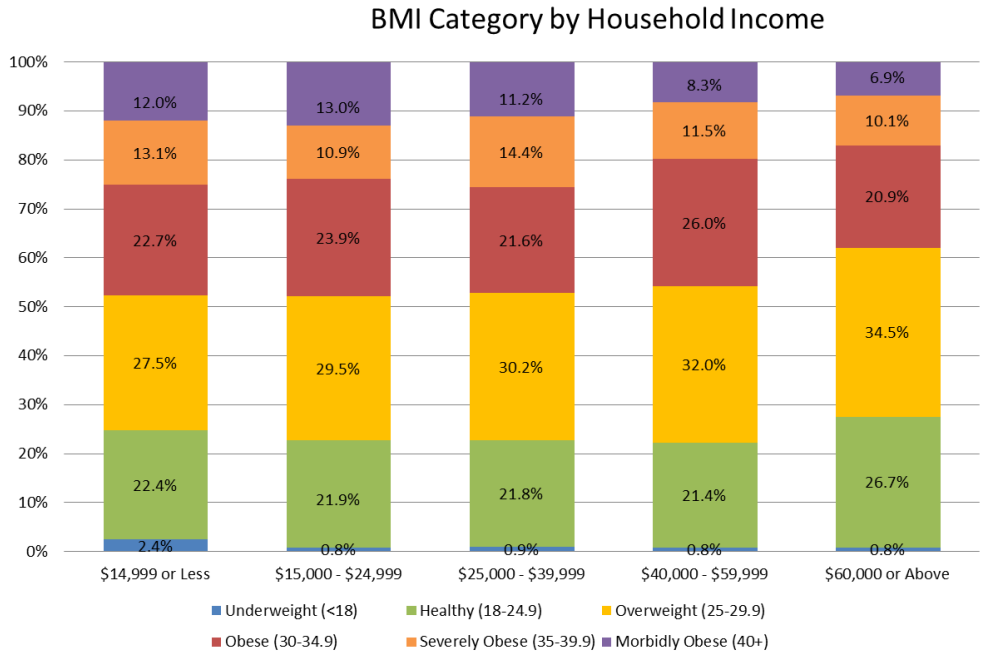


Figure 35

Diabetes

Diabetes lies tantamount to obesity and has become a prevalent health concern in our community. While it has its own set of detriments, having diabetes can also contribute to health issues such as blindness, kidney disease, foot problems, and heart disease. There are treatments for type II diabetes – such as better diet, exercise and medications. As per the National Diabetes Statistics Report (2017), an estimated 30.3 million people in the United States have diabetes, with 23.8% of those individuals being undiagnosed. What's more, a staggering 33.9% of the adult U.S. population has prediabetes.

In examining rates of obesity, Trust for America's Health discovered rates of diabetes in the nation almost doubled since the beginning of its studies, moving from 6.1% in 1990 to 11.3% in 2016. At its current pace, however, there may be a projected 1,731,248 cases of diabetes nationwide by 2030 – an increase of 34%[53]. The state is ranked 15th out of 51 states, with 1 being the most obese and 51 being the least[54].

[53] https://www.tfah.org/reports/stateofobesity2016
[54] https://www.tfah.org/reports/stateofobesity2016

Additionally, 2019 survey results indicated that there is an inverse relationship between diabetes prevalence and annual income, as evidenced by the fact that SLUHN service area respondents in the $14,999 or less (19.3%) and $15,000 to $24,999 (21.0%) income categories had higher reported diabetes diagnosis rates than those in the $60,000 or above income category (12.2%) (Figure 36). Similarly, to BMI, it is important to keep this relationship between social determinants of health and disease status in mind when planning interventions to target diabetes in the community.

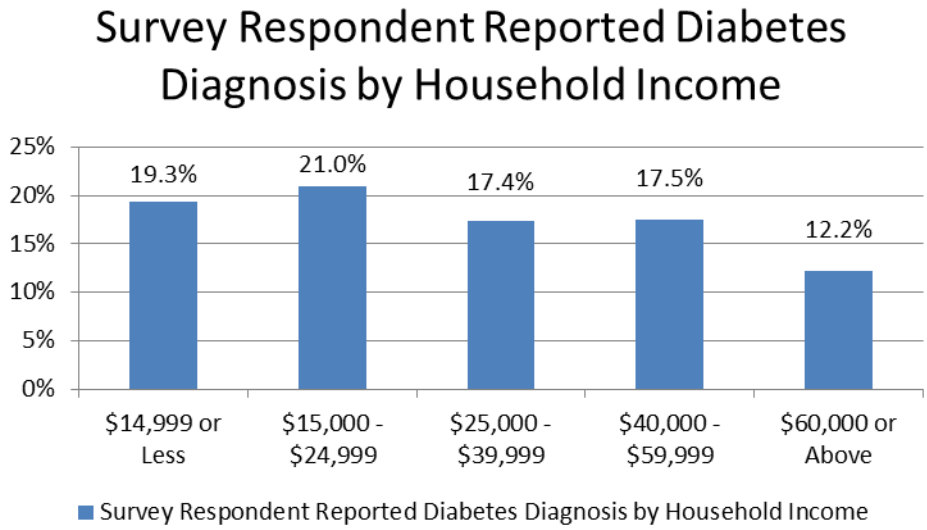


Figure 36

Tobacco Usage

Smoking contributes to illnesses such as cardiovascular disease, cancers, and breathing conditions. In order to promote healthy living, cutting down on tobacco usage within the community is a necessity. According to County Health Rankings, 14% of adult U.S. citizens smoke, compared to the 18% in the state and 15% in Northampton County[55]. For the St. Luke's Anderson service area specifically, 8.6% of adults over the age of 18 reported to our community survey that they currently smoke (Figure 37). This is lower than the Healthy People 2020 goal of having only 12% of adults smoking by 2020; however, efforts at improvement should continue to be made, especially among our vulnerable populations. Survey responses for SLUHN service area indicated that smoking rates are inversely related to annual income level. 26.8% of all respondents reporting incomes of $14,999 or less reported smoking, compared to 6.5% of those reporting incomes of $60,000 or above (Figure 38).

[55] http://www.countyhealthrankings.org/app/pennsylvania/2018/rankings/

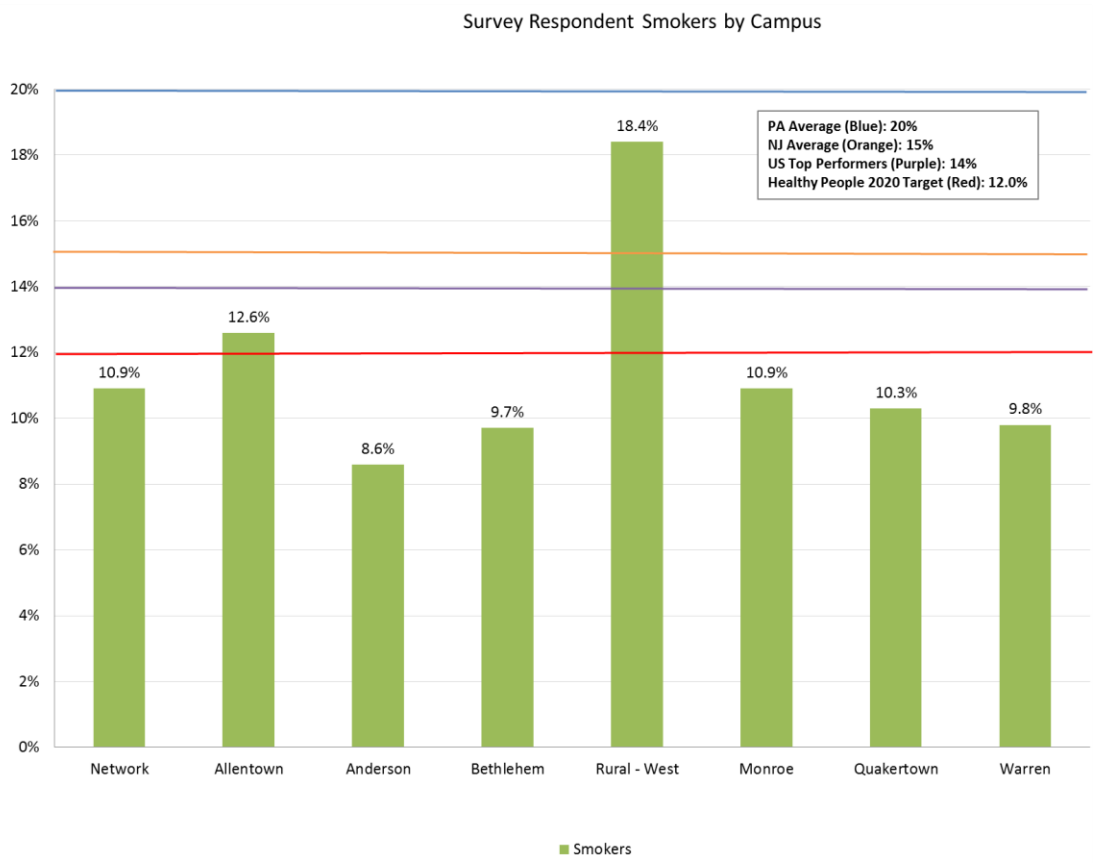


Figure 37

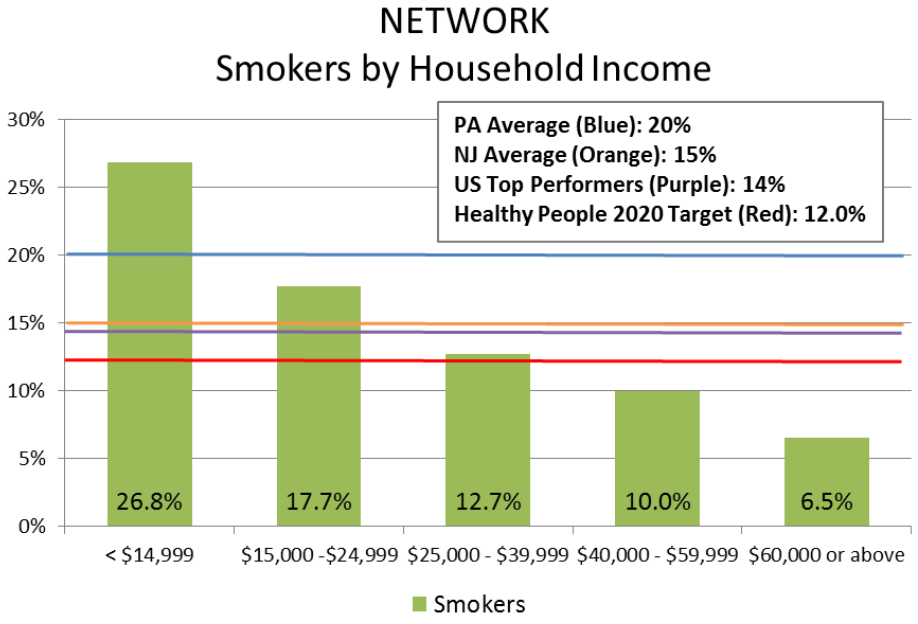


Figure 38

According to the Pennsylvania LGBT Health Needs Assessment, 30.6% of survey respondents reported being current smokers, which is significantly higher than the 18% average in Pennsylvania, and 10.9% smoking rate reported in our CHNA survey. Additionally, Figure 39 compares the reported use of different tobacco products among LGBT survey respondents and SLUHN CHNA survey respondents.

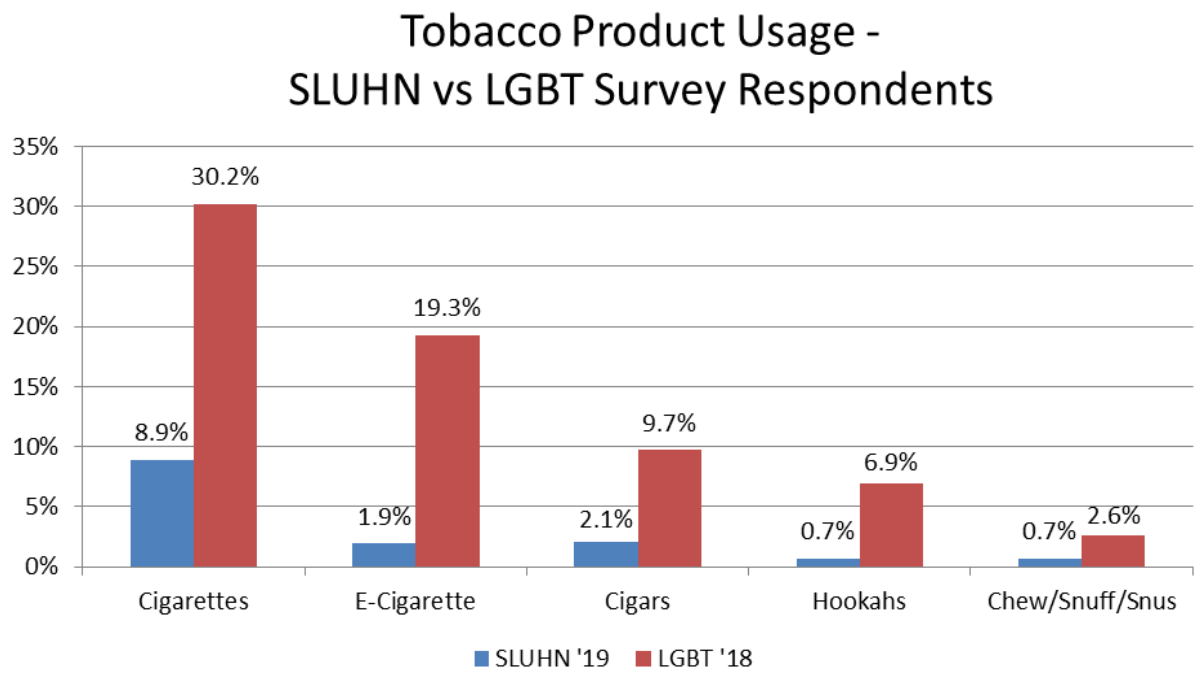


Figure 39

Substance Abuse

It is imperative to discuss excessive drinking and substance abuse disorders, since they are recognized as comorbidities with mental health issues. In many cases, mental health issues go undetected because alcoholism and substance abuse can overshadow mental illness. According to County Health Rankings, 20% of the population in Northampton County report excessive drinking, compared to 21% in the state and 13% nationally. As shown in our 2019 community survey, 81.9% of St. Luke's Anderson service area respondents reported no episodes of binge drinking in the past month. However, 18.1% reported having one or more episodes of binge drinking, and 5.9% had three or more episodes. Anderson respondents reported less episodes of binge drinking than those in other service areas (Figure 40). When looking at binge drinking by sex among all SLUHN respondents, 83.3% of female respondents reported no episodes of binge drinking, compared to 76.5% of male respondents.

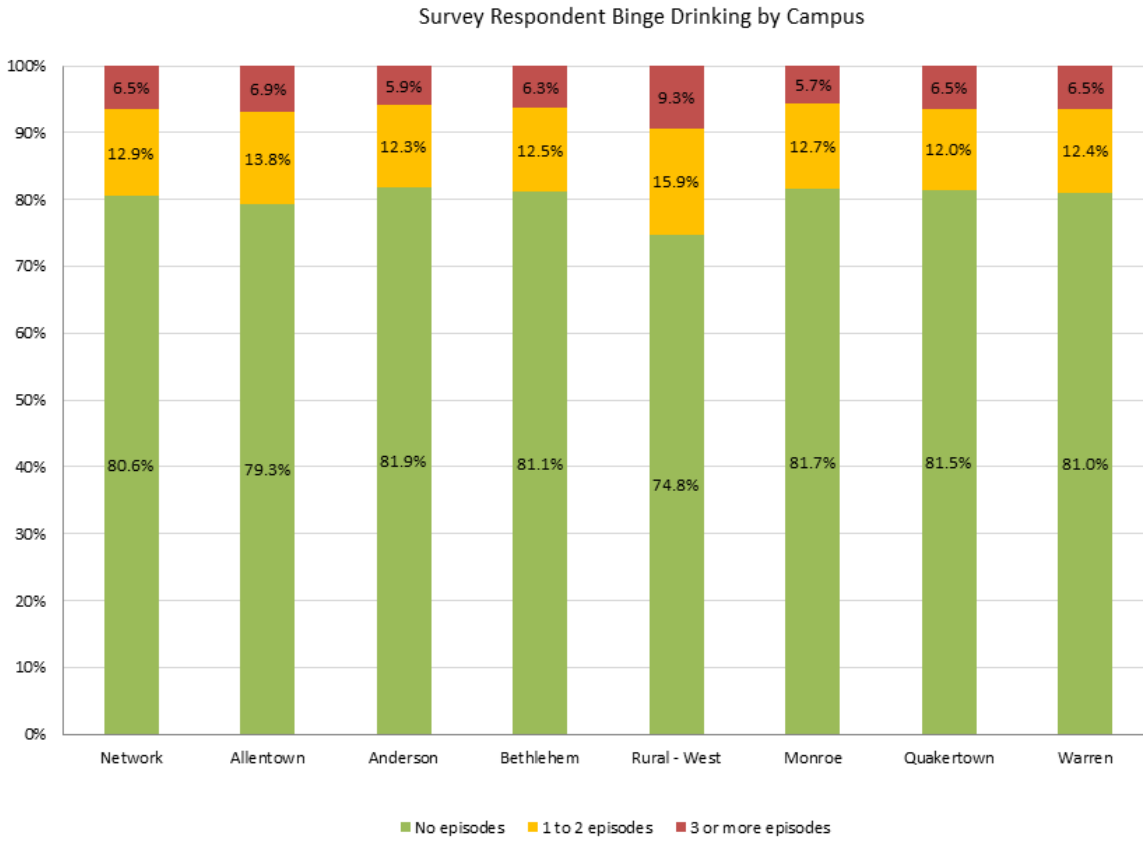


Figure 40

In January 2018, Governor Tom Wolf issued a disaster declaration for the heroin and opioid epidemic, stating "[e]very day we lose 10 Pennsylvanians to the disease of addiction." In response to the growing need to treat this medical crisis, the PA Department of Drug and Alcohol Programs (DDAP) published a Drug and Alcohol Annual Plan and Report since 2009. In their most recent addition, published in 2015-16 analyzing data from 2013-14, the DDAP found there were 37,735 unique clients (single persons "who [have] been admitted and [have] received any substance abuse treatment at a licensed provider during the given state fiscal year"). In addition, there were 53,047 total admissions, wherein each unique client can have multiple admissions.

Out of all admissions, 66.2% of those who received treatment were unemployed, compared to 15.3% who worked full-time and 6.5% who worked part-time. An overwhelming 37.8% of admitted individuals listed heroin as their primary drug of use, followed by 29.5% using alcohol, 12% using marijuana, and 11.2% using other opiates and synthetics. These percentages of heroin and alcohol usage have seemed to switch since initial 2009-10 data, wherein 38.66% listed alcohol and 20.9% listed heroin as their primary drug of use[56].

When comparing demographic data, DDAP found men used alcohol more than women, and women used heroin more than men. People who identified as Black used marijuana more than

[56] https://www.ddap.pa.gov/Reports/State%20Plan%20and%20Annual%20Reports/2015-2016

those who identified as White, and those who identified as White used heroin more than those who identified as Black. In a similar vein, those who identified as Hispanic used marijuana more than those who identified as non-Hispanic, and those who identified as non-Hispanic had a higher prevalence of using opiates[57].

Also, in 2018, Muhlenberg College Institute of Public Opinion published their findings on substance abuse in the Lehigh Valley. The report found higher levels of disparities in those misusing or abusing opiates or heroin, compared to those using other substances such as alcohol and marijuana. About 74% of employers reported having a major or minor concern about opioid abuse, and 70% were concerned about heroin abuse. In terms of misuse and abuse at work, 28% of employers reported employee use of drugs at work, with 21% reporting employees using painkillers. About 15% of employers reported employee absenteeism due to use, and 12% were impaired in their work performance. The most popular approach to employees abusing or misusing alcohol or marijuana was to allow the employee to return to work after treatment (40%), whereas 34% of employers choose to dismiss employees who abuse or misuse heroin. Over one-fourth of employers (28%) indicated employee abuse and misuse of drugs makes it hard for their organizations to hire and retain qualified employees[58].

The Northampton County Heroin and Opioid Overdose Task Force aims to "improve data collection related to heroin and opioid overdoses, increase access to substance abuse treatment programs, increase access to naloxone, [and] provide community-based education and awareness programs via worksites." In 2018, the task force gathered county- and city-wide internal data to assess the impact of drug misuse on the region. For Northampton County, there were 250 total overdoses in 2015; this number more than doubled to 567 in 2016 and dropped slightly to 558 in 2017. There were 130 men and 120 women who overdosed in 2015, 311 men and 256 women who overdosed in 2016, and 303 men and 255 women who overdosed in 2017. Additionally, there were 71 overdose deaths in 2015; this number dropped by one in 2016, but then jumped to 109 in 2017.

Health behaviors in childhood and adolescent years tend to carry over into adulthood. If we can identify what risky health behaviors are prevalent among youths, we can target these behaviors and determine how to reduce their frequency. The Pennsylvania Youth Survey (PAYS) looks at youth attitudes, knowledge and behavior regarding drugs and alcohol, as well as mental health. PAYS reports are broken down by county, so here we will specifically focus in on Northampton County, since it is the county where most of the St. Luke's Anderson service area lives. In measuring substance use in the last 30 days, the Pennsylvania Youth Survey found alcohol was the most popular substance among Northampton County middle and high school students at 20.3%, compared to the 18.2% average statewide. Marijuana was ranked second, at 10.5% usage in Northampton County and 9.4% statewide. When asked about driving while under the influence, 1.7% of Northampton County students said they drove after alcohol use in the last year and 3.8% after marijuana use. For the state of Pennsylvania, 2.4% of students drove after using alcohol and 3.5% after using marijuana[59].

[57] https://www.ddap.pa.gov/Reports/State%20Plan%20and%20Annual%20Reports/2015-2016
[58] Muhlenberg College Institute of Public Opinion, 2018
[59] https://www.pccd.pa.gov/Juvenile-Justice/Pages/Pennsylvania-Youth-Survey-(PAYS)-2017.aspx

Before announcing the disaster declaration, Governor Wolf provided legislation to fund opioid treatment services in 45 "Centers of Excellence" across the state. Across the entire SLUHN service area, there are five Centers of Excellence – the Clinical Outcomes Group, Inc. in Schuylkill County; the Family Service Association of Bucks County, Mt. Pocono Medical in Monroe County, and the Neighborhood Health Centers of the Lehigh Valley in both Lehigh and Northampton Counties.

*Please see the Substance Abuse Addendum included at the end of this assessment.

Child and Adolescent Health

Health behaviors in childhood and adolescent years tend to carry over into adulthood. If we can identify what risky health behaviors are prevalent among youths, we can target these behaviors and determine how to reduce their frequency. The Pennsylvania Youth Survey (PAYS) looks at youth attitudes, knowledge and behavior regarding drugs and alcohol, as well as mental health. PAYS reports are county specific, so here we focus on Northampton County, since it is the county where most of the St. Luke's Anderson service area lives.

Alcohol, the most commonly used substance by the students surveyed, was consumed at least three times in the past month by 15.1% of all 12th graders, 6.1% of all 10th graders, and 1.9% of all 8th graders (Figure 41). Early exposure to alcohol is one of the strongest known links to alcohol abuse later in life[60]. While there still remains debate over the physiological effects of alcohol on adolescent development, there is some theoretical and empirical evidence that suggests that alcohol usage can have detrimental impacts on neurologic and endocrine development[61]. There is, however, stronger evidence to conclude that alcohol usage at younger ages is associated with poorer performance in school and riskier sexual behavior[62]. When asked how they got alcohol in the past year the three most common responses were: 1) A parent or friend's parent, 2) Sibling, friend, or friend's sibling, 3) Gave someone older money to buy it.

How many times in the past 30 days have you had beer, wine, or hard liquor?							
Grade	0 Times	1 - 2 Times	3 - 5 Times	6 - 9 Times	10 - 19 Times	20 - 39 Times	40 + Times
6th	96.60%	3.00%	0.40%	0.00%	0.10%	0.00%	0.00%
8th	90.9%	7.20%	1.50%	0.30%	0.10%	0.00%	0.00%
10th	79.8%	14.20%	4.00%	1.00%	1.00%	0.00%	0.10%
12th	63.40%	21.40%	9.30%	3.30%	2.00%	0.30%	0.20%

Figure 41

Additionally, CHNA survey data indicate that the young adult (18-24 year old) age group reported the highest amounts of binge drinking, with nearly 18% of all respondents reporting 3 or more episodes of binge drinking in the past 30 days (Figure 42).

[60] https://pubs.niaaa.nih.gov/publications/arh26-4/287-291.htm
[61] https://pubs.niaaa.nih.gov/publications/arh26-4/287-291.htm
[62] https://pubs.niaaa.nih.gov/publications/AA67/AA67.htm

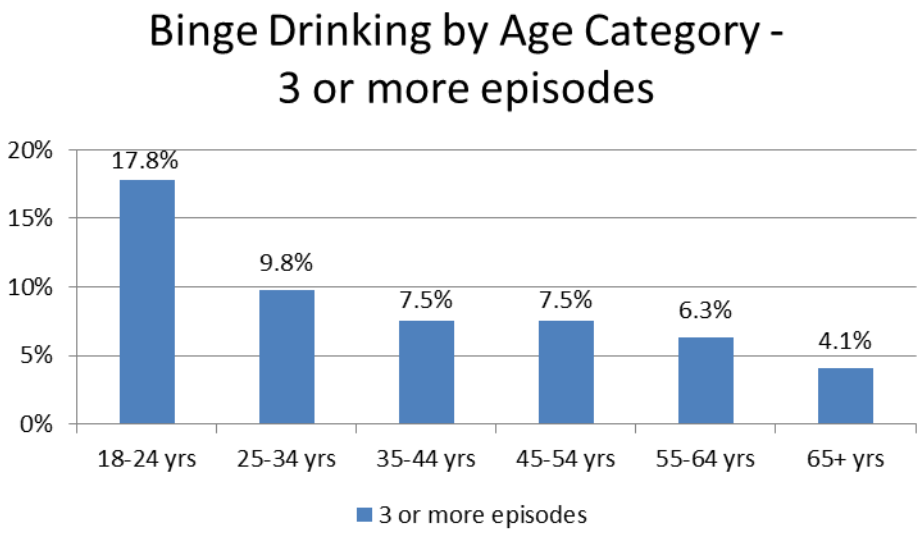


Figure 42

Another established risky behavior in adulthood and adolescence is cigarette smoking. Cigarette smoking causes nearly half a million deaths every year in the United States in the form of its influence on cases of lung cancer, COPD, stroke, and heart disease[63]. It is important to reduce the rates of young people smoking because, according to the World Health Organization, "most young people who smoke regularly will continue to smoke through adulthood", compounding and exacerbating the short-term effects of cigarette smoking into even more fatal long-term consequences. In Northampton County, over 4% of all 12th graders surveyed reported smoking traditional cigarettes at least once a week (Figure 43).

How frequently have you smoked cigarettes during the past 30 days?					
Grade	0 Times	1 - 2 Times	1 - 2 A Week	Once a Day	More Than Once a Day
6th	99.70%	0.30%	0.00%	0.00%	0.00%
8th	98.20%	1.30%	0.30%	0.20%	0.00%
10th	97.00%	1.70%	0.30%	0.30%	0.70%
12th	91.60%	4.10%	1.50%	0.80%	1.90%

Figure 43

Similar to binge drinking, CHNA survey data indicate that reported smoking rates decrease with age, with the 18-24 age group having the highest rate and the 65+ age group having the lowest rate (Figure 44).

[63] https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm

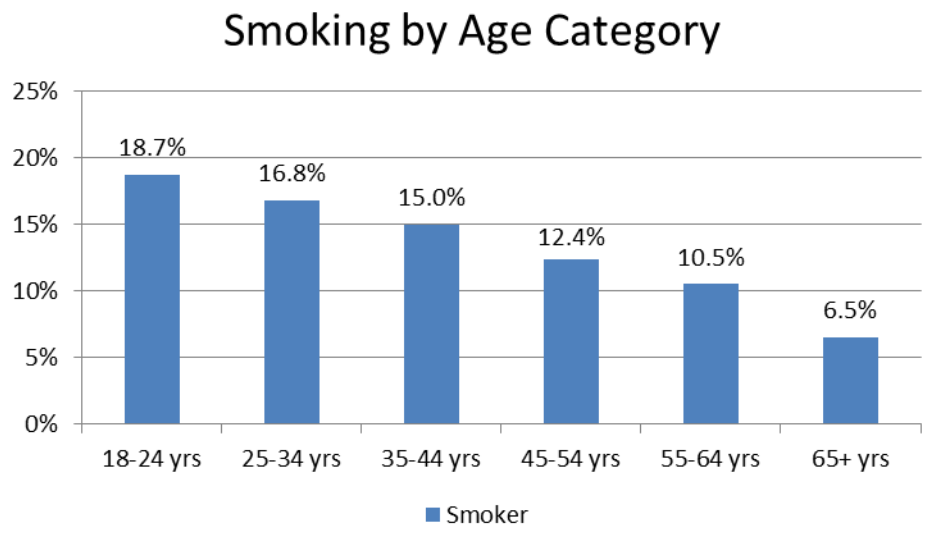


Figure 44

An emerging trend is youth substituting traditional cigarettes for electronic-vapor products including e-cigarettes, e-cigars, vape pipes, vape pens, e-hookah, and hookah-pens. From 2011 to 2015 there was 900% increase in the usage of e-cigarettes among high school students nationally[64]. In 2016 the Surgeon General declared youth usage of vapor products to be a significant public health concern. While the exact chemicals in the vapor vary greatly between products and brand, many have nicotine, known to impact brain development, and other detectable toxic and cancer-causing chemicals[65]. In Northampton County, the usage of electronic-vapor products is much more prevalent among youth surveyed than traditional cigarettes. Over 10% of 12th graders reported using a vapor product at least once a week in the past month (Figure 45).

How frequently have you used an electronic vapor product such as e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, or hookah pens during the past 30 days?					
Grade	0 Times	1 - 2 Times	1 - 2 Times a Week	Once a Day	More Than 1 a Day
6th	97.8%	1.8%	0.30%	0.10%	0.10%
8th	90.5%	7.1%	1.80%	0.20%	0.40%
10th	84.8%	11.20%	2.30%	0.70%	1.00%
12th	74.90%	14.90%	4.7%	1.90%	3.70%

Figure 45

This reported utilization of electronic vapor products among young adults is also seen in the CHNA survey responses. Figure 46 depicts reported tobacco product usage by age group, and it is evident that the highest rates of electronic vapor products are among the younger age groups.

[64] U.S. Department of Health and Human Services. E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General. 2016

[65] https://www.lung.org/stop-smoking/smoking-facts/e-cigarettes-and-lung-health.html#sources

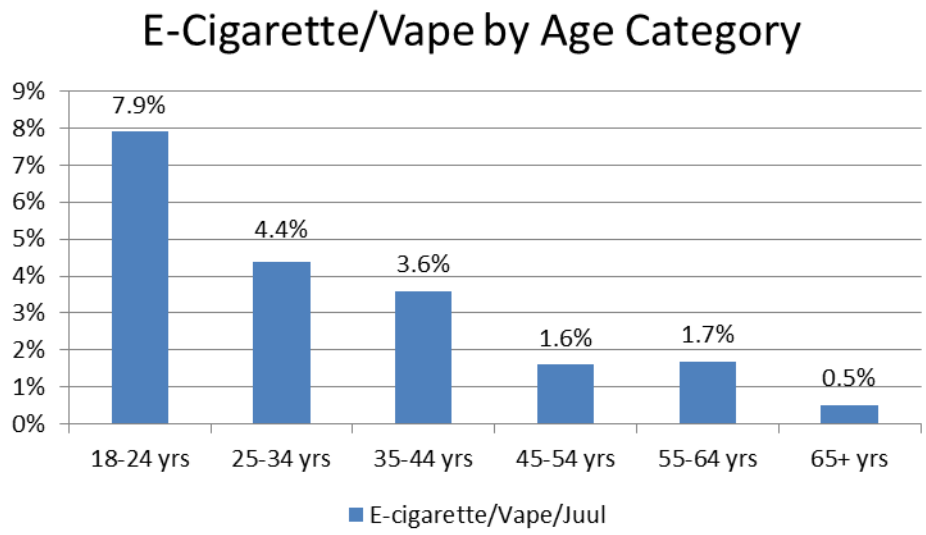


Figure 46

Another area of serious concern is mental health. PAYS report a number of alarming statistics related to depression, self-harm, and suicide rates among surveyed students. For example, 19% of 8th graders report having inflicted self-harm in the form of cutting, scraping, or burning themselves in the past year. Rates vary by grade, with 11.7% of 6th graders reporting self-harm, 17.6% of 10th graders, and 15.1% of 12th graders. Self-injury is commonly the result of depressive, anxious, confused, or distressed feelings[66]. When asked about feeling depressed *most days* in the past year, over 40.5% of youth responded some degree of "yes". Over 45% of 12th graders agree that they have felt depressed *most days* in the past year, with 18.1% expressing a strong agreement. At least 16% of all 8th, 10th, and 12th graders surveyed reported having "seriously considered attempting suicide" (Figure 47).

Did you ever seriously consider attempting suicide?		
Grade	no	Yes
6th	89.90%	10.10%
8th	83.10%	16.90%
10th	79.90%	20.10%
12th	77.60%	22.40%

Figure 47

Youth who report being bullied have an increased risk for suicide-related behavior[67]. Bullying also has long-term effects on youths' mental and physical health, likelihood of substance abuse, involvement in inter-personal and/or sexual violence, poor scholastic performance, and poor social functioning[68]. As such, prevalence of bullying in and out of schools is an important factor for youth and adolescent health. 17.3% of 6th graders report being bullied occasionally or more frequently, with 5.1% reporting having been bullied at least several times a week (Figure 48).

[66] http://www.mentalhealthamerica.net/conditions/self-injury-and-youth
[67] https://www.cdc.gov/violenceprevention/pdf/bullying-suicide-translation-final-a.pdf
[68] https://www.cdc.gov/violenceprevention/pdf/bullying-suicide-translation-final-a.pdf

Furthermore, the bullying doesn't have to occur in-person, with at 17.7% of respondents aggregated across grades reporting that they have been bullied through text or social media in the last year.

If you have been bullied in the past 12 months, how frequently were you bullied?						
Grade	No	Yes, Very Rarely	Yes, Now and Then	Yes, Several Times a Month	Yes, Several Times a Week	Yes, Almost Daily
6th	65.50%	17.2%	10.00%	2.20%	2.10%	3.00%
8th	64.80%	16.00%	10.10%	3.70%	2.20%	3.20%
10th	70.70%	14.30%	10.30%	2.10%	1.00%	1.60%
12th	75.40%	11.20%	8.90%	1.80%	1.40%	1.40%

Figure 48

Another important metric of youth health is safety. Exposure to school violence increases the likelihood of drug and alcohol usage, suicide, depression, and anxiety[69]. It also impacts student's ability to learn and get good grades. Nearly 13% of all 6th graders reported being "attacked, hit, or beaten up on school property" (Figure 49). Additionally, 3.8% of all students surveyed report having belonged to a gang at some point.

In the past 12 months, how often have you: Been attacked and hit by someone or beaten up on school property?						
Grade	No	Once	Two or Three Times	Four or Five Times	Six to Nine Times	Ten or More Times
6th	87.40%	9.20%	2.90%	0.30%	0.10%	0.10%
8th	90.10%	6.90%	2.10%	0.70%	0.00%	0.30%
10th	94.20%	3.90%	1.13%	0.20%	0.00%	0.40%
12th	94.90%	3.00%	1.10%	0.60%	0.00%	0.50%

Figure 49

According to the County Health Rankings produced by the Robert Wood Johnson Foundation, Northampton County has 14% of children living below the poverty line. This is lower than the state average of 18%. Childhood poverty is not distributed evenly throughout the county, with much of it existing in and around Bethlehem and Easton (Figure 50). In fact, the median household income in the highest income census tract we serve, Northampton County 169.01 in Lower Nazareth Township, is nearly five times greater than the median income in the lowest income census tract, Northampton County 105 northeast Bethlehem. The range of median income in all census tracts we serve is bookended by these two tracts, stretching from $106,755 a year to $22,008 a year. This disparity means that public health interventions need to be targeted to prioritize our lower income neighborhoods. Lastly Northampton County has a teen birth rate of 21.7 teenage mothers out of every 1,000 teenage women, a rate lower than the state's rate of 28 out of every 1,000[70].

[69] https://www.cdc.gov/violenceprevention/pdf/bullying-suicide-translation-final-a.pdf
[70] https://wonder.cdc.gov/

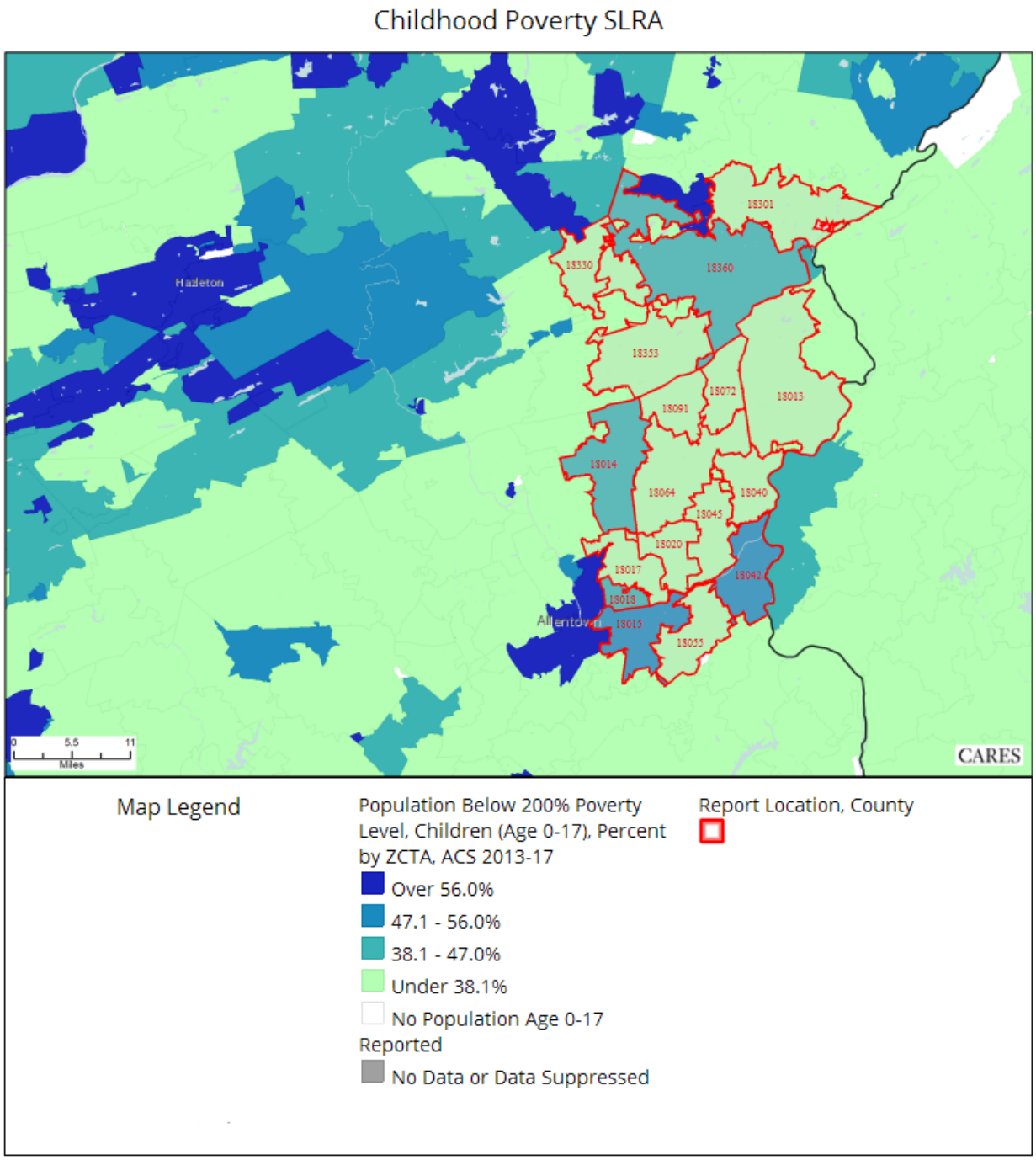


Figure 50

The Bangor Area School District reports having 22 students have experienced homelessness this year. Students experiencing homelessness have complex needs and additional challenges that the district isn't always equipped to deal with. Homelessness can impact mental and physical health, school performance, behavior, and attendance.

When assessing school performance, the guidepost of third grade reading proficiency is often employed. According to the National School Boards Association, "if children cannot read

proficiently by the end of third grade, they face daunting hurdles to success in school and beyond"[71]. In Pennsylvania, 64.7% of all third grade students scored either proficient or advanced on the PSSA reading comprehension section in the 2016-2017 school year. During that same year, 72% of 3rd graders in the Bangor Area School District scored proficient or advanced. Between elementary schools the scores ranged from 66% - 77.3%, with both elementary schools scoring well above the state's average.

Low birth weight infants are most often caused by being born prematurely. While not necessarily indicative of an unhealthy infant, being born low weight can be accompanied by many serious health problems including infection, nervous system problems, trouble feeding, immature lungs, developmental delay, and even death[72]. As such, low birth weight rates are an important metric of childhood community health. In Northampton County, 8.8% of all live births are considered low birth weight babies. This number is higher than the state average of 8.3% and the nation average of 8.2%. Health People 2020 targets aim to reduce that rate to 7.8%.

In Northampton County 2.9% of all children are uninsured[73]. This is slightly below the state average of 4.8%. According to the State of the Child county profile through the Annie E. Casey Foundation, 78.6% of children eligible for publically funded, high quality pre-school, are considered unserved[74]. That's significantly higher than the state average of 63.9%. Similarly, across the country, comparable urban counties have a rate of 64.8%.

Women, Infants, and Children (WIC), a program through the USDA's Food and Nutrition Services (FNS) offers supplemental food, healthcare referrals, and nutrition education to pregnant women through when their children turn five years of age. State-level data show that in 2018 Pennsylvania had an average monthly participation rate of 48,507 women. 6,934 of them were fully breastfeeding and an additional 3,367 were partially breastfeeding. Unless there are medical reasons to abstain, FNS strongly encourages all mothers participating in WIC to breastfeed their children. Breastfeeding is shown to provide essential nutrients to infants and lower their risk for some common childhood infections and diseases[75].

Protective factors, unlike the risk factors presented above, are positive assets for children, families, and communities in providing a safe and nurturing environment to raise youth. High prevalence of protective factors increases the health and well-being of children raised in those environments[76]. Some of these protective factors include rewards for prosocial involvement in the community, family attachment, and opportunities for prosocial involvement in school. The "Total Protection" of a community represents, in the aggregate, the percentage of students who have at least three protective factors operating in their lives. Northampton County's total score is 50% (Figure 51). The Pennsylvania "Total Protection" for all youth throughout the state is 55.3%.

[71] https://www.nsba.org/sites/default/files/reports/NSBA_CPE_Early_Literacy_Layout_2015.pdf
[72] https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=90&contentid=p02382
[73] https://factfinder.census.gov/
[74] https://www.papartnerships.org/state-of-the-child/
[75] https://www.nichd.nih.gov/health/topics/breastfeeding/conditioninfo/benefits
[76] https://www.childwelfare.gov/topics/preventing/promoting/protectfactors/

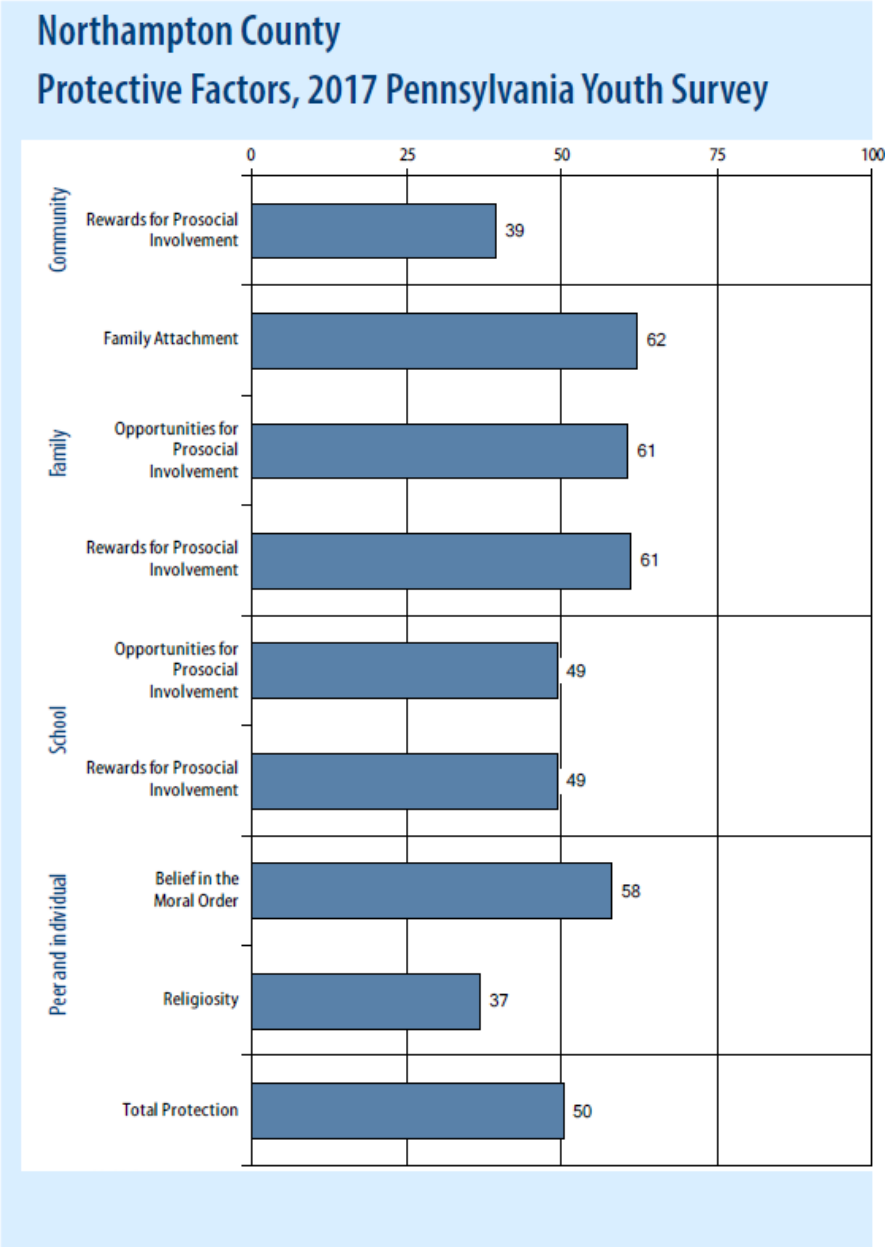


Figure 51

Senior Health

As of the 2010 census, Northampton County had 53,465 seniors (65+) living in its municipalities. This is 17.9% of the total population. By 2020 the Lehigh Valley Planning Commission projects there will be 62,701 comprising 19.0% of the total population. By 2030 they project 82,553 seniors making up 22.6% of the total population. Over just 20 years the senior population is projected to increase 54.4%. As such, senior healthcare will become an increasingly important aspect of the services we offer.

Currently there are 60,332 people in Northampton County insured through Medicare, 53,020 of whom are 65 years of age or older. Only 3.5% of the senior population isn't insured through Medicare. Because of the considerable overlap between our senior population and our Medicare population, we'll use Center for Medicare and Medicaid Services data as a proxy for senior data.

In Northampton County, 18.6% of our Medicare population reports being depressed. This is higher than the state average of 17.8% and the national average of 16.7%. 28.22% of our Medicare population has heart disease. This is also higher than the state and nation averages of 27.49% and 26.46% respectively (Figure 52).

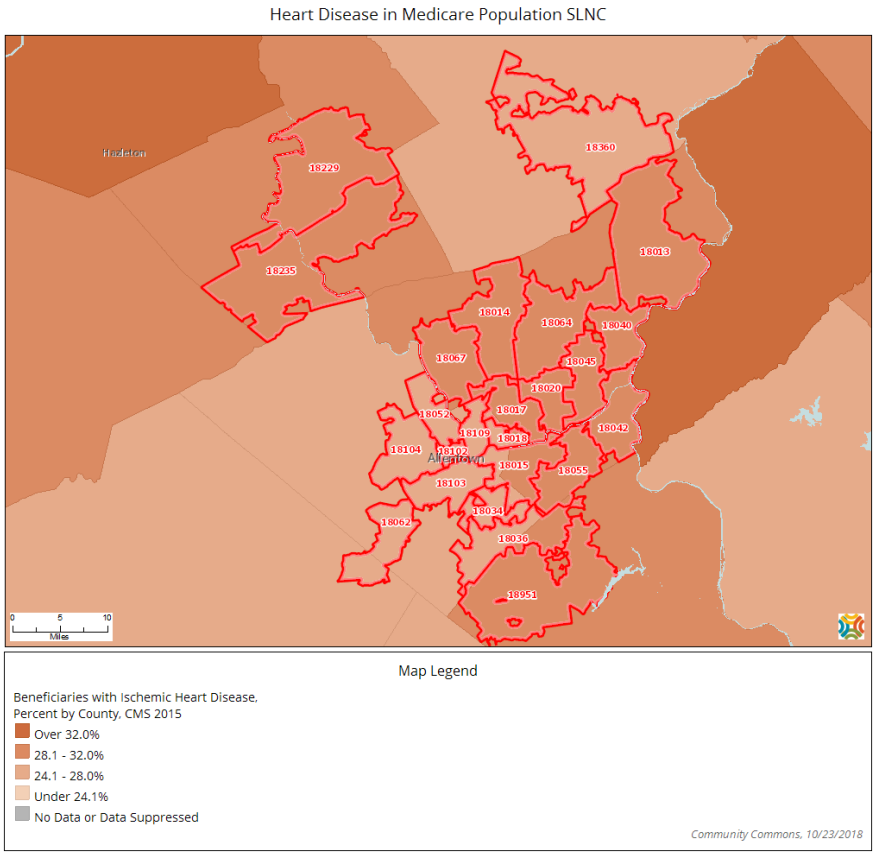


Figure 52

Another health outcome of concern is diabetes. 26.81% of the Medicare population in Northampton County has diabetes. This is higher than the 25.79% state average and 26.55% national average. Type II Diabetes, the most common form, is caused by a combination of genetics and lifestyle factors like physical activity levels and body weight[77]. As risk factors to contracting diabetes, and important components in managing it, physical activity and diet are vital public health concerns. According to the USDA's Food Access Resource Atlas, multiple census tracts that send patients to our Anderson Campus have rates of limited food access for seniors over 50%. In Northampton County tract 180.02, 65.88% of the seniors are considered to

[77] https://www.niddk.nih.gov/health-information/diabetes/overview/symptoms-causes

have low access to food. This means a higher reliance on less healthy processed foods. High blood pressure, Alzheimer's, high blood cholesterol, and cancer are also considerably more prevalent in Northampton County than the state and nation (Figure 53).

	Northampton County	PA	US
High Blood Pressure	62.50%	56.62%	54.99%
Alzheimer's	12.1%	11.8%	11.3%
High Cholesterol	53.24%	48.85%	44.61%
Cancer	10.5%	9.8%	8.9%

Figure 53

According to America's Health Rankings 2018 Senior Report, through the United Health Foundation, Pennsylvania ranks 17th out of the nation's 50 states in overall senior health. This is a drastic improvement over their 2017 ranking where Pennsylvania placed 26th. The states are assessed according to senior "behaviors", "community and environment", "policy", "clinical care", and "health outcomes". Pennsylvania scored best, 3rd overall, in the policy section. It scored worst, 32nd overall, in health outcomes. Policy factors include things like the number of geriatricians in the state, prescription drug coverage (Figure 54) and percentage of the state's senior population on SNAP. Health outcomes look at things like falls, frequent mental distress, and hip fractures.

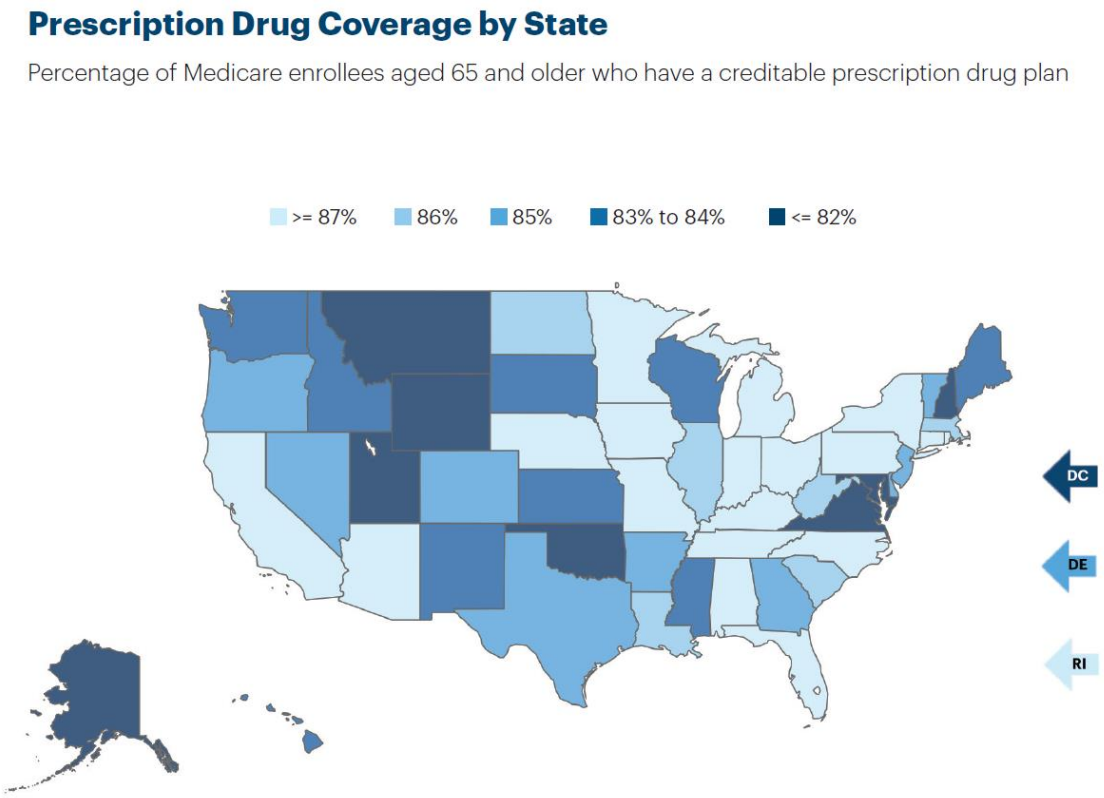


Figure 54

According to CDC data, Pennsylvania ranked 20th out of the states for deaths related to senior falls. Falling is a major concern for senior populations. Over 25% of seniors nationally report falling each year leading to approximately 3 million emergency room visits[78]. In 2016 nearly 30,000 seniors died from falling, a number that steadily increased by 3% annually during the proceeding decade[79]. The Mayo Clinic advises senior populations to remove hazards from common walkways, maintain physical activity levels, and consult with their doctors to reduce the risk of fall-related injuries and death. According to 2019 CHNA survey data, 22.1% of Anderson respondents age 45 years or older reported falling at least one time in the past 12 months. The average number of falls among Anderson respondents age 45 years or older was 2.20, with an average of 1.53 resulting in injury. These are similar to the Network respondent numbers, where 22.0% of respondents age 45 years or older reported falling at least one time in the past 12 months, with an average of 2.63 falls, and an average of 1.51 resulting in injury.

Another health issue particularly salient for senior populations is polypharmacy. While there is no exact definition, it has been categorized by the use of five or more drugs simultaneously, or the unnecessary prescription of drugs[80]. Senior populations, particularly in nursing home facilities, are vulnerable to this type of over prescription. Multiple studies have found that it is common for up to half the population of nursing homes to be on nine drugs simultaneously[81]. This has become increasingly prevalent lately due, in part, to more available drugs and patients having multiple diseases at once. Economic considerations aside, there are serious clinical consequences to polypharmacy. Due to the interplay between different drugs, increased numbers of prescriptions is shown to lead to drastic increases in adverse drug events. Non-adherence is another concern due to the complicated scheduling that can result from taking multiple drugs daily[82].

The AARP promotes some core principles for age-friendly communities. Some of their recommendations include: ensuring access to the built environment by making public spaces and homes accommodating for seniors, ensuring access to community based long term supports and services (LTSS) through CMS, and keeping older residents active through volunteer and community-based arts programs. Keeping seniors active and socially engaged has long-term benefits to their health and the community in general[83].

[78] https://www.cdc.gov/mmwr/volumes/67/wr/mm6718a1.htm#F2_down
[79] https://www.cdc.gov/mmwr/volumes/67/wr/mm6718a1.htm#F2_down
[80] https://www.jamda.com/article/S1525-8610(15)00477-6/abstract
[81] https://www.jamda.com/article/S1525-8610(15)00477-6/abstract
[82] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3864987/
[83] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4889622/

Health Outcomes

Mortality and Morbidity

When thinking about Health Outcomes it is important to examine mortality and morbidity rates. According to the 2018 National Vital Statistics Report, across the nation a total of 2,744,248 resident deaths were registered in the United States, yielding an age-adjusted death rate of 728.8 deaths per 100,000 U.S. standard population, accounting for the aging of the population. When broken down further we see that the age-adjusted rate was 155.8 per 100,000 for malignant neoplasms, 165.5 per 100,000 for diseases of the heart and 47.4 per 100,000 for accidents/unintentional injuries.

Additionally, life expectancy at birth was 78.6 years. And the 10 leading causes of death in 2016 were:

1. Diseases of heart (heart disease)
2. Malignant neoplasms (cancer)
3. Accidents (unintentional injuries)
4. Chronic lower respiratory diseases
5. Cerebrovascular diseases (stroke)
6. Alzheimer's disease
7. Diabetes mellitus (diabetes)
8. Influenza and pneumonia
9. Nephritis, nephrotic syndrome and nephrosis (kidney disease)
10. Intentional self-harm (suicide)

In Pennsylvania, a total of 133,040 resident deaths were registered, yielding an age-adjusted death rate of 770.1 deaths per 100,000. When delving further into the Pennsylvania data, we see that the age-adjusted rate was 164.7 per 100,000 for malignant neoplasms, 176.2 per 100,000 for diseases of the heart and 61.8 per 100,000 for accidents/unintentional injuries. Death rates overall, as well as for the top three leading causes of death, are significantly higher in Pennsylvania when compared to the national rates.

In New Jersey, a total of 73,155 resident deaths were registered, yielding an age-adjusted death rate of 668.5 deaths per 100,000. When delving further into the New Jersey data, we see that the age-adjusted rate was 149.7 per 100,000 for malignant neoplasms, 164.7 per 100,000 for diseases of the heart and 40.8 per 100,000 for accidents/unintentional injuries. Death rates overall, as well as for the top three leading causes of death, are significantly lower in New Jersey when compared to Pennsylvania and national rates.

Overall America's Health Rankings, places Pennsylvania at 28th in the nation for 35 different health measures in 2017, citing high levels of air pollution, high drug death rates and low per capita public health funding as being primary challenges. Highlights include:

- In the past year, air pollution decreased 8% from 11.0 to 10.1 micrograms of fine particles per cubic meter
- In the past two years, excessive drinking increased 16% from 17.7% to 20.5% of adults
- In the past five years, diabetes increased 19% from 9.5% to 11.3% of adults

- In the past seven years, infant mortality decreased 20% from 7.5 to 6.0 deaths per 1,000 live births
- In the past 10 years, drug deaths increased 80% from 12.3 to 22.2 deaths per 100,000 population

Whereas America's Health Rankings, places New Jersey at 12th in the nation for 35 different health measures in 2017, citing a high prevalence of physical inactivity, large disparity in health status by educational attainment and low per capita public health funding as challenges. Highlights include:

- In the past two years, chlamydia increased 10% from 319.6 to 350.6 cases per 100,000 population
- In the past five years, physical inactivity increased 13% from 26.4% to 29.8% of adults
- In the past seven years, premature death decreased 5% from 6,152 to 5,875 years lost before age 75 per 100,000 population
- In the past 10 years, drug deaths increased 83% from 8.1 to 14.8 deaths per 100,000 population
- In the past 15 years, violent crime decreased 36% from 384 to 245 offenses per 100,000 population

Perceptions of Health

It is important to assess a community's perceived sense of health status to interpret their overall wellbeing, as well as highlight areas where health education would benefit the community. According to our 2019 community survey, most individuals in the St. Luke's Anderson service area reported very good or excellent health, followed by good health, and then by poor or very poor health. This pattern is similar network-wide, with 93.0% of respondents rating their health as good or better (Figure 55).

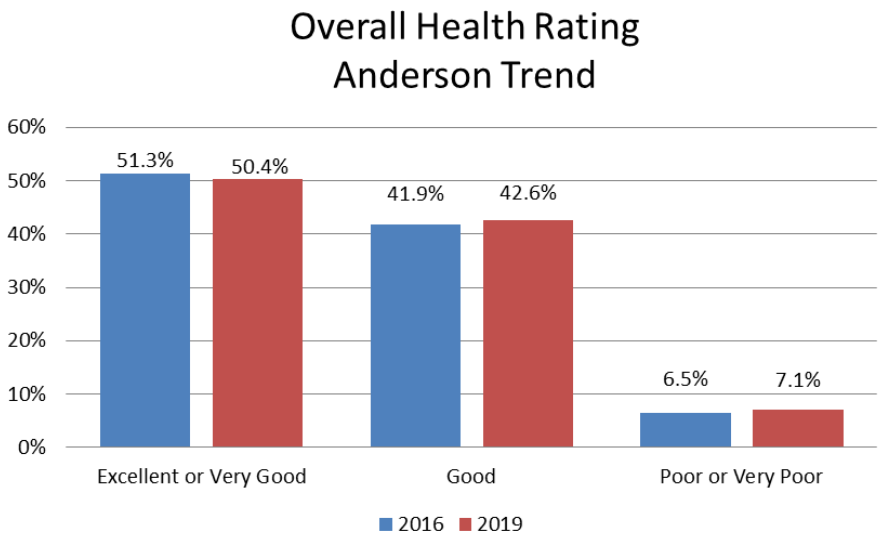


Figure 55

Chronic Health Problems

Upon examining self-perceptions of health, it is important to look at the prevalence of specific health conditions to assess the health status and needs of the community. Our 2019 survey results conveyed that the highest percentage of patients in the St. Luke's Anderson service area reported having high blood pressure at 42.4%, followed by 29.2% with high cholesterol and 22.6% with

arthritis or rheumatic disease (Figure 56). According to the ACS, 13.15% of individuals in the Anderson service area have a disability, compared to 12.52% nationally and 13.67% statewide.

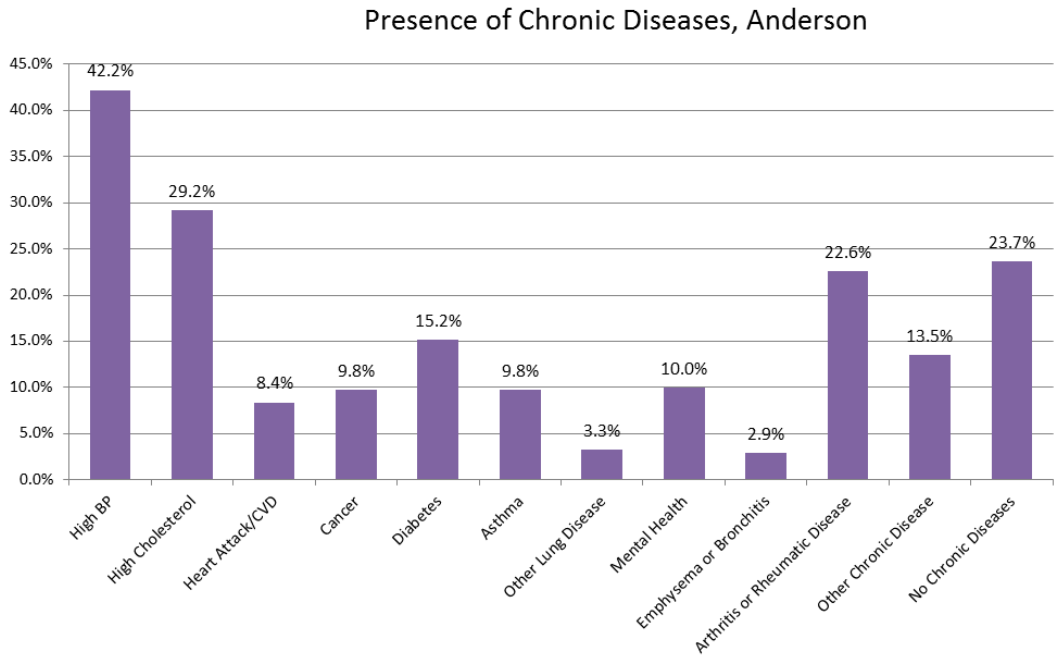


Figure 56

Cancer

When looking at cancer statistics for the SLUHN service area, it is evident that cancer is a significant health concern across all populations. However, there are specific groups within our service area that are of particular concern.

Figure 57 examines cancer incidence rates by age and indicates that all counties, as well as both states, and the U.S. as a whole followed the trend that increasing age was associated with much higher cancer incidence rates. When looking specifically at counties in our service area, 27 (96%) of the 28 counties and age groups were worse than the national incidence rate, and 21 of those 27 (78%) were worse than both the U.S and their respective state[84]. Furthermore, Northampton County specifically was worse than both state and national rates across all age groups.

[84] https://www.statecancerprofiles.cancer.gov/incidencerates/

Cancer Incidence Rate by Age and County (Per 100,000 population) National Cancer Institute State Cancer Profiles, 2011-2015					
Location	All Ages	Age <50	Age 50+	Age <65	Age 65+
United States	441.2	102.8	1331.3	222.8	1951.0
New Jersey	477.5	109.4	1441.4	235.8	2148.5
Warren	497.8	110.9	1511.1	235.1	2313.5
Pennsylvania	481.7	116.7	1441.9	247.4	2101.4
Bucks	488.2	118.1	1461.1	247.7	2150.6
Carbon	477.0	107.0	1451.0	233.1	2162.8
Lehigh	492.2	118.5	1474.3	248.4	2177.8
Monroe	472.7	99.6	1453.5	227.0	2171.2
Northampton	516.4	121.7	1555.0	256.1	2316.1
Schuylkill	489.2	115.1	1474.0	246.9	2164.5
Key					
Better than both state and national levels		Between state and national levels		Worse than both state and national levels	

Source: National Cancer Institute, State Cancer Profiles 2011-2015

Figure 57

Similarly, when comparing cancer incidence between males and females, it is evident that males have a much higher incidence rate than females in both Pennsylvania and New Jersey, as well as in the U.S. in general, as seen in Figure 58. Additionally, both sexes in Northampton County had cancer incidence rates that were higher than both state and national rates[85].

Cancer Incidence Rate by Sex and County (Per 100,000 population) National Cancer Institute State Cancer Profiles, 2011-2015			
Location	All Sexes	Females	Males
United States	481.7	412.5	483.8
New Jersey	477.5	447.6	525.2
Warren	497.8	475.1	532.9
Pennsylvania	418.7	455.2	524.3
Bucks	488.2	457.7	532.4
Carbon	477.0	458.3	508.9
Lehigh	492.2	458.6	544.5
Monroe	472.7	437.4	515.6
Northampton	516.4	472.0	583.2
Schuylkill	489.2	459.4	538.9
Key			
Better than both state and national levels		Between state and national levels	Worse than both state and national levels

Source: National Cancer Institute, State Cancer Profiles 2011-2015

Figure 58

[85] https://www.statecancerprofiles.cancer.gov/incidencerates/

When looking at cancer incidence rates by race, it is apparent that cancer rates in our region are higher than state and national levels among all races; however, this is especially true among the White population, which has higher rates of cancer incidence than the White population in the United States as a whole (475.9 and 488.0 versus 442.8, respectively) (Figure 59). Furthermore, the White population in Northampton County had higher rates of cancer incidence than both state and national rates[86].

Northampton County specifically has incidence rates that are higher than both state and national levels across all race and ethnicity groups, with the exception of the Black population, which is between state and national levels[87].

Cancer Incidence Rate by Race/Ethnicity and County (Per 100,000 population) National Cancer Institute State Cancer Profiles, 2011-2015						
Location	All Races	White (Includes Hispanic)	Black (Includes Hispanic)	American Indian/Native Alaskan	Asian/Pacific Islander	Hispanic (Any Race)
United States	441.2	442.8	447.9	283.0	285.4	340.9
New Jersey	477.5	488.0	441.5	**	263.4	385.6
Warren	497.8	495.6	408.9	**	303.7	498.3
Pennsylvania	481.7	475.9	492.7	159.4	270.8	353.5
Bucks	488.2	482.2	427.4	**	242.4	278.6
Carbon	477.0	470.8	366.1	**	**	**
Lehigh	492.2	481.9	484.5	**	292.7	398.5
Monroe	472.7	477.5	370.9	**	165.4	323.5
Northampton	516.4	511.7	473.2	**	292.4	446.1
Schuylkill	489.2	485.6	432.2	**	387.6	245.3
Key	** Data suppressed due to small sample size					
	Better than both state and national levels		Between state and national levels		Worse than both state and national levels	

Figure 59

According to Pennsylvania Department of Health's Surveillance, Epidemiology, and End Results (SEER) Program, males and females in Northampton County had significantly higher incidence of all cancers than expected from 2008-2012[88]. Figure 60 shows the primary sites that were significantly higher than expected, as well as which county and gender the significantly higher values were found in. Northampton County had higher than expected levels of all cancers, lung/bronchus, urinary bladder, kidney/renal pelvis, thyroid, Non-Hodgkin Lymphoma, corpus uterus, and leukemia.

[86] https://www.statecancerprofiles.cancer.gov/incidencerates/
[87] https://www.statecancerprofiles.cancer.gov/incidencerates/
[88] http://www.ehsf.org/sites/default/files/2017-09/An_Analysis_of_Cancer_Incidence_in_PA_Counties_2008_2012.pdf

Counties with Significantly Higher than Expected Cancer Levels by Cancer Type and Gender, 2008-2012	
Primary Site	County and Gender with Significantly Higher than Expected Cancer Levels
All Sites	Bucks, Carbon, Lehigh, Northampton, and Schuylkill
Lung/Bronchus	Carbon, Lehigh, Northampton, Schuylkill
	Bucks, Monroe
Breast	Bucks
Colon and Rectum	Schuylkill
Oral Cavity and Pharynx	Schuylkill
	Bucks
Melanoma of Skin	Bucks
Testis	Bucks
Urinary Bladder	Bucks, Carbon, Lehigh, Northampton, Schuylkill
Kidney/Renal Pelvis	Bucks, Carbon
	Northampton, Schuylkill
	Lehigh
Thyroid	Carbon
	Bucks, Lehigh, Northampton
Non-Hodgkin Lymphoma	Northampton
	Bucks
Hodgkin Lymphoma	Lehigh
Larynx	Monroe
Cervix Uteri	Monroe, Schuylkill
Corpus, Uterus, NOS	Bucks, Carbon, Northampton, Schuylkill
Esophagus	Bucks
Leukemia	Northampton
Key	Both Males and Females
	Females Only
	Males Only

Figure 60

Figure 61 shows cancer incidence and mortality rates in our counties and compares them to state and national levels. The table indicates that lung and colorectal cancers are significant issues in the SLUHN service area, since no counties had incidence rates that were lower than both state and national levels. Northampton County had lung and colorectal cancer incidence rates that were between state and national levels[89]. Furthermore, breast cancer is also a significant issue in our service area, since only two counties have rates that are better than state and national levels. Northampton County's breast cancer incidence rate was higher than both state and national levels[90].

According to the U.S. Department of Health and Human Services, Healthy People provides science-based, 10-year national objectives for improving the health of all Americans. In addition to county, state and national comparisons, cervical cancer incidence and colorectal cancer screening both have a Healthy People 2020 comparison. Northampton County's cervical cancer incidence rate (6.5 per 100,000) was lower than both state (7.6 per 100,000) and national (7.62) levels, and below the Healthy People 2020 target (7.1 per 100,000)[91].

[89] https://www.statecancerprofiles.cancer.gov/incidencerates/
[90] https://www.statecancerprofiles.cancer.gov/incidencerates/
[91] https://www.statecancerprofiles.cancer.gov/incidencerates/

2018	United States	Pennsylvania (PA)	Bucks (BU) County, PA	Carbon (CR) County, PA	Lehigh (LH) County, PA	Monroe (MO) County, PA	Northampton (NO) County, PA	Schuylkill (SC) County, PA	New Jersey (NJ)	Warren (WA) County, NJ
Breast Cancer Incidence [1]	123.5	129.8	137.3	125.1	124.2	123.5	137.3	114.2	132	129.7
Cervical Cancer Incidence [2]	7.62	7.6	5.3	No Data	8.5	9.3	6.5	10.8	7.9	6.6
Colorectal Cancer Incidence [1]	39.8	43.1	39.6	41.7	42.7	40.4	41.1	51.2	42.3	43.3
Lung Cancer Incidence [1]	61.2	65.4	61.9	67.4	63.1	73.0	64.5	68.0	57.8	64.9
Prostate Cancer Incidence [1]	114.8	117.5	120.8	111.6	124.3	109.2	141.6	94.2	139.4	135.4
Cancer Mortality [3]	160.9	169.48	157.3	189.9	159.6	178.4	164.5	190.9	154.54	169.8
Sources										
1. State Cancer Profiles, 2010-14										
2. State Cancer Profiles, 2009-13										
3. Centers for Disease Control and Prevention, National Vital Statistics Program, Accessed via CDC WONDER, 2012-16										
Key		Better than both state and national levels			Between state and national levels			Worse than both state and national levels		

Figure 61

In looking at cancer mortality rates, Northampton County (164.5 per 100,000) has cancer mortality rates between state (169.48 per 100,000) and national (160.9 per 100,000) levels[92].

Figure 62 illustrates cancer screening rates for colorectal, cervical, and breast cancer. The data indicate that screening rates are relatively low in the SLUHN service area, especially in Schuylkill, Warren, Monroe, and Carbon counties. Northampton County's colorectal cancer screening rates (63.9%) was above state (62.1%) and national (61.3%) levels; however, it still fell below the Healthy People 2020 target of 70.5%, as well as the American Cancer Society target of 80% by 2018[93].

Cancer Screenings in SLUHN Service Area

2018	United States	Pennsylvania (PA)	Bucks (BU) County, PA	Carbon (CR) County, PA	Lehigh (LH) County, PA	Monroe (MO) County, PA	Northampton (NO) County, PA	Schuylkill (SC) County, PA	New Jersey (NJ)	Warren (WA) County, NJ
Sigmoidoscopy or Colonoscopy	61.3%	62.1%	71.1%	43.0%	70.3%	66.1%	63.9%	52.3%	60.1%	57.6%
Pap Test	78.5%	78.8%	72.6%	78.0%	82.6%	74.5%	80.1%	76.8%	81.5%	79.8%
Mammogram	63.1%	64.8%	66.4%	58.3%	65.9%	62.4%	65.4%	59.9%	61.5%	59.3%
Sources										
1. Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Accessed via the Health Indicators Warehouse. US Department of Health & Human Services. Health Indicators Warehouse, 2006-12										
2. Dartmouth College Institute for Health Policy & Clinical Practice. Dartmouth Atlas of Health Care. 2014										
Key		Better than both state and national levels			Between state and national levels			Worse than both state and national levels		

Figure 62

[92] Centers for Disease Control and Prevention, National Vital Statistics System. Accessed via CDC WONDER. 2012-16.

[93] Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Accessed via the Health Indicators Warehouse. US Department of Health & Human Services, Health Indicators Warehouse. 2006-12.

In addition to CDC data, we looked at breast cancer screening rates among 2019 community survey respondents. Figure 63 shows that 82.2% of Network survey respondents and 83.9% of Anderson service area respondents indicated that they had been screened for breast cancer within the past 2 years, which are higher than the national rate (71.6%) and Healthy People 2020 target of 81.1%. Internal data indicate that our SLUHN screening rate is approximately 67.47%, which is lower than survey respondent reported rates.

Figure 63 also depicts survey respondents' reported screening rates by campus area. Based off these findings, there is room for improvement in screening rates among all campus areas; however, there are especially low rates among our rural populations. Similarly, internal data show vast differences in breast cancer screening rates between differing practice types. The SLUHN average colorectal cancer screening rate (67.47%) is higher than our internal medicine and family medicine clinic rates.

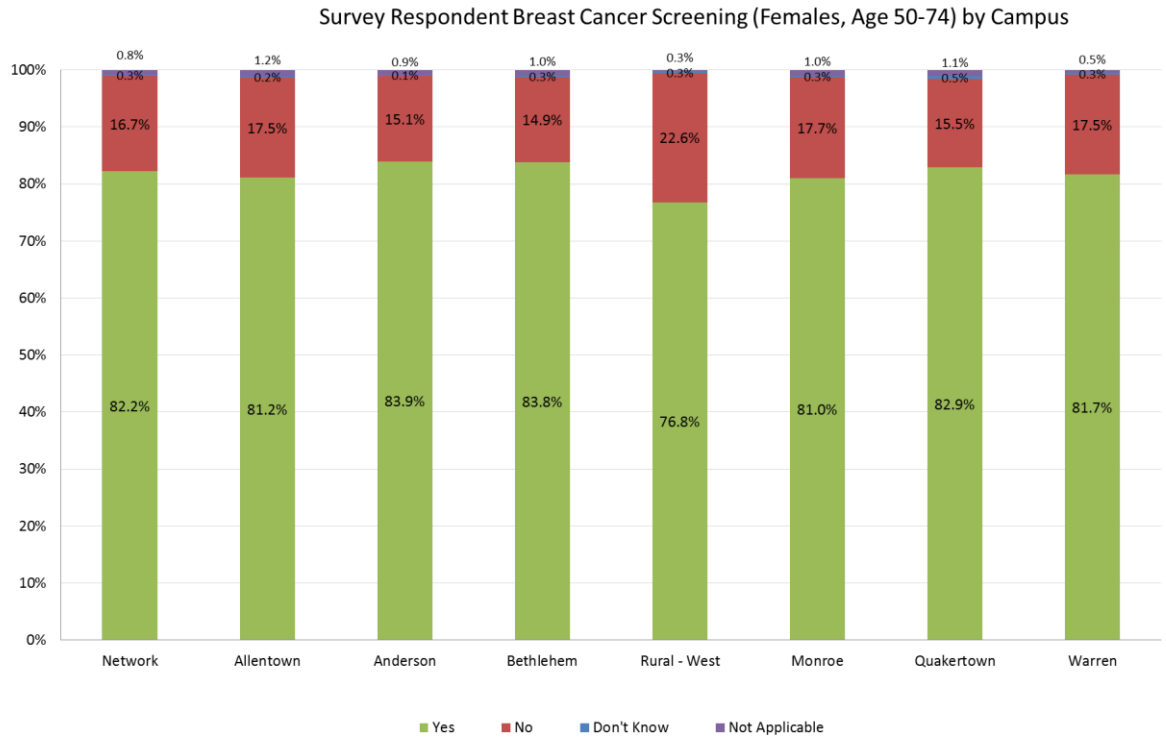


Figure 63

Additionally, our 2019 community survey asked about colorectal cancer screening. Two questions were included to determine if respondents were up to date on colorectal cancer screening. The first question asked respondents age 50-74 to indicate which of the following ways they had been screened for colorectal cancer: colonoscopy, sigmoidoscopy, stool blood test (i.e. FIT/FOBT), don't know, never been screened, or Not Applicable. Respondents were then asked the approximate date of their last screening. In order to be considered up to date with screenings for this analysis, respondents must have had a screening date fall in the recommended time frame for their screening type (Figure 64). If a respondent was missing an answer to one of the questions, their screening status was marked "Unknown".

Time Frame for Colorectal Screening based on Screening Type	
Colonoscopy	Within 10 years
Sigmoidoscopy	Within 5 years
Stool Blood Test (i.e.: FIT/FOBT)	Within 1 year

Figure 64

Figure 65 illustrates colorectal cancer screening rates among survey respondents age 50 to 74. Approximately 65% of Network respondents indicated that they were up to date with colorectal cancer screening, which is (lower than the national rate (66.4%) and the Healthy People 2020 goal of (70.5%), and American Cancer Society goal of 80% by 2018. Similarly, 66.4% of Anderson service area respondents reported being up to date with colorectal cancer screening, which is also lower than state and national rates, as well as Healthy People 2020 and American Cancer Society goals. Internal data indicate that our SLUHN screening rate is approximately 55.17%, which is lower than survey respondent reported rates[94].

Figure 65 also depicts survey respondents' reported screening rates by campus area. Based off these findings, there is room for improvement in screening rates among all campus areas; however, there are especially low rates among our rural populations. Similarly, internal data show vast differences in colorectal cancer screening rates between differing practice types. The SLUHN average colorectal cancer screening rate (55.17%) is higher than our internal medicine and family medicine clinic rates. What is especially striking is that within our clinics, our rural population has the lowest screening rates, which mirrors the findings from our survey responses.

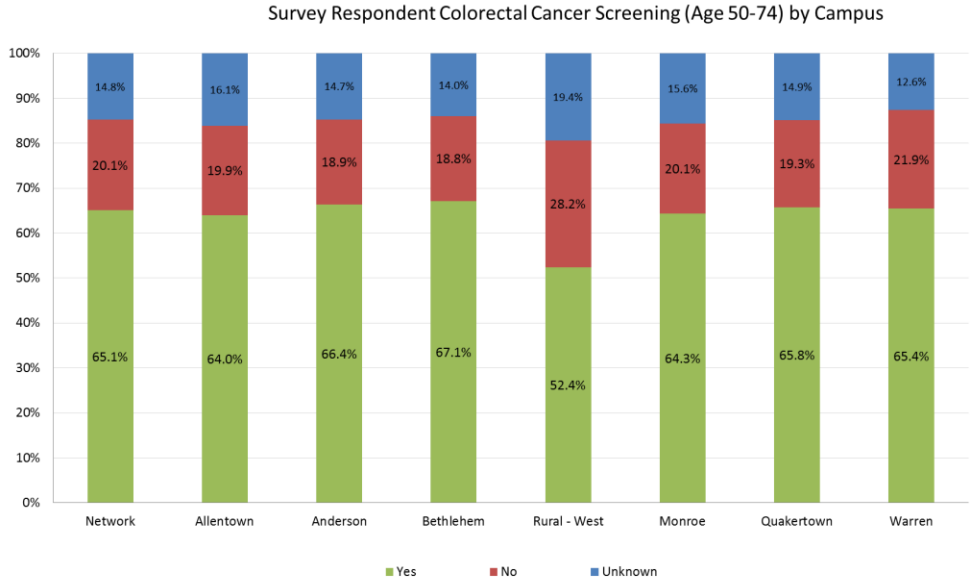


Figure 65

When looking at how insurance coverage influences breast screening rates among 2019 community survey respondents, it is evident that there are vast differences in screening rates based on insurance type. Figure 66 shows that women with private insurance (84.1%) and

[94] http://www.healthypeople.gov/

Medicare (82.4%) have much higher reported screening rates than women who are insured through Medicaid (67.0%) or who are uninsured (48.8%).

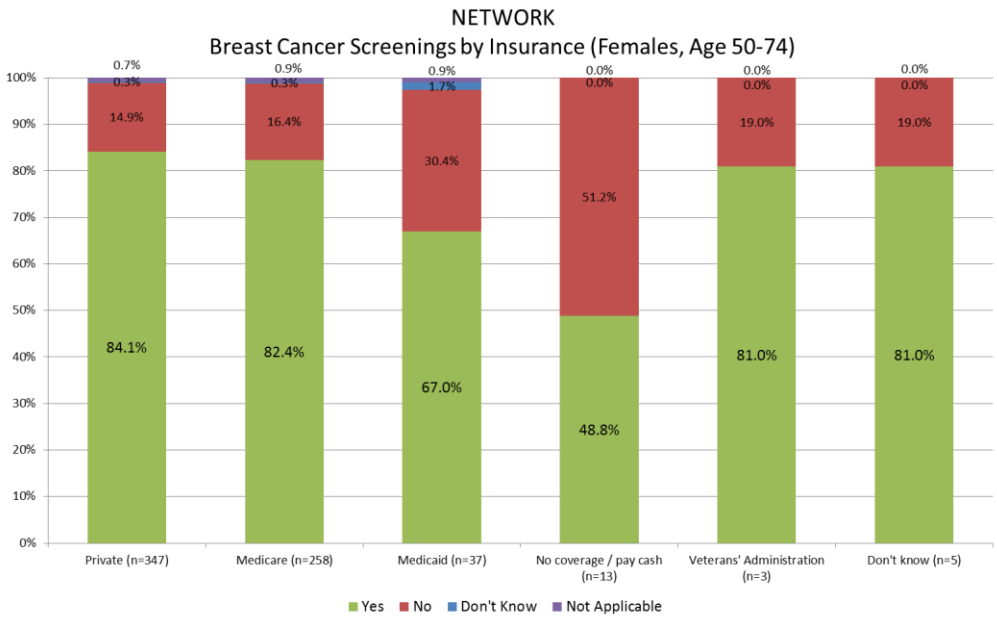


Figure 66

A similar pattern can be seen within colorectal cancer screening rates. According to survey results, respondents with private insurance (68.0%) or Medicare (65.6%) had much higher screening rates compared to those who were uninsured (45.5%) or who were insured through Medicaid (28.3%). However, as previously mentioned, this indicator shows if respondents were up to date on colorectal cancer screening, based off their reported screening type and approximate date of last screening. Many respondents did not respond to one of the questions, therefore their status could not be calculated. Thus, there are a high number of respondents whose screening status is "Don't Know".

As shown in Figure 67, the state and national levels for colon cancer screening fell around 66.4%, so this shows that our patients with private insurance or Medicare were better or the same as the state and national screening averages, but that the uninsured and Medicaid populations were lower than the state and national screening levels. These cancer breakdowns, especially among screened cancers is highly important to note because it makes it evident that there are some barriers with our uninsured and Medicaid populations being screened, most notably for colorectal and breast cancer.

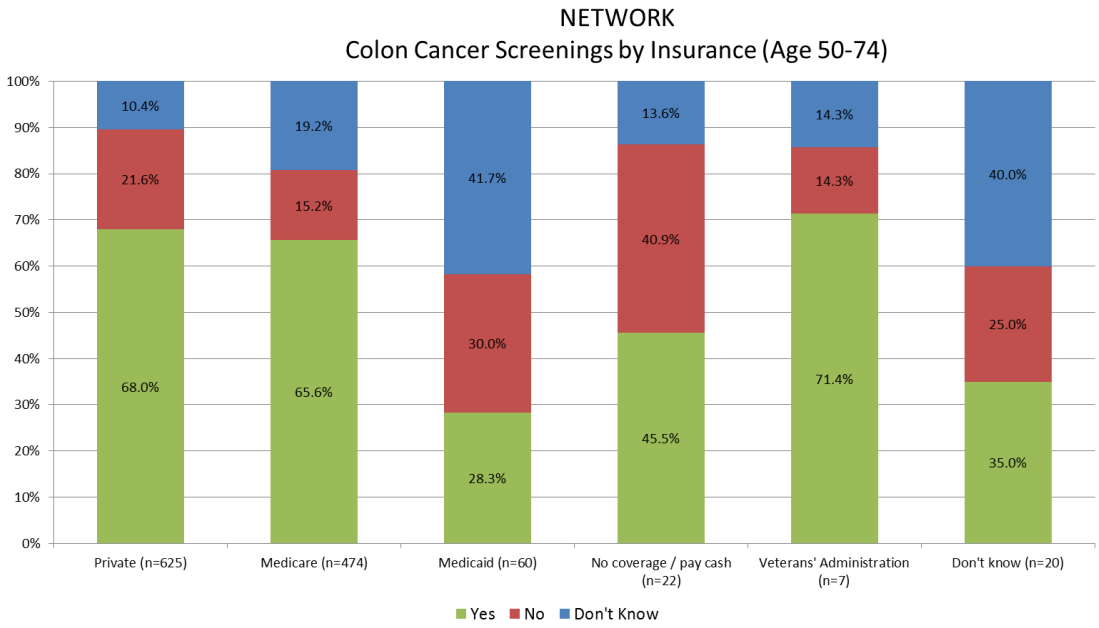


Figure 67

Days of Poor Physical Health

If an individual has not visited their primary care physician for a routine checkup within the past year, their physical health could be compromised by unknown medical conditions being left untreated. To better illustrate the service area's health status, we can examine the number of days respondents of our 2019 survey could not perform daily functions due to physical health issues. As shown in Figure 68, about 45.6% of respondents reported missing one or more days of normal activity in the past month due to poor physical health.

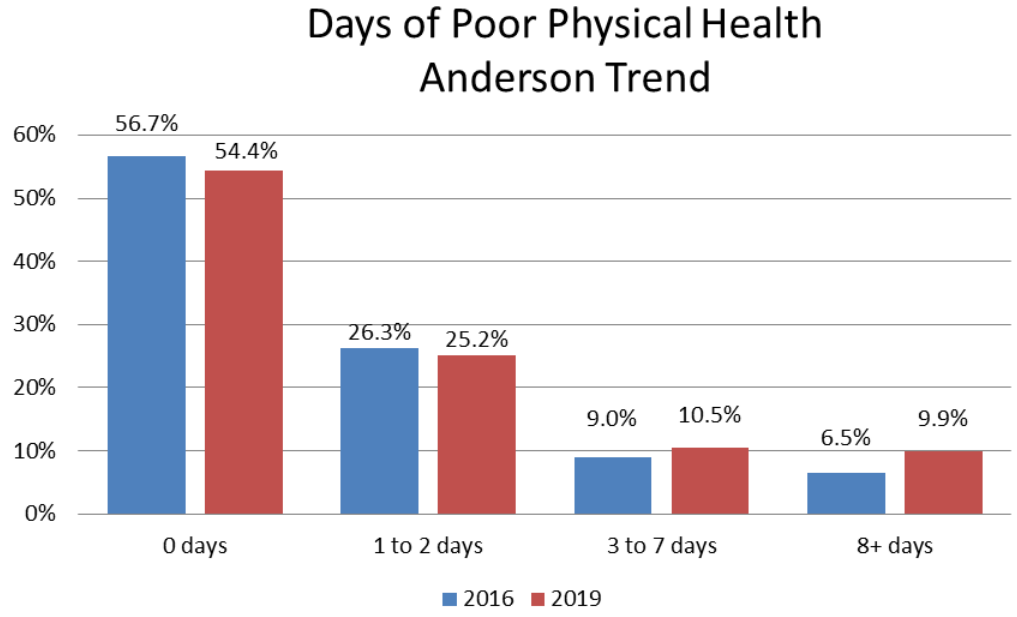


Figure 68

Days of Poor Mental Health

In an effort to assess the overall well-being of the service area, we can look to the average number of days of poor mental health. According to our 2019 survey data, 36.8% of respondents reported having missed one or more days of normal activity due to poor mental health within the past month of their being surveyed (Figure 69). Those who are missing days of normal activity due to poor mental health may not be receiving any type of medical attention, leaving their condition untreated. This is important to take into consideration when reading the rest of this section, as inconsistent care can worsen mental illness.

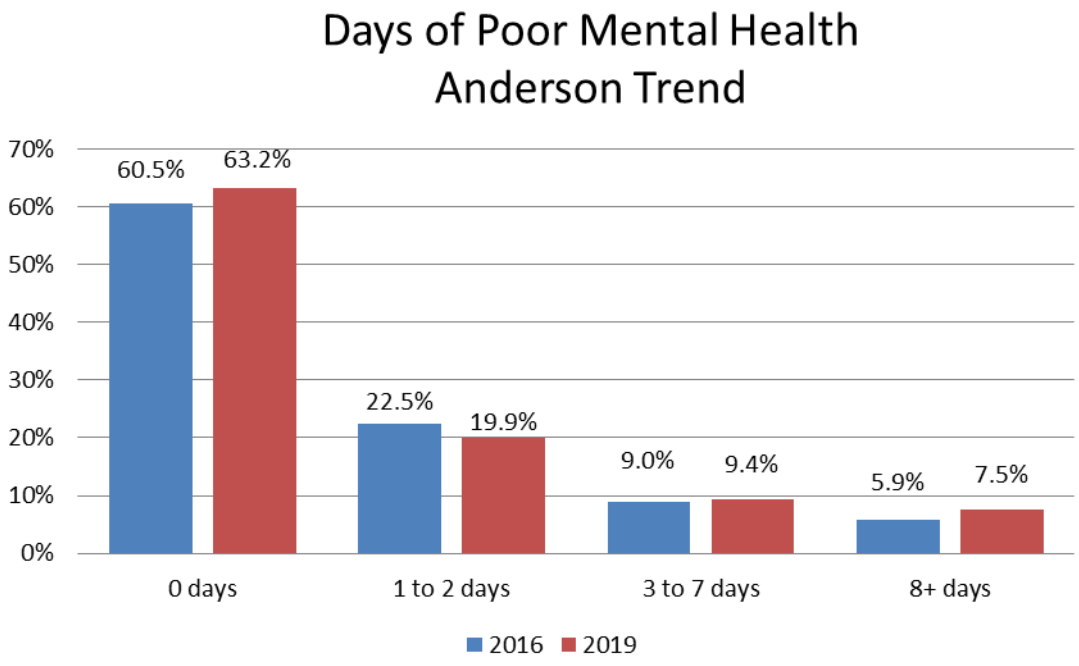


Figure 69

Unintentional Injury

The top reason for death from ages 1 through 44 is unintentional injury. In 2015, there were a total of 2,753 unintentional injury deaths for individuals ages 1 through 14, and 12,514 deaths of those ages 15 through 24[95]. Additional data from the Pennsylvania Department of Health echoed this sentiment. The 2014 Hospitalized Injury Profile found unintentional injury was the most common reason for hospitalization for children ages 14 and under.

Top Reasons for Hospitalization

Examining the most frequent reasons for hospital admissions can indicate common health disparities, thereby allowing us to develop programming to treat or prevent these disparities before inpatient hospitalization is required. Figure 70 delineates the top 10 reasons for inpatient hospitalization at St. Luke's Anderson campus in 2017. The top three causes were sepsis, kidney failure and hypertensive heart. These health outcomes directly influence the priority health categories discussed in the next section of this report.

[95] https://www.cdc.gov/nchs/data/nvsr/nvsr66/nvsr66_06.pdf

FY17 SLRA - Top 10 Principal Diagnoses for Inpatient Encounters
(From Zip Codes Comprising Top 80% of Facility Encounters)

Principal Diagnosis	Ranking
A41.9 - Sepsis, unspecified organism	1
N17.9 - Acute kidney failure, unspecified	2
I13.0 - Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease	3
J18.9 - Pneumonia, unspecified organism	4
I11.0 - Hypertensive heart disease with heart failure	5
A41.51 - Sepsis due to Escherichia coli [E. coli]	6
J96.21 - Acute and chronic respiratory failure with hypoxia	7
I21.4 - Non-ST elevation (NSTEMI) myocardial infarction	8
N39.0 - Urinary tract infection, site not specified	9
J96.01 - Acute respiratory failure with hypoxia	10

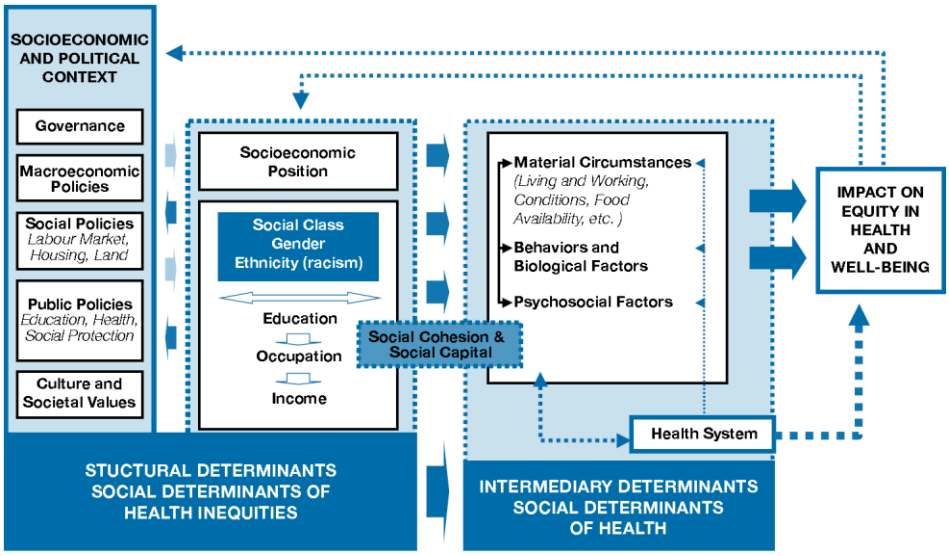
Figure 70

According to internal data, the majority of trauma-related incidents in 2017 resulted in falls at 55.7%, followed by motor vehicle accidents at 19.3%. The fewest instances of trauma resulted from gunshot wounds, at 1.1%.

Conclusion and Key Findings

In reviewing the extensive primary and secondary data, it is evident that there are significant needs to address within our communities. For the upcoming three-year (2019-2022) cycle, St. Luke's University Health Network will continue to work toward addressing the health priorities identified network-wide, in order to improve the community's health. The three main priorities identified include: improving access to care; preventing chronic disease; and improving mental and behavioral health. The upstream factors related to the social determinants of health and individual lifestyle behaviors contribute to the poor health status of our communities.
These three health priorities will be addressed using the social determinants of health framework in conjunction with Lifestyle Medicine interventions in order to influence the overall health of our communities. Lifestyle Medicine interventions are related to behaviors such as – not smoking, eating sufficient amounts of fruits and vegetables, exercising regularly and maintaining a healthy weight. The following is the social determinants of health framework developed by the World Health Organization (WHO) which outlines the structural components (social determinants) that need to be considered in relationship to the intermediary determinants

(lifestyle based behavior modification interventions) in order to achieve desirable health outcomes.



The social determinants of health and lifestyle behaviors are the barriers that impact a wide range of health, function and quality of life. While there are many that need to be addressed, overall this CHNA found the most pressing needs to be specifically in areas related to:

- Housing
- Transportation
- Food insecurity
- Obesity reduction
- Physical activity promotion
- Opioids and other substance use
- Child/Adolescent mental health

The needs discussed within the health categories outlined in this document will serve as our guide in creating a detailed campus specific implementation plan to best address the specific needs of the St. Luke's Anderson campus service area using the three buckets of: Wellness and Prevention; Care Transformation; and Research and Partnerships. We will work collaboratively in partnership with our community and network partners in order to create a more equitable society with better health outcomes, especially among our most vulnerable populations such as our Hispanic communities, seniors, women and children.

Addendum

Substance Abuse

Over the past two decades an estimated 700,000 people died of drug overdoses in the United States[96]. In October of 2017, the federal government declared a national Public Health Emergency in response to the astronomical rise in overdose deaths[97]. The precipitous increase in overdose deaths is primarily driven by the over 600% increase in synthetic opioid deaths, predominately fentanyl, since 2013 (Figure 1)[98]. The Centers for Disease Control's (CDC) *Annual Surveillance Report of Drug-Related Risks and Outcomes* breaks the opioid crisis into three phases. The first phase, starting in the 1990's, was defined by rising overdose deaths from a sharp increase in prescribed opioids for chronic pain[99]. The second wave of the crisis is thought to have started in 2010 with an increase in overdose deaths from heroin. People struggling with opioid addiction can transition to heroin due to its similar effects on the body and cheaper price. 80% of Americans using heroin report having misused prescription opioids first[100]. The third, and deadliest, phase of the opioid crisis started in 2013 when synthetic opioids like fentanyl dramatically increased overdose deaths and hospitalizations[101]. With the most recent data showing the highest number of overdose deaths to date in Pennsylvania, as well as nationally, we are very much still in the midst of the third phase[102].

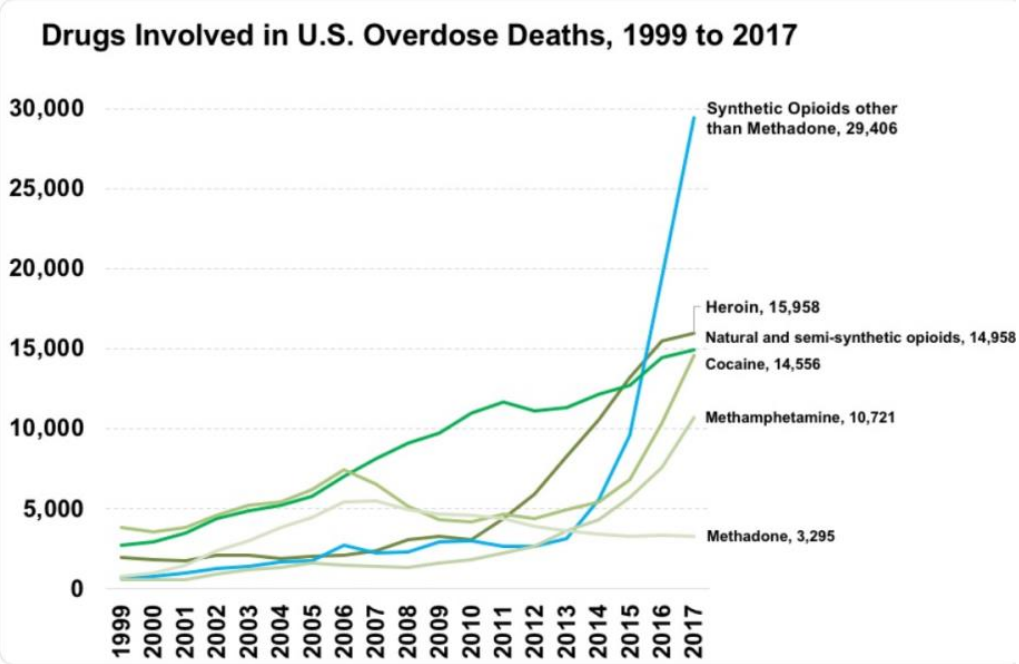


Figure 1

Pennsylvania is particularly affected by this national crisis. In 2017, the state recorded the third most drug overdose deaths after only West Virginia and Ohio[103]. In total, there were 5,456 drug-related overdose deaths, meaning an overdose death rate of 43 out of every 100,000 residents which is nearly double the national average of 22 out of every 100,000 residents[104]. Pennsylvania also had statistically significant increases in overdose deaths between 2016 and 2017. Similarly,

[96] https://www.cdc.gov/nchs/products/databriefs/db329.htm
[97] https://www.whitehouse.gov/opioids/
[98] https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates
[99] https://www.cdc.gov/drugoverdose/pdf/pubs/2018-cdc-drug-surveillance-report.pdf
[100] https://www.drugabuse.gov/publications/drugfacts/heroin#ref
[101] https://www.cdc.gov/drugoverdose/pdf/pubs/2018-cdc-drug-surveillance-report.pdf
[102] https://www.cdc.gov/drugoverdose/data/statedeaths.html
[103] https://www.cdc.gov/drugoverdose/data/statedeaths.html
[104] https://www.dea.gov/sites/default/files/2018-10/Opioid%20threat%20in%20Pennsylvania%20FINAL.pdf

it was one of only six stated to see a statistically significant increase in the amount of non-fatal overdose hospitalizations between 2016 and 2017[105].

According to data from the Substance Abuse and Mental Health Services Administration, under the US Department of Health and Human Services, Pennsylvania is in the top cohort of states for heroin usage in every age bracket in 2016 and 2017. It's one of only nine states with rates of adult heroin usage above 450 out of every 100,000 adults (Figure 2)[106].

***Heroin Use in the Past Year among Adults Aged 26 or Older*, by State: Percentages, Annual Averages Based on 2016 and 2017 NSDUHs**

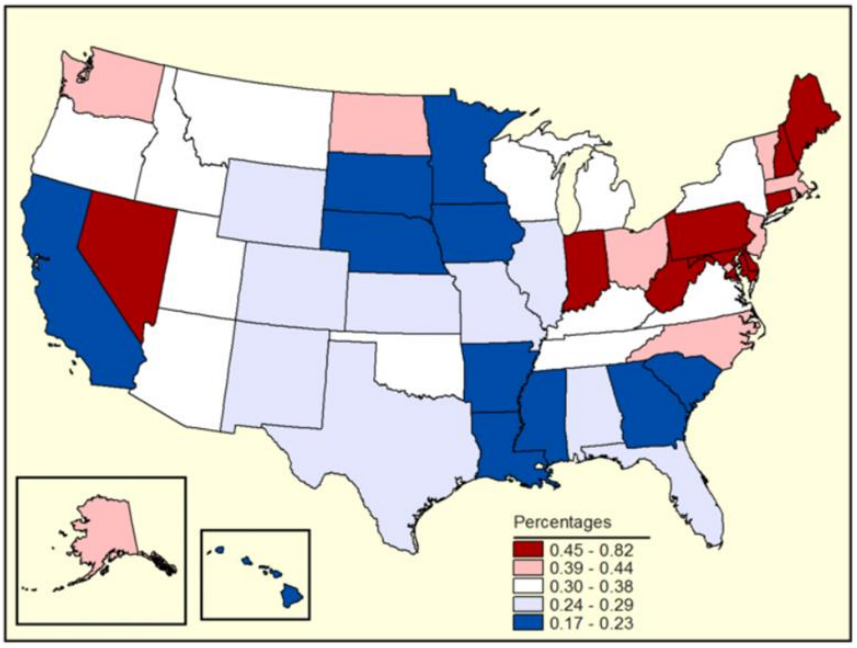


Figure 2

According to data from the National Center for Health Statistics, through the CDC, Northampton County had 44 total deaths from opioids overdoses between 2007 and 2011[107] (Figure 3). This amounts to 4.7 opioid deaths per 100,000 residents over that time. Between 2012 and 2016, this rate rose to 17.7 per 100,000 residents, amounting to 160 opioid overdose deaths. The state and national averages were 15.9 and 14.1, respectively.

[105] https://www.cdc.gov/drugoverdose/data/nonfatal.html
[106] https://www.samhsa.gov/data/report/2016-2017-nsduh-national-maps-prevalence-estimates-state
[107] https://opioidmisusetool.norc.org/

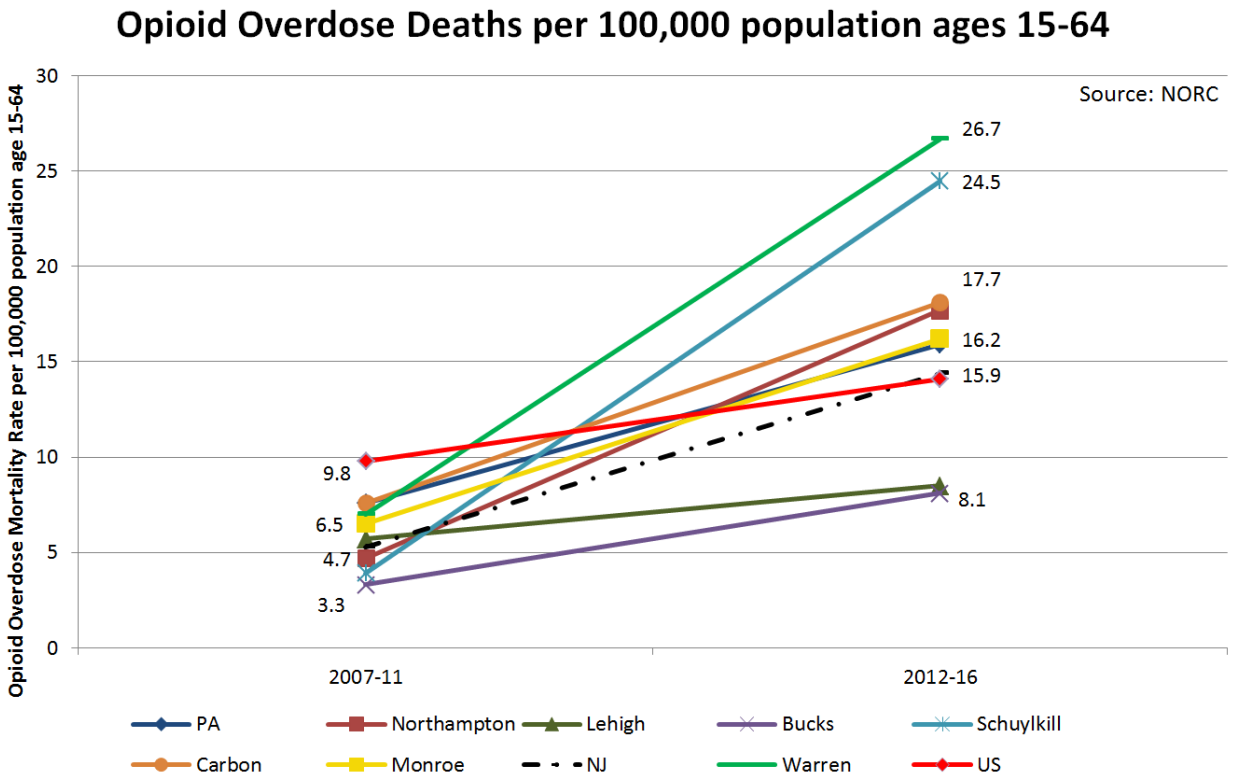


Figure 3

County level data from the Pennsylvania Opioid Data Dashboard and the Pennsylvania Healthcare Cost Containment Council shows the number of newborns on Medicaid born with Neonatal Abstinence Syndrome, a group of medical conditions resulting from withdrawal a newborn experiences when exposed to certain drugs in the womb, predominantly opioids[108]. In 2016, Northampton County had 8.4 incidents of Neonatal Abstinence Syndrome for newborns on Medicaid per 1,000 newborn hospital stays on Medicaid (Figure 4)[109]. Northampton County had 1,107 residents covered by Medicaid with Opioid Use Disorder (OUD), colloquially called addiction[110]. Additionally, Northampton County had 793 residents on Medicaid who received Medically-Assisted Treatment (MAT), a combination of behavioral therapy and medications to treat individuals with OUD[111].

[108] https://www.stanfordchildrens.org/en/topic/default?id=neonatal-abstinence-syndrome-90-P02387
[109] https://data.pa.gov/stories/s/Treatment/fvkx-eumb
[110] https://data.pa.gov/stories/s/Treatment/fvkx-eumb
[111] https://data.pa.gov/stories/s/Treatment/fvkx-eumb

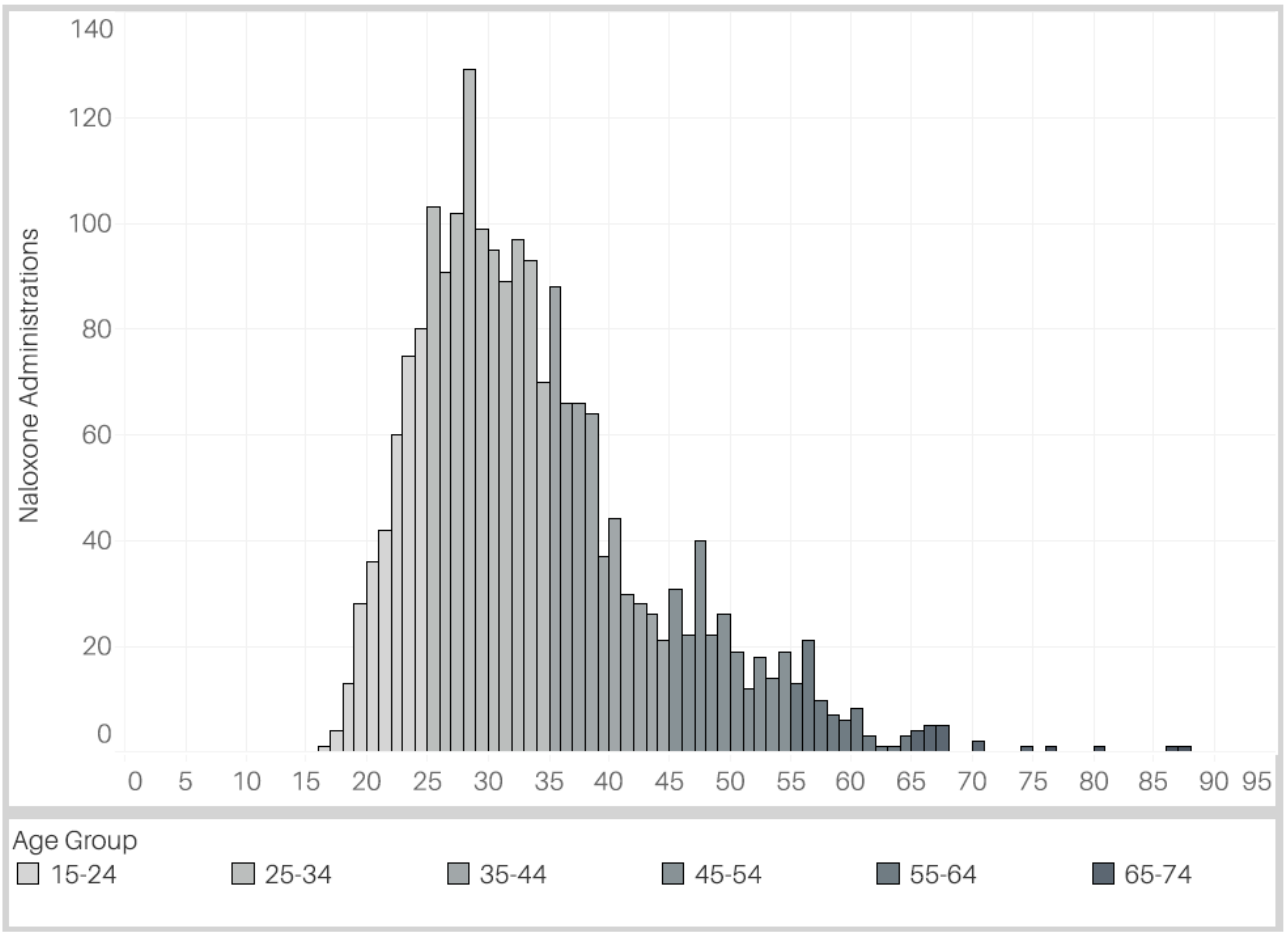
Pennsylvania County-Level Opioid Data 2016. Sources: PA Opioid Data Dashboard & PA Healthcare Cost Containment Council

	Lehigh	Northampton	Schuylkill	Carbon	Monroe	Bucks
Newborns on Medicaid Born with Neonatal Abstinence Syndrome (Per 1,000 newborn hospital stays with Medicaid)	4.6	8.4	13.6	19.0	19.4	16.1
Number of Successful Naloxone Reversals (Per 100,000)	13.4	28.0	9.8	34.5	0.0	20.2
Pennsylvanians Covered by Medicaid with Opioid Use Disorder (Per 100,000)	656.5	514.8	998.1	892.7	762.9	820.7
Pennsylvanians Covered by Medicaid Receiving Medically-Assisted Treatment (Per 100,000)	302.1	261.4	480.5	463.6	441.0	498.1

Figure 4

In 2016 Northampton County saw 85 successful Naloxone reversals[112]. Naloxone is opioid-antagonist medication that can rapidly reverse an opioid overdose by binding to opioid neurological receptors to prevent further uptake and restoring normal respiration[113]. It can be administered by paramedics, first responders, and emergency room doctors. Additionally, physicians can write third-party prescriptions for friends and family close to residents experiencing OUD. Furthermore, the Pennsylvania Secretary of Health, Dr. Rachel Levine, issued a standing order for Naloxone[114]. This serves as a prescription for any interested Pennsylvania residents who can pick up Naloxone at general pharmacies in order to use it to save someone experiencing an opioid overdose. Data from the Drug Enforcement Administration (DEA) shows that in 2017 the most likely residents in Pennsylvania to reportedly receive Naloxone were between the ages of 25 and 35, comprising 46% of all treatments (Figure 6)[115]. Over two thirds of all treatments were administered to males, and 89% were to recipients who identified as White[116]. Both of these percentages represent a significant disparity with the composition of the general Pennsylvania population where 49% of the population identifies as male and 78% identifies as White[117]. These disparities could indicate disproportionate usage of opioids and/or disproportionate access to the life-saving medicine Naloxone.

[112] https://data.pa.gov/stories/s/Treatment/fvkx-eumb
[113] https://www.drugabuse.gov/related-topics/opioid-overdose-reversal-naloxone-narcan-evzio
[114] https://www.health.pa.gov/topics/Documents/Opioids/General%20Public%20Standing%20Order.pdf
[115] https://www.dea.gov/sites/default/files/2018-10/Opioid%20threat%20in%20Pennsylvania%20FINAL.pdf
[116] https://www.dea.gov/sites/default/files/2018-10/Opioid%20threat%20in%20Pennsylvania%20FINAL.pdf
[117] https://www.dea.gov/sites/default/files/2018-10/Opioid%20threat%20in%20Pennsylvania%20FINAL.pdf



Source: Liberty Mid-Atlantic HIDTA

Figure 6

Disparities exist between the data reported by different governmental agencies and nonprofits. In this report we've opted to use the most localized data available for each section. Part of managing this public health crisis requires accurate and uniform access to data such that the issues can be clearly understood and more effectively redressed. Local, state, and national agencies, as well as nonprofit organizations, should look to better collaborate in the sharing of opioid-related mortality and morbidity data. There have been some effective interventions reducing the fatalities experienced across Pennsylvania and New Jersey communities. In addition to the standing order, Pennsylvania has also implemented a "warm hand-off" program where healthcare providers work with county Drug and Alcohol offices to facilitate a direct referral from emergency opioid overdose care to OUD treatment programs[118]. Furthermore, since 2016 Pennsylvania has funded 45 Centers of Excellence (CoE) across the state which offer "whole person" focused community-based healthcare management for residents suffering from OUD. The centers manage a patient's physical and mental healthcare, offer care navigators, and link the patient up with resources like housing, food, and employment. In the first year the centers

[118] https://www.ddap.pa.gov/SiteAssets/Pages/Warm-Hand-Off/Clinical%20Pathways%20Letter_2018.pdf

engaged 15,000 residents, over 70% of whom were entered into treatment[119]. The Lehigh Valley has one CoE provider, Neighborhood Health Centers of the Lehigh Valley. According to the Drug Enforcement Administration's "The Opioid Threat in Pennsylvania" report, legislation targeting the prescription of medical opioids has decreased the overall availability of opioids; however, it remains unclear if this has decreased the demand for prescription opioids. While all of these treatment methods are crucial for individuals and families struggling with addiction, it is important to address the community supports/resources that can prevent addiction in the first place. Healthy communities must offer social cohesion, meaningful employment, recreational activities, and a sense of hope in order to interdict residents who might otherwise become addicted to opioids or other harmful drugs.

[119] https://www.governor.pa.gov/governor-wolf-announces-year-one-successes-centers-excellence/

Appendix A

2019 CHNA Key Informant Interview

St. Luke's University Health Network (SLUHN) is a nationally recognized non-profit health network that has facilities serving counties in both Pennsylvania (Lehigh, Northampton, Carbon, Schuylkill, Bucks, Monroe) and New Jersey (Warren). As part of the Patient Protection and Affordable Care Act, all non-profit hospitals are required to conduct a Community Health Needs Assessment (CHNA) every three years. In order to accomplish our goals, St. Luke's is conducting key informant interviews to identify health needs within the community. Since you are a vital member of our community, you are being asked for your feedback to assist us in data collection. Your answers will be compiled by St. Luke's to determine health needs in the community.

Please note that your name will not be associated with your responses. Additionally, please complete your responses in a word document and email responses to the Community Health Needs Assessment Liaison for facilitated follow up during the interview.

1. Name:

2. Title:

3. Organization:

4. How long have you been a part of this community?

5. When thinking about others you interact with here, do you feel a sense of community?

6. Do you work and live in this community? Please explain.

7. How would you describe your community?

8. What are the major needs/challenges within this community?

9. What are some of the challenges specific to your organization?

10. How do you feel this community has been successful in meeting its needs?

11. What improvements in policy and community infrastructure would assist you in meeting community needs?

12. Who are some of the key players in your community and what organization do they belong to?

13. What are some of the strengths and resources of your community?

14. Do you feel these strengths are shared and evenly distributed throughout the community? Please explain.

15. What are some concrete examples of strengths and challenges related to the following topics in your community:

    a. Health disparities/Access to care (example: access to medical, mental, dental and vision care)

    b. Healthy Living (example: diet and physical activity)

    c. Chronic Disease (example: diabetes, heart disease and cancer)

    d. Mental/Behavioral Health (example: substance abuse, depression and anxiety)

    e. Child/Adolescent Health (example: physical and mental wellness)

    f. Elder Health (example: falls, medications and isolation)

16. What are the top three issues that need to be addressed in our community?

17. Any additional Comments

Appendix B

2019 CHNA Community Forum Invited Organizations – Anderson Campus

- Bangor Area School District
- Bangor Block Watch
- Bangor Police Department
- City of Easton
- Easton School District
- Family Connections in Easton
- Family Life Community Center
- Kellyn Foundation
- Lehigh and Northampton Transportation Authority
- Meals on Wheels
- Merchants Bank – Bangor
- Northampton Community College
- Northampton County Area Agency on Aging
- Northampton County Drug and Alcohol Unit
- Northampton County Health and Human Services
- Northampton County Medical Society Alliance
- Northampton County Mental Health
- Northampton County Prison Advisory Board
- Northampton County Veterans Affairs
- Pen Argyl School District
- Recovery Revolution
- Salvation Army
- Senior Life Lehigh Valley
- Slate Belt Chamber of Commerce

- Slater Family Network
- St. Luke's Anderson Emergency Department
- St. Luke's Anderson NICHE
- St. Luke's Patient Care Services
- Suddenly Samantha Salon
- Two Rivers Health and Wellness Foundation
- United Way of the Greater Lehigh Valley
- Valley Youth House