



Executive Report
Community Health Needs Assessment

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Department of
Community Health & Preventive Medicine

Rajika E. Reed, MPH, M.Ed

Bonnie Coyle, MD, MS

Lehigh University
Samantha Polansky, MA

I. St. Luke's University Health Network Executive Report

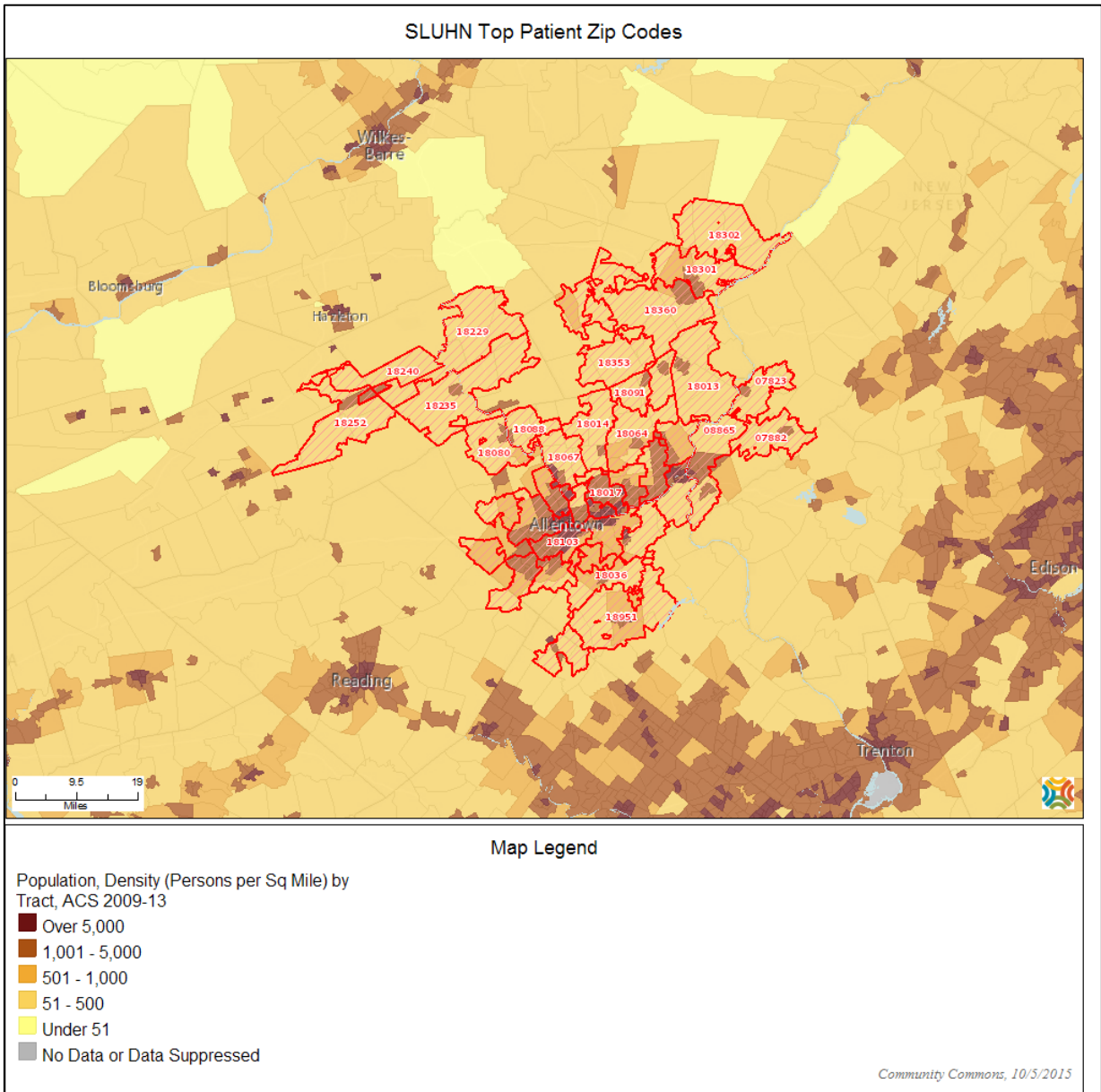
A. Community Health Needs Assessment (CHNA) Background

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 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 amongst residents within the community. The needs assessment must state every health priority addressed by community stakeholders, hospital professionals, or public health experts. Additionally, campus specific implementation plans will be crafted for each of the St. Luke's University Health Network (SLUHN) campuses in order to determine how resources will be allocated to address the specified health needs.

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

B. About SLUHN & Geographic Description of Medical Service Area

St. Luke's University Health Network (SLUHN) is a nationally recognized non-profit health network that is composed of six hospitals (Bethlehem, Allentown, Quakertown, Anderson, Miners and Warren) and over 200 outpatient facilities serving counties in both Pennsylvania (Lehigh, Northampton, Carbon, Schuylkill, Bucks, Montgomery, Berks) and one in New Jersey (Warren). Additionally, we have a seventh campus in Monroe County where construction is underway; it will open in fall 2016. We included a separate CHNA for Monroe campus in our efforts to assess and better plan for the needs of the community we will be serving. The implementation plan for the Monroe campus will be focused on learning more about the community, making in-roads, and developing partnerships with key community stakeholders in order to provide the desired community programming without duplication of services.



A total of 839,522 people live in the 1,113.34 square mile report area defined for this six campus assessment according to the U.S. Census Bureau American Community Survey (ACS, 2009-13) 5-year estimates. The population density of this area, estimated at 754.06 persons per square mile, is greater than the national average population density of 88.23 persons per square mile. For our assessment, we focused on our top patient zip codes to determine where 80% of our patients reside for each hospital campus (45 zip codes total). The map above, generated through Community Commons, displays the top patient zip codes where 80% of our patients reside network wide. For this report, when we mention the “SLUHN service area”, we are referring to the currently operating six hospital campus areas in which 80% of our patients come from (i.e. the zip codes from the chart in Appendix A). In the campus specific CHNA documents our service area will be referring to the areas in which 80% of the patients come from for that particular campus.

C. Summary of the Needs Assessment Methodology

Our CHNA is comprised of both primary and secondary data. The primary data was collected through our community health surveys, where approximately 3,000 surveys were conducted in our seven campus geographic region. Primary data was also collected through campus specific key stakeholder focus groups, where the main priority health needs were identified for each entity (besides Monroe campus). Secondary data included the use of county level, state level, and national level data obtained via the U.S. Census, the Robert Wood Johnson Foundation, Vital Statistics, Community Commons, the American Community Survey, U.S. Department of Labor, the Behavioral Risk Factor Surveillance System as well as other data sources, which can be found in the appendices. The needs identified in the focus groups were supplemented by the survey data and secondary data to provide us with a more comprehensive picture of the needs in the community and what factors are affecting these health issues. Through reviewing our primary data and secondary data, we were able to categorize the identified health needs into five major categories for the 2016-2019 CHNA cycle. These priority health categories include improving access to care/reducing health disparities, promoting healthy lifestyles and preventing chronic disease, improving mental/behavioral health, improving child and adolescent health, and improving elder health. These health categories were seen as priorities across the network, and they will be discussed in further detail within the individual reports.

D. Description of Community Served

First we will present the findings from the Robert Wood Johnson 2015 County Health Rankings, in which the counties in each state are ranked in terms of health outcomes, length of life (mortality), quality of life (morbidity), health factors, health behaviors, clinical care, social and economic factors, and the physical environment. For Pennsylvania, the counties are ranked from 1-67, with 1 representing the best ranking and 67 representing the poorest ranking. For New Jersey, the counties are ranked from 1-21, with 1 representing the best ranking and 21 representing the poorest ranking. Within each of the categories discussed, more specific measures are examined. The chart below shows the overall and specific rankings for our main counties: Bucks, Northampton, Lehigh, Carbon, Schuylkill, Monroe, and Warren. For the Pennsylvania counties, comparisons are made against the top performing counties in the U.S. (counties that fall in the 90th percentile—i.e. only 10% of counties perform better than them) and the state of Pennsylvania as a whole. For Warren, comparisons are made against the U.S. top performing counties and the state of New Jersey. If a cell is highlighted in green it means for that measure the county is performing at or better than the top U.S. performers. If the cell is yellow it means that the county is performing worse than the top U.S. counties on that measure, but is performing better than the state standard. If the cell is red, this means that the county is performing at or worse than the state standard for this measure. We use this color coding method so that it is easy visualize how our counties are performing compared to the top performers and to the state.

Robert Wood Johnson (RWJ) County Specific Data for Counties with SLUHN Services

	US Top Performers* 2015	Pennsylvania 2015	Bucks (BU) 2015	Northampton (NO) 2015	Lehigh (LH) 2015	Schuylkill (SC) 2015	Carbon (CR) 2015	Monroe (MO) 2015	New Jersey 2015	Warren (WA) 2015
Premature death	5,200	6,926	5,889	5,804	6,001	8,319	8,276	6,364	5,558	5,576
Poor or fair health	10%	14%	11%	15%	12%	16%	15%	12%	15%	13%
Poor physical health days	2.5	3.5	2.9	3.6	3.5	3.5	3.7	3.3	3.3	3.6
Poor mental health days	2.3	3.6	3.5	3.9	3.4	3.6	4.1	3.9	3.3	3.6
Low birthweight	5.9%	8.3%	7.5%	8.8%	8.3%	7.7%	8.0%	8.4%	8.4%	7.9%
Adult smoking	14%	20%	16%	18%	20%	25%	30%	24%	16%	19%
Adult obesity	25%	29%	26%	30%	29%	33%	36%	28%	24%	27%
Food Environment Index	8.4	7.7	8.6	8.1	7.9	8.1	8.1	7.5	8.1	8.5
Physical inactivity	20%	24%	22%	25%	21%	30%	29%	24%	24%	24%
Access to exercise opportunities	92%	85%	94%	87%	88%	71%	78%	83%	96%	96%
Excessive drinking***	10%	17%	19%	17%	18%	19%	17%	24%	16%	16%
Alcohol-impaired driving deaths	14%	34%	31%	34%	37%	27%	35%	39%	26%	19%
Sexually transmitted infections	138	431	179	287	441	205	117	219	308	122
Teen Births	20	28	12	22	35	32	29	17	22	15
Uninsured	11%	12%	9%	11%	14%	12%	12%	14%	15%	13%
Primary care physicians	1,045:1	1,249:1	1,122:1	1,257:1	1,045:1	1,690:1	2,167:1	2,221:1	1,168:1	1,583:1
Dentists	1,377:1	1,600:1	1,285:1	1,947:1	1,224:1	2,578:1	2,492:1	2,696:1	1,240:1	1,491:1
Mental Health Providers	386:1	623:1	529:1	592:1	647:1	1,749:1	2,314:1	1,161:1	623:1	651:1
Preventable hospital stays	41	63	66	69	63	70	86	75	61	67
Diabetic monitoring	90%	86%	87%	86%	87%	87%	86%	86%	83%	83%
Mammography Screening	70.7%	63.4%	64.2%	61.3%	66.0%	58.3%	58.4%	62.2%	60.8%	59.7%

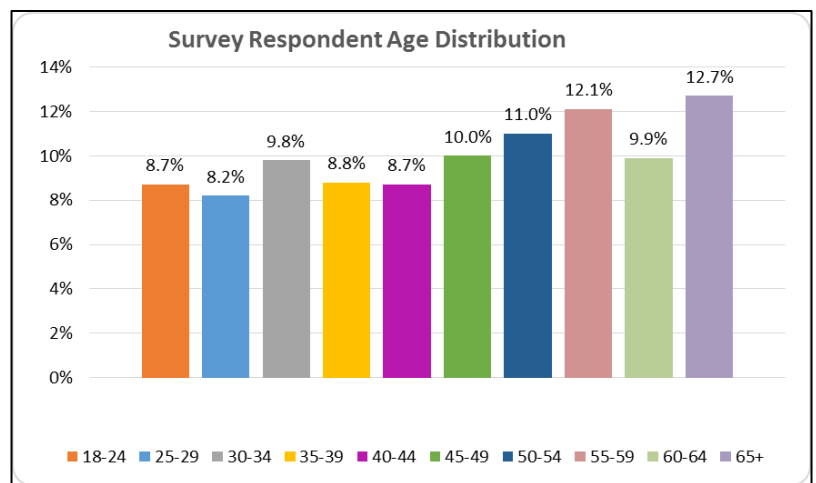
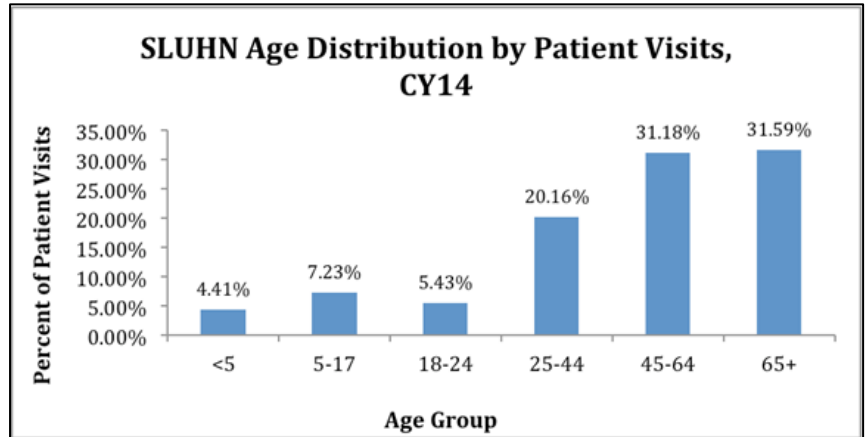
	US Top Performers* 2015	Pennsylvania 2015	Bucks (BU) 2015	Northampton (NO) 2015	Lehigh (LH) 2015	Schuylkill (SC) 2015	Carbon (CR) 2015	Monroe (MO) 2015	New Jersey 2015	Warren (WA) 2015
High school graduation (coded compared to PA/NJ)		85%	93%	89%	82%	86%	91%	85%	87%	90%
Some college	71%	61.9%	69.7%	65.5%	62.2%	48.4%	52.6%	62.9%	66.0%	63.6%
Unemployment	4%	7.4%	6.9%	7.7%	7.8%	8.8%	9.1%	9.4%	8.2%	7.0%
Children in poverty	13%	19%	8%	13%	22%	20%	22%	17%	17%	12%
Social associations	22.0	12.3	7.5	11.3	10.8	13.7	14.5	7.8	8.3	9.6
Children in single-parent households	20%	33%	20%	28%	36%	32%	34%	32%	29%	23%
Violent crime	59	357	112	197	269	205	275	336	302	93
Injury deaths	50	66	59	56	63	83	82	62	41	43
Air Pollution - particulate matter	9.5	12.9	11.6	11.7	11.9	12.3	11.9	11.7	11.3	11.5
Drinking water violations	0%	8%	6%	1%	6%	2%	25%	19%	6%	0%
Severe housing problems	9%	15%	15%	16%	16%	11%	13%	21%	23%	16%
Driving alone to work	71%	77%	83%	84%	81%	82%	80%	78%	72%	81%
Long commute – driving alone	15%	34%	39%	35%	27%	34%	47%	45%	41%	53%

* 90th percentile, i.e., only 10% are better

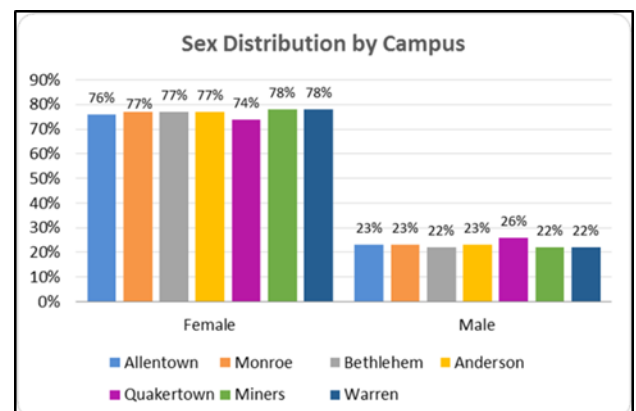
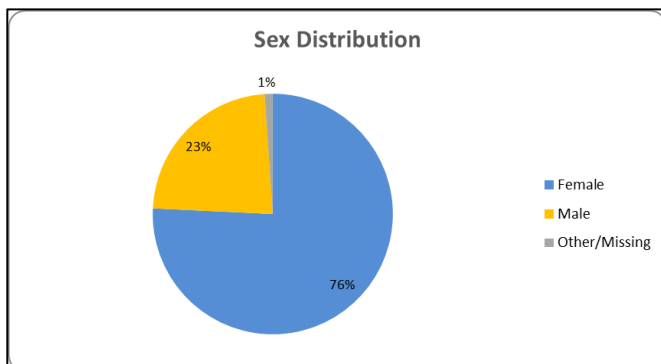
KEY: ■ At or Worse than PA Standards ■ Worse than U.S. Top Performer but better than PA/NJ ■ At or Better than U.S. Top Performer

i. Demographics

SLUHN services patients of all ages. This top bar graph shows the specific breakdown of patient ages in our population, representing the age distribution by patient visits in 2014. This graph shows that a large portion of our patients seen were from the older population, with about one third of our patients between the ages of 45-64, and one third of our patients being ages 65 and older. This signifies the importance of focusing care specifically in regards to the elderly population, who tend to be a vulnerable group that have many health challenges and face various barriers to care. This age distribution graph covers all types of medical care, i.e. inpatient, outpatient, ER, primary care.

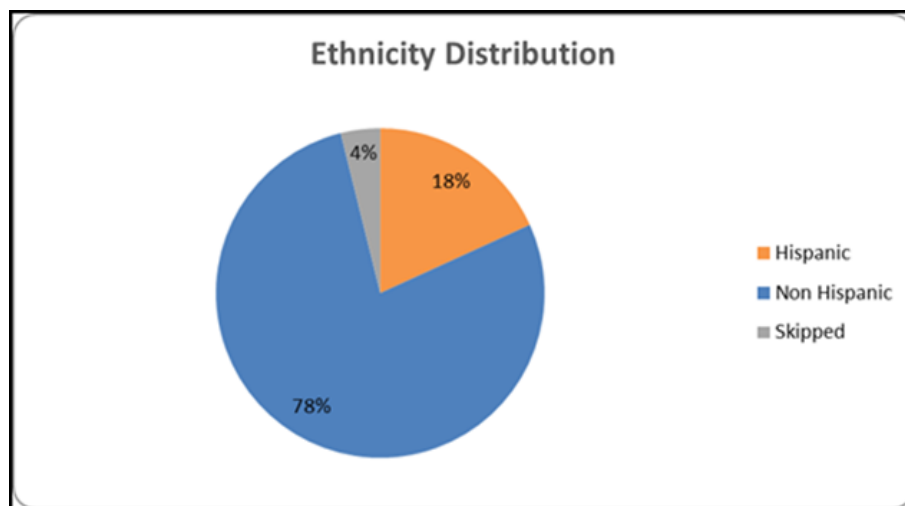


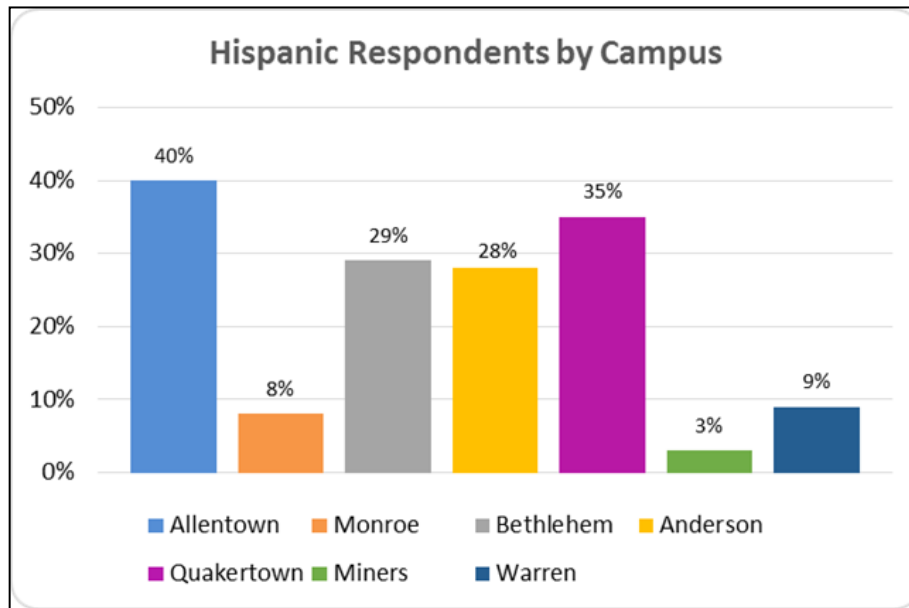
From our 2016 community survey, we found that 76% of the respondents were female and 23% were male. As evidenced by the bar graph below, the sex distribution by campus mirrors the distribution for SLUHN as a whole. This is important to note because there is an overrepresentation of females in this sample, since in the SLUHN service area the percentage of females throughout our service area ranges from 49.17% (Schuylkill County) to 51.48% (Montgomery County) (ACS, 2009-13).



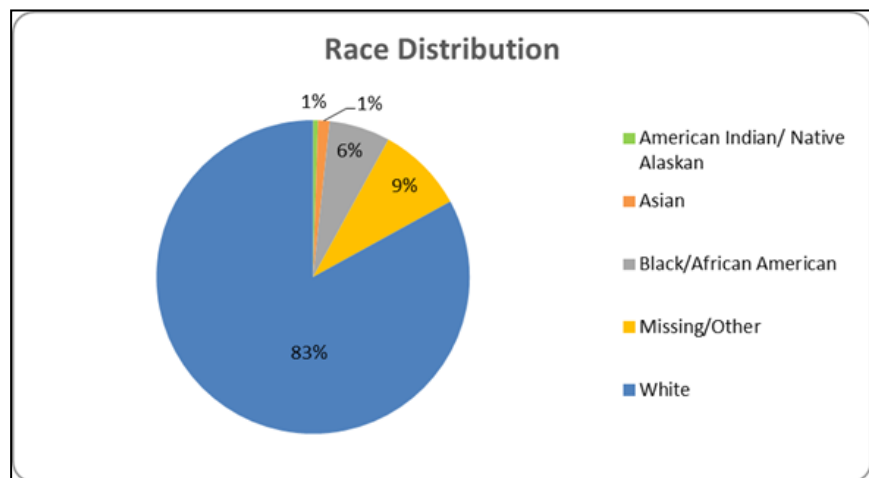
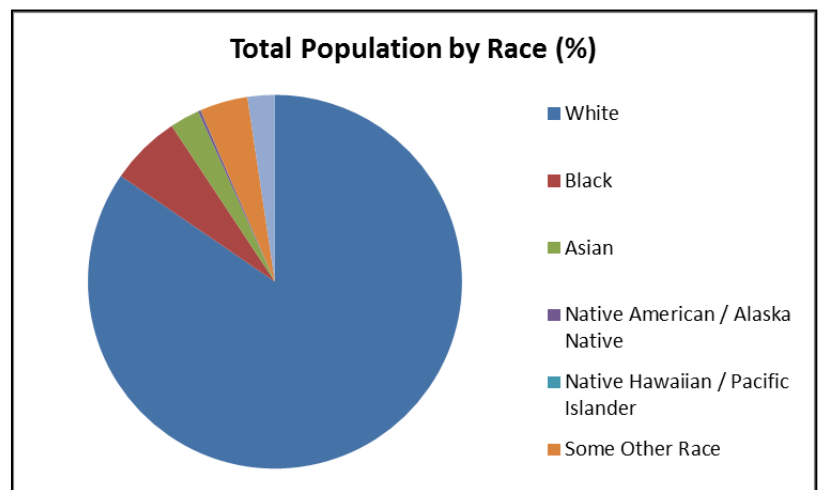
SLUHN services areas that are both rural and urban. The urban/rural population indicator reports the percentage of population living in urban and rural areas. Data from the U.S. Census Bureau's Decennial Census in 2010 shows that 85.14% of the area that SLUHN serves is considered an urban population, and 14.86% is considered rural. Although our counties are mostly urban, Carbon County (47.16%), Monroe County (38.35%) and Schuylkill County (36.46%), have large percentages of their counties that are considered rural. Urban and rural areas tend to have differing barriers to care, which may influence the health status of their residents. According to the Rural Health Reform Policy Research Center's 2014 Rural-urban chart book, residents of rural areas are more likely to be uninsured than those who live in the outskirts of large metropolitan areas. The report also identified differences in mortality rates, with ischemic heart disease, COPD and suicide having higher mortality rates in rural areas. The differences in urban and rural health aligns with our priority area of improving access to care and reducing health disparities, because an individual should be able to easily receive care and obtain the preventative services that they need, regardless of living in a rural or urban area.

The estimated population that is of Hispanic, Latino, or Spanish origin in the SLUHN service area is 13.87% of the total service area population, which is less than the national rate of 16.62% (ACS, 2009-13). 86.13% of the population in our service area is non-Hispanic or Latino, as compared to the national percentage of 83.38% (ACS, 2009-13). The percentages of Hispanic versus non-Hispanic populations differ depending on the county, but the percentages range from 3% (Schuylkill County) to 19.58% (Lehigh County). When examining the results from our 2016 community survey, the breakdown by ethnicity in the pie chart follows the same pattern that we see for the SLUHN service area as a whole. The majority of respondents from our survey were non-Hispanic (78%), followed by those who were Hispanic (18%). The bar graph on the following page displays the 2016 survey data for Hispanic respondents by campus, which shows us that there are generally lower percentages of individuals identifying as Hispanic in our more rural campuses (Miners and Monroe), as opposed to our more urban campuses (Bethlehem, Allentown, Anderson, Quakertown and Warren).





We can break down the SLUHN population even more specifically by examining the race distribution. According to the ACS (2009-13), 84.57% of the SLUHN service area is white, 6.12% is black and 4.14% identify as some other race (top pie chart). When comparing the breakdown of race for the SLUHN service area as a whole to the race distribution from our 2016 community survey, we can see from the bottom pie chart that the distribution is very similar. The percentage of white and black respondents is almost identical to that seen in the service area as a whole. The higher percentage for missing/other race in our 2016 survey data could be due to the fact that Hispanic/Latino individuals may not have considered their race to be white, so they may have declined to respond or chose Other.



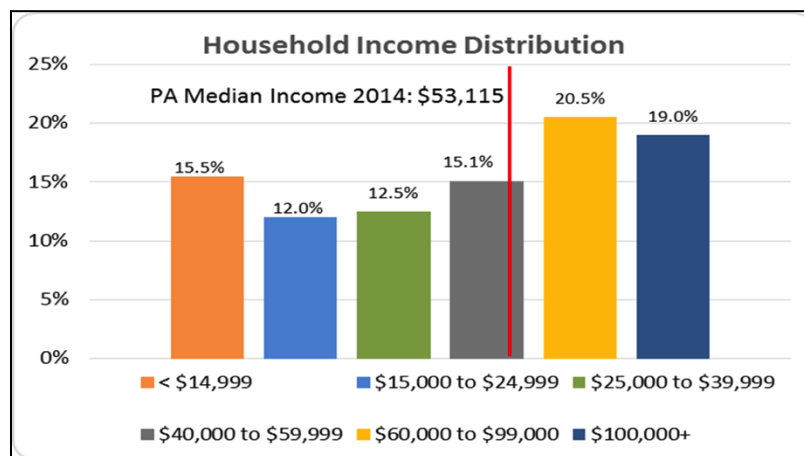
Zip Code	% of SLUHN population	% Spanish Speaking in zip code	% of zip code who speaking Spanish but speak English less than "very well"	Next Frequent Language in zip code
18017	8.03%	9.8% (3,447 people)	4.25% (1,492 people)	Arabic (1% -363 people)
18015	7.76%	22.37% (6,743 people)	8.28% (2,495 people)	Chinese (1% - 394 people)
18018	5.39%	11.16% (3,506 people)	3.21% (1,009 people)	Greek (0.5% - 156 people)
18102	5.38%	46.21% (19,756 people)	19.85% (8,485 people)	Arabic (2.4% - 1,030 people)
18103	4.86%	24.41% (11,002 people)	10.78% (4,858 people)	Vietnamese (1.4% - 611 people)
18042	4.31%	9.82% (3,885 people)	3.69% (1,459 people)	Other Indic Languages (0.65% - 259 people)
18951	3.73%	1.7% (550 people)	0.79% (254 people)	Vietnamese (1.1% - 187 people)
18064	3.70%	1.26% (295 people)	0.33% (78 people)	German (0.7% - 154 people)
18020	3.51%	6.26% (1,230 people)	1.82% (358 people)	Portuguese (1.4% - 278 people)
18045	3.06%	2.87% (702 people)	1.00% (247 people)	Other Indic Languages (1.88% - 461 people)
18104	3.00%	6.34% (2,623 people)	2.69% (1,113 people)	Arabic (1.47% - 606 people)

We can examine our campus specific data to explore the different types of languages that people speak in the SLUHN service area. If zip codes have over 1,000 people that speak a language or this makes up more than 5% of their campus, translators/interpreters are required. Spanish translation services are required at three of our six campuses and Arabic at two of the three. More specifically, in two Allentown zip codes (18102 and 18103), 46.21% and 24.41% of the population are primarily Spanish speaking, respectively. One zip code in Bethlehem (18015) has a total of 22.37% of the population that is Spanish speaking. Population with Limited English Proficiency is represented by the percentage of the population ages five and older who speak a language other than English at home and speak English less than "very well." This indicator is relevant because an inability to speak English well creates barriers to healthcare access, provider communications, and health literacy/education. According to the ACS (2009-13), for our network, 5.69% of the population speaks English less than very well, which is lower than the New Jersey average of 12.38% and the national average of 8.63%, but it is greater than the Pennsylvania average of 3.92%. Looking at the percentage of the population that does not speak English very well is important because language barriers can result in huge issues related to accessing care and ultimately lead to disparities in care. Additionally, from the chart above, we

can see that there is a wide diversity of languages that our residents speak, exemplifying the diversity in the SLUHN service area.

ii. Social and Economic Factors

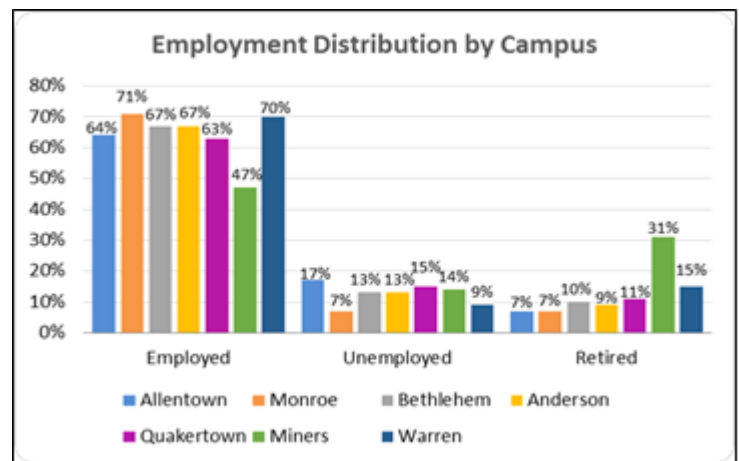
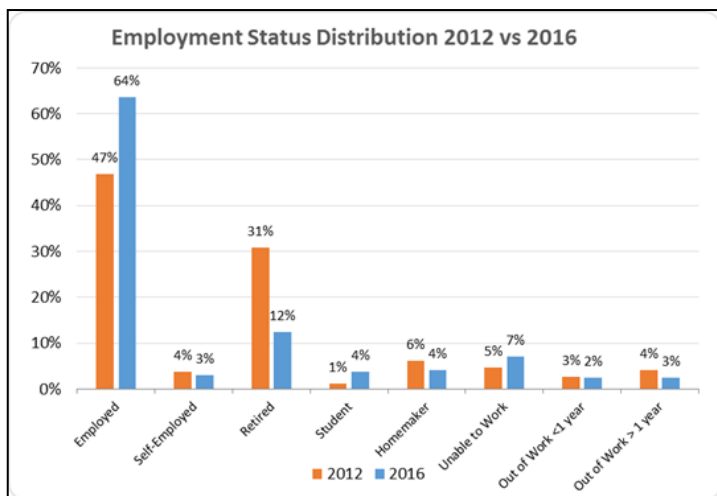
According to the ACS (2009-13), the per capita income for the population that SLUHN serves is \$27,959. The per capita income for our service area is lower than the average for New Jersey residents (\$36,027), Pennsylvania residents (\$28,502), and U.S. citizens (\$28,154). The lower average per capita income suggests that people may be less likely to afford care that is not covered by insurance (i.e. dental care) and may have difficulty paying out of pocket for care if they are uninsured. In relation to per capita income we can also look at household income, to assess the likelihood of respondents to be able to cover basic necessities as well as pay for healthcare. When examining the household income as reported by respondents of our 2016 community survey for the SLUHN service area, we can see that most of our respondents reported household incomes that fell below the Pennsylvania median household income of \$53,115. 15.5% of respondents fell into the less than \$14,999 category. In 2015, the federal poverty level for a family of four was \$ 24,250 (U.S. Department of Health and Human Services, 2015). Approximately 40% of respondents reported incomes below \$39,000 and 40% reported incomes above \$60,000, showing the variation in household income in the SLUHN service area.



Poverty represents a significant barrier to receiving healthcare because those who are living in poverty may not have insurance coverage or are unable to pay for healthcare services out of pocket. Additionally, these individuals are more likely to face housing problems and have limited access to healthy food, both which can contribute to poor health status. Statistics from the ACS (2009-13) shows that within the SLUHN service area, 11.99% or 97,633 individuals are living in households with incomes at or below 100% of the Federal Poverty Level (FPL). This percentage is lower than the Pennsylvania average of 13.3% and the national average of 15.37%. But, the percentage of people who fall below 100% of the FPL is 10.4% in New Jersey, which is better than the percentage in the SLUHN service area. Additionally, 28.9% of our population is

living in households with incomes at or below 200% of the FPL, but this percentage is smaller than those seen in Pennsylvania (30.51%) and nationally (34.23%).

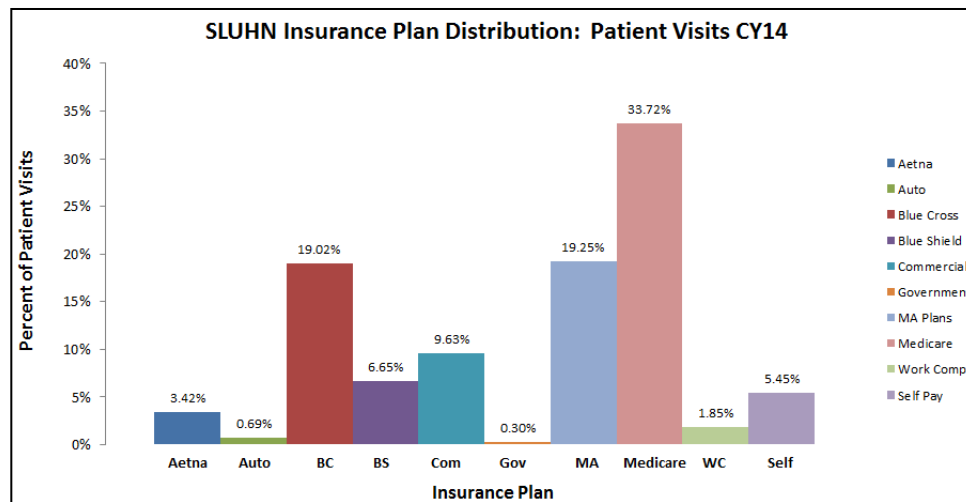
In addition to poverty, it is important to examine unemployment, because these factors have an interrelated role in the ability to access care. Total unemployment in the SLUHN service area reported by the Bureau of Labor Statistics in July 2015 was 6.7% of the population over the age of 16. The unemployment rate for our area was slightly higher than the Pennsylvania average of 6.4% and the national average of 6.6%. The highest rates of unemployment can be seen in Monroe County (7.9%) and Carbon County (7.4%). Unemployment has implications for financial stability, healthcare access, insurance, as well as physical and mental health issues. When comparing data from our 2012 community survey to our 2016 community survey, we can see that 17% more respondents are employed in 2016 than there were in 2012, and the percent of retired respondents has increased by 19%. The other percentages generally stayed the same. If we examine the employment distribution by campus, we can see that the majority of respondents are employed (or self-employed) across all campuses except for Miners (47%). Allentown has the highest percentage of those out of work or unable to work (17%), likely indicating that disability is an issue in this service area. From this discussion, we can see that poverty and unemployment are both social determinants of health that are important to understand when addressing the health status of our community.



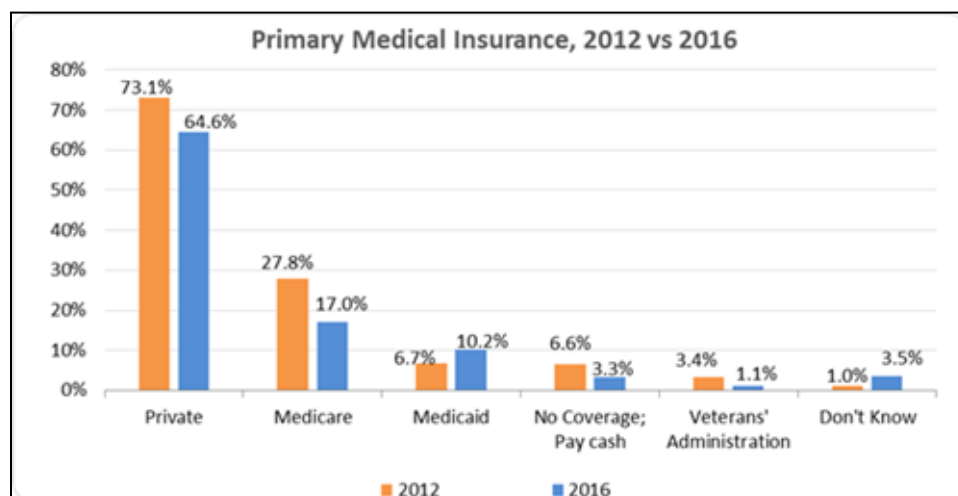
Lack of health insurance is an important predictor of health. In the SLUHN area served, 10.32% of the non-institutionalized population is uninsured, as indicated by the ACS (2009-13). This percentage is lower than the national (14.87%) and New Jersey (12.84%) uninsured populations, but higher than the Pennsylvania average (9.81%). The Healthy People 2020 objective is to have 100% of the population covered by health insurance. If people are not covered by health insurance this creates barriers to care since it will become more difficult for them to see a

provider (since many require insurance), or they will have to pay out of pocket which is very costly.

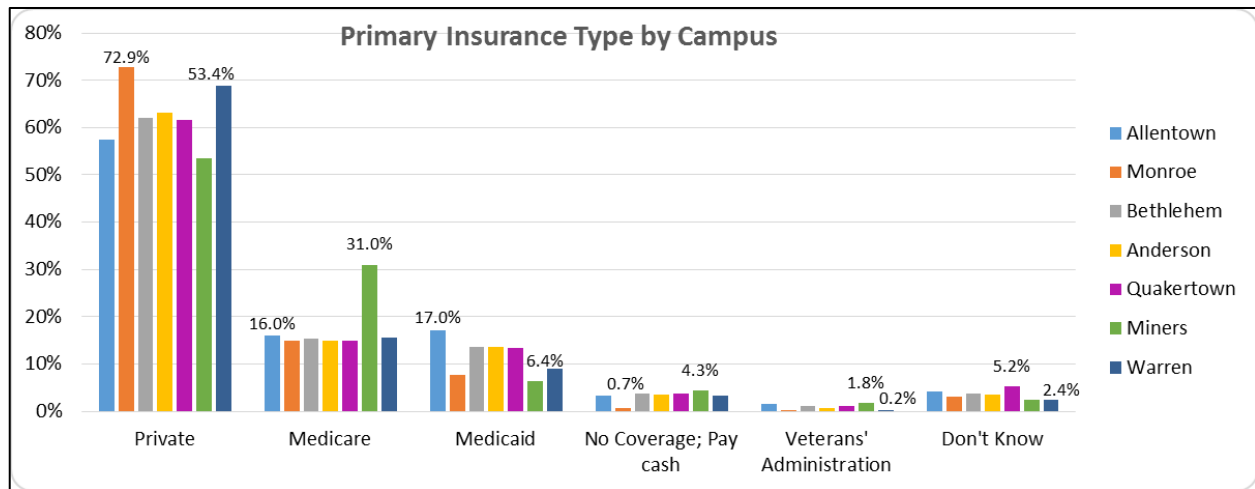
Our patients use a variety of different methods of payment to cover their healthcare needs. The type of insurance that a patient uses may be indicative of their income level, employment status, age, occupation, or disability. The graph below shows that almost one third of our patients used Medicare as their insurance plan, which speaks to the aging nature of our population. The second and third most popular insurance plans were Medical Assistance (MA) plans constituting 19.25% of patients' insurance plans, and Blue Cross representing 19.02%. This insurance distribution graph covers all types of medical care, i.e. inpatient, outpatient, ER, primary care. Throughout SLUHN, the total cost of healthcare provided to uninsured and vulnerable populations in 2014 was \$48,796,104.



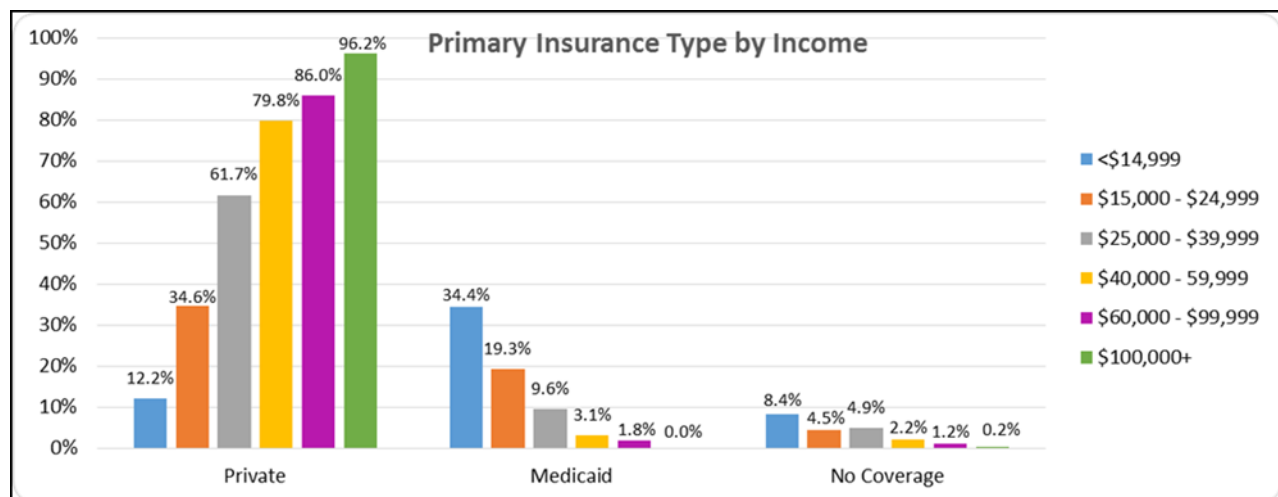
When examining the distribution of insurance types for the SLUHN service area, we can see that from our 2012 survey to our 2016 survey, all types of medical insurance decreased except for Medicaid, which increased by 3.5%. This shows that more respondents are now using needs based subsidized government insurance plans, indicating a possible rise in the poverty level in our service area within this time period.



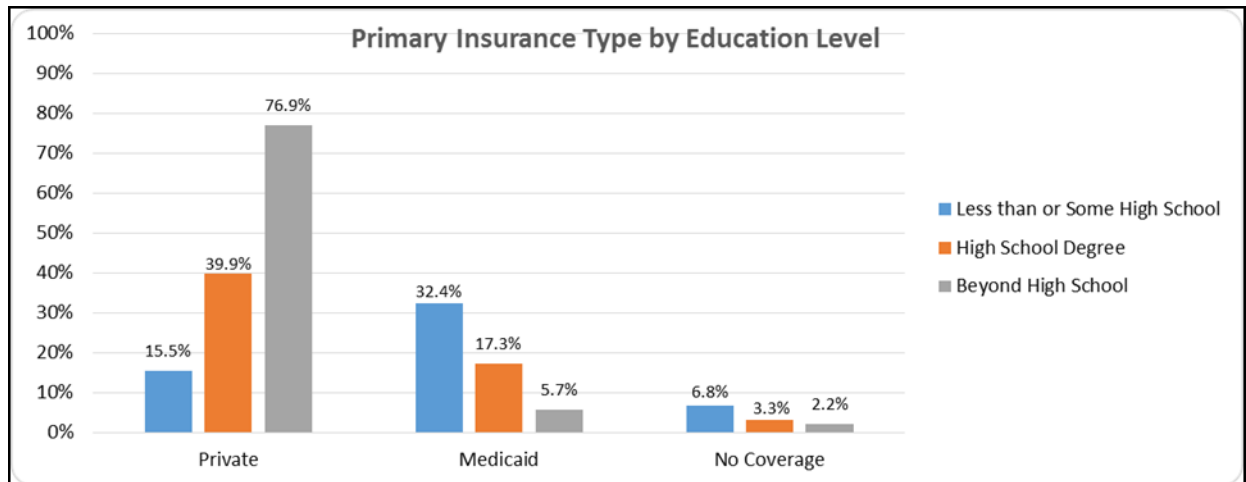
Across all of the SLUHN campuses, private insurance was the most commonly used form of coverage, followed by Medicare and Medicaid. As suspected, Miners campus had the largest percentage of respondents using Medicare (31%), which correlated with Miners campus surveying the largest percentage of respondents over 65. Allentown had the largest percentage of survey respondents using Medicaid at 17% and Miners had the smallest percentage at 6.4%.



Additionally, we found interesting correlations between type of primary insurance used and demographic factors such as income and level of education from our 2016 survey data. We found that the highest percentage of respondents who reported using Medicaid for coverage (34.4%) or had no coverage at all (8.4%) were in the lowest income bracket (less than \$14,999). On the other hand, we found that the highest percentage of respondents who reported using private insurance (96.2%) and the lowest percentage who reported no coverage (0.2%) came from the highest income bracket (over \$100,000).



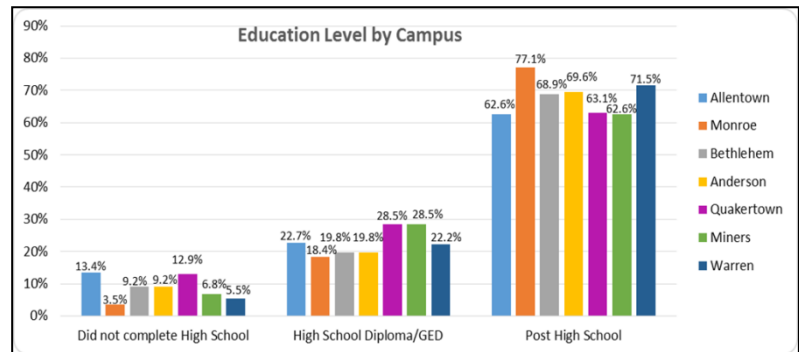
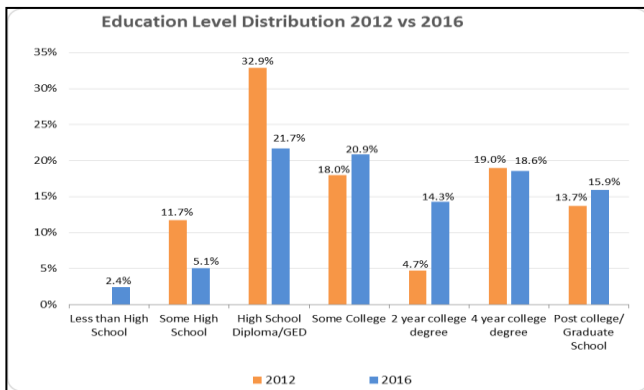
Lastly, we found that 32% of respondents who reported having less than a high school education were enrolled in Medicaid as opposed to 5.7% who had an education beyond high school. Following this pattern, out of those respondents who reported higher than a high school education, 78% reported having private insurance as opposed to 15% of those who reported having less than high school education. The previous two sections show the disparity in healthcare coverage as related to income and education, which are important to take into consideration when examining health outcomes and issues of access to healthcare.



There is a wealth of information regarding the use of public health insurance programs by U.S. citizens. Within the U.S., public health insurance plans includes federal programs such as Medicare, Medicaid and other medical assistance programs, VA Health Care; the Children's Health Insurance Program (CHIP), and individual state health plans. When looking at national reports, the ACS (2008) estimated that 25.5% of the non-institutionalized U.S. population had public health coverage as opposed to 69.6% who were estimated to have private health coverage. Breaking down public coverage more specifically, according to the Kaiser Family Foundation, 19% of the total population in Pennsylvania were beneficiaries of Medicare in 2012. In terms of Medicaid, national enrollment from 1966 to 2015 increased astronomically, more than 17 times from 4 million to 68.9 million (Statista, 2015). It is clear from the previous graphs that many people in the SLUHN population receive care through public coverage, which aligns with the upward trend of Medicaid and Medicare usage in the U.S as a whole.

Level of education is a factor that influences health disparities. Research has taught us that education is tied to earning capacity, and studies such as the renowned Whitehall Study have directly correlated socio-economic status with health outcomes. Higher levels of education generally lead to better health outcomes. From our 2012 survey to our 2016 survey, we found that fewer people reported that they had only a high school diploma (32.9% versus 21.7%), and

the percentage of respondents who achieved education beyond high school (some college and above) increased (55.4% versus 69.7%). When breaking down the education level distribution by campus, we can see that the majority of respondents have post high school education, with the lowest percentages seen at Miners and Allentown (both 62.6%). Allentown also had the highest percentage of respondents who reported that they did not complete high school (13.4%).



When examining education, it is important to take into consideration other factors related to level of educational attainment, such as ethnicity and income. When ethnicity is considered in relation to education, 24.7% of Hispanic survey respondents reported having an education of less than high school, compared to 3.7% of Non-Hispanic respondents. This striking pattern can also be seen in terms of earning beyond a high school education, where 43.2% of Hispanic survey respondents reported having an education beyond high school, as compared to 76.4% of Non-Hispanic respondents. In terms of income, 71.5% of survey respondents who completed less than high school reported making less than \$24,999, as compared to 51.1% of those with a high school diploma or a GED and 15.6% of those with education past high school. 51.5% of those with an education past high school reported making \$60,000 or more, which is much higher than the 14.7% of those with a high school degree, and 4.8% of those who have completed less than high school who reported incomes in this bracket. These relationships show that education, ethnicity, and income are important social determinants of health, because they all influence one another and impact access to care and health outcomes.

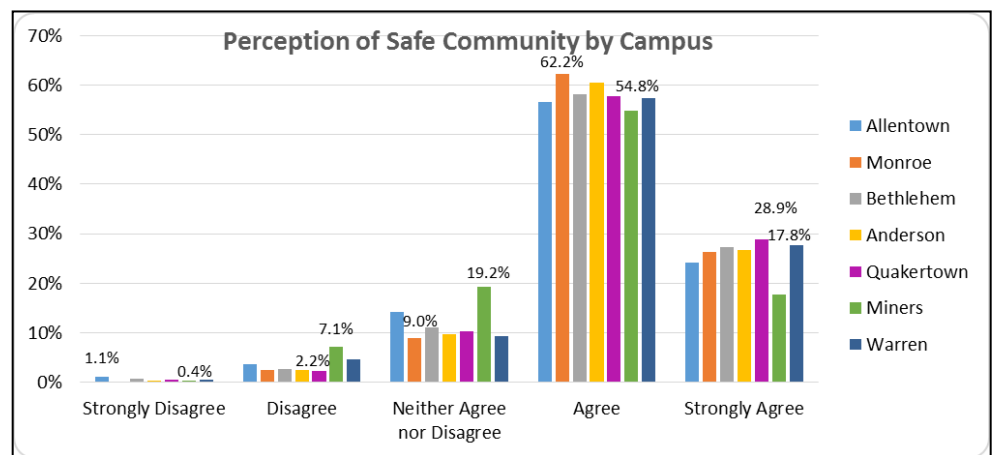
iii. Physical Environment

First we will provide a brief description of the infrastructure present in the Lehigh Valley. Many community members utilize public transportation provided by the Lehigh and Northampton Transportation Authority (LANTA). This bus service provides busing through the cities of Allentown, Easton, and Bethlehem. The Trans-Bridge Bus line and Bieber Tourways both provide coach buses to and from New York City and Philadelphia. Additionally, if traveling by car, the Lehigh Valley has access to major highways such as I-78, I-80, and PA-33.

Although the Lehigh Valley is an urban area, there is a lot of green space and parks available for community use. The Greenway in South Bethlehem is a wonderful community asset; it is a park with a path that can be used for walking, running, or biking. It stretches from East 3rd street to Saucon Park. The Lehigh Valley has many other adventurous trails that can be easily accessed by all community members. SLUHN teamed up with Delaware & Lehigh National Heritage Corridor (D&L) to organize a new program to promote exercise and encourage community members to embrace the great outdoors. The “Get Your Tail on the Trail” program allows participants to track their mileage (will the goal of 165 miles) along the D&L Trail, which begins in Mountaintop, PA and runs along the Lehigh River, then eventually follows the Delaware River all the way south to Bristol, PA.

The Lehigh Valley has a unique geography, where the cities are located downward from large rural areas, which encompasses a large valley. These factors as well as others have lent an unfortunate hand in the problem of air pollution in the region. The American Lung Association found that the Bethlehem-Easton-Allentown-Warren area was ranked as the 14th most polluted area in regards to particle pollution (Olanoff, 2013). In 2015, our counties received rankings of C, D, and F (Northampton, Lehigh, and Bucks respectively) based on weighted averages of ozone levels and particle pollution based on the number of days that pollution reached its highest points. Asthma and pulmonary disease are prevalent in our community, so it will be important to focus on going green and keeping our air clean in the coming years.

Another aspect of the physical environment is how safe people feel in their community. In our 2016 community survey we asked respondents how safe they felt their community was. For the SLUHN service area, the majority of respondents agreed (57.6%) or strongly agreed (27.2%) that their community was a safe place to live in. When breaking this down by campus, we can see that 26.7% of survey respondents from Miners and 18.9% of respondents from Allentown strongly disagreed, disagreed, or neither agreed nor disagreed with the statement that their community is a safe place to live. Anderson campus respondents had the highest percentage (87.1%) of people who agreed or strongly agreed that their community is a safe place to live.

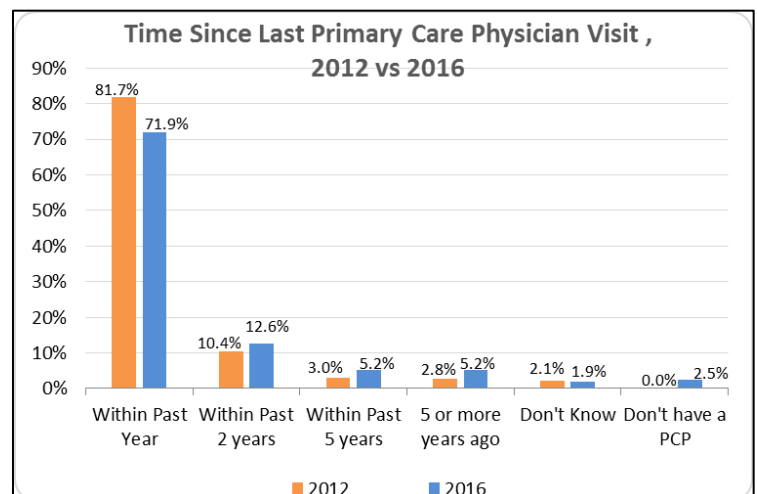


Lastly, in terms of the physical environment we can measure grocery store access, which is important because it can help determine if community members have access to stores where they can purchase healthy foods. This indicator from the U.S. Census Bureau County Business Patterns (2013) reports the number of grocery stores per 100,000 population. Grocery stores are defined as supermarkets and smaller grocery stores that sell general food stuffs such as canned and frozen foods, fresh fruits and vegetables, as well as fresh prepared meats, fish, and poultry (County Business Patterns, 2013). We do not have an estimate for the rate of establishments in the SLUHN service area, but Northampton County (16.79), Carbon County (15.33), Monroe County (11.19) and Schuylkill County (19.56) have rates of grocery stores that are lower than the rates in New Jersey (30.5), Pennsylvania (21.4) and nationally (21.2). Overall, this means in our area there are fewer grocery stores, resulting in limited access. As we will see in later sections, in the SLUHN service area we have very high rates of obesity, which could be tied to lack of access to fresh and healthy foods such as fruits and vegetables.

iv. Clinical Care

Access to primary care represents the ability of people to see a primary care provider (PCP), which is important because many times primary care doctors are the first point of contact for patients navigating the greater healthcare system. Additionally, they may be the first to recognize signs of chronic disease or mental illness. The access to primary care indicator reports the number of primary care physicians per 100,000 population. Doctors classified as "primary care physicians" by the AMA include: General Family Medicine MDs and DOs, General Practice MDs and DOs, General Internal Medicine MDs and General Pediatrics MD's. According to the U.S. Department of Health and Human Services Area Health Resource File (2012), in the SLUHN service area the rate of PCP's ranges from 31.6 (Pike County) to 146.6 (Montgomery County). The rate in Pennsylvania is 80, the rate in New Jersey is 85.6, and the national rate is (74.5). The rates for the SLUHN service area are somewhat influenced by the proximity of multiple health systems, especially in Lehigh County (95.7).

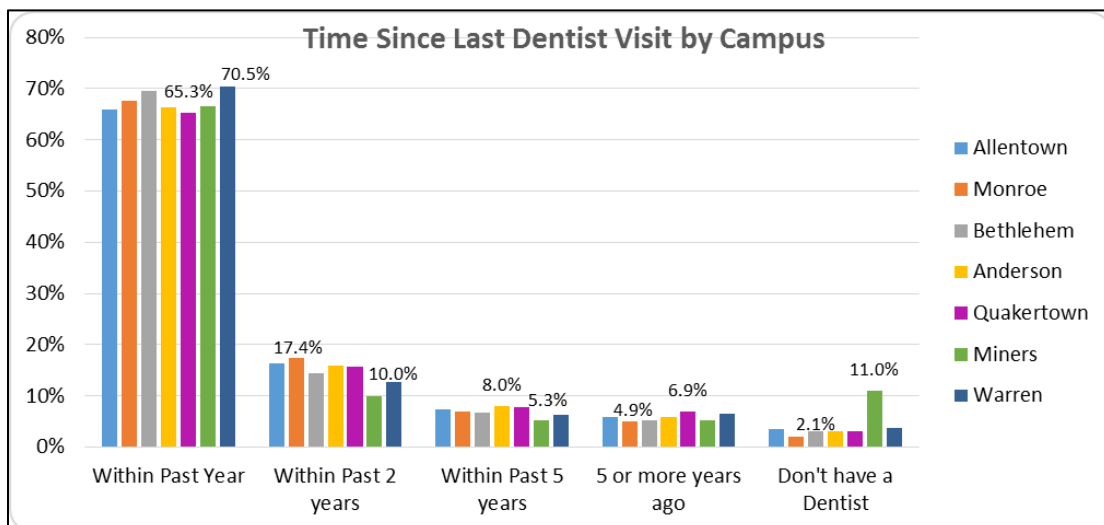
Even if there are PCP's available in our service area, this does not guarantee that people are visiting their PCP yearly for a routine checkup. In our 2016 community survey, we asked respondents when the last time they visited their PCP for a checkup was and compared this to the responses from our 2012 community survey. As evidenced by the bar graph to the right we can see that the percentage of respondents who had seen their PCP within the last year unfortunately decreased by 9.8%. This decrease was



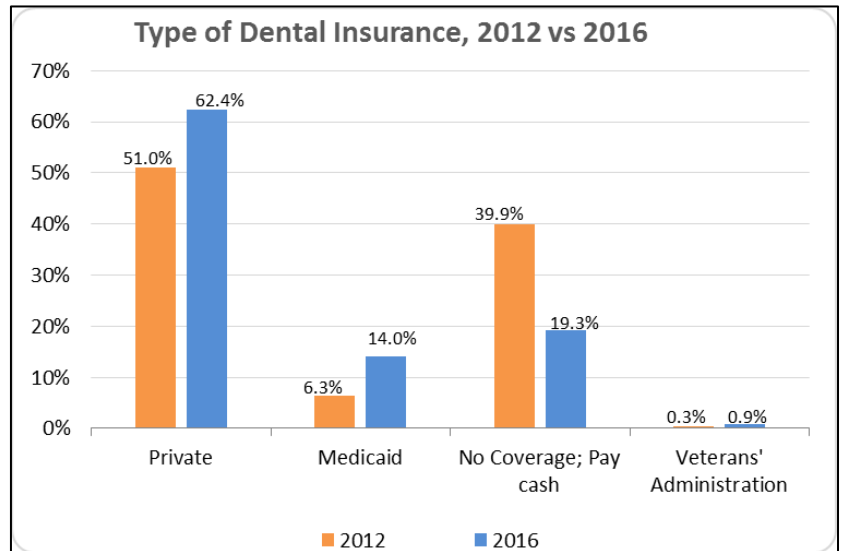
accompanied by increases in the percentages of respondents who visited their PCP within the past 2 years, within the past 5 years, and 5 or more years ago.

Examining access to dentistry has been indicated as a major issue throughout the network. Dental care is not always considered a priority, and if not covered by insurance it is likely to be very costly. Lack of preventative and restorative dental services can result in higher chance for heart disease or stroke, gum disease, tooth decay, diabetes, and some types of cancer. The access to dentists indicator reports the number of dentists per 100,000 population. In the SLUHN service area, our counties have rates ranging from 17.7 (Pike County) to 92.2 (Montgomery County) (Area Health Resource File, 2012). Our county rates are very similar to the rates seen in Pennsylvania (62.5) and nationally (63.2). Dental care is a concern for us as a network because Medicare does not cover dental services. This is an issue because about one third of the patients who receive care from SLUHN use Medicare as their primary form of insurance coverage. Additionally, Medicaid is supposed to cover children for dental care, but many times dentists will not accept patients using Medicaid. This means there is a gap in providing dental care to a large portion of our population. SLUHN has dental vans that travel to the different school districts within the network in order to provide preventative and restorative dental care. Many of the students do not have dental coverage and receive free or subsidized care from the dental vans.

Since accessing dental care seems to be an important issue in the SLUHN service area, in our 2016 community survey we asked respondents when the last time they visited their dentist was as well as what type of coverage they used for their dental care. For SLUHN we found a pattern between income and time since last dentist visit. Our 2016 survey results showed us that for the network, 51.3% of respondents who reported making less than \$24,999 saw a dentist in the past year as compared to 82.3% of respondents who reported making over \$60,000. Additionally, 8.0% of those making less than \$24,999 do not have a dentist compared to 1.0% of those making more than \$60,000.



When examining the type of dental insurance used, our 2016 community survey revealed promising results. From 2012 to 2016, the percentage of respondents who reported using private insurance to cover dental care increased by 11.4% and who reported using Medicaid increased by 7.7%. The percentage of those who reported no coverage or paid with cash decreased by 20.6%. This shows that more people are now insured for dental care, which will make access easier and will hopefully improve dental health outcomes for respondents in the SLUHN service area. Although these results are promising, we found disparities when examining



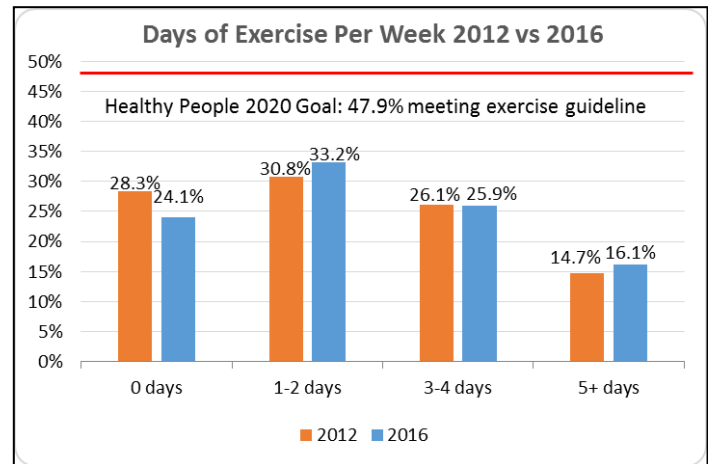
type of dental insurance used in relation to income. 22.9% of respondents who reported making less than \$24,999 used private insurance to pay for dental care as compared 86.8% of respondents who reported making more than \$60,000. Additionally, 30.7% of respondents who reported making less than \$24,999 as compared to 10.5% respondents who reported making more than \$60,000 did not have a dentist.

Access to mental health professionals is another important aspect of clinical care, because if there is a lack of mental health professionals, community members will likely have difficulty receiving treatment for their mental health problems. According to the Robert Wood Johnson 2015 County Health Rankings, the ratio of population to mental health providers was 623:1. A good ratio is represented by a smaller population size per every one mental health provider. Unfortunately, there are great disparities seen in the ratio of population per provider for the counties in the SLUHN service area, ranging from 529:1 (Bucks County) to 2,314:1 (Carbon County). In the health outcomes section we will take a deeper look into mental health status by examining the number of poor mental health days reported per month, which could possibly be linked to the lack of mental health professionals in some of our counties served.

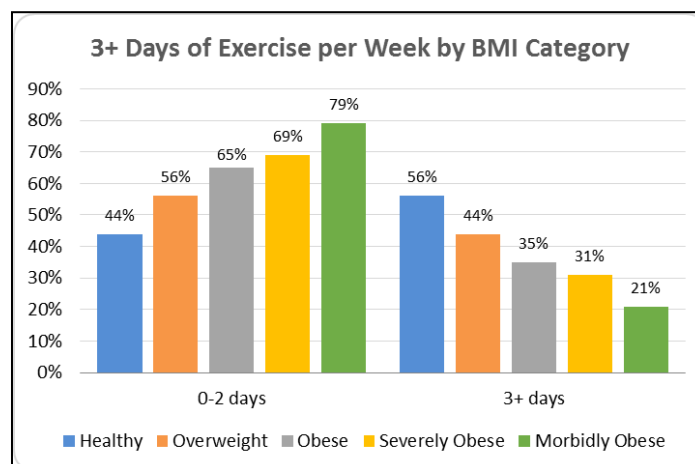
v. Health Behaviors

Physical inactivity is an important indicator of health because being active promotes positive physical and mental health, therefore being inactive may have negative implications for overall health. Consistent exercise is also important for decreasing rates of obesity and cardiovascular disease. The National Center for Chronic Disease Prevention and Health Promotion (2012) reported that in the SLUHN service area, 17.1% (Hunterdon County) - 26.7% (Schuylkill

County) of adults 20 years and older self-reported that they did not participate in any type of physical activity in the prior month. This percentage of individuals reporting no physical activity is slightly worse than the percentages seen in New Jersey (23.6%), Pennsylvania (22.9%), and nationally (22.6%). From our 2016 community survey we found similar results, where 24.1% of respondents in the SLUHN service area reported exercising no times per week. The largest percentage of respondents reported exercising one to two days per week (33.2%). This bar graph compares our community survey data from 2012 to the community survey data from 2016, where we can see that there were slight increases in the percentage of people who reported exercising one to two days per week and more than five days per week. These increases are not substantial, and from the graph we can also see that we are not nearly close enough to the Healthy People 2020 goal of 47.9% of people meeting exercise guidelines (150 minutes per week, an average of 30 minutes per day for 5 days a week).



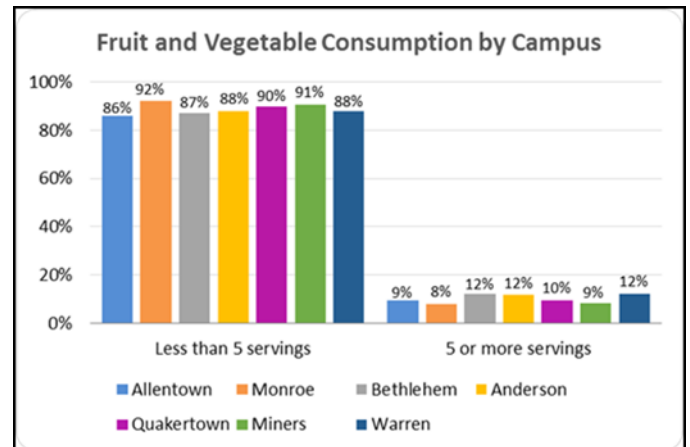
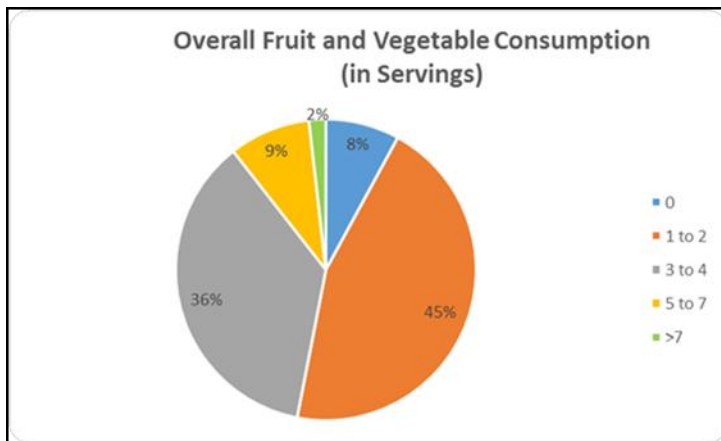
We will take a closer look at obesity rates in the SLUHN service area in the health outcomes section, but here we can examine the number of days per week respondents reported exercising. We were able to analyze five different BMI categories in terms of how many days per week they exercised. These categories included individuals of a healthy weight, overweight, obese, severely obese and morbidly obese. As evidenced by our 2016 survey data, the percentage of people exercising three or more days a week was the highest for people of a healthy weight (56%) and was lowest for the people who were morbidly obese (21%). This bar graph shows that when moving up BMI categories, there are higher percentages of people who are exercising zero to two days per week, but this is the opposite pattern for those exercising three or more days a week.



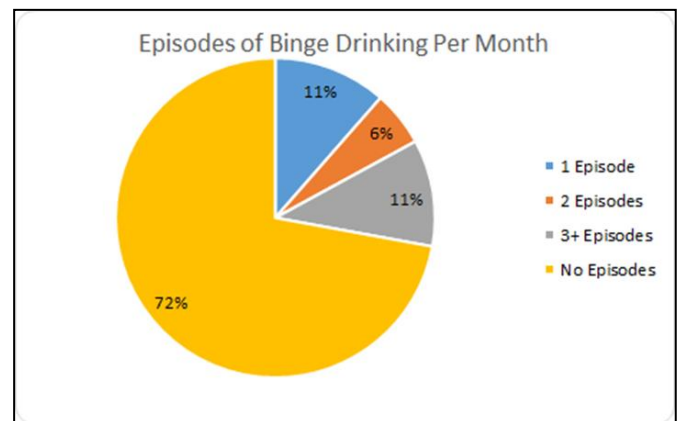
Examining recreation and fitness facility access is important to take into consideration when thinking about promoting healthy lifestyles and preventing chronic disease. This indicator reports the number of recreation and fitness facilities per 100,000 population. The U.S. Census Bureau County Business Patterns (2013) reported that many of our counties had lower rates of facilities per population, ranging from 6.48 (Monroe County) to 18.88 (Montgomery County). The rate for New Jersey was 14.3, Pennsylvania was 10.8, and the national rate was 9.72. Although some of our county rates may have been similar to or lower than the national rate, the Lehigh Valley does have many parks and trails that were mentioned earlier that community members often utilize for exercising such as walking, biking, and running.

Fruit and vegetable consumption is important in order to maintain a healthy lifestyle. The percent of adults with inadequate fruit or vegetable consumption was not available at a network level, but we can see that our counties vary in the percentage of adults who consume inadequate amounts of fruit/vegetables. 73.4% of adults in New Jersey, 75.5% of adults in Pennsylvania, and 75.7% of adults in the U.S. do not eat enough fruit and vegetables (BRFSS, 2005-09). There is a pressing need to get fresh fruits and vegetables to community members, but the difficulty lies in the limited access to grocery stores, as well as the cost of purchasing fruits and vegetables. SLUHN is surrounded by farmland, which means that quantity availability is not the issue. Throughout the summer, SLUHN participates in farmer's markets, where community members can use their SNAP or double SNAP benefits to purchase double the amount they would normally be able to (i.e. they can spend \$10 but actually receive \$20 worth of fruits/vegetables). Unfortunately, many community members are not eligible for SNAP, and it is hard to rationalize spending money on fruits and vegetables when fast food and processed foods can be purchased in larger quantities for less money.

In our 2016 community survey we asked respondents to report how many servings of fruits and vegetables they had consumed the previous day. We found that only 11% of the survey respondents reported eating at least the five daily recommended servings of fruits and vegetables, and 47% reported consuming three or more servings daily. Warren, Bethlehem and Anderson campuses performed best in terms of moving towards the FDA targets of consuming five or more servings of fruit and vegetables per day. Bethlehem and Anderson campus have CSA's offered to employees and Anderson campus is the home of the St. Luke's Rodale Institute Organic Farm. Monroe (8%) has the lowest percentage of respondents meeting the FDA five a day guideline, which is interesting because Monroe is located in a more rural location, which possibly indicates a lack of access to fresh fruits and vegetables. In general, the low percentage of respondents meeting the recommendations is a concern across the network, as roughly only one in ten people are meeting the FDA recommendations for fruits and vegetable consumption.

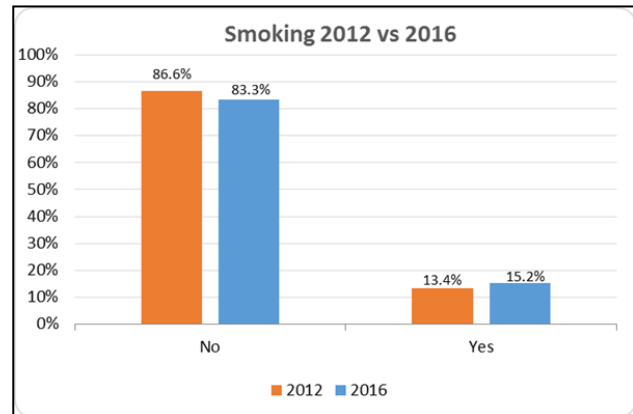
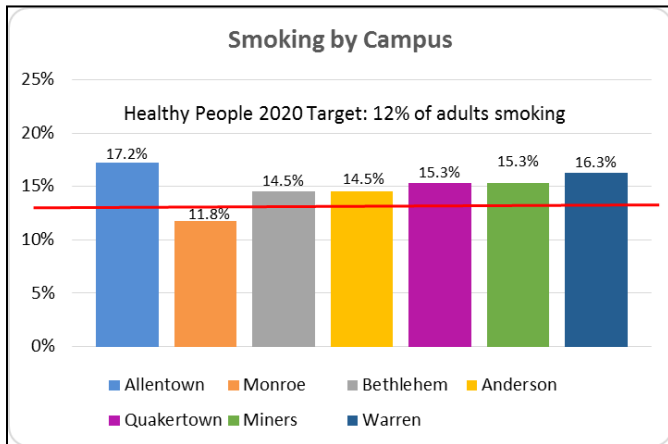


Excessive alcohol consumption is a widespread issue that has deleterious consequences for physical health, and may also mask or exacerbate mental and behavioral health issues. The excessive drinking indicator from the BRFSS (2006-12) reports the percentage of adults aged 18 and older who reported heavy alcohol consumption (defined as more than two drinks per day on average for men and one drink per day on average for women). In the SLUHN service area, the age adjusted rate for adults reporting excessive drinking ranges from 15.5% (Pike County) -24.5% (Monroe County), which is higher than the rates reported in New Jersey (16.7%) and nationally (16.9%). However, some of our counties do have lower percentages than that reported in Pennsylvania (18.7%). In examining rates of binge drinking for SLUHN as a whole, data from our 2016 community survey revealed that 28% of respondents reported one or more episodes of binge drinking in the past month (defined as five or more drinks on one occasion). However, when breaking this down, we can see that when considering two or more episodes of binge drinking, the percentage of respondents in this category drops to 17%. From examining responses from the network as a whole, we found that there were certain factors associated with those who reported binge drinking. Amongst those who reported no episodes of binge drinking, females were more likely to report no binge drinking episodes (74.4%) than males (63.2%).

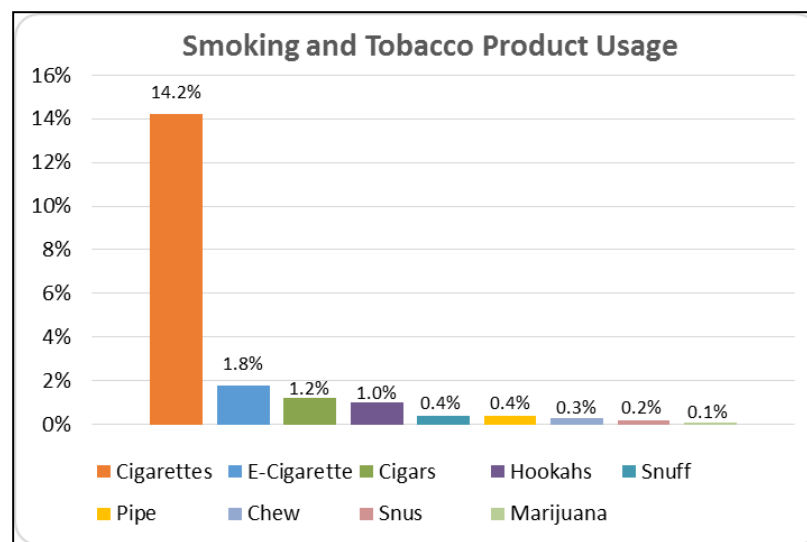


Tobacco usage is a negative health behavior because it contributes to illnesses such as cardiovascular disease, cancers, and breathing conditions. Second hand smoke also has negative health consequences for current smoker's family and friends. According to the BRFSS (2006-12), between 13.2% (Hunterdon County) and 30.5% (Carbon County) of adults age 18 or older in the SLUHN service area reported that they smoke. The percent of the population that reported smoking in New Jersey (15.8%), nationally (18.1%), and in Pennsylvania (20.8%) are similar to

our county percentages. From our 2016 community survey, we found that 15.2% of respondents in the SLUHN service area reported smoking, and the Healthy People 2020 target is to have only 12% of adults smoking. Unfortunately, when the 2012 and 2016 data were compared, the percentage of smokers increased from 13.4% to 15.2%.

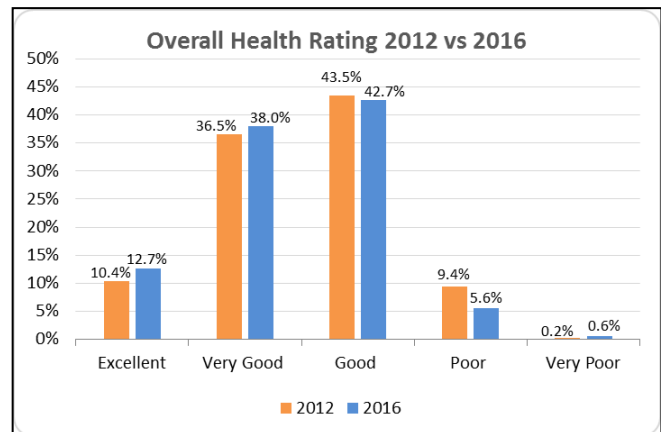
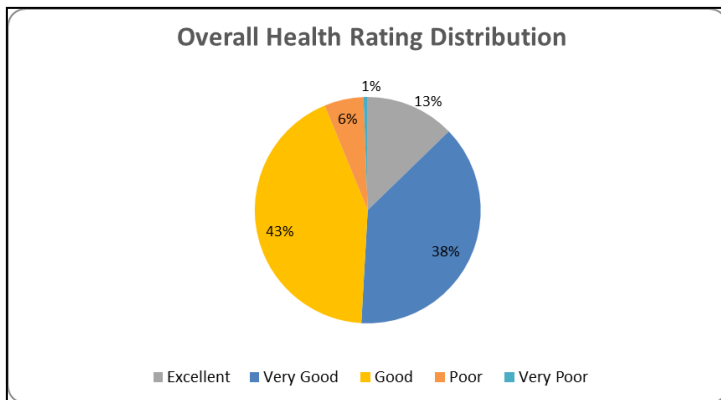


Tobacco usage also includes the use of e-cigarettes and hookahs. Amongst U.S. Youth, the CDC in the Morbidity and Mortality Weekly Report in November 2013 found that amongst students attending high school, hookah usage rose from 4.1% to 5.4%. Additionally, the report found that from 2011-2012, e-cigarette usage increased for those students in high school (1.5% - 2.8%) as well as middle school (0.6%-1.1%). From our 2016 survey data, we found that the most popular tobacco product was cigarettes (14.2%), followed by e-cigarettes (1.8%). It is important to note that 55% of people who use e-cigarettes classify themselves as non-smokers. It will be important to track the use of different tobacco products in the future, especially amongst the younger generation, where e-cigarette usage seems to be growing in popularity.

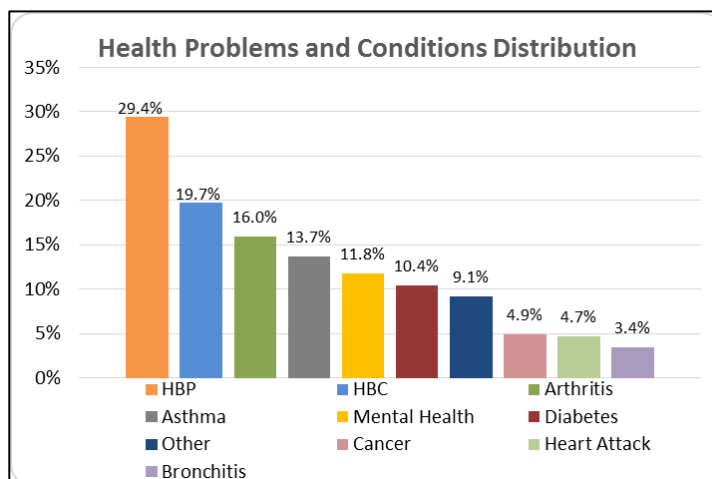


vi. Health Outcomes

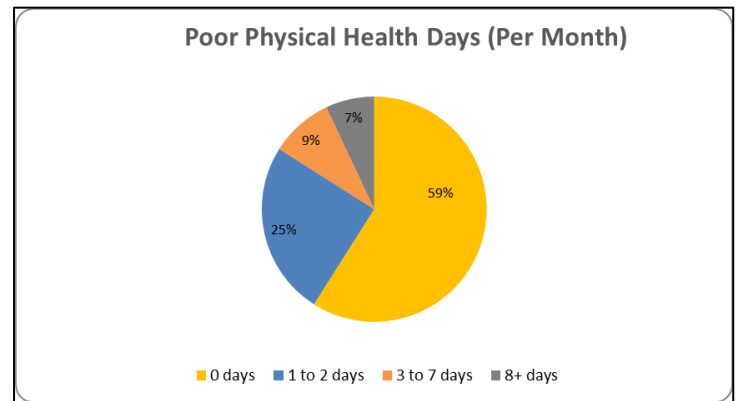
It is important to examine people's perception of their overall health status in order to have a greater understanding of what the health of the community looks like as a whole. The results from our 2016 community survey are similar to those reported in the 2012 survey, where in the current survey 93.4% of respondents ranked their overall health as "good" or better as compared to 90.4% in 2012. Because this question is quite subjective, it is difficult to use it on its own to assess health outcomes for the community, but it can be used in conjunction with more specific data (which follows) to obtain a more accurate image of health in the SLUHN service area.



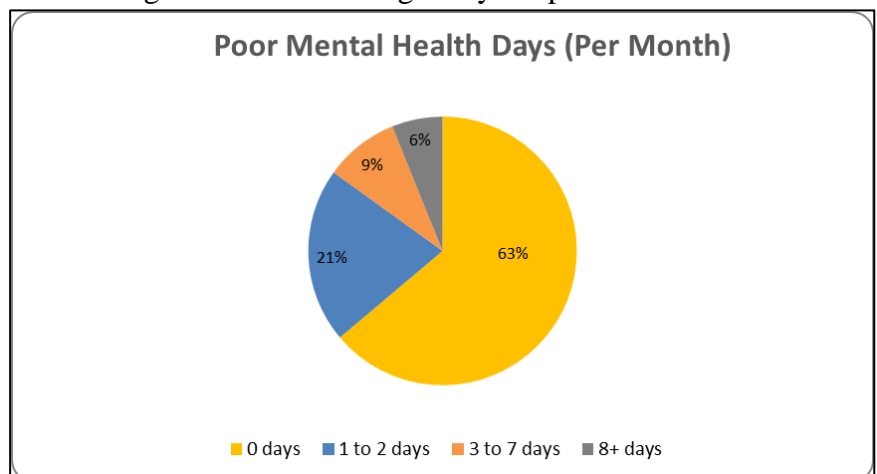
After examining people's perceptions of their own health, it is important to look at the prevalence of specific health conditions reported by respondents in order to assess the health status and needs of the community. According to our 2016 survey results, high blood pressure was definitively the most common condition for respondents to have, and it is generally considered to be a precursor to many other problematic conditions, such as heart attacks and heart disease. Interestingly, although nearly 30% of respondents reported having high blood pressure, the potential negative effects of the condition did not prevent them from considering their overall health good or better. It is possible that many people who have high blood pressure are on medications to control their condition, so they do not see their high blood pressure as negatively impacting their health status. High blood pressure was followed by high blood cholesterol (19.7%) and arthritis (16%) as the most commonly reported health conditions.



We can also examine how many days of normal activity respondents have missed due to poor physical health and poor mental health to better assess the health status of the SLUHN service area. 41% of respondents reported missing at least one day of normal activity in the past month due to poor physical health, despite 93.4% of respondents considering their health to be “good” or better (as discussed previously by asking respondents how they would rate their overall health). From our 2016 community survey, we found various factors that were associated with days of work missed due to poor physical health. In terms of physical activity, 69.8% of people exercising five or more days a week had no sick days due to poor physical health as compared to 47.7% of those who did not exercise. Additionally, 12.5% of those who did not exercise had eight or more poor physical health days, compared to 5.0% of people who exercised one or more days a week. Another factor we examined was whether or not respondents were smokers or non-smokers. Our data showed that 12.4% of smokers had eight or more sick days as compared to 5.7% of non-smokers.



As expected, fewer respondents reported missing at least one day of normal activity in the past month due to poor mental health (36%) as compared to days missed due to poor physical health. The percentage of those who reported missing at least one day of normal activity in the past month due to poor mental health decreased slightly from the 2012 community survey (from 41% to 36%). There are many factors that could be influencing the number of poor mental health days people experience, such as income level and participation in physical activity. In terms of income, respondents who reported making between \$15,000 and \$24,999 (12.3%), and less than \$14,999 (10.5%) were the two largest groups to suffer eight or more poor mental health days. The lowest percentage of respondents suffering from more than eight days of poor mental health were in the population that reported making more than \$100,000 (2.3%). This suggests that poor mental health could be linked to lower income levels. Exercise has been shown to improve mental health by producing endorphins during activity, which is why it is important to examine in relation to poor mental health days. From



our 2016 survey we found that 71% of people exercising five or more days a week had missed no days of work due to poor mental health compared to 51% of those who did not exercise. 11.6% of those who did not exercise had eight or more poor mental health days, compared to 5.0% of people who exercised one or more days a week.

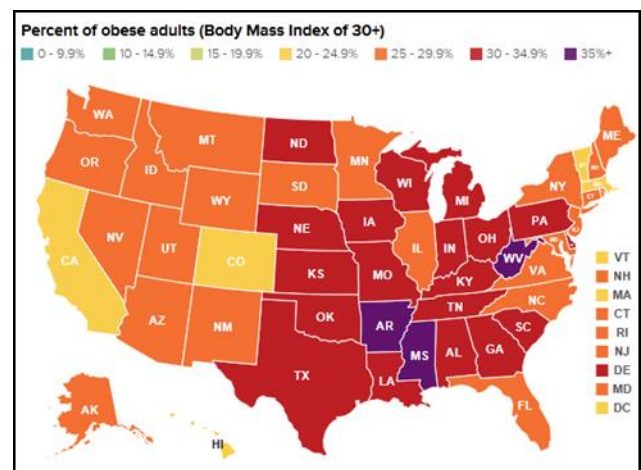
The discussion of missing work due to poor mental and physical health days is interesting to examine in light of our findings about people's perceptions of their overall health, as well as the health conditions that respondents reported. It is especially important to take into consideration the social determinants of health and personal factors, such as income, education, and level of physical activity when examining the health status of the community.

SLUHN provides many different types of health services to our population. Since we examined respondent's perception of their own health as well as the health conditions that are most prevalent in the SLUHN service area, it is important to look at the top reasons for hospitalization. This chart represents the ranking of the top 10 medical reasons for inpatient hospitalization in 2014. From our 2016 survey data we found that high blood pressure, high cholesterol, and asthma were amongst the top five conditions present in the community, which aligns with cardiovascular and pulmonary medicine being in the top three reasons for inpatient hospitalization.

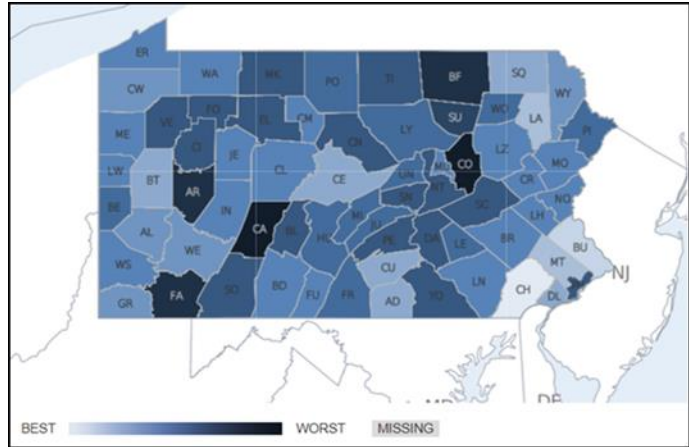
**Top 10 Reasons for Hospitalization by Service Line, Inpatients
St. Luke's University Health Network, 2014**

Service Line	Encounters	Rank
Cardiovascular	5,681	1
General Medicine	4,051	2
Pulmonary Medicine	3,555	3
Obstetrics - Delivery	3,399	4
Gastroenterology	3,026	5
Behavioral	2,865	6
Infectious Disease	2,400	7
Normal Newborns	2,353	8
General Surgery	1,701	9
Neurology - Other	1,481	10

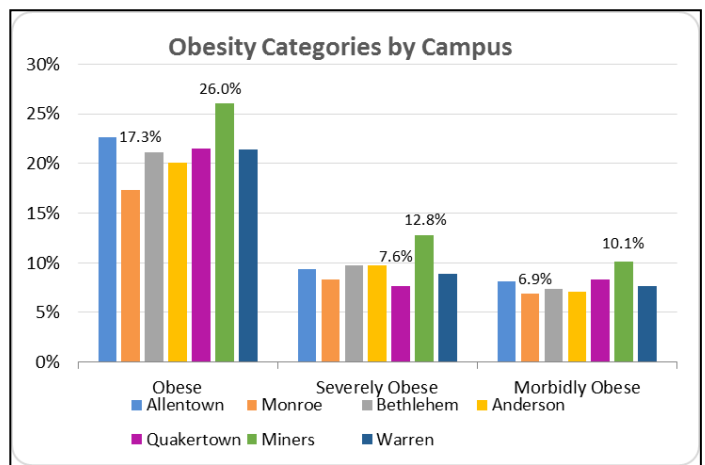
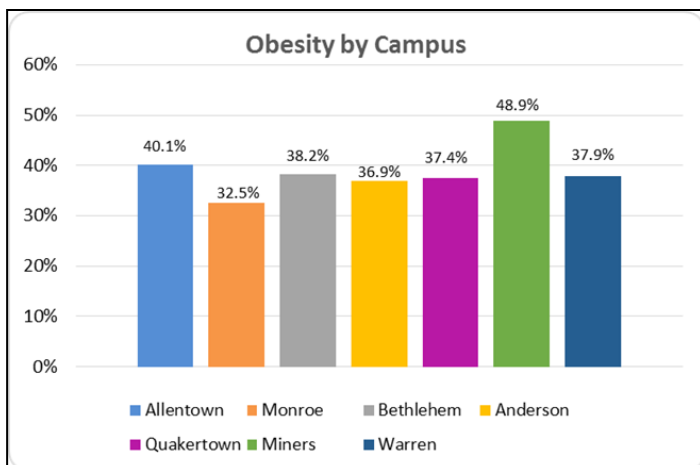
Obesity is a major health concern, considering the easy accessibility of unhealthy foods, the high rates of physical inactivity, and the risks it poses for future health issues such as type II diabetes, heart disease, stroke, and hypertension. Obesity is determined by Body Mass Index (BMI), which is an indirect measure of an individual's body fat. For a person who has a normal weight, the BMI range is from 18.5-24.9, for someone who is overweight the range is 25-29.9, and for someone who is obese the BMI is 30.0 or more (CDC, 2015). For those who have BMI's at 30 or above, 35-39.9 is considered severely obese, and over 40 is considered morbidly obese. According to the *State of Obesity: Better Policies for a Healthier America*, Pennsylvania is ranked 20th out of 50 states when comparing obesity rates (where 1 is the most obese state and 50 is the least obese state). The map above shows the breakdown of the



obesity rates in each state, showing that Pennsylvania falls in the second highest category for obesity in the 30-34.9% range. The map to the right represents the percentage of the population that is obese within each of the counties in the state of Pennsylvania, with white/light blue being the lower percentages and dark blue being higher percentages.

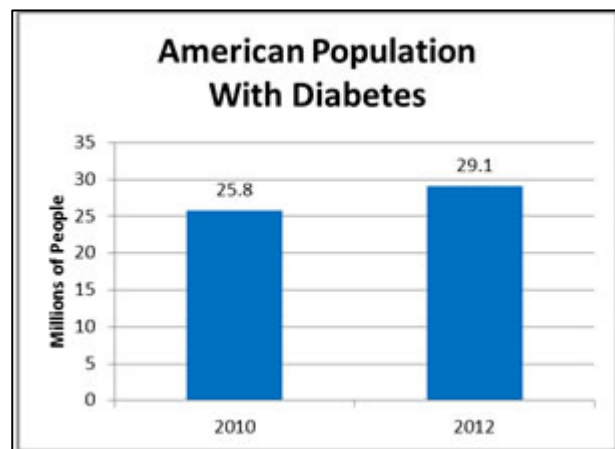


From 1990-2014, obesity rates have more than doubled in Pennsylvania, from 13.7% to 30.2% (The State of Obesity, 2014). The age group in Pennsylvania with the highest obesity rate is the 45-64 group, in which 33.6% of this population is obese. According to HealthyPeople.gov, 34% of adults and 16.2% of children and adolescents are considered obese in the U.S. In the SLUHN service area, 28.42% of adults aged 20 and older reported that they have a Body Mass Index (BMI) greater than 30.0 (National Center for Chronic Disease Prevention and Health Promotion, 2012). This obesity rate is slightly higher than the percentages seen in Pennsylvania (28.4%) and the U.S. (27.1%). Interestingly, data from our 2016 community survey conveys a different story. Based on standardized BMI calculations, 71% of the survey respondents fell into the “overweight or obese” category. This number represents a continuation in the area’s trend towards obesity, which is mirrored in the United States as a whole. When information about BMI was broken up by campus, it became apparent that all campuses reported obesity rates that were higher than national and state levels. Monroe campus reported the lowest percentage of obese respondents at 32.5%. Miners campus had the highest percentage of obese adults at 48.9% followed by Allentown at 40.1%. Miners had the highest percentage of morbidly obese people at 10.1% and Monroe campus had the least at 6.9%.



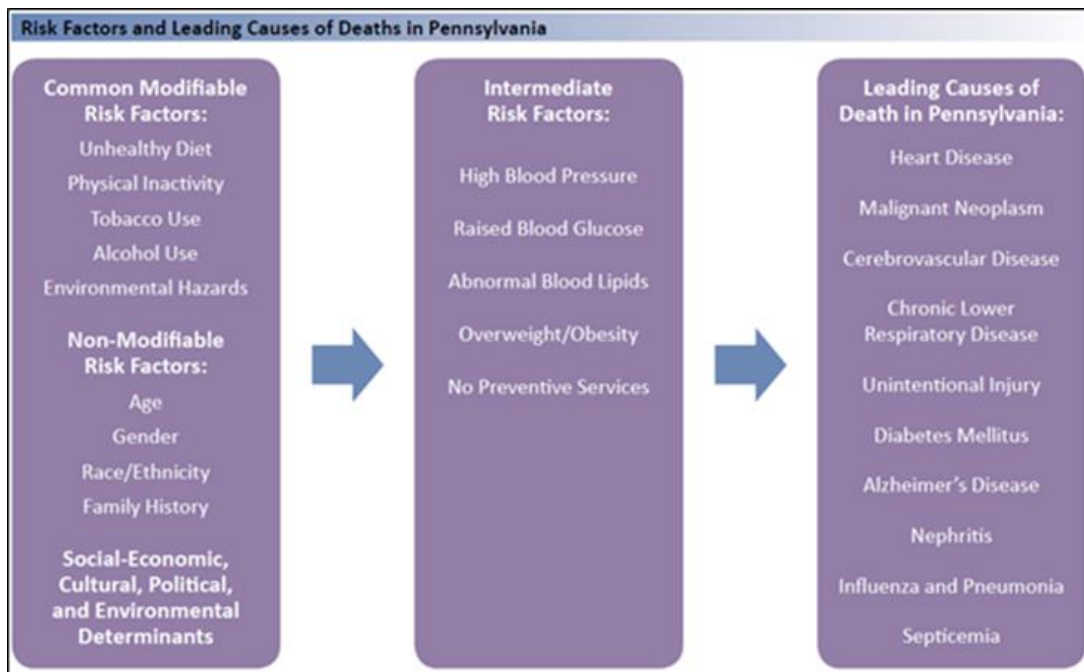
From our 2016 community survey we found that there are a variety of socioeconomic factors that are related to BMI, such as employment status and income. Since BMI can have an impact on a person's ability to work, it is important to consider BMI in light of employment status. Nearly 50.0% of those who reported that they were unable to work fell into the obese category, as did 48.5% of those who reported that they were out of work for more than one year. An additional socioeconomic factor that can influence BMI is income of the respondent. Amongst all respondents with a morbidly obese BMI, the largest percentage was evident among those earning less than \$14,999 per year (19.8%). Conversely, 8.9% of the morbidly obese respondents reported making more than \$100,000 per year. The income range with the highest percentage obesity was \$15,000 - \$24,999 at 44.3%, while the lowest percentage of obesity was in the \$100,000 or more range at 31%. This pattern suggests that there is a negative correlation between BMI and income, where if income decreases BMI increases, and vice versa. It is evident that these social determinants of health play a vital role in the rising obesity rates we are witnessing across our service area.

Diabetes is a prevalent chronic health issue that can be caused by obesity, and since our obesity rates are high this is an important condition to address. Diabetes can lead to other health problems such as blindness, kidney disease, foot problems, heart disease, and breathing issues. There was no data for the SLUHN service area as a whole, but when examining all of our counties, we can see that the lowest percentage of the adult population diagnosed with diabetes was in Montgomery County (6.2%), and the highest



percentage was in Lehigh County (9.4%)(National Center for Chronic Disease Prevention and Health Promotion, 2012). The percentage of the adult population diagnosed with diabetes in Pennsylvania was 8.86%, New Jersey was 8.21%, and the nation was 9.11%. According to the National Diabetes Statistics Report (2014), in 2010 diabetes was the 7th leading cause of death, but it is likely that many more deaths resulted from diabetes but were not reported as such. This happens because of the various co-morbid conditions associated with diabetes. From 2010 to 2012, the rate of diabetes in the United States has risen from 25.8 million to 29.1 million people, where this current percentage represents 9.3% of the U.S. population. The number of people in the U.S. population over the age of 20 who have pre-diabetes also increased from 2010 to 2012, from 79 to 86 million people (National Diabetes Statistics Report, 2014).

In terms of morality rates as health outcomes, according to the Pennsylvania Department of Health (2011), the leading causes of death in the U.S. were heart disease, cancer, cerebrovascular disease, chronic lower respiratory diseases, unintentional injuries, and diabetes. The flow chart below shows the risk factors that contribute to the leading causes of death in Pennsylvania. The top three leading causes of death in Pennsylvania were heart disease, cancer, and cerebrovascular disease. These modifiable and intermediate risk factors as well as the leading causes of death are important to keep in mind when thinking about the health problems facing our communities (Pennsylvania Department of Health- Bureau of Health Promotion and Risk Reduction, 2011). The leading causes of death chart below the flow chart looks at the breakdown of the leading causes of death in Pennsylvania by age bracket. These leading causes of death are similar to those seen in our counties across the network.



Selected Leading Causes of Death, Number by Age Group (2012)

<u>Under 5 Years of Age</u>		<u>5-24 Years of Age</u>		<u>25-44 Years of Age</u>		<u>45-64 Years of Age</u>		<u>65 Years and Older</u>	
Perinatal Conditions	562	Accidents	641	Accidents	1,539	Cancer	7,202	Diseases of Heart	25,720
Birth Defects	184	Assault (Homicide)	259	Cancer	602	Diseases of Heart	4,244	Cancer	20,704
Accidents	71	Suicide	202	Suicide	502	Accidents	1,645	Stroke	5,758
Diseases of Heart	23	Cancer	101	Diseases of Heart	495	C.L.R.D.**	763	C.L.R.D.**	5,681
		Diseases of Heart	39	Assault (Homicide)	290	Diabetes Mellitus	733	Alzheimer's Disease	3,448
TOTAL	1,130	TOTAL	1,490	TOTAL	4,645	TOTAL	21,461	TOTAL	96,704

*In situ, benign, and uncertain neoplasms

Note: Total includes all other causes.

Mortality due to cancer is expressed as the rate of death per 100,000 population. According to the National Vital Statistics System (NVSS, 2009-13), In the SLUHN service area, the age adjusted death rate due to cancer was 173.47, which was better than the mortality rate in

Pennsylvania (177.6), but worse than the mortality rate seen in New Jersey (164.1) and the nation (168.9). The Healthy People 2020 goal for deaths due to cancer is 160.6.

The indicator examining lung disease reports the death due to chronic lower respiratory disease per 100,000 population. Data from the NVSS (2009-13) show that in the SLUHN service area, the age adjusted death rate due to lung disease was 35.14, which was better than the mortality rates due to lung disease in Pennsylvania (39.1) and the U.S. (42.2), but was slightly worse compared to the mortality rate in New Jersey (31.4) (NVSS, 2009-13).

Heart disease is a leading cause of death in the Lehigh Valley, and it is also a leading cause of death in the nation. It can be caused by various risk factors that we mentioned earlier such as obesity, lack of physical activity, and tobacco use. The rate of death due to coronary heart disease per 100,000 population in the SLUHN service area was 95.04. This rate of death was lower than to the rates seen in New Jersey (113.0), Pennsylvania (113.0), and the U.S. as a whole (109.5) (NVSS, 2009-13). The predicted spike in the prevalence of heart disease may be due to the growing obese population.

As mentioned previously, the top three reasons for hospitalization throughout SLUHN included cardiovascular, general medicine and pulmonary issues. This pattern correlates with the prior discussion regarding mortality due to lung disease and heart disease in the SLUHN service area. There should be an emphasis placed on prevention and treatment of these specific health issues so that we can determine how to best reduce mortality rates and improve morbidity rates.

vii. Child and Adolescent Health

In terms of youth health, the Youth Behavior Risk Surveillance System (2013) found that many youth were taking part in risky health behaviors that have been identified as major causes of death within the age group of 10-24. The report found that in the U.S., nearly half of the 64.7% of high school students who drove a car reported that they had texted or sent an e-mail while operating a vehicle in the past month. Additionally, 23.4% of the high school students surveyed had smoked marijuana, 34.9% had experimented with alcohol, and 15.7% had smoked cigarettes in the past month. These are major health risk behaviors that must be addressed nationally, as well as within our own community so that we can ensure the safety and health of our younger generations.

Examining some of the youth health needs in our community more specifically, the ACS (2009-13) found that in the SLUHN service area, 38.22% of children under the age of 18 were living in households with incomes that are at or below 200% of the Federal Poverty Level. This was lower than the national percentage (43.81%) and the Pennsylvania percentage (38.97%). Related to the issue of poverty is the lack of insurance, since many of those in poverty are unemployed or do not have enough money to pay out of pocket for healthcare services. According to the Small

Area Health Insurance Estimates (2012), 5.71% of children under the age of 19 were not covered by medical insurance. This uninsured rate was worse than the percentages seen in New Jersey (5.38%) and Pennsylvania (5.31%), but was better than the national percentage of uninsured children (7.54%). Related to the issue regarding lack of insurance coverage for children is the lack of dental and vision care for youths. This was discussed as a prominent issue across the stakeholder focus groups for each of the hospital campuses. This issue is being addressed through the increased use of the mobile health vans, which routinely visit the school districts and provide free and subsidized care for students.

viii. Elder Health

Elder health is extremely important to SLUHN because this group is a vulnerable population within our service area that may have trouble navigating the healthcare system. We can see through America's Health Rankings (2015) that New Jersey ranks 26th and Pennsylvania ranks 25th out of the 50 states for elder health, placing them squarely in the middle of all of the states within the U.S. The main challenges that New Jersey faces in preserving the health of the elderly are the high rates of Intensive Care Unit (ICU) utilization and the large population of seniors that are underweight (America's Health Rankings, 2015). The main challenges that Pennsylvania faces in preserving the health of the elderly is the high prevalence of obesity, the lack of physical activity, and the low prevalence of high quality nursing homes (America's Health Rankings, 2015). The LVRC (2012) report says the state of Pennsylvania has one of the highest proportions of elderly adults in the population, more specifically in Lehigh and Northampton Counties, 21% of the total population is over the age of 60. Considering the U.S. Census Bureau Population Estimates and Projections (2014) said the elderly population in the United States could rise to be 83.7 million by the year 2050, it is vital that more medical professionals be trained in elderly health related arenas such as chronic disease, mental health, and palliative care. Chronic disease amongst the elderly is an issue we will have to face in our service area, especially considering the growing aging population. Additionally, falls are a big concern for the elderly population, where the CDC reported that throughout the year one out of three seniors in the U.S. will experience a fall. There are many socioeconomic and health challenges that the elderly will face, and it will be important to stay on top of these issues in the coming years.

II. Conclusion

This report presents a brief overview of the SLUHN service area and the health needs facing our community. From the data about our community served, it is easy to see that there is room for improvement in health and access to care, which are both influenced by socioeconomic factors. According to Americas Health Rankings, Pennsylvania ranks 29th out of 50, situating Pennsylvania towards the middle as slightly less healthy than half of the states in the country (1 represents the healthiest state and 50 represents the least healthy state). The main health challenge areas identified by America's Health Rankings in Pennsylvania include the high rates

of death due to drug use, high rates of air pollution, and lower per capita health funding as compared to other states. Strengths in Pennsylvania identified from the report include, increased immunization coverage for children and adolescents and a low frequency of infectious disease. From the Robert Wood Johnson 2015 County Rankings we can look more specifically at our counties within Pennsylvania (and Warren in New Jersey), where it is evident that our counties generally rank well in terms of mortality (besides Schuylkill and Carbon), but are ranked poorly for morbidity. (Higher numbers are counties that are considered worse off, whereas lower numbers are counties that are considered better off). Our counties were ranked compared to the 67 counties in Pennsylvania and the 21 counties in New Jersey. The chart below shows our seven counties and their rankings within their respective states for 2015.

	Bucks (BU) 2015	Northampton (NO) 2015	Lehigh (LH) 2015	Schuylkill (SC) 2015	Carbon (CR) 2015	Monroe (MO) 2015	Warren (WA) 2015
Health Outcomes	12	27	21	55	57	26	10
Mortality	13	11	14	62	61	19	9
Morbidity	17	54	33	35	48	39	12
Health Factors	6	12	35	55	62	57	9
Health Behaviors	5	15	26	48	62	35	11
Clinical Care	7	22	21	45	61	57	12
Social and Economic Factors	6	16	52	59	58	54	7
Physical Environment	26	27	28	12	53	64	13

(Source: University of Wisconsin Population Health Institute. *County Health Rankings & Roadmaps 2015*.) www.countyhealthrankings.org

This chart shows that as a community, health networks such as SLUHN are good at keeping sick people alive. We should continue to focus on helping people who are sick, while also emphasizing the need to focus on the prevention of disease. This shortcoming is addressed in our prioritized health needs, which focus on improving health for vulnerable populations such as youth and elderly, providing better access to care and reducing health disparities; improving mental and behavioral health; and improving healthy lifestyles and preventing chronic disease. Social and economic factors are also a key area for improvement, since our counties are not ranked very highly and these factors (such as poverty, unemployment, and lack of social support), which have a huge impact on health behaviors and outcomes. Research and best practices in public health have taught us that improving on these social determinants of health is vital to sustainable change.

In order to gain a deeper understanding of these health needs and what can be done to address them, we have created campus specific CHNA reports. The reports for each hospital can be accessed by clicking on the link for the respective hospitals below:

SLUHN Bethlehem
SLUHN Allentown
SLUHN Anderson
SLUHN Quakertown
SLUHN Miners
SLUHN Warren
SLUHN Monroe

SLUHN CHNA Data Sources

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Appendix A. Top Patient Zip Codes for SLUHN Service Area

Analysis of Top Patient ZIP Codes, All Patients St. Luke's University Health Network, 2014			
Facility	ZIP	Encounters	% SLUHN
SLUHN	18017	79,808	6.87%
SLUHN	18015	76,896	6.62%
SLUHN	08865	57,680	4.97%
SLUHN	18018	53,423	4.60%
SLUHN	18102	53,136	4.58%
SLUHN	18042	49,346	4.25%
SLUHN	18103	48,102	4.14%
SLUHN	18064	37,709	3.25%
SLUHN	18951	36,813	3.17%
SLUHN	18020	35,289	3.04%
SLUHN	18045	33,947	2.92%
SLUHN	18104	29,675	2.56%
SLUHN	18252	26,927	2.32%
SLUHN	18055	19,269	1.66%
SLUHN	18109	17,415	1.50%
SLUHN	18052	16,976	1.46%
SLUHN	18013	15,691	1.35%
SLUHN	18014	14,354	1.24%
SLUHN	18040	13,911	1.20%
SLUHN	18036	13,874	1.20%
SLUHN	18067	12,986	1.12%
SLUHN	18360	12,176	1.05%
SLUHN	18062	12,090	1.04%
SLUHN	18232	11,105	0.96%
SLUHN	18049	11,005	0.95%
SLUHN	18235	10,897	0.94%
SLUHN	18091	9,812	0.85%
SLUHN	07882	9,795	0.84%
SLUHN	18353	9,640	0.83%
SLUHN	07823	9,255	0.80%
SLUHN	18301	9,254	0.80%
SLUHN	18229	9,027	0.78%
SLUHN	18072	8,247	0.71%
SLUHN	18034	7,622	0.66%

SLUHN	18218	7,541	0.65%
SLUHN	18240	6,969	0.60%
SLUHN	18073	6,190	0.53%
SLUHN	18032	5,632	0.49%
SLUHN	18250	5,540	0.48%
SLUHN	18080	5,493	0.47%
SLUHN	18330	4,394	0.38%
SLUHN	18088	4,354	0.38%
SLUHN	18302	4,263	0.37%
SLUHN	18031	4,206	0.36%
SLUHN	18069	4,076	0.35%
Grand Total		931,810	80.30%

Sarah Kalavoda
 Analytics & Business Intelligence
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