2019-2021

Community Health Needs Assessment

A collaboration between Spectrum Health Lakeland and the Berrien County Health Department

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Spectrum Health Lakeland

Contents

Acknowledgements

As a health care system, Spectrum Health Lakeland recognizes that the health of a community is not just about responding to illness but creating a space for wellness. The 2019 CHNA sought the voices of community residents and used their feedback to be the guide for this document. We thank the almost 2,000 Berrien County community members who took the time to tell us about the resources for and barriers to their optimal health in this area. We would also like to thank the numerous local, regional, and national organizations whose databases provided us with invaluable information on the state of health in our community. Our hope is that this document will provide all of the stakeholders in this community with a deeper understanding of the social drivers of health and how we all play a role in creating a community where optimal health is achievable for everyone.

Introduction

Introduction

The Community Health Needs Assessment (CHNA), required under the Patient Protection and Affordable Care Act of 2010, is an appraisal of the health status of a community. It is required of every hospital in the U.S. that enjoys tax-exempt status and is intended to ensure that they have information needed to provide community benefits that meet the health needs of the communities they serve. CHNAs must be conducted every three years, and acted upon through an associated Implementation Strategy.[1,2]

Per the legislation, this CHNA contains descriptions of: (i) the community served and how it was determined; (ii) the processes and methods used to conduct the CHNA; (iii) how input was received from people who represent the broad interests of the community; (iv) the process and criteria used to identify and prioritize the community's health needs; (v) the resources that address the significant health needs identified through the CHNA; and (vi) the impact of the Implementation Strategy (IS) undertaken to address the health needs identified in the 2016 CHNA.

The CHNA Project Team executed the CHNA in accordance with six principles that were informed by ACA requirements and Spectrum Health Lakeland's (Lakeland) organizational commitment to advance population health. These principles are inclusive input, community voice, transparent communication, authentic collaboration, health equity, and the influential role of social determinants of health.

Throughout the document, two images are used to provide additional information to the reader.

The light bulb is used to highlight connections among various social determinants of health or to provide greater detail about a priority health need.

The media player provides insights into health needs, resources, and ideas for health improvement provided by community youth.

Introduction

About Spectrum Health Lakeland

Lakeland is headquartered in Berrien County, Michigan (see figure 1.1 for a map depicting the zip codes in Lakeland's service area). It also has facilities and serves patients in the adjacent counties of Van Buren and Cass. Roughly 237,000 people are estimated to reside in Lakeland's service area.

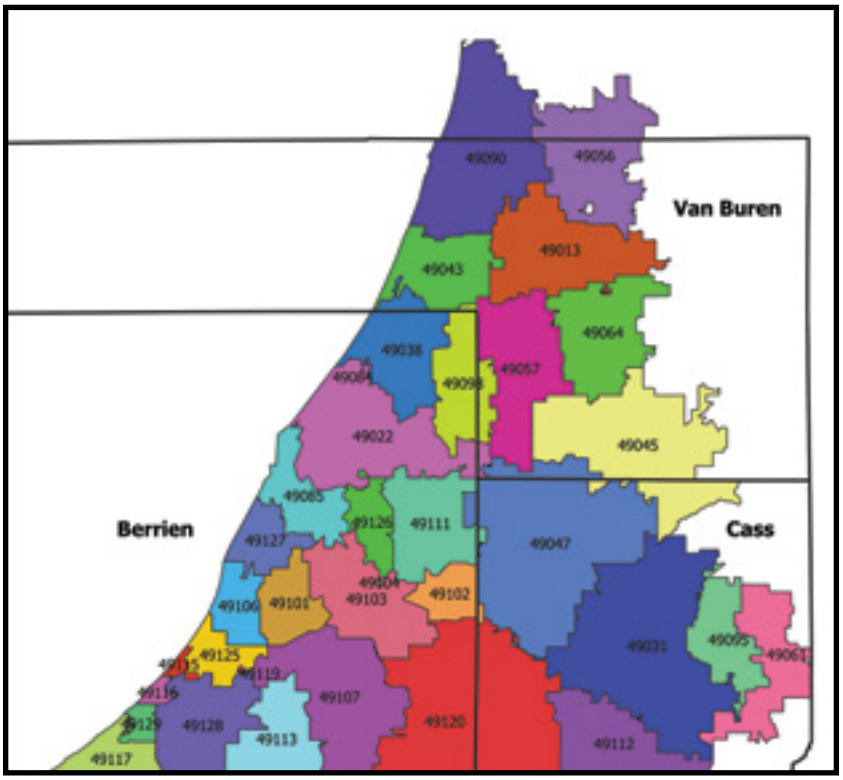


Figure 1.1
Zip codes within the Lakeland service area.

Lakeland provides medical services at 49 locations including three hospitals, a center for outpatient services, a regional cancer center, rehabilitation centers, two long-term care residences, home care and hospice services, and 34 affiliate physician practice locations. With more than 4,000 professionals, including 490 primary and specialty care physicians and other licensed providers, Lakeland is the largest employer in Berrien County.

Since the last CHNA conducted in 2016, effective October 1, 2019, Lakeland has become a division of Spectrum Health, which is headquartered in Grand Rapids, Michigan.

In June 2019, Spectrum Health unveiled a new mission, vision, values, and strategic priorities. The values of compassion, collaboration, curiosity, and courage serve as the guide for the new direction. The mission and/or vision are pursued through five strategic priorities: (i) to reimagine the personalized experience, (ii) cultivate breakthrough talent and culture, (iii) think and act digitally, (iv) build and partner innovatively, and (v) drive value. This CHNA and its associated Implementation Strategy addresses these strategic priorities.

Introduction

Meeting the CHNA Requirements

Who conducted the CHNA? This CHNA was conducted by Lakeland's Population Health team – a multidisciplinary group of professionals in the fields of education, evaluation, healthcare, mental health, nutrition, public health, social work, and urban planning.[3] Key external partners in the execution of the CHNA included the Berrien County Health Department, Andrews University, Western Michigan University, and the Southwest Michigan Planning Commission. Other organizations including K-12 schools, local businesses and municipalities, and community organizations, provided valuable input into the CHNA by providing data, documents, and other resources.

The Community Served. Lakeland serves all of Berrien County, and parts of Van Buren and Cass Counties – all located in the southwest corner of Michigan. The service area was determined by the location of Lakeland's facilities and locations of patients' places of residence. This CHNA focuses only on the health needs of Berrien County. Table 1.1 provides a snapshot of Berrien County's demographics.[4]

Population Health Team

MISSION

To intentionally foster an environment where optimal health is achievable for everyone.

VISION

A thriving, resilient and socially cohesive community.

	Michigan	Berrien
Population	9,925,568	154,948
Education (High School Graduate & Beyond) 25+ Years	90.2%	89.5%
Poverty	15.6%	17.2%
Unemployment	7.4%	7.3%
Median Age	39.6	42
Median Individual Income	$30,416	$28,446
Median Household Income	$52,668	$47,132
Caucasian	78.7%	78.4%
African American	13.8%	14.7%
Asian	2.9%	2%
American Indian	0.5%	0.3%
Hispanic	4.9%	5.2%
Uninsured	7.2%	8.7%
Overall Health Ranking	N/A	59/83 (3rd quartile)

Table 1.1 Berrien County Demographics

Processes and Methods. The CHNA was informed by data collected through multiple methods. Primary source data (firsthand information collected directly from community members) was collected through surveys, Photovoice, and interviews, with a focus on gathering input from neighborhoods experiencing the poorest health outcomes (i.e., highest mortality rates and lowest life expectancy).[5]

Additional information (secondary data) was gathered through scientific literature, policy briefs, and other organizational documents. Government datasets (e.g., employment, income, agriculture, housing, transportation, healthcare resources, civil engagement, and recreation) were also utilized.

Community and Stakeholder Input. The survey was administered in electronic and paper formats to government bodies, local businesses, K-12 schools, higher education institutions, and non-profit and other community organizations. Input was solicited from stakeholders who were diverse by age, ethnicity, gender identity, language proficiency, literacy level, profession, sexual orientation, and socioeconomic status. To ensure input was received from community members faced with literacy challenges and language barriers, survey questions were administered verbally (i.e., interviews) and translated into Spanish. Survey responses were received from nearly 2,000 people. Photovoice was used to capture responses to the survey questions from more than 100 area youth.

While gathering community input, efforts were made to ensure that the demographics of respondents reflected the demographics of Berrien County. Moreover, the CHNA team oversampled in geographic areas with the highest death rates and lowest life expectancies. Thus, the team was able to ensure input from the medically underserved, low-income, and minority populations, and from individuals and organizations who serve or represent the interests of these populations.

Data was also collected through reviews of documents published by the Berrien County Health Department, the Berrien County Mental Health Authority (Riverwood Center), the Southwest Michigan Planning Commission, and other bodies with specialized knowledge, information, and expertise relevant to the health needs of the community.

Impact of the Implementation Strategy for the 2016 Community Health Needs Assessment

Figure 1.3 reveals that in the 2016 Community Health Needs Assessment the residents of Lakeland's service area identified the following priority health needs: mental health, obesity, diabetes, cardiovascular conditions, provider availability, cost of care, health education and information, the food environment, and health behaviors.[6]

To address these priority health needs, the Population Health team executed an Implementation Strategy (IS) that laid out three major objectives:

1. *Build trust between Lakeland and the community it serves*
2. *Increase the capacity of Lakeland and the community it serves to improve population health*
3. *Improve knowledge, attitudes, and behaviors of Lakeland and the community it serves to improve population health*

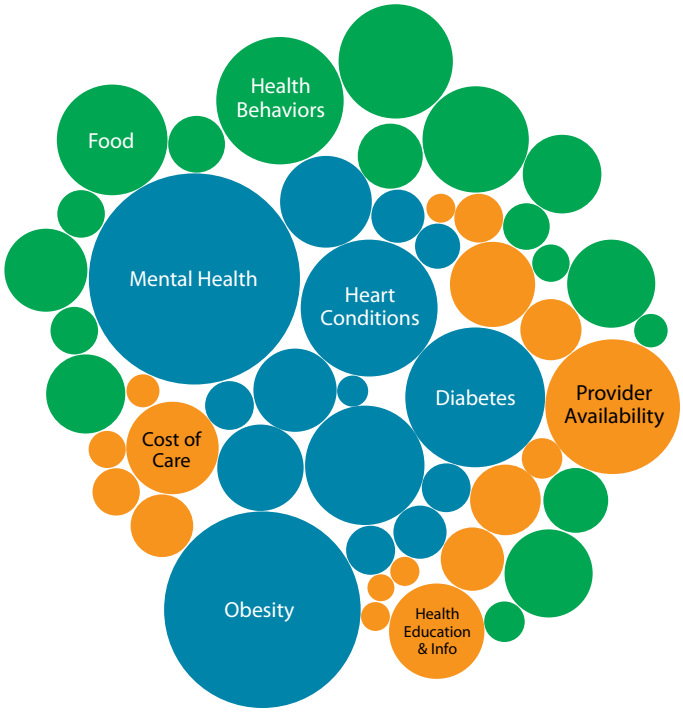


Figure 1.3 2016 Community Health Needs Assessment - Priority Health Needs

Introduction

Eleven programs were developed to address the priority health needs. They fell into four categories: (i) Mental Wellbeing, (ii) Nutrition Education & Access, (iii) K-12 Health Education, and (iv) Community Health Education.

The evaluation of the 2016 Implementation Strategy results yielded the following findings:

- Pre-and post-tests, surveys, and interviews showed decisively that the *programs' curriculum and distribution made a strong, positive impact on many of the participants' health-related knowledge, attitudes, and behaviors*. The activities were highly effective.
- More than 4,000 individuals participated in Lakeland's IS activities. *Nearly half of those people lived or worked in a targeted census tract* (i.e., tracts experiencing high rates of death).
- Some programs cast a wide net for a short period of time (e.g., CPR classes), while others targeted a smaller group over a longer time period (e.g., Prescription for Health, Harbor Towers). *This mix of programmatic offerings is a strength and should continue*. However, programs with a wider range of participants could work to provide more targeted programming for populations in target areas, while programs with a narrower scope could focus on increasing capacity. These changes have begun to take place as evidenced by changes to the CPR and Babysitting courses, and the expansion of Elite Barbershop and Harbor Towers activities to additional similar locations within the target areas.
- On multiple occasions, *participants in one program activity learned about, and subsequently, participated in another Lakeland activity. This fostered a more robust and holistic picture of health* for those individuals.
- *There is room for improvement with individuals' trust in Lakeland*. The findings of a mystery shopping exercise demonstrated that some individuals were treated differently at Lakeland based on their race. Moreover, surveys demonstrated that those living in Benton Harbor and Niles were less likely to have trust in Lakeland. Interviews with physicians revealed that some staff make inappropriate comments about patients "behind the scenes," which perpetuates and serves to justify patient and community feelings of mistrust.

For a more detailed summary of the Evaluation Results, see Appendix A.

Framing the 2019 CHNA

To ensure clarity of terms used throughout this document, definitions of some key concepts are provided below. These concepts informed the data collection and analytic processes, as well as the prioritization of health needs.

Health: "Health is a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity".[7] According to this definition put forth by the World Health Organization, health is more than the physical state of the human body. It also refers to psychological and emotional wellbeing, and the capacity to engage in productive interpersonal and communal interactions. Often used interchangeably, health and health care are not the same.

Health Care: Health care is the organized provision of medical services that help to ensure the maintenance or improvement of health. Health care comprises the prevention, diagnosis, and treatment of disease, illness, injury, and other physical and mental conditions.

Population Health: Population health is defined as the "health outcomes of a group of individuals, including the distribution of such outcomes within the group."[7] Typically, these groups are defined geographically (i.e., nation, state, county, city, zip code, census tract, or neighborhood), but they may also be defined in terms of a shared social identity such as physical or mental ability, age, gender identity, income, race or ethnicity, religion, or sexual orientation. These groups may include individuals with or without established access to health care.

Introduction

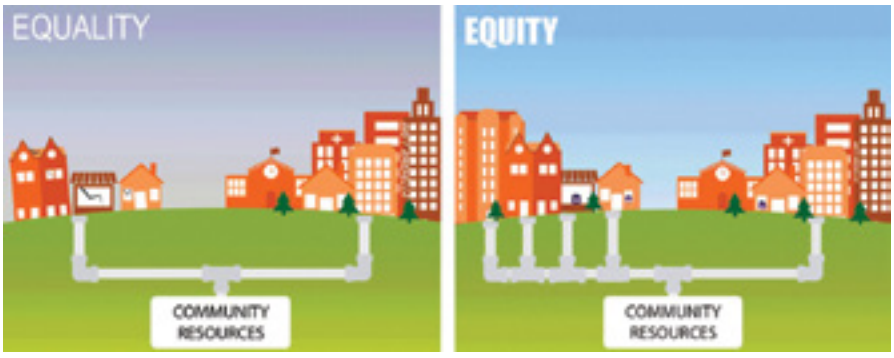
Social Determinants of Health: Social determinants of health (SDoH) are defined as the conditions in which people are born, live, learn, work, play, and age: the quality of food, education, housing, transportation access, availability of employment, recreational and cultural opportunities, environmental exposures, and sense of safety and security.[8] The distribution of SDoH shape a community's access to nutritious foods, structurally sound homes, state-of-the-art education, living wage jobs, opportunities for physical activity and social interactions, clean air and water, and safe neighborhoods – all of which are critical to good health.

Health Equity: By referencing "…the distribution of such (health) outcomes within the group…", the definition of population health evokes the concept of health equity, which is defined as the absence of systematic disparities in health between and within groups. Health equity means that all people – regardless of racial, gender or class identity; sexual orientation; physical or mental ability; residential location; or national origin and other social identifiers – are able to achieve their highest level of health.

Achieving health equity requires leveling the playing field by allocating SDoH so that everyone has access to the specific resources and opportunities needed to achieve optimal health. Often, achieving health equity necessitates that some communities (or members) receive more resources, opportunities, and support than others due to the cumulative effects of historical and/or structural limitations on their access to SDoH. Achieving health equity also calls for reducing exposure to stigma and discrimination which underlie the unfair distribution of SDoH which, in turn, leads to heath inequities.

Figure 1.4

Equity and Equality are not the same. **Equity**—depicted on the right—means that communities get precisely what they need to attain optimal health. **Equality**—depicted on the left side—means that all communities get the same resources, which entrenches existing inequities.



Achieving health equity is important for moral, financial/operational, economic, legal, and social reasons.

- First morally, it is simply "the right thing to do." In a wealthy nation such as the United States, health inequities should not exist.
- Health equity is critical to the financial and operational imperatives of health systems as they shift from volume to value-based care.[9] By ensuring that everyone achieves an optimal level of wellbeing, health equity can help reduce the financial costs borne by health systems as they care for the underinsured and uninsured who often require uncompensated care. In addition to lowering health systems' global cost of care, achieving health equity can help enhance quality of care and, therefore, patient satisfaction.
- Health equity is critical to regional economic growth. Ensuring everyone in a community is physically, mentally, and socially healthy helps to ensure a productive and engaged workforce, which is essential for a thriving economy. Additionally, because Lakeland is the largest employer and a major purchaser in Berrien County, achieving health equity can help reduce its risk for poor financial and operational outcomes, and ensure that Lakeland contributes to regional economic growth.
- The spirit of the Affordable Care Act (ACA) – reflected in provisions, such as Medicaid expansion, protections for pre-existing conditions, regulation of nondiscrimination policies, and mandatory CHNAs for nonprofit hospitals—aims to increase health equity.[10, 11]

- Achieving health equity is important because it cultivates a sense of belonging and unified identity which fosters the social cohesion necessary for thriving and socially sustainable communities.
- Finally, as the demographic makeup of the nation continues to shift, and racial, ethnic, and other disadvantaged groups continue to grow as a percentage of the national population, their health will increasingly shape the overall health, and, as a consequence, the social and economic wellbeing, of the nation.

More on the Social Determinants of Health (SDoH)

Increasingly epidemiological, medical, and social science research indicates that social factors are more influential than medical factors in shaping health outcomes. In fact, studies suggest that up to 90 percent of health outcomes are determined by social factors.[12] According to recent research, deaths and major diseases like heart attacks, cerebrovascular disease, and some cancers are attributable to SDoH. For instance, in 2000, approximately 245,000 deaths in the United States were attributed to low education; 176,000 to racial segregation; 162,000 to low social support; 133,000 to individual-level poverty; 119,000 to income inequality; and 39,000 to area-level poverty.[13]

The significance of social drivers in shaping health is evident in Berrien County. In terms of clinical care (i.e., preventable hospital stays and access to and quality of care), Berrien County ranks 30th among Michigan's 83 counties, meaning that only 29 counties achieve a higher ranking. However, Berrien's health outcomes (i.e., length and quality of life) rank 59th, meaning that 58 of the state's 83 counties rank better than Berrien. The disconnect between the county's relatively high clinical care ranking and low health outcomes ranking suggests that there are other factors determining health – specifically, the county's social, economic, and environmental conditions. Due to the vital role they play in shaping health, SDoH are a major focus of this CHNA.

The SDoH impact health outcomes in at least two ways. First, the distribution of SDoH influences health behaviors by determining the amount and type of health-enhancing opportunities and resources made available. For example, maintaining an exercise routine and a healthy diet (health behavior) is easier for individuals who live in communities that are safe and walkable and have good access to full-service grocery stores (social determinants). Alternatively, it is difficult to take prescribed medication (health behavior) if it is unaffordable due to unemployment or employment that does not pay a living wage or provide health insurance (social determinants). Similarly, it is hard to manage stress in a healthy manner (health behavior) when living in conditions of chronic poverty and in neighborhoods with easy access to alcohol, tobacco, and other drugs (social determinants). It is easier to manage stress when there is easy access to parks and green space (social determinants).

Second, the SDoH impact health through the distribution of psychosocial stressors that not only impact health behaviors (as discussed in the preceding section), but also have neurobiological effects which are associated with health outcomes. Exposure to psychosocial stressors (e.g., chronic poverty, food insecurity, discrimination, social isolation, incarceration, violence, and other sources of trauma) have been linked to dysregulation of the central nervous system; an increase in bodily inflammation and a decrease in immune system functions. These changes are implicated in a wide range of poor health outcomes such as hypertension, diabetes, cancer, autoimmune disorders, obesity, anxiety, depression, and early mortality.

There is also growing evidence to suggest that psychosocial stressors may produce health impacts that are passed on to subsequent generations through changes in gene expression. The science behind these observations linking social stressors to health has important implications for health equity as some groups are exposed to more health-depleting psychosocial stressors than others, with implications not only for the present but for future generations, as well.

Introduction

It is important to note that there are complex interactions among the social determinants of health. For example, children experiencing limited educational opportunity may have few employment opportunities as adults and, therefore, low income. Their low income will likely reduce their access to what is needed for good health including health care, nutritious food, secure housing, and safe recreational places. Moreover, their low income is also likely to increase the emotional hardship and psychological distress they endure, which can, in turn, stimulate unhealthy coping mechanisms such as substance misuse, sedentary lifestyle, and poor eating habits as well as physiological and biological effects – all of which contribute to poor health.

Underlying and giving shape to the social determinants of health are structural determinants of health. Structural determinants are intangible phenomena such as societal and cultural norms, attributes, values and beliefs; laws and public policy of all types (e.g., housing, social welfare, economic, fiscal, environmental, transportation, criminal justice and agricultural); and governance structures (i.e., organizational frameworks that establish the direction and coordinate the management, oversight, and activities of decision-making bodies). These structures shape the distribution of power, money, and resources which, in turn, shape the distribution of SDoH and, thereby, structure the risk for poor health.

A Final Note: Health disparities are not the same as health inequities. Health disparities are differences in the prevalence of illness or disease within and among populations. Health inequities are a subset of health disparities. They are socially driven, thus they are avoidable, unfair, and unjust. An example of a health disparity is the genetically-determined lower birthweights of female babies relative to male babies. An example of a health inequity is the socially-determined difference in birth weights between black and white babies. In Berrien County, for instance, 13% of black babies are born with a low birthweight compared to 6% of white babies. This is an inequity because the difference is a reflection of social factors such as higher percentage of black babies born into poverty and the persistent experiences of racial discrimination faced by their mothers over the life course, both of which research has shown to be causally linked to low birthweight babies.

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[1] Throughout the document, two images are used to provide additional information to the reader. The **Light Bulb** is used to highlight connections among various social determinants of health or to provide greater detail about a priority health need. The **Camera** provides insights into health needs, resources and ideas for health improvement provided by community youth.

[2] Community benefits are programs and services administered by not-for-profit hospitals. They are designed to improve community health by responding to community-identified needs, with a specific focus on the needs of the medically underserved. Community Benefit reporting is required for hospitals to maintain their tax-exempt status.

[3] In July 2018, Lakeland's department of Community Health and Wellness formally changed its name to Population Health. Embracing the definition of Population Health put forth by Kindig & Stoddart (2003) and used by the Population Health Roundtable of the National Academy of Sciences, i.e.,"... the health outcomes of a group of individuals, including the distribution of such outcomes within the group," the department also created a new mission and vision.
Kindig, D., & Stoddart, G. (2003). What is population health? American Journal of Public Health, 93 (3), 380-383. Retrieved from https://www.who.int/social_determinants/sdh_definition/en/

[4] U.S. Census Bureau (2017). Selected Characteristics Of The Native And Foreign-Born Populations, Table S0501: 2013-2017 American Community Survey 5-Year estimates. Retrieved from https://data.census.gov/cedsci/table?q=berrien%20county,%20michigan&g=0500000US26021&hidePreview=false&tid=ACSST5Y2016.S0501&layer=VT_2018_050_00_PY_D1&cid=DP05_0001E&vintage=2016

[5] Photovoice is the use of photographic images and narrative to articulate community needs.

[6] In figure 1.3, the blue bubbles represent the relative importance of the health conditions that were identified in the 2016 CHNA as priority health issues. The orange bubbles represent the relative importance of health system-related priority health issues. And the green bubbles represent the relative importance of the social determinants of health.

[7] Constitution of the World Health Organization. (1946). American Journal of Public Health and the Nations Health, 36(11), 1315–1323. doi: 10.2105/ajph.36.11.1315

[8] Braveman, P. (2003). Defining equity in health. Journal of Epidemiology & Community Health, 57(4), 254-258. doi:10.1136/jech.57.4.254

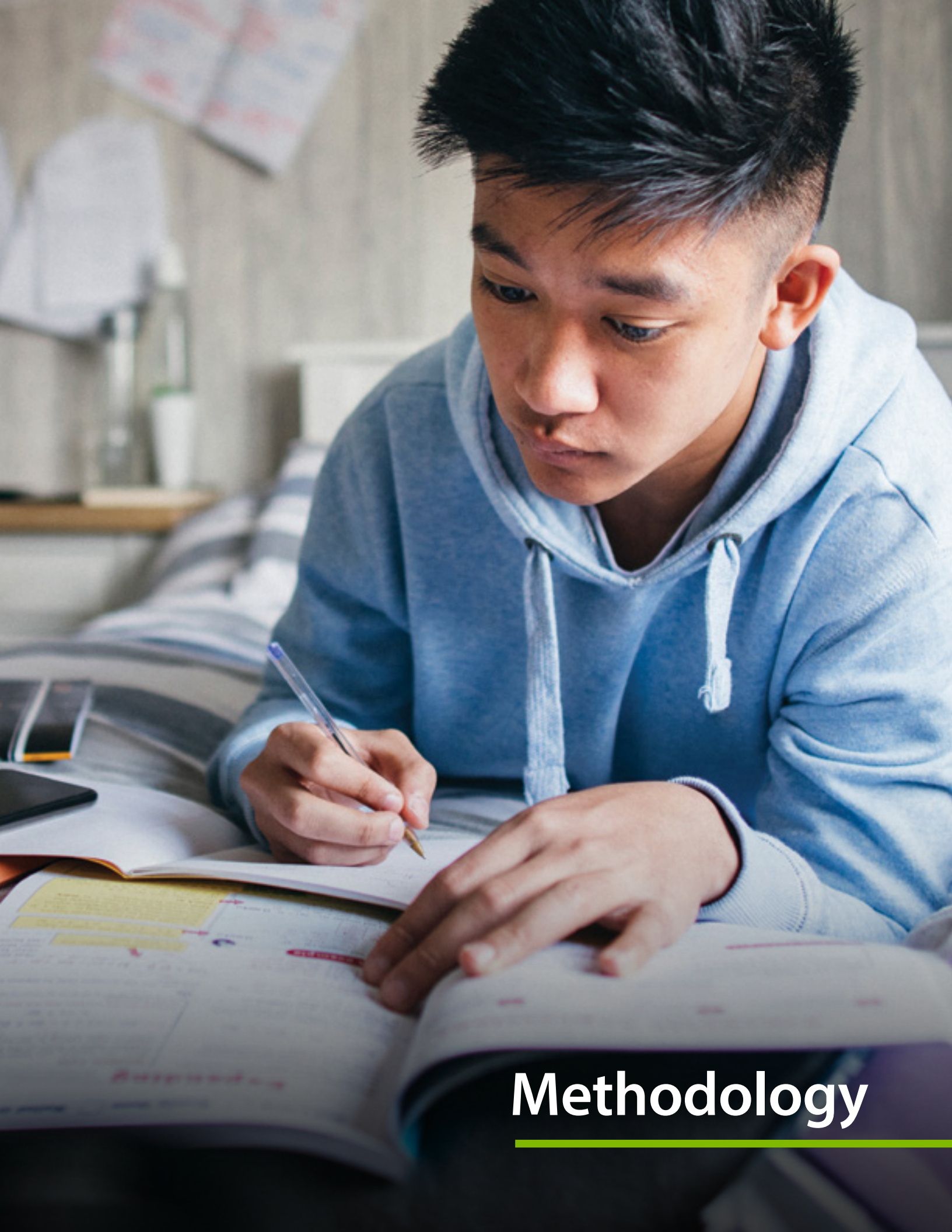
[9] Volume-based care refers to payment models in which providers (e.g., physicians) are paid based on the number of patients they see. Value-based care refers to payment models in which providers are paid based on patients' health outcomes.

[10] Evidence suggests that when the entirety of the ACA was instituted, economic and racial inequities in insurance coverage were narrowed.

[11] Henry J. Kaiser Family Foundation. (2013) Summary of the Affordable Care Act. (2013). Health Reform. Retrieved from https://www.kff.org/health-reform/fact-sheet/summary-of-the-affordable-care-act/

[12] Park, H., Roubal, A. M., Jovaag, A., Gennuso, K. P., & Catlin, B. B. (2015). Relative Contributions of a Set of Health Factors to Selected Health Outcomes. American Journal of Preventive Medicine, 49(6), 961–969. doi: 10.1016/j.amepre.2015.07.016

[13] Galea, S., Tracy, M., Hoggatt, K. J., Dimaggio, C., & Karpati, A. (2011). Estimated Deaths Attributable to Social Factors in the United States. American Journal of Public Health, 101(8), 1456–1465. doi: 10.2105/ajph.2010.300086



Methodology

Methodology

The data that informs this CHNA was collected using surveys, Photovoice, and interviews (i.e., primary data). In addition, information was also gathered from sources such as scientific, peer-reviewed literature, whitepapers and policy briefs, and government agency dataset (i.e. secondary data). All data was collected and analyzed between September 1, 2018 and May 30, 2019.

Primary Data

Surveys: Electronic and paper format surveys were administered with the help of local and regional government bodies, businesses, K-12 schools, universities, and community organizations. Input was solicited from stakeholders who were diverse by age, ethnicity, gender identity, language proficiency, literacy levels, profession, race, sexual orientation, and socioeconomic status.

To ensure input was received from community members who faced literacy or language barriers, survey questions were also administered in interview formats and translated into Spanish. Nearly 2,000 people completed the survey. To capture the perspectives of area youth, more than 100 students participated in Photovoice—a method that involves the use of photographic images and narrative to articulate community needs.

All of the methods were intentionally participatory and transparent in an effort to encourage the exchange of ideas and perspectives, capture authentic community voices, and sow the seeds for collective ownership of the CHNA. New relationships were developed to build trust and reach groups that would not have otherwise been included. For instance, the survey was administered in Spanish to patients by staff of the Federally Qualified Health Center (Inter Care) and in the waiting room of a local tire company to reach men, who were relatively underrepresented among survey respondents.

The following prompts were administered in surveys, Photovoice, and interviews:

- Prompt 1: What are some things in your community that help you to be healthy?
- Prompt 2: What are some things in your community that make it hard to be healthy?
- Prompt 3: What are the biggest health issues in your community?
- Prompt 4: How would you improve the health in your community?
- Prompt 5: When I experience hard or stressful times, these are the ways I help myself feel better/relaxed/calmer.

Individuals were asked to respond to these prompts in the context of the community they felt most comfortable speaking about – where they live, go to school, recreate, work, or worship.

The first four prompts were similar to those used in the 2016 CHNA. To reduce the possibility of repeat responses and to gather as much new information as possible, respondents were asked a screening question on whether they participated in the 2016 CHNA (For full survey instrument, see Appendix B). Those who answered, "Yes" (13%), skipped questions 1-4; and those who answered, "No" (48%) or "I'm not sure" (39%) proceeded to respond to prompt 1.

Prompt 1 was used to gather input on community resources and assets that support or promote health. Prompts 2 and 3 established what residents perceived to be the most pressing health needs in their community, and underlying issues that cause or contribute to those needs. The responses to these two prompts were used to identify the CHNA's priority health needs. In prompt 4, respondents were asked to identify potential solutions for the health needs of their community. Respondents were also prompted to share specific activities that they and/or people they know engage in to cope with adversity. The results of the survey provide a balanced perspective on what health needs and assets exist, as well as ideas and aspirations for improvement in community health.

Methodology

Interviews: Upon request, the survey was administered in an interview format as a member of the CHNA project team transcribed responses. Additionally, a small group interview was conducted with students from the Bridge Academy in Benton Harbor. The interviewees responded to the survey verbally. Subsequently, they addressed their identified priority health needs in their Photovoice projects. The students also spent time reflecting on how their priority health needs came to be, how the community might address their concerns, and their hopes for the future.

Photovoice: To ensure that the voices of youth were reflected in the CHNA, 109 high school students throughout Berrien County participated in Photovoice – a participatory, action-research method in which photography and narrative were used to provide insight into community health needs and assets. In addition to gathering input for the CHNA, the Photovoice projects helped students develop a better understanding of their community; reflect on its strengths and concerns; better understand the economic, social, and political forces that impact community health; and consider how to influence policy makers to improve the health of their community.

There were three Photovoice project locations:

1. Niles New Tech Entrepreneurial Academy at Niles High School (60 tenth grade students)
2. Berrien County Mathematics and Science Center (30 ninth grade students attending schools throughout Berrien County[1])
3. Bridge Academy of Benton Harbor (19 students between the ages of 16 and 21)

Prior to participation, students signed a release form. If they were under the age of 18, a parent or guardian signed on their behalf. Students were instructed on the purpose of the CHNA and Photovoice process. Many students used their own devices. However, digital cameras were made available for others, as needed. Each student took photos and reflected on them, individually or in small groups, selecting the photo(s) they felt best reflected their answers to the survey questions and prompt.

Students wrote narratives describing their photos and explained their responses to the survey. The students of Niles New Tech Entrepreneurial Academy formally presented their findings to a panel of community leaders. Students of the Berrien County Mathematics and Science Center and the Bridge Academy showcased their findings in a gallery walk at their respective locations, where community members were invited to view and discuss their work.

Secondary Data

Literature Review: A review of literature in the fields of public and population health, criminal justice, housing, education, transportation, faith and spirituality, civic engagement, and the medical, social, and environmental sciences were leveraged to understand the local environmental factors that shape health. Sources included policy briefs, whitepapers, and publications from federal government agencies such as the U.S. Department of Health and Human Services (e.g. Agency for Toxic Substances and Disease Registry, National Center for Injury Prevention, the Centers for Medicare and Medicaid Services, Food and Drug Administration, Health Resources and Services Administration, the National Institutes of Health, Substance Abuse and Mental Health Services Administration). Other government sources included federal agencies such as the Census Bureau, the Department of Justice, the Department of Transportation, and the Department of Housing and Urban Development. State agency sources included the Michigan Departments of Health and Human Services, Education, Transportation, and Corrections. The project team also reviewed literature produced by county and other municipal authorities (e.g., master plans, crime reports).

Non-governmental sources of literature included (not exclusively) the Robert Wood Johnson Foundation, the Institute for Healthcare Improvement, and the American Hospital Association. Information was also gathered from national, local, and regional news outlets (e.g., Kaiser Health News, Modern Healthcare). The project team also used literature produced by university research bodies such as the Department of Population Health Sciences at the University of Wisconsin School of Medicine and Public Policy, and Think Tanks such as the Center on Budget and Policy Priorities, Urban Institute, the Pew Research Center, and the Economic Policy Institute.

Methodology

Other Documents and Databases: Collaborating organizations (refer to Table 2.1 for full collaborators list) also provided additional information and data. For instance, the Southwest Michigan Planning Commission provided park and trail data, and the Berrien County Health Department provided mortality rates and information pertaining to the food environment. Tertiary and supporting documentation, such as local newspapers (e.g., Herald Palladium reports on the Berrien County Trial Court) were used to support findings of the literature reviews.

Data from state and national surveys including the Michigan Behavioral Risk Factor Survey (BRFS) and the American Community Survey (ACS) were used throughout the document. They provided basic demographic information as well as data on community conditions (e.g., ages of housing structures, household incomes, vehicle ownership, and insurance status) and health care access and outcomes.

Government data on employment, wages, and other economic indicators was retrieved from the U.S. Bureau of Labor Statistics, the Federal Reserve, and the Organization for Economic Cooperation and Development. Other sources such as the U.S. Department of Agriculture, the Michigan Department of Licensing and Regulatory Affairs, and the Centers for Disease Control and Prevention (CDC) provided essential data for assessing the food environment. Datasets from the CDC and the U.S. Environmental Protection Agency were used to assess the physical environment (e.g., water, air, and land quality).

Table 2.1 Community Collaborators

Interviews, Photovoice, and Surveys Collaborators

2nd Chance Ministries
A & J Hardware Store - Baroda
Andrews University
Benton Harbor Housing Commission
Benton Harbor Police Department
Benton Harbor Soup Kitchen
Benton Harbor Township Housing Authority
Berrien County Health Department - BH
Berrien County Health Department - Niles
Berrien County Sheriff Department
Berrien County Trail Court
Berrien RESA
Blossom Acres
Blue Water Solutions
Boys & Girls Club
Cares HIV
Coloma High School
Consortium for Community Development
Dial-A-Ride
Discount Tire
Ebenezer Baptist Church
Elite Barbershop - Benton Harbor
Emergency Shelter
Ferry Street Resource Center - Niles
First Congregational Church Women's Thursday Group
Foster Grandparenting Program Area Agent on Aging
Harbor Packaging
Harbor Towers
Health Department Clinic - Niles
Herald Palladium
InterCare
Lake Michigan College
Lakeland Care
Michigan State University Extension
MI-Journey
Niles - Buchanan YMCA
Niles Community Schools New Tech Center
Niles Community Schools Special Education
Niles District Library
Niles High School
Niles Middle School
North Berrien Senior Center
Orchards Mall
Overflow Church
River Springs Estates/Trailer Park
River Terrace High Rise Apartments
Riverwood Center
Salvation Army (Men's Shelter)
Sandbar Grill
Shaw's Barbershop
Spectrum Health Lakeland Center for Outpatient Services
Spectrum Health Lakeland - Obstetrics
Spectrum Health Lakeland Parish & Senior Center Nurses
Spectrum Health Lakeland Scheduling - Meadowbrook
Spectrum Health Lakeland Transport & EVS
St. Joseph Lincoln Senior Center
The OutCenter
Trinity Lutheran - Berrien Springs
Van Buren ISD
Watervliet Public Schools
Women's Health Council
YMCA of Southwest Michigan

[1]Students attending the Berrien County Mathematics and Science Center were enrolled in the following schools: Berrien Springs High School, Buchanan High School, Coloma High School, Countryside Academy, Edwardsburg High School, homeschool, Niles High School, and Watervliet High School.

Mortality/Life Expectancy

Mortality/Life Expectancy

High Level Findings

- Life expectancy varies by as much as 19 years across Berrien County.
- The top three causes of death in Berrien County are heart disease, cancer, and cerebrovascular diseases.
- There are significant black/white death rate disparities (a measure of the difference in death rates between two groups).[1, 2]

Like the 2016 CHNA, the 2019 CHNA presents age-adjusted mortality (or death) rates for all 48 census tracts in Berrien County.[3] Whereas the previous CHNA presented mortality rates for one year (2013), this CHNA presents a five-year analysis (2012-2016) of mortality rates at the census tract level for greater accuracy.[4] Disease-specific death rates according to sex, race and ethnicity at the county level are also presented. In addition, this CHNA presents life expectancy at the census tract level.[5]

Life Expectancy at Birth

State and National Trends. Life expectancy at birth (life expectancy) is a measure of the number of years that a newborn is expected to live given current mortality rates. It is commonly used to examine mortality patterns and allows for comparison between populations, which can highlight inequities in health outcomes.

Figure 3.1 shows that life expectancy varies by place of residence, sex, and year of birth. In the United States, females born in 2016 have a life expectancy that is five years greater than males. However, the average life expectancy in Michigan is one year less (0.9) than that of the United States. This difference in average life expectancy between Michigan and the United States (U.S.) has been increasing since 1990.

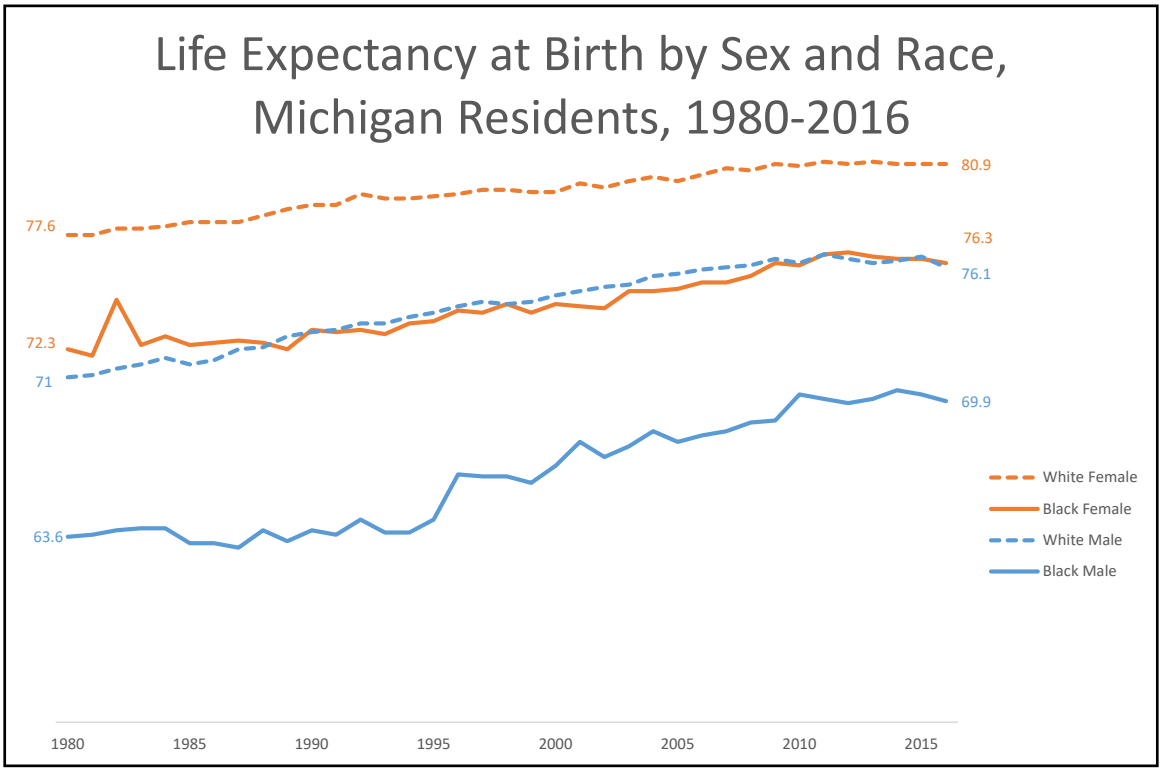


Figure 3.1 Life Expectancy at Birth by Sex for Michigan and United States Residents, from 1990-2016

Mortality/Life Expectancy

Over the last century, life expectancy rates in the U.S. and Michigan have trended upward. However, in recent years, there has been a decrease in life expectancy at both the national and state level, particularly for males. Nationally, male life expectancy steadily decreased from 76.5 years in 2014 to 76.1 in 2017.[6,7] In Michigan, male life expectancy dropped from 75.7 in 2010 to 75.4 in 2017.[8] One explanation for this trend is an increase in "deaths of despair" (i.e., suicide, opioid overdoses, and cirrhosis of the liver).[9] This explanation, however, overlooks the fact that the U.S. has experienced a decline in life expectancy relative to peer nations since the 1980s.[10] This decline is driven in part by factors such as wage stagnation.[11]

Berrien County. The average life expectancy in Berrien County is 77.3 years.[12] However, life expectancy varies considerably throughout the county.

Life expectancy in Lincoln Township and Berrien Springs is approximately 86 years, while in Benton Harbor and Benton Township, life expectancy is approximately 67 years. This life expectancy gap occurs between places separated by as little as 15 miles. (For more information on life expectancy and death rates by census tract, see Appendix C).

Figure 3.2 shows the geographic clustering of census tracts with low life expectancies. The darker green tracts have the lowest life expectancies. Apart from one census tract in Niles, the tracts with low life expectancies (i.e., under the age of 72) are in Benton Township and Benton Harbor.

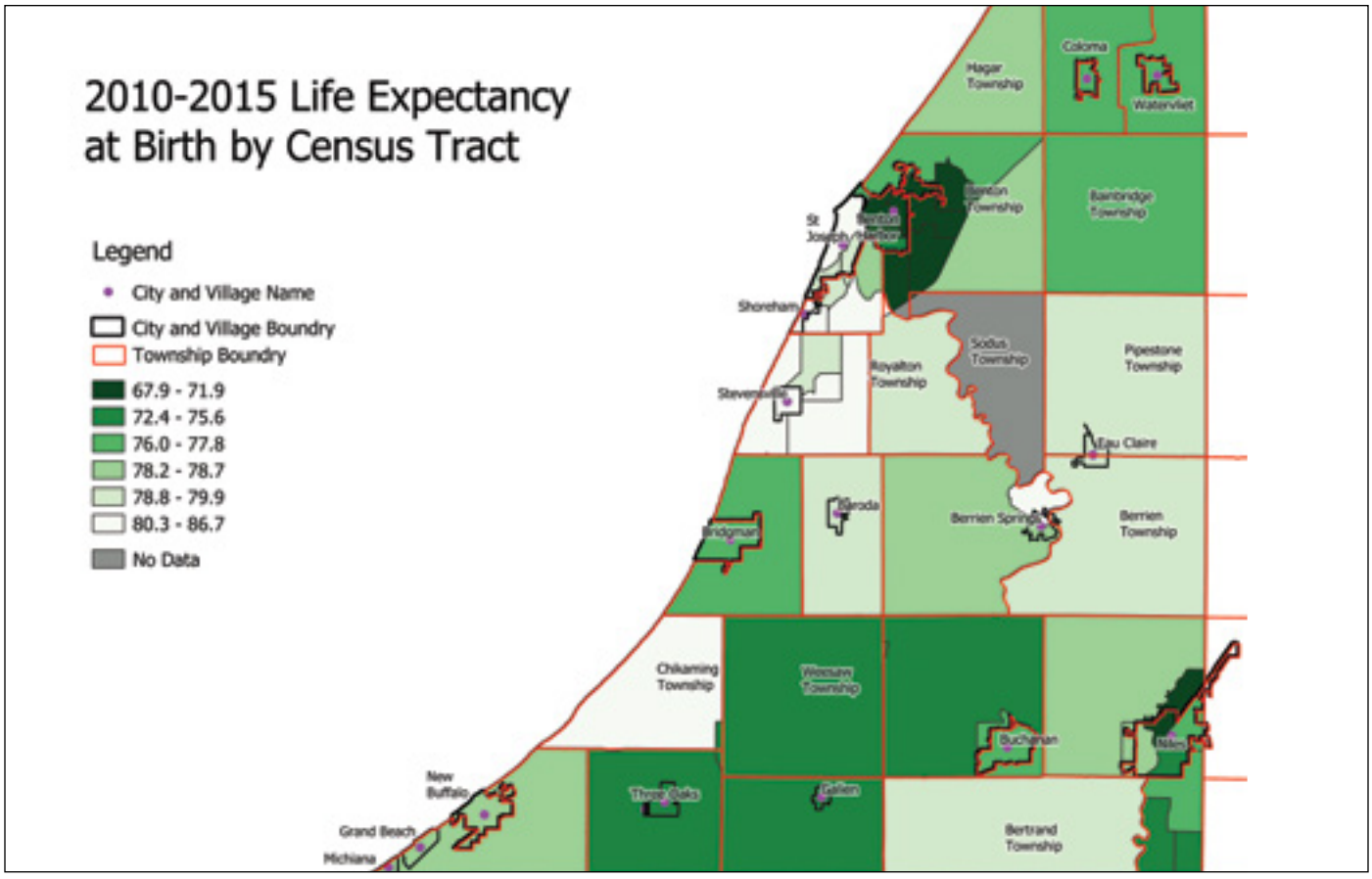


Figure 3.2 Life Expectancy by Census Tract. Data from NVSS 2010-2015

Age-Adjusted Mortality[13]

Between the years of 2007 and 2016, the age-adjusted mortality rate in Berrien County (815.6) was higher than that of the state of Michigan (795.1). The Age-Adjusted Mortality Rate table in Appendix C shows that there are significant regional variations in death rates. The county's highest death rate is in Benton Township (1598.6), and the lowest is in Shoreham (525.9). Figure 3.3 shows that there is a geographic clustering of high death rate census tracts located in and around the city of Benton Harbor. There is one census tract in Niles that has a high death rate.

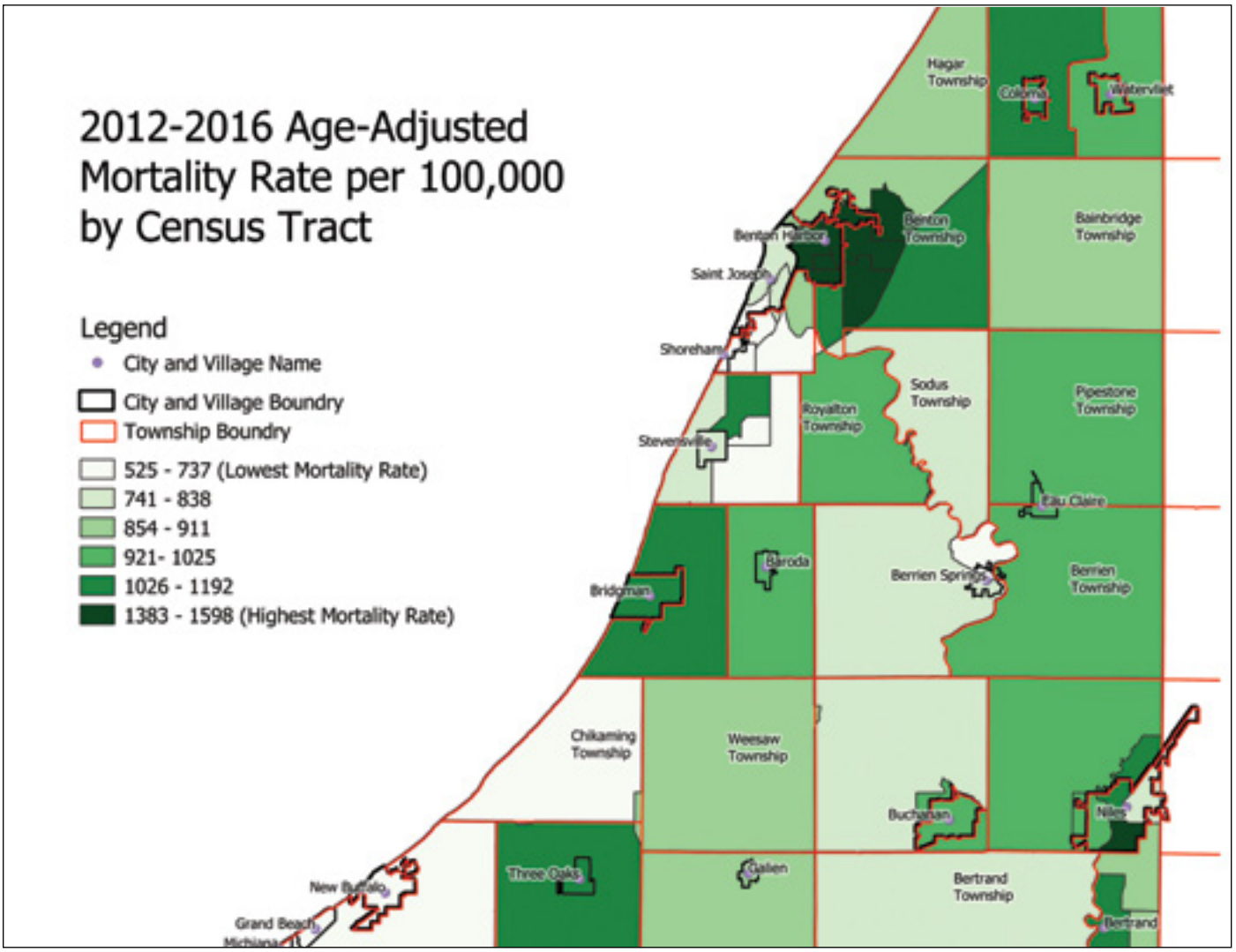


Figure 3.3 Age-Adjusted Mortality Rate per 100,000 by Census Tract, 2012-2016

Mortality/Life Expectancy

Additionally, there are significant variations in death rates among races and ethnic groups as shows in figure 3.4. For instance, the death rate for blacks (1037.7) was higher than for whites (782.9). Hispanics had a lower death rate than non-Hispanics (503.3 compared to 815.1, respectively).[14]

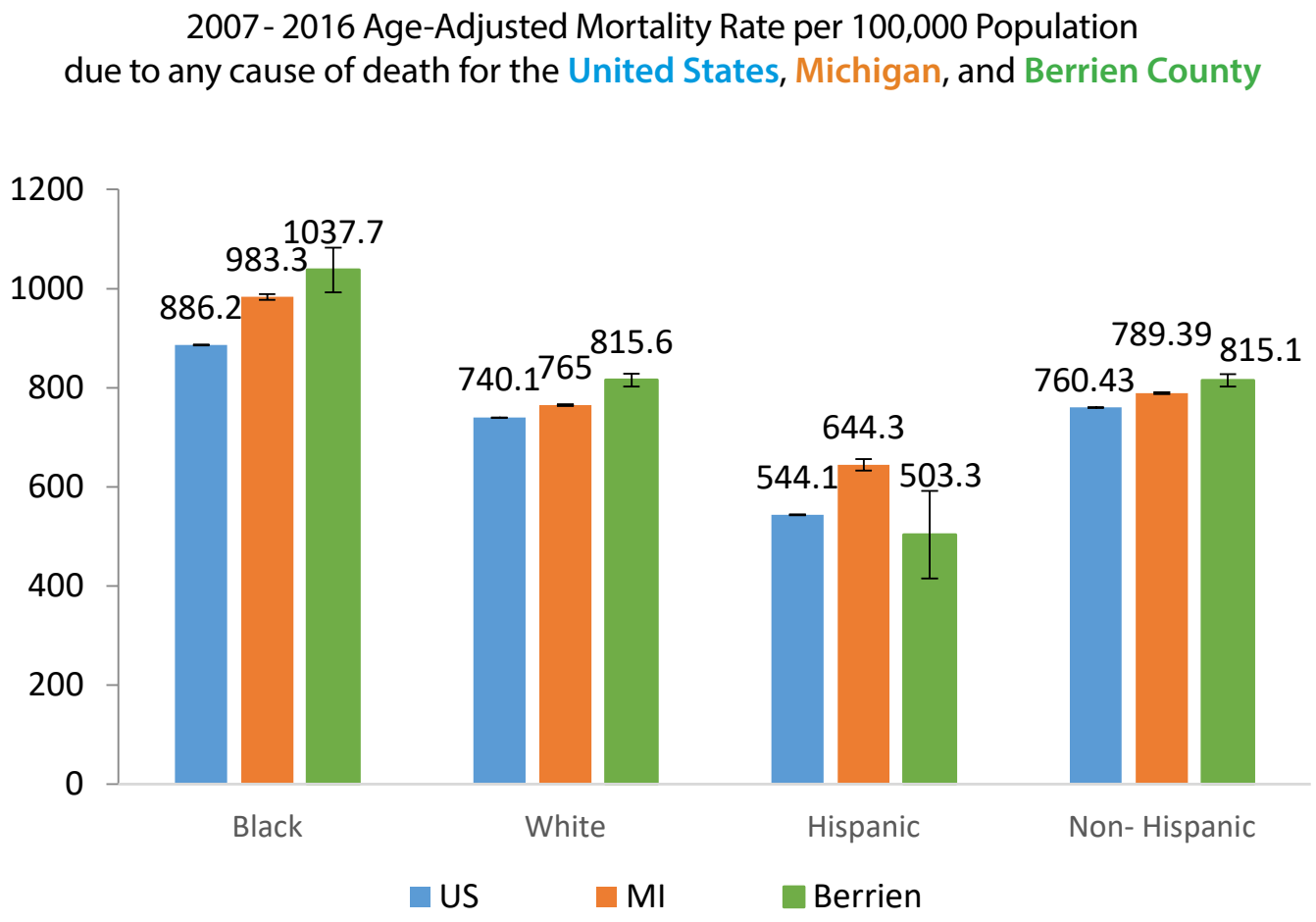


Figure 3.4 Age-Adjusted Mortality Rate per 100,000 population due to any cause of death for the United States, Michigan and Berrien County, from 2007-2016.[15]

Mortality/Life Expectancy

From a population health perspective, death rate disparity is an important indicator to track over time. For the purpose of this report, death rate disparity refers to the difference in the death rates between black and white individuals.

Table 3.1 shows that the death rate disparity in Berrien County is 32.5%. This means that the black death rate is 32.5% higher than the white death rate. The death rate disparity is even greater for age-adjusted premature mortality (death prior to the age of 75): the black premature death rate is 66.4% higher than the white death rate.

Disaggregating the death rates by sex reveals a 38.2% death rate disparity for black and white males, and a 29.2% death rate disparity for black and white females.

Age	Black	Black Male	Black Female	White	White Male	White Female	Death Rate Disparity %	Male Death Rate Disparity %	Female Death Rate Disparity %
AAMR	1037.7	1255.1	877.7	782.9	908.3	679.1	32.5†	38.2†	29.2†
AAPMR	589.5	726.2	479.2	354.3	433.2	278.6	66.4†	67.6†	72.0†
<1	15.4§	16.4§	14.2§	5.7§	6.2§	5.1§	170.4†	163.4†	178.0†
1 to 4	***	***	***	42.1	***	***	***	***	***
5 to 14	***	***	***	13.5	***	***	***	***	***
15 to 24	91.9	139.8	***	81.6	113	48.1	12.6	23.7	***
25 to 34	185.4	236.4	144.2	127.9	169	86.3	45.0	39.9	67.1†
35 to 44	334.4	417	266.9	172.1	204.7	139.5	94.3†	103.7†	91.3†
45 to 54	824.7	987.4	691.1	422	531.4	313	95.4†	85.8†	120.8†
55 to 64	1539.6	1863.3	1267.8	892.6	1080.5	712.2	72.5†	72.4†	78.0†
65 to 74	2866.5	3598.1	2320.8	1955.2	2357.7	1595.7	46.6†	52.6†	45.4†
75 to 84	5669.8	7160.9	4655.7	4970.6	5639.6	4480.8	14.1†	27†	3.9
85+	14878.3	16389.5	14114.1	14655.4	16022.2	13972.6	1.5	2.3	1.0

Table 3.1 Age-Adjusted Mortality Rates and Death Rate Disparity between black and white populations for any cause of death.

Death rate disparity relative to whites is = (black rate minus white rate) divided by white rate times 100

† Statistically significant difference between black and white populations.
*** Rate has been suppressed or is unreliable due to a small number of deaths.
§ Infant Mortality Rates are expressed as per 1,000 population.

Mortality/Life Expectancy

The Age-Adjusted Mortality Rate table in Appendix C and Figure 3.5 show that the death rate disparity between blacks and whites varies among age groups. The highest death rate disparity is for children under the age of one year (i.e., infants). Death rate for white infants is 5.7 (per 1,000) compared to 15.4 (per 1,000) for black infants, resulting in a disparity of 170.4%.

Among adults, the greatest disparity lies in the age ranges of 35-44, 45-54, and 55-64. In these age groups, the black death rate is respectively 94.3%, 95.4%, and 72.5% greater than the rate in whites.

For males, the greatest death rate disparity is in the 35-44 age group (103.7%) with more than double the rate for white males. For females, the greatest death rate disparity is within the 45-54 age group (120.8%), well more than double the rate for white females.

The data shows that blacks in Berrien County are dying at twice the rate of whites during primary earning years (35-54). This has significant implications for generational wealth and community-level income generation and wealth creation which impact essential health determinants, such as education, food, housing, transportation, and health care.

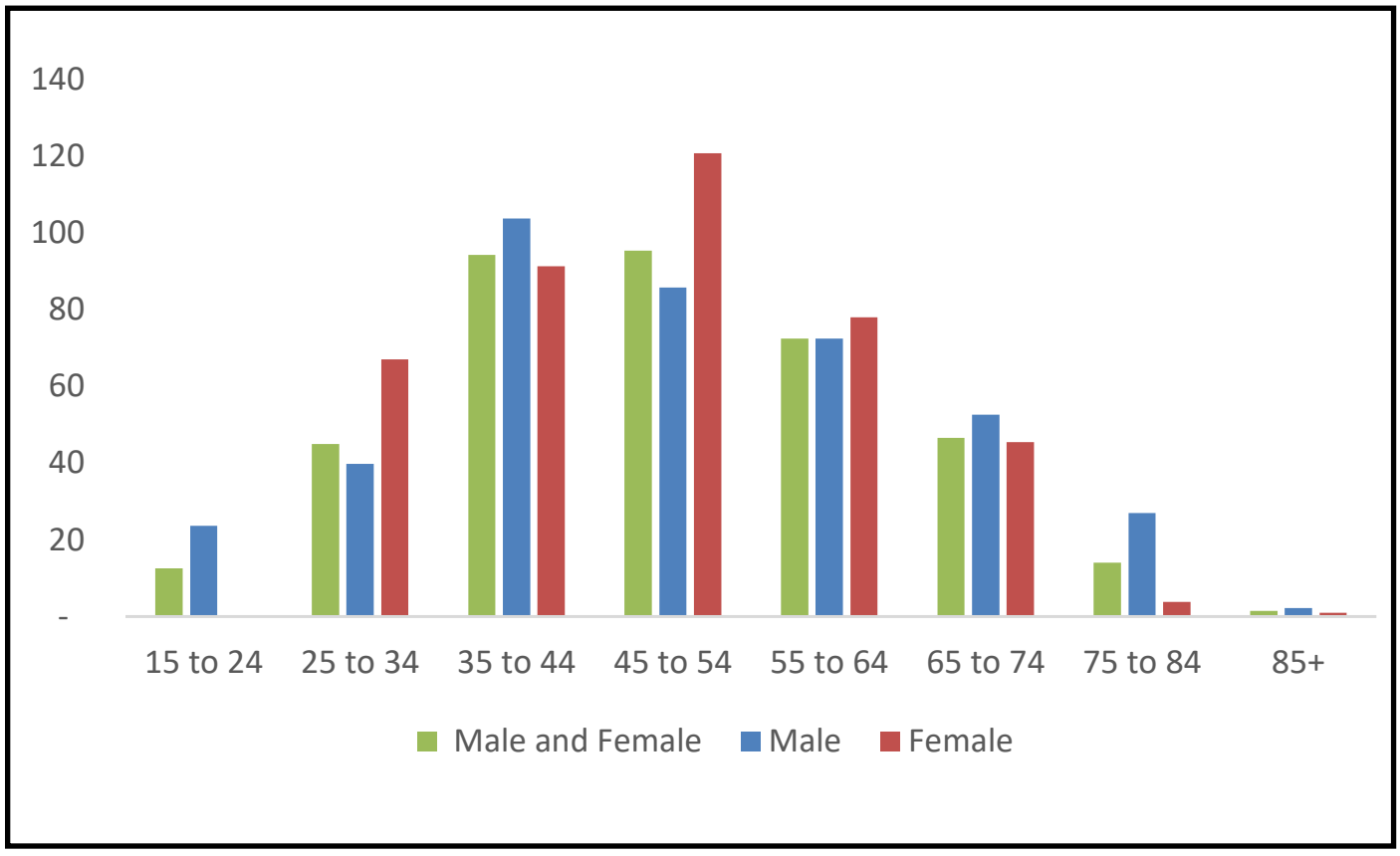


Figure 3.5 Death Rate Disparity among Age Groups and Sex, Berrien County, from 2007-2016.

Causes of Death

Rk	Black Female	Black Male	White Female	White Male	Hispanic (All Races)	Non-Hispanic (All Races)
1	Cancer 201.6	Cancer 301.3	Cancer 151.4	Heart Disease 229.7	Cancer 107.1	Heart Disease 190.99
2	Heart Disease 201.6	Heart Disease 274.2	Heart Disease 149.3	Cancer 206.9	Heart Disease 80.6	Cancer 182.17
3	Cerebrovascular Disease 66.9	Cerebrovascular Disease 75.4	Cerebrovascular Disease 54.5	Accidents 61	Accidents 37.2	Cerebrovascular Disease 54.36
4	Diabetes 57.7	Diabetes 71.8	Chronic Lower Respiratory Diseases 45.3	Chronic Lower Respiratory Diseases 57.8	No Data	Chronic Lower Respiratory Diseases 48.9
5	Alzheimer's 31.9	Accidents 60.4	Alzheimer's 32.4	Cerebrovascular Disease 47	No Data	Accidents 45.3

Table 3.2 Top five causes of death in Berrien County, from 2007-2016.

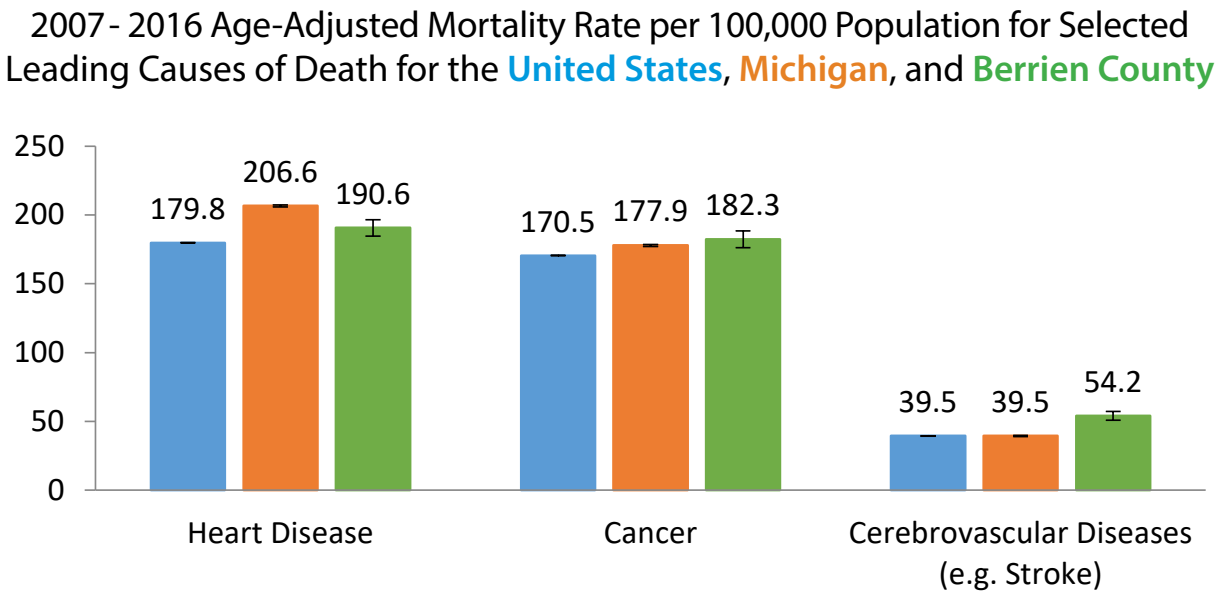


Figure 3.6 Disease specific death rates in the United States, Michigan, and Berrien County for the combined black and white population, from 2007-2016.

In Berrien County, the leading causes of death are heart disease, cancer, cerebrovascular disease (e.g., stroke), chronic lower respiratory disease, Alzheimer's disease and accidents.[15]

Figure 3.6 shows that, between 2007 to 2016, the rate of death due to heart disease in Berrien County was lower than the Michigan rate but higher than the U.S. rate. The county's cancer death rate was comparable to the Michigan rate, but higher than the U.S. rate. Berrien County's stroke death rate was higher than both the state and national rates.

Heart Disease

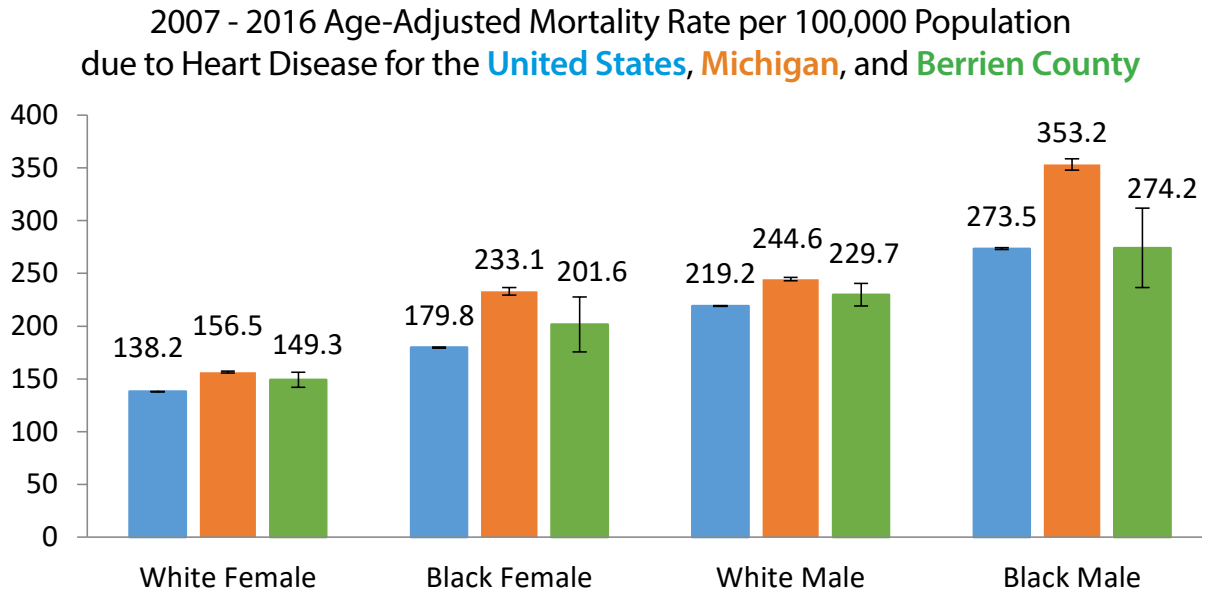


Figure 3.7 Heart Disease Death Rates for the combined Sex and Race population in the United States, Michigan, and Berrien County, from 2007-2016.

	Black	Black Male	Black Female	White	White Male	White Female	Death Rate Disparity %	Male Death Rate Disparity %	Female Death Rate Disparity %
Death Rate	230.8	274.2	201.6	184.4	229.7	149.3	25.1†	19.4†	35.0†
Premature Death Rate	115.2	136.2	98.8	59.8	82.9	38.2	92.6†	64.23†	158.6†

Table 3.3 Heart Disease death rate disparity for the combined Sex and Race population in Berrien County, from 2007-2016.

Death rate disparity relative to whites is = (black rate minus white rate) divided by white rate x 100
† Statistically significant difference between black and white populations.

In Berrien County:

- The death rate due to heart disease is lower than the rate for the state of Michigan, but higher than the U.S rate (see figure 3.6).
- White females have the lowest heart disease death rate and black males have the highest. This disparity in death rates is also evident at the state and national levels.
- The black/white death rate disparity for heart disease is 25.1% (i.e., the black heart disease death rate is 25.1% higher than that for whites).
- The black/white death rate disparity for heart disease among females (35%) is greater than the black/white death rate disparity for males (19.4%).
- For premature deaths due to heart disease, the black/white death rate disparity is 92.6%.
- The premature black/white death rate disparity due to heart disease for males is 64.2%. For females, it is 158.6%.

Cancer

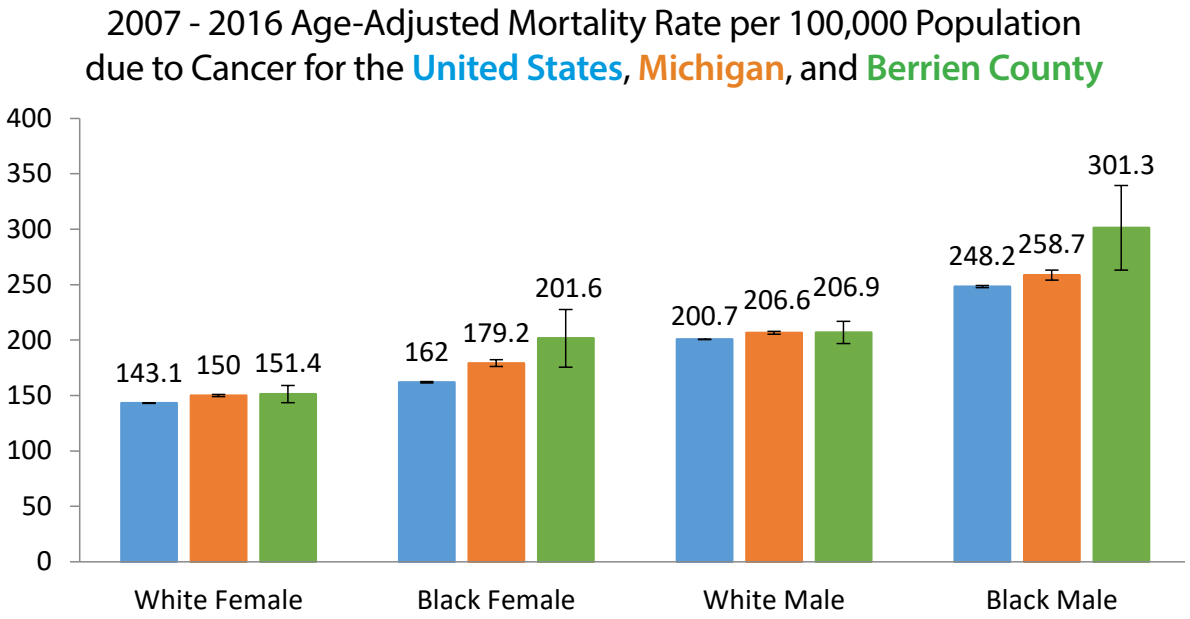


Figure 3.8 Cancer Death Rates for the combined Sex and Race population in the United States, Michigan, and Berrien County 2007-2016.

	Black	Black Male	Black Female	White	White Male	White Female	Death Rate Disparity %	Male Death Rate Disparity %	Female Death Rate Disparity %
Death Rate	242.5	301.3	201.6	175.1	206.9	151.4	38.5†	45.6†	33.2†
Premature Death Rate	149.4	182.8	123.4	101.2	114.8	88.6	47.6†	59.2†	39.3†

Table 3.4 Cancer death rate disparity for the combined Sex and Race population in Berrien County, 2007-2016.

Death rate disparity relative to whites is = (black rate minus white rate) divided by white rate x 100
† Statistically significant difference between black and white populations.

In Berrien County:

- The cancer death rate was comparable to the Michigan rate, but higher than the U.S rate.
- Black males have the highest cancer death rate, and white females have the lowest.
- White cancer death rates are comparable to state and national rates. However, black cancer death rates were higher than the national average.
- The black/white death rate disparity due to cancer is 38.5%. The black/white female disparity is 33.2% and the black/white male disparity is 45.6%.
- The premature cancer death rate disparity in Berrien County is 47.6%. The female premature death rate disparity is 39.3%, and the male death rate disparity is 59.2%.

Cerebrovascular Disease

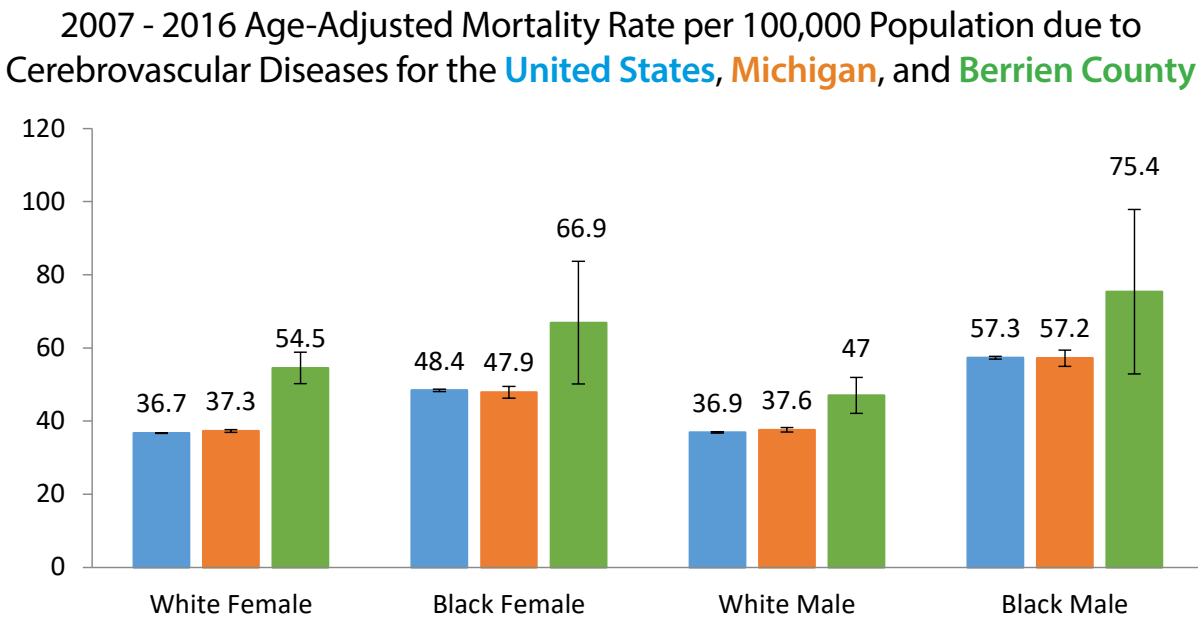


Figure 3.9 Cerebrovascular Disease Death Rates for the combined Sex and Race population in the United States, Michigan, and Berrien County, from 2007-2016.

	Black	Black Male	Black Female	White	White Male	White Female	Death Rate Disparity %	Male Death Rate Disparity %	Female Death Rate Disparity %
Death Rate	71.2	75.4	66.9	52.1	47	54.5	36.7†	60.4†	22.8
Premature Death Rate	27	30.5	24	11	11.8	10.3	145.5†	158.5†	133.0†

Table 3.5 Cerebrovascular Disease death rate disparity for the combined Sex and Race population in Berrien County, 2007-2016.

Death rate disparity relative to whites is = (black rate minus white rate) divided by white rate x 100
† Statistically significant difference between black and white populations.

In Berrien County:

- The death rate due to cerebrovascular disease is higher than the Michigan and the U.S. rates (see figure 3.6).
- The cerebrovascular disease death rate for blacks is higher than the rate for whites, and highest for black males.
- The cerebrovascular death rate disparity in Berrien County is 36.7%. The black/white male disparity is 60.4%.
- The premature black/white death rate disparity is 145.5%. The female death rate disparity is 133%, and male death rate disparity is 158.5%.

Hispanic Age-Adjusted Mortality Due to Cancer and Heart Disease

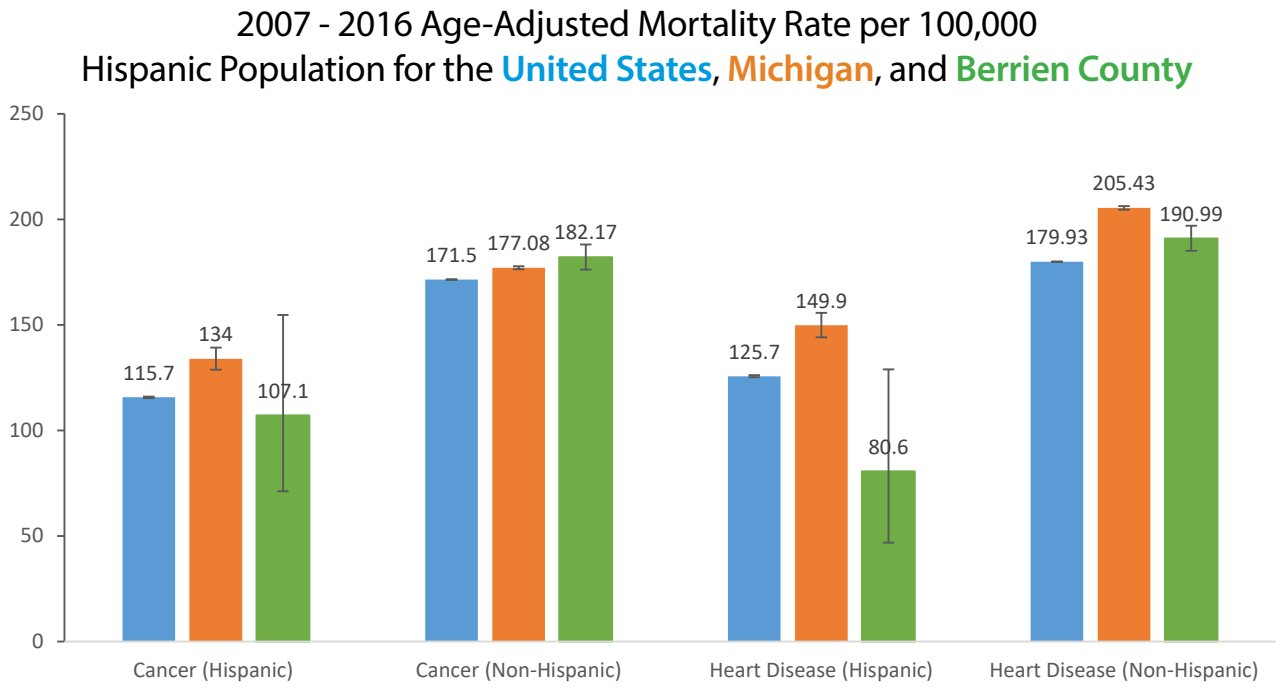


Figure 3.10 Cancer and Heart Disease Death Rates for the Hispanic population compared to Non-Hispanics in the United States, Michigan, and Berrien County 2007-2016.

In Berrien County:

- Compared to non-Hispanics, Hispanic individuals in Berrien County have lower death rates due to cancer (107.1 vs. 182.17) and heart disease (80.6 vs. 190.99). These lower death rates mirror differences at the state and national levels, as well.
- As seen in Figure 3.10, the heart disease death rate for the Hispanic population in Berrien County is lower than the state rate but is not significantly different than the national rate.
- The Hispanic cancer death rate is not significantly different from the state or national death rate.

Limitations

The priority health conditions identified in the CHNA were obesity and mental health. However, data on mortality related to these conditions is not available at the local level. In order to ensure a sufficient sample size within sub-groups (i.e., ethnicity, race, and sex), data was aggregated to create 10-year estimates. However, this prevents analysis of trends over time. Additionally, due to small population sizes, analysis of Hispanic death rates was limited. Likewise, analysis of racial groups (besides blacks and whites) was not technically feasible due to small population sizes.

[1] Disparity (%) = (black rate minus white rate) divided by white rate times 100.
[2] Klein, R, Huang, D., & National Center for Health Statistics Centers for Disease Control and Prevention. (2010). [3] Census Tracts are small, relatively permanent statistical subdivisions of a county with an average population of 4,000 individuals.
Defining and measuring disparities, inequities, and ... Retrieved from https://www.cdc.gov/nchs/ppt/nchs2010/41_klein.pdf
[3] Census Tracts are small, relatively permanent statistical subdivisions of a county with an average population of 4,000 individuals.
[4] Age-adjusted mortality rate is a death rate that controls for the effects of differences in population age distributions. This controls for the influence that different population age distributions might have on health event rates. All age-adjusted mortality rates presented in this document are expressed as per 100,000 population (i.e., the number of individuals who would have died if the population for a given area were 100,000).
[5] Statistical significance of data obtained through CDC WONDER was determined using the methodology outlined in the CDC's report on racial disparities in age-specific mortality and in the National Vital Statistics Report.
[6] Center for Disease Control and Prevention. (2018). Health, United States, 2017 – Data Finder.
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[7] Arias, E., Xu, J., & Division of Vital Statistics. (2019). United States Life Tables, 2017. National Vital Statistics Reports , 68(7).
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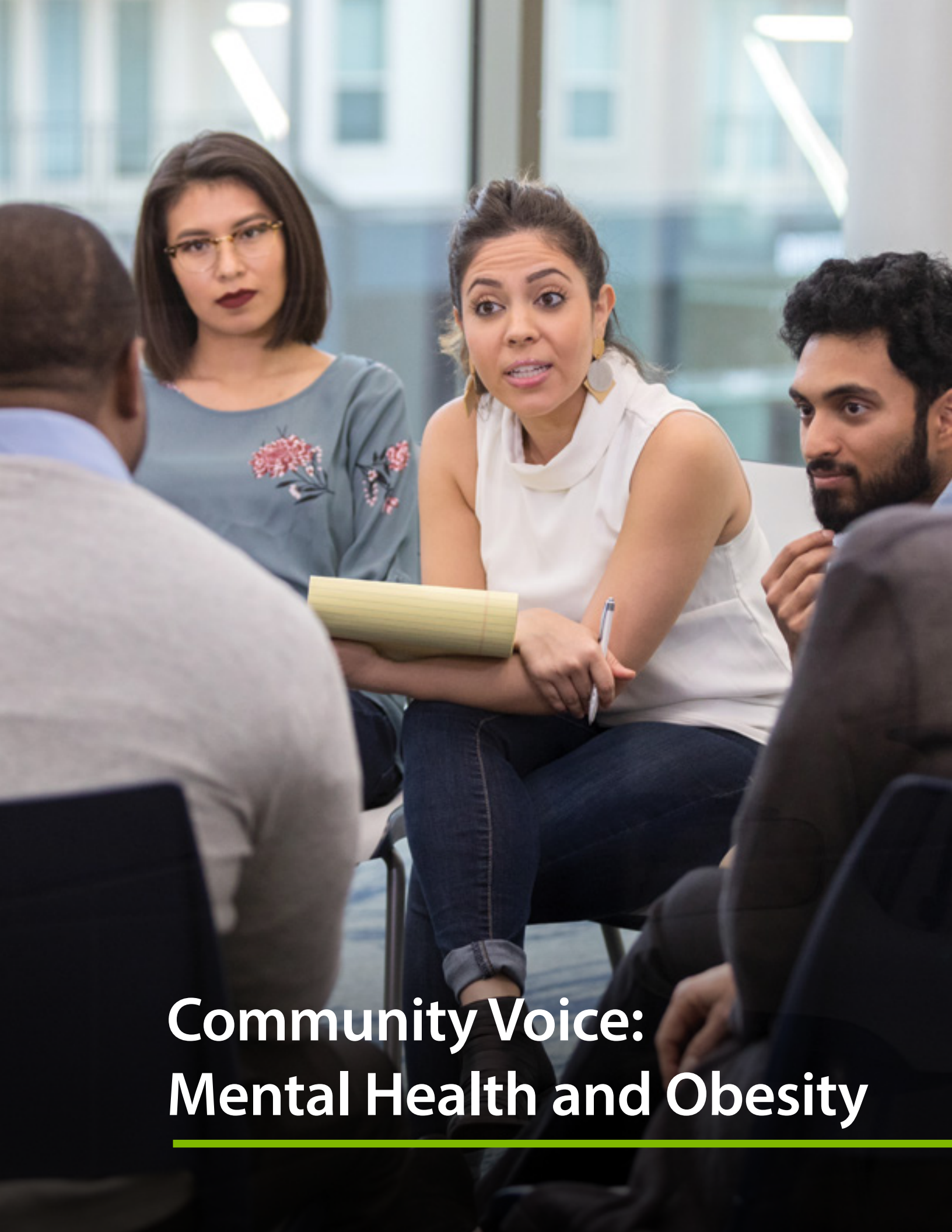
[8] Michigan Department of Community Health. (2019). Life Expectancy at Birth by Sex Michigan and United States Residents, 1901-2018.
Retrieved from https://www.mdch.state.mi.us/osr/deaths/lifeUSMI.asp
[9] In a November 2018 statement, Robert R. Redfield, Director of the Centers for Disease Prevention and Control, indicated that the national trend of declines in life expectancy was largely driven by deaths from drug overdose and suicide
[10] Muennig, P. A., Reynolds, M., Fink, D. S., Zafari, Z., & Geronimus, A. T. (2018). America's Declining Well-Being, Health, and Life Expectancy: Not Just a White Problem. American Journal of Public Health, 108(12), 1626–1631. doi: 10.2105/ajph.2018.304585
[11] Mishel. L,.(2015). Causes of Wage Stagnation. Retrieved from https://epi.org/publication/causes-of-wage-stagnation/
[12] University of Wisconsin Population Health Institute (2019). County health rankings & roadmaps 2019. Retrieved from https://www.county healthrankings.org/app/michigan/2019/measure/outcomes/147/dat.
[13] Mortality rates are calculated per 100,000. Of the 74 census tracts in Cass, Van Buren, and Berrien County, the 18 census tracts with the highest mortality rates were in Berrien County, and the census tract with the highest rate of 1598.6 is in Benton Township. Additionally, seven out of the 19 census tracts with the lowest mortality rates in the three-county area were in Berrien County, and the census tract with lowest death rate of 525.9 is in Shoreham.
[14] For death rate calculations, black refers to Hispanic and non-Hispanic black or African American individuals, white refers to Hispanic and non-Hispanic whites. Hispanic and non-Hispanic counts include all races (American Indian or Alaskan Native, Asian/Pacific Islander, Black or African American, and White).
The significantly lower death rate for Hispanics merits further investigation. Some reasons could be: an overestimate of the Hispanic population (i.e., the denominator is potentially lower than the census count that this death rate is based on); the ethnicity documented on death certificates may be incorrectly determined by the coroner; a larger percentage of the Hispanic population may be first generation (with health habits associated with higher life expectancy).
[15] Michigan Department of Community Health. (2019). Michigan Mortality Statistics, 2007-2016. Retrieved from https://www.mdch.state.mi.us/osr/index.asp?Id=4



Community Voice: Mental Health and Obesity

Community Voice: Mental Health and Obesity

High Level Findings

1. Mental health concerns and obesity are the priority health needs. These findings mirror those of the 2016 CHNA.
2. Community members overwhelmingly view social and environmental factors, such as food, recreational, and physical environments; social supports and cohesion; and faith-based and spiritual practices, to be key factors that influence health.
3. The food and recreational environments, better health care resources and increased social support/cohesion were areas that respondents believed could be improved to promote better health in the community.

To determine the priority health needs resulting from the CHNA, the project team conducted a thematic analysis[1] of the data gathered from surveys, interviews, and Photovoice projects.[2] The analysis also highlighted the community's perspective on current and desired resources, assets, and hopes for the future. The findings suggest that community members remain concerned about the mental wellness and environmental factors that contribute to excess weight and increase the risk for negative health outcomes.

	Number of Respondents	Percentage of Respondents
Under 18	98	5%
18-29	210	11%
30-44	385	21%
45-59	536	29%
60+	629	34%

Table 4.1 CHNA Respondent Age Range

Demographics of Respondents

The project team gathered surveys, interviews, and Photovoice data from nearly 2,000 community members. According to the American Community Survey (ACS), the median age of Berrien County residents is 42 years. The ACS reports that 51.1% of the Berrien County population is female and 48.9% is male.[3] In comparison, the respondents across the three (3) methods of this survey had a median age of 45-59 years. Unlike the ACS, which asks for sex (female and male), the project team asked respondents for their identified gender. A majority of the respondents identified as female (73.49%) with 24.25% identifying as male, 0.38% as transgender, 0.38% a gender identity not listed, and 1.51% preferred not to identify.

Table 4.2 provides a breakdown of gender and racial/ethnic identities of CHNA respondents. In each racial/ethnic category, individuals who identified as female represented the majority of respondents including those who chose not to identify their race/ethnicity. It is worth noting that 20 respondents chose to neither identify their race/ethnicity or gender.

	Female	Male	Transgender	I choose not to identify	Option not listed
White or Caucasian	945	258	6	6	0
Black or African American	308	145	1	2	1
Hispanic or Latino	28	12	0	0	1
Asian or Asian American	11	2	0	0	0
American Indian or Alaskan Native	9	3	0	0	0
Native Hawaiian or Pacific Islander	1	0	0	0	0
Option not listed	20	13	0	0	5
I choose not to identify	37	14	0	20	0

Table 4.2 CHNA Respondent Race/Ethnicity and Gender Identity Comparison

Location of Respondents

Respondents had the option to provide their address. Of the 1,891 respondents, 1,285 reported a city of residence. Most survey respondents who provided a city address reported living in Benton Harbor (31%), St. Joseph (17%), and Niles (16%).

Community Voice: Mental Health and Obesity

Priority Health Needs

The question "what are the biggest health issues in your community?" was used to determine the priority health needs. The question "what in your community makes it hard to be healthy?" was used to help the project team understand the circumstances (or environmental circumstances) that may be contributing to those needs.

What are the biggest health issues in your community?

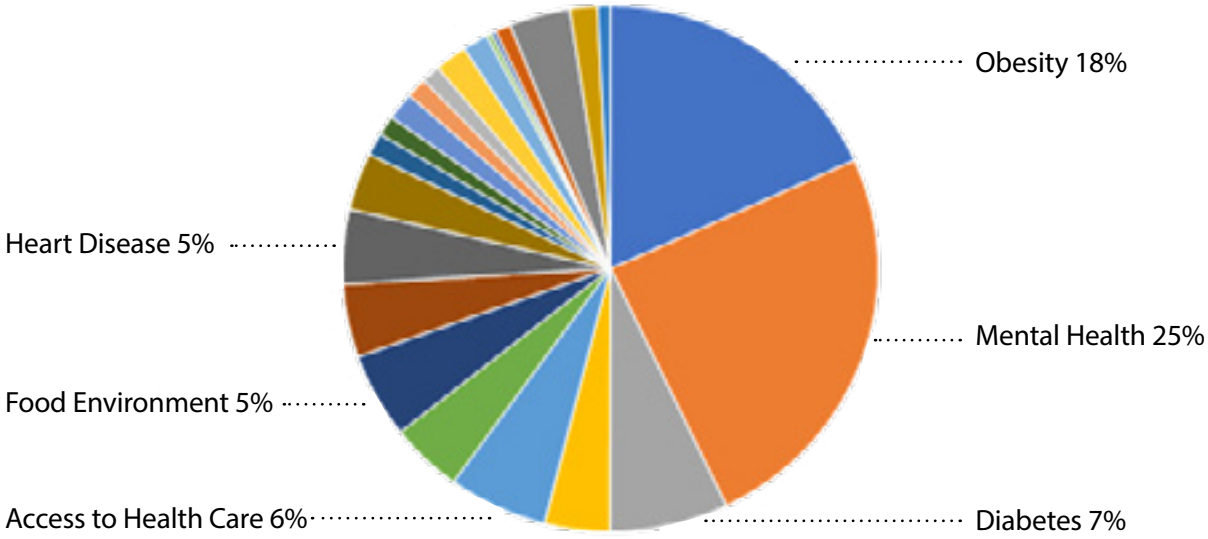


Figure 4.1 Combined responses to "What are the biggest health issues in your community?"

According to Figure 4.1, survey respondents most frequently cited mental health concerns as the biggest health issue. Participants spoke about anxiety, depression, stress related to work and school, substance misuse, and other untreated mental illness concerns. Within these responses, the largest concerns focused on high levels of stress and access to or use of alcohol, tobacco, and other drugs (ATOD). For example, one resident responded with "Adolescent mental health and ease of access to illicit drugs (meth, heroin, cocaine)" as the biggest health issues. Another respondent noted, "I think mental health is the biggest issue in our community. Because of it, the local economy isn't increasing, people are depressed and start bad habits, and we can't really come together as a community."

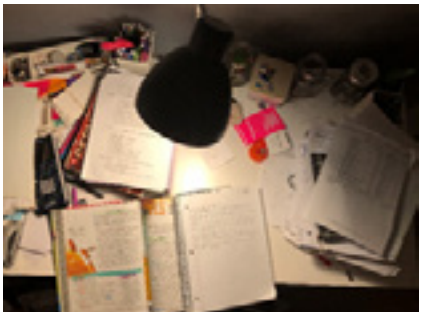


Figure 4.2 Photo taken by student at BCMSC

Figure 4.3 Taken by student at Niles New Tech

Youth who responded to this same question through Photovoice echoed that mental health is the biggest health issue. Students mentioned that the stress they experience comes from many places, such as school, extracurricular activities, lack of sleep, peer relationships, parents, and social media. Their responses also referenced a lack of accessible resources both in school and in the community.

Community Voice: Mental Health and Obesity

During the group interview with Bridge Academy Photovoice participants explained the bi-directional relationship between mental health and health behaviors. One example given was people using substances "to ease the mind when they don't feel safe or have other activities." Another noted that "if there aren't youth activities, then how do kids…take out their emotions?"

The second most frequently cited health concern among the survey respondents was obesity. It should be noted that obesity is the term used by the community in surveys, Photovoice projects, and interviews conducted by the project team. However, the concept of obesity is complex. Obesity results from behaviors influenced by environmental conditions.This was recognized by respondents who noted the connection between excess weight and social determinants of health, such as access to food and recreational environments. Also, the focus on obesity as a primary indicator of health has many unintended consequences, such as low self-esteem and unhealthy cycles of weight loss.

P: What are the biggest health issues in your community?

"We don't have a place to go to get help. And we don't want to talk about it because that makes us different. Broken. Others might be going through the same stuff, but we only see the happy faces people put on for school or on social media."

–10th grade female student from Niles

P: What are the biggest health issues in your community?

"Probably people dealing with maintaining healthy weight which leads to issues with diabetes, hypertension, heart disease, etc. Also, for many people in this community the biggest health issue is poverty."

–30 - 44 y.o., black, female

As depicted in Figure 4.4, aside from the top priority health need surrounding mental health, Photovoice participants had a different take on the needs of their community. As opposed to specific health conditions, they reported environmental factors they believed to be negatively impacting health. Their remaining top needs included concerns about public safety, the physical environment, health resources, and diminished social supports/cohesion. For instance, students made a connection between public safety and environmental factors such as having abandoned houses and buildings, a lack of street lighting, and the prevalence of drugs and violence.

Though these did not rise to the level of being a priority health need across the various data collection methods, it is worth noting that these issues are of concern to youth.

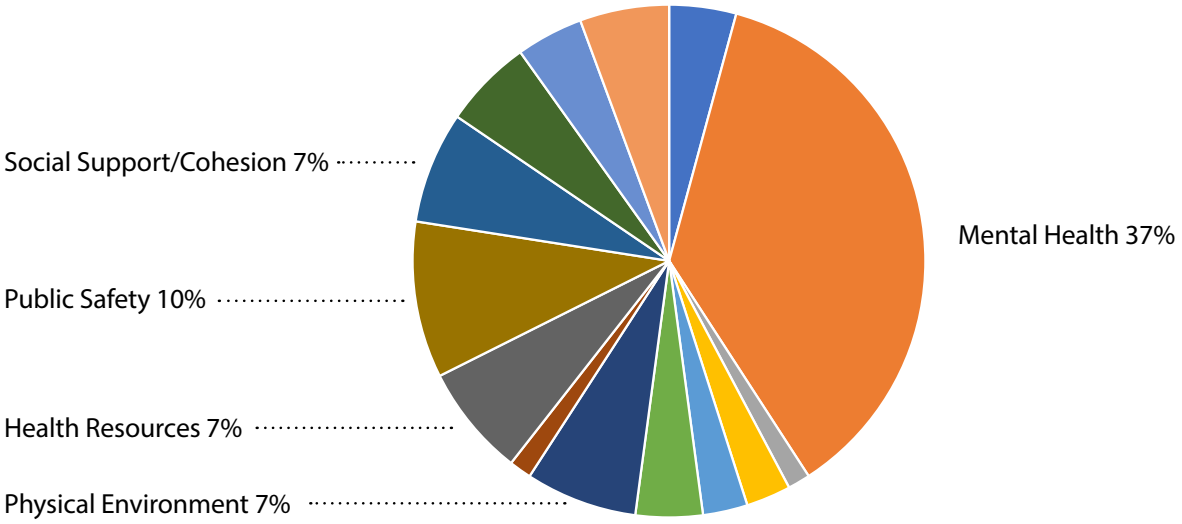


Figure 4.4 Photovoice responses to "What are the biggest health issues in your community?"

Community Voice: Mental Health and Obesity

What are some things in your community that make it hard to be healthy?

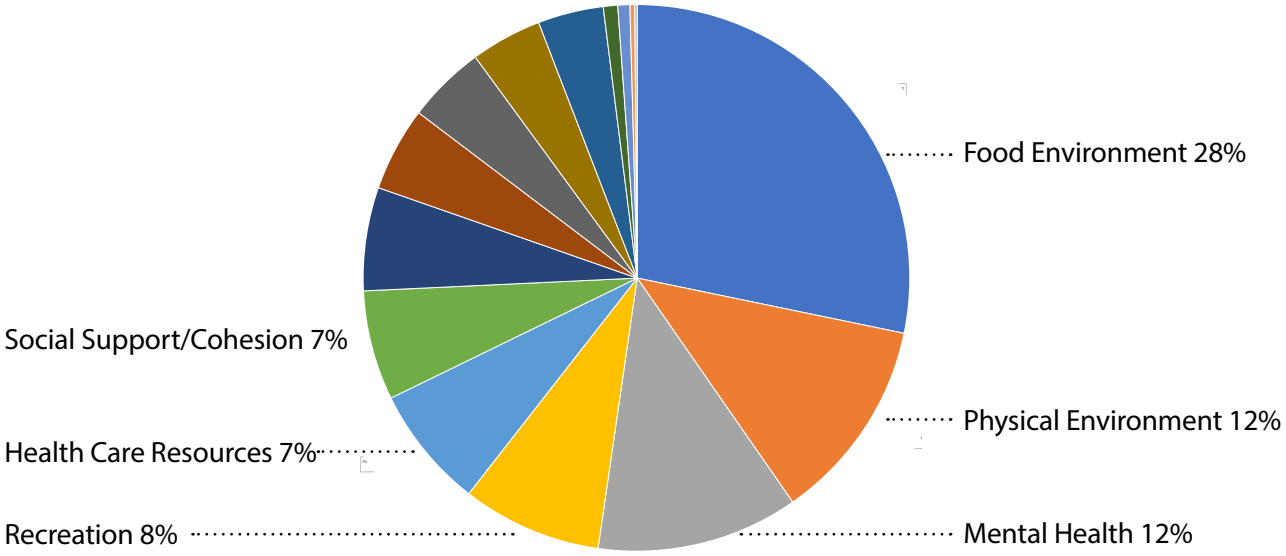


Figure 4.5 Combined responses to "What are some things in your community that make it hard to be healthy."

According to Figure 4.5, the most frequent response for what makes it hard to be healthy, both among survey respondents as well as students who participated in Photovoice, was the food environment. Participants referenced the prevalence of unhealthy food options while experiencing a lack of healthy and affordable options. Within these responses, the largest concerns focused on having increased access to unhealthy fast food and restaurants, healthy food being too expensive and having a lack of access to grocery stores. For example, one resident responded "...food that is not good for you is more accessible and cheaper."

P: What are some things in your community that make it hard to be healthy?

"Everybody knows what you're supposed to do to be healthy but if you don't have a healthy choice, it's not really a choice. People have to eat something."

-9th grade male BCMSC

Another noted, "...we don't have an actual grocery store, so if you are in a bind for something quick to eat, you can choose to eat packaged food or eat at one of our 'restaurants' that don't have the best options."

Additionally, survey respondents noted the double-burden of having limited access to recreational opportunities and healthy foods. For example, a black female respondent replied, "Not many known biking or hiking trails. Plus, gym memberships are so expensive. Lastly, the availability of "unhealthy fast foods," make it hard to be healthy, and the biggest health issue in the community is "obesity."

Community Voice: Mental Health and Obesity

Figure 4.6 Photo taken by student at Bridge Academy

For survey respondents and Photovoice participants,the second most frequently cited challenge was the physical environment. Responses referenced a multitude of concerns including weather, air, and water quality, litter, pollution, abandoned houses, and buildings and old factories. "The overwhelming amount of litter;" "The cracked sidewalks, litter and the abandoned buildings;" and "Pollution" are some examples of common community responses to this prompt. A 10th grade male student from Niles responded that, "We have so many abandoned buildings… and when people come to our high school, they drive by them. How does that make our community look? I'm embarrassed. Like we don't care enough to take care of our own community." Another male student from Benton Harbor's Bridge Academy stated, "There's boarded up houses on every street. This kinda shocks some people but this is normal to me."

The third most frequent response, for both survey respondents and Photovoice participants, was mental health related challenges or access to mental health specific resources. Participants discussed themes of work- or school-related stress, ease of access to and/or use of alcohol, tobacco, and other drugs (ATOD), and a lack of mental health resources. One respondent mentioned that, "mental health services are few and expensive." A 9th grade female student from the Berrien County Math & Science Center (BCMSC) noted that, "many people are affected by poor mental health, but the sad truth is that most people are unable to identify what they're dealing with, how to manage it, or how to get the help they need."

For both survey respondents and Photovoice participants, the fourth most frequent response was the recreational environment. Within these responses, the largest concerns focused on the lack of outdoor recreational spaces such as walking, running, or biking trails. It was also noted that there is a lack of access to affordable gym memberships. One participant stated, "All wellness/recreation program[s] are provided by centers for profit, Y, South Shore, RAC, etc. Minimal community-based wellness/recreational opportunities."

P: What are some things in your community that make it hard to be healthy?

"Expense of healthy foods, not enough time in the day to maintain self-care and poor integration of multiple disciplines in health care. Sometimes to address one diagnosis I have to see three separate physicians which all may give a different diagnosis which may all be related, no one talks to each other across disciplines."

–30 - 44 y.o., white, female

Other issues such as lack of health care resources and poor social cohesion were listed as health issues. However, they did not rise to the level of a priority health need. It should be noted that while these issues individually did not meet the criteria for being a priority health need, there is increasing literature that supports the importance of improving the social environment to improve the overall health and wellbeing of communities.

Obesity and mental health were the top priority health needs in the 2016 CHNA. The persistence of these priority health needs is indicative of the slow changes in the social environments which shape health.

Priority Health Resources

In addition to understanding the priority health needs and the barriers to achieving optimal health, the project team sought to understand the community's strengths and assets as they pertain to health. To learn more, the CHNA survey featured the prompt, "What in your community helps you to be healthy?" Additionally, respondents were prompted to supply the common coping skills they and those around them use to deal with hard and stressful times. These ideas will be leveraged and further explored in the Implementation Strategy.

What in your community helps you to be healthy?

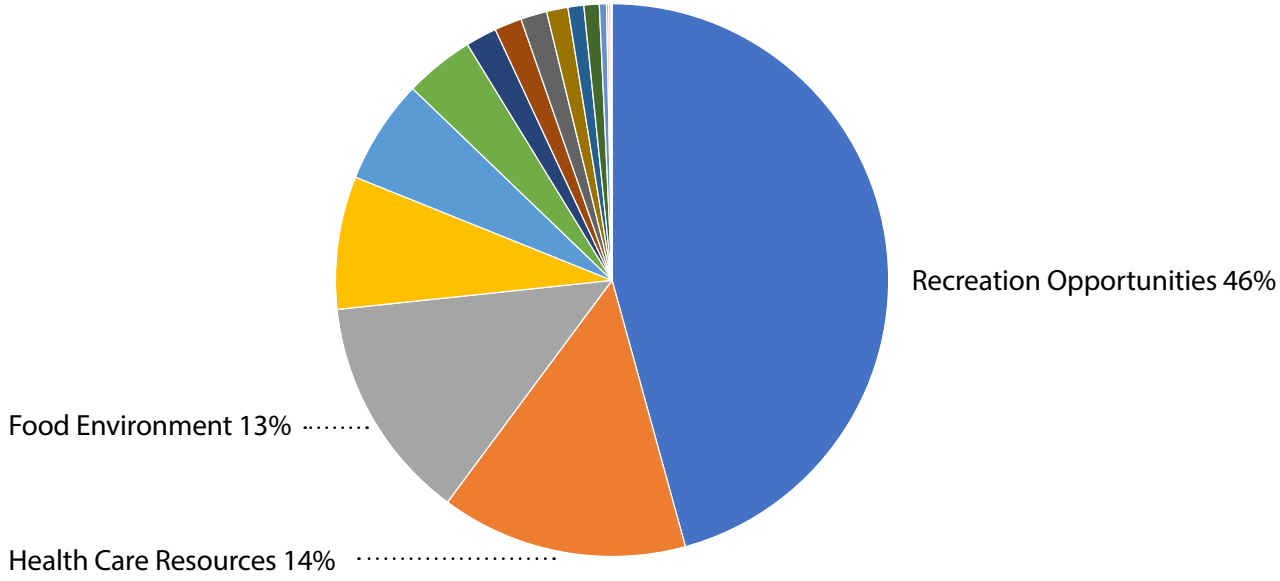


Figure 4.7 Survey responses to " What are some things in your community that help you to be healthy?"

According to Figure 4.7 and 4.9, the most frequent response among both survey respondents and Photovoice participants was the recreational environment. Respondents referred to the current availability and need for more parks and trails – places like the YMCA of Southwest Michigan, the Benton Harbor Boys and Girls Club Teen Center, and extracurricular activities such as school-based sports.

Figure 4.8 Photo taken by student at Bridge Academy

Community Voice: Mental Health and Obesity

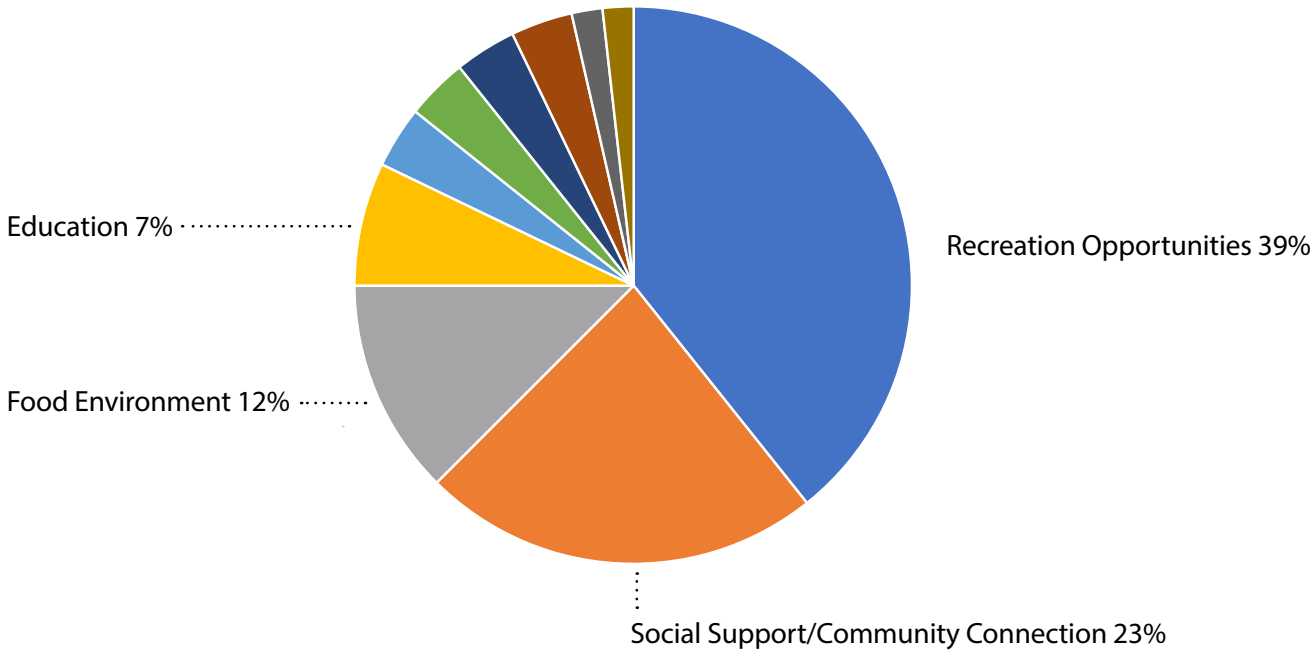


Figure 4.9 Photovoice responses to " What are some things in your community that help you to be healthy?"

Ironically, the recreational environment was the top response to both prompts "what makes it hard to be healthy" and "what makes it easy to be healthy." This apparent contradiction results from the fact that some elements of the recreational environment promote good health (e.g., parks and trails) and other elements of the recreational environment (e.g., cost of membership and lack of choices) are not supportive of good health. For example, a 9th grade female student at BCMSC stated, "We have some amazing walking trails, but I know other communities aren't as lucky as ours." Another 10th grade male Niles student mentioned, "Yeah, the Riverwalk and skate park are great, but they can be dangerous. There's drug dealers that like to hang out in those areas." During the group interview, students from the Bridge Academy, while agreeing that the Boys and Girls Club Teen Center was a great resource, also said there is a need for more locations to accommodate more youth and provide more choices.

P: What are some things in your community that help you to be healthy?

"Walking trails, community physical health events that also introduce the importance of healthy nutrition, and introduction to the importance of mental health and what may lead to mental health challenges."

–18 - 29 y.o., black male

P: What are the biggest health issues in your community?

"Mental and physical health seems to be the biggest issue."

–18 - 29 y.o., black male

The second most frequently cited response from survey respondents was health care resources. Community members mentioned having access to doctors, hospitals, and other health care facilities and wellness centers, as well as the availability of social services and health programming.

Community Voice: Mental Health and Obesity

The second most frequently cited response from Photovoice participants was social support and/or social cohesion. Students spoke about organizations within their community, as well as the importance of their families and friends. A 10th grade student group from Niles expressed that a healthy community is one that "feels happy, spreads love, feels safe, and one where everyone knows their neighbors." A transgender female student at the Bridge Academy in Benton Harbor stated that The OutCenter is "a place of acceptance and pride. A shining beacon of what a community and united humanity should be." Students in the group interview reiterated their need for more adult mentors, inclusive spaces, and opportunities to "just be kids."

P: How would you improve the health of your community?

> "I would improve the health in my community by raising awareness and providing more education in those areas."
>
> *–18 - 29 y.o., black male*

The third most frequently cited response to "what makes it easy to be healthy" for both survey respondents and Photovoice participants was the food environment. A community member stated that it is helpful "living in a community with many farms and fresh fruits and vegetables..." Another commented that "large rural areas provide access to fresh air, exercise and local produce." Similar to the recreational environment, survey and Photovoice responses both cited food environment as being both a challenge and a resource. Responses indicated that if they had access to healthier options, or if fresh and/or healthier options were affordable and of better quality, it would help them be healthy.

Figure 4.10 Photo taken by student at Bridge Academy

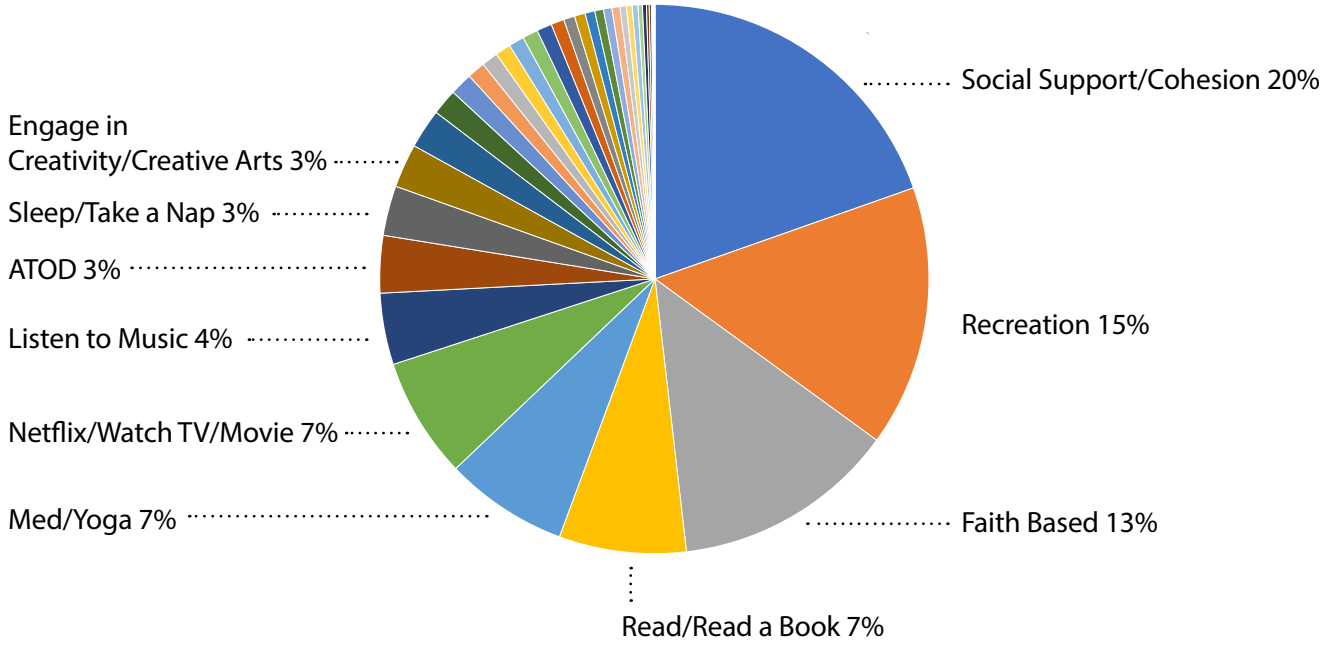


Figure 4.11 Survey Responses to "Ways community members feel better/relax/destress".

Community Voice: Mental Health and Obesity

The project team sought to understand not only the health challenges of the community, but also how community members coped with difficult times. As depicted in Figure 4.11, responses to this prompt varied widely, but social supports and activities that promote social cohesion were the most frequent. This was followed closely by recreational and faith-based or spiritual practices. One respondent captured all of these by saying "Bible reading, prayer, walks outdoors, drive down to the lake, talking with a friend, acknowledging what is stressful and grieving the loss." Among responses related to social support/social cohesion, 667 of the responses referred to talking with a family member, friend, or spouse. Other forms of social support included volunteering and helping others. Many respondents were candid and made comments such as, "A beer and my hot tub helps;""I EAT, can't control myself;" and "Drink alcohol at first [then] talk to family." The variety of responses can be attributed to people using a variety of ways to relieve stress that are not solely based on "right and wrong" or "healthy versus unhealthy," but on what is available and effective for them.

Figure 4.12 Photo taken by student at Bridge Academy

Youth who participated in the Photovoice project also identified social supports and activities that build social cohesion as their preferred ways of handling hard or stressful times. They also referenced listening to music and other activities related to the arts as ways to relieve stress. During the group interview, when asked about relieving stress youth said, "Music helps you relax and calm down. Daydreaming and going to Lala land to take you somewhere else-flip another page."

Like the larger, public survey results, the students were candid when they described what strategies they use. For example, one female student stated, "When I'm super-duper stressed, I'll go smoke some weed." When asked to elaborate on how that activity helps her during hard times she went on to say, "When you smoke some weed it takes you to a whole different world and it makes you calm. It can be a good thing if you put it to good use: [inspiring] music, writing, thinking."

P: When I experience hard or stressful times, these are the ways I help myself feel better/relax/calm down:

> "I go to sleep. I use some cannabis. I take a Xanax. I talk to a friend or a sister. I may drink some wine. I cry. Crying is a release. It helps."
>
> *–60+, white female*

How would you improve the health of your community?

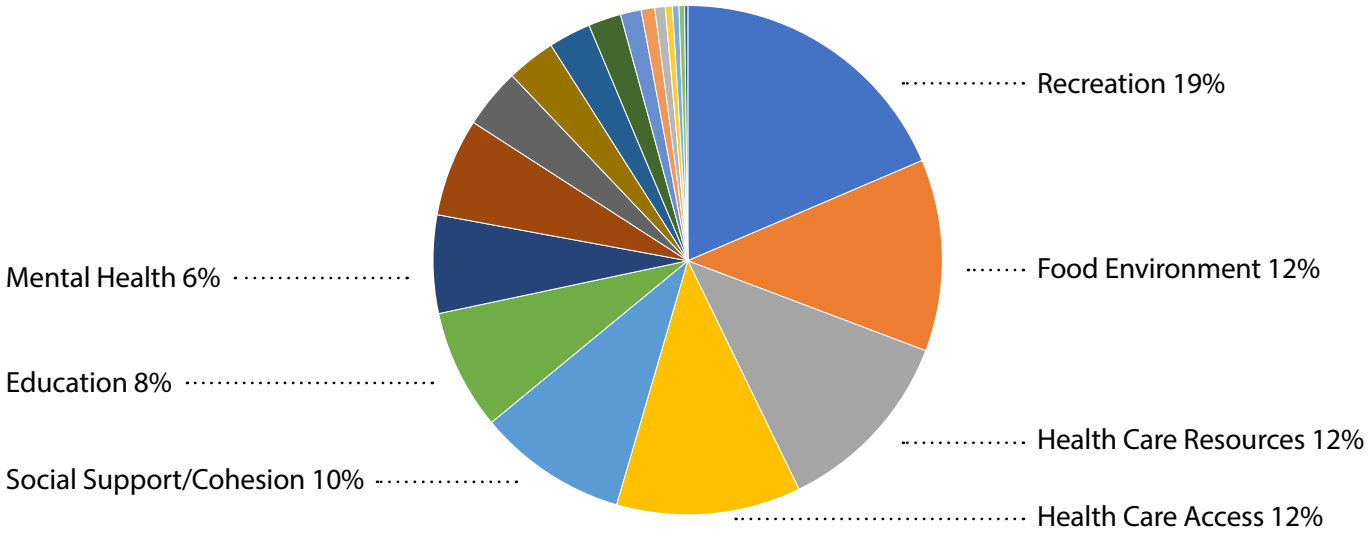


Figure 4.13 Survey responses to " How would you improve the health of your community?"

Community Voice: Mental Health and Obesity

In addition to identifying community assets and resources, respondents provided ideas and suggestions to improve the health of their community. These aspirations will inform the Implementation Strategy including its key activities and essential partnerships.

Among survey respondents, the most frequent theme for improving community health was recreational opportunities/environment. Responses mentioned improving access and expanding options. Specific examples included increasing the number of walking, running, and biking trails; gaining access to affordable gym memberships; and having more community exercise opportunities (both indoors and outdoors).

According to Figure 4.14, the most frequently cited response from Photovoice participants related to aspects of the physical environment. Within these responses, students mentioned repurposing abandoned buildings and houses; recycling initiatives; having more garbage and recycling bins available and serviced throughout the community; and volunteer opportunities for cleaning up litter and helping neighbors.

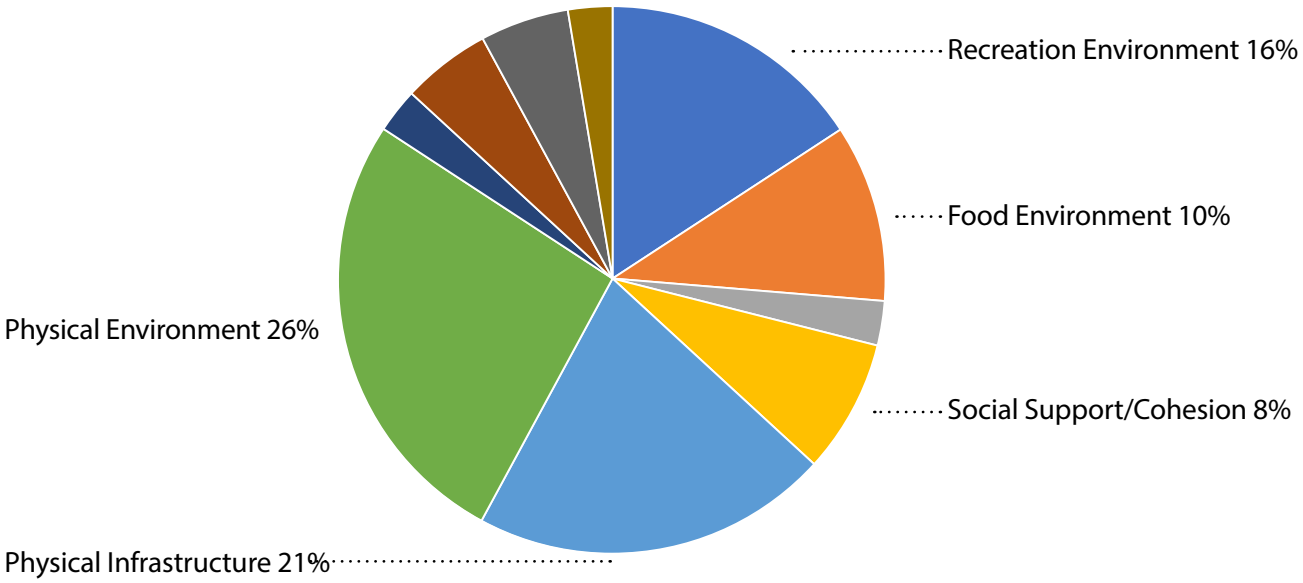


Figure 4.14 Photovoice responses to " How would you improve the health of your community?"

The second most frequently cited idea for improvement from survey respondents featured suggestions related to the food environment. Participants mentioned the desire for more affordable, high-quality, and healthy foods in stores and restaurants. To improve the health of their community, respondents would like to see "better options for going out to eat," and residents be "provid[ed] access to affordable fresh food year round, especially to areas not near 'major' grocery stores."

Alternatively, the second most frequently cited idea among Photovoice respondents was physical infrastructure. Students referenced fixing roads, sidewalks, and increasing lighting while drawing the connections between these environmental factors and their potential impact on health. For example, a common theme from students attending the New Tech Entrepreneurial Academy in Niles was the usability of sidewalks. They discussed wanting opportunities to safely exercise. For example, they expressed concern that poorly maintained sidewalks could result in injury leading to medical care and the associated cost.

Figure 4.15 Photo taken by student at Niles New Tech

Community Voice: Mental Health and Obesity

Among survey respondents, the third most frequently cited ideas for improvement included health care resources and access to care. Survey respondents suggested having more health promotion education available in the community. Ideas regarding improved access to care included free or low-cost health care, medication and screenings and treatments; increasing the quantity, quality, and type of care providers; mobile clinics; and better insurance coverage.

Alternatively, Photovoice respondents suggested improvements to the recreational environment. Like the survey respondents, students suggested a greater variety of and more affordable options for recreational activities/facilities. A 9th grade male BCMSC student stated, "I wish my school offered intramural sports. If you get cut from the team, it's over. You can exercise and play individual sports, but you lose the chance to play on a team." Another 10th grade female student noted that, "I think one of the things that would help is advertising. There's a lot that goes on, but people just don't know about it."

The fourth most frequently cited idea from survey respondents for improvement included promoting social support and cohesion. Over 75% of these responses indicated a need for more social services and outreach programs within their community. For example: "Offer volunteering opportunities on the news, radio and paper;" and/or "Community awareness, involvement, and action." Additional responses relayed themes of connection. For example, "People need to care about each other" and "Everyone needs to feel wanted and loved."

P: How would you improve the health of your community?

"Maybe a few "town-wide" gatherings (or weekly gathering, think "farm market!") to share recipes and do/show/join a group of those doing various things like trying to beat step goals or just stretching daily. Little things that add up to a lot! :) We need more CO-mmunity happening and to help one another."

–18 - 29 y.o., white, female

Photovoice respondents cited food environment. Similar to survey respondents, students would like healthy, affordable, and fresh foods available to them both at school and in the community. A male student at the Bridge Academy stated, "When you eat that greasy, fatty food, you just don't feel good. But that's what's cheap. And it's everywhere." Another 9th grade female student from BCMSC recommended, "adding water stations throughout the school. We can't bring bottles with liquids to school and the water in the fountains tastes nasty."

Limitations

This portion of the CHNA was limited by the low number of male respondents and/or participants. Though the ACS reports that 51.1% of the county is female, the survey respondents for this project disproportionately identified as female (73.49%).

Another limitation related to reach. Despite Lakeland's service area including Van Buren and Cass counties, a significant number of populations in those areas could not be reached.

In the literature review that follows, there will be continued exploration of how the social determinants of health (SDoH) impact the health of Berrien County residents. Some of these SDoH, such as social cohesion; physical, food, and recreational environments; and access to health care and resources were specifically named by respondents as being key factors that both positively and negatively impact the health of their community. Other SDoH, such as transportation, education, housing, public safety, and economic conditions were also examined in relation to their impacts on the health of the community. Within the CHNA, these SDoH will be addressed in order of importance (according to survey and Photovoice responses).

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[1] Thematic analysis is a method for identifying, analyzing, organizing, describing, and reporting themes found within a data set. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology, Qualitative Research in Psychology, 3:2, 77-101. DOI: 10.1191/1478088706qp063oa

[2] A health need is significant based on all the facts and circumstances present in the community it serves. Any criteria to prioritize the significant health needs it identifies, including, but not limited to the: burden, scope, severity, or urgency of the health need; the estimated feasibility and effectiveness of possible interventions; the health disparities associated with the need; or importance the community places on addressing the need.

[3] U.S. Census Bureau (2017). Selected Characteristics Of The Native And Foreign-Born Populations, Table S0501: 2013-2017 American Community Survey 5-Year estimates. Retrieved from https://data.census.gov/cedsci/table?q=berrien%20county,%20michigan&g=0500000US26021&tid=ACSST5Y2016.S0501&hidePreview=false

Economy

Economy

High-level Findings

- Since 2004, fewer jobs in Berrien County offer a livable income.
- Despite employment, many individuals in Berrien County live in poverty.
- Many single parent households live below the poverty line, particularly single mothers.

Introduction

Economic factors, such as income, wealth, poverty, and employment play a key role in determining health outcomes. There are several pathways by which economic factors may either positively or negatively influence health. First, adverse economic conditions such as unemployment and low income are associated with high levels of stress. Stress is associated with poor health outcomes such as heart disease, diabetes, obesity, mental illness, breast cancer and low birthweight babies.[1] Stress is also associated with the adoption of health harming behaviors such as poor dietary choices, smoking, alcohol and substance misuse, limited physical activity, and limited use of preventive medical care.[2]

Economic factors play a crucial role and could affect personal nutrition status and health. Economic decision factors such as food price and income do influence people's food choices. Moreover, food costs are a barrier to healthier food choices for low-income families.

Second, economic factors affect health by shaping access to resources essential to health. Respondents to the 2019 CHNA frequently commented on the lack of affordable health care, insurance, nutritious foods, exercise opportunities, transportation, and housing. While few respondents explicitly stated that the economy was a top health concern, this concern was implicit in responses indicating that health promoting resources are unaffordable (i.e., if wages were higher, individuals could afford nutritious foods).

A third pathway by which economic factors impact health is through cumulative effects that accrue over a lifetime. Studies have shown that financial hardship endured over a lifetime can have effects on physical and cognitive functioning, psychological well-being, diabetes, and mortality.[3,4] Moreover, evidence indicates that there are critical periods of life (e.g., during gestation and from birth to age 5) when economic adversity and its material and psychosocial consequences can have particularly powerful effects on health.[5]

P: What are the biggest health issues in your community?

"I feel a lot of employers do not pay a living wage making it hard for people to have their own transportation and afford basic necessities such as healthy food."

–18 - 29 y.o., black male

Economic Conditions and Health

According to the Small City Economic Dynamism Index, the Niles-Benton Harbor region is classified as a low economic dynamism region (i.e., limited economic growth and development). Economic Dynamism is assessed by measuring changes in indicators associated with local economic development.[6] Specifically, changes in economic measures such as median household income, employment, poverty, and income inequality provide information on regional economic health.

In figure 5.1, the association between income and life expectancy is displayed. With few exceptions, census tracts with a low median income also have lower life expectancy. For example, the census tract with the lowest average life expectancy (67.6 years) was also one of the census tracts with the lowest median incomes ($19,387). Conversely, the two census tracts with the highest life expectancies had median incomes of $36,493 and $69,732.

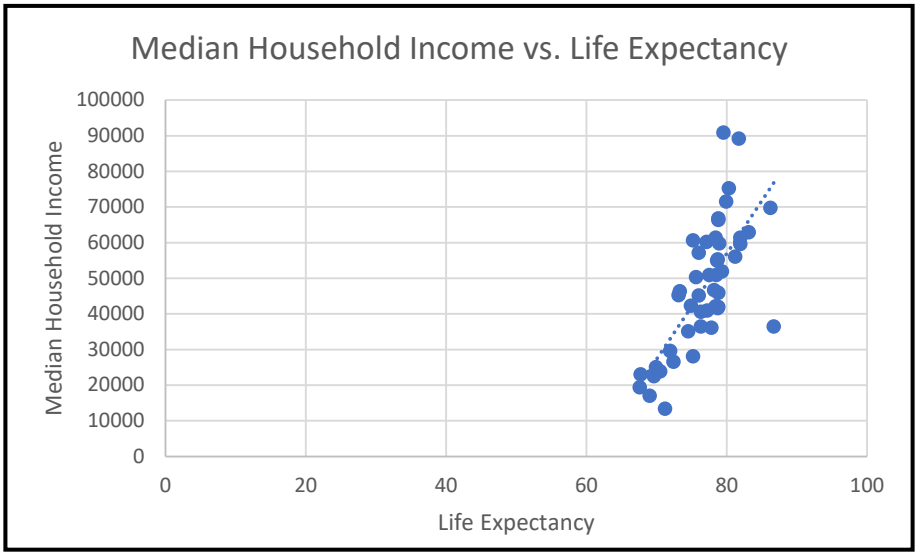

Figure 5.1 Scatterplot showing Median Household income in relation to Life expectancy, From 2012 to 2016[7]

Unemployment

The number of jobs in Berrien County decreased during the Great Recession, but in recent years has returned to approximately prerecession levels. Likewise, the unemployment rate has also improved, decreasing from 12.7% at the height of the recession in 2009 to 4.8% in 2017. However, unemployment rates vary widely within the county. For example, in Benton Harbor and Benton Township, there are four census tracts where over 20% (21.8 to 29.5%) of the population are unemployed (i.e., jobless, looking for a job, and available for work). In St. Joseph, Shoreham, Lincoln, and Lake Charter Township, this rate is 3% or lower.[8]

Individuals with steady employment tend to report better physical and mental health and lower stress and anxiety than do the recently unemployed. In figure 5.2, the association between unemployment and death rates is presented. Generally, census tracts with a low unemployment rate are also census tracts with low death rates.

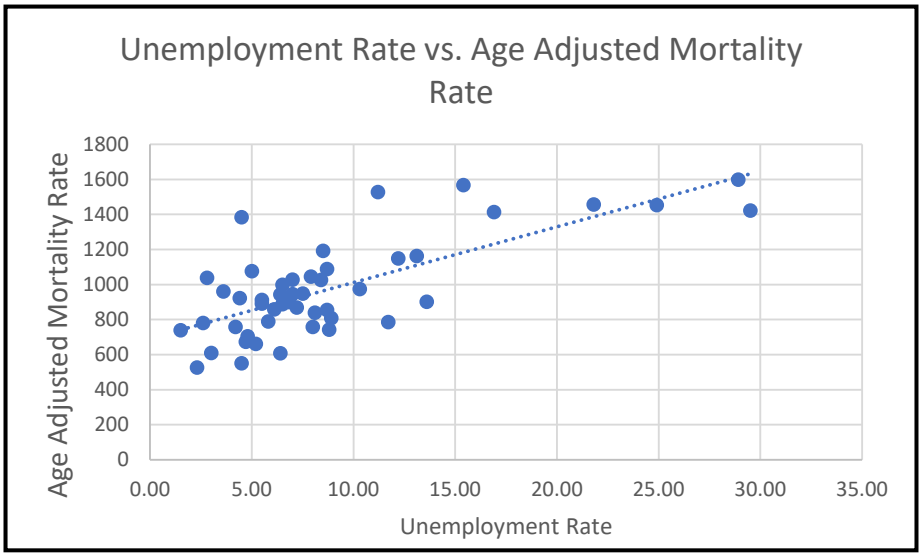

Figure 5.2 Scatterplot showing Age-Adjusted Mortality Rate data in relation to Unemployment Rate in Berrien County, From 2012 to 2016

Employment and Wages

Since the recession, industries that have traditionally been associated with higher wages, such as manufacturing and construction, offer fewer jobs. Conversely, jobs have increased in industries associated with lower wages such as leisure and hospitality (see figure 5.3 and table 5.1 for employment trends).

> The shift in employment towards the service sector likely indicates a decrease in the average annual wage for individuals in Berrien County.[9]

Between 2004 and 2017, the manufacturing industry in the region lost 2,213 jobs (a 14% decrease), which represents the greatest total number of jobs lost in any industry during that period. Meanwhile, the number of jobs in the leisure and hospitality industry has increased. Between 2004 and 2017 employment rose from 5,987 to 7,320, an increase of 22%.

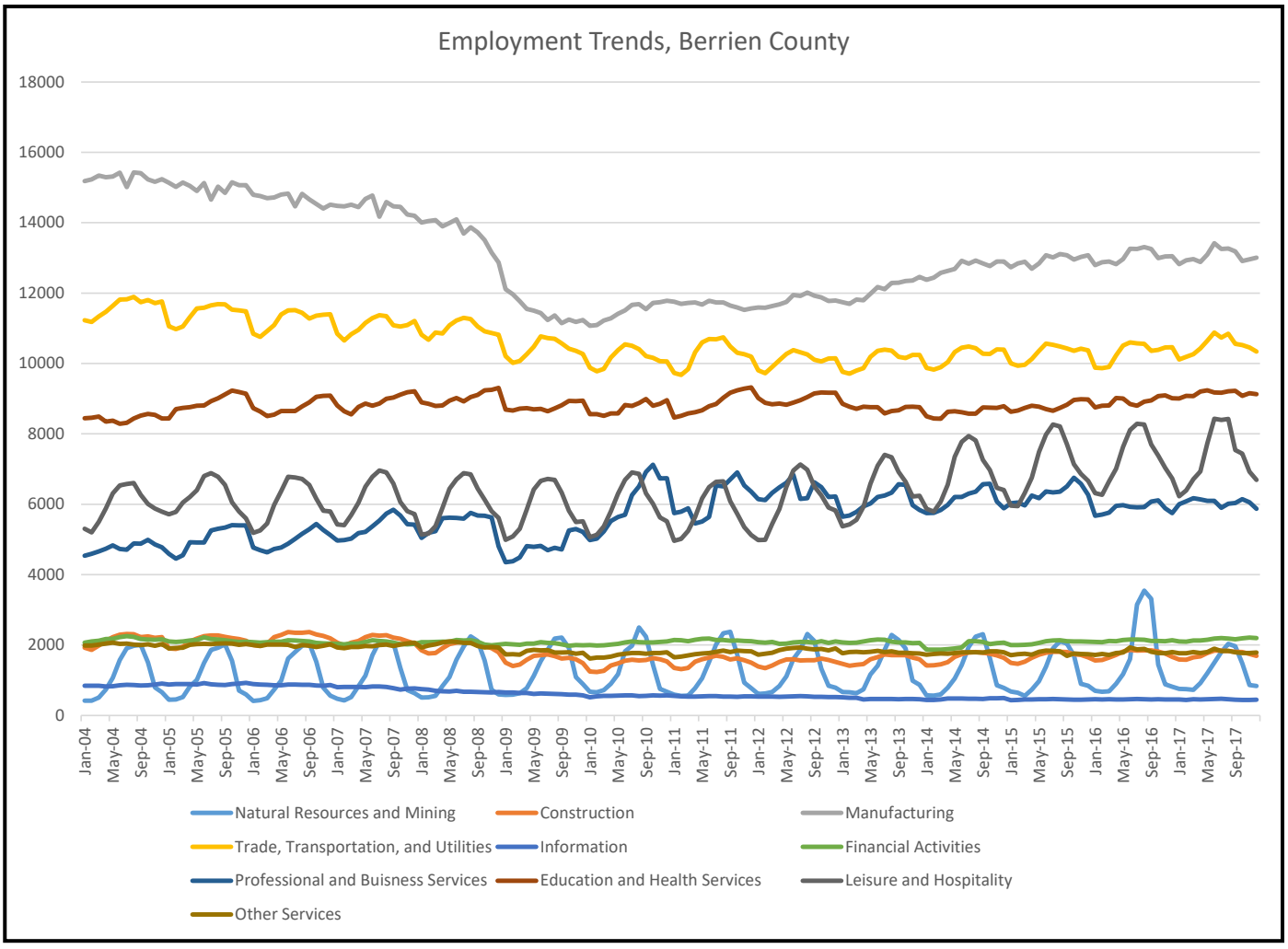

Figure 5.3 Trends in Employment by Privately Owned Industries in Berrien County, from 2004 to 2017[7]

	Natural Resources	Construction	Manufacturing	Trade, transportation, and Utilities	Information	Financial Activities	Professional and Business Services	Education and Health Services	Leisure and Hospitality	Other Services
2004	1131	2162	15271	11617	856	2166	4766	8434	5987	2017
2005	1117	2130	15015	11423	891	2127	5038	8906	6218	2000
2006	1115	2226	14666	11240	867	2087	4981	8771	6070	1989
2007	1171	2153	14454	11073	794	2061	5365	8902	6157	1982
2008	1191	1939	13743	10978	685	2079	5451	9015	6039	2008
2009	1284	1590	11479	10405	616	2028	4799	8765	5906	1792
2010	1293	1473	11477	10167	556	2051	6031	8740	5966	1725
2011	1267	1536	11678	10295	541	2139	6131	8875	5757	1770
2012	1226	1522	11790	10099	533	2076	6365	8998	6111	1856
2013	1278	1594	12088	10106	475	2092	6066	8735	6393	1794
2014	1230	1641	12732	10221	472	1980	6125	8618	6855	1779
2015	1206	1681	12944	10295	452	2073	6303	8787	7108	1765
2016	1574	1746	13043	10316	457	2124	5888	8922	7282	1799
2017	1236	1736	13058	10497	453	2160	6052	9145	7320	1799
Change in number of jobs by industry from 2004-	105	-426	-2213	-1120	-403	-6	1286	711	1333	-218
Percent change from 2004-2017	9%	-20%	-14%	-10%	-47%	0%	27%	8%	22%	-11%

Table 5.1 Job losses and gains in Berrien County, from 2004-2017[7]

Out of the industries represented in the private sector, only the manufacturing, construction and financial activities sectors have an average annual wage that is livable for a family of one adult and one child.[10] All three industries have experienced job losses since 2004.

While some individuals may work part-time by choice, over 10% of leisure and hospitality industry employees nationally worked part-time involuntarily in 2015 (i.e., they would work full time if possible).[11] Thus, several part-time jobs would be necessary in order to earn a livable income, which is the "earnings necessary to meet a family's basic needs while also maintaining self-sufficiency."[8] In the Niles-Benton Harbor metro region during 2017, this amount was $22,449 for a single adult and $46,934 for one adult and one child (see table 5.2 for a breakdown of annual expenses and additional living wage estimates for varying family sizes and work situations). Part-time employees are significantly less likely to have access to benefits such as paid leave, health insurance, and retirement funds which are imperative for maintaining good health. Employee benefits allow workers to afford medical care, take time to recover from illness and maintain their quality of life as they age. Adults with health insurance are more likely to seek care than are those who are uninsured, and part-time workers are more likely to suffer financially in the event of illness. Due to the shift in the regional labor market, these benefits are becoming less available.

> The leisure and hospitality industry is the lowest paying industry, paying an average annual wage of $16,569, likely reflective of the fact that the average weekly hours worked by employees in this industry is 26.1 hours.

Typical Expenses

These figures show the individual expenses that went into the living wage estimate. Their values vary by family size, composition, and the current location.

Annual Expenses	1 Adult	1 Adult 1 Child	1 Adult 2 Children	1 Adult 3 Children	2 Adults (1 Working)	2 Adults (1 Working) 1 Child	2 Adults (1 Working) 2 Children	2 Adults (1 Working) 3 Children	2 Adults (1 Working Part Time) 1 Child*	2 Adults	2 Adults 1 Child	2 Adults 2 Children	2 Adults 3 Children
Food	$3,656	$4,500	$6,799	$9,001	$5,607	$6,979	$9,012	$10,972		$5,607	$6,979	$9,012	$10,972
Child Care	$0	$7,068	$12,267	$17,506	$0	$0	$0	$0		$0	$7,068	$12,267	$17,506
Medical	$2,214	$5,536	$5,192	$5,274	$4,749	$5,192	$5,274	$4,993		$4,749	$5,192	$5,274	$4,993
Housing	$6,036	$9,048	$9,048	$11,460	$6,864	$9,048	$9,048	$11,460		$6,036	$9,048	$9,048	$11,460
Transportation	$4,866	$8,867	$10,426	$12,063	$8,867	$10,426	$12,063	$11,925		$8,867	$10,426	$12,063	$11,925
Other	$2,785	$4,633	$5,030	$5,855	$4,633	$5,030	$5,855	$5,729		$4,633	$5,030	$5,855	$5,729
Required annual income after taxes	$19,960	$39,609	$48,770	$61,109	$30,609	$36,673	$41,251	$43,080		$29,891	$43,743	$53,536	$62,586
Annual taxes	$3,489	$7,276	$8,933	$11,232	$5,637	$6,732	$7,564	$8,306		$5,530	$8,018	$9,801	$11,492
Required annual income before taxes	$22,449	$46,934	$57,703	$72,391	$36,296	$43,407	$48,815	$53,386	$50,375	$35,421	$51,761	$63,339	$74,078

Table 5.2 Typical Expenses for Families in the Niles-Benton Harbor Metro Area, 2017[12]

However, even when working 40 hours a week, the average annual income for the third largest occupation in the Niles-Benton Harbor metro area (i.e., food preparation and serving related occupations), pays less than a living wage for one adult. Four out of the top five occupations provide an average annual wage that is lower than the wage necessary to support one adult and child. These occupations include office and administrative support occupations (9,950 jobs with an average hourly wage of $15.06), production occupations (8,150 jobs with an average hourly wage of $15.63), food preparation and serving related occupations (7,190 jobs with an average hourly wage of $9.51), sales and related occupations (5,780 jobs with an average hourly wage of $11.79) (see figure 5.4 for information on wages for all major occupation groups).

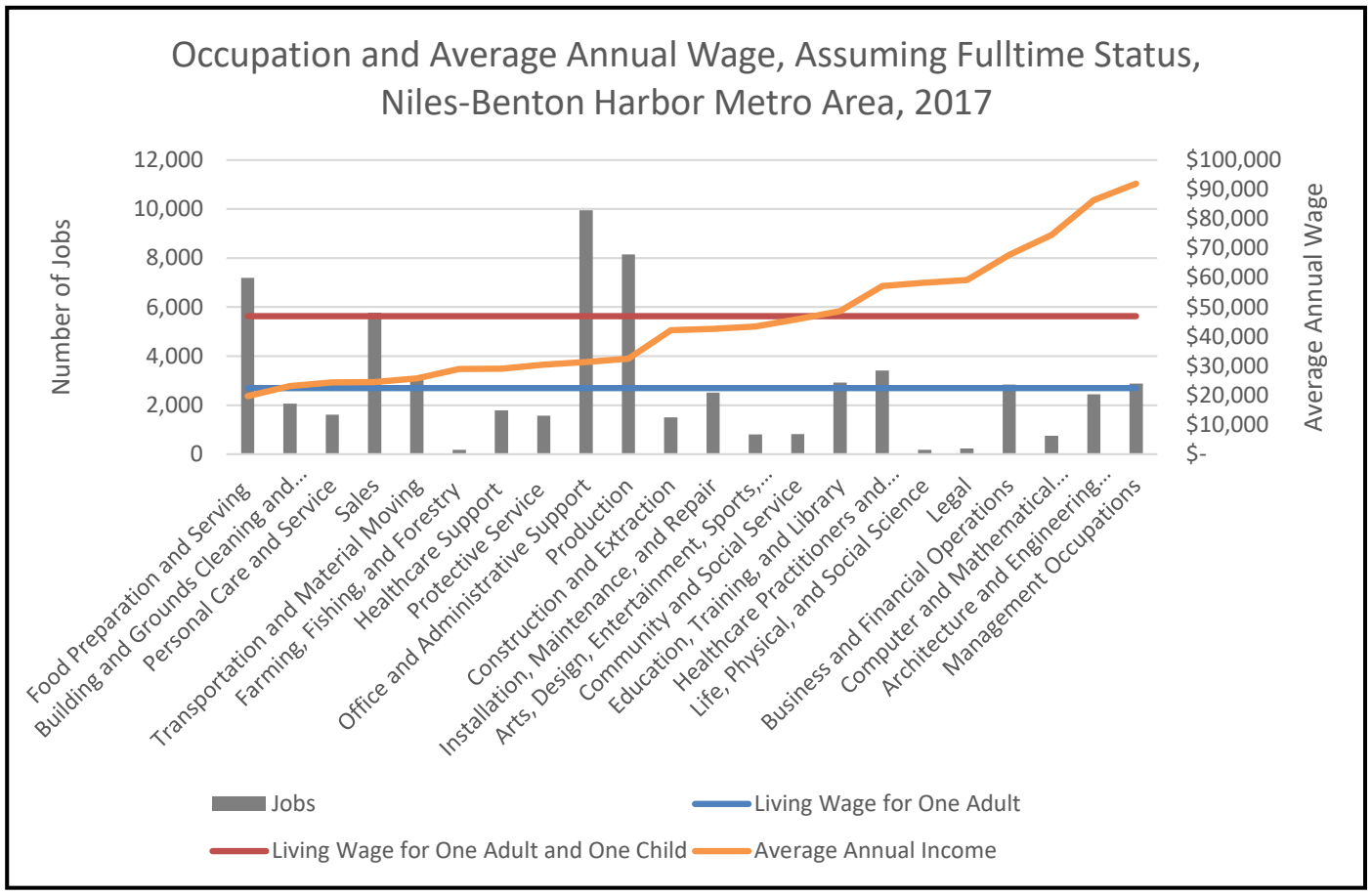

Figure 5.4 Employment and Average Annual Wage, Niles-Benton Harbor Metro Area, 2017[13]

Median Income and Poverty Implications

In 2016, the industry responsible for the greatest number of jobs and the highest average annual wage (i.e., manufacturing), employed a significantly greater number of men compared to women (see figure 5.5 for data on all major industries). The sector with the greatest female employment is the education and health services industry, and while this industry has a relatively high average annual wage, it is still below what is considered a living wage for an adult with a child. This could partially explain why an estimated 6.9% of employed men and 11.9% of employed women live below the federal poverty level in Berrien County.[14]

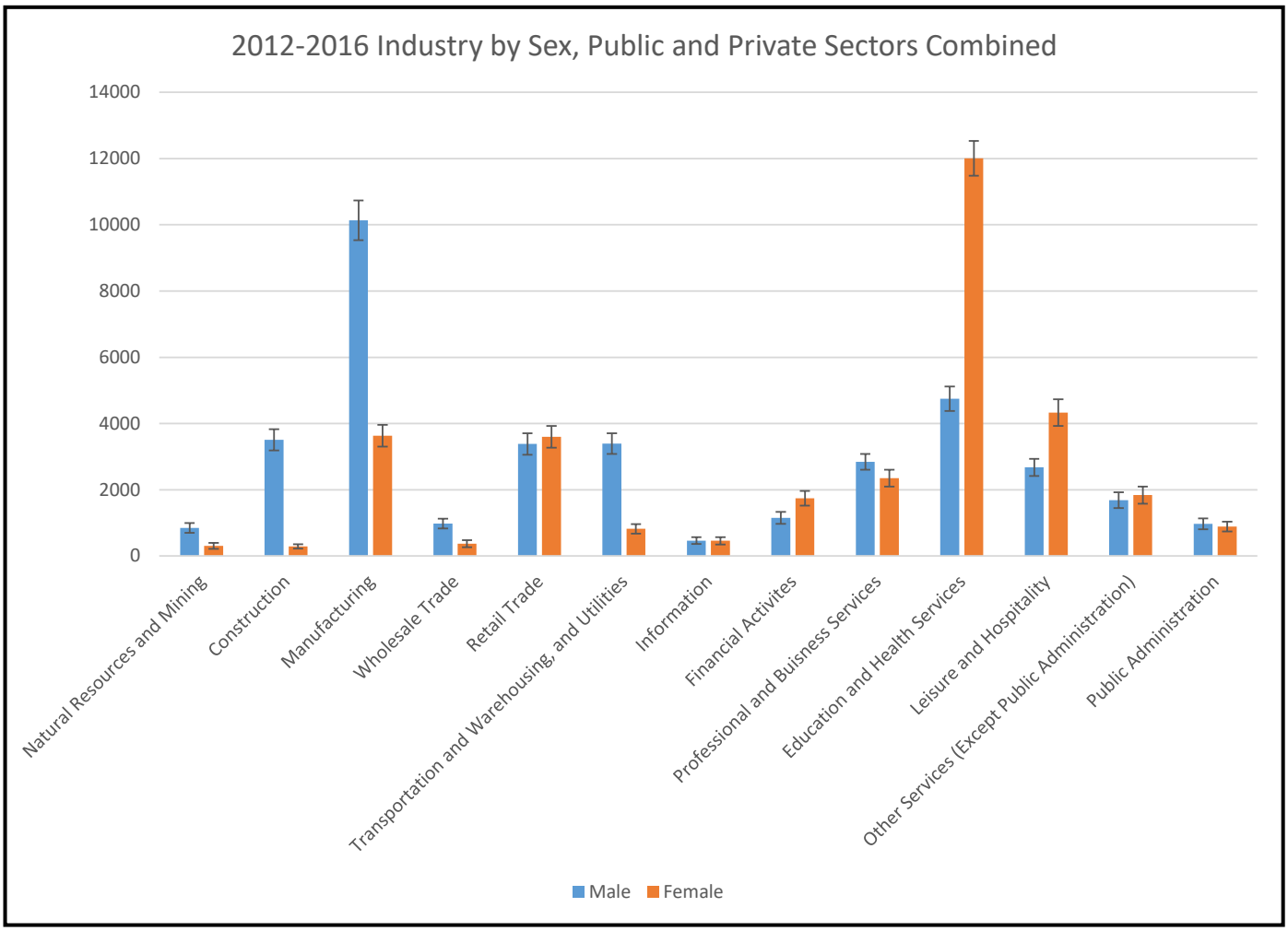

Figure 5.5 Industry by Sex, Public and Private Sectors Combined, from 2012-2016[15]

In Berrien County, women are primarily employed in office and administration occupations and sales occupations. Both of these occupations pay less than a living wage for a child and adult (see figure 5.6 for information on all major occupation categories). Conversely, men are primarily employed in production occupations and management occupations, both of which pay a higher wage than the occupations predominantly occupied by women. However, production occupations are the top employer of men in the county and the average annual income for this occupation is below a living wage for an adult with a child.[16]

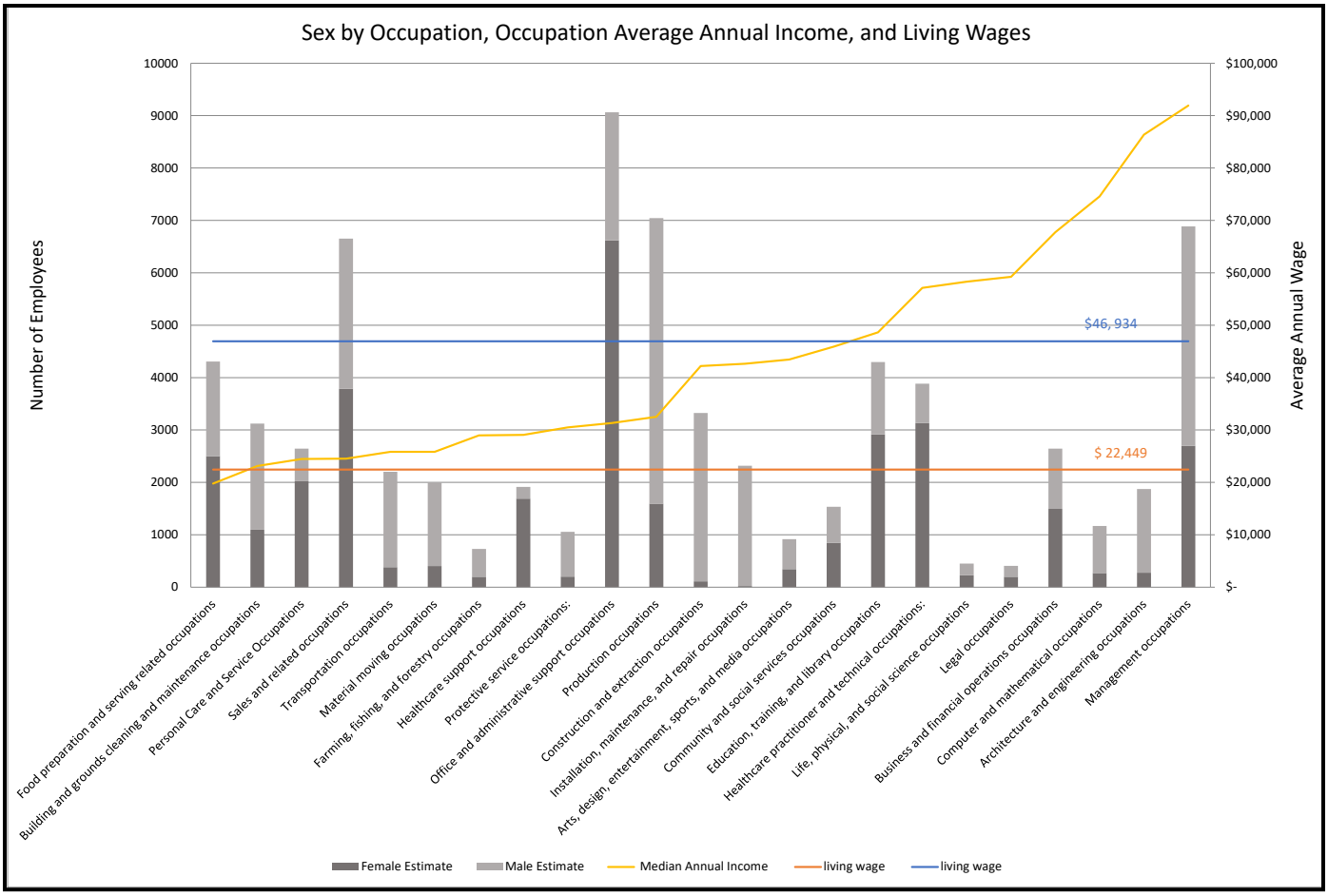

Figure 5.6 Employment and Average Annual Income by Occupation, Niles-Benton Harbor Metro Area, 2017 [11]

Considering the impact of income on childhood development, the large number of single parents living in the region makes the lack of well-paying jobs concerning. Over one-third of family households (households comprised of at least one adult and related child) are headed by a single parent, and a considerable proportion of single parent households live below the poverty line, particularly single mothers. An estimated 24% of single father households and 48.3% of single mother households are in poverty. Additionally, poverty disproportionately affects black and Hispanic children; 54% of black children and 40% of Hispanic children live in poverty compared to 16% of white children.[17]

The percent of the employed white and black populations working in each industry is similar; however, there is a difference in the median earning for white and black workers. From 2012 to 2016, on average, black workers earned half of what white workers earned ($15,408 versus $30,859). These differences remain for full time workers. White females working full time earned on average $36,968 and black females earned $24,690. Black males working full time earned $29,031 compared to white males who earned $50,570 on average.

Income Inequality

Income inequality refers to an unfair distribution of income within a population. According to a 2018 report by the Economic Policy Institute, Michigan ranks 15 out of the 50 states in terms of income inequality (as measured by comparing the average income of the top 1% and the average income of the bottom 99%).[18] Put another way, only 14 states have a more inequitable distribution of income than Michigan. The report also notes that Berrien County ranks 278 in terms of income inequality among the nation's 3,061 counties; that is, income is more inequitably distributed in Berrien County than in 90 percent of all counties in the United States. Using another measure of income inequality – the Gini Coefficient, Berrien County is found to have one of the highest rates of income inequality in Michigan, ranking 77 out of 83 counties.

P: What are some things in your community that make it hard to be healthy?

"The lack of opportunities for meaningful employment for a part of our population leads to depression and substance abuse."

–60+ y.o., white male

P: How would you improve the health of your community?

"The health of our community will improve when everyone can get a job that allows him/her to support himself and his family. If you are struggling to survive, there is very little incentive to go to the gym to work out."

–60+ y.o., white male

Documented effects of income inequality include increased risk of self-rated poor health and increased cardiovascular disease risks.[19] Income inequality is also independently associated with higher health care expenditures and more health care use, with increases in both potentially discretionary procedures and in potentially preventable admissions and with higher rates of hospitalizations for ambulatory care-sensitive conditions.[20]

Income inequality can also accentuate differences in social class and status and serve as a social stressor, which has adverse health effects. Income inequality is particularly harmful to the health of lower income people.[21]

Limitations

Average annual income by occupation and industry is only available at the national level making comparing the average wage between industries difficult (e.g., not all workers in the construction industry make over $50,000 a year). Additionally, the various data sources used in this chapter (e.g., American Community Survey and the Current Employment Statistics Survey) did not use the same collection methods resulting in slightly different estimates depending on the data source.

Communities with greater income inequality can experience a loss of social connectedness, as well as decreases in trust, social support, and a sense of community for all residents.

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Health Care

Health Care

High-Level Findings

- In Berrien County there are shortages of health care providers for primary, dental, and mental health care.
- Increasing costs of health care insurance limits access to health care resources.
- The quality of health care is high in some categories and very competitive with national benchmarks. However other categories require improvement.

Introduction

Health care resources include care providers, such as physicians, nurses, and lab technicians; public and private insurance; facilities such as pharmacies, clinics, and hospitals; health education; and many other services and facilities that provide medical care and information to individuals and communities. The findings of the CHNA indicate that many Berrien County residents have limited access to health care resources. This is largely due to challenges related to the availability of care, the affordability of care, and the quality of care that is provided. The survey results highlighted common themes such as limited access to mental health care and affordable substance abuse treatment; long wait times for specialty care; not enough family practices; and too few opportunities for health education.[1]

P: What in your community makes it hard to be healthy?

"Extremely lacking in mental health services in our community. Riverwood availability is almost non-existent. If you call for an appointment, you will probably have to wait 30 days to get one."

–60+ y.o., male, undisclosed race

Availability of Care

The Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services designates some populations and geographic areas as Health Professional Shortage Areas (HPSA). HPSAs have shortages of primary, dental, and/or mental health care. Berrien County has five primary care HPSAs, five dental care HPSAs, and five mental health care HPSAs. Additionally, Berrien has been designated by the state to be a low-income population HPSA for primary and dental care, and a high needs HPSA for mental health care.[2]

Figure 6.1 Taken by male student at Bridge Academy

HRSA also designates Medically Underserved Areas and Populations (MUA/P) which have shortages of primary care providers, high infant mortality, high poverty, or a high elderly population.[3] In addition to its federal designation as an MUA, Berrien County has been designated by the state of Michigan as primary care MUA.[2,4] The county has two primary care MUAs: Benton Harbor City and Chikaming Township.

The results of the 2018-2019 Behavioral Risk Factor Survey (BRFS) show that 18.8% of Berrien County adults do not have a personal doctor or health care provider. According to the County Health Rankings, the ratio of the Berrien County population to primary care physicians increased between 2010 and 2017 from 1,215:1 to 1,307:1. This means that over the seven year period, the number of county residents served by one physician increased, leading to a reduced availability of primary care providers. Moreover, in 2017, the availability of primary care physicians in the county was more limited than the state average of 1,280:1.[5]

During the same period, the ratio of dental care providers fell from 2,036:1 to 1,732:1, suggesting an increase in the availability of providers. However, in 2017, the dental care ratio remained considerably higher than the state average of 1,340:1.[5]

In 2019, the ratio of the population to mental health care providers in Berrien was 450:1 compared to a state average of 370:1, suggesting that the availability of mental health care in the county is considerably more limited when compared to the rest of the state.[5]

P: What are the biggest health issues in your community?

> "Lack of doctors in various specialties as well as primary doctors and distances one must travel in order to receive care."
>
> *–60+ y.o., white, female*

National shortages in key health care professions play a role in limiting the availability of health care professionals. Other significant factors limiting availability in Lakeland's service area include skill limitations of the local labor market; difficulty attracting diverse talent to a rural community; uncompetitive pay when compared to larger and urban markets; and a lack of opportunities for job mobility.

Availability of care is also determined by the location of services and facilities. Figure 6.2 shows the location of medical facilities. Most facilities are in areas where a high percentage of households have vehicle access. There are relatively few facilities in areas with low vehicle access, such as Benton Harbor and Benton Heights. There is a public transportation system in Berrien County, comprised of four distinct services but it is fractured and, according to survey responses, does not operate effectively.

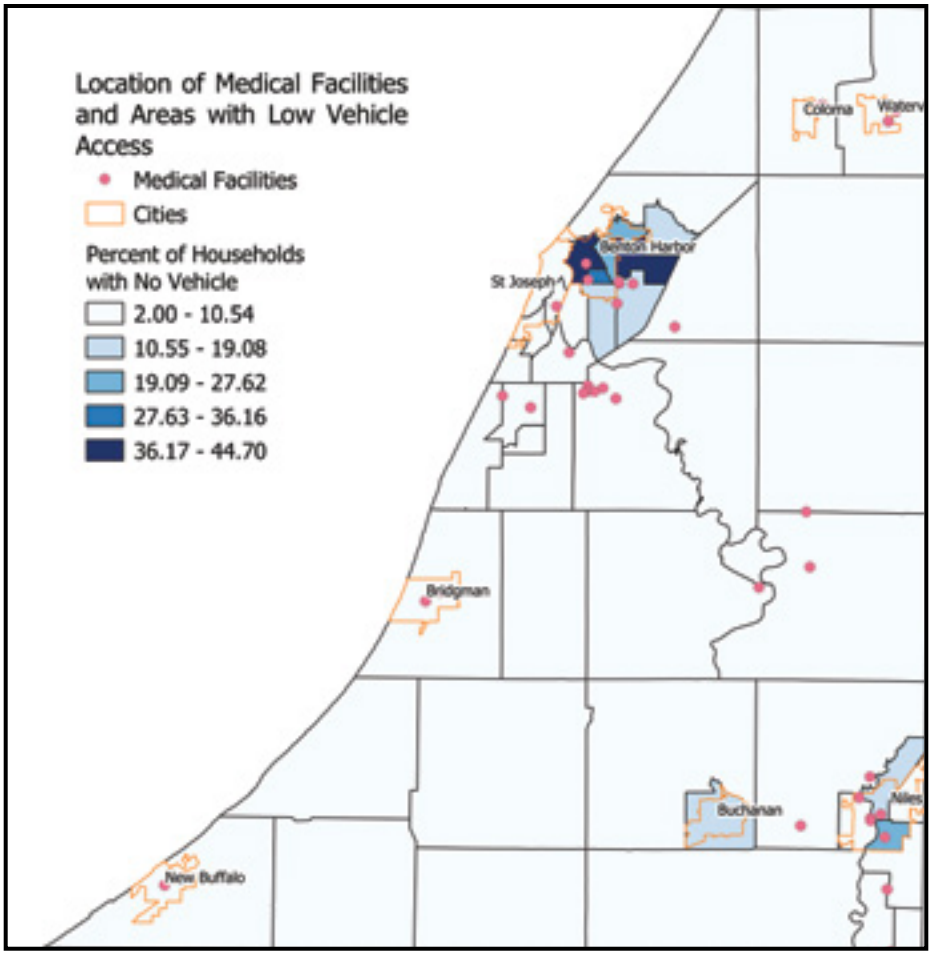

Figure 6.2 Map of medical facilities and areas with low vehicle access

Affordability of Care

Many factors impact the affordability of health care. Cost of care is a major factor. The results of the 2018-2019 Behavioral Risk Factor Survey (BRFS) suggest that 13.7% of Berrien County residents, compared to 11.7% statewide, did not see a doctor due to high cost.[6]

Table 6.1 shows that the cost of health care in the county increased each year between 2012 and 2016 and declined in 2017 and 2018. However, from 2012 – 2018, health care costs in Berrien remained below the state average, according to the 2020 County Health Ranking.

Avg Health Care Cost	2012	2013	2014	2015	2016	2017	2018
Berrien County	$8,893	$9,100	$9,452	$8,790	$9,019	$8,895	$8,790

Table 6.1 Access to Care: Cost of Care: Based on Price-adjusted Medicare Reimbursements, Parts A & B, per enrollee[5]

Without health care insurance, the cost of health care exceeds the capacity of many Berrien residents, forcing them to go without needed care and increasing the risk of illness, disability, and even death. Even with insurance, the out-of-pocket costs of care, such as deductibles, coinsurance, and copayments, can be so burdensome as to discourage some people from seeking care when needed. Research shows that adults who are uninsured are over three times more likely than insured adults to say they have not had a visit about their own health to a doctor or other health professional's office or clinic in the past 12 months. They are less likely to receive recommended screening tests such as blood pressure, cholesterol, colon, blood sugar screenings; and pap smears or mammograms (among women). They are more likely to delay or neglect prescription drugs. Because they are less likely to receive needed follow-up screenings when compared to the insured, they are more likely to be diagnosed at later stages of diseases, including cancer, and have higher mortality rates. As seen in figure 6.3, the uninsured also have higher mortality rates because when hospitalized, they receive fewer diagnostic and therapeutic services than those with insurance.[7]

P: What in your community makes it hard to be healthy?

"Outrageous prices for everything. Not affordable even with insurance. Have to choose between medical care and basic needs."

–60+ y.o., white, male

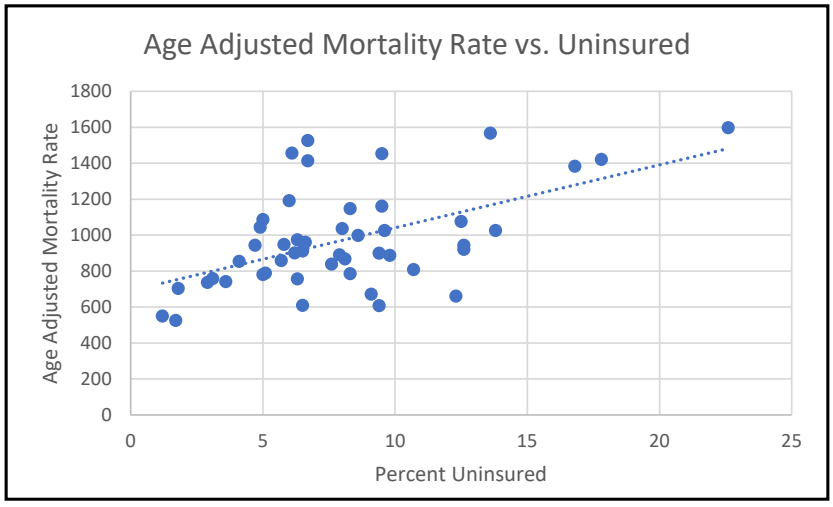

Figure 6.3 Scatterplot showing Age-Adjusted Mortality Rate data in relation to Uninsured Rate in Berrien County, From 2014 to 2018

Health Care

Health insurance is provided by both public and private bodies. Roughly 41% of the county's population is covered by some form of public or government-provided insurance including Medicare (21.3%), Medicaid (23.2%), and/or Military/Veterans Administration (2.5%). About 67% of the Berrien population is covered by some form of private insurance such as employer-sponsored (54.1%), direct purchase (15.7%), and military health (1.3%).[8,9,10]

P: What in your community makes it hard to be healthy?

> "Cost of health insurance premiums, health providers no longer accepting insurance for some services, people will tend to do without medications if cost is too high."
>
> *–45 - 59 y.o., white, female*

The costs of both public and private insurance have increased in recent years. Average annual premiums and out-of-pockets costs have increased at rates that have outpaced the growth of worker wages.[11] Similarly, Medicare premiums, deductibles, and coinsurance costs have also increased.[12] Even with health care insurance, access to care may be restricted by coverage limitations on medications, procedures, and care providers. Coverage may be partial, or it may be completely unavailable.

According to recent census data, about 92% of Berrien County residents are insured, slightly lower than the insured rate for the state of Michigan which is 94%. Women in the county are slightly more likely to be insured than men (93% vs. 91%). Whites are insured at higher rates than blacks and Hispanics (93%, 90%, and 79% respectively). Roughly 97% of people with a college degree are insured compared to 85% of those with less than a high school diploma. Among those with annual earnings of less than $25,000, about 88.9% are insured compared to 96% of those with earnings that exceed $100,000. Among age groups, people between the ages of 26 and 34 have the lowest rate of insurance (85%), and people over the age of 75 have the highest rate (100%).[13]

People with more education are more likely to have some form of health insurance.

Among Michigan's 83 counties, only about one third have higher rates of uninsured people than Berrien County. According to most recent census estimates, 7.8% of Berrien residents are uninsured. Men are more likely to be uninsured than women (9% vs. 6.7%). The rate of uninsured blacks is about 10.3%, compared to 7.1% of whites, and 21.2% for Hispanics. The uninsured rate is higher for people with less than a high school diploma (14.7%) compared to people with a college degree (4.1%). Among the employed, the uninsured rate is 10.3% compared to 24.4% among the unemployed.[13]

Figure 6.3 Taken by male student at Bridge Academy

Quality of Care

Access to health care resources is also impacted by the quality of care provided. Quality health care is effective, safe, efficient, patient-centered, equitable, and timely. Quality measures are used to assess health care processes and outcomes, patient perceptions of care and organizational structure, and/or systems that determine the ability to provide high-quality health care and/or that relate to one or more quality goals for health care. The quality of care is increasingly important as the health care system moves towards value-based reimbursement models.

Health Care

According to the County Health Rankings, Berrien ranked 29 out of 83 counties (the top 3rd) in terms of the quality of clinical care – a significant improvement over the ranking of 53 in 2015. One of the key measures of clinical quality is preventable hospitalizations. Between 2012 and 2017, preventable hospitalizations, a standard measure of the quality of care, declined from 5,057/100,000 to 3,761/100,000. During that same period, the rate has remained well below state and national averages. However, the impressive figures mask significant disparities, which is a key quality indicator. The rate of preventable hospital stays for whites is 3,501/100,000 compared to 6,880/100,000 for blacks.[5]

Each year, Spectrum Health Lakeland (SHL) issues a State of Quality report that summarizes the health system's performance in four key areas: readmissions, mortality, patient satisfaction, and complications (infections & patient safety indicators). Some notable achievements include hospital readmission rates in the top quartile, improving mortality rates, and historical successes in patient satisfaction. However, there are opportunities for improvement.

Hospital readmissions are tracked in six health conditions: heart attack, heart failure, chronic obstructive pulmonary disease (COPD), pneumonia, and hip and knee replacement. Between July 2015 and June 2018, Lakeland Medical Center, Saint Joseph achieved hospital readmission rates that were in the top performance quartile, performing better than 75% of all hospitals nationwide. While heart attack readmissions increased between July 2018 and June 2019, readmission rates for heart attacks between 2012 and 2019 decreased from 25% to 13%. In fiscal year 2020, SHL became one of less than 10% of hospitals nationwide to avoid financial penalties for readmissions by the Centers for Medicaid and Medicare Services of the US. Department of Health and Human Service (CMS). A collaborative approach between hospital and ambulatory services has resulted in a three-year run of top quartile performance. The average percentile rank of these programs for the last three years has been 84th, 93rd, and 89th.[14]

SHL tracks mortality rates across five health conditions: heart attack, heart failure, chronic obstructive pulmonary disease (COPD), pneumonia, and stroke. The mortality rate for heart attacks at SHL ranked in the bottom performing decile between 2013 through 2016. After a slight favorable increase, the health system's heart attack mortality rate increased in 2019 and is poised to land in the bottom decile in 2021.[15]

In June 2018, the 30-day mortality rate for all patients was 5.1% lower than the preceding six years. The inpatient, in-house mortality rate was 1.63%, the second lowest in the preceding six years. Historically, the mortality rates for heart failure and pneumonia are higher than average. Heart attack, stroke, and COPD all have lower than average mortality rates. In 2018, the COPD death rate was the lowest since mortality data started being collected at the 53rd percentile. The stroke mortality rate is in the top performing decile and is projected to stay in that category for the foreseeable future. Heart failure and pneumonia both suffer worse than average rates of mortality. Both sit in the bottom quartile of performance.[15]

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is used to measure patient experience. There are three categories of patient experience: overall hospital rating and likelihood to recommend; nurse and physician communication; and responsiveness and care transitions. In 2014, the overall hospital rating was high; 76% of the survey respondents rated SHL at least 9 out of 10. In 2015, 2016, and 2017, they gave the hospital high ratings – 74%, 73%, and 73%, respectively. In 2018 and 2019, SHL ranked below the 50th percentile in patient satisfaction.[16]

To assess nurse and physician communication, patients are asked three questions:

1. How often did your nurses/doctors treat you with courtesy and respect?
2. How often did nurses/doctors listen to you carefully?
3. How often did nurses/doctors explain things in a way you could understand?

Significantly, nurse and physician communication correlate with patients' overall rating of the hospital. Both nurse and physician scores have dropped significantly in recent years, down to the 3rd decile, though the nurse scores rebounded slightly in 2018. In 2019, both nurse and physician scores dipped to historical lows.[16]

In recent years, care transitions and responsiveness have been slightly better than average but are projected to be below the 50th percentile in 2020. To assess responsiveness and care transitions, patients are asked five questions, the answers to which correlate with patients' likelihood to recommend scores.

The questions are:

1. How often did you get help soon after pressing your call light?
2. When you needed it, did you get help with a bedpan/to the bathroom?
3. Staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left.
4. When I left, I had a good understanding of the things I was responsible for in managing my health.
5. When I left, I clearly understood the purpose for taking each of my medications.

These surveys are a direct line of feedback from patients and families which inform initiatives within the system to improve quality of care.[16]

Complications fall into two categories: Hospital Acquired Infections (HAI) and Patient Safety Indicators (PSI). Due to national improvements in HAI and PSI rates, and recent declines in SHL performance, SHL's overall ratings are at risk for poor performance. Among the five HAI categories, three are rated in the bottom quartile. On the other hand, for the fifth year in a row, SHL avoided CMS penalties for HAI. Among the five PSI measures, two are rated in the top performing quartile, one is rated at 50%, and two are rated in the bottom quartile.[17]

Officials at SHL note dissatisfaction with average and underperforming quality outcomes. Some of the efforts to improve the quality of care include eliminating HAIs, reducing readmissions by strengthening clinical collaborations, improving the patient experience, and improving health by helping patients better manage and live with diabetes and hypertension. Other actions include SHL's involvement in a Blue Cross Blue Shield of Michigan's Collaborative (including other hospital systems, health care providers, and patients) focused on improving patient care; monthly Clinical Quality Scans to benchmark complication, mortality, and readmission rates with state and national hospitals and mine opportunities for quality improvement; and prioritizing team member safety, to ensure that the Zero Harm mindset extends beyond the patient to team member experience.[18]

Limitations

This chapter has several limitations. First, SHL's State of Quality reports aggregate data that obscures disparities that, if highlighted, provide opportunities for significant quality improvements. For instance, while Berrien County's clinical outcomes are competitive with other counties, the significant racial disparity in preventable hospitalizations provides insight into the kinds of interventions the health system might undertake to further improve clinical rankings. The lack of disaggregated data begs a series of unanswered, but critical, questions such as what other disparities exist, what have been recent trends, and how do they compare to national data. Going forward, it will be important to disaggregate the data to determine best where and how to intervene to improve quality outcomes.

Second, localized quality benchmark data that is adjusted for the socio-economic conditions (e.g., poverty) is difficult to find. Therefore, SHL's quality data is benchmarked against federal quality measures which are based on claims data for the nation's Medicare beneficiaries.[19] While not ideal, federal benchmarks provide useful metrics against which to compare SHL's quality outcomes to that of other health systems nationwide.

It is important to note that SHL serves a larger proportion of "dual eligible" patients than most hospitals, meaning it serves a high percentage of people who are eligible for both Medicaid and Medicare – a higher percentage of people over the age of 65 and a higher percentage of low-income people. Both advanced age and poverty pose widely acknowledged challenges to quality outcomes. Nevertheless, when compared to its peers nationwide, SHL frequently achieves above average quality scores.

Finally, this chapter has merely touched on the challenges of availability, affordability, and quality of health care, which are among the priority needs highlighted by community members. It presents only a small snapshot of the health care resources landscape of Berrien County. A more comprehensive discussion would include, for instance, a deeper dive into how and why social factors such as health literacy, education levels, income, transportation, and the location decisions of health care providers impact the availability of health care; the impact on the cost of care resulting from the immense, complex, and ever changing nature of the insurance industry; and disaggregation of quality data to better discover where opportunities for improvement lie.

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[1] Health education is defined as any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes.

[2] Bureau of Health Workforce, Health Resources and Services Adminstration (HRSA), U.S. Department of Health & Human Services. (2020). Designated Health Professional Shortage Area (HPSA) Statistics. Retrieved from https://data.hrsa.gov/tools/shortage-area/hpsa-find

[3] MUAs and MUPs are determined by the HRSA by measuring 4 variables: (1) ratio of PCPs per 1000 population, (2) infant mortality rate, (3) percentage of the population below the poverty level, and (4) percentage of the population age 65 or over. In a given area or population, each of these variables is measured and then converted to a weighted value using conversion tables.
Morelli V. An Introduction to Primary Care in Underserved Populations: Definitions, Scope, and Challenges. Primary Care. 2017 Mar;44(1):1-9. DOI: 10.1016/j.pop.2016.09.002.

[4] Governor's Designated Secretary Certified Shortage Areas for Rural Health Clinics are areas that a state Governor or designee designates as having a shortage according to the state-established shortage plan for the establishment of a Rural Health Clinic.

[5] University of Wisconsin Population Health Institute (2020). County health rankings & roadmaps 2020. Retrieved from https://www.countyhealthrankings.org/app/michigan/2020/rankings/berrien/county/outcomes/overall/snapshot

[6] Berrien County Health Department. (2020). 2018-2019 Berrien County Behavioral Risk Factor Surveillance Survey. Retrieved from https://berriencounty.org/ArchiveCenter/ViewFile/Item/528.

[7] Garfield, R., Orega, K., & Demico, A. (2019). The Uninsured and the ACA: A Primer – Key Facts about ... Retrieved from https://www.kff.org/uninsured/report/the-uninsured-and-the-aca-a-primer-key-facts-about-health-insurance-and-the-uninsured-amidst-changes-to-the-affordable-care-act/

[8] The percentage of people who have private and public health insurance exceed 100% because some individuals have both public (e.g., Medicare) and private (e.g., direct purchase) insurance.

[9] U.S. Census Bureau (2018). Public Health Insurance Coverage By Type And Selected Characteristics (S2704), 2014-2018 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/cedsci/table?q=health%20insurance%20coverage%20in%20Berrien%20County,%20Michigan&g=0500000US26021&tid=ACSST5Y2018.S2704&vintage=2018&t=Health%20Insurance&layer=VT_2018_050_00_PY_D1&cid=S2704_C01_001E

[10] U.S. Census Bureau (2018). Private Health Insurance Coverage By Type And Selected Characteristics (S2703), 2014-2018 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/cedsci/table?q=S2703%3A%20PRIVATE%20HEALTH%20INSURANCE%20COVERAGE%20BY%20TYPE%20AND%20SELECTED%20CHARACTERISTICS&g=0500000US26021&tid=ACSST5Y2018.S2703&layer=VT_2018_050_00_PY_D1&cid=S2704_C01_001E&vintage=2018&hidePreview=true

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[14] Spectrum Health Lakeland. (2019). State of Quality report: CMS' Hospital Readmission Reduction Program. St Joseph, Michigan: Getty, M., Kendall, T.

[15] Spectrum Health Lakeland. (2019). State of Quality report: CMS' 30 Day Mortality Metrics. St Joseph, Michigan: Getty, M., Kendall, T.

[16] Spectrum Health Lakeland. (2019). State of Quality report: The Patient's Experience Matters. St Joseph, Michigan: Getty, M., Kendall, T.

[17] Spectrum Health Lakeland. State of Quality report: Hospital Acquired Infections and Patient Safety Indicators. St Joseph, Michigan: Getty, M., Kendall, T.

[18] Spectrum Health Lakeland. State of Quality report: State of Quality Report Executive Summary. St Joseph, Michigan: Getty, M., Kendall, T.

Health Care

Name	Facility Type	Address	City	Phone
Lakeland Medical Center, St. Joseph	Hospital	1234 Napier Ave.	St. Joseph	269.983.8300
Lakeland Hospital Watervliet	Hospital	400 Medical Park Dr.	Watervliet	269.463.3111
Lakeland Hospital Niles	Hospital	31 N. St. Joseph Ave.	Niles	269.683.5510
Orchard Grove Nursing & Rehabilitation Center	Nursing Facility	1358 E. Empire Ave.	Benton Harbor	269.925.0033
Royalton Manor, LLC	Nursing Facility	288 Peace Blvd.	St. Joseph	269.556.9050
Coventry House Inn	Nursing Facility	3905 Lorraine Path	St. Joseph	269.428.1111
Pine Ridge - Rehabilitation & Nursing Center	Nursing Facility	4368 Cleveland Ave.	Stevensville	269.983.6501
West Woods of Bridgman	Nursing Facility	9935 Red Arrow Hwy.	Bridgman	269.465.3017
Riveridge Rehabilitation & Healthcare Center	Nursing Facility	1333 Wells St.	Niles	269.684.1111
Chalet of Niles, LLC	Nursing Facility	911 S. 3rd St.	Niles	269.684.4320
West Woods of Niles	Nursing Facility	1211 Stateline Rd.	Niles	269.684.2810
Intercare Community Health Network	Community Health Center (federally funded)	870 Colfax Ave.	Benton Harbor	269.605.1277
Mercy Family Medical Center	Community Health Center	800 M-139	Benton Harbor	616.927.5400
Intercare	Community Health Center (federally funded)	1485 M-139	Benton Harbor	269.427.7937
Intercare Women's Health Center	Community Health Center	796 M-139	Benton Harbor	269.427.7937
Solis Memorial Health Center	Community Health Center	6270 W. Main St.	Eau Claire	
Niles Community Health Center	Community Health Center (federally funded)	24 N. Joseph Ave., Ste. G	Niles	239.487.4267
Cassopolis Family Clinic	Community Health Center (federally funded)	60 N. St. Joseph Ave.	Niles	269.445.3874
Niles Community Health Center Dental Clinic	Community Health Center	122 Grant St.	Niles	269.262.4364
Battle Creek VAMC	Mental Health Treatment Facility	115 E. Main St.	Benton Harbor	269.934.9123
Spectrum Health Lakeland (Behavioral Health Unit)	Mental Health Treatment Facility	1234 Napier Ave.	St. Joseph	269.983.8316
Berrien County Mental Health Authority (Riverwood Center)	Mental Health Treatment Facility/Drug and Alcohol Treatment Facility	1485 S. M-139	Benton Harbor	269.925.0585
Harbortown Treatment Center, PLLC	Drug & Alcohol Treatment Facility	1022 E. Main St.	Benton Harbor	269.926.0015 (ext. 110)
Sacred Heart/Serenity Hills	Drug & Alcohol Treatment Facility	6418 Deans Hill Rd.	Berrien Center	269.815.5500
Community Healing Centers	Drug & Alcohol Treatment Facility	1225 S. 11th St.	Niles	269.684.7741
Berrien County Health Department	Clinic/Community Health	2149 E. Napier Ave.	Benton Harbor	269.926.7121
Berrien County Health Department	Clinic/Community Health	1205 Front St.	Niles	269.684.2800
Berrien County Health Department	Clinic/Community Health	21 N. Elm St., #6	Three Oaks	269.756.2008

Table 6.2 Health Care Resources in Berrien County

Food Environment

Food Environment

High-Level Findings

- Eating patterns are influenced by a combination of individual factors (e.g., income) and environmental conditions (e.g., location of healthy food stores).
- In Berrien County, all access-burdened census tracts where people have low income, low vehicle access, and live far from a grocery store are located in Benton Harbor, Benton Township, Niles, and Niles Township.
- In locations where residents are both access-burdened and utilize SNAP benefits at high rates, the closest SNAP authorized stores are convenience stores. These stores sell food that is generally of lesser quality for higher prices than supermarkets.

Health, Behavior, and the Food Environment

Decades of research has established that diets rich in fruits, vegetables, whole grains, and lean protein with moderate amounts of dairy are associated with lower rates of obesity, diabetes, heart disease, and certain types of cancer.[1] More recently, research has also indicated that lacking access to nutritious foods (i.e., food insecurity) is associated with anxiety,[2] suicidal ideation,[3] and "mental disorders."[4]

The importance of a nutritious diet is also highlighted by the United Nations Human Rights Council, which states that food is a human right.[5] Elements of the "right to food" include:

1. Availability: Food is available for purchase or it is possible to produce, gather, or hunt for food. For example, there are fish available to purchase at the grocery store.

2. Accessibility: Individuals are physically and economically able to acquire food. For example, grocery stores are within a feasible distance and the product for sale is affordable.

In response to the prompt "What makes it hard to be healthy?" the most frequent themes referred to the food environment. Concerns centered around the number of fast food restaurants, limited access to fresh foods, and the cost of healthier food options.

To improve health, respondents overwhelmingly suggested more affordable healthy food options in local stores and restaurants.

3. Adequacy: Food meets individual nutritional and cultural needs. For example, fish may be available and accessible but would not be adequate for a strict vegetarian. Additionally, the fish may not be of high nutritional quality (e.g., breaded and deep-fried) and thus not adequate for all fish-eating individuals.

4. Sustainability: Food will be accessible in the future as well as the present. For example, fish may be available, accessible, and adequate at this time, but current fishing practices may not protect future fish populations.

There are many successful programs aimed at changing eating patterns through education. However, for long-term behavioral shifts, it is also important to ensure that these programs happen in environments where food is available, accessible, adequate, and sustainable. This requires addressing the barriers present in the food and nutrition environment.

Food Environment

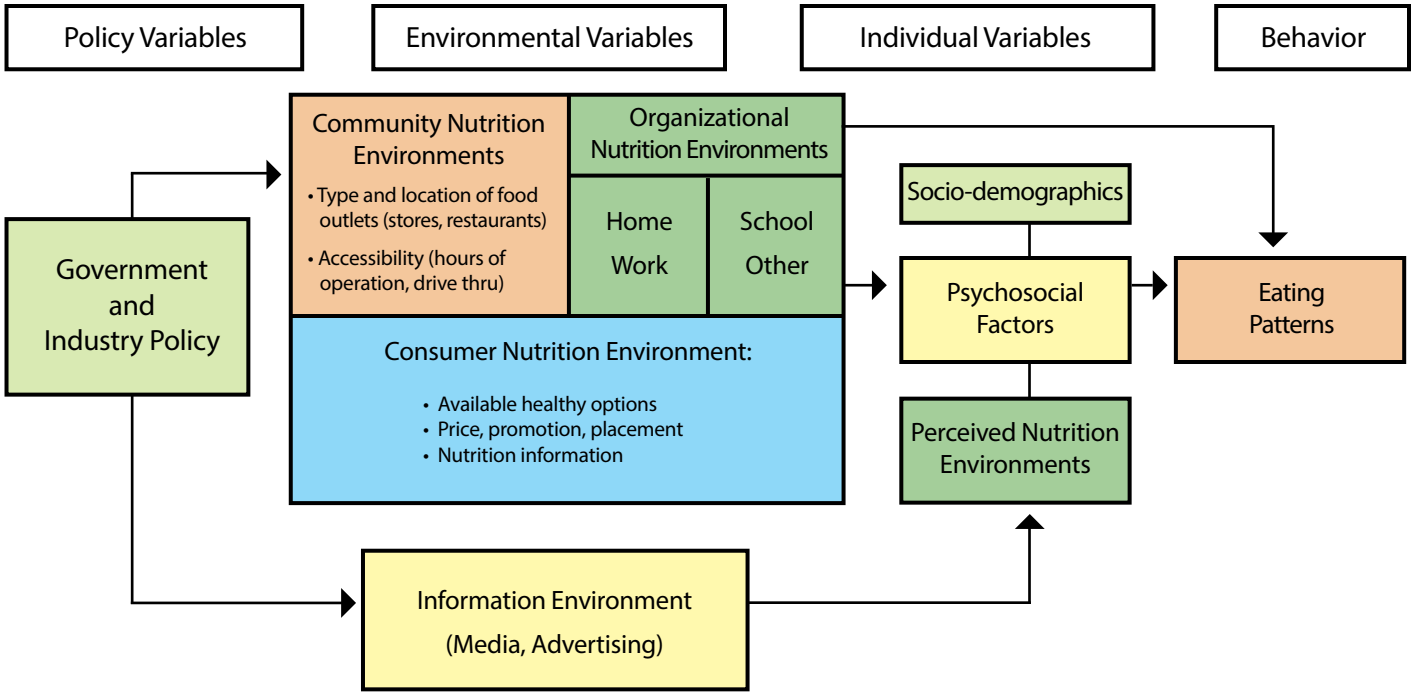

Figure 7.1 Model of Community Nutrition Environments[6]

Figure 7.1 demonstrates that behaviors such as eating patterns are driven by:

1. Policy variables: For example, the U.S. government subsidizes crops (e.g., corn and soy) which influences the price consumers pay for food.

2. Environmental variables: For example, the types of stores (e.g., large supermarkets vs. convenience stores) is associated with the availability of healthy foods. Additionally, store hours of operation dictate the accessibility of that food (e.g., stores open 9 a.m. to 5 p.m. are not accessible for individuals working during that period).

3) Individual variables: For example, personal income determines if an individual can afford the food available. Social support like friends and family impacts eating patterns.

Therefore, in order to influence eating patterns, a full understanding of contextual information (e.g., the socio-demographic makeup of communities) and environmental barriers and supports is required.

Availability of Healthy Food

Unhealthy food environments (i.e., places with large numbers of fast-food restaurants, convenience stores, and general stores) are associated with childhood sugar-sweetened beverage consumption,[6] less healthy eating patterns,[7] and obesity.[8] Additionally, foods purchased from places like convenience stores are more expensive (up to 10-54% more costly) and are of a poorer quality than in supermarkets or grocery stores.[9,10]

P: What are the biggest health issues in your community?

"I feel a lot of employers do not pay a living wage making it hard for people to have their own transportation and afford basic necessities such as healthy food."

–18 - 29 y.o., white, female

Food Environment

The healthfulness of the food environment can be measured with the Modified Retail Food Environment Index (mRFEI).[11,12] The mRFEI illustrates the relative amount of healthy food stores (i.e., large supermarkets, larger grocery stores, supercenters, and produce stores) compared to less healthy food retailers (i.e., fast food restaurants, small grocery stores, and convenience stores) within a census tract or a half-mile of its boundary. In Berrien County, scores range from 0 (i.e., no healthy food retailers) to 50 (i.e., equal number of healthy and less healthy food retailers).

Figure 7.2 shows that, in many census tracts in Berrien County, the number of less healthy food retailers outweighs the number of healthy food stores. The census tracts with the highest mRFEI scores (i.e., healthier food environments) are in the Bertrand, Niles, Pipestone, and Three Oaks Townships. However, these locations also contain few food retailers, some of which are seasonal in nature (e.g., produce markets).

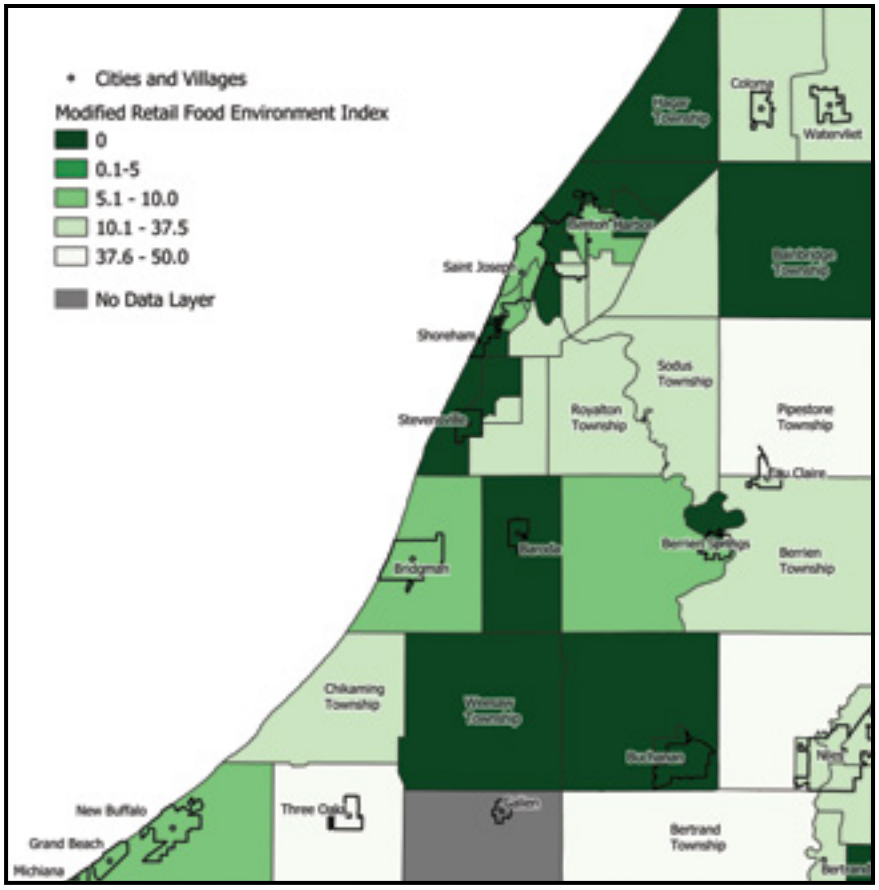

Figure 7.2 Modified Retail Food Environment Index

About one third (31.25%) of Berrien's census tracts contain no healthy food retail locations. These tracts include two in the city of Benton Harbor; two in Benton, St. Joseph, and Lincoln Townships; one in the cities of Buchanan and southern Niles; and one in Weesaw, Buchanan, Baroda, and Oronoko Townships.[13]

Accessibility of Healthy Food

"Food desert" is a term used to describe low-income communities with limited access to healthy food. Whereas the mRFEI is helpful in understanding the proportion of healthy and less healthy food retailers in a census tract, this measure factors in the distance a resident must travel to a store selling healthy food, median income, and neighborhood vehicle access. Therefore, some locations identified as having a good balance of healthy and less healthy food retail locations may also be a food desert if there is a large population of low-income residents who live farther than a half-mile from a healthy food store.

Figure 7.3 Taken by student at Niles New Tech Center

Food Environment

Figure 7.4 shows the location of food deserts in Berrien County. These are where a significant portion of the population is low income and is at least a half-mile (for urban census tracts) or 10 miles (for rural census tracts) from the nearest supermarket (shown in blue). Also shown are census tracts where many residents are access-burdened; they live more than a half-mile from the nearest supermarket and do not have access to a vehicle.

Fifteen (31.25%) census tracts are located in the cities of Benton Harbor and Niles, and the Townships of Benton, Oronoko, and Niles are considered food deserts. Additionally, ten census tracts in the cities of Benton Harbor and Niles and the Townships of Benton and Niles are access-burdened.

Research suggests access-burdened households spend roughly the same percentage of their food budget at supermarkets and large grocery stores as those households with enough access. However, households with lower access make fewer trips to these stores, which could influence the types of foods purchased (i.e., more inclined to buy shelf-stable foods, which are often higher in sodium).

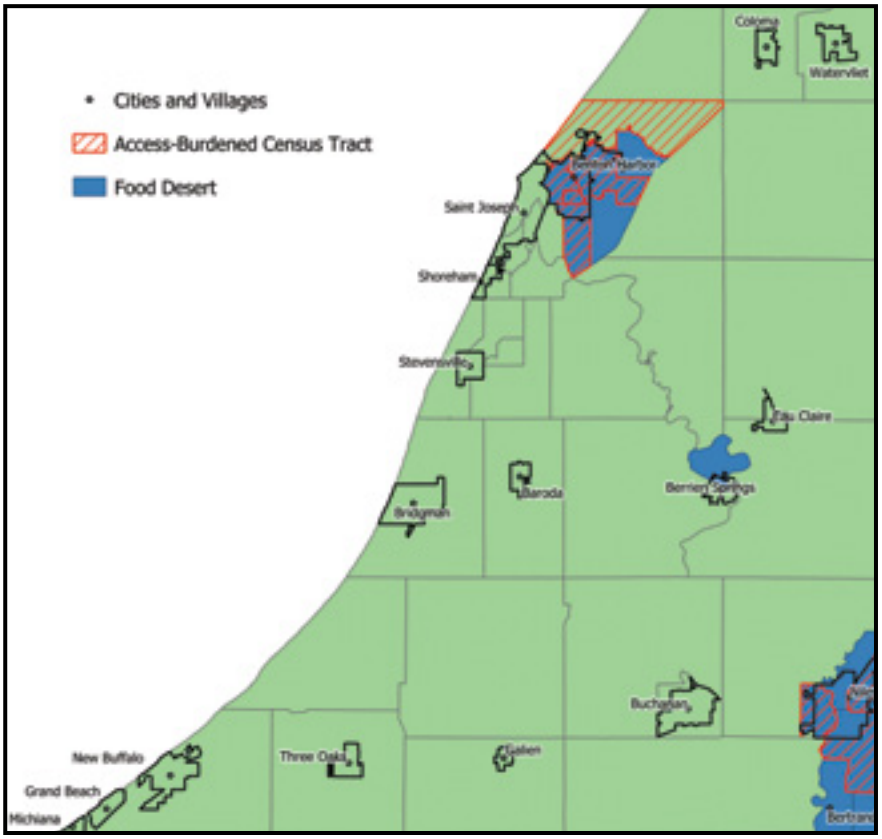

Figure 7.4 Food deserts in Berrien County

In Benton Harbor, Niles, and Benton Township there are five census tracts where more than 20% of households do not have vehicle access. All five of these census tracts are food deserts.

Access and Affordability

P: What are the biggest health issues in your community?

"Some people do not have access to well-stocked grocery stores. There are liquor stores that advertise as grocers, but they don't sell healthy foods or fresh produce. There needs to be a healthy alternative in the "food desert" areas of the community."

–18 - 29 y.o., white, female

One indicator of healthy food accessibility is the presence of supermarkets accepting food assistance benefits.[14] In Berrien County, there are 30 supermarkets and grocery stores that accept Supplemental Nutrition Assistance Program (SNAP) and/or Women, Infants and Children (WIC) benefits, with almost 23% of these stores located in just one census tract.[15,16] Only two supermarkets that accept food assistance benefits are located in access-burdened neighborhoods.[17]

Figure 7.5 depicts the percent of the population per census tract that utilizes SNAP benefits. Census tracts with the highest rate of SNAP utilization (29.1 - 63.9% of the population) are located in Benton Harbor, Benton Township, and Niles. Participation in SNAP is associated with reduced rates of food insecurity.[18]

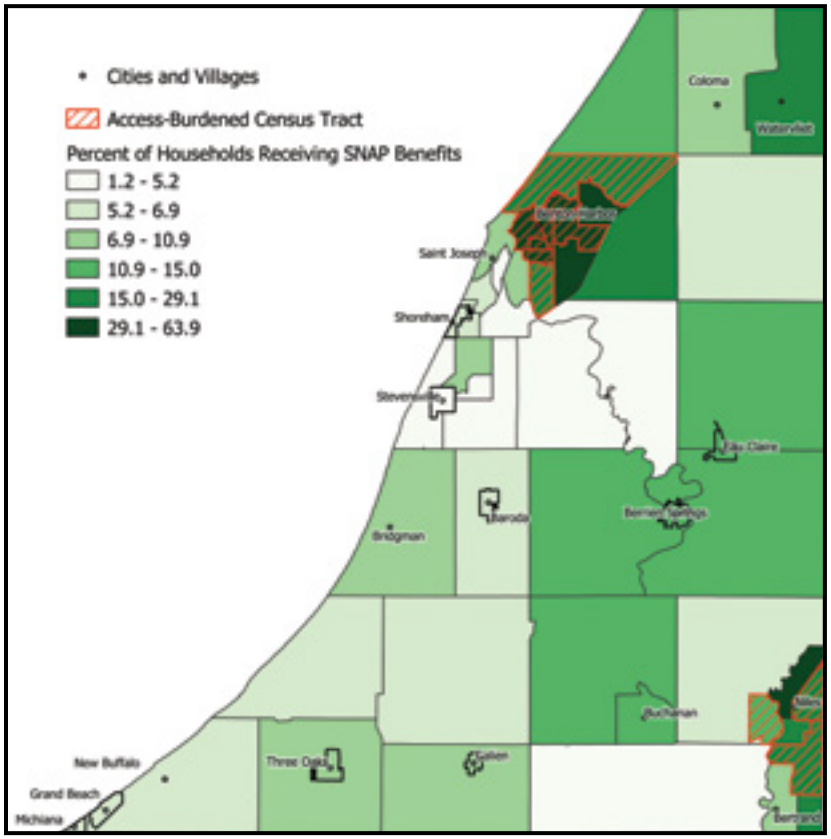

Figure 7.5 Percentage of the population per census tract that utilizes SNAP

About 15.5% of all households in Berrien County pay more than 30% of their income to housing, the amount at which a household will begin sacrificing other needs like health care and food to pay rent.

However, due to continued policy changes, families are increasingly at risk for decreased SNAP benefits, thus increasing risk for food insecurity. Additionally, families who experience an increase in income may experience a "benefits cliff," where the loss of benefits exceeds the increase in income. This reduces accessibility to healthy food despite the apparent increase in spending power.

Food accessibility is particularly precarious in Benton Harbor and Benton Township, where five out of seven census tracts with a high percentage of households receiving SNAP benefits are also access-burdened.

Accessible Foods and Exposure to Harmful Advertising

Figure 7.6 Taken by student at Bridge Academy

Preliminary analysis suggests that there is a high density of convenience stores and small grocery stores that sell alcohol and accept food assistance in the most access-burdened census tracts in Berrien County (i.e. the most accessible stores in these census tracts also sell alcohol). Additionally, convenience stores and small grocery stores have a high degree of interior and exterior alcohol advertising.[19] The existing literature shows that there is an association between exposure to alcohol messaging and alcohol consumption among youth.[20,21] Youth respondents to Photovoice expressed concern over the accessibility of alcohol, tobacco, and other drugs (ATOD).

P: What are the biggest health issues in your community?

> "There's so much drug use. Alcohol, cigarettes, vaping, weed, whatever. It's everywhere. I think a lot of adults would be shocked to know how easy it is for us to get it."
>
> *–9th grade, male, BCMSC*

Community input and existing data suggest that additional research is needed to determine the location and density of alcohol messaging and childhood exposure in the county.

Limitations

There was a lack of data on several key components of the food environment. Although the relative healthfulness of foods for sale is often estimated based on the type of store they are sold at, this can be misleading. Currently, information is not available on the local consumer environment (e.g., the quality and affordability of foods sold in small supermarkets and grocery stores). Additionally, information on the local food media environment (e.g., store advertising, billboards, and school proximity to advertisements for unhealthy foods and ATOD) and organizational environments (e.g., the food environment of schools and workplaces) was lacking.

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[9] Gosliner, W., Brown, D. M., Sun, B. C., Woodward-Lopez, G., & Crawford, P. B. (2018). Availability, quality and price of produce in low-income neighborhood food stores in California raise equity issues - CORRIGENDUM. Public Health Nutrition, 22(1), 184–185. Retrieved from https://doi.org/10.1017/S1368980018000058

[10] Gosliner, W., Brown, D. M., Sun, B. C., Woodward-Lopez, G., & Crawford, P. B. (2018). Availability, quality and price of produce in low-income neighborhood food stores in California raise equity issues - CORRIGENDUM. Public Health Nutrition, 22(1), 184–185. Retrieved from https://doi.org/10.1017/s1368980018002823

[11] Classification of the mRFEI used the same methodology as CDC's original maps: 0 (no healthy food retailers), 0.1–5 (fewer less healthy food retailers), 5.1–10, 10.1–37.5, and 37.6–100 (more healthy food retailers).

[12] mRFEI = 100 x (# of Healthy Food Retailers) / (# of Healthy Food Retailers + # of Less Healthy Food Retailers).

[13] When the mRFEI was calculated, two census tracts in Lincoln Township did not have a healthy food store. However, since then a Meijer has been constructed.

[14] Ploeg, M. V., Larimore, E., & Wilde, P. (2017). The influence of food store access on grocery shopping and food spending. Retrieved from https://www.ers.usda.gov/webdocs/publications/85442/eib-180.pdf?v=0

[16] Store addresses were provided by the Berrien County Health department. Store type was determined using the North American Industry Classification System codes supplemented with store website information.

[17] Census tract 21 in Benton Township.

[18] One is a small supermarket (which typically stock fewer healthy options) and the other is a Walmart which is located more than ½ mile from many individuals in the census tract.

[19] Gundersen, C., Kreider, B., & Pepper, J. V. (2017). Partial Identification Methods for Evaluating Food Assistance Programs: A Case Study of the Causal Impact of SNAP on Food Insecurity. American Journal of Agricultural Economics, 99(4), 875–893. Retrieved from https://doi.org/10.1093/ajae/aax026

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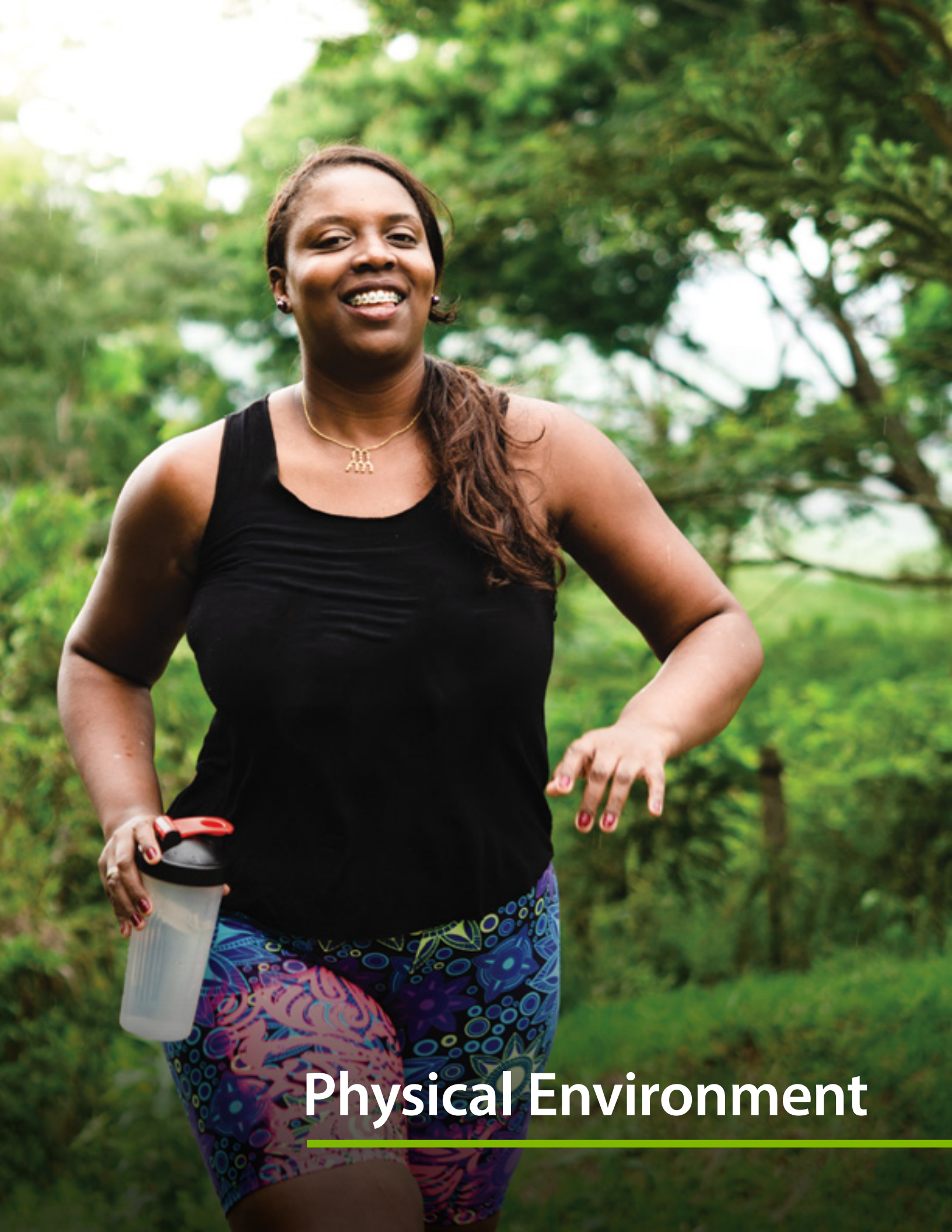

Physical Environment

Physical Environment

High-level Findings

- The greatest number of potentially polluted facilities/sources in Berrien County are located in areas where vulnerable populations live.
- In 2018 and 2019, Berrien had high levels of ozone, but this has improved recently. This is mostly due to emissions from outside of Berrien County.
- Most drinking water violations in Berrien County were related to problems with reporting and monitoring (i.e., failure to conduct regular monitoring of drinking water quality, or to submit monitoring results in a timely fashion).
- Of the locations with older homes, Benton Harbor, Galien Township, Niles Township, and Three Oaks census tracts had the greatest percentage of children living below the poverty level, indicating higher risk for lead poisoning.

Introduction

The physical environment can be thought of as the natural and built environment. Individually, the quality of these environments contributes to health. For example, clean river waters provide drinking water, and opportunities for recreation and sidewalks provide a form of active transportation. However the interactions between these environments (e.g., as a result of urban planning) can also influence health.[1] For example, decisions regarding the location and maintenance of infrastructure (i.e., the built environment) can contribute to the pollution of the air, water, and soil (i.e., natural environment).

When discussing the physical environment, survey respondents viewed water quality concerns, air pollutants, trash/litter and abandoned homes and factories as being issues that negatively impacted the health of the community.
Some of the suggested solutions included repurposing old factories, creating affordable housing out of abandoned homes, and community cleaning efforts.

Locations of Potential Sources of Pollution

Community members frequently mentioned litter, pollution, and air and water quality as conditions which make it hard for them to be healthy. Although there is a lack of data available on litter in Berrien County, information is available on the location of facilities commonly associated with pollution. Individuals living next to contaminated locations and other sources of hazardous waste have a higher risk for negative health outcomes, such as childhood cancers, chronic respiratory symptoms, asthma hospitalizations, adverse pregnancy outcomes, and infant mortality.[2,3,4]

Figure 8.1 Taken by 10th grade student at Niles New Tech Center

Brownfields and Superfund sites are two types of locations which may contain pollutants and "might need to be cleaned up, are being cleaned up, or have been cleaned up."[5] Locally, there are 29 brownfield sites, 19 of which are in Benton Harbor. In Buchanan there are six sites (see Table 8.1).[6] However, further analysis on this data is needed to determine the status of each location (i.e., which locations are clean or in the process of being cleaned). Additionally, only locations which have received a brownfield grant are considered brownfields. Therefore, analyzing only brownfield sites does not fully represent all potentially polluted locations.

Other potentially polluted locations include active Superfund sites. These are locations where activities (e.g., site assessment, waste removal, remedial actions) are being planned or conducted under the Superfund program. In Berrien County, there are a total of 20 Superfund sites, three of which are on the national priorities list (NPL). The NPL is a list of facilities that are considered the highest priority and "warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances, pollutants, or contaminants."[7] Benton Harbor has the greatest number of active Superfund sites in the county with 1 NPL site and 7 non NPL sites.

Research indicates low income and/or minority communities are more likely to live in communities located near sources of pollution, thus increasing the chance of exposure.[8,9,10] Locally, the greatest number of brownfield and Superfund sites are located in areas where vulnerable populations live.[11] This is significant, as vulnerable individuals may be more susceptible to adverse outcomes when they have reduced access to care, lack resources (e.g., language or education) that would help them avoid exposure, or are at vulnerable life stages.[12]

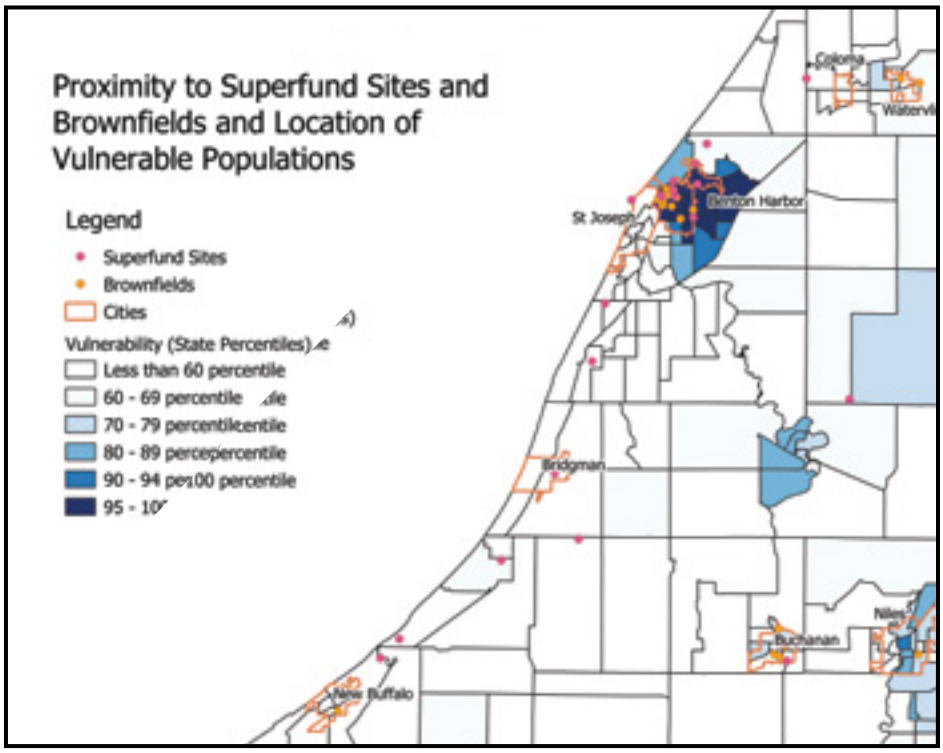

Figure 8.2 Map displaying the location of potential sources of pollution and the locations where vulnerable populations live[13]

	Benton Harbor	Bridgman	Buchanan	Coloma	Eau Claire	New Buffalo	Niles	Sawyer	St. Joseph	Stevensville	Union Pier	Watervliet	Total
Brownfield	19		6			1	1					2	29
Superfund	7	2	1	1	1	1		1	1	1	1		17
Superfund (National Priorities List)	1		1						1				3
Total	27	2	8	1	1	2	1	1	2	1	1	2	49

Table 8.1 Count of Brownfield and Superfund sites by city

A proxy indicator for potential exposure to hazardous waste is proximity to facilities that generate large quantities of hazardous waste or treat, store, or dispose of hazardous waste.[14,15] This is represented with the proximity score.[16] Locally, those most vulnerable to the effects of pollution live closest to potential pollution sources. Of the 28 areas with a high proximity score, 21 of these locations are in Benton Harbor or Benton Township, and one is in Niles (see Figure 8.4 and appendix D for full details).[17]

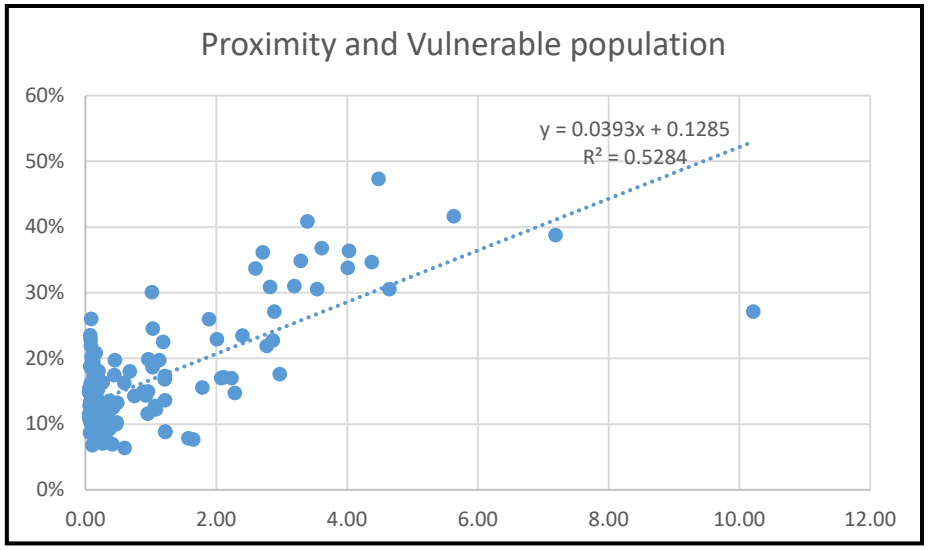

Figure 8.3 Scatterplot showing relationship between Proximity and Vulnerable population, 2019

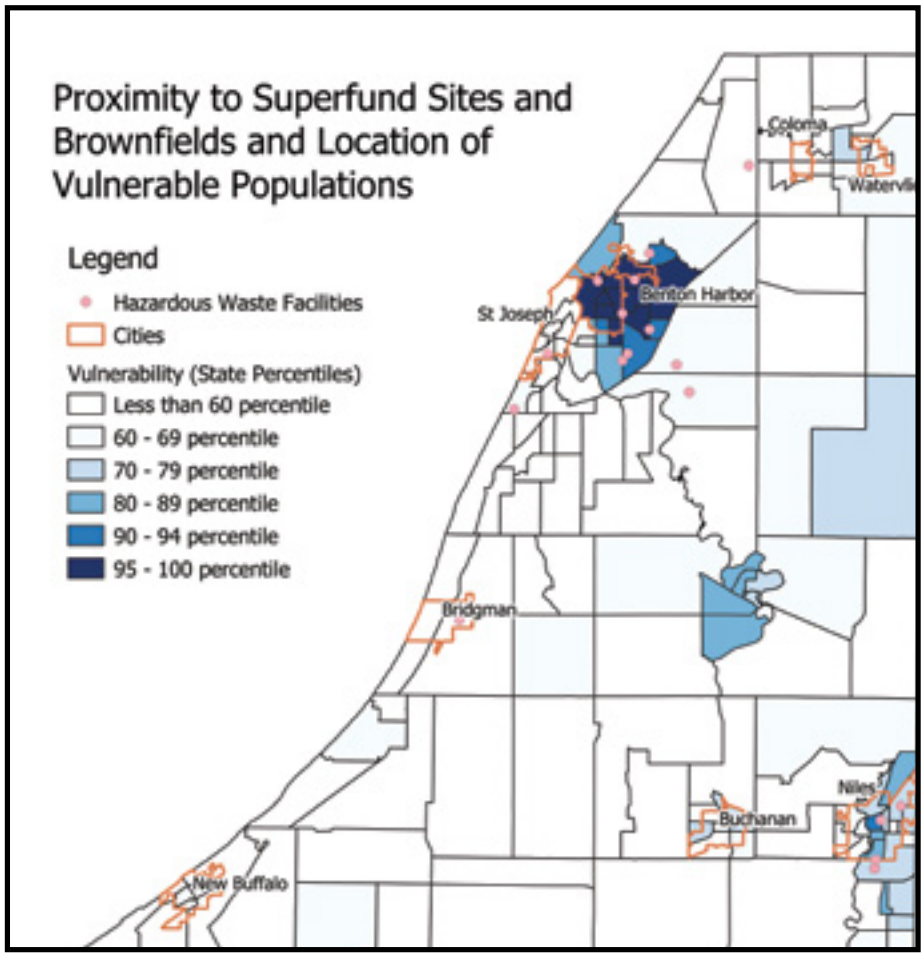

Figure 8.4 Map displaying the location of hazardous waste facilities and the locations where vulnerable populations live[18]

Proximity to Pollution or Contaminants

Environmental Water Quality

The EPA's wastewater discharge indicator helps users to identify areas where there may be potential health impacts of toxic discharges to water.[19] People may be exposed to the discharged pollutants through swimming in downstream waters or through drinking water if contaminants are not removed by drinking water utilities.[19] Compared to state rates, the census tracts with the greatest estimated toxic releases were those bordering the St. Joseph River, particularly to the north of Niles.

Figure 8.5 Taken by 10th grade student at Niles New Tech Center

Current information is limited on the impact of these emissions on local waterways. However, some information on what's being done to restore and protect local waters is available through the "How's My Waterway" website.[20] For example, the most recent river quality assessment for the St. Joseph River near Niles is from 2016. At that time the river was designated as impaired (i.e., limited ability to support fishing and recreation due to contamination) with E. coli and PCB. Probable sources contributing to impairment are agriculture and other sources outside state jurisdiction or borders (E. coli) and atmospheric deposition (PCB).[21,22]

Drinking Water

In 2018, about 75% of the population in Michigan received water from Public Water Systems (PWS).[23] These systems have standards in place for water safety and quality and systems that exceed these standards are required to immediately notify the public, correct the problem, and provide a safe alternate source of drinking water in the interim if necessary.[24] In 2018, 88.5% of water quality violations in the county were related to monitoring and reporting (i.e., failure to conduct regular monitoring of drinking water quality or to submit monitoring results in a timely fashion).[25] There were few health-based violations in 2018, all of which have been addressed.

Since 2018, there have been 33 water systems in Michigan which have had lead levels above the action level (i.e., the level above which a response is required).[26] Two of these water systems were in Berrien County (i.e., the city of Benton Harbor and the Village of Eau Claire).[27] Exceeding the action level requires water systems to act to minimize exposure to lead in drinking water, including water quality parameter monitoring, corrosion control treatment, source water monitoring/treatment, public education, and lead service line replacement.[26] Information regarding city and township response to exceeding the action level for lead can be found on the Berrien County Health Department website.

The 25% of Michigan residents who do not receive their drinking water from public water systems get their water from small water supplies like private wells. While the Michigan Department of Environment, Great Lakes, and Energy investigates well water contamination, and oversees remedial activities where groundwater contamination has affected private drinking water, owners of private wells are responsible for testing.[26] It is recommended that owners have their wells tested once a year.

Air Quality

Air pollutants such as fine particulate matter, ozone, and nitrogen oxides have been associated with a wide variety of health conditions such as cardiovascular disease, negative birth outcomes, and pulmonary disease.[28,29] In order to monitor the presence of air pollutants, the EPA has established standards for six common air pollutants that can be harmful to health and the environment.[30] In 2018 and 2019, ground level ozone in Berrien County exceeded this standard.[31,32] Ground level ozone exposure can trigger chest pain, coughing, throat irritation, and airway inflammation and is of particular concern to the elderly, children, and those with pre-existing conditions such as bronchitis, emphysema, and asthma.[33] Most emissions contributing to ground level ozone are from major urban areas in the Lake Michigan area (e.g., Chicago, Gary, and Milwaukee) and from other source areas in the eastern U.S.[34] In shoreline counties, the contribution of ozone forming emissions from sources in Michigan is negligible.

TRI facilities (i.e. facilities listed in the Toxic Releases Inventory), are additional sources of pollution. These are typically larger facilities involved in manufacturing, metal mining, electric power generation, chemical manufacturing, and hazardous waste treatment.[35] The EPA provides a screening tool called the Risk-Screening Environmental Indicator (RSEI) score to assist the public with identifying situations where hazardous releases into the air or water may affect human health.[36] A RSEI Score is a value that accounts for the amount and type of chemicals released and the size and location of the exposed population. RSEI Scores are useful for making comparisons and ranking facilities, industry, or geographic areas.[37]

In 2018, Berrien County had the 17th highest RESI Score in Michigan (see figure 8.6 below). Aside from an increase in emissions from 2012 to 2014, this score has been relatively stable since 2007. Most of the RSEI Scores (over 99%) are attributable to air releases rather than releases made to water.[38]

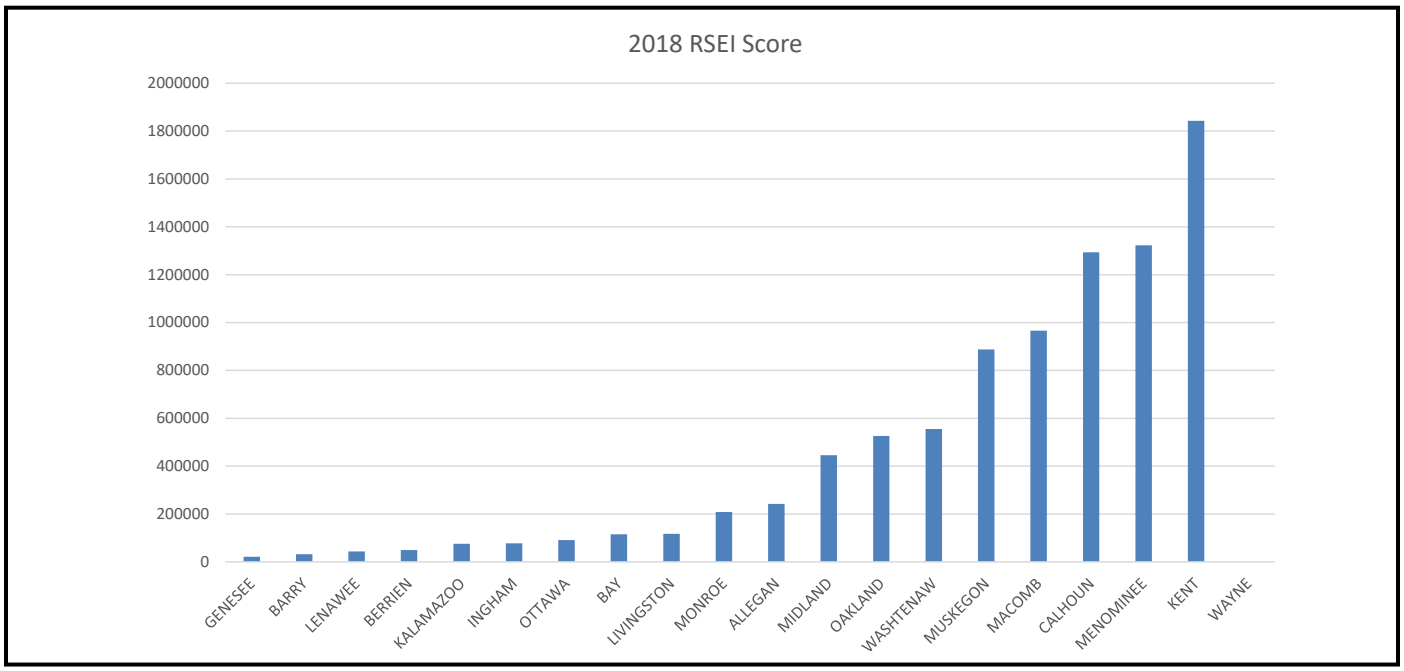

Figure 8.6 Top 20 Risk-Screening Environmental Indicator (RSEI) Score Counties in Michigan, 2018[39]

These and other sources of pollution are reflected in the National Air Toxics Assessment (NATA), including vehicle emissions, agriculture, construction, wood burning, and waste disposal.[40] Based on this information, risk estimates for cancer and respiratory hazards in Berrien County were determined.

Physical Environment

According to the NATA, the risk of someone in Berrien County developing cancer from these pollutants is 22.05 per 1 million population.[39] In other words, if there were 1 million people living in Berrien County, the estimated number of residents who would develop cancer would be about 22. This is slightly lower than the estimated cancer risk for the state of Michigan (23.8 per 1 million). At a sub county level, one census tract in St. Joseph (census tract 10) has a high cancer risk compared to the state (31.56 per 1 million). However, due to limitations in the data, sub county estimates should be viewed as a starting point for investigation. Local level air monitoring and more detailed modeling are needed to determine local level risk.[40]

Recent research suggests that environmental noise such as traffic noise may be associated with depression and anxiety.

NATA data suggests that air toxins are unlikely to cause respiratory conditions at the county or state level. Locations with a hazard index of 1 or lower means that air toxins are unlikely to cause adverse noncancer health effects over a lifetime of exposure. Berrien County and Michigan both have a hazard index far below this level (0.26 and 0.29, respectively). However, this data does not reflect risk at a more local level. Further research is needed to assess the respiratory risk associated with living in close proximity to sources of hazardous emissions, such high traffic roads.[41]

The Local Built Environment

The second most frequently cited idea "How would you improve the health of your community?" among Photovoice respondents was physical infrastructure. Respondents frequently mentioned removing or improving old and abandoned houses, buildings, and factories.

There is a lack of data available on the number of abandoned homes; however, information on the age of the existing housing stock can indicate locations in the community that are at risk for some of the negative health effects of aging infrastructure, such as lead poisoning from leaded paint. This is particularly true for lower value old homes.[42] Lead exposure, especially in children, can cause irreversible IQ reduction and attention-span reductions. Young children suffering from lead poisoning can experience learning, behavior, and health problems. Adults exposed to excessive lead can suffer from high blood pressure, kidney damage, and fertility problems.[43]

P: What are the biggest health issues in your community?

"The biggest health issue in our community to me is probably drugs and depression (mental health). These can take place and be caused by a number of situations, but part of it may be not having enough involvement with nature in our everyday lives, and having so many open unregulated areas that let crime walk right in like the abandoned buildings and the unsupervised parts of riverfront park."

–Under 18, white, female

As seen in Table 8.2, Benton Harbor, Niles, St. Joseph, Three Oaks, Galien, Buchanan, and Weesaw Township have the highest percentage of housing built pre 1940.[44,45] Of these locations, Benton Harbor, Galien Township, Niles Township, and Three Oaks census tracts had the greatest percentage of children living below the poverty level, indicating higher risk for lead poisoning.[41]

City/Township	Geography	Percent housing units built pre 1940s	Percent below poverty level, under 5 years old
Benton Harbor	Census Tract 5	68%	30.2
Niles	Census Tract 207	47%	0
St. Joseph	Census Tract 8	45%	8.3
Benton Harbor	Census Tract 6	34%	67.9
Three Oaks	Census Tract 114	34%	21.5
Galien Township	Census Tract 115	30%	46.7
Benton Harbor	Census Tract 3	28%	93.9
Benton Harbor	Census Tract 4	27%	79.1
Niles Township	Census Tract 112	25%	23.9
Buchanan	Census Tract 202	24%	0
Weesaw Township	Census Tract 116	24%	0

Table 8.2 Pre-1940 housing and percent of children living below the poverty level by census tract. See appendix D for a complete table[46]

Sidewalks and Lighting

Photovoice participants also suggested that adding or improving sidewalks and increasing lighting would help to improve health in the community. Research indicates that sidewalks are important opportunities for physical activity and increase community mobility. Locations with no sidewalks are more than twice as likely to have pedestrian/motor vehicle crashes than sites where sidewalks exist. Additionally, inadequate lighting is associated with an increased risk of injury.[47] However, there is limited information on the location and condition of sidewalks in Berrien County.

Limitations

The primary limitation of this report is the lack of data on specific concerns identified by the community. For example, community members identified abandoned housing, sidewalk conditions, the presence of litter and limited street lighting as concerns. However, data on these topics is not regularly collected in all communities. Additionally, due to the difficulty and expense of collecting environmental data, many data sources used in this report are several years old, are based on models, or are updated irregularly. It should be noted that this report can only relay information on contaminants and locations which are monitored by the EPA and other government organizations. As such, contaminantes of emerging concern (i.e., pharmaceuticals and personal care products) and locations which have not been assessed (or received funding to assess) for pollution by the EPA are not represented.

[1] Coutts, C. (2010). Public Health Ecology. Journal of Environmental Health. Retrieved from http://purl.flvc.org/fsu/fd/FSU_migr_durp_faculty_publications-0006

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[5] U.S. Environmental Protection Agency. (2020). CIMC - About the Data. Retrieved from https://www.epa.gov/cleanups/cimc-about-data#background
[6] Brownfields are defined as real properties, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. EPA assesses these sites to clean them up, prevent more contamination and make plans for re use.
[7] National Achieves and Records Administration. (2018). National Priorities List. Retrieved from https://www.federalregister.gov/documents/2018/01/18/2018-00623/national-priorities-list
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[10] Gray, S. C., Edwards, S. E., & Miranda, M. L. (2013). Race, socioeconomic status, and air pollution exposure in North Carolina. Environmental Research, 126, 152–158. doi: 10.1016/j.envres.2013.06.005
[11] For this analysis, vulnerable communities are census block groups where a large percentage of the population are low income, linguistically isolated, have less than a high school education, are under the age of five or older than 64, and are a race other than white alone and/or list their ethnicity as Hispanic or Latino.
[12] U.S. Environmental Protection Agency. (2019). EJSCREEN Technical Documentation. Retrieved from https://www.epa.gov/sites/production/files/2017-09/documents/2017_ejscreen_technical_document.pdf
[13] All vulnerable population data used to create maps are from 2019: https://www.epa.gov/ejscreen/downloadejscreen-data
[14] Large quantity generators create large amounts of waste that can be stored in containers, tanks, drip pads, and containment buildings for up to 90 days. After 90 days waste is treated, stored or disposed of at an approved facility. 15 U.S. Environmental Protection Agency, (1996). Hazardous Waste Requirements for Large Quantity. Retrieved from https://www.epa.gov/sites/production/files/2015-01/documents/lqgpdf.pdf
[16] The proximity score represents the relative magnitude of the proximity of the population within a block group to facilities or waste sites surrounding it. A block group with more facilities closer to the block group's residential population will have a higher score than a block group where facilities are further away.
[17] For the purposes of this report, a location (i.e., census block group) is considered to have a high proximity score if the score is higher than 80% percent of other locations in the U.S. In other words, proximity scores in the 80th percentile or greater are considered high scores.
[18] U.S. Environmental Protection Agency. (2019). RCRAInfo. Retrieved from https://enviro.epa.gov/facts/rcrainfo/search.html
[19] U.S. Environmental Protection Agency. (2019). Technical Documentation for EJSCREEN. Retrieved from https://www.epa.gov/sites/production/files/2017-09/documents/2017_ejscreen_technical_document.pdf
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[22] It should be noted that E. Coli and PCB are monitored and removed from municipal water sources.
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[25] U.S. Environmental Protection Agency. (2020). Water Systems Search Results. Retrieved from https://ofmpub.epa.gov/apex/sdw/f?p=108:103::NO:RP::
[26] In 2018, Michigan revised the Lead and Copper rule to require more comprehensive sampling methods. For a full list of changes, please visit: http://graham.umich.edu/media/files/Lead-and-Copper-Rule-Info-Brochure-11x17- Tabloid-042319.pdf
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[29] Goldsmith, J. (1968). Effects of Air Pollution on Human Health. Air Pollution and Its Effects, 547–615. doi: 10.1016/b978-0-12-666551-2.50021-2
[30] National Ambient Air Quality Standards are set for ground-level ozone, particulate matter, carbon monoxide, lead, sulfur dioxide, and nitrogen dioxide.
[31] U.S. Environmental Protection Agency. (2020). Michigan Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Retrieved from https://www3.epa.gov/airquality/greenbook/anayo_mi.html
[32] Designated as marginal attainment. However, the State of Michigan, through the Department of Environment, Great Lakes, and Energy (EGLE), has filed for Berrien to be predesignated as in attainment due to improved air quality from 2017 to 2019. From more information visit https://www.michigan.gov/documents/egle/aqd-aqe-sipBerrien_County_Redesignation_Request_680643_7.pdf.
[33] U.S. Environmental Protection Agency. (2020). Ground-level Ozone Pollution. Retrieved from https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#:~:text=

[34] Studies are ongoing to determine sources and patterns. See the Lake Michigan Ozone Study for details as they emerge. https://www.michigan.gov/documents/deq/deq-aqd-air-aqe-ozone-EPA-WMichigan-report2008_272757_7.pdf
[35] U.S. Environmental Protection Agency. (2020). What is the Toxics Release Inventory? Retrieved from https://www.epa.gov/toxics-release-inventory-tri-program/what-toxics-release-inventory
[36] In this case, releases are TRI only and does not account for other industry releases (see NATA)
[37] U.S. Environmental Protection Agency. (2019). How RSEI Should Be Used. Retrieved from https://www.epa.gov/rsei/how-rsei-should-be-used
[38] The remaining 0.04 is attributable to transfers to publicly owned treatment works (i.e., sewage treatment plant).
[39] U.S. Environmental Protection Agency. (2019). EPA's Risk-Screening Environmental Indicators (RSEI) model, Version 2.3.8. Retrieved from https://edap.epa.gov/public/extensions/EasyRSEI/EasyRSEI.html
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[44] The largest decrease in lead dust levels are seen between housing built prior to 1940 and after 1940.
[45] Clark, C., Crumpler, C., & Notley, H. (2020). Evidence for Environmental Noise Effects on Health for the United Kingdom Policy Context: A Systematic Review of the Effects of Environmental Noise on Mental Health, Wellbeing, Quality of Life, Cancer, Dementia, Birth, Reproductive Outcomes, and Cognition. International Journal of Environmental Research and Public Health, 17(2), 393. doi: 10.3390/ijerph17020393
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Recreation Environment

Recreation Environment

High-Level Findings

- Townships with the least park access also have the most restricted access parkland (i.e., membership or entrance fees are required).
- Approximately 24% of the urban population does not live within walking distance to a mini park (i.e., a park that is 5 acres or less); 11% do not live within a walking distance of parks larger than 5 acres.

P: What in your community makes it easy to be healthy?

"We have some amazing walking trails but I know other communities aren't as lucky as ours."

–Female student, BCMSC

- Trails in Berrien County provide additional exercise options; however, they are generally located in areas where access to recreation resources is not an issue.

Introduction

The health effects of physical activity are well documented, with research consistently finding associations between exercise and reduced risk of mortality from cardiovascular disease.[1] Research has also shown that exercise can result in improved bone health, reduced cancer risk, improved cognitive function, reduced fall-related injuries for older adults, and reduced risk of excessive weight gain, gestational diabetes, and postpartum depression.[1] More recently, evidence has also indicated the possible connection between exercise and a reduced risk of anxiety and depression, improved sleep, and improved quality of life.[2]

However, despite the well-known benefits of exercise, in 2014 an estimated 32.9% of Berrien County adults did not engage in leisure time physical activity.[3] In Michigan and the United States, fewer adults did not engage in leisure time physical activity (25.5% and 22.6%, respectively).[4] While individual level factors such as physical ability influence exercise habits, these habits are also a product of the interaction between a person and the environment.[5] Specifically, individuals are influenced by the following:

1. Social/cultural environment: Exercise is encouraged through social supports and a culture of active living. For example in a supportive environment friends and co-workers regularly take walking breaks and invite others to join them.
2. Built environment: The physical infrastructure required for exercise and active living is present. For example, sidewalks are available and accessible for walking breaks.
3. Policy environment: Budgets, zoning, and development codes, school physical activity policy, and building and road design standards ensure the creation and maintenance of a supportive social/cultural and built environment. For example, sufficient tax revenue to devote to maintaining safe sidewalks.[5]

Figure 9.1 Photo by 9th grade student at BCMSC

The connection between the built recreation environment and health was highlighted in the 2019 CHNA survey and Photovoice project results. A frequent response to the prompt, "What in your community helps you to be healthy?" was the presence of parks, trails, and indoor recreation opportunities such as the Boys and Girls Club and the Niles-Buchanan YMCA. However, respondents also expressed the need to increase the availability and quality of outdoor spaces such parks, trails, and affordable indoor facilities (e.g., gyms). Respondents recognized that some communities have a multitude of diverse recreation opportunities, but this is not the experience of all Berrien County residents. Research indicates that recreational opportunities are often inequitably distributed. Generally, higher income, majority white communities have greater access to parkland and have higher quality parks than low-income and minority communities.[6]

Recreation Environment

To understand the relative accessibility of recreational opportunities in the county, the proximity and quantity of parks, park acreage, trails, and recreation facilities were analyzed. Due to the impact that cost has on accessibility, this report focuses on parks and trails that are open to the public and free of charge.[7,8]

Park Quantity, Park Size, and Accessibility

Assessing the number of residents per park is one way that a community can determine if available parks are adequate for the number of people living within a municipality.[9,10] Generally, a lower number of residents per park implies a greater degree of accessibility. An additional measure of park quantity and accessibility is the number of park acres per 1,000 population, an important indicator of potential crowding issues. Generally, higher acreage implies a lower risk of crowding (i.e., too many people for the available space) and greater degree of accessibility due to increased availability of space for recreation. It should be noted that the National Recreation and Park Association does not set standards for measures of quantity, as there is no one standard that "encompasses the uniqueness found in every community across the country."[11] For this report, scores (i.e., residents per park and acres per 1,000 population) for municipalities will be compared to the average score of like municipalities (e.g., urban municipalities are compared to the average for all urban municipalities).

> **P**: What are some things in your community that make it hard to be healthy?
>
> "Gyms, walking trails, lakes (glorified ponds), are all in wealthier communities. Access to libraries, safe exercise locations, farmers markets for fresh produce are not accessible to my home patients from their neighborhood without access to a car. And if you don't have reliable transportation, which is rarer in a poorer community, you don't have access to the benefits. Even road conditions are terrible in poorer neighborhoods, which if you have an older car makes it even harder."
>
> *–30 - 44 y.o., white, female*

Out of the 30 townships and cities in Berrien County, only one (Bainbridge Township) did not have access to a park. The cities of Benton Harbor, Niles, St. Joseph, Coloma, New Buffalo, and Watervliet, as well as Watervliet Township, have more parks than average; however, these parks are likely smaller than average. These parks may experience a high degree of crowding, which limits their usability for socializing and recreation. Benton, Royalton, Lincoln, Hagar, Lake, and Bertrand Townships as well as the city of Bridgman have fewer parks for the population size; however, the parks are relatively large. This indicates that park acreage is likely concentrated to a few large parks, potentially reducing resident proximity to a park. Moreover, a lack of proximity is particularly burdensome for individuals without a vehicle. Oronoko, Coloma, Bainbridge, Pipestone, Baroda, Galien, and Sodus Townships have relatively fewer and smaller than average parks, indicating the least degree of access in the county.

Income and Access

In parts of Benton Township, almost half of homes do not have a vehicle. Approximately 23% of the population in this area is not within walking distance to a park.

Some municipalities contain large amounts of recreational land which is restricted access due to entrance or membership fees. This provides additional access to a subset of individuals (e.g., those able to pay entrance fees) while leaving low income residents with comparatively fewer options. In particular, Oronoko and Pipestone Townships have the lowest amount of park access in the county and also have the largest share of restricted access park space. Table 9.1 displays the number of people per park, the number of park acres per 1,000 people, and the percentage of park acres which is restricted access for each municipality in Berrien County.

Urban Municipality

	People per open park	Open access park acres per 1,000	% of park acres, open access	% of park acres, restricted access
Median	1,071	18.5	52.8%	47.2%
Oronoko Township	↑2,281	↓2.6	↓9.8%	↑90.2%
Benton Township	↑2,072	20.5	↓29.1%	↑70.9%
City of Buchanan	242	29.2	↓44.9%	↑55.1%
City of Benton Harbor	497	↓13.8	↓49.0%	↑51.0%
City of Niles	493	↓10	↓50.9%	↑49.1%
Coloma Township	↑1,242	↓9.6	52.8%	47.2%
Niles Township	1,071	18.5	55.1%	44.9%
Royalton Township	↑1,589	21.3	54.8%	45.2%
St. Joseph Township	705	34.3	75.9%	24.1%
City of St. Joseph	377	↓17.8	79.5%	20.5%
Lincoln Township	↑1,457	82.1	97.3%	2.7%

Rural Municipalities

	People per open park	Open access park acres per 1,000	% of park acres, open access	% of park acres, restricted access
Median	592	38.8	68.8%	31.2%
Bainbridge Township	↑No parks	↓0	NA	NA
Pipestone Township	↑1,168	↓2.2	↓0.7%	↑99.3%
Watervliet Township	346	↓6.7	↓16.1%	↑83.9%
City of Coloma	334	↓2.5	↓22.8%	↑77.2%
Buchanan Township	585	78.8	↓28.4%	↑71.6%
Hagar Township	↑724	38.8	↓30.4%	↑69.6%
New Buffalo Township	148	196.1	↓56.0%	↑44.0%
Lake Township	↑741	437	↓57.4%	↑42.6%
Three Oaks Township	221	117.1	↓64.4%	↑35.6%
Bertrand Township	↑655	76.7	↓64.8%	↑35.2%
Berrien Township	↑631	50.3	72.9%	27.1%
Chikaming Township	155	284	82.3%	17.7%
City of Bridgman	↑599	161	88.1%	11.9%
City of New Buffalo	117	↓11.8	94.5%	5.5%
Weesaw Township	370	151.9	96.4%	3.6%
Baroda Township	↑919	↓12.1	100.0%	0.0%
City of Watervliet	250	↓32.3	100.0%	0.0%
Galien Township	↑730	↓14.1	100.0%	0.0%
Sodus Township	↑798	↓6.5	100.0%	0.0%

↑=Above the median and unfavorable, ↓=Below the median and unfavorable, NA= Not Applicable

Table 9.1 Park access by urban and rural municipalities in Berrien County

Park Proximity, Park Size, and Recreational and Social Needs

Figure 9.2 Photo by 9th grade student at BCMSC

Living in close proximity to parks is associated with park use, physical activity, and mental wellness.[12,13] These benefits exist regardless of the size of a park. However, the type of activity a park is best suited for is determined by its size. For example, mini parks (i.e., parks up to 5 acres in size) serve specific recreational needs (e.g., child play) and provide space for social gatherings (e.g., picnics). Neighborhood and community parks (i.e., parks larger than 5 acres) serve broader social and recreational needs and provide space for activities such as sports and jogging.[14]

Portions of the urban population do not live within walking distance to a park.[15] Notably, 68% of the population in census tract 213 (Berrien Springs) does not live within walking distance of a park, indicating a lack of access. A further 43% of the population in census tract 212 (Niles Township) does not have access. Additionally, 15% of the population in census tract 21 and 23% in census tract 22 (Benton Township) does not have access to parks.

Approximately a quarter (24%) of the urban population in the county does not live within walking distance to a mini park. Most notably, residents of Benton, Lincoln, Niles, and St. Joseph Townships do not have access to mini parks. Eleven percent of the urban population does not live within walking distance of a neighborhood or larger park, including residents living in census tracts in Benton, Coloma, Niles, and St. Joseph Townships, the city of Niles, and Berrien Springs. Conversely, it is estimated that all individuals living in the cities of Benton Harbor, Bridgeman, Buchanan, and St. Joseph have access to mini and larger parks (See Table 9.2 for the percent of the population living outside of walking distance to a park for each urban census tract in Berrien County).

P: What are some things in your community that help you to be healthy?

> “Parks that you can either walk to or that you can get to quickly and take walks.”
>
> *–30 - 44 y.o., black, female*

City/Township/Village	Tract Name	% without access to a mini park	% without access to a neighborhood or community park
Benton Township	23	0%	0%
Benton Township	20	100%	0%
Benton Township	22	23%	23%
Benton Township	21	15%	43%
City of Benton Harbor	3	0%	0%
City of Benton Harbor	5	0%	0%
City of Benton Harbor	6	0%	0%
City of Benton Harbor	4	0%	0%
City of Bridgman	111	0%	0%
City of Buchanan	202	0%	0%
City of Niles	205	0%	0%
City of Niles	207	0%	0%
City of Niles	209	0%	16%
City of Niles	206	0%	29%
City of St. Joseph	8	0%	0%
City of St. Joseph	10	0%	0%
City of St. Joseph	11	0%	0%
Coloma Township	102	0%	27%
Lincoln Township	14	38%	0%
Lincoln Township	15	44%	0%
Lincoln Township	16	100%	0%
Lincoln Township	17	100%	0%
Niles Township	211	100%	0%
Niles Township	210	0%	0%
Niles Township	212	43%	100%
Berrien Springs	213	68%	68%
St. Joseph Township	9	0%	0%
St. Joseph Township	13	100%	0%
St. Joseph Township	7	0%	28%

Table 9.2 Percent of residents without access to parks by city, township, or village

Access to Other Recreation Resources

Much of the research linking the recreation environment to health assesses population proximity to parks. However, community input indicated that other resources for physical activity (e.g., gyms and other recreation facilities) were also important for health. Analysis suggests that over 49,000 individuals living in urban census tracts do not live within walking distance of a recreation facility.[16] Residents of Benton Township have the least access with an estimated 88% of the population outside of walking distance. A lack of recreation facilities within walking distance, combined with the lack of transportation, further complicates access to recreational resources (see Figure 9.3 to view available recreation resources and vehicle ownership rate by census tract).

P: What in your community make it hard to be healthy?

> "Things in our community that makes it hard to be healthy are fast food, dangerous parks, expensive gym memberships, broken sidewalks/running/biking areas."
>
> *–Under 18 y.o., white, male*

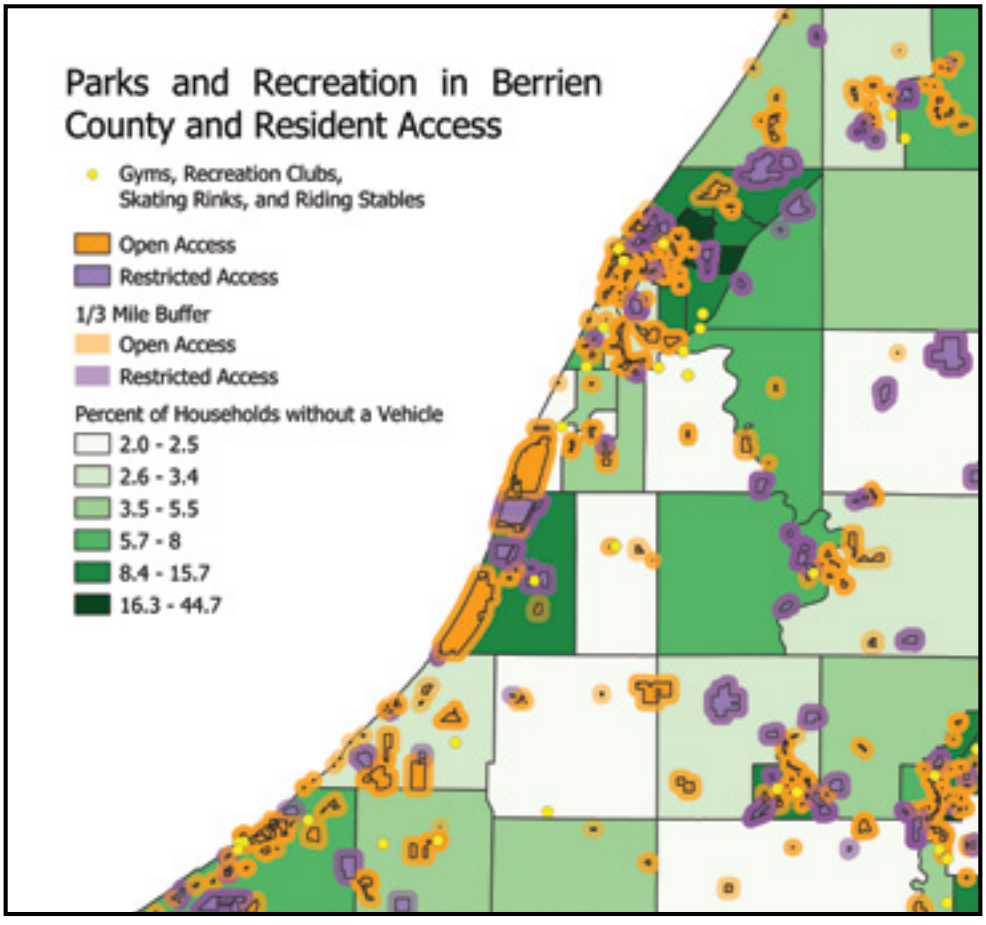

Figure 9.3 Parks and Recreation facilities in Berrien County and resident access

Recreation Environment

In addition to parks and gyms, survey respondents also indicated a need for trails.[17] Trails can serve as a form of active transportation to schools and places of work. Additionally, research shows that the presence of trails in parks is associated with increased park use and physical activity.[18] At the time of analysis, there were more than 32 miles of trails within the county (see Table 9.3 for the number of trail miles by township and city). These trails provide additional recreation options in locations with lower than average park acreage (e.g., Benton Harbor). However, these trails are typically located within walking distance of existing parks, which may help to increase park use but does not necessarily improve recreation access (i.e., trails do not typically increase the number of people who are within walking distance to a recreation resource). Additionally, trails are primarily concentrated in urban municipalities, where residents are generally closer to parks and recreation resources than residents of rural municipalities.

P: How would you improve the health of your community?

"Create community sport leagues for adults, make a trail system that is actually a decent length and connected well, the harbor shores trails are basically [unusable] during golf season, encourage bike riding with more bike lanes, make local road running races with monetary prizes from entrance fees."

–18 - 29 y.o.,white, male

Municipality	Trail Miles
City of Benton Harbor	7.066
City of St. Joseph	6.424
City of Buchanan	4.790
Niles Township	4.403
City of Niles	2.438
Benton Township	2.24
St. Joseph Township	2.179
Lincoln Township	1.738
Coloma Township	0.63
Watervliet Township	0.376
Buchanan Township	0.333
Grand Total	**32.617**

Table 9.3 Trail miles by municipality in Berrien County

Trails are not necessarily accessible to all residents due to real and perceived barriers. For example, the municipality with the most trail miles in the county is the City of Benton Harbor. However, these trails are almost exclusively located in the Harbor Shores Golf Course, which may prevent use due to fear of injury from golf balls or from a lack of knowledge that the trails are for public use.

Limitations/Future Research

CHNA respondents indicated that components of park quality were of concern, particularly the conditions of sidewalks and roads, the lack of adequate lighting, and the perceived safety of existing exercise resources. However, there is a lack of data available regarding park quality. While many parks and recreation plans include information on amenities and the condition of park equipment, many do not. There is also a lack of information available on the condition and safety of sidewalks, roadside shoulders, and bike lanes for pedestrians.

Respondents also indicated concerns over the affordability of recreation resources. However, parks and recreation plans were inconsistent in providing information on the cost of usage and other access restrictions. Information on other non-traditional recreation resources such as schools, cemeteries, and privately-owned public spaces are not consistently mentioned in recreation plans and will need further research.

Lastly, respondents mentioned a lack of advertisement. Further research is needed to determine areas where additional signage could be located to increase utilization (e.g., non-motorized trail heads) and where advertising can promote community use of local parks (e.g., advertising free parking passes).

P: What are the biggest health issues in your community?

"It's not very safe. The roads, sidewalks, even the lights. A kid got hit walking to school last year because the street lights are terrible and it's dark when we walk to school."

–10th grade, male student, Niles New Tech

[1] U.S. Department of Health and Human Services. (2019). Physical Activity Guidelines for Americans 2nd edition. Retrieved from https://health.gov/sites/default/files/2019-10/PAG_ExecutiveSummary.pdf

[2] Motta, R. W. (2010). The Role of Exercise in Reducing Childhood and Adolescent PTSD, Anxiety, & Depression. PsycEXTRA Dataset. doi: 10.1037/e573582011-004

[3] Berrien County Health Department. (2020). 2018-2019 Berrien County Behavioral Risk Factor Surveillance Survey. Retrieved from http://www.berriencounty.org/ArchiveCenter/ViewFile/Item/528

[4] Fussman C. (2015). Health Risk Behaviors within the State of Michigan: 2014 Behavioral Risk Factor Survey, 28th Annual Report. Retrieved from https://www.michigan.gov/documents/mdch/2014_MiBRFS_Annual_Report_Final_Web_504843_7.pdf

[5] Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An Ecological Approach To Creating Active Living Communities. Annual Review of Public Health, 27(1), 297–322. doi: 10.1146/annurev.publhealth.27.021405.102100

[6] Rigolon, A. (2016). A complex landscape of inequity in access to urban parks: A literature review. Landscape and Urban Planning, 153, 160–169. doi: 10.1016/j.landurbplan.2016.05.017

[7] Harvard Chan University (2019). Environmental Barriers to Activity. Obesity Prevention Source. Retrieved from https://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/physical-activity-environment/

[8] Excluded from analysis are locations identified by the Southwest Michigan Planning Commission (SWMPC) as closed, limited, or restricted access. Private parks, athletic facilities or fields, sports facilities, golf courses, and education centers were also excluded unless otherwise stated as open to the public. All parks and recreation data were provided by the SWMPC and include recreational options that are owned and operated by non-governmental organizations (i.e., the Sarett Nature Center) as well as local, county, and state governmental bodies.

[9] Residents per park equals the municipal population divided by the number of parks within, or intersecting, municipality boarders.

[10] This analysis includes parks that overlap municipality boundaries. For example, the Boyle Lake State Wildlife Area is divided between Weesaw and Buchanan Townships and counts as a park in each municipality. The park acres within Weesaw Township are counted toward the total acreage for Weesaw Township and the acers within Buchanan Township are counted toward the Buchanan Township total.

[11] May, M. (2019). NRPA Park Metrics Replaces NRPA Areas and Facilities Standards. Retrieved from https://www.nrpa.org/parks-recreation-magazine/2019/november/nrpa-park-metrics-replaces-outdated-nrpa-areas-and-facilities-standards/

[12] Sturm, R., & Cohen, D. (2014). Proximity to urban parks and mental health. The journal of mental health policy and economics, 17(1), 19–24. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4049158/

[13] Kaczynski, A. T., Besenyi, G. M., Stanis, S. A. W., Koohsari, M. J., Oestman, K. B., Bergstrom, R., … Reis, R. S. (2014). Are park proximity and park features related to park use and park-based physical activity among adults? Variations by multiple socio-demographic characteristics. International Journal of Behavioral Nutrition and Physical Activity, 11(1). doi: 10.1186/s12966-014-0146-4

[14] Nicholls, S. (2001). Measuring the accessibility and equity of public parks: a case study using GIS. Managing Leisure, 6(4), 201–219. doi: 10.1080/13606710110084651

[15] In this analysis, walking distance is approximately a 6-minute walk, or 1/3 of a mile. If a resident lives more than 1/3 of a mile from a park, they lack access. Urban population refers to residents of urban census tracts.

[16] Analysis used Standard Industry Classification (SIC) codes from Hoover's database to identify recreation facilities in Berrien County. Included in this analysis were a wide variety of facilities including gyms, community centers, dance studios and pools. Facilities with the following Standard Industry Classification (SIC) codes were included: 799101, 799102, 799103, 799106, 799107, 799108, 799109, 799110, 799111, 799112, 799201, 799701, 799702, 799703, 799704, 799707, 799711, 799717, 799723, 799901, 799908, 799958, 799969, 799971, 799984, or 799998. Excluded from this analysis were "civic organizations" and "amusement and recreation services, not elsewhere classified".

[17] This analysis includes trail data from the SWMPC and from the Sarett Nature Center website.

[18] Zhang, R., Wulff, H., Duan, Y., & Wagner, P. (2019). Associations between the physical environment and park-based physical activity: A systematic review. Journal of Sport and Health Science, 8(5), 412–421. doi: 10.1016/j.jshs.2018.11.002

Social Cohesion

Social Cohesion

High-Level Findings

- Social cohesion is positively associated with many social determinants of health.
- The relationship between social cohesion and many of the social determinants is not immediate and often indirect.
- Social cohesion may also have negative effects by causing "in-group" vs. "out-group" dynamics.
- There are many levers that can be used to enhance social cohesion.

Introduction

There is no single definition of social cohesion.[1] However, for the purposes of this CHNA, social cohesion is defined as the connectedness or "bonds" that hold members of a community together. Members of socially cohesive communities have strong interpersonal relationships, dense social networks, and high levels of mutual trust and cooperation.

They adhere to a shared system of values, beliefs, and norms. Principles of solidarity, belonging, inclusion, and the pursuit of collective wellbeing are central to socially cohesive communities.[2,3]

Social cohesion was the number one theme in response to the prompt "When I experience hard or stressful times, these are the ways I help myself feel better/relax/calm down." Participants named various ways they connect with families, friends, spiritual leaders and others during hard or stressful times.

Social Cohesion and Its Relationship to Health and Health Behaviors

Research suggests that social cohesion is associated with many health benefits. It is positively associated with mental health, physical health, and a wide range of health behaviors.[4,5]

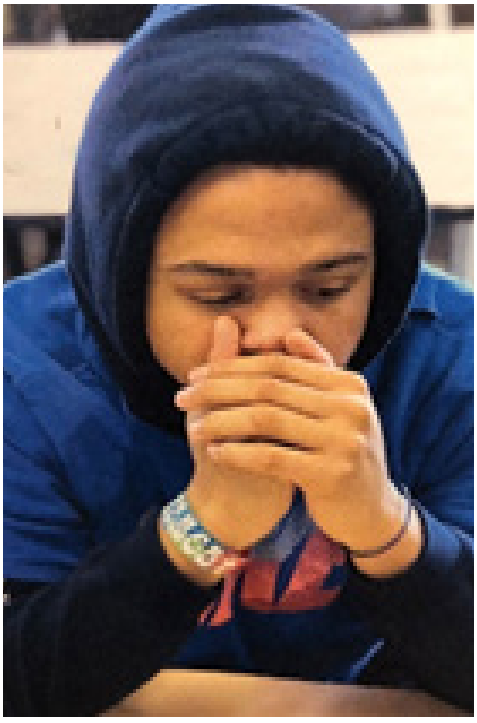

Figure 10.1 Photo taken by student at Bridge Academy

Social Cohesion on Mental Health

Satisfying relationships with family, friends, neighbors, and other community members are associated with greater happiness and lower risk of dementia.[6] Having a person or people in one's life who can be relied on for practical support is associated with a calmer nervous system, healthier brain, and reduced emotional and physical pain.[7] Social connections are associated with lower stress levels which is causally linked to reduced risks for cardiovascular, gastrointestinal, endocrine, and immune system problems.[8] Neighborhood social cohesion is associated with better adolescent behavioral health.[9]

Social Cohesion and Physical Health

Higher levels of neighborhood social cohesion are associated with lower blood sugar levels,[10] Type 2 Diabetes,[11] inflammatory biomarkers,[12] hypertension,[13] and risk of being overweight or obese.[14] Perceptions of neighborhood social cohesion also correlate with reduced risks of heart attack,[15] stroke,[16] stroke mortality,[17] and sexually transmitted diseases.[18] Trust, a key indicator of social cohesion, is associated with reduced mortality.[19] (For Lakeland's Trust and Relationships Summary, see Appendix E).

Social Cohesion

Lack of Social Cohesion (i.e., social isolation) on Health

Chronically isolated individuals are more likely to develop inflammation-related diseases[20] and are at greater risk factor for poor cognitive performance, cognitive decline, poor executive functioning, negativity, depressive thoughts, and heightened sensitivity to social threats.[21] Lack of social ties are also associated with increased risk of infections, mental illness, cardiovascular and respiratory conditions, and early mortality.[22,23,24] Disconnection from mainstream society, such as residential segregation, is associated with many poor health effects among African Americans such as mortality,[25] cardiovascular disease and hypertension,[26] cognitive decline,[27] pre-term and low weight births,[28] and late-stage breast and lung cancers.[29,30]

Social Cohesion and Health Behavior

Social cohesion is also associated with many health behaviors such as medication adherence,[31] smoking,[32] physical activity,[33,34] sleep,[35] and preventive health care such as vaccinations, cholesterol tests, mammograms, and Pap smears.[36] Community cohesion is also associated with lower risk for substance use,[37] better diet, and exercise habits.[38] Living in less socially cohesive neighborhoods is associated with increased smoking and more sedentary lifestyle.[39]

The residents of low-income communities that have low levels of social cohesion are more likely to be food insecure.

Social Cohesion and Its Relationship to the Social Determinants of Health

Social cohesion is associated with many social (and environmental) factors known to determine health and health behaviors, including those identified as needs in this CHNA (i.e., the food, recreational, and physical environments; and health care resources). In subsequent sections of this chapter, the discussion will focus on the associations between social cohesion and the following social determinants: transportation, housing, the physical environment, the recreational environment, economic conditions, and faith-based and spiritual practices.

Transportation

Transportation infrastructure, such as roads, sidewalks, paths, bridges, rail, airports, waterways, and harbors, has significant impacts on community social cohesion. Depending on factors like design, location, maintenance, modal mix, and cost of use, transportation infrastructure can promote (or discourage) social cohesion by making it easier (or harder) for people to connect and to build relationships with one another. For instance, communities where residents often travel by foot, bike, or public transit are more cohesive than auto dependent communities.[40] In fact, auto dependency has a negative effect on activities that build cohesion, such as visiting friends, participating in community sports and cultural activities, and engaging in civic and political activities.[41]

People in communities where physical activity, such as walking or biking, serves as a mode of transportation exhibit more social cohesion community, and better mental health.

Residents of Berrien County are highly auto dependent. The public transit system is fragmented and provides limited service. Moreover, other aspects of the regional transport infrastructure, such as the bridges between the cities of St. Joseph and Benton Harbor, undermine social cohesion by contributing to community severance[42] – i.e., physical and psychological barriers that limit the development of social networks among communities.

P: What are some things in your community that make it hard to be healthy?

> "Lack of complete bike paths/sidewalks to connect neighborhoods and other living/playing areas. We're bound by cars for safe transportation."
>
> *–30 - 44 y.o., black, female*

Together, these three factors – high auto dependence, poor public transport, and infrastructure that contributes to community severance – challenge the development of social cohesion across Berrien County. This is manifest, for instance, by the limited relationships between north and south county residents, and between the residents of Benton Harbor and St. Joseph.

P: How would you improve the health of your community?

> "Greater connectivity with sidewalks and bike paths that link neighborhoods and downtown St. Joe. Benton Harbor desperately needs more sidewalks, public transportation, and better grocery options."
>
> *–30 - 44 y.o., black, female*

Housing

Residential stability impacts community social cohesion. The less frequently community members change residences, the more time and opportunity they have to build stable relationships of trust and reciprocity, and, therefore, social cohesion with their neighbors. Residential stability also increases likelihood that people will participate in civic groups, neighborhood associations,[43] and local elections (e.g., voter turnout) – all of which are positively associated with social cohesion. Figure 10.2 shows that across subdivisions in Berrien County, the higher the level of residential stability, the higher the rate of voter turnout.[44,45]

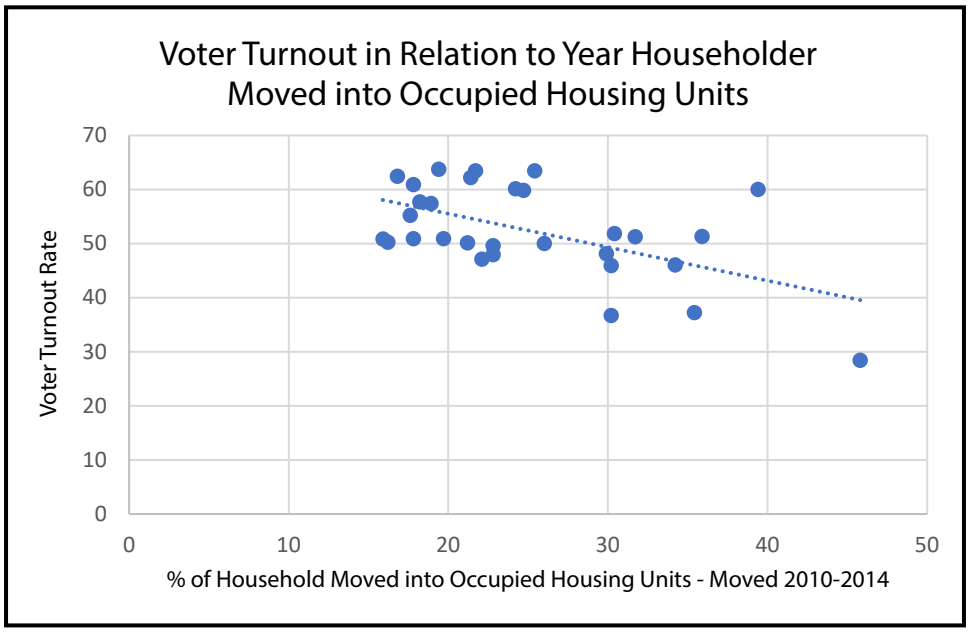

Figure 10.2 Scatterplot showing Voter Turnout Rate in relation to Year Householder moved into Occupied Housing Units From 2010 to 2014

Social cohesion is also impacted by homeownership. Compared to renters, homeowners are less inclined to move (due to higher costs of moving) and, therefore, have longer community tenure which is associated with greater social cohesion. They are also more inclined to be civically and socially engaged (e.g., friendship formation, voting, and neighborhood associations) which are also associated with higher levels of social cohesion.[46]

In Berrien County, the average rate of owner-occupied housing (a proxy for home ownership) is about 69% compared to 70% state average.[44] Neighborhoods in Benton Harbor have the lowest rates of owner-occupied housing and the lowest rates of voter turnout (see Appendix F for Voter Turnout and associated social determinants by municipality).[47] Communities with high rates of owner-occupied housing, such as St. Joseph Charter, Lincoln Charter, and Chikaming have some of the highest rates of voter turnout.

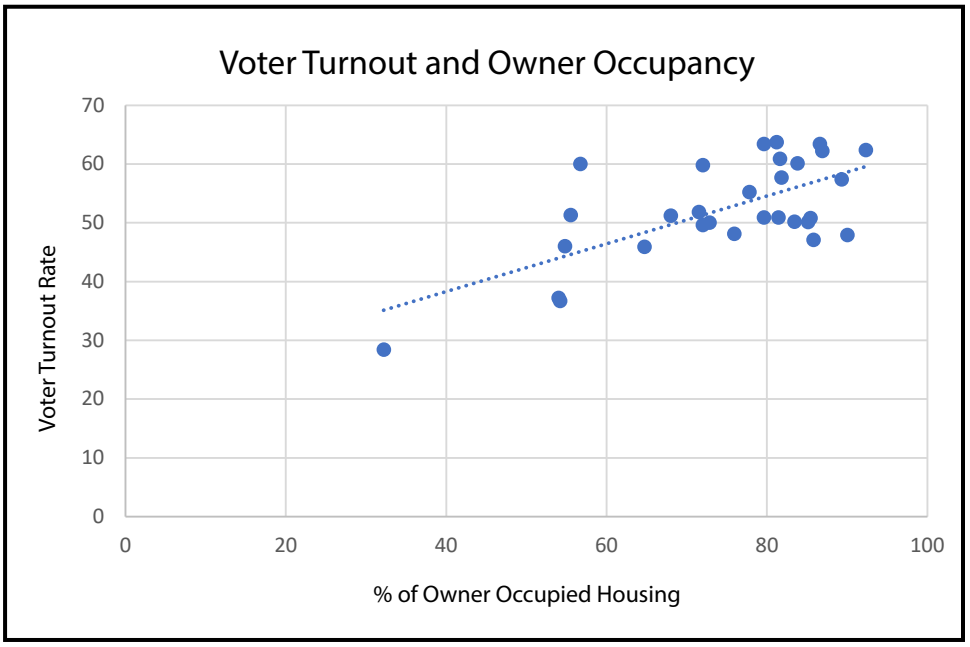

Figure 10.3 Scatterplot showing relationship between Voter Turnout Rate and Owner-Occupied Housing

Figure 10.3 shows that there is a positive association between the percentage of owner-occupied housing in a census tract and the rate of voter turnout, suggesting that those tracts with high rates of home ownership also experience higher levels of social cohesion.

P: How would you improve the health of your community?

"Increase home ownership to instill pride and create a better tax base, increase access to healthy food, fix the sidewalks, decrease racial segregation."

–45 - 59 y.o., white, female

Residential segregation reduces opportunities to build cohesion.[48] Berrien County is highly segregated along racial lines. The dissimilarity index – a measure for segregation – for Berrien County is 70%, meaning that for each census tract to have a black-white racial composition that reflects the composition of the entire county, 70% of people would have to move to another tract. Only five counties in Michigan (Ionia, Muskegon, Montcalm, Wayne, and Gratiot) are more segregated than Berrien. (See Dissimilarity Index in Appendix G).

Figure 10.4 Photo by 10th grade student at Niles New Tech

Physical Environment

Social cohesion is also impacted by a community's physical environment, including the condition of its housing and other structures, sidewalks and streets; the quality of its air, water, and soil; and its weather. For instance, well-maintained sidewalks and streets that are walkable and bikeable help promote social cohesion by providing opportunities for people to connect with one another and to engage in social and civic activities.[49,50] For information on bikeable and walkable communities, see Appendix H.

Social Cohesion

Figure 10.5 Photo by student at Bridge Academy

"Street-scale" features of the physical environment such as street furniture,[51] traffic calming,[52] street crossing aids,[53] public squares, and green infrastructure[54] enhance social cohesion by fostering social interaction, creating opportunities to build community trust and creating a shared sense of community identity.[55] Weather and air quality have been shown to impact people's levels of outdoor activities and, consequently, opportunities for and levels of social interactions and cohesion.[56]

Aspects of the physical environment, such as street lighting, help foster social cohesion by enhancing perceptions of safety, thereby encouraging people to trust, bond, and cooperate with one another.

Recreation Environment

Higher rates of social cohesion are associated with rich recreational environments, such as places where there are many usable parks, trails, beaches, waterways, and playgrounds available for sports and other leisure activities.[57] Activities, such as organized sports teams, walking and running groups, chess and other game clubs, and playgroups, help build cohesion.[58,59] Additionally, sports and leisure activities have been shown to help reduce crime and other anti-social behaviors that erode community trust, collaboration, and mutual support.[60] They have also been shown to build community pride and sense of belonging and to provide participants with opportunities to develop collective problem-solving and negotiation skills which are essential for building social cohesion.[61,62]

Figure 10.6 Photo by student at Bridge Academy

P: What in your community helps you to be healthy?

"The Teen Center gives us a safe place. Play basketball, get help with homework, hang out with friends. It's like the only place we have though."

–18 - 29 y.o., black male

Moreover, research shows that people who engage in sporting activities are more likely to engage in civic activities that build cohesion.[63] Cultural activities, such as festivals and parades, are also associated with community cohesion[64] Through their recreational and leisure programming, local organizations such as the Benton Harbor Boys and Girls Clubs and the YMCA of Southwest Michigan positively affect social cohesion by providing opportunities for social interaction and network development.

Economic Conditions

Social cohesion is profoundly impacted by income inequality, i.e., large income gaps between high and low wage earners. Income inequality can drive social wedges between people of different economic statuses. And, to the extent that economic status correlates with racial and ethnic identity, income inequality can result in social disconnections among racial and ethnic groups. In addition to contributing to a lack of social cohesion, income inequality can lead to a lack of trust, social supports, and a sense of community – all of which are critical to social cohesion. Income inequality is particularly harmful to the health of lower income people.[65]

Social Cohesion

Michigan ranks 15 out of the 50 states in terms of income inequality.[66] In other words, only 14 states in the U.S. have income distributions that are more unequal than Michigan. In addition, Berrien County ranks 278 in terms of income inequality among the nation's 3061 counties. Put another way, income is more inequitably distributed in Berrien County than it is in 90 percent of all counties in the United States. Only six Michigan counties have higher rates of income inequality than Berrien.[67] Data from the Federal Reserve indicates that income distribution in Berrien County has worsened since 2010. That year, the ratio of the income of the top 20% compared to the income of the bottom 80% was 14.32. By 2017, the ratio had increased to 15.36.[68]

Living in high-poverty areas can increase the likelihood that residents will build social cohesion. Low income people who lack formal healthcare, for instance, have been shown to depend on neighbors for medications and medical supplies.

Employment is also associated with social cohesion. Being employed provides access to social networks, such as colleagues and friends, and also helps people develop collaboration and conflict resolution skills, which are necessary to build social cohesion.[69] Jobs that provide opportunities for empowerment, self-determination and voice are associated with key aspects of social cohesion, such as trust and participation in civic life.[70]

In contrast, being unemployed narrows opportunities to build cohesion. Job loss or lack of access to jobs is also associated with lower levels of trust and civic engagement. Joblessness can lead to hopelessness, alienation, and frustration that can breed anti-social behavior, which undermines community cohesion.

Figure 10.7 shows that as the rate of unemployment decreases voter turnout – a measure of social cohesion – increases.[71]

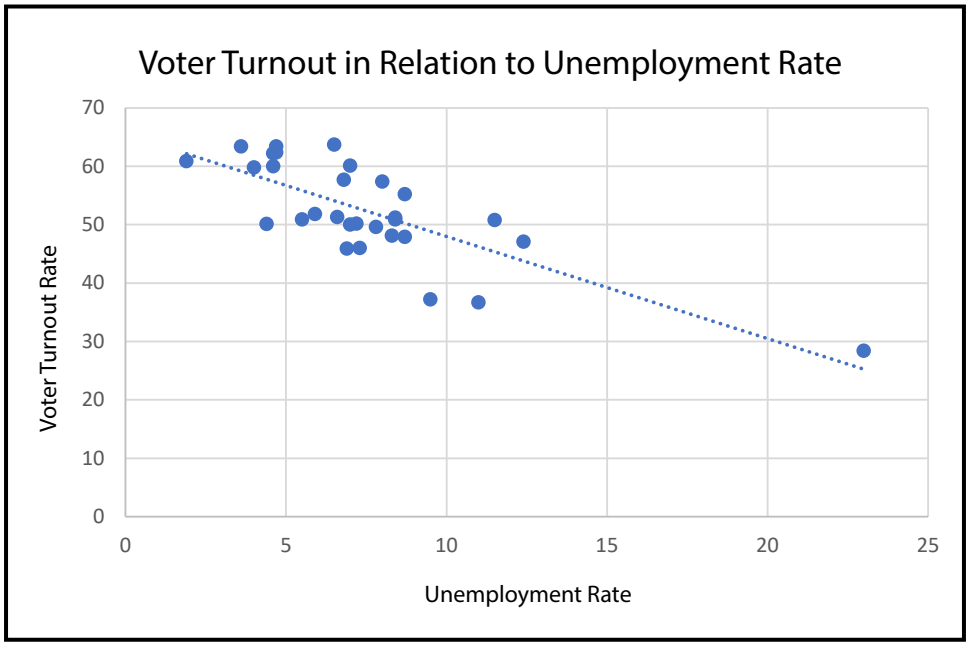

Figure 10.7 Scatterplot showing relationship between Voter Turnout and Unemployment rate

Social Cohesion

Education

Education contributes to social cohesion by socializing young people and providing students with knowledge and skills required to foster social cohesion. For instance, education provides students with knowledge and understanding about social norms, values, and behaviors required for effective interpersonal interaction. Education also provides students with skills needed to form relationships, collaborate, and negotiate with others and establish the trusting social networks that are critical for social cohesion. By teaching the "social rules of the game," education lays the groundwork for social cohesion.

Education may also undermine cohesion by conveying norms, values, and beliefs that drive wedges between people and groups through policies and practices that create social and other types of inequities among different groups of students (e.g., racial minorities, children with physical or cognitive limitations, or language differences).

Religion

Organized religion, religious affiliation, and religiosity (i.e., the internalization of religious doctrine) build social networks and social supports which contribute to social cohesion.[72,73,74,75] They contribute to social cohesion by creating conditions that lead to the establishment of mutual trust, shared values and beliefs, and accepted norms such as reciprocity and volunteerism.[76,77] Organized religion, religious affiliation, and religiosity are also sources of formal and informal social control (i.e., rules and standards that lead to conformity in norms, values, behaviors, and expectations) which are also critical for social cohesion.[78]

P: What are some things in your community that help you to be healthy?

"Church can be a big impact for the community. I didn't know which way to go. Going to church opened my eyes to something greater than my heartache and pain. It can be a hospital for the sick souls."

–Male student, Bridge Academy

Organized religion, religious affiliation, and religiosity can also breed cohesion that leads to the social exclusion and marginalization of "out-groups" based on attributes such as race, ethnicity, gender, sexuality, and national origin. Networks of religious-based trust and shared norms, values, and beliefs can also fuel deep and sometimes violent societal divisions (e.g., inter-religious conflict between Protestants and Catholics, Muslims and Hindus, Jews and Christians).[79]

Organized religion, religious affiliation, and religiosity can enhance in-group favoritism (i.e., favoritism toward people of the same religious group), and has been shown to be positively associated with a willingness to discriminate on the basis of non-religious social identities. Research has found that the degree of in-group and out-group cohesion varies by denomination.[80]

Appendix I shows that, in 2010, roughly half of the population in Berrien County participated in organized religion. A significant majority were Protestants followed by Catholics.

Research shows that social cohesion is critical to community health. Therefore, future research should focus on developing processes for building, measuring, and tracking cohesion within and across Berrien County neighborhoods.

Limitations

There is no universal definition of the concept of social cohesion and the tools and processes by which to measure are varied and contested. Moreover, much of the literature on social cohesion is based on non-U.S. populations.

Additionally, there is limited recent data on organized religion, religious affiliation, and religiosity – key inputs to social cohesion – in Berrien County.

[1] Generally, social cohesion is understood to be a protective factor that promotes good health and good health behaviors. However, it can have a less positive side by driving social wedges among groups that create divisions and social isolation and promoting and normalizing behaviors that do not promote good health. In this chapter, we focus more on the health promoting aspects of social cohesion.

[2] Social cohesion overlaps and is often used interchangeably with term social capital. While they are related, social cohesion typically refers to group closeness, solidarity, connectedness and commitment to a body of shared values, beliefs and norms. Social capital refers to trust, reciprocity, mutual aid, social support and other social assets, resources or networks. Social capital is a measure or indicator of social cohesion.

[3] Inclusion Health is a concept that is gaining currency. It refers to the idea that people and communities that are socially excluded (i.e., are not connected to the societal mainstream) suffer worse health and higher rates of mortality, and that creating inclusive societies is central to improving population health.

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[48] Transit-oriented developments may reinforce decades-old processes of residential segregation, gentrification, and displacement of low-income residents and communities of color. Careful consideration of zoning, neighborhood design, and affordability is vital to mitigating the impacts of transit-induced gentrification, a socioeconomic byproduct of transit-oriented development whereby the provision of transit service "upscales" nearby neighborhood(s) and displaces existing community members with more affluent and often White residents.

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[52] Physical interventions in street design, including traffic circles and roundabouts, neck downs, center island narrowing's, chicanes, speed bumps, and textured surfaces, among others, that can reduce speeds and traffic volumes, improving the experience and safety of users of nonmotorized transportation.

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Appendix A

2017-2019 Implementation Strategy

To evaluate the Implementation Strategy (IS) for the 2016 Community Health Needs Assessment conducted by Lakeland, the Population Health team hired external evaluators, iEval. They assisted in the development, execution, and administration of assessment instruments and in the analysis of the assessment results.

Summary of High-Level Findings

- **Pre- and post-tests, surveys, and interviews showed decisively** that the programs' curriculum and delivery made a strong, positive impact on many of the participants' health-related knowledge, attitudes, and behaviors. **The activities were highly effective.**
- **More than 4,000 individuals** participated in Lakeland's Implementation Strategy activities. **Nearly half of those individuals** lived or worked in a targeted census tract (i.e., tracts experiencing high rates of age-adjusted mortality).
- Some programs cast a wider net for a shorter period of time (e.g., CPR classes), while others targeted a smaller group over a longer time period (e.g., Prescription for Health, Harbor Towers). **This mix of programmatic offerings is a strength and should continue.** However, programs with a wider range of participants could work to provide more targeted programming for populations in target areas, while programs with a narrower scope could focus on increasing capacity. These changes have begun to take place as evidenced by changes to the CPR and Babysitting courses, and the expansion of Elite Barbershop and Harbor Towers activities to additional similar locations within target areas.
- On multiple occasions, **participants in one program activity learned about, and subsequently participated in, another Lakeland activity**, fostering a more robust, exhaustive, and holistic picture of health for those individuals.
- **There is room for improvement with individuals' trust in Lakeland.** The findings of a mystery shopping exercise demonstrated that some individuals were treated differently at Lakeland based on their race. Moreover, surveys demonstrated that those living in Benton Harbor and Niles were less likely to have trust in Lakeland. Interviews with physicians revealed that some staff make inappropriate comments about patients "behind the scenes," which perpetuates and serves to justify patient and community feelings of mistrust.

Full Evaluation Findings

The IS laid out three major objectives: build trust between Lakeland and the community; increase the capacity of Lakeland and the community to improve health; and improve knowledge, attitudes, and behaviors required to improve population health. Twelve programs were undertaken to help accomplish these objectives. The programs fell into four categories of activities: (I) Mental Wellbeing; (II) Nutrition Education & Access; (III) K-12 Health Education; and (IV) Community Health Education. Qualitative and quantitative methods were used to inform formative and summative evaluations the programs. In the sections below, key summative findings are presented.

Category I: Mental Wellbeing

Program 1: Adult Mental Health First Aid (AMHFA). AMHFA provides participants with information and skills required to recognize and address early signs and symptoms of mental distress and illness in adults. Evaluation data was collected from January 2017 through August 2019. Table 1 shows the total number of program participants, average class size, number of organizations that received training, and the percentages of attendees that either had their class held in a target area or that lived in or worked in targeted areas (i.e., census tracts with high rates of age-adjusted mortality).

Appendix A

Recorded total # of participants	Avg attendance per class	Recorded total # of organizations trained	% of attendees from classes held in target areas	% of attendees that work or live in target area
198	**6-7**	**43**	**36.3%**	**41.9%**

Table 1. Adult Mental Health First Aid Metrics

Pre- and post-tests indicated that the course was effective with 100% of participants passing the post-test in 2017. The data also showed that the program helped to de-stigmatize mental illness as demonstrated in participants' shifts in understanding, attitudes, perspectives, and opinions.

Despite its success in conveying new knowledge and skills, the program was challenged by low class attendance, and frequent "no-shows" by registrants led to numerous class cancellations. Major barriers to participation, especially among people and organizations that lived in or served the high needs targeted areas, included challenges posed by lack of transportation and bad weather.

Based on these observations, AMHFA might be more appropriate for classes in which instructors provide onsite trainings at organizations that serve people who live in high needs areas. Such a shift (from instructors seeking to train people that reside in high needs areas) is likely to help increase attendance and better address the mental health needs of people who live in or serve high needs areas.

Three questions merit attention as the future of this program is considered:

1. How can the participants in AMHFA see its connection to Lakeland?
2. Are there ways to make Lakeland's involvement in the AMHFA program clearer to the participants?
3. How can AMHFA be used to advance organizational policy and practice changes that support mental health?

Program 2: Youth Mental Health First Aid (YMHFA). YMHFA provides participants who regularly interact with youth with the information and skills required to recognize and address early signs and symptoms of mental distress and illness in young children and adolescents.

Evaluation data was collected from January 2017 through August 2019. Table 2 shows the total number of program participants, average class size, number of organizations that received training, and the percentages of attendees that either had their class held in a target area or that lived in or worked in targeted areas (i.e., census tracts with high rates of age-adjusted mortality).

Recorded total # of participants	Avg attendance per class	Recorded total # of organizations trained	% of attendees from classes held in target areas	% of attendees that work or live in target area
515	**12-13**	**81**	**24.4%**	**49%**

Table 2. Youth Mental Health First Aid Metrics

Pre and post-tests suggest that the class was highly effective in teaching about youth mental health. Internal discussions around the benefits/drawbacks of mandating attendance at MHFA activities should continue. More thought should go toward strategies to increase capacity and engagement of community members to do this work.

In 2017, one objective was to conduct five YMHFA trainings. Instead, a total of 16 trainings were held, demonstrating Lakeland's significant capacity. That year, in the 11 classes where data was collected, there was a more than 50% improvement in pre/post-test scores and a roughly 70% increase in knowledge about risk factors for mental illness.

While YMHFA reached more people than AMHFA (more than 2.5 times more), YMHFA had fewer attendees from the target areas (i.e., target area percentages of 36.3% for adults vs. 24.4% for youth). That said, this activity did see larger participation numbers, often among more vital and relevant community groups.

Program 3: Incite Insight. This was a three-week theater performance arts program for middle and high school students designed to explore themes related to mental health, including key definitions, stigma, and the importance of support.

This program faced numerous challenges. Most significant were administrative turbulence in the schools and resistance from teachers to let their students attend the program. Both contributed to inconsistent student attendance. Despite efforts to shore up the program with additional Lakeland staff and student volunteers from Andrews University, the decision was made to disband the program. The school's administrative turbulence combined with the very high needs of its students exceeded Lakeland's capacity to adequately execute the program. This was a difficult decision given its success in generating trust among the students in the program staff.

Category II: Nutrition Education & Access

Program 4: Prescription for Health (PFH). PFH aimed to provide access to nutritious foods and nutrition information to individuals with low food access and individuals who either have, or are at increased risk of developing, a chronic disease. Evaluation data was collected during each of the three summers (2017-2019) the program was administered.

Recorded total # of participants	Avg attendance per session	Recorded total # of sessions	% of participants living in target area
93	**16-17**	**37**	**95.5%**

Table 3. Prescription for Health Metrics

PFH participants showed increased positive attitudes toward the affordability and value of fruits and vegetables, and they also demonstrated an increased frequency with which they consumed vegetables. They utilized 91% of their tokens in exchange for food at the Benton Harbor Farmers Market in 2018 and 83% of their tokens in 2019.

The program had a slow start due to the challenges of identifying and enrolling program participants. While this challenge was eventually overcome, in the future, the barriers to finding eligible participants (e.g., inconsistent referral processes) must be addressed.

Generally, PFH participants' attendance at farmers' markets was regular and their health outcomes were positive. However, there were mixed results in regards to participants' perceptions of the affordability of fruits and vegetables and their confidence in cooking. Some results were positive, and others were not.

Program 5: Community Kitchen Club (CKC). CKC is a community-directed cooking and nutrition education program that serves English and Spanish-speaking community residents. It was administered from January 2017 through August 2019.

Recorded total # of participants	Avg # of unique attendees per month	Recorded total # of sessions	% of participants living in target area
70	**7**	**43**	**21%**

Table 4. Community Kitchen Club Metrics

CKC had modest but consistent participation (just under 10 unique individuals) for each class. In 2017, roughly 91% of participants said they were planning meals with more vegetables. All participants indicated that they were eating two or more servings of vegetables at dinner.

Among other recorded benefits, participants reported strong satisfaction with the program, better confidence in cooking with certain ingredients, and improved trust in Lakeland. They also experienced increased social cohesion; the last class in 2018 started their own mental health support group.

While many of the program participants were economically disadvantaged and had limited English proficiency, many did not live in the targeted high needs areas. Future versions of this programs should more explicitly focus on meeting the needs of residents in the high needs' areas.

Category III: K-12 Health Education

Program 6: Coordinated School Health (CSH). CSH is an integrated set of planned and sequential school-affiliated strategies, activities, and services that promote optimal physical, emotional, social, and educational development of students. Evaluation data was collected from January 2018 through August 2019.

Recorded total # of participants	Avg # of attendees per session	Recorded total # of sessions	% attending school in target area
308	**14**	**22**	**76.3%**

Note: School-Based CPR totals were counted under the Community CPR data table

Table 5. K-12 Health Education Metrics

In school districts throughout Berrien County, Cardiopulmonary Resuscitation (CPR) certification was provided for all 9th grade students, and YMHFA and CPR training were provided to staff.

Supported by the Population Health team, the Niles Community School Board approved a new sex education curriculum for the middle and high schools. The PH team members subsequently forged a new relationship with Watervliet Public Schools. This was an important "win" as previous relationship and Watervliet is a region with some significant health needs.

Other accomplishments of the CSH program included a successful $100,000 grant request to build a fitness center at Lardner Middle School, increased trust in Lakeland, and the Van Buren Intermediate School District's adoption of the Michigan Model for Health curriculum.

CSH activities encountered some challenges as well such as turbulent school administrations, particularly with Benton Harbor Area Schools, and to a lesser extent with River Valley School District Schools, which made collaboration difficult. Other challenges included organizational silos and the need to create a strategy that appeals to multiple, non-school stakeholders, such as law enforcement, that impact health.

Category IV: Community Health Education

Program 7: Elite Barbershop. This program used Elite Barbershop as a venue for providing health services and information to bridge the gap between health care and community residents, especially underserved African American and Hispanic men. Evaluation data was collected between January 2017 through August 2019.

Recorded total # of unduplicated participants	Avg # of unique attendees per month	Recorded total # of sessions	% living in target area
330	**6-7**	**49**	**47%**

Table 6. Elite Barbershop Metrics

Elite Barbershop's health screenings and speaker presentations led to immediate health and lifestyle changes for a number of patrons. In 2017, the average number of participants reached per month ranged between 6 and 58. Most program participants lived in the targeted areas. Interviews conducted with the shop's patrons found that many began drinking more water, eating healthier foods, being more physically active, and giving more care to medications and health behaviors. The barbers also demonstrated increased trust of the Lakeland team members who administered the program. This program was one of the most successful of the IS.

One challenge was the problem of "no-shows" by scheduled guest presenters.

Program 8: Community Food Network (CFN). This program involved Lakeland team members providing health education and information and preventative health screenings at a community food co-op that serves low income people who live in a targeted, high needs area. Evaluation data was collected between January 2017 through August 2019.

Recorded total # of participants	Avg # of attendees per session	Recorded total # of sessions	% living in target area
103	**16-17**	**75**	**75.6%**

Table 7. Community Food Network Metrics

CFN activities were well attended and trust increased as evidenced by one CFN member who defended Lakeland against community misconceptions. In general, attitudes toward Lakeland took a noticeable shift for the better among program participants.

Pre- and post-tests would be helpful in empirically determining the effectiveness of the program. Reflection on the program in late 2018 showed that cohesion, trust, and capacity were all increased at CFN, with numerous success stories. Grant funding was received to "help the program evolve to whatever kind of issues the group wants to address," but structure is still needed.

Program 9: Harbor Towers. This program provides residents of Harbor Towers, an independent housing facility for people with low income or physical disabilities, with resources to manage their emotional, mental, and physical health. Evaluation data was collected between January 2017 through August 2019.

Recorded # of unique participants	Avg attendance per month	Recorded total # of sessions	% living in target area
107	**49**	**119**	**100%**

Table 8. Harbor Towers Metrics

Harbor Towers' support groups and on-site health clinic staffed by a Lakeland team member averaged just under 50 participants per month. There were numerous successes at Harbor Towers, but among the most significant are increased social cohesion and collective efficacy among its residents; increased trust in Lakeland team members; and increased use of preventive care. In interviews, Harbor Towers residents indicated that they had developed care and compassion for one another that was not previously there. One of the major successes born out of increased cohesion and efficacy was the residents' increased capacity for self-advocacy to the Michigan Department of Civil Rights when their tenant rights were not being adhered to by the Benton Harbor Housing Commission. Harbor Towers residents indicated that there were noticeable improvements in their lives that could be attributed to help from Lakeland team members. As of the closing months of 2019, many Harbor Towers residents that were highly involved in the Lakeland programming have moved into better quality housing.

There were also notable challenges. The management at Harbor Towers have been strongly resistant to Lakeland staff working to address social determinants of health such as housing, transportation and public safety. Despite their resistance, Lakeland was able to help residents resolve heat and water issues, and challenges related to public safety and transportation.

In 2019, the tension between Lakeland team members and the management of Harbor Towers escalated with discussions taking place regarding the sustainability of the program. The sources of the tension are many but are fundamentally rooted in two issues: the overwork of the building management and their perception that housing is not something that Lakeland should concern itself with. There is a fundamental lack of understanding of housing as a health determinant. Another challenge was the distrust and fear that Lakeland's medical residents (who provide medical advice as part of the program) exhibited when visiting Harbor Towers.

Program 10: Community Health Screenings (CHS). The Community Health Screenings are free preventative health screening programs offered for adults at community sites. Evaluation data was collected between January 2017 through August 2019.

Recorded total # of participants	Avg # attendees per session	Recorded total # of sessions	% living in target area
489	**9-10**	**52**	**16.5%**

Table 9. Community Health Screenings Metrics

Appendix A

One consistent challenge for this program was access to people who live in the targeted, high needs areas. Only 16.8% of those served in this program lived in a targeted area. Nevertheless, there were instances of individuals being inspired to get needed medical help due to these free screenings. Interviews indicated that, particularly among low-income individuals, there was a perceived "lack of respect" from Lakeland. Interviews also indicated significant behavior changes around diet, exercise, and health literacy.

Program 11: Community CPR[1] *(CCPR)*. This program provides community participants with information and skills to aid a choking adult, child, or infant. Evaluation data was collected between January 2017 through August 2019.

Recorded total # of participants	Avg # attendees per class	Recorded total # of classes	% living in target area
408	**11-12**	**36**	**29.3%**

Table 10. Community CPR Metrics

School-based CPR[2] (SCPR). This program provides school-based participants (e.g., teachers, students, etc.) with information and skills to aid a choking adult, child or infant. Evaluation data was collected between January 2017 through August 2019.

Recorded total # of participants	Avg # attendees per class	Recorded total # of classes	% of participants at schools in target area
1,159	**40**	**29**	**66.9%**

Table 11. School CPR Metrics

Finding locations and groups within the targeted, high needs areas was a major challenge for the CCPR classes, although nearly 67% of SCPR classes occurred in the targeted, high needs areas.

Moreover, the costs associated with this program were prohibitive. In general, most participants indicated they acquired knowledge and skills that they previously did not have, and nearly all successfully received certification.

CPR instructors cited challenges such as high cost of certification, logistical challenges (e.g., facility cleanliness, access to DVD, cancellations, transport of equipment, and the lack of time to serve as a CPR instructor), and difficulty coaching participants whose performance was not satisfactory. The free CPR training and certification has demonstrably improved perceptions of Lakeland within area schools and organizations.

Appendix A

Program 12: Babysitting with Confidence (BWC). This program provided participants with the knowledge and skills required to care for small children. Evaluation data was collected between March 2017 through August 2019.

Recorded total # of participants	Avg # attendees per class	Recorded total # of classes	% living in target area
393	**32-33**	**12**	**31.5%**

Table 12. Babysitting with Confidence Metrics

BWC classes averaged around 20 participants, with a few outliers. Parents were happy with the class content and appreciated their children's acquisition of knowledge and skills required for babysitting. By class completion, participants showed high levels of new knowledge in all areas (e.g., feeding and clothing children, engaging in and supervising their activities, providing minor first aid). Pre-test knowledge baselines were between 20-40%. Post-tests showed improvement in more than 90% knowledge domains such as safe sleep, play, and feeding, and appropriate responses to a variety of childcare scenarios. This course has been discontinued due to shrinking demand, other alternatives being readily available, and its lack of alignment to community identified health needs.

Overall Outputs: 2017-2019

Program	Recorded total # of participants	Avg # attendees per session	Recorded total # of sessions	% of attendees from classes in target area	% of attendees working or living in target area
AMHFA	**198**	**6-7**	**43 orgs trained**	**36.3%**	**41.9%**
YMHFA	**515**	**12-13**	**81 orgs trained**	**24.4%**	**49.0%**
PFH	**93**	**16-17**	**37**	**---**	**95.5%**
CKC	**70**	**7 per month**	**43**	**---**	**21.0%**
CSH	**308**	**14**	**22**	**---**	**76.3%**
Elite	**330**	**6-7**	**49**	**---**	**47%**
CFN	**103**	**16-17**	**75**	**---**	**75.6%**
HT	**107**	**49 per month**	**119**	**---**	**100%**
CHS	**489**	**9-10**	**52**	**---**	**16.5%**
CCPR	**408**	**11-12**	**36**	**---**	**29.3%**
SCPR	**1,159**	**40**	**29**	**66.9%**	**---**
BWC	**393**	**32-33**	**12**	**---**	**31.5%**
Overall	**4,173 (total)**	**7 (average)**	**598 (total)**	**52.0% (average)**	**44.4% (average)**

Appendix A

Trust in Lakeland

One salient and consistent theme to emerge from the Community Health Needs Assessment is the lack of trust of the community in Lakeland. In 2017, a baseline trust survey was conducted among participants in various program activities: CFN, CPR, Harbor Towers, AMHFA, YMHFA, and PFH. The survey found that between 82% and 88% of respondents had trust in Lakeland on various measures in the survey. The lowest level of trust was in respondents "trusting their health care to Lakeland" (82%). Respondents from Benton Harbor and Niles had statistically significantly less trust in Lakeland than respondents from Berrien Springs, St. Joseph, Stevensville, or Watervliet. Younger respondents were more likely to trust Lakeland as well. One feature of this baseline survey is that data collection occurred at IS program activities, meaning that the sample is likely predisposed toward trusting Lakeland, since they had decided to partake in a Lakeland activity.

One year later, a mystery shopping analysis was conducted. Eight observers, of varied demographics, assessed their experiences at five Lakeland facilities. They assessed their experiences at front desks and in hallways, the cafe, and the emergency waiting room. The purpose of the analysis was to determine whether people of different demographics had disparate experiences at Lakeland. This observational research was coupled with in-depth interviews with two physicians to better understand clinicians' perspectives on trust.

Overall, the Lakeland atmosphere at all five locations was positive and friendly, and only a handful of less-than-friendly interactions suggested race as an underlying factor. The mystery shopping analysis indicated that there were differences between how white and black individuals were greeted at a front desk (15 total interactions observed); specifically, black individuals were less likely to be treated courteously or receive eye contact at the front desk, and they also tended to wait longer to be helped. In the hallways (16 instances to observe), white individuals were more likely to be treated in a friendly manner when compared to blacks. In the café, the shoppers observed 22 interactions, noting that around three out of every four interactions were pleasant or friendly. Staff appeared to exhibit "caution" when serving some black visitors. In the waiting room, shoppers observed 29 interactions, and found that over 90% of the greetings by staff were friendly with no differences between race.

Interviews with physicians revealed that there is a history of mistrust between Lakeland and the community, specifically among the older segment of the population. Older Lakeland staff members perpetuate the mistrust "when they make comments about patients and they don't understand their situations." The interviewees also said that trust is solidified very early in the interaction, possibly even before a physician is seen, although that doesn't diminish their role in maintaining trust. The interviewees noted that comments are made "behind the scenes" that are inappropriate, but outwardly the staff are attentive and caring.

Four key recommendations emerged from the observational study:

1. Increase opportunities for Lakeland staff to interact with community members, representing Lakeland as medical experts, in comfortable community settings such as barbershops/beauty salons, and community organizations. This would provide opportunities similar to that afforded to medical residents, enabling nurses, physicians, and other clinical and administrative staff to better understand the issues and needs faced by the community that Lakeland serves.
2. Expand outreach work into communities served by Lakeland to continue efforts to build trust and shift community perceptions of the health system. This should be coupled with an emphasis on continuing to offer high quality customer service. Lakeland employees should remember that negative experiences often linger in the minds of patients and the community well past the time of the actual encounter.
3. Provide better training to front desk staff on how to greet community members as they enter the building, ensuring they understand that the patient/visitor is the priority, and a friendly greeting goes a long way in building trust.
4. Develop a process for internal staff to use the observation protocol ("mystery shopping" experiences) on a regular basis. Having staff observe from a more objective perspective, with specific things in mind to watch for during the observation, may help increase their sensitivity to and awareness of actions they can take in their work or departments.

[1] These two programs' data are separated because the data was collected separately. However, the programs are similar, so they are best reported together.

[1] There were over 5,400 farmers market attendees across 2018 and 2019 with over 1,000 non-PFH visitors to the Lakeland booth at the markets. In 2017, the Lakeland booth engaged with, on average, 20% of the total number of market shoppers.

Spectrum Health Lakeland

Community Health Needs Assessment

Thank you for taking the time to complete the 2019 Community Health Needs Assessment. As a resident of Berrien, Cass, or Van Buren County your input is invaluable to helping not just Spectrum Health Lakeland, but other community organizations better understand the strengths and needs of our local population. This survey will ask questions about the health of your community, how you are able to recover from stressful situations, and how you feel about your neighborhood.

Please note: the information you provide in this survey will not be used to identify you in any way. If you have any questions about how your information will be used, or need assistance completing the survey you may call the Population Health team at 1.866.260.7544 or email us at chna@lakelandhealth.org.

Q1 Do you live in Berrien, Cass, or Van Buren County?

- o Yes (1)
- o No (2)

Q2 Did you participate in the 2016 Community Health Needs Assessment?

- o Yes (1)
- o No (2)
- o I'm not sure (3)

The following questions are about the health of your community:

- When thinking about your community think about the places you live, work, and play.
- As for health, think about all types of health: physical, mental, social, emotional, and spiritual.

Q3 What are some things in your community that help you to be healthy?

Appendix B

Q4 What are some things in your community that make it hard to be healthy?

Q5 What are the biggest health issues in your community?

Q6 How would you improve the health in your community?

Appendix B

Q7 Please rate your agreement with the following statements about your ability to recover from challenging or stressful situations. Please mark only one choice for each statement; statements with multiple or written in responses cannot be used.

	Strongly agree (1)	Somewhat agree (2)	Neutral (3)	Somewhat disagree (4)	Strongly disagree (5)
I tend to bounce back quickly after hard times. (1)	○	○	○	○	○
I have a hard time making it through stressful events. (2)	○	○	○	○	○
It does not take me long to recover from a stressful event. (3)	○	○	○	○	○
It is hard for me to snap back when something bad happens. (4)	○	○	○	○	○
I usually come through difficult times with little trouble. (5)	○	○	○	○	○
I tend to take a long time to get over setbacks in my life. (6)	○	○	○	○	○

Q9 When I experience hard or stressful times, these are the ways I help myself feel better/relax/calm down: This can be any person, place, thing, or activity: Some people talk to a family member, smoke cigarettes, read a book, or watch television. Please list as many as you can.

Appendix B

Q10 How strongly do you agree or disagree with the following statements about your neighborhood (where you live)
(Please mark only one choice for each statement; statements with multiple or written in responses cannot be used):

	Strongly agree (6)	Agree (7)	Somewhat agree (8)	Neither agree nor disagree (9)	Somewhat disagree (10)	Strongly disagree (11)
This is a close-knit neighborhood. (1)	○	○	○	○	○	○
People in this neighborhood can be trusted. (2)	○	○	○	○	○	○
People around here are willing to help their neighbors. (3)	○	○	○	○	○	○
People in this neighborhood do not share the same values. (4)	○	○	○	○	○	○
People in this neighborhood generally do not get along with each other. (5)	○	○	○	○	○	○

Q16 Would you say it is very likely, likely, unlikely, or very unlikely that your neighbor could be counted on to intervene or do something if...
(Please mark only one choice for each question; questions with multiple or written in responses cannot be used):

	Very Likely (1)	Likely (2)	Unlikely (3)	Very Unlikely (4)
Children were skipping school and hanging out in the neighborhood? (1)	○	○	○	○
Children were spray-painting graffiti on something in the neighborhood? (2)	○	○	○	○
Children were showing disrespect to an adult? (3)	○	○	○	○
A fight broke out in front of their house? (4)	○	○	○	○
The fire station closest to their home was threatened with budget cuts? (5)	○	○	○	○

Appendix B

To finish the survey please complete the following demographic information. While every question is optional, we encourage you to answer them all as completely as possible. As a reminder, information shared will not be used to identify you in any way. Instead, information provided will help us to better understand the specific strengths and needs of our community. If you have any questions about how your information will be used you can contact the Population Health team at Spectrum Health Lakeland at 1.866.260.7544 or chna@lakelandhealth.org.

Q8 What is your age range?

o Under 18 (1)
o 18-29 (2)
o 30-44 (3)
o 45-59 (4)
o 60+ (5)

Q12 What is your identified gender?

o Female (1)
o Male (2)
o Transgender (4)
o Option Not Listed: (6) _____
o I choose not to identify (7)

Q13 What race/ethnicity best describes you?

o White or Caucasian (1)
o Black or African American (2)
o Hispanic or Latino (3)
o Asian or Asian American (4)
o American Indian or Alaskan Native (5)
o Native Hawaiian or other Pacific Islander (6)
o Option not listed: (7) _____
o I choose not to identify (8)

Q14 Please provide your full home address.

Providing your address will help us to better understand the specific needs and strengths of our community. If you would not like to provide your full address please leave all boxes blank.

Address (6) _____

Address 2 (7) _____

City (8) _____

Postal code (10) _____

Q15 What is the nearest intersection (cross-streets) to your home?

Intersection/cross-streets (1) _____

o I would not like to provide any address/location information (2)

Life Expectancy in Berrien County

Census Tract	Life Expectancy	City /Township	Village(s)
Tract 21	67.6	Benton Township	
Tract 23	67.7	Benton Township	
Tract 22	69	Benton Township	
Tract 5	69.6	City of Benton Harbor	
Tract 3	69.9	City of Benton Harbor	
Tract 205	70.5	City of Niles	
Tract 4	71.2	City of Benton Harbor	
Tract 20	71.9	Benton Township	
Tract 6	72.4	City of Benton Harbor	
Tract 116	73.1	Weesaw Township	
Tract 211	73.3	Niles Township	
Tract 212	74.5	Niles Township	
Tract 114	74.9	Three Oaks Township	Three Oaks
Tract 201	75.2	Buchanan Township	
Tract 207	75.2	City of Niles	
Tract 115	75.6	Galien Township	Galien
Tract 104	76	Bainbridge Township	
Tract 202	76	City of Buchanan	
Tract 103	76.3	Watervliet Township	
Tract 25	76.3	Benton Township	
Tract 111	77.1	City of Bridgman	
Tract 210	77.2	Niles Township	
Tract 102	77.5	Coloma Township	
Tract 209	77.8	City of Niles	
Tract 7	78.2	St. Joseph Township	
Tract 204	78.4	Niles Township	
Tract 206	78.4	City of Niles	
Tract 24	78.5	Benton Township	
Tract 101	78.6	Hagar Township	
Tract 113	78.7	City of New Buffalo	Michiana and Grand Beach
Tract 214	78.7	Oronoko Township	Berrien Springs
Tract 10	78.8	City of St. Joseph	

Life Expectancy in Berrien County *(continued)*

Census Tract	Life Expectancy	City /Township	Village(s)
Tract 105	78.8	Pipestone Township	Eau Claire
Tract 203	78.8	Bertrand Township	
Tract 9	78.8	St. Joseph Township	
Tract 106	78.9	Berrien Township	Eau Claire
Tract 110	79.3	Baroda Township	Baroda
Tract 18	79.5	Royalton Township	
Tract 14	79.9	Lincoln Township	Stevensville
Tract 17	80.3	Lincoln Township	Stevensville
Tract 112	81.2	Chikaming Township	
Tract 11	81.7	City of St. Joseph	
Tract 15	81.9	Lincoln Township	Stevensville
Tract 8	81.9	City of St. Joseph	
Tract 13	83.1	St. Joseph Township	Shoreham
Tract 16	86.2	Lincoln Township	Stevensville
Tract 213	86.7	Oronoko Township	Berrien Springs
Tract 19	No Data	Sodus Township	

Age Adjusted Mortality Rate in Berrien County

Census Tract	Age-Adjusted Mortality Rate	City/Township	Village(s)
Tract 21	1,598.62	Benton Township	
Tract 4	1,566.85	City of Benton Harbor	
Tract 207	1,526.70	City of Niles	
Tract 5	1,455.90	City of Benton Harbor	
Tract 6	1,453.30	City of Benton Harbor	
Tract 3	1,421.52	City of Benton Harbor	
Tract 22	1,413.66	Benton Township	
Tract 23	1,383.83	Benton Township	
Tract 14	1,192.15	Lincoln Township	Stevensville
Tract 205	1,161.77	City of Niles	
Tract 211	1,147.76	Niles Township	
Tract 20	1,087.11	Benton Township	
Tract 24	1,076.38	Benton Township	

Appendix C

Census Tract	Age-Adjusted Mortality Rate	City/Township	Village(s)
Tract 102	1,043.95	Coloma Township	
Tract 111	1,036.79	City of Bridgman	
Tract 114	1,026.59	Three Oaks Township	Three Oaks
Tract 105	1,025.95	Pipestone Township	Eau Claire
Tract 204	997.93	Niles Township	
Tract 103	974.25	Watervliet Township	
Tract 18	959.94	Royalton Township	
Tract 202	948.41	City of Buchanan	
Tract 110	943.79	Baroda Township	Baroda
Tract 206	943.16	City of Niles	
Tract 106	921.45	Berrien Township	Eau Claire
Tract 7	911.40	St. Joseph Township	
Tract 212	901.26	Niles Township	
Tract 210	899.40	Niles Township	
Tract 115	891.03	Galien Township	Galien
Tract 104	887.73	Bainbridge Township	
Tract 116	868.07	Weesaw Township	
Tract 25	858.58	Benton Township	
Tract 101	854.53	Hagar Township	
Tract 209	838.48	City of Niles	
Tract 214	808.38	Oronoko Township	Berrien Springs
Tract 8	788.34	City of St. Joseph	
Tract 19	785.95	Sodus TownshipFairplain	
Tract 10	780.76	City of St. Joseph	
Tract 15	758.27	Lincoln Township	Stevensville
Tract 203	757.48	Bertrand Township	
Tract 201	741.15	Buchanan Township	
Tract 17	737.75	Lincoln Township	Stevensville
Tract 11	703.99	City of St. Joseph	
Tract 112	671.88	Chikaming Township	
Tract 213	660.55	Oronoko Township	Berrien Springs
Tract 9	608.54	St. Joseph Township	
Tract 113	607.59	City of New Buffalo	Michiana and Grand Beach
Tract 16	549.56	Lincoln Township	Stevensville
Tract 13	525.92	St. Joseph Township	Shoreham

Proximity Score and Percent of Vulnerable Population by Census Tract

Census Tract	Block Group	Township/City	Proximity Score	% Vulnerable Population
21	2	Benton Township	10.21	27%
21	1	Benton Township	7.19	39%
22	3	Benton Township	5.63	42%
21	3	Benton Township	4.65	31%
22	2	Benton Township	4.48	47%
6	1	City of Benton Harbor	4.38	35%
3	2	City of Benton Harbor	4.03	36%
3	1	City of Benton Harbor	4.01	34%
5	1	City of Benton Harbor	3.61	37%
20	1	Benton Township	3.54	31%
4	1	City of Benton Harbor	3.39	41%
22	1	Benton Township	3.29	35%
6	2	City of Benton Harbor	3.19	31%
24	2	Benton Township	2.97	18%
20	2	Benton Township	2.89	27%
209	1	City of Niles	2.87	23%
23	1	Benton Township	2.82	31%
20	3	Benton Township	2.77	22%
4	2	City of Benton Harbor	2.71	36%
23	2	Benton Township	2.60	34%
6	3	City of Benton Harbor	2.40	23%
19	1	Sodus Township	2.28	15%
9	1	St. Joseph Township	2.23	17%
7	1	St. Joseph Township	2.11	17%
7	2	St. Joseph Township	2.08	17%
207	2	City of Niles	2.01	23%
25	2	Benton Township	1.89	26%
7	3	St. Joseph Township	1.79	16%
10	2	City of St. Joseph	1.65	8%
10	1	City of St. Joseph	1.57	8%
209	3	City of Niles	1.22	9%
8	3	City of St. Joseph	1.22	9%
8	1	City of St. Joseph	1.22	14%

Proximity Score and Percent of Vulnerable Population by Census Tract

Census Tract	Block Group	Township/City	Proximity Score	% Vulnerable Population
209	4	City of Niles	1.22	17%
207	3	City of Niles	1.21	17%
209	2	City of Niles	1.19	22%
207	1	City of Niles	1.13	20%
8	2	City of St. Joseph	1.08	12%
206	4	City of Niles	1.06	13%
205	1	City of Niles	1.03	25%
210	2	Niles Township	1.03	19%
205	3	City of Niles	1.01	30%
205	2	City of Niles	0.96	20%
25	1	Benton Township	0.95	15%
9	2	St. Joseph Township	0.95	12%
210	1	Niles Township	0.92	14%
206	3	City of Niles	0.88	15%
206	2	City of Niles	0.75	14%
206	1	City of Niles	0.68	18%
18	1	Royalton Township	0.60	6%
24	1	Benton Township	0.59	16%
101	4	Hagar Township	0.48	13%
11	1	City of St. Joseph	0.48	10%
18	3	Royalton Township	0.47	10%
210	3	Niles Township	0.45	20%
210	4	Niles Township	0.44	17%
111	2	City of Bridgman	0.42	13%
102	4	Coloma Township	0.41	7%
101	1	Hagar Township	0.40	13%
111	1	City of Bridgman	0.38	12%
211	1	Niles Township	0.37	9%
13	1	St. Joseph Township	0.37	14%
11	2	City of St. Joseph	0.35	7%
102	6	Coloma Township	0.34	13%
102	7	Coloma Township	0.33	12%

Appendix D

Census Tract	Block Group	Township/City	Proximity Score	% Vulnerable Population
13	2	St. Joseph Township	0.33	8%
204	3	Niles Township	0.32	9%
18	2	Royalton Township	0.32	11%
19	2	Sodus Township	0.28	12%
15	2	Lincoln Township	0.28	11%
203	2	Bertrand Township	0.27	10%
102	5	Coloma Township	0.27	13%
212	1	Niles Township	0.26	16%
17	3	Lincoln Township	0.26	7%
101	3	Hagar Township	0.26	11%
204	2	Niles Township	0.23	10%
17	1	Lincoln Township	0.23	12%
110	1	Baroda Township	0.23	11%
14	2	Lincoln Township	0.22	13%
102	3	Coloma Township	0.22	11%
14	1	Lincoln Township	0.21	9%
211	2	Niles Township	0.20	18%
15	1	Lincoln Township	0.20	10%
212	2	Niles Township	0.19	16%
204	1	Niles Township	0.19	15%
101	2	Hagar Township	0.19	9%
14	3	Lincoln Township	0.18	11%
111	3	City of Bridgman	0.18	11%
110	2	Baroda Township	0.18	8%
102	2	Coloma Township	0.17	14%
16	1	Lincoln Township	0.17	8%
104	1	Bainbridge Township	0.16	9%
103	2	Watervliet Township	0.16	21%
103	3	Watervliet Township	0.15	15%
17	2	Lincoln Township	0.15	15%
103	1	Watervliet Township	0.15	12%
110	3	Baroda Township	0.15	15%

Proximity Score and Percent of Vulnerable Population by Census Tract

Census Tract	Block Group	Township/City	Proximity Score	% Vulnerable Population
203	1	Bertrand Township	0.14	10%
102	1	Coloma Township	0.14	11%
105	2	Pipestone Township	0.14	16%
104	3	Bainbridge Township	0.14	15%
202	3	City of Buchanan	0.12	17%
103	4	Watervliet Township	0.12	19%
103	5	Watervliet Township	0.12	11%
202	2	City of Buchanan	0.12	14%
202	4	City of Buchanan	0.11	10%
106	2	Berrien Township	0.11	15%
202	5	City of Buchanan	0.11	7%
113	5	City of New Buffalo	0.11	12%
202	1	City of Buchanan	0.10	9%
214	1	Oronoko Township	0.10	14%
115	2	Galien Township	0.10	13%
202	6	City of Buchanan	0.10	19%
201	3	Buchanan Township	0.10	13%
112	1	Niles Township	0.09	13%
105	1	Pipestone Township	0.09	19%
213	1	Oronoko Township	0.09	20%
104	2	Bainbridge Township	0.09	15%
106	3	Berrien Township	0.09	13%
113	4	City of New Buffalo	0.09	14%
116	1	Weesaw Township	0.09	14%
213	2	Oronoko Township	0.09	26%
115	1	Galien Township	0.08	12%
213	3	Oronoko Township	0.08	22%
201	2	Buchanan Township	0.08	10%
106	1	Berrien Township	0.08	16%
214	5	Oronoko Township	0.08	16%
112	2	Niles Township	0.08	13%
214	2	Oronoko Township	0.08	23%

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Census Tract	Block Group	Township/City	Proximity Score	% Vulnerable Population
116	2	Weesaw Township	0.08	10%
213	4	Oronoko Township	0.08	19%
113	6	City of New Buffalo	0.08	13%
201	1	Buchanan Township	0.07	13%
214	3	Oronoko Township	0.07	19%
214	4	Oronoko Township	0.07	24%
113	3	City of New Buffalo	0.07	15%
112	4	Niles Township	0.07	11%
114	1	Three Oaks Township	0.07	9%
113	2	City of New Buffalo	0.07	13%
114	3	Three Oaks Township	0.06	15%
114	2	Three Oaks Township	0.06	11%
113	1	City of New Buffalo	0.06	12%
112	3	Niles Township	0.06	15%

Pre-1940 Housing and Percent of Children Living Below the Poverty Level by Census Tract

City/Township	Geography	% housing units built pre 1940s	% housing units built between 1940-1959	% housing units built between pre 1960s	% below federal poverty level	% below poverty level, under 5 years old
Benton Harbor	Census Tract 5	68%	17.4%	85.7%	38.4	30.2
Niles	Census Tract 207	47%	26.2%	73.0%	4.9	0
St. Joseph	Census Tract 8	45%	18.3%	63.8%	5.9	8.3
Benton Harbor	Census Tract 6	34%	40.7%	74.8%	51.6	67.9
Three Oaks	Census Tract 114	34%	21.3%	55.1%	6.2	21.5
	Census Tract 115	30%	20.5%	50.9%	1	46.7
Benton Harbor	Census Tract 3	28%	34.5%	62.9%	4.3	93.9
Benton Harbor	Census Tract 4	27%	10.6%	37.5%	15.3	79.1
	Census Tract 112	25%	24.0%	48.7%	4.7	23.9
	Census Tract 202	24%	19.6%	44.1%	35.8	0

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City/Township	Geography	% housing units built pre 1940s	% housing units built between 1940-1959	% housing units built between pre 1960s	% below federal poverty level	% below poverty level, under 5 years old
Benton Harbor	Census Tract 116	24%	24.4%	48.0%	21.7	0
Niles	Census Tract 209	22%	52.1%	74.2%	39.5	65.3
	Census Tract 205	22%	27.3%	49.2%	5	50.4
	Census Tract 103	22%	26.4%	48.1%	7.9	32
	Census Tract 19	20%	20.9%	40.4%	14.2	3.1
	Census Tract 105	19%	18.7%	37.7%	17.7	31.6
Niles Township	Census Tract 211	19%	48.7%	67.4%	11.8	10.5
	Census Tract 104	18%	19.1%	37.1%	8.9	19.4
	Census Tract 206	18%	23.9%	41.6%	28.2	22.8
	Census Tract 106	17%	16.2%	33.6%	9.3	16.1
	Census Tract 214	17%	25.7%	42.3%	56.7	57.9
	Census Tract 22	16%	21.4%	37.9%	11.5	50.2
	Census Tract 113	16%	18.6%	34.5%	10.1	0
	Census Tract 101	16%	36.0%	51.7%	6.2	34.4
St. Joseph	Census Tract 10	16%	63.5%	79.1%	58.6	4.1
St. Joseph Twp.	Census Tract 7	15%	45.7%	61.0%	3.8	3
	Census Tract 25	15%	25.1%	40.5%	14	52.3
	Census Tract 201	15%	19.1%	34.1%	15.8	49
	Census Tract 203	14%	20.3%	34.8%	11.9	20.4
	Census Tract 110	14%	18.3%	31.9%	6.7	2.8
	Census Tract 21	11%	22.3%	33.6%	17	58.4
	Census Tract 102	11%	30.4%	41.7%	10.5	26.2
	Census Tract 204	11%	20.3%	31.0%	7.5	6.6
	Census Tract 111	10%	20.7%	31.1%	7.6	19.5
	Census Tract 24	10%	41.9%	52.2%	7.2	38.8
	Census Tract 18	10%	10.8%	21.1%	28.9	16
	Census Tract 210	10%	27.3%	37.3%	12.8	18.9
	Census Tract 17	9%	9.2%	17.8%	12.3	2.1
	Census Tract 20	8%	29.6%	37.3%	6.2	10.6
	Census Tract 213	8%	11.9%	19.6%	24.9	52.1
	Census Tract 15	7%	16.9%	24.2%	21.5	9.4

Appendix D

City/Township	Geography	% housing units built pre 1940s	% housing units built between 1940-1959	% housing units built between pre 1960s	% below federal poverty level	% below poverty level, under 5 years old
St. Joseph Twp.	Census Tract 212	6%	34.4%	40.1%	17.4	33.8
	Census Tract 14	4%	9.2%	12.9%	20.9	12.6
	Census Tract 11	4%	22.7%	26.3%	38.3	4.1
	Census Tract 16	4%	13.1%	16.7%	24.1	4.2
	Census Tract 13	4%	13.8%	17.4%	20.7	0
	Census Tract 9	3%	14.8%	18.0%	21	0
	Census Tract 23	1%	41.6%	43.0%	57.6	86.1

Spectrum Health Lakeland

Trust and Relationships Summary

September 2018

Prepared by:

Wendy L. Tackett, Ph.D.
Kristin Everett, Ph.D.
Corey Smith, Ph.D.

Overview

Over the past two years, the external evaluation team, iEval, in partnership with the Population Health department at Lakeland, have identified trust as a primary concern. There are two types of trust in a medical setting: institutional trust and interpersonal trust. The Population Health team has been focused on building interpersonal trust with community residents and organizations in hopes that it would transfer to the institution.[1] However, the interpersonal connections made while patients are visiting Lakeland also have a critical impact on their perception of institutional health.

To further examine the interpersonal connections made with patients (and visitors) while at Lakeland, the evaluation team, along with other trained observers, conducted observations of interactions at five Lakeland locations in four different settings. Additionally, two Lakeland medical providers were interviewed for their perceptions on the relationships and trust within Lakeland and between Lakeland staff and visitors/patients.

Key Findings

Overall, the atmosphere within the five locations[2] the evaluation team conducted observations at was pleasant. There were several key findings and recommendations based on type of observation.

- Front desk: The level of professionalism of the greeters at each location varied, and it was unclear who were volunteers or staff. It should be made clear to greeters that their primary focus should be on the visitors, not on their own personal conversations. What kind of training is currently given to staff? Are they encouraged to say hi but only directly engage if asked questions? It may be more inviting if they greet and offer assistance to all who pause nearby.
- Hallway: Lakeland staff were pleasant in the hallways, often smiling as they walked by the observers. It was noted that Lakeland staff in lab coats or business attire less frequently smiled or acknowledged anyone in the halls, while nurses, CNAs, and other staff were friendly.
- Café: In all café and cafeteria observation times, the majority of people within those locations were Lakeland staff members. The cafeteria at the St. Joseph location is difficult to find, with even the greeters giving inaccurate directions to get there. Better signage, which may be part of the renovation, would be helpful.
- Waiting room: The waiting rooms, both in the emergency room and other locations, were positive places with warm, helpful staff interactions with patients and visitors. All locations were fairly quiet in the emergency room during observation times with the exception of Watervliet, which had approximately 20 people waiting at one point during the observation.

There were several key differences and recommendations based on the race of the observer and patient/visitor.

- **Front desk:** There was more wait time, less friendly greetings, and less direct eye contact with the African American observers compared to the white observer.[3] Training on how to greet visitors would make that initial experience more positive for all.
- **Hallway:** There were some small differences in the direct interaction by staff (e.g., offers of help, a vocal greeting) based on race, with white observers having more engagement than African American observers. The African American observers also felt a less welcoming atmosphere in the hallways in general, but there were definitely examples of extreme helpfulness (i.e., for two different African American observers, a Lakeland staff member asked if they could help them and personally walked them to their requested destination).
- **Café:** While the majority of staff/visitor interactions were positive, four out of the five less than pleasant interactions were with African American visitors.
- **Waiting room:** There were no differences in treatment of visitors/patients based on race.

Literature Review

What is trust?

One group of researchers who study trust within the medical field define trust as "the patient's expectation that his or her best interests will be kept in mind at all times by those caring for them."[4] A patient has expectations for how they will be treated: with professionalism and care. Those expectations of behavior open up a patient, allowing them to trust the medical professional and to visit a provider voluntarily.

Trust is voluntary; patients do not have to trust their medical providers or institutions. In the literature, trust is also defined as "a voluntary action based on expectations of how someone will behave in relation to yourself in the future.[5]"

Certain behaviors have been identified as forming trust in the medical setting. Those behaviors are:

- Technical competence – Does the provider know what they are doing and relay their knowledge to the patient?
- Openness – Is the provider willing and able to share information in a personable manner?
- Impartial concern – Does the provider show concern for the patient, no matter the context of the visit?
- Reliability – Can the patient get information and service from the provider in a consistent, dependable way?

Types of trust

Many different types of trust exist in the medical setting. Trust is most often talked about in two ways: interpersonal trust and institutional trust. Institutional trust includes the health care system and trust in insurers. Patients can have trust in one and not the other (e.g., they trust the system, but they do not trust insurers). Some research has identified additional types of trust: 1) trust in the competence of the physician's care and 2) trust coming from formal and informal health sources.

- Interpersonal:
  - Trust in one's own personal physician[2,6]
- Institutional:
  - Trust in the health care system[2,7]
  - Trust in the insurers[2,4,8]
- Trust in the competence of the physician's care[3]
- Trust in formal and informal health sources. This includes getting health information from friends, family, churches, etc. This highlights the significance of other sources of health information, especially in African American communities.[3]
- Distrust is not necessarily the absence of trust. Distrust may be defined as "having anxious or pessimistic views of motivation and expected results.[9]

Appendix E

Outcomes related to lack of patient trust

Trust impacts patients on many levels. Lower trust in the health care system puts people at greater risk for negative outcomes. Research has identified the following as potential outcomes related to lack of trust:

- Less doctor-patient interaction[3]
- Reduced routine medical care[4]
- Poor clinical relationships, fewer long term relationships with providers[3,4]
- Reduced adherence to recommendations and medications[3,4]
- Worse self-reported health[3]
- Reduced utilization of health care services[3]
- Delay in seeking care[10]
- Higher rates of changing physicians and seeking second opinions[2]
- Decreased patient satisfaction[2]

Factors affecting patient trust in health care providers

Many factors have been identified as affecting patient trust in health care providers. Bringing awareness of these may help providers understand the patient's perspective and what may be influencing their trust with the provider.

- Perception of the provider's competence/ability
- Informal information sources (friends, family, church)
- Integrity of the institution
- Personal experience with racism. Patients who have experienced racism will bring that experience with them, which has been shown to impact their trust in their provider.
- Knowledge of the history of racism in the health care system[4]
- Belief in conspiracies, stemming from mistrust in institutions
- Trust that the physician would not encourage the respondent to participate in research not in the patient's best interest. This is related to the Tuskegee Syphilis study.
- The provider protects confidentiality and privacy
- The provider shares knowledge in a way that is understandable
- The patient believes that the physician wants to do good to the patient (benevolence)

Factors affecting health professional staff trust in patients/the community

Providers and staff also need to trust patients. Research has identified some of the reasons providers may have less trust in patients.

- Provider has suspicion of ulterior motives/feigning symptoms (e.g., trying to get pain medication)
- Providers find it more difficult to trust patients with surprising or unusual symptoms
- Patient describes vague and unobservable symptoms; providers are more likely to trust patients who present observable symptoms
- The level of respect and honesty the patient shows the provider
- The patient is not competent in making informed decisions
- The patient does not follow directions

Appendix E

What research says about race and trust in a health care setting

- In one study, black respondents were less likely than white respondents to trust their physician and more likely to trust their health care plan; there was no statistically significant difference in trust in hospitals.[4] The greater trust in the health care plan may come from the anonymity a patient has in large health care plan, where they are rarely seen face to face, as opposed to seeing a physician in an office.
- Black respondents were more likely to express concerns about personal privacy and the occurrence of harmful experiments in hospitals.[4]
- Black respondents reported significantly more trust than did whites in health information sources like family, friends, and church or religious leaders, reflecting the importance of informal social networks, faith communities, and extended family for blacks.[4]
- In a study measuring physicians' trust in patients, it was found clinicians had a higher level of trust with white patients compared to non-white patients, despite similar levels of illicit drug use and opioid analgesic misuse. The authors determined this finding may reflect unconscious stereotypes by primary care providers.[11]

Research-based solutions to build trust

Trust Repair Mechanism	Assumptions	Practical Examples
Sense-making	A shared understanding or accepted account of the trust violation is required for effective trust repair	Investigations, public inquiries, explanations, & accounts
Relational	Trust repair requires social rituals and symbolic acts to resolve negative emotions caused by the violation and re-establishing the social order in the relationship	Explanations, apologies, punishment, penance, compensation, redistribution of power, and resetting expectations
Regulation & Controls	Trust repair requires formal rules and controls to constrain untrustworthy behavior and hence prevent a future trust violation	Regulation, laws, organizational rules, policies, controls, contracts, codes of conduct, sanctions, and incentives
Ethical Culture	Trust repair requires informal cultural controls to constrain untrustworthy behavior and promote trustworthy behavior, and hence prevent a future trust violation	Cultural reforms, induction and socialization, professional training, leadership, and role modeling
Transparency	Transparency sharing relevant information about organizational decision processes and functioning with stakeholders helps restore trust	Corporate reporting, external audits, public inquiries, and whistleblower protection
Transference	Trust repair can be facilitated by transferring trust from a credible party to the discredited party	Certifications, memberships, affiliations, awards, and endorsements

(Bachmann, Gillespie, and Priem 2015)

Appendix E

Strategies from health care organizations

In 2010, representatives from health care organizations gathered in Austin, TX to discuss using social media to build greater trust. The following were deemed the strongest ideas health care organizations could use to build trust and credibility.[12] Although the original intent was to build trust through social media, these ideas can be used in a more general way when thinking about building trust.

1. **Listen to and implement ideas from the community.** Although listening is important, the crux of this item is action. Trust is built when people see action as a result of the community's participation. This shows the community that the health care organization did listen to them and it made an impact.
2. **Have shared value on good health.** Patients may see the goal of the health care organization to offer more medication or deliver "efficient" care. A patient's priority is to get and stay healthy. Building trust requires aligning the patient's and the systems goals and clearly communicating how those goals align, to the community. Focusing on prevention is a way to align the patient and system goals.
3. **Answer your patient's or customer's concerns directly.** The original intent of this idea was through a social media lens; using social media tools to listen to people's thoughts and concerns and developing strategies for responding to them. This idea can also be thought of in more broad terms, highlighting the importance of listening and answering concerns with patients throughout programming.
4. **Aggregate or curate useful information.** Many consumers have access to much information. In the health care space, the difficulty lies in finding reliable sources to gain information. The health care system can create resources to share with people, which demonstrates commitment to their needs, and in turn, builds trust.
5. **Serve as a resource or guide for the community.** The organization should utilize the experts (physicians, staff, etc.) within the system to share information used in marketing and communications. Introducing the experts through marketing materials connects patients and customers with the organization and to the people in it.
6. **Set expectations on what you do and why.** Transparency is key. Patients and the community may assume policies or practices are based on financial or legal reasons, but there may be more behind the story. Sharing the motivation for the policies and practices, especially those that go beyond financial reasons, may help build trust.
7. **Focus on setting a clear mission for employees.** Defining a clear mission and vision is crucial. All employees need to understand that vision and work towards it together. A consistent message from all staff to the public establishes a belief in the organization, because it is clear what the group stands for.
8. **Communicate the human results and outcomes.** Large organizations often focus on the financial metrics. Tracking, evaluating, and reporting the impact of the efforts of the organization in human measures can help inspire belief and trust.
9. **Recognize both sides of the issue or data.** Presenting data in a balanced way helps people to believe there is not a bias from the organization. People tend to believe reports and data provided by health care organizations, especially related to pharma, are biased towards the organization. Balanced presentation of the data can help relieve those fears and build trust.
10. **Build trusted long-term relationships.** This suggestion was specifically about building up the trust of a group of people online, those who interact with the health care organization's social media presence and those that are considered "influencers" online. As the relationships with these groups strengthen, they will learn more about the real philosophy and thinking behind the organizations. They will also serve as advocates for the organization, especially online.

Appendix E

Methodology

Observations

Guiding question: How are Lakeland staff treating patients differently?

Explanation: Mystery shopping is when a person goes to an organization to access services a regular customer would but with the purpose of evaluating the "shopping" experience. For example, a mystery shopper may be tasked with recording how long it takes before an employee at clothing store asks them if they need any help or what temperature the chicken was when served at a restaurant. Mystery shopping experiences are useful for collecting information on how patients experience Lakeland. However, because posing as a patient or observing patient-staff interactions during medical services may be deemed unethical or a possible HIPAA violation, the evaluation team only observed interactions from afar.

Purpose: iEval has begun to develop a base of evidence for mistrust in Lakeland among community members, and there seems to be a growing understanding that much of this mistrust stems from interactions that the community has in Lakeland facilities as well as broken promises/commitments. The purpose of this approach is to better understand the day-to-day interactions between Lakeland staff and the patients they serve.

Where: Observations at five locations: Lakeland Medical Center, St. Joseph; Lakeland Hospital Niles; Lakeland Hospital Watervliet; Center for Outpatient Services (COPS); Marie Yeager Cancer Center

Process: Observations were conducted in person for a period of 2-4 hours at each location, with the St. Joseph hospital location having visits on three separate days. Observations occurred on July 19, August 15, August 16, and August 21. All visits occurred during the day but varied the time of day (i.e., morning, mid-day, afternoon). Eight different mystery shoppers observed on these dates: five African American and three white, four males and four females.

Mystery shoppers were dressed as regular community members – no name tag, no business attire, no clipboard or computer, etc. Records of the observations were made using Google Forms on each observer's phone, so it would not stand out and just look like observers were texting.

Observations were conducted around four elements: front desk interaction, walking the hallways, sitting in the cafe, and sitting in the emergency room or waiting room. The front desk experience required direct interaction, with the observer specifically asking for directions somewhere. The rest of the observations required observations with some tertiary interaction (e.g., smiles, greetings). The full protocol used for the observations can be found in Appendix A.

Interviews

Guiding question: What are the root causes of the perceived lack of trust or the actual lack of trust that medical providers and staff have in patients?

Purpose: Because the iEval team was not able to observe any physician/patient interactions or nurse/patient interactions, interviewing several key staff on their perceptions was deemed an acceptable alternative. The purpose of this approach is to better understand the front-line staff perspectives on trust.

Process: Two interviews were conducted, one with a family physician and one with an emergency room physician, both from Lakeland. The family physician was interviewed over the phone for approximately 30 minutes and the emergency room physician was interviewed in person for approximately one hour. The full protocol for interviews can be found in Appendix B.

Appendix E

Findings: Observations

The findings are reported by type of interaction or observation, disaggregated by the race of the observer when appropriate.

Front Desk Interactions

At the five locations, there were 15 different interactions recorded at a front desk, which could be at the primary facility entrance or the emergency room entrance.

Greetings: All four front desk interactions with white observers began with a friendly greeting from the employees/volunteers,[13] while seven out of the 11 interactions with the African American observers were deemed friendly. The other four greetings with African American observers were bored/apathetic (2), unfriendly (1), and pleasant yet bothered (1).

"I was greeted immediately after walking in. The front desk employee (or volunteer) seemed preoccupied with something he was doing. He did ask me if I needed help. I did not receive a smile or felt like it was his pleasure to help me."

~Black observer, Niles

Eye Contact: All four interactions with white observers noted direct eye contact from the Lakeland staff/volunteers. Eight of the 11 interactions with the African American observers involved direct eye contact, while two interactions had the staff/volunteer avoiding direct eye contact and one interaction had the staff/volunteer pre-occupied so not looking at the observer.

"They were friendly and personable. There was a desk for nurses in the waiting room, and these nurses seemed to have a rapport with some of the patients, calling out to them to say hi or check in on them."

~White observer, Cancer Center

Wait Time: Of the 15 interactions, only nine interactions involved any wait time, the observers in the other five interactions were helped immediately as they approached the desk. All three interactions with white observers that involved wait time were less than one minute. Four interactions with African American observers involved wait time of less than one minute, one had wait time of 6-10 minutes, and one observer was not helped after waiting near the desk for 15 minutes.

"There was a line. I was third in line, and she (staff/volunteer) seemed irritated because her staff friend was waiting to continue their conversation."

~Black observer, St. Joseph

"Upon entering, I lingered within clear view of two of the three front desk women. Both were looking down at their desktops. One looked up but then walked away from the area and out of sight. She did not speak, ask if I needed anything, or acknowledge my presence. The other woman looked up and asked if I needed anything. She was pleasant and provided clear directions to the cafeteria. She ended with a smile.

~Black observer, Niles

Clear Directions: When the observers asked for directions from the front desk staff/volunteer, nine out of 11 of the directions were clear and accurate. Two sets of directions given were somewhat clear, resulting in inaccurate directions that did not get the observer where they asked to go. There were no differences among racial lines for the inaccurate directions, as it happened to one white observer and one African American observer.

"The emergency room front desk staff were very helpful and quickly got me directions."

~Black observer, St. Joseph

"Two friendly older ladies greeted me and gave me directions, but they did not give clear directions about the location of the cafeteria. They stumbled a bit."

~White observer, Watervliet

Hallway Interactions

At the three hospital locations and COPS, there were 16 different timeframes that observers walked the hallways, recording how many Lakeland staff they passed and what type of interactions they had.

Number of Interactions: During the hallway walks, the observers walked by an average of 6 staff members, ranging from 1 to 18 staff per stroll.

"Positive and welcoming. One African American staff walked me to my destination and joked with me along the way."

~Black observer, St. Joseph

Smiles: 69% of the staff the observers passed while walking smiled at them, with a higher percentage smiling at white observers (75%) than African American observers (67%).

Direct Interaction: 39% of the staff the observers passed while walking spoke to them (e.g., a general greeting, an offer of help), with a higher percentage speaking to white observers (44%) than African American observers (38%).

Friendliness: Observers felt the majority of the staff they passed in the halls seemed friendly (69%), which aligns exactly with people smiling at the observers. All three hallway walks by white observers were deemed friendly overall while only 61% of the walks by African American observers were deemed friendly overall. The remaining walks that African American observers took gave the overall feeling that staff were distracted (e.g., tired, engaged in conversation with a coworker, looking away) and did not take the time to create a welcoming atmosphere.

"Both people asked me if I needed help and gave me clear directions on how to get to where I asked about. One walked me to the vending machine area since the cafeteria was closed, and then came back about a minute later to let me know that even though the cafeteria was closed, I could knock on the door and buy a sandwich."

~White observer, Watervliet

"I did not see a lot of staff during my walk. The first person I came in contact with was very helpful. He actually showed me to the café and gave me a brief rundown of where everything was in the café. He was extremely helpful and seemed genuinely interested in making sure I was taken care of."

~Black observer, St. Joseph

Appendix E

Cafe Observations

At the three hospital locations and COPS, there were 22 different observations of interactions in the café or cafeteria between Lakeland staff and visitors/patients.

Visitor Demographics: There were observations of interactions with male visitors/patients (8) and female visitors/patients (14), African American visitors/patients (13), and white visitors/patients (9)[14], and different age groups, using best guesses: less than 25 years old (6), 25-49 years old (10), 50-74 years old (5), and 75 years or older (1).

"African American visitor had a meal pass for one meal but had two meals on tray. Staff member explained she needed to pay for second meal. She didn't have any money. Staff was very friendly and gave her meal for free."

~White observer, St. Joseph

Greetings: The majority of the greetings by Lakeland staff to visitors were friendly (77%). The five greetings that were not friendly were: cautious to an African American visitor (3), bored/bothered to a white visitor (1), and unfriendly to an African American visitor (1).

"Staff pleasantly engaged with visitors upon entering and generally at their exit, if within speaking range."

~Black observer, Niles

Staff Disposition: Aligned with the type of greeting received, the overall staff disposition was pleasant (73%). Other general dispositions of Lakeland staff members included unengaged/disinterested (3), agitated/anxious (2), and unfriendly (1). The only difference by race of the visitors was that both interactions from the staff member that seemed agitated/anxious was with African American visitors, but note that it was the same staff member with this behavior so it may have been something external that was causing the anxiety.

"Overall very pleasant. There was a worker in training. Ordering food took a while, but everyone was kind."

~Black observer, COPS

Visitor Disposition: Because the disposition of the visitor also affects the interaction, the general disposition of visitors was noted. 77% of the visitors were pleasant, with two visitors being unengaged (African American), one visitor being agitated/anxious (white), one visitor being distressed (African American), and one visitor being unfriendly (African American). However, there were no clear patterns between staff greetings and visitor disposition, but there was one incident where the staff behavior dramatically changed to match that of the visitor.

"The cafeteria staff were very helpful. They greeted the person (African American male) and made light jokes while helping him select food."

~Black observer, St. Joseph

"Very little eye contact and almost rude interaction between visitor (African American female) and staff. The staff member was previously kind, yet during this interaction, the staff matched the visitor's attitude."

~Black observer, St. Joseph

Appendix E

Waiting Room Observations

At the five locations, there were 29 different observations of interactions in an emergency room or waiting room between Lakeland staff and visitors/patients. Overall, the waiting rooms were the most positive environment the observers witnessed during each visit, regardless of race, gender, or age.

Visitor Demographics: There were observations of interactions with male visitors/patients (13) and female visitors/patients (16); African American visitors/patients (10), Asian visitors/patients (1), Latino/a visitors/patients (2), and white visitors/patients (16)[15]; and different age groups, using best guesses: less than 25 years old (5), 25-49 years old (9), 50-74 years old (11), and 75 years or older (4).

"The staff were warm and friendly, going as far as to help the patient (African American male) dial numbers on the phone so he could contact his transportation home."

~Black observer, St. Joseph

Greetings: The majority of the greetings by Lakeland staff to visitors were friendly (93%). The two greetings that were not friendly were: not observed with an African American visitor (1) and bored/apathetic to a white visitor (1).

"It was good. It seemed appropriate for a cancer center. There was a recognition of the struggle the patient is going through, sort of a connection."

~White observer, Cancer Center

Service Time: All visitors were helped in a timely fashion.

Staff Disposition: All of the staff had very pleasant dispositions except for one staff member at COPS who was unfriendly towards a white visitor.[16]

Visitor Disposition: Because the disposition of the visitor also affects the interaction, the general disposition of visitors was noted. 72% of the visitors were pleasant, with three visitors being anxious, two in pain, and three showing no emotion. The other dispositions were across all racial groups, and there were no connections between race and staff greetings or staff disposition.

"Staff engaged patient with warm greetings and light banter. Appeared to be familiar with one patient (African American male) in particular, making connections and humorous chastising after patient got medical advice and caregiver instructions. Patient had wide smile.[16]

~Black observer, Niles

Waiting Room Atmosphere: 100% of the waiting rooms and emergency rooms were calm and orderly. The waiting room at the Cancer Center was especially supportive.

"The staff were helpful to each person they encountered in the waiting area. They all were very professional, engaging, and attentive to the needs of everyone coming in."

~Black observer, Watervliet

Appendix E

Findings: Interviews

Some key takeaways from the two interviews with physicians are shared below. On some issues, their perspectives varied quite a bit because of the location of services, the different populations each of them sees, and who they are working with within Lakeland.

Fair Treatment: Historically there are issues of mistrust between the community and Lakeland, and that segment of the population – while getting older – hold on to their memories. Some of the older physicians, nurses, and administrators help perpetuate that mistrust when they make comments about patients and they don't understand their situations. The new current medical residents are proactively doing outreach in the community at places like Elite Barbershop in Benton Harbor and the Community Food Network in Benton Heights to build understandings of the populations they are serving.

Often, by the time a patient gets past the first interactions in a medical facility and actually sees a physician, whether for inpatient or outpatient services, they have already made the decision to trust the medical professionals. The point at which the patient makes that decision is often in the first greetings they receive at the medical facility or during the first interactions with the nurses. However, physicians have a responsibility to treat patients with respect to help improve the overall perceptions of the organization.

Emergency room physicians, specifically, often feel that another medical professional may never treat this patient again, so this is the one opportunity to elevate their care. The ER physicians and residents look at the patients who are most needy and go out of their way to shepherd the patients into outpatient follow-up.

Faith in Patients: The general feeling from the two interviews is that patients do not make unreasonable demands or typically manipulate the visit for a secondary gain. While the patients often do have a difficult time understanding the care needed or managing their own condition, the physicians put that ownership on themselves (to better explain care) and society (for not being proactive in creating solutions to systemic issues of care).

Staff Perceptions of Patients: The perspective is that staff are very attentive and caring with patients when interacting with them, but there are comments made behind the scenes that are inappropriate. While those comments are not made knowingly in front of patients, they should still not be tolerated. Offering more experiences, such as having residents and nurses work in person at Elite Barbershop or the Niles program, can help staff better understand the context of the patients' lives.

Patient Perception of Lakeland: Patients seem to have a more positive perception of Lakeland in Niles than Lakeland in St. Joseph, feeling it is more family-oriented and less impersonal. Many community members have shared that they would rather drive to Kalamazoo or South Bend instead of going to St. Joseph, but those are the potential patients with the means (e.g., transportation, financial) to make those kinds of choices.

"We've gone through Bring Your Heart to Work and other rah-rah programs, but it really comes down to everyone is an ambassador to the health system you work in and you need to remember that every day."

Suggestions for Improvements: As previously mentioned, the physicians feel very strongly that the health care professionals should have experience putting themselves in the place of the patient, trying to understand as much as possible about the position they are in and have empathy for that. The medical professionals need to remember their other important medical roles, in addition to medical care, which include support, guidance, teaching, and elevating personal situations. If medical staff aren't able to spend time in community settings, then they need to make it a priority during the appointment to learn more about the patient, so they can personalize the care and instructions as much as possible.

"If medical professionals can relate to the patients outside of the medical care, they can better relate solutions to their lives. We need to be less problem-focused and more broad in our focus of care because then we'll be more effective. If you can relate the job people do to their health, it'll have more of an impact."

Conclusion

Overall, the atmosphere at all five locations was positive and friendly. While there were some differences in interactions based on race, there were also instances of excellence regardless of race. It is imperative that medical staff take the time to better understand the community they are serving.

It should be noted that there was diversity within the staff at St. Joseph, the Cancer Center, and COPS, while the staff at Niles and Watervliet were mostly white. Aligning with that, however, was the fact that most of the visitors/patients in Niles and Watervliet were also white.

The findings and recommendations in this report may be useful to the leadership teams at Lakeland as they work towards more inclusive, equitable facilities and care.

Recommendations:

- Expand the opportunities for Lakeland staff to interact with community members, representing Lakeland as medical experts, in comfortable community settings such as Elite Barbershop, Niles YMCA, and Community Food Network. Providing similar opportunities that the medical residents have for nurses, physicians, etc. would help open their minds to understanding the issues that community members face.
- Continuing the outreach work into communities served by Lakeland is important for rebuilding trust and shifting perceptions of Lakeland. This should be coupled with an emphasis on continuing to offer high quality customer service. Employees should remember that a negative experience can linger in community members' minds, and may be what is remembered when patients or other community members leave a Lakeland facility.
- Provide better training to front desk staff on how to greet community members as they enter the building, ensuring they understand that the patient/visitor is the first priority and a friendly greeting goes a long way in building trust.
- Develop a process for internal staff to use the observation protocol ("mystery shopping" experiences) in a regular basis. By having staff observe from a more objective perspective, with specific things in mind to watch for during the observation, it may help educate them on things they can change in their own work or in their own department.

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Appendix E

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[1] See other evaluation reports provided to Population Health related to this.
[2] Three Lakeland hospitals (Niles, St. Joseph, Watervliet), the Marie Yeager Cancer Center, and the Center for Outpatient Services
[3] However, there were also more front desk interactions made by the African American observers, so the White observers may have experienced the same if there were more interactions.
[4] Schwei et al. 2014
[5] Gilson 2003
[6] Musa et al. 2009
[7] Boulware et al. 2003
[8] Hall et al. 2002
[9] Govier, T. 1992
[10] Kyung et al. 2010
[11] Moskowitz, D., et. al., 2011
[12] Bhargava, R. 2010
[13] It wasn't always immediately obvious if the front desk staff were employees or volunteers.
[14] The evaluation team did not record the race of the Lakeland staff members.
[15] The evaluation team did not record the race of the Lakeland staff members.
[16] The visitor had come to COPS to get a shot but was told they did not do that there. The visitor did not understand, and the Lakeland staff member became agitated and was unfriendly in helping the visitor understand.

Appendix E

Appendix A: Mystery Shopping Guidelines

1. FRONT DESK – please pick one of the following options to do

*Note: there may be more than one point of entry and more than one help desk. Please do this at each help desk near a point of entry.

Option 1: Indirect interaction

Stand near, but not directly in front of, the help desk and look around like you're looking for something. When someone does speak with you, just let them know that you're just waiting for someone. Wait there a few more minutes, then meander to your next observation, pausing somewhere to type in your notes. Please make note of the following:

- How long you had to wait until someone asked if they could help you
- What type of greeting you were given (friendly, cautious, bored, etc.)
- Level of eye contact (direct, evasive, etc.)
- Overall feelings based on brief interaction

Option 2: Direct interaction

Walk directly up to the front desk to ask for help. Ask how to get to a specific location (e.g., cafeteria to meet a friend if in one of the hospitals or COPS, the waiting room to meet a friend if at the Cancer Center). Go on and follow the directions that were given to you and go to the place you asked about, which is where you can type your notes. Please make note of the following:

- What type of greeting you were given (friendly, cautious, bored, etc.)
- Level of eye contact (direct, evasive, etc.)
- Clarity of directions
- Competence in providing accurate information
- Was there any offer of additional help?
- Overall feelings based on brief interaction

2. HALLWAYS (plan for a 10-15 minute walk TWICE at each hospital, may be shorter at COPS because could seem awkward to wander around that long)

- Walk at a slow place like you're looking for something
- Pay attention, only go where the public are allowed – do not go into any private or restricted areas. This is not about testing hospital security
- Keep in mind some place to ask directions for if a staff member asks if they can help you (e.g., emergency room, cafeteria to meet a friend, birthing center)
- Please make note of the following:
    - Number of staff members who walk by you (How many made eye contact? How many smiled? How many asked if they could help you?)
    - Quality of interaction (eye contact, friendliness, clarity of directions, offer of additional help)
    - Overall feelings based on experience walking the halls

3. CAFÉ (plan for 30-60 minutes)

- Be careful not to be intrusive on patient privacy – you're observing from afar
- This observation does not involve any interaction on your part, you are casually observing the interactions between Lakeland staff and patients/families.
- Most likely interaction will be seen at the cash register or in the line, so position yourself sitting somewhere that you can see/hear what is happening there.
- You may have a book to look up from, be busy on your phone, drinking coffee, eating lunch, etc. Make it look like you belong at the café/cafeteria for the timeframe you are there observing.
- Please make note of the following:
  - Type of greeting (friendly, cautious, bored, etc.)
  - General disposition of visitors/patients & staff, as well as description of patient with whom staff member is interacting (only make notes if there is something memorable – very friendly or very unfriendly behaviors by staff or patients; you do not have to record every interaction)
  - Overall feelings based on interactions you have seen between staff and visitors/patients

4. Emergency Room / Waiting Room (plan for 30-60 minutes, may be broken up in to 3 shorter stays for 20 minutes)

- Be careful not to be intrusive on patient privacy – you're observing from afar
- This observation does not involve any interaction on your part, you are casually observing the interactions between Lakeland staff and patients/families
- You may have a book to look up from, be busy on your phone, drinking coffee, etc.
- Make it look like you are just waiting for someone for the timeframe you are there observing. If anyone asks you what you are doing, just say that you are waiting for a friend
- You primarily will be observing the staff/patient interaction at the registration desk and when nurses come to get patients
- Please make note of the following:
  - Length of time before patient is helped
  - Type of greeting (friendly, cautious, bored, etc.)
  - General disposition of visitors/patients & staff, as well as description of patient with whom staff member is interacting (only make notes if there is something memorable – very friendly or very unfriendly behaviors by staff or patients; you do not have to record every interaction)
  - General description of the feel in the emergency/waiting room area (calm, frantic, stressful, etc.)
  - Overall feelings based on interactions you have seen between staff and visitors/patients

Appendix E

Appendix B: Interview Protocol

My name is [name], and I'm an external evaluator with iEval, who has been helping the Population Health team over the past two years with evaluation. The evaluation work in that department has identified trust as a factor undermining Lakeland's impact on Population Health and how Lakeland can effectively help patients. We wanted to interview some key front-line staff within Lakeland to gather perspectives on trust. Anything you share with me today is confidential and will only be known to the evaluation team. We will be reporting themes across all of the interviews we conduct without attributing anything to individual person.

1. What is your role within Lakeland and what are the primary locations at which you work?
2. As mentioned, we have found that trust is an issue. In surveys we did with community members, 18% of them said they would not trust their health care to Lakeland and 16% said they do not trust they will be treated fairly at Lakeland. Do you believe all community members are treated fairly when they come to Lakeland for medical services? (please explain)
3. Thinking about the patients you typically see, what percentage of patients do you think will….(follow up on each with "What type of patient falls into the XX% that will not do that specific action?")
    a. tell you about all medications and treatments he or she is using?
    b. understand what you tell him/her?
    c. be actively involved in managing his/her condition/problem?
    d. not make unreasonable demands?
    e. not manipulate the office visit for secondary gain (e.g., for inappropriate disability certification or prescription of controlled substances?)
4. Do you feel there are many people who use the ER as their primary source of medical care? If so, why do you think that is?
5. What have you heard employees say about the patients who come to Lakeland? (can be both positive and negative, don't probe – just let people say what they will)
    a. What do you think Lakeland could do to help improve the perceptions and trust that Lakeland employees have in community residents?
6. What have you heard patients say about Lakeland? (can be both positive and negative, don't probe – just let people say what they will)
    a. What do you think Lakeland could do to help improve the trust that community members have in Lakeland as their health home?
7. What other suggestions do you have that could help improve Lakeland's image in the community or relationships with the patients?

Appendix F

Voter Turnout and Associated Social Determinants by Municipality

Geography	Unemployment Rate	% Owner-Occupied Housing Units	%, Year Householder Moved into Unit - Occupied Housing Units - Moved in 2010 to 2014	Voter Turnout Rate
Bainbridge Township	6.5	81.2	19.4	63.7
Baroda Township	7	83.8	24.2	60.1
Benton Charter Township	11	54.2	30.2	36.7
Benton Harbor City	23	32.2	45.8	28.4
Berrien Township	4.4	85.1	21.2	50.1
Bertrand Township	8	89.3	18.9	57.4
Bridgman City	4	72	24.7	59.8
Buchanan City	7.3	54.8	34.2	46
Buchanan Township	8.7	90	22.8	47.9
Chikaming Township	4.7	92.3	16.8	62.4
Coloma City	8.4	68	31.7	51.2
Coloma Charter Township	7.8	72	22.8	49.6
Galien Township	5.5	79.6	19.7	50.9
Hagar Township	8.7	77.8	17.6	55.2
Lake Charter Township	1.9	81.6	17.8	60.9
Lincoln Charter Township	4.7	79.6	25.4	63.4
New Buffalo City	5.9	71.5	30.4	51.8
New Buffalo Township	6.8	81.8	18.2	57.7
Niles City	9.5	54	35.4	37.2
Niles Township	8.3	75.9	29.9	48.1
Oronoko Charter Township	6.6	55.5	35.9	51.3
Pipestone Township	8.4	81.4	17.8	50.9
Royalton Township	3.6	86.6	21.7	63.4
St. Joseph City	4.6	56.7	39.4	60
St. Joseph Charter Township	4.6	86.9	21.4	62.2
Sodus Township	11.5	85.4	15.9	50.8
Three Oaks Township	7	72.8	26	50
Watervliet City	6.9	64.7	30.2	45.9
Watervliet Township	12.4	85.8	22.1	47.1
Weesaw Township	7.2	83.4	16.2	50.2

Appendix G

Dissimilarity Index for all Counties in Michigan

Geography	Estimate; Total:	Estimate; Total: White alone	Estimate; Total: Black or African American alone	% of the population needed to relocate to achieve Integration	Dissimilarity classification
Grand Traverse County	90715	85831	1158	40%	Moderately Segregated
Mecosta County	43259	40303	1140	40%	Moderately Segregated
Clinton	77245	72543	1173	42%	Moderately Segregated
Isabella County	70574	62445	1755	42%	Moderately Segregated
Ingham County	284559	214036	31804	45%	Moderately Segregated
Bay County	106107	100361	1586	45%	Moderately Segregated
Ottawa County	276583	249851	4001	46%	Moderately Segregated
Macomb County	859703	711089	91582	47%	Moderately Segregated
Monroe County	149945	142076	3489	48%	Moderately Segregated
Cass County	51795	45880	2486	48%	Moderately Segregated
Kalamazoo County	258605	210867	28060	49%	Moderately Segregated
Van Buren County	75216	65599	2552	49%	Moderately Segregated
St. Joseph County	60923	55797	1537	55%	Moderately Segregated
Washtenaw County	358082	264906	42970	55%	Moderately Segregated
Calhoun County	134691	110966	14563	55%	Moderately Segregated
Kent County	629352	508965	60729	57%	Moderately Segregated
Midland County	83559	78157	1216	58%	Moderately Segregated
Jackson County	159483	139499	13659	60%	Moderately Segregated
St. Clair County	160069	149831	3416	60%	Moderately Segregated
Marquette County	67418	62911	1109	60%	Moderately Segregated
Allegan County	113666	107300	1625	61%	Highly Segregated
Lenawee County	98673	91338	2891	62%	Highly Segregated
Oakland County	1235215	937568	170742	63%	Highly Segregated
Saginaw County	195201	146532	36154	63%	Highly Segregated
Eaton County	108544	94521	6718	67%	Highly Segregated
Genesee County	413090	309146	83620	67%	Highly Segregated
Chippewa County	38330	27370	2564	67%	Highly Segregated
Lapeer County	88310	84523	1094	69%	Highly Segregated
Branch County	43603	41096	1004	70%	Highly Segregated

Appendix G

Dissimilarity Index for all Counties in Michigan

Geography	Estimate; Total:	Estimate; Total: White alone	Estimate; Total: Black or African American alone	% of the population needed to relocate to achieve Integration	Dissimilarity classification
Berrien County	155134	121439	22985	70%	Highly Segregated
Ionia County	64126	58465	2392	71%	Highly Segregated
Muskegon County	172148	138915	23604	72%	Highly Segregated
Montcalm County	62922	59322	1261	74%	Highly Segregated
Wayne County	1767593	940071	694872	79%	Highly Segregated
Gratiot County	41676	38051	2367	80%	Highly Segregated
Ontonagon County	6165	5928	17	15%	Well Integrated
Keweenaw County	2195	2161	20	15%	Well Integrated
Iron County	11393	10938	63	17%	Well Integrated
Wexford County	32829	31552	222	22%	Well Integrated
Benzie County	17462	16756	75	28%	Well Integrated
Dickinson County	25889	25007	140	29%	Well Integrated
Alpena County	28929	28013	172	30%	Not Classifiable
Emmet County	33091	30628	220	31%	Not Classifiable
Shiawassee County	68800	66636	293	31%	Not Classifiable
Huron County	32021	31183	125	32%	Not Classifiable
Missaukee County	15032	14558	86	32%	Not Classifiable
Mason County	28755	27466	251	32%	Not Classifiable
Sanilac County	41761	40382	233	32%	Not Classifiable
Menominee	23568	22286	65	32%	Not Classifiable
Crawford County	13840	13314	70	33%	Not Classifiable
Schoolcraft County	8186	7118	48	33%	Not Classifiable
Osceola County	23172	22365	218	34%	Not Classifiable
Arenac County	15327	14803	76	34%	Not Classifiable
Otsego County	24198	23231	114	36%	Not Classifiable
Antrim County	23215	22263	79	36%	Not Classifiable
Iosco County	25373	24405	178	37%	Not Classifiable
Luce County	6451	5131	482	38%	Not Classifiable
Hillsdale County	46024	44692	286	39%	Not Classifiable

Dissimilarity Index for all Counties in Michigan

Geography	Estimate; Total:	Estimate; Total: White alone	Estimate; Total: Black or African American alone	% of the population needed to relocate to achieve Integration	Dissimilarity classification
Presque Isle County	12955	12585	67	39%	Not Classifiable
Montmorency County	9317	9038	23	40%	Not Classifiable
Kalkaska County	17259	16612	117	41%	Not Classifiable
Tuscola County	54014	52121	666	43%	Not Classifiable
Livingston County	185841	179295	921	44%	Not Classifiable
Newaygo County	47957	45028	650	44%	Not Classifiable
Barry County	59316	57126	365	45%	Not Classifiable
Charlevoix	26172	24866	91	45%	Not Classifiable
Leelanau County	21764	20191	109	45%	Not Classifiable
Ogemaw County	21103	20439	64	46%	Not Classifiable
Houghton County	36565	34184	282	47%	Not Classifiable
Cheboygan	25579	23858	188	47%	Not Classifiable
Lake County	11415	9983	827	47%	Not Classifiable
Alcona County	10461	10184	26	51%	Not Classifiable
Oceana County	26152	24906	305	51%	Not Classifiable
Clare County	30608	29520	156	52%	Not Classifiable
Baraga County	8612	6341	1567	53%	Not Classifiable
Gladwin County	25367	24704	88	53%	Not Classifiable
Mackinac County	10998	8227	241	53%	Not Classifiable
Delta County	36570	34406	91	59%	Not Classifiable
Oscoda County	8374	8093	49	60%	Not Classifiable
Gogebic County	15650	14164	708	61%	Not Classifiable
Manistee County	24465	22401	698	64%	Not Classifiable
Alger County	9396	8032	688	69%	Not Classifiable
Roscommon County	23900	23137	48	77%	Not Classifiable

Appendix H

Bikeable and Walkable Communities in Berrien County

Location	Walk Score		Bike Score	
City of Benton Harbor	74	Very Walkable	49	Somewhat Bikeable
City of Bridgman	46	Car-Dependent	49	Somewhat Bikeable
City of Buchanan	78	Very Walkable	54	Bikeable
City of Coloma	54	Somewhat Walkable	40	Somewhat Bikeable
City of New Buffalo	66	Somewhat Walkable	67	Bikeable
City of Niles	83	Very Walkable	73	Very Bikeable
City of St. Joseph	44	Car-Dependent	44	Somewhat Bikeable
City of Watervliet	50	Somewhat Walkable	44	Somewhat Bikeable
Coloma Township	0	Car-Dependent	14	Somewhat Bikeable
Village of Baroda	34	Car-Dependent	41	Somewhat Bikeable
Village of Berrien	71	Very Walkable	74	Very Bikeable
Springs	41	Car-Dependent	32	Somewhat Bikeable
Village of Eau Claire	18	Car-Dependent	39	Somewhat Bikeable
Village of Galien	0	Car-Dependent	22	Somewhat Bikeable
Village of Grand Beach	1	Car-Dependent	24	Somewhat Bikeable
Village of Michiana	45	Car-Dependent	NA	NA
Village of Stevensville	59	Somewhat Walkable	54	Bikeable
Village of Three Oaks				

Appendix I

Participation in Organized Religion in Berrien County

Group	% of Total Population	% of Total Adherents	# of Congregations
Protestant	22.7	46.8	155
Catholic	11	23.4	11
Baha'i	0	0.1	1
Jewish	0.2	0.3	1
Muslim	2	4.2	2
SDA	6.4	13.6	23
Christian other (including Mormon)	0.9	1.9	7
Pentecostal	3.9	8.4	40
Jehovah's Witness	0	0	6
Hindu	0	0	1
Sikh	0	0	1
TOTALS	47.1	98.7	248

Spectrum Health
Lakeland

1234 Napier Avenue
St. Joseph, MI 49085

spectrumhealthlakeland.org