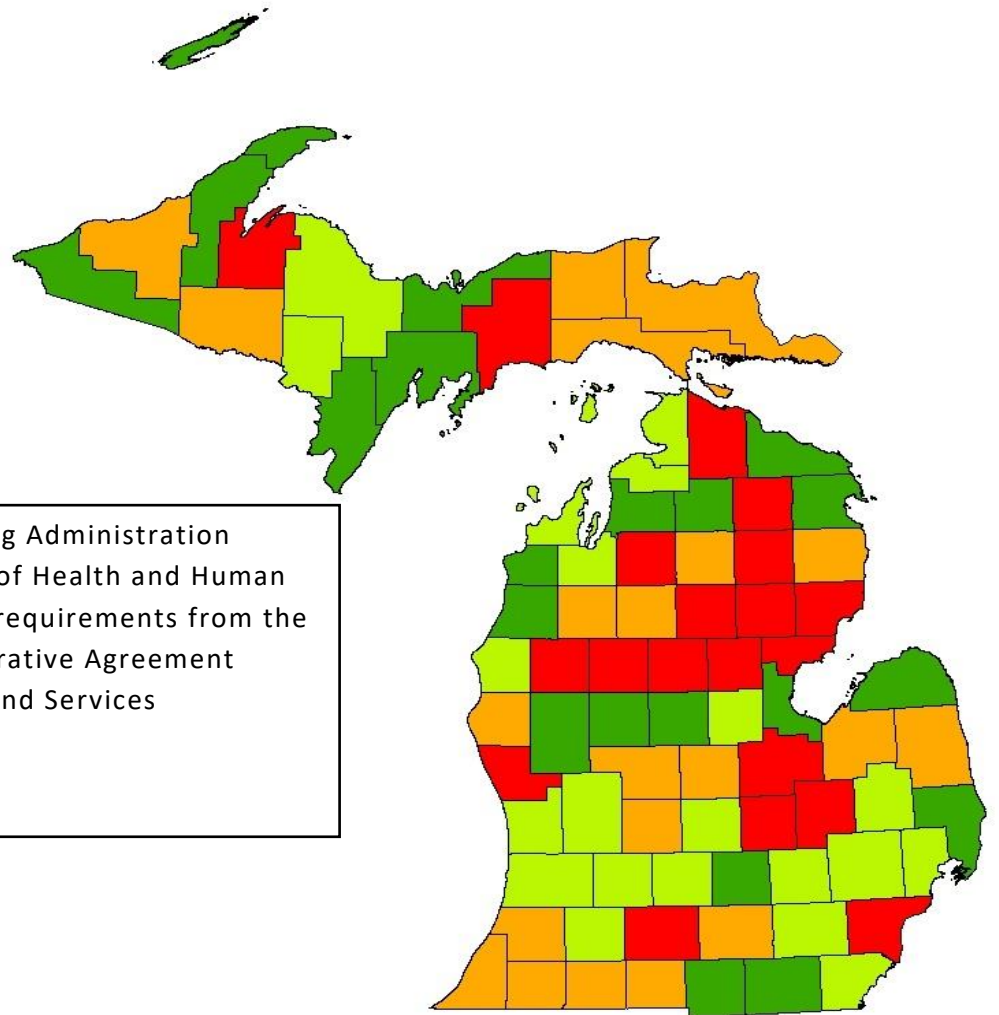


2020

Michigan Primary Care Needs Assessment (PCNA)



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Executive Summary

The Michigan Primary Care Office (PCO) is located within the Michigan Department of Health and Human Services (MDHHS) in the Policy and Planning Administration. The Michigan PCO has been in place since 1991 through the State Primary Care Offices Cooperative Agreement managed by the federal agency of Health Resources and Services Administration (HRSA), authorized under Title 3, Sections 330 and 333, of the Public Health Service Act, as amended. There are three main goals of the PCO cooperative agreement: Conduct a Statewide Primary Care Needs Assessment (PCNA), Provide Technical Assistance and Collaboration, and Shortage Designation Coordination. The Michigan PCO facilitates the coordination of activities that assess the need for primary care services and providers, promote the recruitment and retention of health care providers to fulfill identified needs, and reduce health care workforce shortage and barriers to care in the state.

This statewide PCNA presents a comprehensive and informative view of Michigan's vulnerable populations, unmet health care needs, health disparities, and health workforce issues in the state. This report provides a statewide overview of Michigan as well as highlighting certain areas, counties, and cities with areas of concern, workforce shortages, and barriers to access health care.

Methodology

The needs assessment was primarily developed through the analysis of secondary quantitative data – together with reliable studies and reports based on surveys and qualitative results. Several data sets were collected and, when possible, compared to the national data available and Michigan's overall rates and averages. The sources of data replicate best practices as recommended by HRSA and include a wide range of public federal, state, and local data sources such as the Centers for Disease Control and Prevention (CDC), U.S. Census Bureau's American Community Survey (ACS), U.S. Bureau of Labor Statistics, several MDHHS programs and divisions, among other sources. Over 50 core health indicators were utilized to describe target populations in Michigan, their relative health status, health risk factors, behavioral and mental health issues, and social determinants of health such as access to primary and preventive health care services.

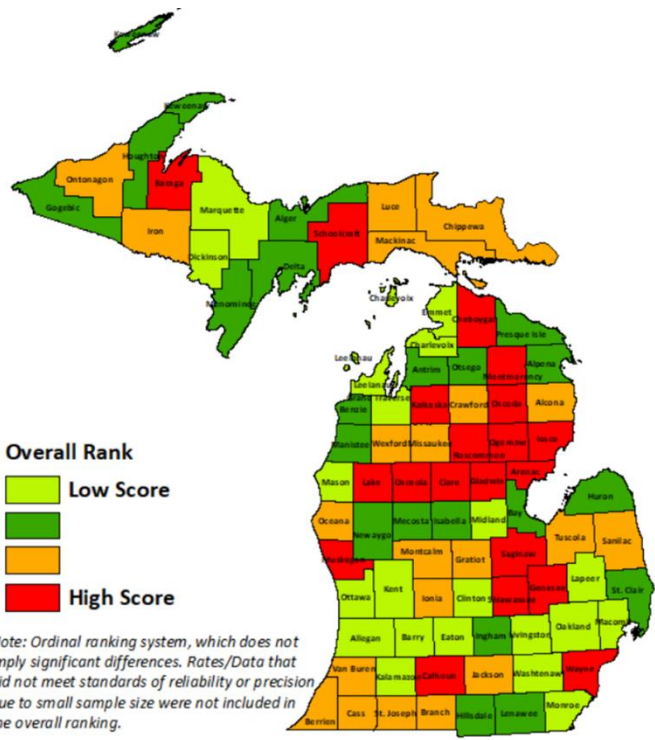
Key measures were selected to rank Michigan's 83 counties from greatest to lowest need based on the following four selection criteria: Data Availability, Shortage Designation Coordination, MDHHS Health Priorities, and National Comparison and Disparity. For each health indicator, the value for each county was normalized, ranked, and was awarded points based on need. The summation of each health indicator was the basis for the final score per county and a final ranking was assigned to showcase the county's need. The ranking was also calculated by established category and rural vs. urban areas were highlighted. Data analyses consist of Z-scores calculation, color-coded maps/geographic analysis, and other statistical analyses. Lastly, one-page data profiles were created for the state and the five areas of need.

Please note that Michigan counties were prioritized using an ordinal ranking system, which does not imply significant differences from one another. Also note that if a rate for a given category or key



measure could not be calculated due to a small sample size or due to some counties not having data available, it was not included in the overall ranking to avoid overestimating and/or underestimating needs.

Findings: Prioritization Results and High-Priority Health Issues in Michigan

Based on a total of 54 selected key measures, the areas of greatest need in Michigan are Wayne (Urban), Clare (Rural), Genesee (Urban), Gladwin (Rural), and Arenac (Rural) counties, which demonstrated the worst outcomes (from highest to smallest score) for the overall rank (Health Status and Social Determinants of Health indicators combined). Whereas the counties with the best outcomes or lowest scores were Livingston (Urban), Ottawa (Urban), Washtenaw (Urban), Leelanau (Rural), and Oakland (Urban).



When looking at the key health indicators by category, the counties with the worst Health Status outcomes were mostly urban counties and the areas with the worst Social Determinants of Health outcomes were rural counties, as shown in the table below.

County Ranking	Health Status Indicators (28)	Social Determinants of Health Indicators (26)
Highest Scores 	1. Genesee (Urban) 2. Wayne (Urban) 3. Muskegon (Urban) 4. Clare (Rural) 5. Calhoun (Urban)	1. Clare (Rural) 2. Arenac (Rural) 3. Gladwin (Rural) 4. Oscoda (Rural) 5. Roscommon (Rural)
Lowest Scores 	79. Washtenaw (Urban) 80. Leelanau (Rural) 81. Clinton (Urban) 82. Livingston (Urban) 83. Ottawa (Urban)	79. Ottawa (Urban) 80. Leelanau (Rural) 81. Oakland (Urban) 82. Washtenaw (Urban) 83. Livingston (Urban)

Some of the high-priority health areas identified in this report are:

- Infectious/Chronic Disease.
- Substance Abuse and Behavioral Health, mainly opioid and drug-related deaths.
- Health disparities, primarily in urban areas.
- Maternal and Infant Health, particularly in rural areas.

- People with disabilities and other vulnerable populations such as elderly and children.
- Socioeconomic factors, including unemployment, poverty, food/housing insecurity, and healthy behaviors.
- Leading Causes of Death, particularly Heart Disease and Cancer.
- Access to Health care and preventive services.

Summary of Major Findings: Key Health Status Measures

Morbidity Profile

- From 2012-2016, Michigan had a slightly higher Invasive Cancer Incidence (all sites) rate (per 100,000 population) than the U.S., particularly for Prostate and Lung/Bronchus cancers.
- In 2016, over 50% of Michigan counties had higher Diabetes prevalence rates than the state and the national rates.
- In 2018, the rate of Acute Hepatitis C (HCV) reported in Michigan was higher than the national acute HCV rate and there was a higher incidence of acute HCV among white people.
- Although the prevalence of HIV and the rates of newly diagnosed cases of Chlamydia, Gonorrhea and Primary and Secondary Syphilis in Michigan were lower than the U.S. rates in 2018, the HIV and STD epidemics continue to disproportionately affect African Americans and minorities in Macomb-Oakland-Wayne Counties metro area, particularly in the City of Detroit.

Health Status Indicators	MI	U.S.
All Invasive Cancer Incidence	450.9	448.0
Prostate Cancer Incidence	108.1	104.1
Lung and Bronchus Cancer Incidence	64.2	59.2
Diabetes Prevalence	9.8%	8.5%
Acute HCV Rate	1.8	1.0

Maternal and Infant Health Profile

- Preterm births and low birthweight are leading contributing factors of infant mortality in Michigan.
- From 2014-2018, the average number of deaths of children under one year of age was 6.7 per 1,000 live births in Michigan, which is higher than the national rate.
- Although the infant death rate has declined over time, African American mothers experienced three times the risk of an infant death compared to Caucasian mothers.
- In 2017, almost 60% of Michigan counties had higher Neonatal Abstinence Syndrome (NAS) rates than the state. The highest county rates were in the northern portion of the Lower Peninsula and in the Upper Peninsula.

Health Status Indicators	MI	U.S.
Preterm Births	10.0%	9.8%
Low Birthweight	8.6%	8.2%
Infant Mortality Rate (x 1,000 live births)	6.7	5.9
Neonatal Abstinence Syndrome Rate	835.8	730.0

Mortality Profile

- Life expectancy at birth for Michigan residents is lower than the U.S. There is also disparity by sex and race. In 2018, Michigan's life expectancy by sex and race shows that black men had the shorter life expectancy (69.1 years) and white women the longest (81.1 years) with more than ten years of difference.

- In 2018, Heart disease and cancer remained the leading causes of death in Michigan and the United States. In general, Michigan had higher death rates than the total U.S. for most of the 10 leading causes of death, except for Pneumonia/ Influenza.
- Opioids are the main cause of drug overdose deaths in the nation, accounting for approximately 78% of all drug poisoning deaths in Michigan. In 2018, there were 2, 599 drug poisoning deaths (26.7 per 100,000) in Michigan, significantly higher than the national rate (20.7 per 100,000).

Summary of Major Findings: Key Social Determinants of Health Measures

Demographics and Socio-Economic Factors Profile

- Michigan’s population is aging slightly faster with 16.3% of the population comprised of seniors aged 65 years and older, higher than the U.S. estimates (15.2%) in 2018.
- The population in the state is getting older, while the percentage of children under age 18 is decreasing. In 2018, over 83% of Michigan counties had higher percentages of elderly people than the state, particularly in rural Michigan.
- In 2018, there was a higher percent of people with a disability in Michigan than the U.S., 14.3% and 12.6% respectively.
- Although only 9.5% of adults aged 25 years and over did not have a high school diploma (or equivalency) in Michigan, which was lower than the U.S. estimates (12.3%) in 2018, the state is performing worse than the national estimates in terms of unemployment and median household income.
- In 2018, the population below the 100% and 200% of the federal poverty levels (FPL) in Michigan was higher than the U.S. estimates, particularly for Black and African Americans.
- Many people in Michigan are experiencing some type of housing instability and food insecurity. In 2017, there were 1,369,250 food insecure people in Michigan at an overall rate of 13.7%, higher than the national rate (12.5%).

Social Determinants of Health	MI	U.S.
Population ≥ 65 years	16.3%	15.2%
Population with a disability	14.3%	12.6%
Unemployment Rate	4.1%	3.9%
Annual Median Income (\$)	54,938	60,293
Population below 100% FPL	15.0%	14.1%
Population below 200% FPL	32.7%	31.9%
Food Insecurity Rate	13.7%	12.5%
Eviction Rate	3.3%	2.3%

Health Risk Factors Profile

- In 2016, the percentage of adults with obesity was 56.1%, significantly higher than the U.S. total (39.6%*). Additionally, 36.7% of Michigan adults with diabetes reported being physically inactive.
- Approximately 24.1% of mothers reported not receiving prenatal care (PNC) during their first trimester, which was higher than the national data (21.9%) in 2018. Late or no prenatal care in

Social Determinants of Health	MI	U.S.
Obesity Prevalence	56.1%*	39.6%*
Late or No PNC	24.1%	21.9%
Maternal Tobacco Use	14.3%	6.5%
EBLL in Children	3.1%	3.0%

the first trimester was higher among teen mothers (38.8%), American Indian (34.4%), Black (31.3%), and mothers of Hispanic Ancestry (31.2%).

- Of the women who gave birth in 2018, 14.3% reported smoking tobacco at some point while pregnant which double the national percent (6.5%). Almost 86% of counties had higher maternal tobacco use percentage than the state.
- In 2017, the percent of children under 6 years old with elevated blood lead levels (EBLL) in Michigan was comparable to the U.S. Over 26% of the counties had higher percent of EBLL in children than the state, including the City of Detroit.

Health Care Access and Preventive Services Profile

- In general, the estimated uninsured rate for the population under age 65 in Michigan was lower than the national average in 2017. However, about 70% of Michigan counties had higher uninsured rate than the state rate.

Social Determinants of Health	MI	U.S.
Uninsured	6.1%	10.6%
Preventable Hospitalizations Rate	22.8%	10.1%*
MH/SUD Hospitalizations Rate	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	46.0%	46.0%
Access to Fluoridated Water	68.8%	62.4%

- The percent of Michigan’s FFS Medicare enrollees that had an annual flu vaccination was 46.0% which is comparable to the national percent in 2017. Approximately 64% of Michigan counties had lower percent of annual flu vaccination than the state. Additionally, the percent of children (19-35 months old) not receiving the recommended immunizations (Combined 7-vaccine Series) was 30.1% in Michigan, slightly higher than the national percent (29.6%) in 2017.
- Only 41.1% of all 1,457 water systems are fluoridated and a total of 6,848,679 Michigan residents on community water systems had access to fluoridated water in 2018, which represents about 68.8% of the total Michigan population with access to fluoridated water. Approximately 80% of Michigan counties had lower than 50% of total county population with access to optimally fluoridated.
- About 22.8% of all hospitalizations in Michigan were classified as preventable in 2017– which was higher than the percent of preventable hospitalizations in 2016 (21.6%).
- In 2016, the age/sex adjusted rate of discharges involving mental and/or substance use disorders (MSUD) stays per 100,000 population was 3,675.5 in Michigan, higher than the U.S. (3,087.7).
- While the provider data shows that there may be an abundant overall supply of primary care, mental health, and dental health providers practicing in Michigan – relative to the total resident population, the supply is not evenly distributed throughout the state, with counties with relatively high population-to-FTE ratios or no providers identified in the service area.

All the information utilized for this report comes from secondary data sets, from publicly available reliable sources. Although qualitative data (information collected through key informant interviews, focus groups, or similar methods) was not included in this needs assessment, a comprehensive literature review was conducted to enhance this report and to identify additional health care challenges and

barriers to care. In addition, key stakeholders and PCO partners were consulted about the needs assessment's structure, methodology, content, health indicators, data sources, and other related topics.

Main Barriers to Care

- **Medically Underserved Areas/Populations and Health Workforce Shortage:**
 - 2,826,423 MI residents are underserved in terms of primary medical care resources with a need of 546 additional practitioners to remove primary care designations.
 - 1,446,086 MI residents are underserved in terms of dental health care resources with a need of 350 providers to remove dental designations.
 - 4,225,899 Michigan residents are underserved in terms of mental health care resources with a need of 207 providers to remove mental HPSAs.
- **Health Care Safety Net Sites Locations and access to health care in Rural Michigan:** rural hospital closures and limited access to maternity care.
- **Health Workforce Projections and Residency/Fellowship Capacity:** There is a need to assess the capacity of Michigan's future health care workforce and to address health professional shortages and maldistribution of providers in urban vs. rural areas.
- **Transportation, Infrastructure, and Other Challenges:** Michigan's geography and its unique challenges, limited access to public transportation and long travel times in rural Michigan, general infrastructure status and road conditions in the state.
- **Political and Economic Climate:** Previous Medicaid Work Requirement Law, Opioid and Prescription Drug Epidemic, Flint Water Crisis Update and Response Action, COVID-19 Impact on Health Care Delivery in Michigan, and Access to Telemedicine and Telehealth Reimbursement.

Implementation Plan

This needs assessment serves as a source of reliable and accurate information for our community and stakeholders to improve accessibility of primary care resources, particularly for underserved and vulnerable populations in Michigan.

In response to the key findings and barriers to care discussed in this report, Michigan PCO will establish priorities that will support its diverse efforts to strengthen primary care in the state – including:

- Address primary health care needs by prioritizing resources through shortage designation coordination, strengthen current partnerships and build new strategic collaborations, and reduce barriers to primary health care by leveraging existing federal, state, and other programs including the Michigan State Loan Repayment Program.
 - Update current shortage designations and reassess high-need areas and underserved populations for new HPSA/MUA/P applications in the state.
 - Continue supporting health care facilities interested in expanding access to primary health care to underserved areas through the rural health clinic (RHC) certification, free clinics program, NHSC site certification, opiate treatment funding, loan repayment programs, and other recruitment and retention programs.
- Conduct key informant interviews/surveys and revise provider data regularly to enhance future needs assessment update and for the development of statewide rational service areas plans based on health care utilization patterns.

I. Introduction

A. Purpose of the Report

The Michigan Primary Care Office (PCO) is located within the Michigan Department of Health and Human Services (MDHHS) in the Policy and Planning Administration. The Michigan PCO continues to build upon its successful work to identify health workforce shortages and improve the health status of medically underserved populations in Michigan. The purpose of this report was to identify high-priority health issues affecting Michiganders and to determine areas of greatest need in the state by ranking our 83 counties.

This statewide Primary Care Needs Assessment (PCNA) presents a comprehensive and informative view of Michigan’s vulnerable populations, unmet health care needs, health disparities, and health workforce issues in the state.

The PCO utilized existing tools and data sources as well as networking with PCO partners and health organizations within the state to gather an extensive array of health needs within Michigan. This report provides a statewide overview of Michigan as well as highlighting certain areas, counties, and cities with areas of concern, workforce shortages, and barriers to access health care.

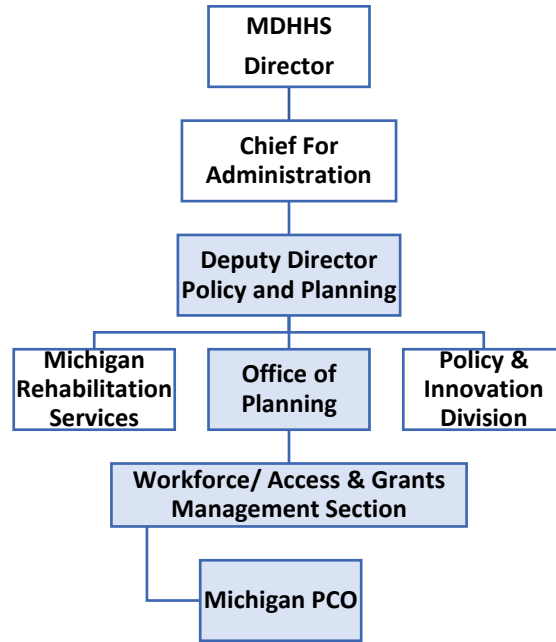


Figure 1: Michigan PCO Lite Organizational Chart

B. Background and PCO Key Programs

The Michigan PCO has been in place since 1991 through the State Primary Care Offices Cooperative Agreement managed by the federal agency of Health Resources and Services Administration (HRSA), authorized under Title 3, Sections 330 and 333, of the Public Health Service Act, as amended. Over the years, the PCO roles and responsibilities have varied with the main goals of improving primary care service delivery, enhancing access to care, and to address and reduce health workforce shortages to meet the needs of underserved populations.

There are three main goals of the PCO cooperative agreement: Conduct a Statewide Primary Care Needs Assessment, Provide Technical Assistance and Collaboration to stakeholders, and Shortage Designation Coordination. The Michigan PCO facilitates the coordination of activities that assess the need for primary care services and providers, promote the recruitment and retention of health care providers to fulfill identified needs, and reduce health care workforce shortage and barriers to care in the state. With that in mind, the Workforce/Access & Grants Management Section, which manages the PCO grant,

concentrates on four inter-related areas – including areas outlined by HRSA as priority areas of the PCO grant. See Figure 2.

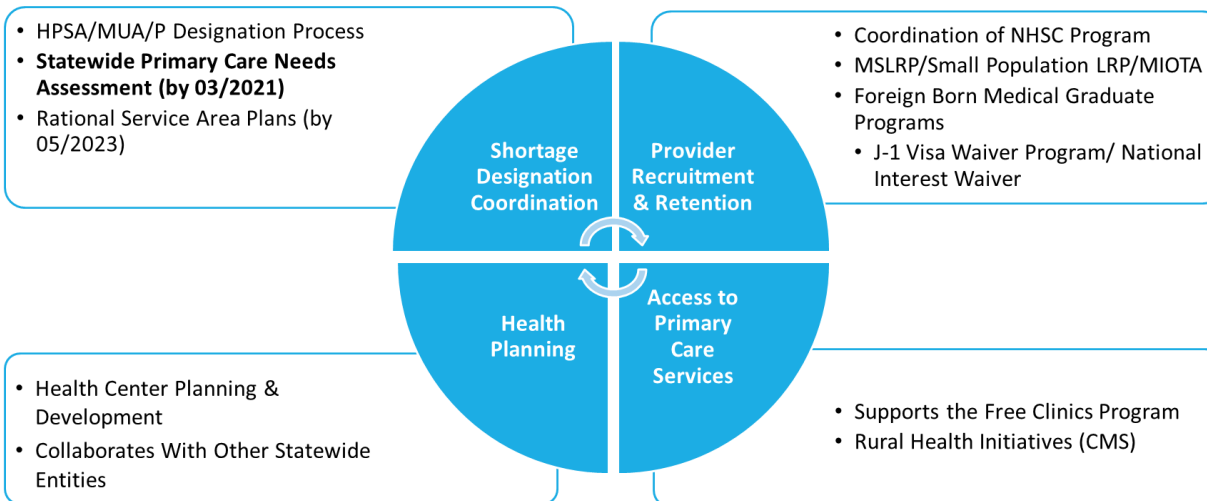


Figure 2: Michigan PCO Key Program Areas

Shortage Designation Coordination

Michigan PCO coordinates the shortage designation process in the state. The PCO submits applications to HRSA to designate areas in Michigan, primarily as Health Professional Shortage Areas (HPSA) or Medically Underserved Areas or Populations (MUA/P). However, there are several types of shortage designations, as shown below per federal definitions¹:

- **Health Professional Shortage Areas (HPSA)** identify geographic areas, populations groups, or facilities within the state that are experiencing a shortage of health care professionals.
- **Medically Underserved Areas (MUAs)** and **Medically Underserved Populations (MUPs)** identify geographic areas and populations with a lack of access to primary care services.
- **Exceptional Medically Underserved Population (Exceptional MUP)** identify a specific population subset that does not meet the established criteria but due to unusual circumstances do not have access to primary care services.
- **Governor’s Designated Secretary-Certified Shortage Areas for Rural Health Clinics** are areas designated by a state Governor or designee as having a shortage according to the state-established shortage plan/criteria for the establishment of a Rural Health Clinic.

In our role as the HRSA-designated state PCO, one of our responsibilities is to establish Statewide Rational Service Area (SRSA) plans covering the entire state as part of this project period. An RSA is a state-identified geographic area within which most area residents could or do seek and obtain most of

¹ Health Resources and Services Administration (HRSA); Shortage Designations < <https://bh.w.hrsa.gov/shortage-designation/what-is-shortage-designation>> (14, October 2019).

their health care services². The SRSA plans must reflect utilization patterns for each discipline: primary care, dental, and mental health. For shortage designations, RSAs may be a whole county, multiple counties, sub-counties (not smaller than a census tract), catchment areas³ (for mental health HPSA only), and/or statewide established RSA. The purpose of the SRSA plans is to establish rules, a statewide system, for defining service areas that reasonable reflect effective health care access patterns and needs in Michigan. To support the shortage designation process and to establish PCO priorities, the Michigan PCO must conduct a statewide primary care needs assessment every five years, which must be updated on an annual basis if there are significant data changes and new findings.

Provider Recruitment and Retention

To address identified health care needs, reduce health care workforce shortage and barriers to care in the state, the PCO promotes the recruitment and retention of health care providers in underserved areas by leveraging federal, state and other programs, such as:

- **National Health Service Corps (NHSC):** federal program that awards scholarships and loan repayment to providers in eligible disciplines, and help health care facilities to recruit, retain and support clinicians serving in high-need areas.
- **Michigan State Loan Repayment Program (MSLRP):** state program that helps employers recruit and retain primary medical, dental, and mental healthcare providers by providing loan repayment to those entering service obligations.
- **J-1 Visa Waiver or Conrad 30 Waiver Program:** Under this program, MDHHS may recommend up to 30 J-1 Visa physicians annually to receive a waiver of the 2-year home residence requirement in exchange for a commitment of 3-years of service in an underserved area.

For more information about these programs, please visit <https://www.michigan.gov/mdhhs/>

Access to Primary Care Services and Health Planning

This division also provides assistance to communities interested in expanding access to primary health care resources through various means, including but not limited to making information on HPSAs and MUA/P available, sharing data about Michigan’s primary health care workforce for grant applications, managing the grant program for free clinic organizations providing care services to the uninsured population, and supporting rural health clinics initiative. The PCO also supports Michigan’s health care safety net providers through health center planning and development and building collaboration with other statewide entities such as the Michigan Primary Care Association (MPCA) and Michigan Center for Rural Health (MCRH).

² Lopes, P. M. (2000, February). State-Wide Rational Service Areas for Primary Care Services: Lessons from Six States. Retrieved from Health Resources and Services Administration (HRSA):

<https://www.hrsa.gov/sites/default/files/grants/apply/assistance/pco/primarycareserviceareas.pdf>

³ The catchment area—the area containing the population for which a community mental health service unit has responsibility.

C. Methodology: Overview of the Needs Assessment Process

The needs assessment methodology for the PCNA began with the Michigan PCO conducting a review of the numerous reports, tools, and data already in existence that help identify unmet health care needs, disparities, and health workforce issues in the state. This needs assessment was primarily developed through the analysis of secondary data to present an informative picture of Michigan’s vulnerable populations, unmet health care needs, health disparities, and health workforce issues in the state. The PCO compiled data from local, state, and federally recognized agencies, such as the U.S. Census Bureau, and several subdivisions within MDHHS (e.g. Vital Statistics, BRFFS, Medicaid, Oral Health Unit, Environmental Health, among others) – together with reliable studies and reports based on qualitative data such as surveys and firsthand results. The sources of data replicate best practices as recommended by HRSA.

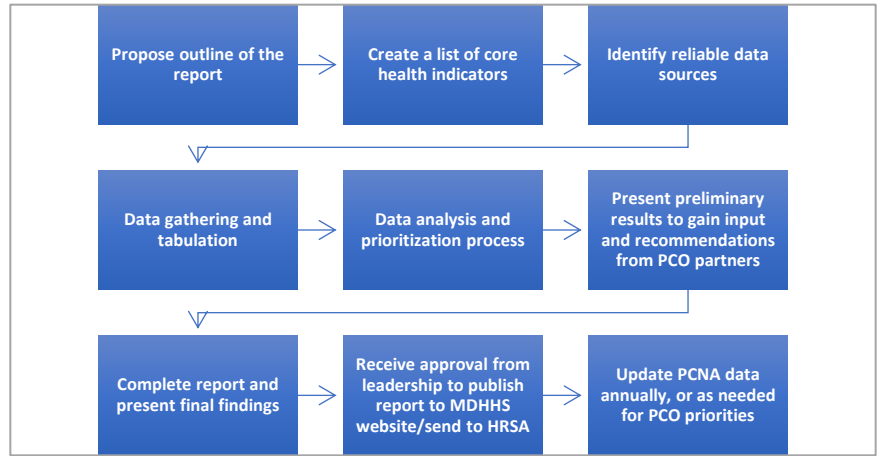


Figure 3: PCNA Process Overview

The data collected consist of a list of over 54 core health indicators used to describe target populations in Michigan, their relative health status, health risk factors, behavioral and mental health issues, and social determinants of health such as socioeconomic status, education, physical environment, infrastructure, as well as access to primary and preventive health care services. This assessment highlighted several barriers to healthcare for the state including poverty, population to provider ratios, healthcare deserts, geographical difficulties, and transportation. Data portraying evidence of these barriers is included and data showing areas that lack access to care, providers, and areas that show the highest needs for improvement in health services.

Prioritization Process

Selection of Key Measures

The purpose of the prioritization process was to identify high-priority health issues affecting Michiganders and to determine areas of greatest need in the state. The key measures used for the prioritization and ranking process were selected based on the following criteria:

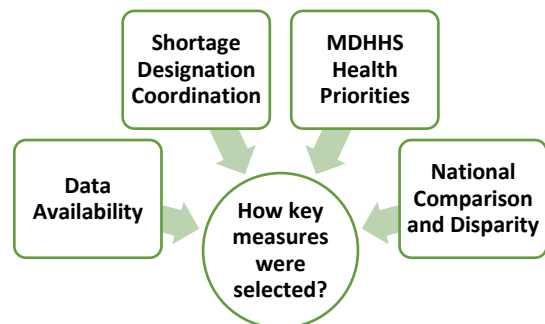


Figure 4: Selection of Key Measures

- **Data Availability:** data must be available at the county, state, and/or national level.
- **Shortage Designation Coordination:** measures used for the designation of HPSAs and MUAs/Ps.

- **MDHHS Health Priorities:** measures related to the current nationwide opioid crisis and other health indicators aligned to MDHHS strategic priorities and focus areas.
- **National Comparison and Disparity:** measures where the state value was worse than the national average, or at least 25% of the counties were worse than the state or national averages. We also looked at measures with greatest subgroups disparities (by race, age, sex, or other), when data was available.

Based on these criteria, Michigan PCO established several categories and selected the key measures.

Table 1: Established Categories and 54 Key Health Measures Used for the Prioritization Process

Categories and Key Health Measures		
Health Status (n=28)		
Morbidity (11)	Maternal and Infant Health (4)	Mortality (13)
<ul style="list-style-type: none"> • All Invasive Cancer Incidence Rate and four leading sites: <ul style="list-style-type: none"> ○ Female Breast ○ Prostate ○ Lung and Bronchus ○ Colon and Rectum • Diabetes Prevalence • Chlamydia Rate • Gonorrhea Rate • Primary & Secondary Syphilis Rate • HIV Prevalence Rate • Acute Hepatitis C Rate 	<ul style="list-style-type: none"> • Preterm Live Births • Low Birthweight • Infant Mortality Rate • Neonatal Abstinence Syndrome (NAS) Rate 	<ul style="list-style-type: none"> • Total Mortality Rate (All Causes) • Heart Disease Mortality • Cancer Mortality • Chronic Lower Respiratory Diseases Mortality • Stroke Mortality • Alzheimer's Disease Mortality • Diabetes Mellitus Mortality • Kidney Disease Mortality • Pneumonia/Influenza Mortality • Suicide Rate • Drug-induced Mortality • Opioid Overdose Mortality • Alcohol-induced Mortality
Social Determinants of Health (n=26)		
Demographics and Socio-Economic Factors (10)	Health Risk Factors (6)	Health Care Access and Preventive Services (10)
<ul style="list-style-type: none"> • Population under 5 y/o • Population 65 years and over • Population with a disability • Adults without high school diploma • Unemployment Rate • Annual Median Income • Population below 100% FPL • Population below 200% FPL • Food Insecurity Rate • Eviction Rate 	<ul style="list-style-type: none"> • Obesity Prevalence • Physical Inactivity • Maternal Tobacco Use • Teen Births • Late Entry into PNC • Elevated Blood Lead Levels (EBLL) in Children 	<ul style="list-style-type: none"> • Uninsured Population (< 65 y/o) • Preventable Hospitalizations Rate • Hospital Stays Related to Mental Health and/or SUD • Annual Medical Exams • Annual Flu Shot • Access to Fluoridated Water • Population to PC FTE Ratio • Population to OB/GYN FTE Ratio • Population to Dentist FTE Ratio • Population to Psychiatrist FTE Ratio

Data Analysis: Calculating Ranks

The first step of the ranking process was to standardize each of the measures by putting them on the same scale/metric to allow comparison and assessment of health needs across the service areas (i.e. counties), calculating a Z-score for each measure by county.

$$\text{Z-Score} = \frac{(\text{County Value}) - (\text{Average of MI Counties})}{(\text{Standard Deviation of MI Counties})}$$

Figure 5: Calculating the Standard Score

Most of the key health indicators represents different health needs (e.g. poverty, infant mortality, etc.), where a higher Z-score indicates areas of greater health care priority. However, there are some exceptions in which lower values indicate high need (e.g. income, flu shots, etc.). For the exceptions in which the numerical scoring scale runs in the opposite direction, a reverse scoring was calculated multiplying the Z-scores by negative one so that higher scores indicate greater need. Then, a cumulative score was calculated by adding all the z-scores resulting in an overall score, category scores, and highlighting urban and rural counties. Once the Z-scores are calculated for each measure and summed to create the overall score by county, counties were ranked from highest need to lowest need. Note that if a rate for a given category or key measure could not be calculated due to a small sample size or due to some counties not having data available, it was not included in the overall ranking to avoid under or overestimating needs.

The county with the highest score represents the one with greatest health need. Using Geographic Information System (GIS), color-coded maps were created to facilitate understanding and for better visualization of the distribution of health needs within the state. Although other statistical analyses were conducted, the rankings are on an ordinal scale and are not necessarily statistically significantly different from each other. To summarize final findings, one-page data profiles were created for the state and greatest need areas.

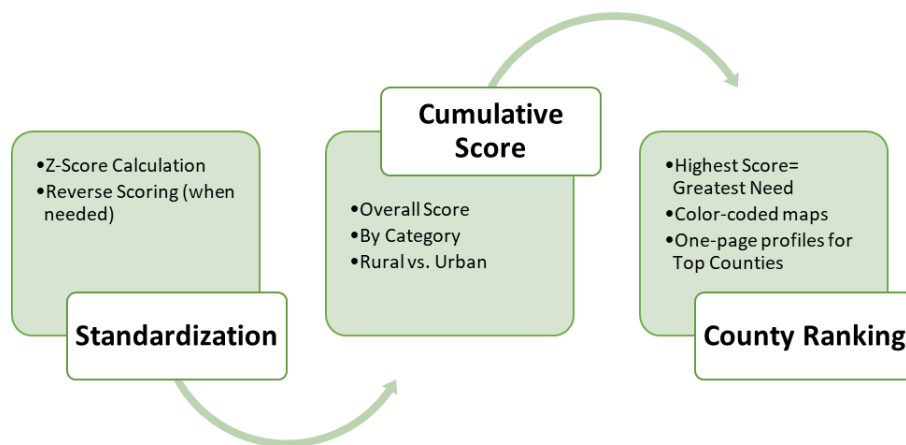


Figure 6: Overview of the Ranking Process

For this PCNA, no weights were assigned, and all the key measures have the same relative importance to present the results based on the available data. We recognize that some measures may have a greater impact on health outcomes and that a weighted-measure approach may be helpful to indicate any relative importance of key measures in estimating unmet needs and establishing priorities – but there are several discrepancies in terms of the selection of specific measures, their categories, and their corresponding weights. ^{4 5 6}

⁴ HRSA (2019). Unmet Need Score (UNS) Resource Guide. Description of Service Area Needs Assessment Methodology (SANAM) and Resulting UNS. URL: https://bphc.hrsa.gov/sites/default/files/bphc/programopportunities/fundingopportunities/NAP/uns_resource_guide.pdf

⁵ Bookse BC, Athens JK, Kindig DA, Park H, Remington PL (2010). Different perspectives for assigning weights to determinants of health. County Health Rankings Working Paper. URL: <https://www.countyhealthrankings.org/sites/default/files/differentPerspectivesForAssigningWeightsToDeterminantsOfHealth.pdf>

⁶ Remington, P.L, Catlin, B. B., & Gennuso K. P. (2015) The County Health Ranking: rationale and methods. Popul Health Metr, 13(11). URL: <https://pophealthmetrics.biomedcentral.com/articles/10.1186/s12963-015-0044-2>

II. State Profile – Michigan

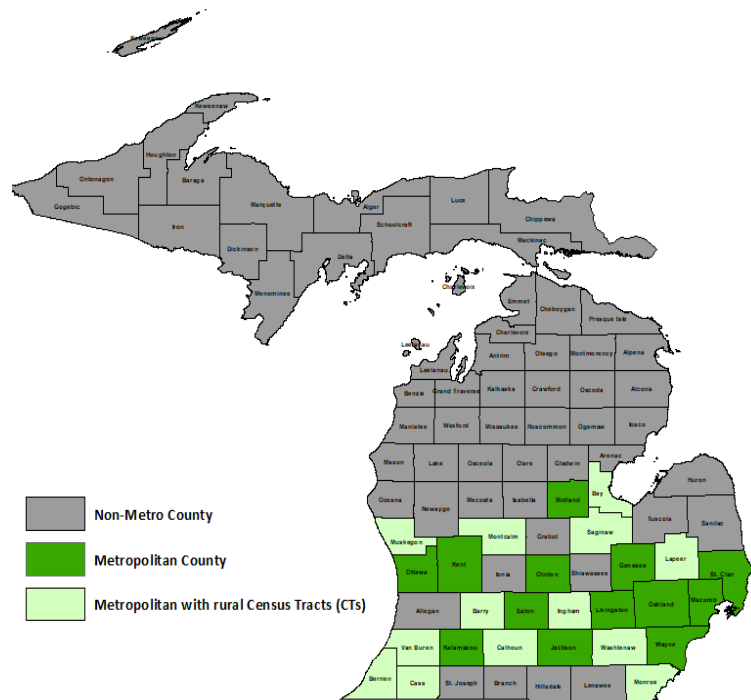
Michigan has significant need for resources contributing to primary care service delivery and workforce availability. With a growing population of just under 10 million people, Michigan is the tenth most populous state in the nation.⁷ The unique geography of the Great Lakes State, the distribution of the population within that geography, recent economic challenges facing the state's population, and trends in healthcare workforce have impacted the ability to provide access to care. Evidence of the need for enhanced primary care service delivery in Michigan is found in the current shortage designation status of many Michigan communities and comparisons of Michigan's health status to that of the nation for several core health indicators, as demonstrated in this report.

A. Population Distribution

Michigan consists of 83 counties and 58,110 square miles of land area divided among two peninsulas surrounded by 3,288 miles of coastline along 38,575 square miles of Great Lakes water area.⁸ The distribution of Michigan's population varies significantly across the state. Much of Michigan's Upper Peninsula and Northern Lower Peninsula is rural with low population density and relatively high similarity in population demographics. Southern Michigan is more metropolitan than northern Michigan with higher concentrations of population centered around a few urban centers. See Figure 7.

Based on the Federal Office of Rural Health Policy (FORHP) definition, Michigan has 57 non-metropolitan counties and 13 metropolitan counties with eligible rural census tracts.^{9 10} Michigan's metropolitan areas tend to

Rural Definition based on the Federal Office of Rural Health Policy (FORHP)



Map prepared by: MDHHS Office of Planning-Workforce/ Access & Grants Management Section.
2020 PCNA

Figure 7: Metropolitan and Non-Metro Counties in Michigan

⁷ U.S. Census Bureau. (2018, December 19). Nevada and Idaho Are the Nation's Fastest-Growing States. Retrieved Dec 10, 2019, from <https://www.census.gov/newsroom/press-releases/2018/estimates-national-state.html>.

⁸ The Library of Michigan Presents: Michigan in Brief. Retrieved Dec 10, 2019, from https://www.michigan.gov/som/0,4669,7-192-29938_30240_30250-56001--,00.html (Last Updated 08/02/2019)

⁹ HRSA Defining Rural Population. Available at: <https://www.hrsa.gov/rural-health/about-us/definition/index.html>

¹⁰ HRSA Federal Office of Rural Health Policy (FORHP) Data Files. Available at: <https://www.hrsa.gov/rural-health/about-us/definition/datafiles.html>

have a more diverse demographic make-up than their rural counterparts. Both, Michigan’s urban and rural areas, experience unique primary care challenges related to the availability and accessibility to health care services, the recruitment and retention of health care providers, and healthy lifestyles.¹¹ Appropriately addressing the health care needs of both Michigan’s metropolitan and non-metropolitan populations requires a broad range of data collection, needs assessment, technical assistance, community development and planning efforts that respond to a variety of health care needs.

According to the 2018 American Community Survey (ACS) 5-year estimates, the population in Michigan was comprised of 50.8% females and 49.2% males. With a median age of 39.7 years, which is higher than the national average (37.9 years). The racial composition and Hispanic origin in the state was: 78.5% white, 13.8% Black or African American, 5.0 % Hispanic or Latino (of any race), 3.1% Asian, and 0.5% American Indian and Alaska Native. The most populous city, and one of the most diverse and impoverished cities in Michigan, is Detroit with a population of 677,155 people. Cities with population counts above 100,000 people are Grand Rapids (197,081 people), Warren (135,192 people), Sterling Heights (132,470 people), Ann Arbor (120,641 people), and Lansing (111,900 people).¹²

B. Health Status

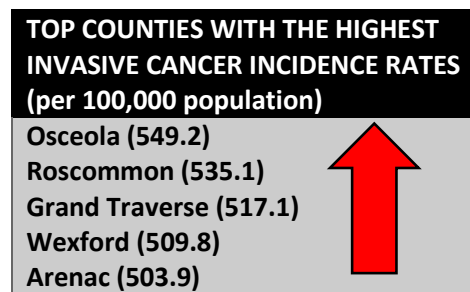
The relative level of wellness and illness of Michigan residents was measured based on a total of 28 health indicators divided into three categories: Morbidity, Maternal and Infant Health, and Mortality.

Morbidity

Morbidity indicators include communicable and chronic diseases such as Cancer, Diabetes, HIV, Sexually Transmitted Diseases (STDs), and Viral Hepatitis. According to the MDHHS Chronic Disease Epidemiology Section, more than 60% of Michigan’s adult population suffers from a chronic disabling condition which account for seven of the 10 leading causes of death in Michigan.¹³

Cancer Incidence Rates

From 2012-2016, there were 450.9 new cases of all sites age-adjusted Invasive Cancer for every 100,000 people in Michigan – slightly **higher** than the national average (448.0 per 100,000). Approximately 36% of Michigan counties (including the city of Detroit) had significantly



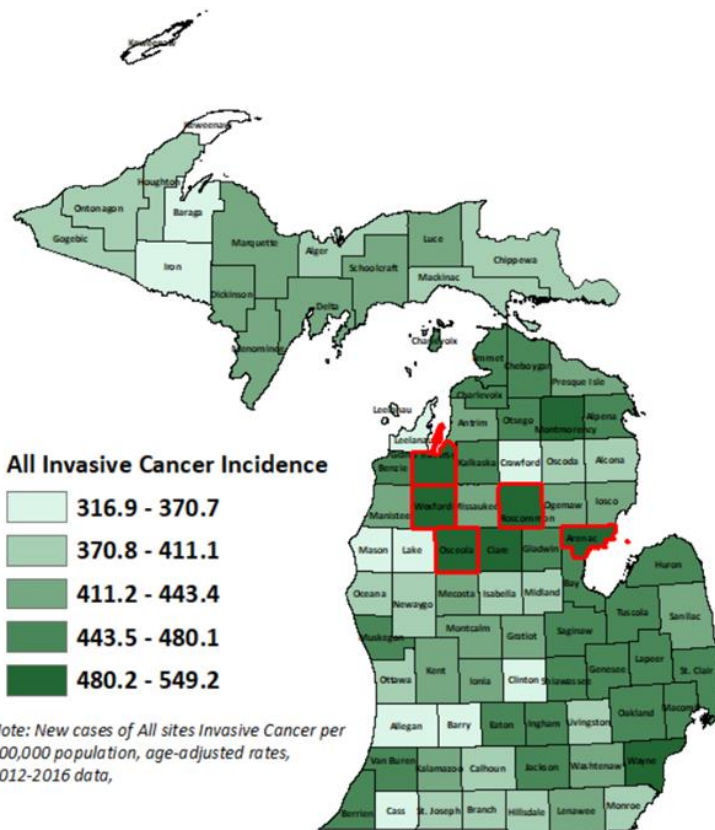
¹¹ Barnas, John, et al.; Michigan Strategic Opportunities for Rural Health Improvement, A State Rural Health Plan 2008-2012; Michigan Center for Rural Health; (23 April 2008).

¹² U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates. Table DP05. Retrieved from: <https://www.census.gov/data.html>

¹³ MDHHS Chronic Disease Epidemiology Section. Lifecourse Epidemiology & Genomics Division. Retrieved Dec 10, 2019, from https://www.michigan.gov/mdhhs/0,5885,7-339-71550_5104_5279-185986--,00.html

higher cancer incidence rates than the state. The five counties with the highest Invasive Cancer incidence rates were in northern Michigan.¹⁴

The four leading sites of new cancer cases per 100,000 population were Female Breast (124.0), Male Prostate Gland (108.1), Lung/Bronchus (64.2), and Colon and Rectum (37.5). The incidence rates for Prostate and Lung/Bronchus cancers in Michigan were higher than the national rates (104.1 and 59.2, respectively).¹⁵ In general, there has been a slight decrease of cancer incidence rate in recent years for some of the leading cancer sites for both sexes in the state. Although the reduction in cancer incidence has been more evident among males, incidence rates for all cancers are higher for black males than white males. Breast, lung, and colorectal cancer rates tend to be slightly higher for black women than for white women. Additionally, the cancer incidence and mortality increase progressively with age for all cancer sites in Michigan and cancer is still the second leading cause of death in the state.¹⁶



Diabetes Prevalence

Diabetes remains another one of the ten leading causes of death in Michigan and the U.S. According to the U.S. Diabetes Surveillance System (USDSS), CDC Division of Diabetes Translation – In 2016, the percent of Michigan adults (aged 18 years or older) with diagnosed diabetes was 9.8%, **higher** than the estimated U.S. prevalence (8.5%). Over 50% of Michigan counties had higher prevalence rates than the state. The county-level estimates show that Baraga (16.0%), Cass (15.9%), Oscoda (15.4%), Gladwin (15.3%), and Montmorency (15.2%) were the five counties with highest diabetes prevalence rates in

¹⁴ Michigan Cancer Surveillance Program. Age-Adjusted Invasive Cancer Incidence Rates by County in Michigan, 2012 - 2016. Based on data released Feb 2019. Cancer-Rates.info. Retrieved Dec 10, 2019, from <http://cancer-rates.info/mi/>

¹⁵ U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2018 submission data (1999-2016): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2019.

¹⁶ MDHHS Division for Vital Records & Health Statistics. Cancer Incidence and Mortality Tables. Michigan Resident Cancer Incidence File. Updated with cases processed through November 30, 2018. Available at: <https://www.mdch.state.mi.us/osr/cancer/summary.asp>. Last Updated: July 23, 2019

2016. Please note that USDSS restricted county estimates to adults aged 20 years or older to be consistent with the population estimates from the U.S. Census Bureau.

More recent data from the CDC Behavioral Risk Factor Surveillance System (BRFSS) shows that the age-adjusted prevalence of diabetes among Michigan adults is slightly increasing over time.¹⁷

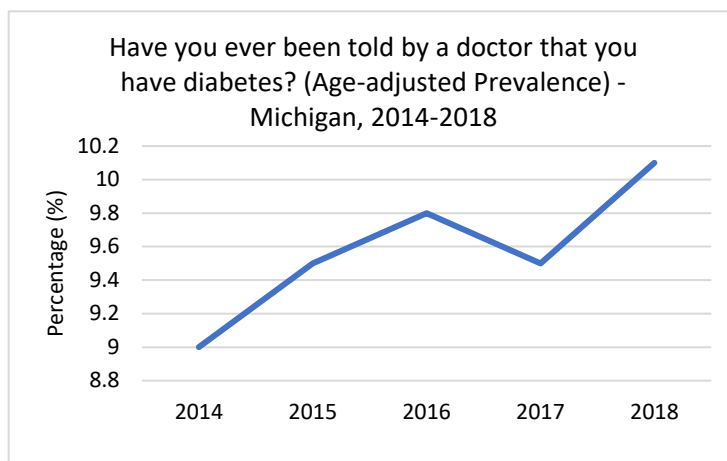


Figure 8: Age-adjusted Diabetes Prevalence Trend, Michigan 2014-2018

HIV and STDs

According to the MDHHS's HIV & STD Surveillance Program reports, the prevalence of HIV continues to increase as the number of new diagnoses (7.1 per 100,000 in 2018) was higher than the number of deaths (2.96 deaths per 100,000 in 2017)¹⁸. Approximately 163.1 per 100,000 people in Michigan were living with HIV in 2018, **lower** than the national prevalence of 372.8 per 100,000 population. In terms of Chlamydia, Gonorrhea and Primary and Secondary (P & S) Syphilis – in general, the rates of newly diagnosed cases in Michigan are **lower** than the total U.S. rate.¹⁹ Chlamydia is the most reported STD nationwide, at a rate of 512.8 cases per 100,000 population in Michigan and 539.9 cases per 100,000 population in the U.S. in 2018. Gonorrhea was the second most common infection and was reported at a rate of 169.3 cases per 100,000 Michigan residents, lower than the national rate (179.1 cases per 100,000 population). The incidence of syphilis is much less frequent than chlamydia and gonorrhea. Primary and secondary infections during the initial stages of syphilis when transmission is most likely to

¹⁷ Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data [online]. 2015. [accessed Dec 12, 2019]. URL: <https://www.cdc.gov/brfss/brfssprevalence/>.

¹⁸ MDHHS HIV & STD Surveillance & Epidemiology Section. Michigan Statewide HIV Surveillance Report New Diagnoses and Prevalence Tables [online]. July 1, 2019. [accessed Dec 12, 2019]. URL: https://www.michigan.gov/documents/mdhhs/Michigan_Statewide_HIV_Surveillance_Report-July_2019_660527_7.pdf

¹⁹ Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2018 STD Surveillance Report: State Ranking Tables [online]. [accessed Dec 12, 2019]. URL: <https://www.cdc.gov/std/stats18/2018-Surveillance-Report-EMBARGOED-FINAL-State-Ranking-Tables.pdf>

occur, was at 6.5 cases per 100,000 population in Michigan and at 10.8 cases per 100,000 population in the U.S. in 2018.

The HIV and STD epidemics continue to disproportionately affect Macomb-Oakland-Wayne Counties metro area, particularly the City of Detroit. The HIV and STD rates in Detroit are over three times higher than the state total (see Table 2). Additionally, most people living with HIV are black and gay men. Chlamydia rates are highest among women, minorities, and adolescents – especially black women. Gonorrhea rates are highest among African Americans and adolescents, with this disparity even higher among black men than white men. Syphilis rates are highest among men who have sex with men and minorities, especially black men.²⁰

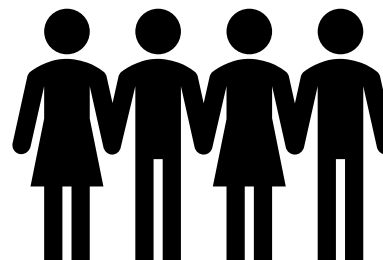


Table 2: Michigan Counties with the Highest Rates of HIV and STDs, 2018

HIV Prevalence State Rate: 163.1	Chlamydia Diagnosis State Rate: 512.8	Gonorrhea Diagnosis State Rate: 169.3	P & S Syphilis Diagnosis State Rate: 6.5
Wayne (391.4) → Detroit (713.3)	Kalamazoo (891.4) Wayne (872.6) → Detroit (1,536.7)	Kalamazoo (387.7) Wayne (363.4) → Detroit (717.9)	Wayne (17.3) → Detroit (31.5)
Oakland (164.5) Kent (156.8)	Calhoun (791.2)	Muskegon (350.3)	Oakland (6.9) Macomb (8.3)
<i>Rates are per 100,000 population</i>			
<i>* Some counties did not meet standards of reliability or precision, and other had zero cases reported in 2018.</i>			
<i>Source: Michigan Disease Surveillance System, MDHHS.</i>			

Viral Hepatitis Incidence

The MDHHS 2018 Hepatitis B and C Annual Surveillance Report shows that the rate of Acute Hepatitis C (HCV) reported in Michigan was at 1.8 cases per 100,000 people in 2018 with a median age of 33 years old, at least 15 years younger than other hepatitis classifications²¹. This is a decrease from rates reported in 2017, but still **higher** than the national acute HCV rate (1.0 cases per 100,000) reported in 2017 (most recent data).²² The five counties with the highest acute HCV rates were Iron (18.0), Ogemaw (14.3), Missaukee (13.3), Antrim (12.9), and Oscoda (12.1). There is a higher incidence of acute HCV

²⁰ MDHHS HIV & STD Surveillance & Epidemiology Section. HIV & STD's in Michigan – an overview [online]. July 1, 2019. [accessed Dec 12, 2019]. URL:

https://www.michigan.gov/documents/mdhhs/2018_HIV_STD_overview_660409_7.pdf

²¹ MDHHS Viral Hepatitis Surveillance and Prevention Unit. 2018 Hepatitis B and C Annual Surveillance Report [online]. [accessed on Dec 13, 2019]. URL:

https://www.michigan.gov/documents/mdhhs/2018_REPORT_655667_7.pdf.

²² CDC, Division of Viral Hepatitis, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. National Notifiable Diseases Surveillance System. Surveillance for Viral Hepatitis – United States, 2017 [online]. Last reviewed: November 14, 2019. [accessed on Dec 13, 2019]. URL:

<https://www.cdc.gov/hepatitis/statistics/2017surveillance/index.htm>

among white population, just over 86% of all the acute HCV cases in 2018 were among Caucasians. Additionally, injection drug use is the predominant risk for acquiring HCV infection.

Maternal and Infant Health

Four key health indicators were selected to present issues affecting infants: preterm live births, low birthweight, infant mortality rate, and Neonatal Abstinence Syndrome (NAS) Rate. Other maternal and child health-related indicators are presented in the social determinants of health section as risk factors (i.e. tobacco use during pregnancy, teen births, elevated blood lead level, among others).

Preterm Live Births Rate


From 2014-2018, the 5-year average rates of infants born prior to 37 completed weeks of gestation was 10.0 per 100 live births in Michigan, slightly **higher** than the national average (9.8%). The counties with the highest preterm birth rates were Genesee (12.6%), Muskegon (11.9%), Schoolcraft (11.9%), Wayne (11.5%), and Crawford (11.3%). The city of Detroit's average preterm birth rate was 14.3% from 2014-2018, one of the highest rates among major U.S. cities.²³

Low Birthweight Rate

The 5-year average rate of live births weighing less than 2,500 grams was 8.6% in Michigan from 2014-2018, **higher** than the national average (8.2%). The counties with the highest low birthweight rates were Wayne (10.9%), Genesee (10.7%), Crawford (10.3%), Muskegon (9.8%), and Saginaw (9.7%). About 20% of Michigan counties (including the city of Detroit) had a higher low birthweight rate than the state. The low birthweight rate for Detroit (14.3%) is almost double the state average.

Maternal and Infant Mortality Rate (IMR)

Preterm births and low birthweight can affect an infant's health and survival, as they are leading causes of infant mortality in Michigan. In 2018, 34.3% of infants died due to conditions related to prematurity as the primary cause of death. Also, 26.0% of infants died due to short gestation and low birthweight as a secondary cause of death.²⁴ From 2014-2018, the average number of deaths of children under one year of age was 6.7 per 1,000 live births in Michigan, **higher** than the national rate of 5.7 infant deaths per 1,000 births in 2018 (most recent data). Approximately 23% of Michigan counties had higher infant mortality rates than the state.

TOP COUNTIES WITH THE HIGHEST INFANT MORTALITY RATES (IMR) (per 1,000 live births)	
Presque Isle (16.2)	
Crawford (11.4)	
Wayne (9.8)	
Gogebic (9.3)	
Iosco (9.3)	

²³ March of Dimes. 2018 Premature Birth Report Card - United States [online]. [accessed Dec 16, 2019]. URL: <https://www.marchofdimes.org/materials/PrematureBirthReportCard-United%20States-2018.pdf>

²⁴ 2014-2018 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services. Retrieved from <https://www.mdch.state.mi.us/osr/InDxMain/Dollfus.asp>.

Although the infant death rate has declined over time, African American mothers experienced three times the risk of an infant death compared to Caucasian mothers, according to MDHHS Division for Vital Records & Health Statistics (see Figure 9). In 2018, the infant mortality rate among white mothers was 4.5 per 1,000 live births while the rate among black mothers was 15.1 per 1,000 live births.²⁵

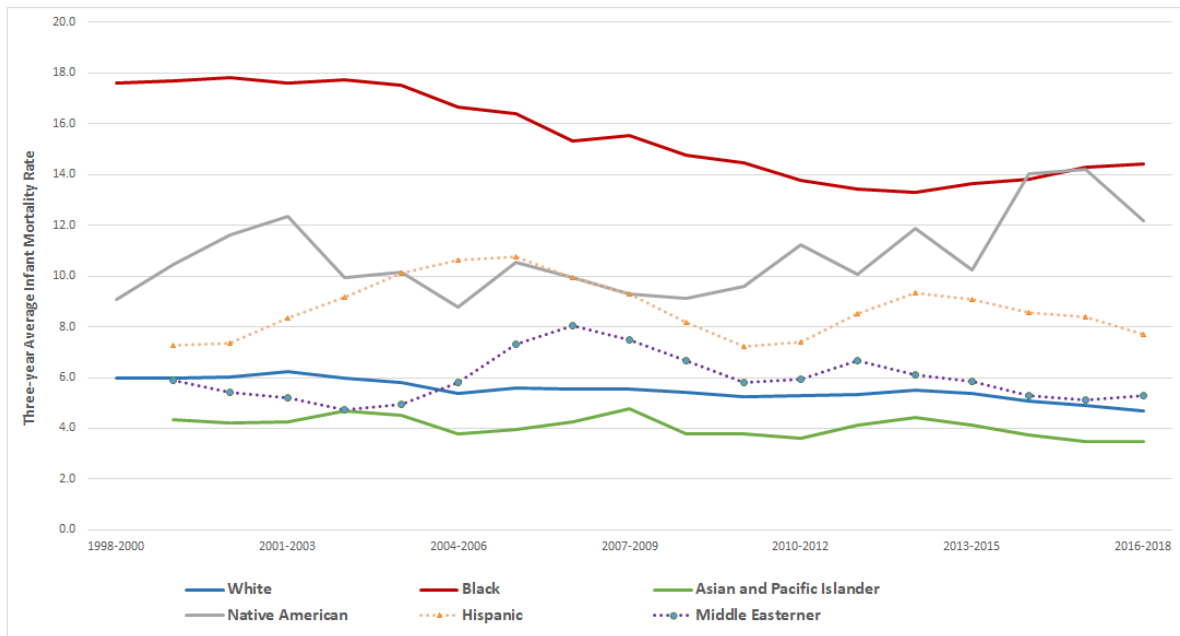


Figure 9: Three-year Average Infant Mortality Rates by Race and Ancestry, Michigan Residents, 1998-2018²⁶

When looking at selected characteristics of mother, the infant death rates were the lowest for mothers aged 30-39 years old and highest for mothers aged under 20 years old. Unmarried mothers had infant mortality rates over twice those of married mothers. Women receiving inadequate prenatal care experienced infant mortality rates three times as high as those women receiving adequate prenatal care. Mothers exposed to secondhand smoking while pregnant had an infant death rate of 8.3 per 1,000 live births compared to a rate of 5.9 for mothers who were not exposed to secondhand smoking during pregnancy.²⁷ According to the Michigan Maternal Mortality Surveillance (MMMS) Program, approximately 80 women die each year in Michigan during pregnancy, at delivery, or within a year after the end of her pregnancy. There are also disparities in maternal mortality by race, age, and education level. In general, black women die from pregnancy-related causes at a much higher ratio compared to white women in Michigan and nationwide. Nearly 50% of pregnancy-related maternal deaths are preventable in Michigan. The most common causes of pregnancy-related death are cardiomyopathy

²⁵ MDHHS Division for Vital Records & Health Statistics. Summary of 2017 Infant Death Statistics [online]. [accessed Dec 16, 2019]. URL: <https://www.mdch.state.mi.us/pha/osr/InDxMain/Infsum05.asp>

²⁶ MDHHS Division for Vital Records & Health Statistics. 1980-2018 Michigan Resident Infant Death File. Retrieved from <http://www.mdch.state.mi.us/osr/InDxMain/G71.asp>

²⁷ MDHHS Division for Vital Records & Health Statistics. Summary of 2018 Infant Death Statistics (January 2020 Release). Retrieved from <https://www.mdch.state.mi.us/pha/osr/InDxMain/Infsum05.asp>.

(also known as heart muscle disease) and infection/sepsis; and the most common cause of pregnancy associated, not related death is accidental drug overdose.^{28 29 30}

Neonatal Abstinence Syndrome (NAS) Rate

There are many negative health outcomes for mothers and their babies associated with Opioid use disorder (OUD), both during pregnancy and after delivery. Infants can be born with breathing and feeding problems, and mothers are at risk of opioid-related overdoses.³¹ In 2017, 835.82 infants per 100,000 births were discharged from hospitals for treated drug withdrawal syndrome or neonatal abstinence syndrome (NAS) in Michigan, which occurs when mothers use illicit or prescription drugs during pregnancy. This is higher than the national rate of NAS-related newborn hospitalizations in 2017, with approximately 730 infants per 100,000 Newborn Hospitalizations.³²

National data indicate that one baby was born with NAS every 15 minutes in 2014, nearly 100 babies a day, which is about 32,000 babies in a year.³³ In 2016, approximately one baby was diagnosed with NAS every 19 minutes in the United States, or nearly 80 newborns diagnosed every day, which is about 29,000 babies in a year.³⁴ When looking at the national and state NAS data by patient location, the rates were higher in rural and small metropolitan areas. Almost 60% of Michigan counties had higher rates than the state in 2017. The highest county rates per 100,000 newborn hospitalizations were in the northern portion of the Lower Peninsula and in the Upper Peninsula, particularly in Baraga (13,043.5), Ontonagon (6,451.6), Alger (6,349.2), Luce (5,000.0), and Chippewa (4,024.8).

Mortality

Life Expectancy at Birth

Life expectancy reflects the mortality pattern of the population and their general health status. In 2018, the life expectancy at birth for Michigan residents was at 77.9 years, lower than the total U.S. population (at 78.7 years) and higher for females than males. Michigan's life expectancy by sex and race

²⁸ Michigan Maternal Mortality Surveillance (MMMS): Executive Summary (2018, January). Retrieved from https://www.michigan.gov/documents/mdhhs/Maternal_Mortality_Executive_Summary_1_2018_Final_609738_7.pdf

²⁹ Michigan Maternal Mortality Surveillance (MMMS) Program – Data. Retrieved from https://www.michigan.gov/mdhhs/0,5885,7-339-73971_4911_87421-474056--,00.html

³⁰ MMMS Maternal Deaths in Michigan, 2012-2016 Data Update. Retrieved from: https://www.michigan.gov/documents/mdhhs/MMMS_2012-2016_Fact_Sheet_1.23.2020_679478_7.pdf

³¹ CDC US Opioid Crisis: Addressing Maternal and Infant Health. Retrieved from <https://www.cdc.gov/reproductivehealth/opioid-use-disorder-pregnancy/pdf/MMWR-Opioids-Use-Disorder-Pregnancy-Infographic-h.pdf>

³² HCUP Fast Stats - Map of Neonatal Abstinence Syndrome (NAS) Among Newborn Hospitalizations. Retrieved from <https://www.hcup-us.ahrq.gov/faststats/NASMap>


³³ Jilani SM, Frey MT, Pepin D, et al. Evaluation of State-Mandated Reporting of Neonatal Abstinence Syndrome – Six States, 2013–2017. MMWR Morb Mortal Wkly Rep 2019; 68:6–10. URL: <https://www.cdc.gov/mmwr/volumes/68/wr/mm6801a2.htm>

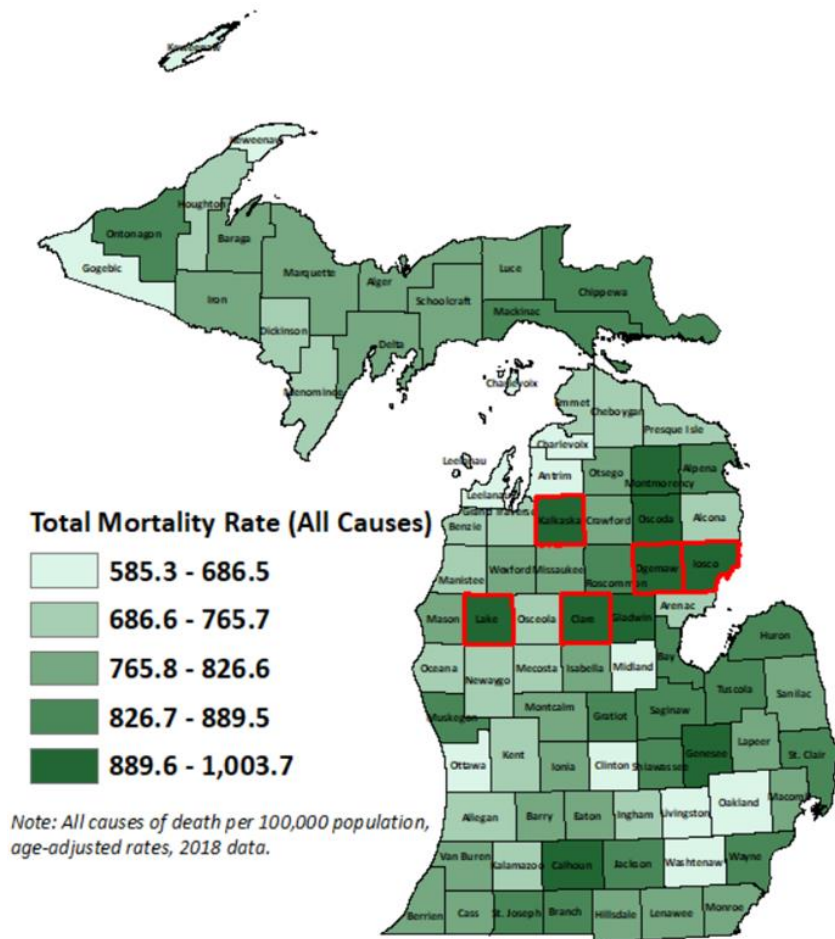
³⁴ CDC Data and Statistics About Opioid Use During Pregnancy. Retrieved from <https://www.cdc.gov/pregnancy/opioids/data.html>

shows that black men had the shorter life expectancy (69.1 years) and white women the longest (81.1 years) with more than ten years of difference, while black women and white men had similar life expectancy (at 76.2 years and 78.7 years, respectively).^{35 36}

Leading Causes of Death

In 2018, a total of 98,985 people died in Michigan at an age-adjusted death rate of 783.1 deaths per 100,000 population, which was **higher** than the national rate (723.6 deaths per 100,000 population). Almost 61% of Michigan counties had higher total death rates than the state, including the City of Detroit (996.2 deaths per 100,000).

TOP COUNTIES WITH THE HIGHEST TOTAL MORTALITY RATES (per 100,000 population)	
Ogemaw (1,003.7)	
Kalkaska (978.8)	
Lake (962.2)	
Clare (947.6)	
Iosco (929.6)	



³⁵ MDHHS Division for Vital Records & Health Statistics, 1901–2018 Michigan Resident Death File; Population Estimate (latest update 6/2018), National Center for Health Statistics, U.S. Census Populations with Bridged Race Categories. [accessed February 18, 2019]. URL: <https://www.mdch.state.mi.us/osr/deaths/lifeUSMI.asp>

³⁶ Xu JQ, Murphy SL, Kochanek KD, Arias E. Mortality in the United States, 2018. NCHS Data Brief, no 355. Hyattsville, MD: National Center for Health Statistics. 2020. URL: <https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf>

The 10 leading causes of death in Michigan and the United States are the same with similar ranks: 1) heart disease, 2) cancer, 3) chronic lower respiratory diseases (CLRD), 4) unintentional injuries, 5) stroke, 6) Alzheimer’s disease, 7) diabetes, 8) kidney disease, 9) influenza and pneumonia, and 10) suicide. The causes of death are listed in order of the 10 leading causes of death for Michigan residents in 2018. These 10 leading causes accounted for 76.3% of all deaths in Michigan in 2018.

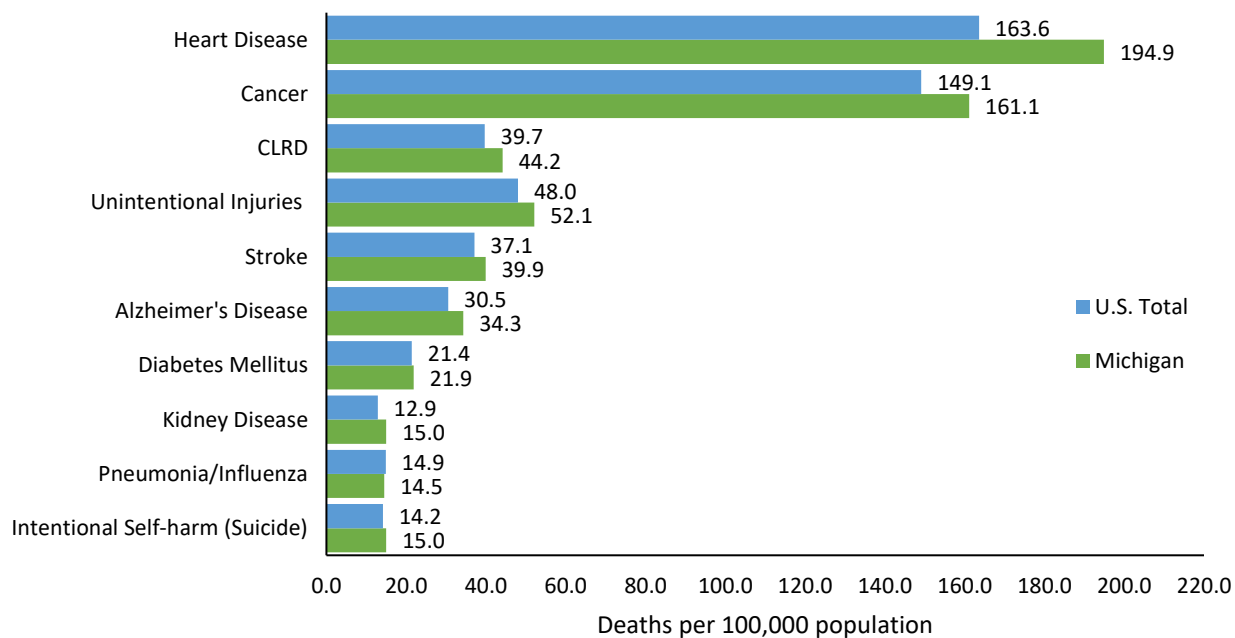


Figure 10: Age-adjusted death rates for the 10 leading causes of death: Michigan and United States, 2018

Heart disease and cancer remain the leading causes of death in Michigan and the United States. In general, Michigan had **higher** death rates than the U.S. for most of the 10 leading causes of death, except for Pneumonia/ Influenza. The difference in death rates between Michigan and the United States is most evident in heart disease, with a rate of 31.3 more deaths per 100,000 population in Michigan than in the U.S. The five counties with the highest heart disease death rates were Ogemaw (265.1), Gladwin (263.8), Wayne (248.4), Alpena (243.1), and Montmorency (238.7). Approximately 36% of Michigan counties had higher heart disease death rates than the state, including the City of Detroit (299.8 deaths per 100,000).³⁷


Mental Health-Related Mortality

With the current nationwide opioid crisis, mental health issues are a major public health concern in the state – including suicide and substance abuse. Suicide is the tenth leading cause of death in Michigan as

³⁷ 2018 Geocoded Michigan Death Certificate Registry. MDHHS Division for Vital Records & Health Statistics; Population Estimate (latest update 6/2018), National Center for Health Statistics, U.S. Census Populations with Bridged Race Categories. [accessed Dec 20, 2019]. URL: <https://www.mdch.state.mi.us/pha/osr/chi/deaths/frame.asp?Topic=7&Mode=1>

well as the U.S. and it keeps rising.³⁸ There was a statistically significant increase in the age-adjusted suicide rate from 2017 to 2018 in the United States (14.0 to 14.2 per 100,000) and in Michigan (13.6 to 15.0 per 100,000).³⁹ In 2018, the Michigan counties with the highest suicide rates per every 100,000 population were Van Buren (23.7), Calhoun (23.1), Eaton (22.7), Jackson (19.4), and Muskegon (18.7). Also, excessive alcohol use led to approximately 1,078 deaths in Michigan (9.2 deaths per 100,000 population) in 2018. In the United States, approximately 37,329 people died (9.9 deaths per 100,000 population) due to alcohol-induced causes in 2018, higher than the state rate.

Approximately 2,848 drug-induced deaths occurred in Michigan at a rate of 29.3 deaths per 100,000 population, which was significantly **higher** than the national drug-induced mortality rate (21.8 deaths per 100,000 population). In 2018, the counties with the highest drug-induced death rates were Genesee (55.1 per 100,000), Wayne (46.1 per 100,000), Calhoun (42.5 per 100,000), Macomb (40.5 per 100,000), and St. Clair (37.7 per 100,000). Out of a total of 71,147 drug-induced deaths in the United States in 2018, approximately 67,367 deaths (20.7 per 100,000) were due to drug poisonings (overdose). In Michigan, there were 2, 599 drug poisoning deaths (26.7 per 100,000), significantly **higher** than the national rate.

TOP COUNTIES WITH THE HIGHEST OPIOID OVERDOSE DEATH RATES (per 100,000 population)	
Genesee (46.4)	
Calhoun (40.1)	
Wayne (38.7)	
Macomb (33.1)	
Monroe (29.0)	

Recent results from the 2018 Michigan Statewide Opioid Assessment, which overlays three years of documented cases of unintentional overdose deaths with five years of prescription records in the Michigan Automated Prescription System (MAPS), shows that the number of overdose-related deaths have been increasing in the state and that men are at greater overall risk of overdose death than women, especially people between the ages of 26-55.⁴⁰

³⁸ Suicide rates rose across the U.S. from 1999 to 2016. CDC’s National Vital Statistics System; CDC Vital Signs, June 2018. [Accessed URL: <https://www.cdc.gov/vitalsigns/suicide/infographic.html#graphic1>]

³⁹ Murphy SL, Xu JQ, Kochanek KD, Arias E. Mortality in the United States, 2017. NCHS Data Brief, no 328. Hyattsville, MD: National Center for Health Statistics. 2018 [online]. Accessed Dec 19,2019, from <https://www.cdc.gov/nchs/products/databriefs/db328.htm>

⁴⁰ Statewide Opioid Assessment: Michigan, Appriss Health. March 29,2018 [online]. Retrieved from https://www.michigan.gov/documents/lara/BPL_ApprissStatewideOpioidAssesmentMICHIGAN_03-29-2018_620258_7.pdf

Opioids are the main cause of drug overdose deaths in the nation⁴¹, accounting for approximately 78% of all drug poisoning deaths in Michigan. In 2018, there were 2,036 opioid overdose deaths in the state (21.1 deaths per 100,000). In general, the opioid poisoning mortality rates were higher among black residents (35.1 per 100,000) than white people (26.1 per 100,000), increasing by 19.9% between 2017 and 2018.⁴²

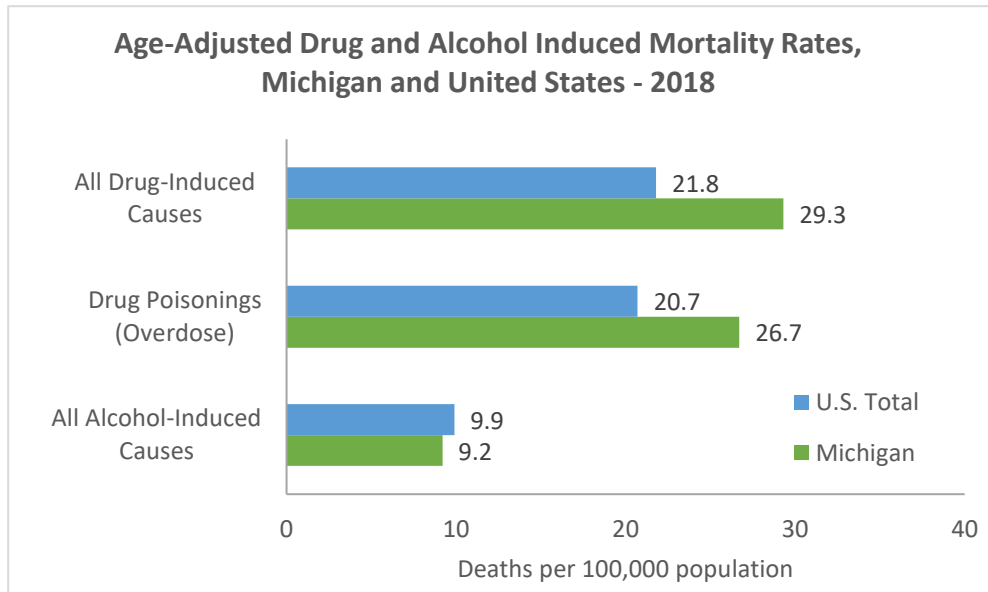


Figure 11: Age Adjusted Drug and Alcohol Induced Mortality Rates, Michigan and U.S.

⁴¹ CDC Drug Overdose Deaths. (2019, June 27). Retrieved from <https://www.cdc.gov/drugoverdose/data/statedeaths.html>

⁴² MDHHS Drug Poisoning Deaths among Michigan Residents 1999-2018, Fact Sheet. Retrieved from https://www.michigan.gov/documents/opioids/1999-2018_All_Drug_and_Opioid_Poisoning_Deaths_Fact_Sheet_672096_7.pdf

C. Social Determinants of Health

Demographics and Socio-Economic Factors

Demographics and socioeconomic factors are major social determinants of health. This section focuses on conditions that influence the population's health status such as poverty level, income, unemployment, education, homelessness, and vulnerable populations (i.e. children, elderly, people with disabilities, etc.).

Vulnerable Populations

According to the 2018 ACS 5-year estimates, 5.7% of the population in Michigan is under 5 years, slightly lower than the U.S. estimates (6.0%). Additionally, 22.1% of the population in Michigan is under 18 years, compared to 22.8% for the national estimates. Michigan's population is aging slightly faster with 16.3% of the population comprised of seniors aged 65 years and older, **higher** than the U.S. estimates (15.2%). By 2034, the U.S. Census Bureau's 2017 National Population Projections predicts that

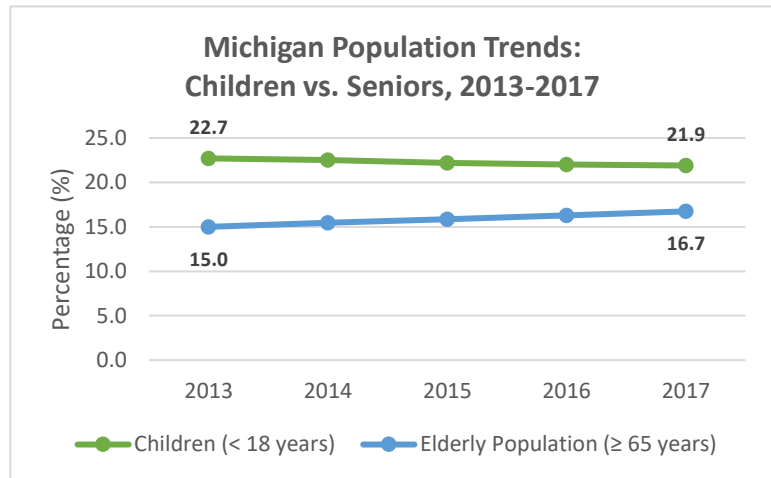


Figure 12: Michigan Population Trends: Children vs. Seniors, 2013-2017

the older people will outnumber children for the first time in U.S. history.⁴³ The population in the state is getting older like the national estimates, while the percentage of children under age 18 is decreasing (see Figure 12).⁴⁴ The following rural counties had the highest percentages of people aged 65 years and over in Michigan: Alcona (35.5%), Ontonagon (34.3%), Keweenaw (33.4%), Roscommon (31.2%), and Montmorency (30.7%). Over 83% of Michigan counties had higher percentages of elderly people than the state.

Additionally, there is a **higher** percent of people with a disability in Michigan than the U.S., 14.3% and 12.6% respectively. The counties with the highest percentages of disabled people were Roscommon (26.3%), Lake (25.8%), Montmorency (24.2%), Alcona (23.3%), and Ogemaw (23.3%). Approximately 77% of Michigan counties had higher percentages of disabled people than the state, including the City of Detroit (19.6%). Almost 35% of people aged 65 years and over, 12.2% of people aged 18-64 years and 5.0% of people aged under 18 years had a disability in Michigan based on the 2018 ACS data.


⁴³ U.S. Census Bureau. (2019, October 8). Older People Projected to Outnumber Children. Retrieved from <https://www.census.gov/newsroom/press-releases/2018/cb18-41-population-projections.html>.

⁴⁴ MDHHS Division for Vital Records and Health Statistics, Population Estimates (latest update 6/2018) released by the CDC National Center for Health Statistics (NCHS). URL: https://www.mdch.state.mi.us/OSR/CHI/POP/MAIN/DP00_A1.ASP

Social and Economic Factors

There are several socioeconomic factors that may determine the health of the population and our ability to make healthy choices, afford health care, food, and stable housing. These factors include education, employment, income, and poverty level.

About 9.5% of adults aged 25 years and over did not have a high school diploma (or equivalency) in Michigan, which was **lower** than the U.S. estimates (12.3%) in 2018 ACS. However, the state is performing worse than the national estimates in terms of unemployment and median household income. Even when there has been a decrease in unemployment over the years, for both Michigan and the U.S., the annual unemployment rate in Michigan was 4.1 percent of the civilian labor force (16 years and over) which was slightly **higher** than the national rate (3.9%) in 2018. Nearly 74% of Michigan counties had higher unemployment rates than the state.

TOP COUNTIES WITH THE HIGHEST UNEMPLOYMENT RATES (%)	
Mackinac (9.7%)	
Cheboygan (9.2%)	
Montmorency (8.6%)	
Presque Isle (8.0%)	
Alger, Ontonagon, and Roscommon (7.8%)	

Also, Michigan had a **lower** annual median household income than the nation in 2018. There was a difference of over \$5,000 dollars between the annual median income household for Michigan and the U.S. (\$54,938 vs. \$60,293, respectively). The counties with the lowest annual median income were Lake (\$34,631), Clare (\$37,369), Gogebic (\$38,798), Ontonagon (\$38,906), and Iron (\$38,918). Approximately 80% of the counties had lower annual median income than the state, including the City of Detroit (\$29,481).

These health indicators are also a representation of the poverty level and exacerbated health needs in many of our communities. According to the 2018 ACS 5-year estimates, the population below the 100% and 200% of the federal poverty levels (FPL) in Michigan was **higher** than the U.S. total. Approximately 15.0% of people in Michigan are living below the 100% FPL compared to 14.1% for the national estimates. The poverty rates by sex and race show that the female population below the poverty line is higher than males and the poverty rates for most minorities are significantly higher than the state estimates – especially for Black and African Americans (30.1%).

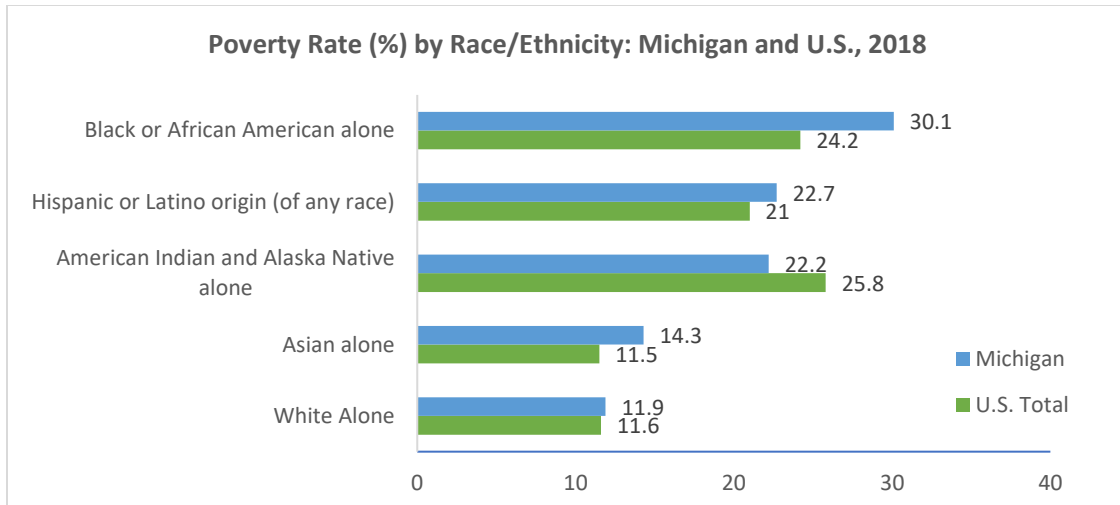
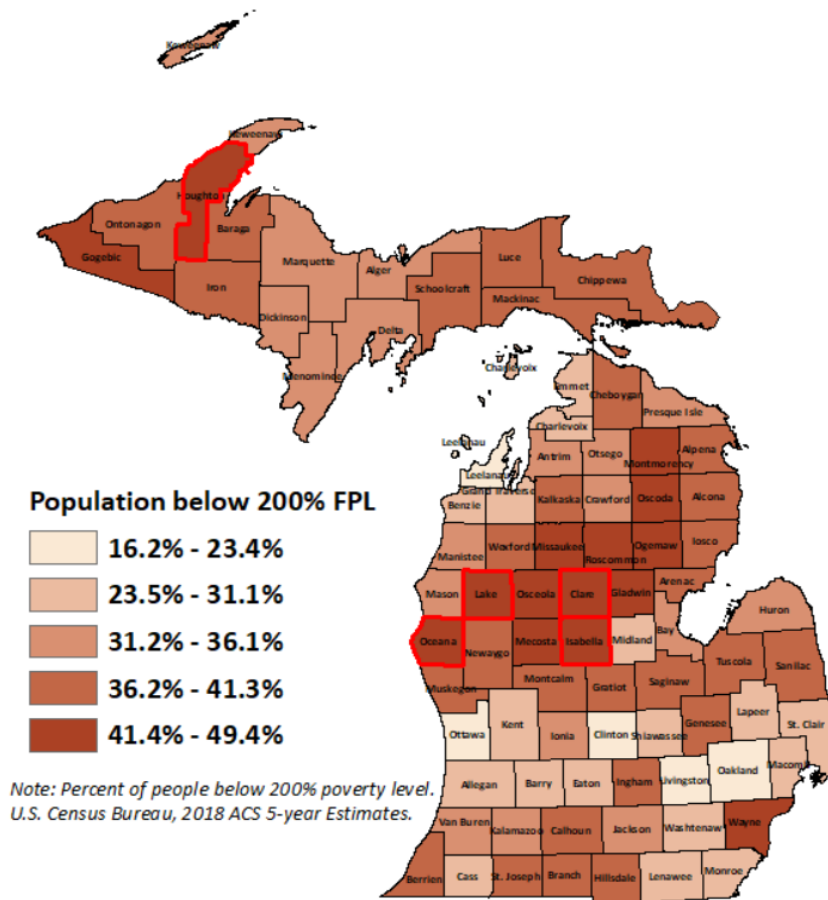


Figure 13: Poverty Rate (%) by Race/Ethnicity: Michigan and U.S., 2018

Similarly, the population below the 200% FPL was 32.7% in Michigan and 31.9% in the U.S in 2018 ACS. The Michigan counties with the highest poverty rates at 200% FPL were Clare (49.4%), Lake (48.7%), Isabella (45.5%), Oceana (44.6%), and Houghton (44.6%). Almost 74% of the counties had higher poverty rates than the state, including the City of Detroit (62.5%) with almost double the state rate.



Housing and Food Insecurity

According to the Michigan State Housing Development Authority (MSHDA) annual report, an estimated total unduplicated count of 65,104 people experienced homelessness in 2018. This count includes “literally homeless” – individuals and families residing on the streets, in emergency shelters or in other places not fit for human habitation. From 2017 to 2018, there was an increase of the number of homeless individuals in Michigan. Seniors and minorities homelessness continue to increase – with a higher rate of persons of color experiencing homelessness. Over half of the people who are experiencing homelessness in Michigan are African American.⁴⁵

Since the Great Recession, Michigan's housing availability has been slowly recovering. Still some deficits and problems exist, and Michigan's housing has not yet recovered to pre-recession levels according to MSHDA. The following information was gathered from Michigan Statewide Housing Needs Assessment (April 2019) and the entire assessment can be viewed [here](#).

The Great Recession caused a decline in Michigan home ownership which had previously been even higher than the national average, mostly due to the automotive industry in Michigan. Those levels have not recovered. A great deal of Michigan's homes are older dwellings. Half of the housing options (rental and owned) in Michigan were built prior to 1970. In Flint, Detroit, and Detroit's surrounding suburbs, the age of homes built before 1960 is approximately 75% of housing options. 75% of rental units in Detroit predate 1960 construction. Normally older homes would be more affordable to rent and own, instead the age of these dwellings is causing more cost in maintenance and heating/cooling. These homes also have risks from their old construction, lead levels, and blight.

The number of rooms in Michigan's rental units is very limited and rentals showed more issues with overcrowding and lack of plumbing than owned units. Also, from the Great Recession until 2017, over half of Michigan's renters were overburdened by the cost of their housing. Overburdened is defined as exceeding 30% of that household's income to pay for rent. One quarter of homeowners' mortgages showed they were overburdened. Michigan has a distinct lack of rental housing for residents in the lowest quintile income. There are approximately 200,000 households in Michigan that do not have rental housing that corresponds with their income. Low income housing is limited in number of rooms with most rentals only having two bedrooms and very limited number of rental units having greater than that number. Of the low-income housing available in Michigan, 50% of these homes have overburdened renters or owners. Senior housing that is affordable and safe for the increasing elderly population is also needed within Michigan. Interviewed MDHHS Housing Service Specialists noted difficulty in locating enough larger low-income housing that would not overburden their clients as well as units that would accept clients with criminal backgrounds.

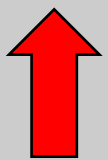
Most of the owned housing in Michigan is the Single-family detached houses. Of rentals, one third are multifamily units (apartments of ten or more). The rest of rentals are single-family detached units and

⁴⁵ Michigan State Housing Development Authority (MSHDA). Ending Homelessness in Michigan: 2018 Annual Report. URL: https://www.michigan.gov/documents/mcteh/2018-CTEH_AR_WEB_667374_7.pdf

other housing options (townhomes and condominiums). Mobile homes are more common in rural areas where land is less expensive and other forms of more affordable housing is scarce.

Many people in Michigan are experiencing some type of housing instability, with approximately 92.94 evictions per day. In 2016, the eviction rate in the state was at 3.3%, **higher** than the total U.S. rate (2.3 evictions per 100 renter homes). The counties with the highest eviction rates were Muskegon (10.1%), Calhoun (9.6%), Jackson (7.9%), Clinton (7.5%), and Saginaw (7.3). Over 20% of Michigan counties had higher eviction rates than the state. The top evicting large cities in Michigan and one of the top 100 in the U.S. were Warren (8.1%), Detroit (5.2%), and Lansing (3.2%).⁴⁶

Homelessness has many contributing factors such as unemployment, income, poverty, housing stability, and food insecurity. The U.S. Department of Agriculture (USDA) defines food insecurity as a lack of consistent access to enough food for an active and healthy life. In 2017, there were 1,369,250 food insecure people in Michigan at an overall rate of 13.7%, **higher** than the national rate (12.5%). With an alarming food insecurity rate of 15.9% among children in Michigan.⁴⁷

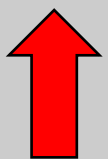
TOP COUNTIES WITH THE HIGHEST FOOD INSECURITY RATES (%)	
Wayne (19.5%)	
Lake (16.9%)	
Genesee (16.5%)	
Isabella (16.4%)	
Schoolcraft (15.7%)	

Health Risk Factors

This section focuses on lifestyle risk factors that could have a critical impact in the development of chronic diseases and preventable health problems such as obesity, physical inactivity, tobacco use, blood lead levels in children, among others. According to the 2017 MiBRFSS annual report, in general, the prevalence of some health risk behaviors within Michigan is higher than the U.S. median prevalence – especially for obesity, no leisure time physical activity, binge drinking, current smoking, and e-cigarette use.⁴⁸

Obesity and Physical Inactivity

In 2016, the percentage of adults (aged 18 years or older) with obesity was 56.1% in Michigan, significantly **higher** than the U.S. total (39.6%* for adults aged 20 years and over). Additionally, 36.7% of Michigan adults with diabetes reported being physically inactive. In the Diabetes Atlas application, a person is physically inactive if he or she reported not participating in physical activity or exercise in the past 30 days. The counties with the highest percentage of physical inactive diabetic people were St. Joseph (30.3%), Chippewa (29.4%), Roscommon (29.3%), Clare (28.7%), and Ogemaw (28.5%). *Please note that USDSS restricted*

TOP COUNTIES WITH THE HIGHEST OBESITY PREVALENCE RATES (%)	
Gladwin (43.1%)	
Chippewa (40.6%)	
Cass (40.5%)	
Osceola (40.5%)	
Lenawee (40.2%)	

⁴⁶ Eviction Lab. Eviction Rates 2000-2016. Retrieved from <https://evictionlab.org/>.


⁴⁷ "Map the Meal Gap." *Feeding America*. URL: <https://map.feedingamerica.org/county/2017/overall/michigan>

⁴⁸ Health Risk Behaviors Within the State of Michigan. MDHHS 2017 Behavioral Risk Factor Survey. Sept 2019 <https://www.michigan.gov/Documents/Mdhhs/2017_Mibrfs_Annual_Report_Final_667126_7.Pdf>

county estimates to adults aged 20 years or older to be consistent with the population estimates from the U.S. Census Bureau.

Prenatal Care and Teen Births

There are some risk factors specific to maternal and child health, such as tobacco use during pregnancy, teen births, late entry into prenatal care (PNC), and blood lead levels in children. Among Michigan women giving birth in 2018, only 73.4% began prenatal care in the first trimester of pregnancy, **lower** than the national percent (77.5%⁴⁹). Late or no prenatal care was calculated as the percentage of births to mothers who reported receiving prenatal care after the first trimester of their pregnancy or no prenatal care. From a total of 110,093 live births in Michigan, approximately 24.1% of mothers reported not receiving prenatal care during their first trimester, which was **higher** than the national data (21.9%) in 2018. By race and Hispanic origin, late or no PNC was higher among American Indian (34.4%), Black (31.3%), and mothers of Hispanic Ancestry (31.2%).⁵⁰ Over 60% of Michigan counties had higher percent of mothers who did not begin PNC during the first trimester than the state.

TOP COUNTIES WITH THE HIGHEST LATE OR NO PNC RATE (%)	
Menominee (49.7%)	
Gratiot (49.1%)	
Oscoda (44.0%)	
Cass (42.8%)	
Branch (42.3%)	

Additionally, teen mothers (aged 15-19 years) reported a higher percent (38.8%) of no prenatal care in their first trimester when compared to the other age groups and the state total (See Figure 14). In 2018, a total of 5,042 babies were born to women aged 15–19 years at a birth rate of 15.8 per 1,000 women in this age group, which was lower than the national rate (17.4 births per 1,000). The counties with the highest teen birth rates were Iosco (49.4/1,000), Muskegon (31.3/1,000), Calhoun (26.5/1,000), St. Joseph (26.5/1,000), and Newaygo (25.7/1,000).

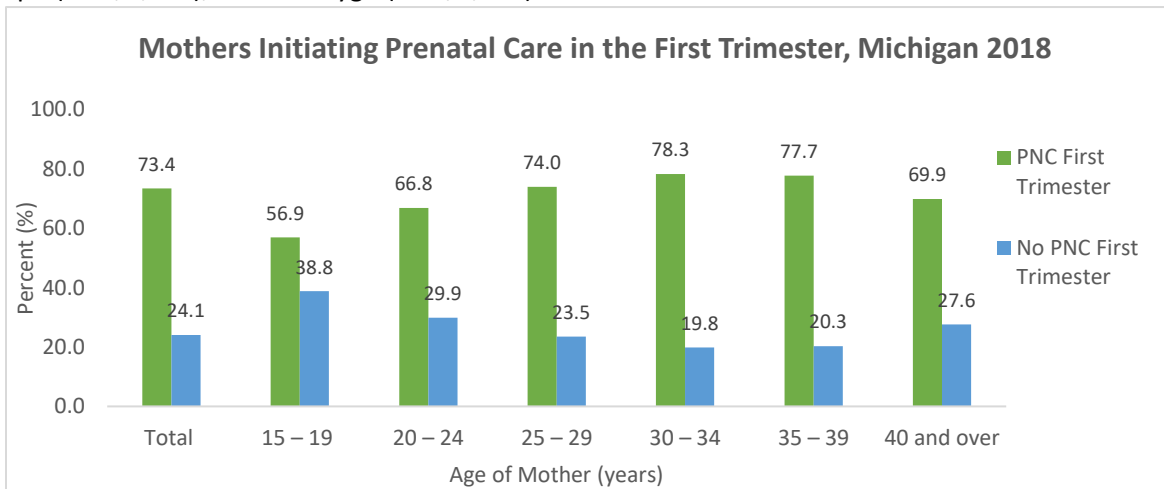


Figure 14: Mothers Initiating Prenatal Care in the First Trimester, Michigan 2018

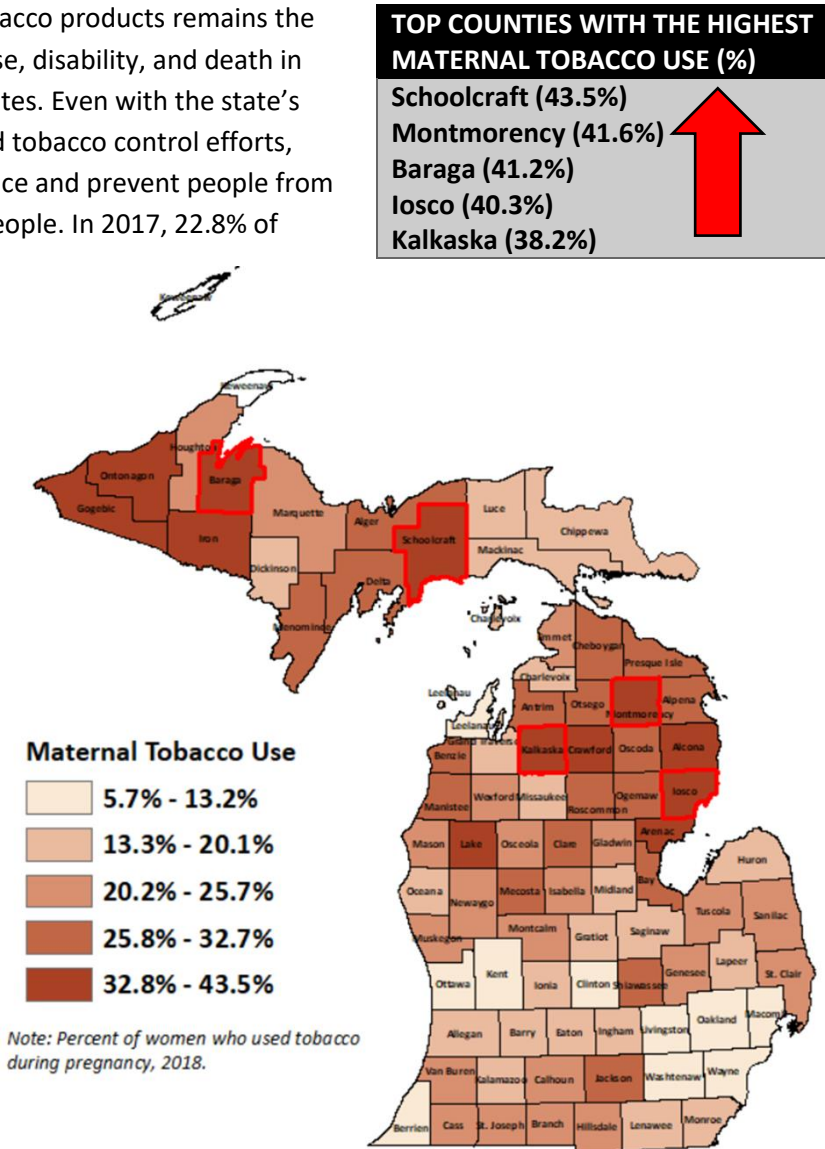
⁴⁹ Births: Final Data for 2018. CDC National Vital Statistics Reports (NVSS). Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_13-508.pdf

⁵⁰ 2018 Geocoded Michigan Birth Certificate Registry. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services. URL: <https://www.mdch.state.mi.us/osr/chi/births14/frameBxChar.html>.

Tobacco Use

The use of cigarettes and other tobacco products remains the leading preventable cause of disease, disability, and death in Michigan and across the United States. Even with the state’s comprehensive smoke-free law and tobacco control efforts, Michigan continues striving to reduce and prevent people from using tobacco – especially young people. In 2017, 22.8% of Michigan high school youth reported currently using any tobacco product, including e-cigarettes. Among Michigan high school youth, 10.5% reported currently smoking cigarettes.⁵¹

Tobacco use during pregnancy increases the risk of health problems for developing babies – including preterm birth, low birthweight, brain and lungs damage and even infant mortality.⁵² Of the women who gave birth in 2018, 14.3% reported smoking tobacco at some point while pregnant which is double the national percentage (6.5%). Almost 86% of counties had higher maternal tobacco use percentage than the state.



Elevated Blood Lead Levels (EBLL) in Children

Childhood lead poisoning and blood lead levels in children is another public health concern for the state as it can seriously harm a child’s health, especially damage to their developing brains and nervous systems. There is no safe blood level in children and the effects of lead exposure cannot be corrected. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic


⁵¹ Extinguishing the Tobacco Epidemic in Michigan. CDC Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion. URL: <https://www.cdc.gov/tobacco/about/osh/state-fact-sheets/michigan/index.html>.

⁵² CDC Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion. URL: <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/substance-abuse/substance-abuse-during-pregnancy.htm>

achievement. MDHHS and the CDC consider 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) or greater of lead in the blood to be an elevated blood lead level (EBLL).⁵³

In 2017, a total number of 150,068 children under 6 years old were tested for blood lead in Michigan, of which 4,711 (3.1%) had elevated blood lead levels ($\geq 4.5 \mu\text{g}/\text{dL}$). This was slightly higher than the U.S. totals (for programs reporting data), where 2,014,208 children (<6 years) were tested and approximately 40,122 (3.0%) children were confirmed with EBLL ($\geq 5 \mu\text{g}/\text{dL}$) in 2017.⁵⁴ Unfortunately, lead poisoning is far from eradicated.

Exposure to lead tends to be higher in Michigan's urban areas due to aging housing stock and poor living conditions. Over 26% of the counties had higher percent of EBLL in children than the state, including the City of Detroit (7.4%).


TOP COUNTIES WITH THE HIGHEST EBLL IN CHILDREN (%)	
Branch (6.1%)	
Cass (5.8%)	
Jackson (5.8%)	
Calhoun (5.4%)	
St. Joseph (5.1%)	

Health Care Access and Preventive Services

Michigan strives to enhance access to health care and preventive primary care services and resources such as flu shots, regular screenings, and medical exams.

Uninsured Population (under age 65)

Health insurance coverage is an important determinant of access to health care as uninsured children and nonelderly adults are substantially less likely to have a usual source of health care or a recent health care visit than their insured counterparts.⁵⁵ In 2017, the estimated uninsured rate in Michigan among the population under age 65 was 6.1%, lower than the national median county uninsured rate at 10.6%. Approximately 2.9% uninsured children under age 19 and 7.3% of Michigan adults aged 18-64 years reported not having any form of health care coverage. In general, the estimated uninsured rate in Michigan was lower than the national average but working-age men, aged 18 to 64, had higher rates than working-age women for all states in 2017.⁵⁶ About 70% of Michigan counties had an estimated uninsured rate for the population under age 65 higher than the state rate.

TOP COUNTIES WITH THE HIGHEST UNINSURED POPULATION < 65 y/o (%)	
Mackinac (11.5%)	
Chippewa (9.3%)	
Oceana (9.2%)	
Oscoda (9.0%)	
Alcona (8.8%)	

⁵³ 2017 Provisional Annual Report on Childhood Lead Testing and Elevated Levels: Michigan. Issued October 22, 2018. MDHHS Childhood Lead Poisoning Prevention Program (CLPPP), Division of Environmental Health. Retrieved from https://www.michigan.gov/documents/lead/2017_Provisional_Michigan_CLPPP_Data_Report_637133_7.pdf

⁵⁴ CDC National Childhood Blood Lead Surveillance Data. National Center for Environmental Health, Division of Environmental Health Science and Practice. Retrieved from <https://www.cdc.gov/nceh/lead/data/national.htm>.

⁵⁵ NCHS Fact Sheet Health Insurance and Access to Care. February 2017 <https://www.cdc.gov/nchs/data/factsheets/factsheet_hiac.pdf>

⁵⁶ Bowers, Lauren, and Carolyn Gann, "Small Area Health Insurance Estimates: 2017," Current Population Reports, P30-05, U.S. Census Bureau, Washington, DC, 2019. URL: <https://www.census.gov/programs-surveys/sahie.html>

Preventive Services

Health services such as regular check-ups, flu shots, and screening tests may prevent illness and health-related problems, especially in children and aging adults. Many of these preventive health services are covered by most health plans. In 2017, uninsured adults were more likely not to have a personal health care provider and not to have seen a doctor within the past 12 months due to cost (48.7% and 28.8%, respectively) when compared to insured adults (12.0% and 9.9%). In terms of race/ethnicity – black, non-Hispanic adults (16.7%) and Hispanic adults (17.0%) were both more likely than white, non-Hispanic adults (10.1%) not to have seen a doctor within the past 12 months due to cost.⁵⁷ The percentage of fee-for-service (FFS) Medicare enrollees that had an annual wellness visit in Michigan was 30.0%, higher than the national percent (27.0%) in 2017. Almost 58% of Michigan counties had lower percentages of Medicare enrollee’s annual wellness visit than the state.

According to the 2017 MDHHS BRFSS annual report, Michigan adults 65+ years who had a routine checkup within the past year were also more likely to have had a flu vaccine within the past year. In general, an estimated 60.3% of Michigan adults aged 65 years and older reported receiving a flu vaccine. The percentage of Michigan’s FFS Medicare enrollees that had an annual flu vaccination was 46.0% comparable to the national percent in 2017. Approximately, 64% of Michigan counties had lower percent of annual flu vaccination than the state.

COUNTIES WITH THE LOWEST ANNUAL WELLNESS VISIT (%)	COUNTIES WITH THE LOWEST ANNUAL FLU SHOT (%)
Newaygo (8.0%)	Luce (12.0%)
Kalamazoo (10.0%)	Schoolcraft (12.0%)
Oceana (10.0%)	Mackinac (23.0%)
Ontonagon (10.0%)	Oscoda (25.0%)
Osceola (10.0%)	Keweenaw (26.0%)
*Among Michigan’s FFS Medicare Enrollees	

Additionally, the percent of children (19-35 months old) not receiving the recommended immunizations (Combined 7-vaccine Series) was 30.1% in Michigan, slightly higher than the national percent (29.6%) in 2017.⁵⁸ Vaccination can protect people from serious diseases and prevent re-emerging disease outbreaks such as the 2019 Measles Outbreak. Even though measles was declared eliminated in the United States in 2000, measles outbreaks continue to occur in countries around the world so there is always a risk of measles importations into the U.S.⁵⁹ In 2019, approximately 1,282 individual cases of measles were confirmed in 31 states, which is the greatest number of cases reported in the U.S. since

⁵⁷ MDHHS 2017 Behavioral Risk Factor Survey: 31st Annual Report [Online]. Retrieved from https://www.michigan.gov/documents/mdhhs/2017_MiBRFS_Annual_Report_Final_667126_7.pdf

⁵⁸ CDC National Center for Immunization and Respiratory Diseases. 2017 Childhood Combined 7-vaccine Series Coverage Dashboard. URL: <https://www.cdc.gov/vaccines/imz-managers/coverage/childvaxview/data-reports/7-series/dashboard/2017.html>

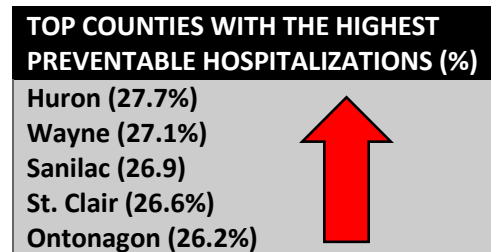
⁵⁹ CDC National Center for Immunization and Respiratory Diseases, Division of Viral Diseases. URL: <https://www.cdc.gov/measles/elimination.html>

Potentially Preventable Hospitalizations

The Prevention Quality Indicators (PQIs) and Pediatric Quality Indicators (PDIs) are a set of measures developed by the Agency for Healthcare Research and Quality (AHRQ) that use hospital discharge data to quantify admissions for ambulatory care sensitive (ACS) conditions. These indicators are intended to identify hospitalizations that are potentially preventable by good outpatient care – such as asthma, diabetes, dehydration and other conditions where timely and effective ambulatory care can decrease hospitalizations, controlling an acute episode of an illness or managing a chronic disease or condition.

The AHRQ’s PQIs were used to develop estimates of the number of potentially preventable hospitalizations for chronic and acute conditions in 2016 (most recent data). In 2016, there were 35.7 million hospital stays in the United States, with a rate of 104.2 stays per 1,000 population.⁶⁴ The overall national rate of potentially preventable hospitalizations in the U.S. was 1,517.3 per 100,000 population, 554.6 for acute ACS conditions and 962.7 for chronic conditions. In Michigan, the rate of preventable hospitalizations was 1,568.9 per 100,000 population, 553.9 for acute conditions and 1,015.0 for chronic conditions.⁶⁵ AHRQ’s statistical brief from 2010, shows that one out of every 10 hospital stays was potentially preventable in 2008. Approximately 10% of all hospital stays in the U.S. – potentially preventable acute conditions accounted for 3.9 percent of all hospital stays, and potentially preventable chronic conditions accounted for 6.2 percent.⁶⁶

Recent data from the Michigan Resident Inpatient Files created by the MDHHS Division for Vital Records and Health Statistics shows that there were 282,947 ACS hospitalizations, about 22.8% of all hospitalizations in Michigan could have been preventable in 2017– which was higher than the percent of ACS hospitalizations in 2016 (21.6%).



Inpatient Stays Related to Mental and/or Substance Use Disorders

Relating to hospital stays associated with mental and/or substance use disorders (MSUD), nearly 10 million inpatient stays in the United States had a principal (2.2 million) or secondary (7.7 million) MSUD diagnosis, constituting almost 28% of all inpatient stays in 2016. The rate of stays principally for MSUDs was highest among adults aged 18–64 years. One in four stays principally for MSUDs were for depressive disorders, alcohol-related disorders, and schizophrenia each constituted nearly one in five MSUD stays.⁶⁷

⁶⁴ Freeman WJ (AHRQ), Weiss AJ (IBM Watson Health), Heslin KC (AHRQ). Overview of U.S. Hospital Stays in 2016: Variation by Geographic Region. HCUP Statistical Brief #246. December 2018. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb246-Geographic-Variation-Hospital-Stays.pdf.

⁶⁵ HCUPnet, Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD. <https://hcupnet.ahrq.gov/>. For more information about HCUP data see <http://www.hcup-us.ahrq.gov/>

⁶⁶ Stranges, E., Stocks, C. Potentially Preventable Hospitalizations for Acute and Chronic Conditions, 2008. HCUP Statistical Brief #99. November 2010. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb99.pdf>

⁶⁷ Owens PL (AHRQ), Fingar KR (IBM Watson Health), McDermott KW (IBM Watson Health), Muhuri PK (AHRQ), Heslin KC (AHRQ). Inpatient Stays Involving Mental and Substance Use Disorders, 2016. HCUP

In 2016, the age/sex adjusted rate of discharges involving MSUD stays per 100,000 population was 3,675.5 in Michigan, higher than the U.S. total (3,087.7). The counties with the highest MSUD inpatient stays rates were Bay (5,544.0), Arenac (5,204.5), Saginaw (4,942.6), St. Clair (4,915.1), and Genesee (4,787.9).⁶⁸

Statistical Brief #249. March 2019. Agency for Healthcare Research and Quality, Rockville, MD.

www.hcup-us.ahrq.gov/reports/statbriefs/sb249-Mental-Substance-Use-Disorder-Hospital-Stays-2016.pdf

⁶⁸ HCUPnet, Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD. <https://hcupnet.ahrq.gov/>. For more information about HCUP data see <http://www.hcup-us.ahrq.gov/>

Population to Provider Ratios

Population to provider ratio is one of the main criteria used for establishing shortage designations in Michigan and the United States. This is a measure of the number of providers that serve the population in a specific geographic area, population group or health care facility. Per federal regulations and policies, there are several threshold ratios at which a geographic area, population group, or health care facility qualifies for designation and therefore, indicates provider shortages in primary care, dental, or mental health.^{69 70}

Table 3: Ratio of Population to Providers for Geographic and Population Group HPSAs

HPSA	Primary Care	Dental Health	Mental Health	
Geographic	3,500:1	5,000:1	6,000:1 & 20,000:1 (CMH and Psych)	9,000:1 (CMH only) 30,000:1 (Psych only)
Geographic “High Needs” <i>Certain high-need indicators are present</i>	3,000:1	4,000:1	20,000:1 (CMH and Psych)	6,000:1 (CMH only)
Population Group	3,000:1	4,000:1	4,500:1 & 15,000:1 (CMH and Psych)	6,000:1 (CMH only) 20,000:1 (Psych only)
If there are NO eligible providers in the RSA, certain minimum population requirements apply	Min Pop 500	Min Pop 1,000	Min Pop 3,000 1,500 HN	
<i>CMH= Core Mental Health Providers & Psych= Psychiatrists Note: These are the threshold ratios at which a geographic area, population group, or health care facility qualifies for designation. Primary Care providers include MDs & DOs in the following specialties: General or Family Practice, Internal Medicine, OB/GYN and Pediatrics. Dental Health providers include Dentists and # of Dental Auxiliaries. Mental Health providers include only Psychiatrists or Psychiatrists and all Core Mental Health providers: Clinical Psychologists, Clinical Social Workers, Psychiatrist Nurse Specialists and Marriage and Family Therapists.</i>				

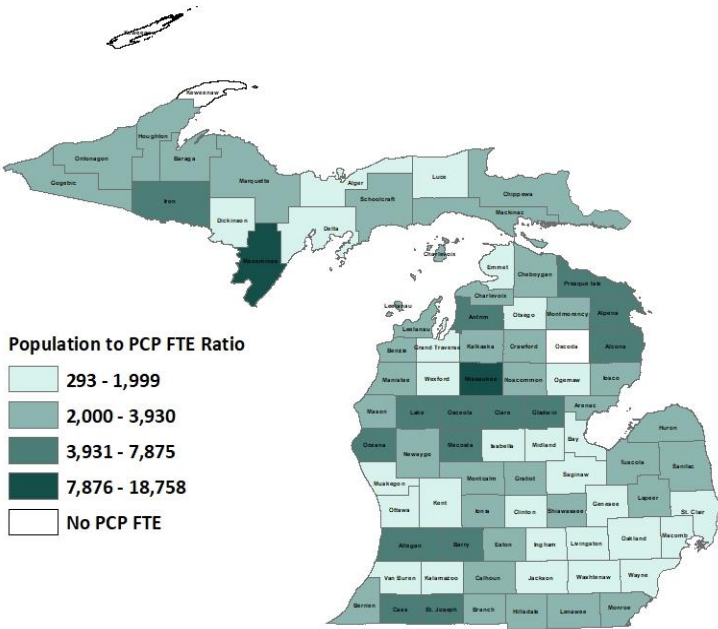
For the purpose of this needs assessment, the population to provider ratios for Michigan were calculated based on the total population of the county and the total Full Time Equivalent (FTE) number of providers serving that geographic area, where 40 hours/week equal 1 FTE. In Michigan (as of 02/2020), the population to one primary care FTE ratio was 765.8:1, the female population in reproductive age (~15-44 years) to one OB/GYN FTE ratio was 1,197.9:1, the population to one psychiatrist FTE ratio was 9,371.1:1, and the population to one dentist FTE ratio was 1,639.8:1.

For shortage designations, a provider is considered over-utilized if the population to provider ratio is greater than –2,000:1 for primary care; 3,000:1 for dental health; and 20,000:1 for mental health (psychiatrists only). While the provider data shows that there may be an abundant overall supply of primary care, mental health, and dental health providers practicing in Michigan – relative to the total resident population, the supply is not evenly distributed throughout the state, with counties with relatively high population-to-FTE ratios or no providers identified in the service area, as shown below.

⁶⁹ MDHHS HPSA and MUA/P Program Overview. URL: https://www.michigan.gov/mdhhs/0,5885,7-339-71551_2945_47514-176068--,00.html

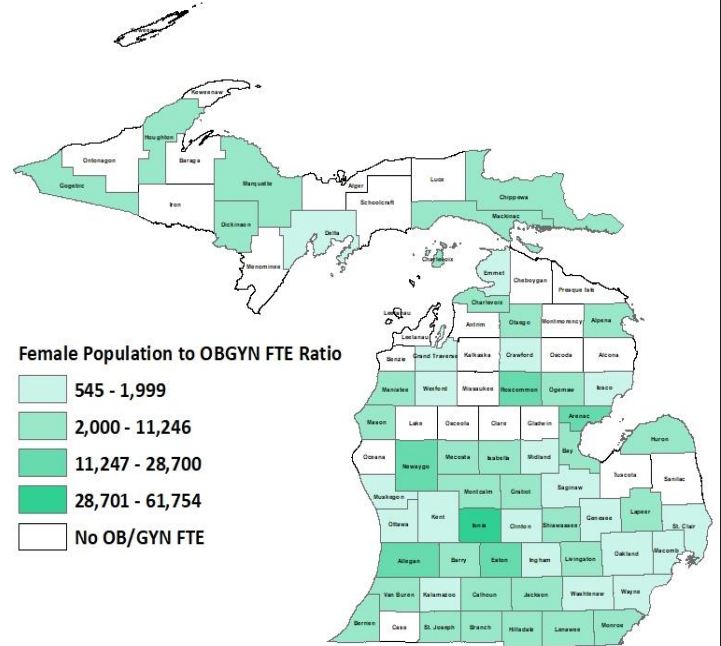
⁷⁰ HRSA Health Professional Shortage Areas (HPSAs). URL: <https://bhw.hrsa.gov/shortage-designation/hpsas>

Estimated Population to Primary Care Physician FTE Ratio Michigan, 2020



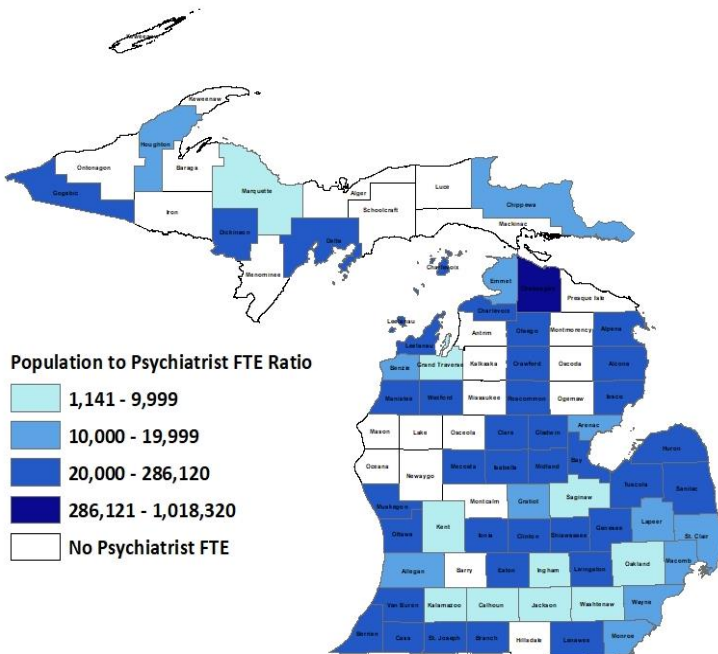
Primary Care Physician (PCP) includes MDs and DOs in General or Family Practice, Internal Medicine, Obstetrics and Gynecology, and Pediatrics. Ratio based on total estimated direct patient care provider FTE and total county population.

Estimated Population to OB/GYN Physician FTE Ratio Michigan, 2020



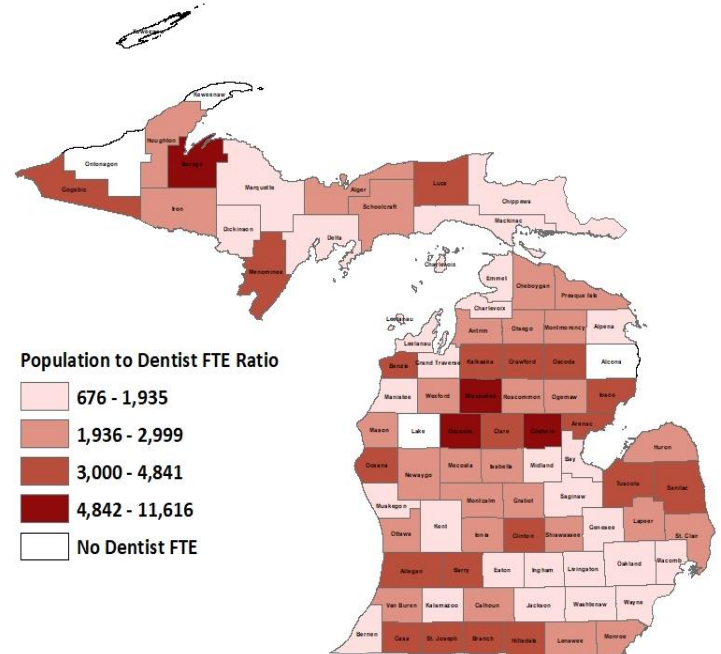
The population used are women aged 15-44 years. Ratio based on total estimated direct patient care FTE in county.

Estimated Population to Psychiatrist FTE Ratio Michigan, 2020



Ratio based on total estimated direct patient care psychiatrist FTE and total county population.

Estimated Population to Dentist FTE Ratio Michigan, 2020



Ratio based on total estimated direct patient care dentist FTE and total county population.

D. Major Barriers to Health Care in Michigan

Medically Underserved Areas/Populations and Health Workforce Shortage

With the assistance of the Michigan PCO, the Secretary of the U.S. Department of Health and Human Services (HHS) designates areas, population groups, or facilities as being medically underserved or as having a shortage of primary care resources based on population to provider ratios and various other indicators of need. All of Michigan’s 41 counties with Great Lakes coastline contain an area or population group designated by the Secretary of HHS as either (or both), a HPSA or MUA/P. Currently, Michigan has 114 areas and population groups designated as medically underserved (MUA/P). Additionally, Michigan has 733 areas, population groups, and facilities designated as having a shortage of health professionals in all three disciplines: primary medical care (259 designations), dental health care (240 designations), and mental health care (234 designations), as shown in Table 4.⁷¹

Table 4: HPSA Type by Discipline

Discipline	Facility	Geographic Area	Population Group	Total
Primary Care	178	23	58	259
Dental Health	177	1	62	240
Mental Health	172	47	15	234

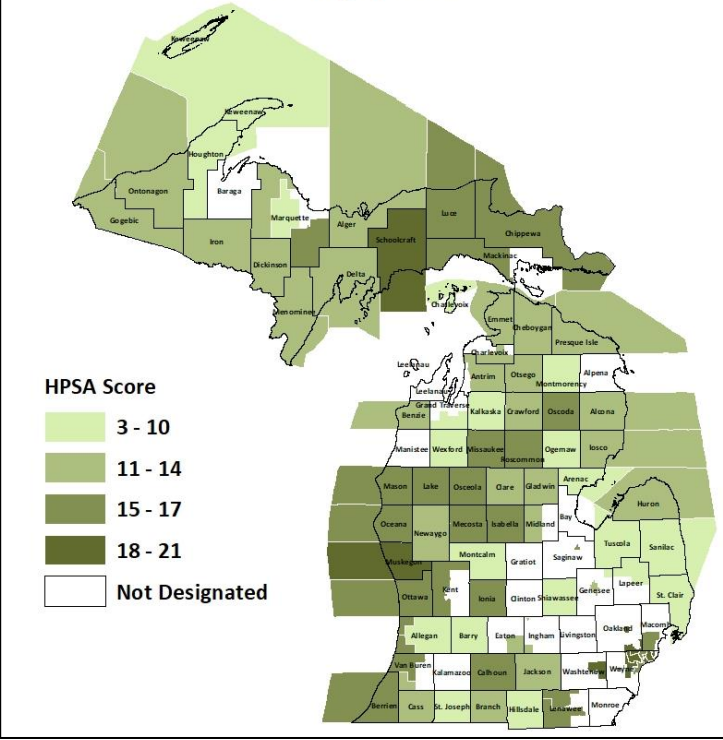
Source: Health Resources and Services Administration (HRSA). *Find Shortage Areas: HPSA Find and MUA Find* < <https://data.hrsa.gov/tools/shortage-area> > (data as of 04/01/2020).

HPSA scores range from 0-25 for primary medical care and mental health disciplines, and 0-26 for dental health, with higher scores indicating greater need. Based on the HPSA designation data above, the Health Resources and Services Administration (HRSA) estimates that 2,826,423 Michigan residents are underserved in terms of primary medical care resources with a need of 546 additional practitioners to remove primary care designations. Similarly, HRSA estimates that 1,446,086 Michigan residents are underserved in terms of dental health care resources with a need of 350 providers to remove dental designations, and 4,225,899 Michigan residents are underserved in terms of mental health care resources with a need of 207 providers to remove mental HPSAs.⁷²

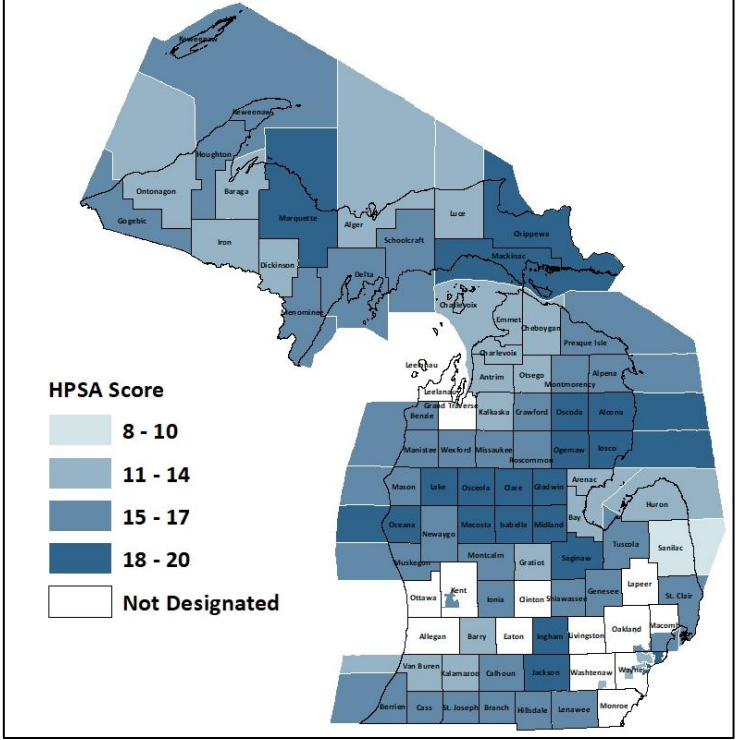
⁷¹ Health Resources and Services Administration (HRSA). *Find Shortage Areas: HPSA Find and MUA Find* < <https://data.hrsa.gov/tools/shortage-area> > (15, May 2020).

⁷² Health Resources and Services Administration (HRSA). Designated Health Professional Shortage Areas Statistics. First Quarter of Fiscal Year 2020 Designated HPSA Quarterly Summary (As of 04/01/2020). Retrieved from <https://data.hrsa.gov/topics/health-workforce/shortage-areas> (15, May 2020).

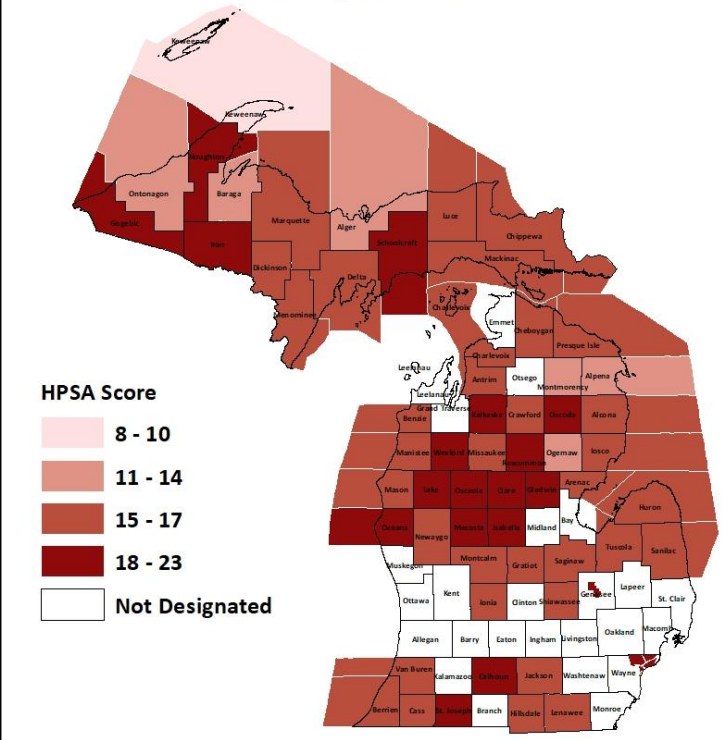
**Health Professional Shortage Areas (HPSA) - Primary Care
Michigan, 2020**



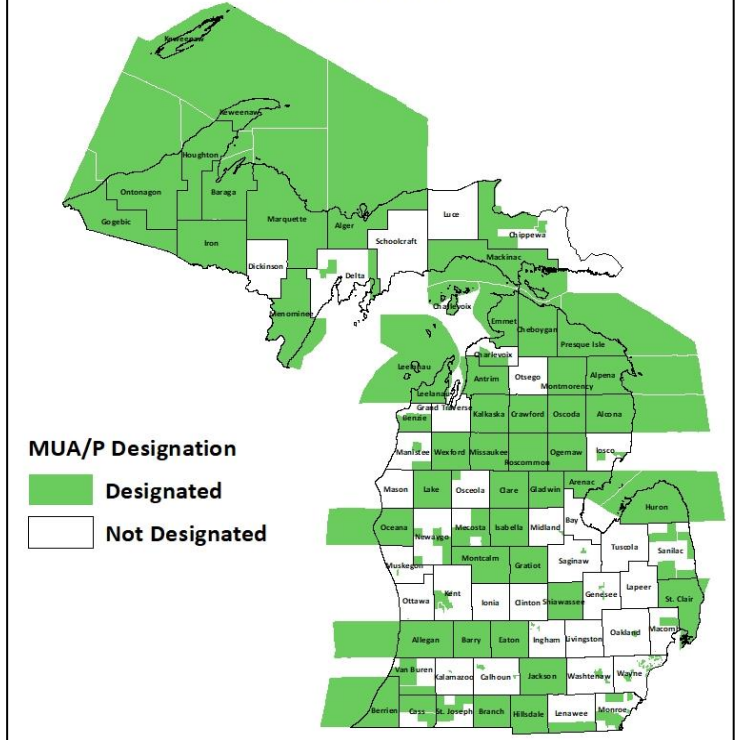
**Health Professional Shortage Areas (HPSA) - Mental Health
Michigan, 2020**



**Health Professional Shortage Areas (HPSA) - Dental Health
Michigan, 2020**



**Medically Underserved Areas/Populations (MUA/P)
Michigan, 2020**

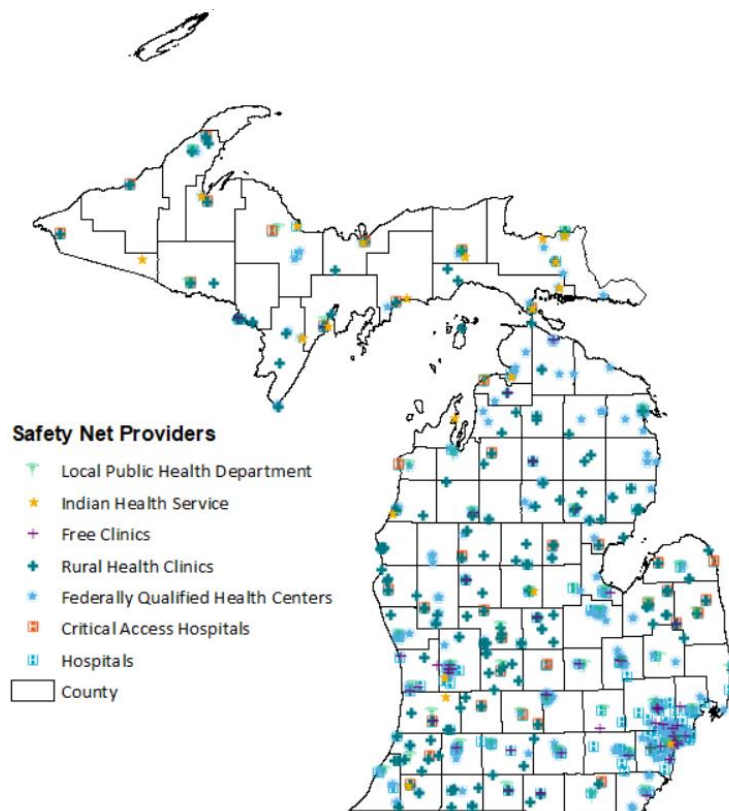


Health Care Safety Net Sites

Michigan’s safety net providers deliver health care services to those that need them most, including uninsured, underinsured, and other medically underserved groups. Michigan’s safety net is comprised of hospitals, federally qualified health centers (FQHCs), rural health clinics (RHCs), local public health departments, free clinics, community-based mental health programs, and tribal health centers, among others.⁷³

As of January 2020, Michigan had over 600 safety net sites⁷⁴ – including the following:

- 169 licensed state and federal hospitals, including 37 critical access hospitals (CAH) serving patients in high-need rural areas.^{75 76}
- Over 200 satellite clinics between 44 community health centers organizations: 38 Health Center Program grantees or Federally Qualified Health Centers (FQHC), three FQHC Look-Alikes, and four Indian Health Services (IHS) organizations (one with dual status, FQHC grantee and IHS).⁷⁷
- A total of 23 Indian Health Service, Tribal or Urban Indian Health Program facility (ITU).⁷⁸
- 195 licensed Rural Health Clinics including 168 Certified Rural Health Clinics.⁷⁹



⁷³ Michigan’s Health Care Safety Net Providers (August 2010). URL:

https://www.michigan.gov/documents/mdch/SAFETY_NET_description_2010_v6_maps_330748_7.pdf

⁷⁴ HRSA Data Explorer. Health Care Facilities (CMS). URL: <https://data.hrsa.gov/tools/data-explorer>

⁷⁵ Michigan Department of Licensing and Regulatory Affairs, Bureau of Community and Health Systems. Hospitals Provider Directory (as of 08/12/2019). URL: https://www.michigan.gov/documents/lara/State_Federal_-_Hospitals_541950_7.pdf

⁷⁶ MCRH. 2019 Michigan Critical Access Hospital List Update, <http://www.mcrh.msu.edu/programs/CAH/2019%20UPDATEDMICHIGAN%20CRITICAL%20ACCESS%20HOSPITALS%20LIST1.pdf>

⁷⁷ MPCA. 2019-2020 Community Health Center Directory, July 2019, https://cdn.ymaws.com/www.mPCA.net/resource/resmgr/directory/MPCA_2019-20_Directory.pdf

⁷⁸ Indian Health Service. Find Health Care Tool. Accessed on 05/15/2020, <https://www.ihs.gov/findhealthcare/>

⁷⁹ Michigan Department of Licensing and Regulatory Affairs, Bureau of Community and Health Systems. Rural Health Clinics Provider Directory (as of 04/16/2019). URL: https://www.michigan.gov/documents/lara/MI_Rural_Health_Clinic_Directory_2-2016_515599_7.pdf

- 46 Local Public Health Departments.⁸⁰
- Approximately 60 Free Clinics with volunteer health professionals providing free health care.⁸¹
- 46 Local Community Mental Health Services Programs (CMHSPs).⁸²

Healthcare in Rural Michigan

Although Michigan’s urban and rural areas experience unique primary care challenges, a review of several reports and needs assessments at the county and regional level identified similar health care priorities and issues throughout the state. A recent systematic review of health priorities for rural Michigan counties, conducted by the Michigan Center for Rural Health and the Michigan State University, shows that rural counties in the state are facing similar challenges and barriers to care. The main health priorities for rural Michigan are: Access to Care, Substance Abuse/Behavioral Health, Infectious/Chronic Disease, Socioeconomic Factors, Obesity, and Maternal and Child Health.⁸³

Millions of Americans living in rural areas depend on their local hospitals and providers for care. There is an alarming increase of rural hospital closures across the U.S. in recent years with more rural hospitals in Michigan at risk of closing. According to a national analysis by Navigant, Michigan has the ninth highest percentage of rural hospitals at high risk of closing in the nation.⁸⁴ The risk of rural hospital closures represents less access to essential health care services in Michigan as many rural hospitals continue to cut services that they can no longer afford, including obstetric care such as labor and delivery services.⁸⁵ Access to obstetric care is critical to ensuring good maternal and child health, especially in rural counties where there is a limited access to maternity care, long distance/ travel time to the nearest source of care. According to a recent report published by March of Dimes, over 5 million women in the U.S. live in maternity care deserts (areas that have no hospital offering obstetric care and no OB providers).⁸⁶

Health Workforce Projections and Residency and Fellowship Capacity

More than a shortage of providers in Michigan, there may be a greater geographic maldistribution of primary care providers in the state. There is a need to assess the capacity of Michigan’s future health

⁸⁰ National Association of County and City Health Officials (NACCHO). Directory of Local Health Departments Tool. Accessed on 05/15/2020, <https://www.naccho.org/membership/lhd-directory>

⁸¹ MDHHS Fiscal Year 2018 Free Clinic Funding Summary Report. Accessed on 05/15/2020, https://www.michigan.gov/documents/mdhhs/FINAL_Free_Clinic_Report_FY2018_AM_Edits_w_correct_phone_number_660825_7.pdf

⁸² MDHHS Local Mental Health Services. List of local CMHSPs. Accessed on 05/15/2020, https://www.michigan.gov/documents/cmh_8_1_02_37492_7.PDF

⁸³ Snow, Douglas BS MPH. 2018 Community Health Needs Assessment Community Analysis: Analysis of Health Priorities for Rural Michigan Counties, <https://www.mcrh.msu.edu/chna-community-analysis.6.14.2017new.pdf>.

⁸⁴ David Mosley and Daniel Debehne, Md, Navigant — February 2019. Rural Hospital Sustainability: New Analysis Shows Worsening Situation for Rural Hospitals, Residents, <https://guidehouse.com/-/media/www/site/insights/healthcare/2019/navigant-rural-hospital-analysis-22019.pdf>

⁸⁵ Ted Roelofs. More than a dozen hospitals in rural Michigan at ‘high risk’ of closing, June 12, 2019, <https://www.bridgemi.com/michigan-health-watch/more-dozen-hospitals-rural-michigan-high-risk-closing>

⁸⁶ March of Dimes (2018). Nowhere to go: Maternity Care Deserts Across the U.S. Available at: https://www.marchofdimes.org/materials/Nowhere_to_Go_Final.pdf

care workforce and to address both issues: health professional shortages and maldistribution of providers in urban vs. rural areas. Federal health workforce projections suggest that the U.S. demand of primary care physicians will continue to grow faster than the supply.⁸⁷

According to a recent report published by the Association of American Medical Colleges (AAMC), there will be a projected shortfall in primary care range between 7,300 and 43,100 physicians by 2030. Approximately 28,698 physicians completed their graduate medical education between 2015 and 2016 from Accreditation Council for Graduate Medical Education (ACGME) and the American Osteopathic Association (AOA) accredited programs. The 2017 AAMC report estimates that a total of 7,675 new physicians (27% of new graduates) enter the workforce as primary care providers annually. Additionally, 1,647 physicians (6% of new graduates) entered as adult primary care–trained new hospitalists; 5,476 (19%) entered in internal medicine and pediatric subspecialties; 5,051 (18%) entered in surgical specialties; and 8,849 (31%) entered in other specialties.⁸⁸

Data from the Center for Health Research and Transformation’s (CHRT) 2019 Michigan Physician Survey indicates that the current primary care capacity in Michigan may be good today, but there is some evidence it may decrease in the near future based on the provider’s capacity to accept new patients, the growth and aging of the population/health care workforce, retirement and anticipated years left practicing medicine, and other factors.⁸⁹ According to a study published by the Robert Graham Center, to maintain current rates of utilization, Michigan will need an additional 862 primary care physicians by 2030, a 12% increase to the state’s current primary care physician workforce used in their analysis.⁹⁰

Recruitment and retention strategies, such as loan repayment programs, are necessary to address health workforce shortages and geographic distribution of providers in the state. This is especially needed in underserved and high-need areas. The role of graduate medical education programs is critical in addressing the physician shortage and workforce distribution in Michigan as providers completing service obligations in underserved areas are more likely to continue practicing in these communities after their training or service commitment.⁹¹ However, the federally imposed cap on Medicare support

⁸⁷ HRSA (2016). National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013-2025. <https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf>

⁸⁸ IHS Markit. 2017 Update. The Complexities of Physician Supply and Demand: Projections from 2015 to 2030. Final Report. Prepared for the Association of American Medical Colleges, Washington, DC. Accessed 05/13/2020: https://aamc-black.global.ssl.fastly.net/production/media/filer_public/a5/c3/a5c3d565-14ec-48fb-974b-99fafaecb00/aamc_projections_update_2017.pdf

⁸⁹ Megan Slowey, Melissa Riba, Michelle Williams, Marianne Udow-Phillips, Center for Health and Research Transformation (CHRT), May 9, 2019. Primary Care Physicians in Michigan, <https://chrt.sites.uofmhosting.net/publication/michigan-physician-survey-primary-care-physicians-in-michigan/>

⁹⁰ Petterson, Stephen M; Cai, Angela; Moore, Miranda; Bazemore, Andrew. State-level projections of primary care workforce, 2010-2030. September 2013, Robert Graham Center, Washington, D.C. <https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/state-collections/workforce-projections/Michigan.pdf>

⁹¹ Sebastian Negrusa, Projesh Ghosh and John T. Warner, The Lewin Group, Inc., December 22, 2014. Provider Retention in High Need Areas, https://aspe.hhs.gov/system/files/pdf/116861/NHSC%20Final%20Report%20508%20compliance%20July_21_2015.pdf

for graduate medical education (GME), effective since the Balanced Budget Act of 1997, represents another challenge as it limits the number of physicians teaching hospitals can train while the number of medical school graduates continue to increase, which creates an intense competition nationwide for a limited number of residency slots each year. All medical school graduates must complete a period of residency training to be licensed to practice medicine in the United States. In Michigan, there are nine MD- and DO-granting schools, 53 teaching hospitals, approximately 6,187 residents in training, and 917 residents not supported by Medicare DGME, according to AAMC data.⁹²

There is a growing need to expand accredited residency programs and increase the number of medical residency training slots in primary care and other high-need specialties in Michigan's underserved areas.^{93 94} Medical residency programs must be accredited by ACGME and/or AOA and some programs may be accredited by both organizations. According to ACGME public data set, Michigan had a total of 6,178 residents and 931 fellows in approximately 311 specialty and 255 subspecialty programs in 41 sponsoring institutions for the academic year 2019-2020 (as of 02/25/2020). However, only around 140 programs are in a primary care specialty (e.g. family medicine, general internal medicine, general pediatrics, general OB-GYN, psychiatry, or general surgery) and most of them are in urban areas.⁹⁵

Transportation, Infrastructure, and Other Challenges

Michigan's geography presents unique challenges to ensuring adequate access to primary care within reasonable travel times. Travel routes to health care resources for many Michigan populations are restricted by large water barriers, which leads to longer and costly travel for residents to seek care. In addition, travel is further affected by Michigan's cold winters which make travel difficult, time consuming, and sometimes dangerous. Extreme weather conditions also impact the drivability of our roads as the physical road surfaces are damaged from the freeze and thaws of Michigan's winters. Not all of Michigan's roads are paved and many areas still rely on dirt roads that are impacted by weather.

Additionally, access to public transportation is limited for many communities, particularly in rural Michigan. According to information from the Michigan Department of Transportation (MDOT), there is some form of public transportation in all of Michigan's 83 counties, although some counties have limited service (See Figure 15). Counties with limited service usually only provide service to seniors and individuals with disabilities.⁹⁶ The 2018 American Society of Civil Engineers (ASCE) Report Card indicates

⁹² AAMC. The Role of GME Funding in Addressing the Physician Shortage. Accessed on 05/13/20, <https://www.aamc.org/news-insights/gme>

⁹³ MDHHS. FY 2019 MIDOCs Program Report, September 1, 2019. Accessed on 05/13/20, https://www.michigan.gov/documents/mdhhs/Section_1870-7_668108_7.pdf

⁹⁴ Michigan State Medical Society (MSMS), March 27, 2019. Medical School Loan Repayment Program Places Doctors in Michigan's Underserved Areas. Accessed on 05/13/2020, <https://www.msms.org/About-MSMS/News-Media/medical-school-loan-repayment-program-places-doctors-in-michigans-underserved-areas>

⁹⁵ Accreditation Council for Graduate Medical Education (ACGME)- Public Data. Available at: <https://apps.acgme.org/ads/Public>

⁹⁶ MDOT Public Transit Providers. Available at: https://www.michigan.gov/mdot/0,1607,7-151-9625_21607-31837-,00.html

that the state of Michigan’s infrastructure is old, outdated, and in poor condition – which represents additional challenges to our population apart from the economic burden.⁹⁷

Michigan Local Public Transit

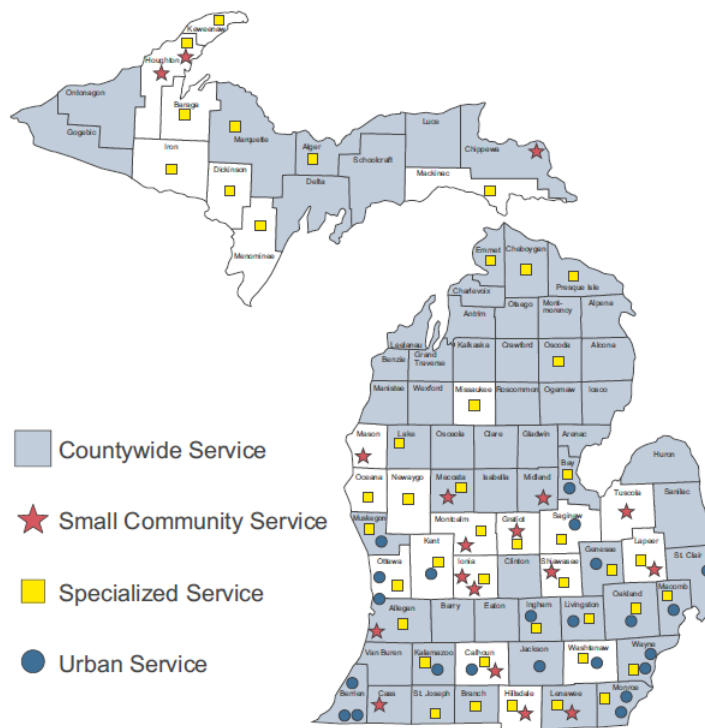


Figure 15: Michigan Local Public Transit, MDOT

Political and Economic Climate

Some policies and laws may have a great impact on access to health resources and the continuity of care, increasing the demand of health care providers in the state.

Medicaid Work Requirement Law

The Healthy Michigan Plan (HMP) is a category of eligibility authorized under the Patient Protection and Affordable Care Act and Michigan Public Act 107 of 2013 which began on April 1, 2014 – also known as the expanded Medicaid program in the state. In January 2020, a new “work requirement” law for participants in the Healthy Michigan Plan took effect. This new law affected over 700,000 people who get their health insurance through the Healthy Michigan Plan (as of May 11, 2020), as participants were required to report work hours, school, or other activities to maintain health care coverage. Up until

⁹⁷ 2018 ASCE Michigan Infrastructure Report Card. Available at: <https://www.infrastructurereportcard.org/state-item/michigan/>

March 04, 2020, when a federal judge ruled the approval of the work requirements as unlawful, stopping the implementation and enforcement of the work rules.⁹⁸

Opioid and Prescription Drug Epidemic

Several rules have been enacted to fight the opioid epidemic that Michigan and the entire nation are currently facing. Michigan Opioid Laws are comprised of a 10-bill package, which represents a comprehensive approach to addressing substance and drug abuse. This bill package includes opioid awareness training for controlled substance license holders and providers are required to certify that they have met the training requirement with their first renewal cycle and for initial licenses. Recently passed laws also require prescribers to obtain and review a patient's prescription history in the Michigan Automated Prescription System (MAPS) prior to prescribing controlled substances to patients. The bills also create disciplinary action for prescribers who fail to use MAPS.^{99 100}

Flint Water Crisis Update and Response Action

The Flint Water Crisis started in 2014 after a change in the drinking water source for the city of Flint, Michigan in Genesee County, which resulted in the contamination of drinking water in the city. This public health crisis has been described as “a man-made disaster of significant proportions, setting up a chain of catastrophic events that we continue dealing with”.¹⁰¹ In our last PCNA in 2016, Genesee County was listed as the highest area of need due to the public health crisis in Flint and residents exposure to high levels of lead which may result in serious health issues.

MDHHS is collaborating with local partners to provide goods, services, access, and education resources to Flint residents in response to the Flint Water Crisis. As part of MDHHS Flint Water Response Action, several resources and funding have been allocated to the city to increasing access to physical and behavioral health services, provide case management, ensure a healthy community, and provide access to nutrition health and education. For instance, MDHHS expanded Medicaid coverage to newly eligible beneficiaries under the Flint Medicaid Waiver, allocating almost \$40,000,000 million.¹⁰² Also, to support provider recruitment and retention efforts in Flint, MDHHS applied to HRSA to designate Flint as a HPSA for Primary Care which was approved in August of 2016. This designation allowed providers in Flint to take advantage of state and federal programs that incentivize the recruitment and retention of primary care providers, such as the Michigan State Loan Repayment Program and the National Health Service

⁹⁸ MDHHS Healthy Michigan Plan. Accessed on 05/13/2020, https://www.michigan.gov/mdhhs/0,5885,7-339-71547_2943_66797---,00.html

⁹⁹ Department of Licensing and Regulatory Affairs (LARA). Laws and Regulations. Available at: https://www.michigan.gov/lara/0,4601,7-154-89334_72600_72603_55478_85991---,00.html

¹⁰⁰ Michigan Health and Hospital Association (MHA). Opioid and Prescription Drug Epidemic. Available at: <https://www.mha.org/Issues-Advocacy/Opioid-Epidemic>

¹⁰¹ Interim Report of the Flint Water Crisis Investigation. Available at: https://www.michigan.gov/documents/ag/Flint+Water+Interim+Report_575711_7.pdf

¹⁰² MDHHS Flint Water Response Action Report. August 2020.

Corps. HRSA also approved whole county HPSA designations for Mental Health and Dental Health in Genesee.

In addition, policies related to cleaner water and better infrastructure have been enacted in Michigan. The state provided over \$350 million to Flint, in addition to \$100 million from the federal government – to help with water quality improvements, pipe replacement, healthcare, food resources, educational resources, job training and creation, and more. Since July 2016, the city of Flint’s water system has been meeting federal standards of the Lead and Copper Rule (LCR).¹⁰³ Michigan is also taking action to protect the public’s water from *Per- and polyfluoroalkyl substances* (PFAS), which are a large group of man-made chemicals persistent in the environment and harmful to the human body.¹⁰⁴

Novel Coronavirus Disease 2019 (COVID-19) Impact on Health Care Delivery in Michigan

The ongoing COVID-19 pandemic, caused by a newly discovered severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has affected millions of people worldwide. Since COVID-19 was identified in Wuhan, China in December 2019, it has caused a deadly respiratory illness in humans which can be spread from person-to-person. The World Health Organization (WHO) declared the novel coronavirus outbreak a public health emergency of international concern (PHEIC) on January 30, 2020, WHO's highest level of alarm.¹⁰⁵ Globally, as of September 21, 2020, there have been 30,905,162 confirmed cases of COVID-19, including 958,703 deaths, reported to WHO. In the U.S., as of September 20, 2020, there have been 6,748,935 Total Cases and 198,754 Total Deaths, which represents 2,039 Cases per 100,000 People and 60 Deaths per 100,000 People.¹⁰⁶ The U.S. has approximately 4% of the world’s population, but over 20% of the coronavirus cases.

The state of Michigan is working tirelessly to fight the coronavirus and to appropriately respond to COVID-19 cases in Michigan. Since the first confirmed cases were announced back in March, the governor declared a state of emergency to maximize efforts and assist local governments and officials to slow the spread of the virus. As of September 19, 2020, there has been 115,870 total confirmed cases and 6,653 total COVID-19 deaths in Michigan with a case fatality rate of 5.7%.¹⁰⁷ COVID-19 has exposed and exacerbated the inequalities and injustices in our society. The COVID-19 pandemic has a disproportionate impact on several vulnerable populations, particularly people of color and our senior citizens. Although most people who have coronavirus may recover completely within a few weeks, some

¹⁰³ State of Michigan Commitment to City of Flint. Retrieved on 09/18/2020 from <https://www.michigan.gov/flintwater/>

¹⁰⁴ Michigan PFAS Action Response Team [online]. Retrieved on 09/18/2020 from <https://www.michigan.gov/pfasresponse>

¹⁰⁵ Timeline: WHO's COVID-19 response. Retrieved on 09/21/2020 from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline>

¹⁰⁶ United States COVID-19 Cases and Deaths by State. Retrieved on 09/21/2020 from https://covid.cdc.gov/covid-data-tracker/#cases_casesinlast7days

¹⁰⁷ Michigan Data. Retrieved on 09/21/2020 from https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html

people experience lingering COVID-19 symptoms which may increase the risk of long-term health problems.¹⁰⁸

Michiganders have been greatly impacted by COVID-19. In addition to the impact of COVID-19 on people's health, it has also affected the economy, education, health care delivery and mental health. Several "stay-at-home" orders were issued in Michigan as a response to COVID-19, resulting in a significant increase in unemployment rates in the state. According to DTMB data, Michigan's April 2020 unemployment rate of 22.7 percent was the highest rate since at least 1976, making it an all-time high.¹⁰⁹ Although the unemployment rate has recently decreased, it is still at least two times higher than prior to the pandemic.¹¹⁰ COVID-19 has become not only a public health crisis, but an economy crisis – severely affecting businesses, education, transportation, productivity, and tourism.

Michigan's healthcare sites and providers have also been impacted by COVID-19 and the subsequent business closures. During times of restrictions, healthcare sites were not allowed to conduct elective treatment and revenue suffered for many of these sites. Especially hard hit were rural healthcare sites that had few COVID-19 related treatments nor tests to administer but also were not able to conduct business as usual. Due to the new financial restraints placed upon many healthcare sites, providers have faced changes in hours, contracts, and many were displaced to other treatment sites. Many Michigan healthcare sites include non-compete clauses within their provider's contracts. This clause disallows providers from leaving the employer and working within Michigan for another healthcare site. With so many provider's contracts, hours, and practice sites changing, if a provider is unhappy and wishes to seek employment elsewhere, Michigan may lose the provider to another state. Further impacting retention.

Access to Telemedicine and Telehealth Reimbursement

The COVID-19 pandemic has forced patients and health care systems to rapidly adapt different models of care and temporary policy changes regarding telehealth services and reimbursement in Michigan. Although the use of telecommunication technology to connect a patient with a health care professional in a different location was already available in the state for some providers and type of services¹¹¹, COVID-19 fueled a rapid transition to telemedicine for many patients, providers, and payers. There have been some temporary updates to the existing policies and flexibilities for telehealth during COVID-19 in efforts to expand access to telehealth services and remove requirements that previously limited access

¹⁰⁸ Long-Term Effects of COVID-19. Retrieved on 09/21/2020 from <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects.html>

¹⁰⁹ Michigan's unemployment rate increases to historic level in April. Retrieved on 09/21/2020 from https://www.michigan.gov/dtmb/0,5552,7-358-82546_9352_99726-529743--_00.html#:~:text=Michigan's%20April%202020%20unemployment%20rate,16.5%20percent%20in%20December%201982.

¹¹⁰ U.S. Bureau of Labor Statistics. *Economy at a Glance*. Local Area Unemployment Statistics. Available at <https://www.bls.gov/eag/eag.mi.htm>

¹¹¹ MDHHS Telemedicine: Policy, Billing & Reimbursement. Available at: https://www.michigan.gov/documents/mdhhs/Telemedicine_2019_671338_7.pdf

to care. However, many of these changes will discontinue after the State of Emergency is over.¹¹² Moreover, this rapid transition to telemedicine may present additional barriers to accessing services as it might limit some populations' ability to access health care due to digital literacy issues and broadband/technology access. These telemedicine accessibility barriers might directly affect vulnerable populations such as senior citizens and low-income Michiganders.

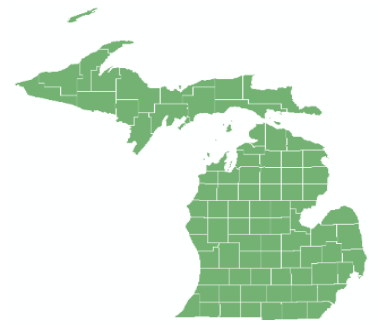
¹¹² What policies or protocols should Medicaid providers use to continue to treat patients during the outbreak?
Available at: https://www.michigan.gov/coronavirus/0,9753,7-406-98178_98156---,00.html

Michigan Data Profile

Total Population: 9,925,568 (10th most populous state in the nation)

Number of Counties: 83 (57 rural counties)

Bordering States: Indiana, Ohio, and Wisconsin as well as the nation of Canada



Health Status Indicators	MI	U.S.	Social Determinants of Health	MI	U.S.	
All Invasive Cancer Incidence	450.9	448.0	Population < 5 y/o	5.7%	6.1%	
Female Breast Cancer Incidence	124.0	125.2	Population ≥ 65 years	16.3%	15.2%	
Prostate Cancer Incidence	108.1	104.1	Population with a disability	14.3%	12.6%	
Lung and Bronchus Cancer Incidence	64.2	59.2	Adults without HS diploma	9.5%	12.3%	
Colon and Rectum Cancer Incidence	37.5	38.7	Unemployment Rate	4.1%	3.9%	
Diabetes Prevalence	9.8%	8.5%	Annual Median Income (\$)	54,938	60,293	
HIV Prevalence	163.1	372.8	Population below 100% FPL	15.0%	14.1%	
Chlamydia Rate	512.8	539.9	Population below 200% FPL	32.7%	31.9%	
Gonorrhea Rate	169.3	179.1	Food Insecurity Rate	13.7%	12.5%	
P & S Syphilis Rate	6.5	10.8	Eviction Rate	3.3%	2.3%	
Acute HCV Rate	1.8	1.0	Obesity Prevalence	56.1%*	39.6%*	
Preterm Births	10.0%	9.8%	Physical Inactivity	36.7%	N/A	
Low Birthweight	8.6%	8.2%	Late or No PNC	24.1%	21.9%	
Infant Mortality Rate (x 1,000 live births)	6.7	5.9	Teen Births Rate	15.8%	17.4%	
Neonatal Abstinence Syndrome Rate	835.8	730	Maternal Tobacco Use	14.3%	6.5%	
Total Mortality Rate (All Causes)	783.1	723.6	EBLL in Children	3.1%	3.0%	
Heart Disease Mortality Rate	194.9	163.6	Uninsured (<65 y/o)	6.1%	10.6%	
Cancer Mortality Rate	161.1	149.1	Preventable Hospitalizations Rate	22.8%	10.1%*	
Chronic Lower Respiratory Diseases Mortality	44.2	39.7	MH/SUD Hospitalizations Rate	3,675.5	3,087.7	
Stroke Mortality Rate	39.9	37.1	Annual Medical Exams (≥65 y/o)	30.0%	27.0%	
Alzheimer's Disease Mortality Rate	34.3	30.5	Annual Flu Shot (≥65 y/o)	46.0%	46.0%	
Diabetes Mellitus Mortality Rate	21.9	21.4	Access to Fluoridated Water	68.8%	62.4%	
Kidney Disease Mortality Rate	15.0	12.9	Population to PC FTE Ratio	766	N/A	
Pneumonia/Influenza Mortality	14.5	14.9	Female to OB/GYN FTE Ratio	1,198	N/A	
Suicide Rate	15.0	14.2	Population to Psychiatrist FTE	9,371	N/A	
Drug-induced Mortality Rate	29.3	21.8	Population to Dentist FTE Ratio	1,640	N/A	
Opioid Overdose Mortality Rate	21.1	N/A	Shortage Designations	Primary Care	Dental Health	Mental Health
Alcohol-induced Mortality Rate	9.2	9.6	HPSA Facilities	178	177	172
<i>Rates per 100,000 population, unless otherwise indicated.</i>			HPSA Geographic Areas	22	1	47
<i>N/A= Data not available.</i>			HPSA Population Groups	58	62	15
<i>*Different reporting period OR age group.</i>			Total Count of HPSAs	258	240	234
<i>Refer to Error! Not a valid result for table. for full explanations of health indicators and data sources.</i>			MUA/P	114		

III. High-Priority Health Issues and Prioritization Results

Based on the quantitative data presented in this report, as well as a systematic review of other studies and community health needs assessments, the following high-priority health issues were identified in Michigan:

- Infectious/Chronic Disease.
- Substance Abuse and Behavioral Health, mainly opioid and drug-related deaths.
- Health disparities, primarily in urban areas.
- Maternal and Infant Health, particularly in rural areas.
- People with disabilities and other vulnerable populations such as elderly and children.
- Socioeconomic factors, including unemployment, poverty, food/housing insecurity, and healthy behaviors.
- Leading Causes of Death, particularly Heart Disease and Cancer.
- Access to Health care and preventive services.

Summary of Major Findings: Key Health Status Measures

Morbidity Profile

- From 2012-2016, Michigan had a slightly higher Invasive Cancer Incidence (all sites) rate (per 100,000 population) than the U.S., particularly for Prostate and Lung/Bronchus cancers.
- In 2016, over 50% of Michigan counties had higher Diabetes prevalence rates than the state and the national rates.
- In 2018, the rate of Acute Hepatitis C (HCV) reported in Michigan was higher than the national acute HCV rate and there was a higher incidence of acute HCV among white people.
- Although the prevalence of HIV and the rates of newly diagnosed cases of Chlamydia, Gonorrhea and Primary and Secondary Syphilis in Michigan were lower than the U.S. rates in 2018, the HIV and STD epidemics continue to disproportionately affect African Americans and minorities in Macomb-Oakland-Wayne Counties metro area, particularly in the City of Detroit.

Health Status Indicators	MI	U.S.
All Invasive Cancer Incidence	450.9	448.0
Prostate Cancer Incidence	108.1	104.1
Lung and Bronchus Cancer Incidence	64.2	59.2
Diabetes Prevalence	9.8%	8.5%
Acute HCV Rate	1.8	1.0

Maternal and Infant Health Profile

- Preterm births and low birthweight are leading contributing factors of infant mortality in Michigan.

Health Status Indicators	MI	U.S.
Preterm Births	10.0%	9.8%
Low Birthweight	8.6%	8.2%
Infant Mortality Rate (x 1,000 live births)	6.7	5.9
Neonatal Abstinence Syndrome Rate	835.8	730.0

- From 2014-2018, the average number of deaths of children under one year of age was 6.7 per 1,000 live births in Michigan, which is higher than the national rate.
- Although the infant death rate has declined over time, African American mothers experienced three times the risk of an infant death compared to Caucasian mothers.
- In 2017, almost 60% of Michigan counties had higher Neonatal Abstinence Syndrome (NAS) rates than the state. The highest county rates were in the northern portion of the Lower Peninsula and in the Upper Peninsula.

Mortality Profile

- Life expectancy at birth for Michigan residents is lower than the U.S. There is also disparity by sex and race. In 2018, Michigan’s life expectancy by sex and race shows that black men had the shorter life expectancy (69.1 years) and white women the longest (81.1 years) with more than ten years of difference.
- In 2018, Heart disease and cancer remained the leading causes of death in Michigan and the United States. In general, Michigan had higher death rates than the total U.S. for most of the 10 leading causes of death, except for Pneumonia/ Influenza.
- Opioids are the main cause of drug overdose deaths in the nation, accounting for approximately 78% of all drug poisoning deaths in Michigan. In 2018, there were 2, 599 drug poisoning deaths (26.7 per 100,000) in Michigan, significantly higher than the national rate (20.7 per 100,000).

Summary of Major Findings: Key Social Determinants of Health Measures

Demographics and Socio-Economic Factors Profile

- Michigan’s population is aging slightly faster with 16.3% of the population comprised of seniors aged 65 years and older, higher than the U.S. estimates (15.2%) in 2018.
- The population in the state is getting older, while the percentage of children under age 18 is decreasing. In 2018, over 83% of Michigan counties had higher percentages of elderly people than the state, particularly in rural Michigan.
- In 2018, there was a higher percent of people with a disability in Michigan than the U.S., 14.3% and 12.6% respectively.
- Although only 9.5% of adults aged 25 years and over did not have a high school diploma (or equivalency) in Michigan, which was lower than the U.S. estimates (12.3%) in 2018, the state is performing worse than the national estimates in terms of unemployment and median household income.

Social Determinants of Health	MI	U.S.
Population ≥ 65 years	16.3%	15.2%
Population with a disability	14.3%	12.6%
Unemployment Rate	4.1%	3.9%
Annual Median Income (\$)	54,938	60,293
Population below 100% FPL	15.0%	14.1%
Population below 200% FPL	32.7%	31.9%
Food Insecurity Rate	13.7%	12.5%
Eviction Rate	3.3%	2.3%

- In 2018, the population below the 100% and 200% of the federal poverty levels (FPL) in Michigan was higher than the U.S. estimates, particularly for Black and African Americans.
- Many people in Michigan are experiencing some type of housing instability and food insecurity. In 2017, there were 1,369,250 food insecure people in Michigan at an overall rate of 13.7%, higher than the national rate (12.5%).

Health Risk Factors Profile

- In 2016, the percentage of adults with obesity was 56.1%, significantly higher than the U.S. total (39.6%*). Additionally, 36.7% of Michigan adults with diabetes reported being physically inactive.

Social Determinants of Health	MI	U.S.
Obesity Prevalence	56.1%*	39.6%*
Late or No PNC	24.1%	21.9%
Maternal Tobacco Use	14.3%	6.5%
EBLL in Children	3.1%	3.0%

- Approximately 24.1% of mothers reported not receiving prenatal care (PNC) during their first trimester, which was higher than the national data (21.9%) in 2018. Late or no prenatal care in the first trimester was higher among teen mothers (38.8%), American Indian (34.4%), Black (31.3%), and mothers of Hispanic Ancestry (31.2%).
- Of the women who gave birth in 2018, 14.3% reported smoking tobacco at some point while pregnant which double the national percent (6.5%). Almost 86% of counties had higher maternal tobacco use percentage than the state.
- In 2017, the percent of children under 6 years old with elevated blood lead levels (EBLL) in Michigan was comparable to the U.S. Over 26% of the counties had higher percent of EBLL in children than the state, including the City of Detroit.

Health Care Access and Preventive Services Profile

- In general, the estimated uninsured rate for the population under age 65 in Michigan was lower than the national average in 2017. However, about 70% of Michigan counties had higher uninsured rate than the state rate.

Social Determinants of Health	MI	U.S.
Uninsured	6.1%	10.6%
Preventable Hospitalizations Rate	22.8%	10.1%*
MH/SUD Hospitalizations Rate	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	46.0%	46.0%
Access to Fluoridated Water	68.8%	62.4%

- The percent of Michigan’s FFS Medicare enrollees that had an annual flu vaccination was 46.0% which is comparable to the national percent in 2017. Approximately 64% of Michigan counties had lower percent of annual flu vaccination than the state. Additionally, the percent of children (19-35 months old) not receiving the recommended immunizations (Combined 7-vaccine Series) was 30.1% in Michigan, slightly higher than the national percent (29.6%) in 2017.
- Only 41.1% of all 1,457 water systems are fluoridated and a total of 6,848,679 Michigan residents on community water systems had access to fluoridated water in 2018, which

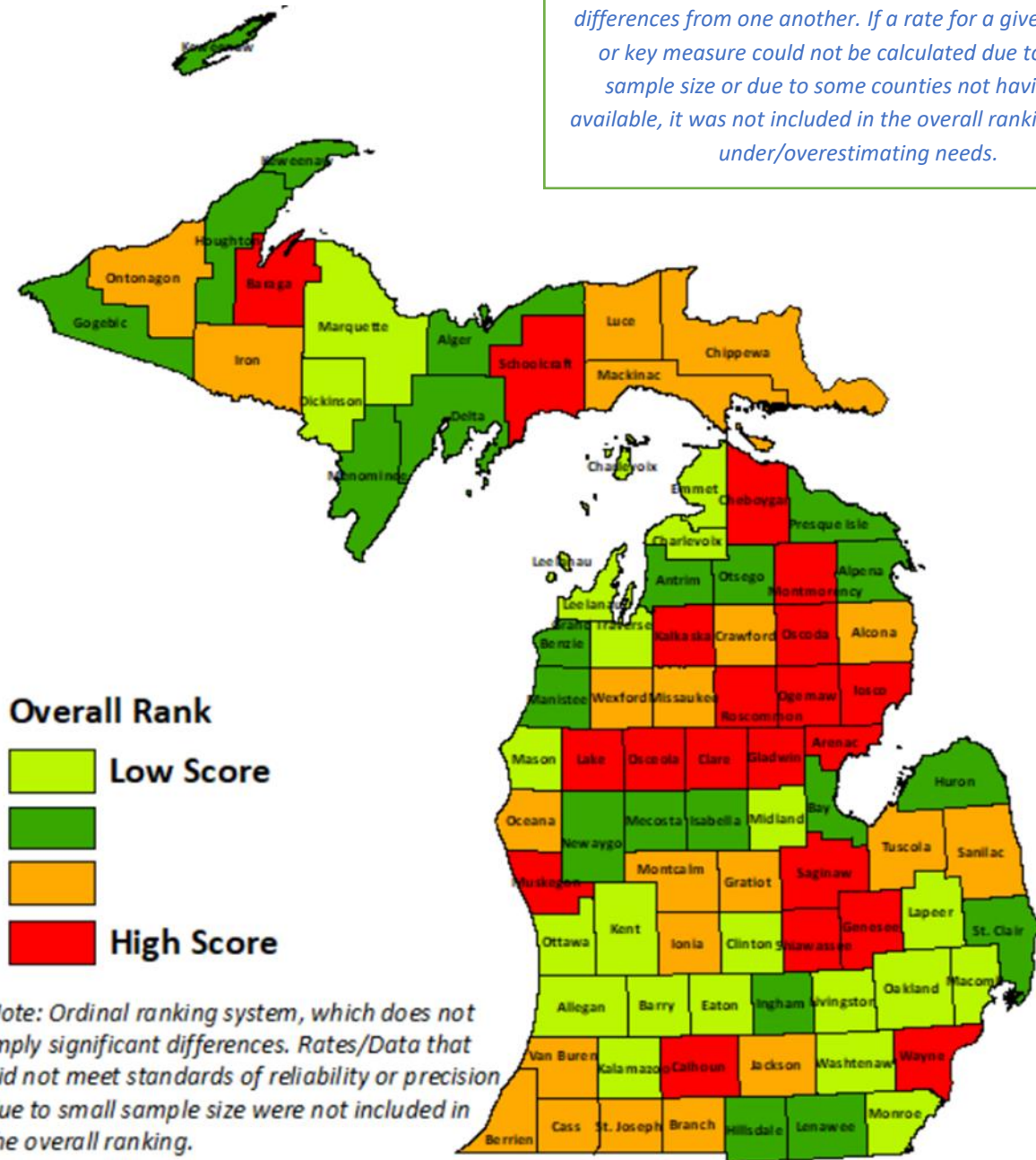
represents about 68.8% of the total Michigan population with access to fluoridated water. Approximately 80% of Michigan counties had lower than 50% of total county population with access to optimally fluoridated.

- About 22.8% of all hospitalizations in Michigan were classified as preventable in 2017– which was higher than the percent of preventable hospitalizations in 2016 (21.6%).
- In 2016, the age/sex adjusted rate of discharges involving mental and/or substance use disorders (MSUD) stays per 100,000 population was 3,675.5 in Michigan, higher than the U.S. (3,087.7).
- While the provider data shows that there may be an abundant overall supply of primary care, mental health, and dental health providers practicing in Michigan – relative to the total resident population, the supply is not evenly distributed throughout the state, with counties with relatively high population-to-FTE ratios or no providers identified in the service area.

Although the method of analysis and the number of selected health indicators for this PCNA differs from other available models, the prioritization results closely resembled published findings such as the Robert Wood Johnson Foundation and University of Wisconsin Population Health Institute’s County Health Rankings & Roadmaps.¹¹³ Based on a total of 54 selected key measures, the areas of greatest need in Michigan are Wayne (Urban), Clare (Rural), Genesee (Urban), Gladwin (Rural), and Arenac (Rural) counties, which demonstrated the worst outcomes (from highest to smallest score) for the overall rank (Health Status and Social Determinants of Health indicators combined). Whereas the counties with the best outcomes or lowest scores were Livingston (Urban), Ottawa (Urban), Washtenaw (Urban), Leelanau (Rural), and Oakland (Urban). When looking at the key health indicators by category, the counties with the worst Health Status outcomes were mostly urban counties and the areas with the worst Social Determinants of Health outcomes were rural counties.

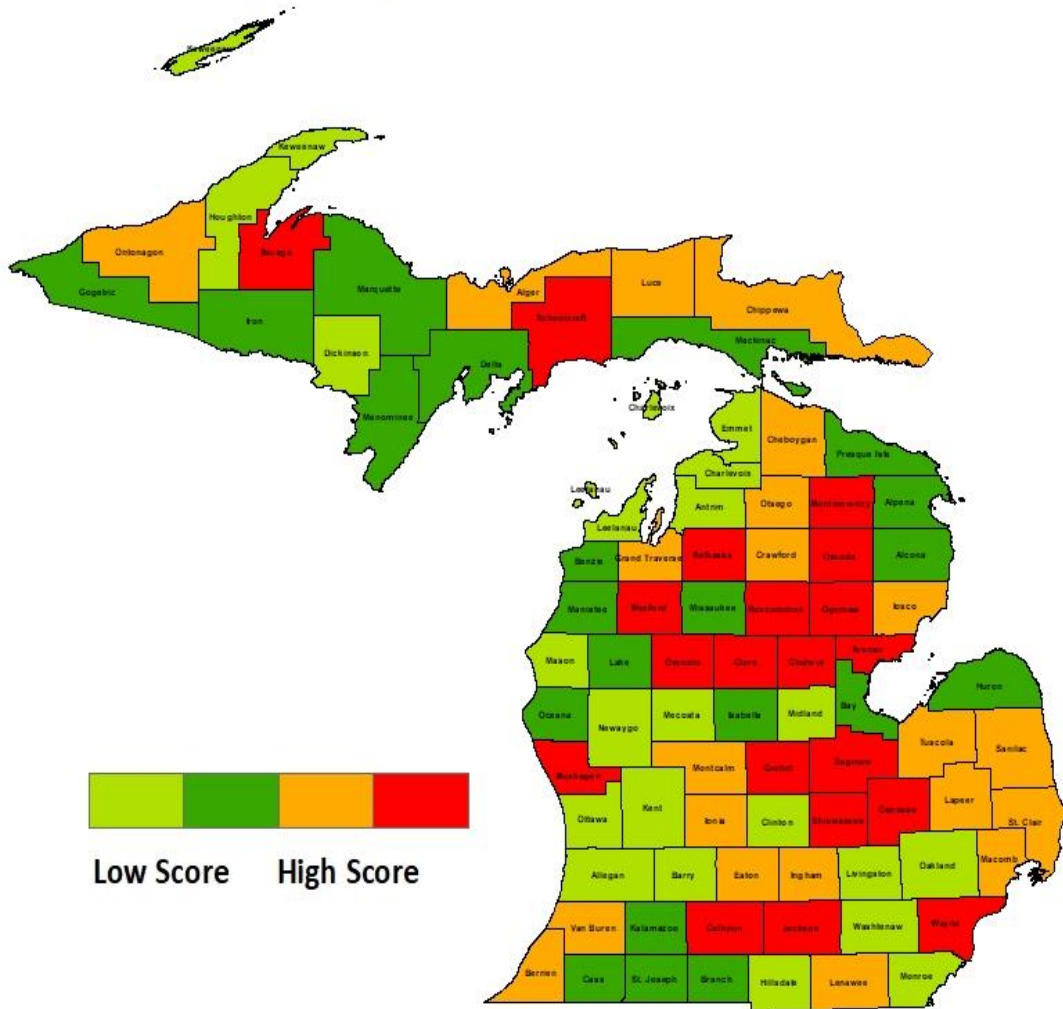
¹¹³ 2020 Michigan County Health Rankings and Roadmaps. Available at: <https://www.countyhealthrankings.org/app/michigan/2020/rankings/outcomes/overall>

Please note that Michigan counties were prioritized using an ordinal ranking system, which does not imply significant differences from one another. If a rate for a given category or key measure could not be calculated due to a small sample size or due to some counties not having data available, it was not included in the overall ranking to avoid under/overestimating needs.



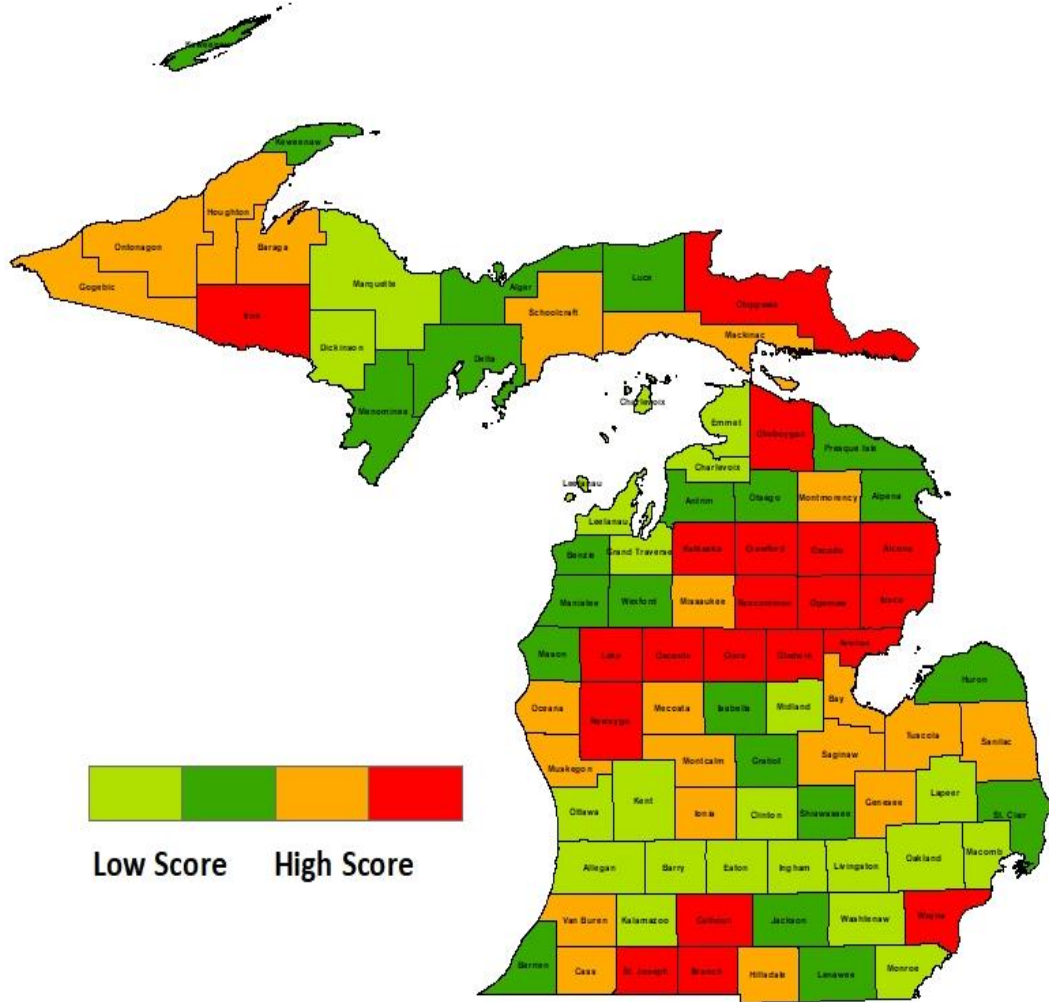
County Ranking (54 Health Indicators)	
Highest Scores	Lowest Scores
Wayne (Urban)	Oakland (Urban)
Clare (Rural)	Leelanau (Rural)
Genesee (Urban)	Washtenaw (Urban)
Gladwin (Rural)	Ottawa (Urban)
Arenac (Rural)	Livingston (Urban)

Overall Rankings in 28 Health Status Measures



County Ranking	Overall Category (28)	Morbidity (11)	Maternal-Infant Health (4)	Mortality (13)
Highest Scores	1. Genesee (Urban) 2. Wayne (Urban) 3. Muskegon (Urban) 4. Clare (Rural) 5. Calhoun (Urban)	Wayne (U) Arenac (R) Genesee (U) Osceola (R) Muskegon (U)	Crawford (R) Genesee (U) Wayne (U) Baraga (R) Muskegon (U)	Genesee (U) Ogemaw (R) Calhoun (U) Shiawassee (R) Clare (R)
Lowest Scores	79. Washtenaw (Urban) 80. Leelanau (Rural) 81. Clinton (Urban) 82. Livingston (Urban) 83. Ottawa (Urban)	Lake (R) Mason (R) Clinton (U) Barry (U) Leelanau (R)	Ottawa (U) Hillsdale (R) Leelanau (R) Clinton (U) Menominee (R)	Kent (U) Livingston (U) Oakland (U) Washtenaw (U) Ottawa (U)

Overall Rankings in 26 Social Determinants of Health



County Ranking	Overall Category (26)	Demographics & Socio-Economic Factors (10)	Health Risk Factors (6)	Access to Care & Preventive Services (10)
Highest Scores	<ol style="list-style-type: none"> 1. Clare (Rural) 2. Arenac (Rural) 3. Gladwin (Rural) 4. Oscoda (Rural) 5. Roscommon (Rural) 	Lake (R) Clare (R) Wayne (U) Roscommon (R) Oscoda (R)	Branch (R) Cass (U) Iosco (R) St. Joseph (R) Calhoun (U)	Osceola (R) Cheboygan (R) Missaukee (R) Roscommon (R) Iron (R)
Lowest Scores	<ol style="list-style-type: none"> 79. Ottawa (Urban) 80. Leelanau (Rural) 81. Oakland (Urban) 82. Washtenaw (Urban) 83. Livingston (Urban) 	Ottawa (U) Washtenaw (U) Leelanau (R) Oakland (U) Livingston (U)	Ottawa (U) Livingston (U) Oakland (U) Leelanau (R) Washtenaw (U)	Marquette (R) Oakland (U) Ottawa (U) Washtenaw (U) Midland (U)

Overall Rank 1: Wayne County Profile

Health Status Rank: 2 of 83

Social Determinants of Health Rank: 11 of 83

County Classification: Urban

Total Population: 1,761,382

rank 1 of 83 (most populous county in Michigan)

County Seat: Detroit City

Adjacent counties: Washtenaw, Monroe, Macomb, Oakland, and Essex (Ontario, Canada)



Health Status Indicators	Wayne	MI	U.S.
All Invasive Cancer Incidence	491.1	450.9	448.0
Female Breast Cancer Incidence	129.9	124.0	125.2
Prostate Cancer Incidence	134.6	108.1	104.1
Lung/Bronchus Cancer Incidence	73.3	64.2	59.2
Colon/Rectum Cancer Incidence	44.8	37.5	38.7
Diabetes Prevalence	10.3%	9.8%	8.5%
HIV Prevalence	391.4	163.1	372.8
Chlamydia Rate	872.6	512.8	539.9
Gonorrhea Rate	363.4	169.3	179.1
P & S Syphilis Rate	17.3	6.5	10.8
Acute HCV Rate	0.28	1.8	1.0
Preterm Births	11.5%	10.0%	9.8%
Low Birthweight	10.9%	8.6%	8.2%
Infant Mortality (x 1,000 live births)	9.8	6.7	5.9
Neonatal Abstinence Syndrome Rate	558.7	835.8	N/A
Total Mortality Rate (All Causes)	889.5	783.1	723.6
Heart Disease Mortality Rate	248.4	194.9	163.6
Cancer Mortality Rate	167.4	161.1	149.1
Chronic Lower Respiratory Diseases Mortality	41.3	44.2	39.7
Stroke Mortality Rate	39.9	39.9	37.1
Alzheimer's Disease Mortality Rate	25.0	34.3	30.5
Diabetes Mellitus Mortality Rate	23.7	21.9	21.4
Kidney Disease Mortality Rate	19.4	15.0	12.9
Pneumonia/Influenza Mortality Rate	20.0	14.5	14.9
Suicide Rate	13.0	15.0	14.2
Drug-induced Mortality Rate	46.1	29.3	21.8
Opioid Overdose Mortality Rate	38.7	21.1	N/A
Alcohol-induced Mortality Rate	7.2	9.2	9.6

Rates per 100,000 population, unless otherwise indicated.

N/A= Data not available.

*Different reporting period OR age group.

Refer to **Appendix A** for full explanations of health indicators and data sources.

Social Determinants of Health	Wayne	MI	U.S.
Population < 5 y/o	6.6%	5.7%	6.1%
Population ≥ 65 years	14.7%	16.3%	15.2%
Population with a disability	16.0%	14.3%	12.6%
Adults without HS diploma	14.1%	9.5%	12.3%
Unemployment Rate	5.2%	4.1%	3.9%
Annual Median Income (\$)	45,321	54,938	60,293
Population below 100% FPL	23.1%	15.0%	14.1%
Population below 200% FPL	43.0%	32.7%	31.9%
Food Insecurity Rate	19.5%	13.7%	12.5%
Eviction Rate	4.0%	3.3%	2.3%
Obesity Prevalence	34.4%	56.1%*	39.6%*
Physical Inactivity	26.0%	36.7%	N/A
Late or No Prenatal Care	25.3%	24.1%	21.9%
Teen Births Rate	22.7%	15.8%	17.4%
Maternal Tobacco Use	10.8%	14.3%	6.5%
EBLL in Children	7.4%	3.1%	3.0%
Uninsured (< 65 y/o)	6.8%	6.1%	10.6%
Preventable Hospitalizations Rate	27.1%	22.8%	10.1%*
MH/SUD Hospitalizations Rate	4,477.5	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	30.0%	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	44.0%	46.0%	46.0%
Access to Fluoridated Water	102.0 %	68.8%	62.4%
Pop to PC FTE Ratio	639	766	N/A
Female to OB/GYN FTE Ratio	1,093	1,198	N/A
Pop to Psychiatrist FTE Ratio	19,224	9,371	N/A
Pop to Dentist FTE Ratio	1,717	1,640	N/A

Current Shortage Designations	
Primary Care HPSA	10 partial county HPSAs
Dental Health HPSA	6 partial county HPSAs
Mental Health HPSA	10 partial county HPSAs
Primary Care MUA/P	19 partial county MUA/P

Overall Rank 2: Clare County Profile

Health Status Rank: 4 of 83

Social Determinants of Health Rank: 1 of 83

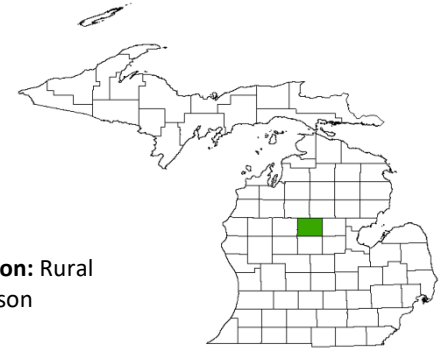
County Classification: Rural

Total Population: 30,616

rank 48 of 83

County Seat: Harrison

Adjacent counties: Missaukee, Roscommon, Gladwin, Midland, Isabella, Mecosta, and Osceola.



Health Status Indicators	Clare	MI	U.S.
All Invasive Cancer Incidence	489.88	450.9	448.0
Female Breast Cancer Incidence	154.68	124.0	125.2
Prostate Cancer Incidence	97.92	108.1	104.1
Lung/Bronchus Cancer Incidence	81.44	64.2	59.2
Colon/Rectum Cancer Incidence	38.0	37.5	38.7
Diabetes Prevalence	13.7%	9.8%	8.5%
HIV Prevalence	117	163.1	372.8
Chlamydia Rate	214.6	512.8	539.9
Gonorrhea Rate	N/A**	169.3	179.1
P & S Syphilis Rate	N/A**	6.5	10.8
Acute HCV Rate	0	1.8	1.0
Preterm Births	7.9%	10.0%	9.8%
Low Birthweight	7.0%	8.6%	8.2%
Infant Mortality (x 1,000 live births)	7.3	6.7	5.9
Neonatal Abstinence Syndrome Rate	1,215.8	835.8	N/A
Total Mortality Rate (All Causes)	947.6	783.1	723.6
Heart Disease Mortality Rate	175.8	194.9	163.6
Cancer Mortality Rate	209.6	161.1	149.1
Chronic Lower Respiratory Diseases Mortality	79.7	44.2	39.7
Stroke Mortality Rate	54.3	39.9	37.1
Alzheimer's Disease Mortality Rate	N/A**	34.3	30.5
Diabetes Mellitus Mortality Rate	48.3	21.9	21.4
Kidney Disease Mortality Rate	N/A**	15.0	12.9
Pneumonia/Influenza Mortality Rate	N/A**	14.5	14.9
Suicide Rate	N/A**	15.0	14.2
Drug-induced Mortality Rate	N/A**	29.3	21.8
Opioid Overdose Mortality Rate	N/A**	21.1	N/A
Alcohol-induced Mortality Rate	N/A**	9.2	9.6

Rates per 100,000 population, unless otherwise indicated.
 N/A= Data not available.
 *Different reporting period OR age group.
 ** Zero cases or small sample size, data do not meet standards of reliability or precision.
 Refer to **Appendix A Error! Not a valid result for table.** for full explanations of health indicators and data sources.

Social Determinants of Health	Clare	MI	U.S.
Population < 5 y/o	5.4%	5.7%	6.1%
Population ≥ 65 years	23.0%	16.3%	15.2%
Population with a disability	23.2%	14.3%	12.6%
Adults without HS diploma	15.3%	9.5%	12.3%
Unemployment Rate	6.1%	4.1%	3.9%
Annual Median Income (\$)	37,369	54,938	60,293
Population below 100% FPL	23.5%	15.0%	14.1%
Population below 200% FPL	49.4%	32.7%	31.9%
Food Insecurity Rate	15.2%	13.7%	12.5%
Eviction Rate	2.2%	3.3%	2.3%
Obesity Prevalence	37.9%	56.1%*	39.6%*
Physical Inactivity	28.7%	36.7%	N/A
Late or No Prenatal Care	33.2%	24.1%	21.9%
Teen Births Rate	N/A**	15.8%	17.4%
Maternal Tobacco Use	28.0%	14.3%	6.5%
EBLL in Children	2.6%	3.1%	3.0%
Uninsured (< 65 y/o)	8.0%	6.1%	10.6%
Preventable Hospitalizations Rate	21.9%	22.8%	10.1%*
MH/SUD Hospitalizations Rate	3,646.7	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	15.0%	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	35.0%	46.0%	46.0%
Access to Fluoridated Water	10.0%	68.8%	62.4%
Pop to PC FTE Ratio	4,710	766	N/A
Female to OB/GYN FTE Ratio	No FTE	1,198	N/A
Pop to Psychiatrist FTE Ratio	153,080	9,371	N/A
Pop to Dentist FTE Ratio	3,402	1,640	N/A

Current Shortage Designations	
Primary Care HPSA	Geographic – Full County
Dental Health HPSA	Low Income – Full County
Mental Health HPSA	Geographic - Multiple Counties
Primary Care MUA/P	MUA – Full County

Overall Rank 3: Genesee County Profile

Health Status Rank: 1 of 83

Social Determinants of Health Rank: 40 of 83

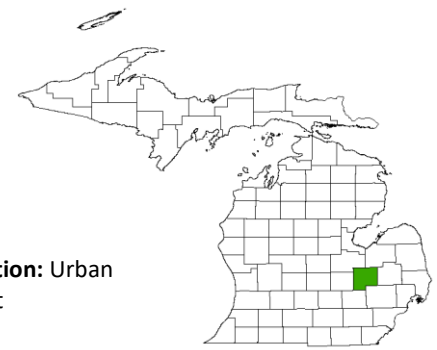
County Classification: Urban

Total Population: 409,361

rank 5 of 83

County Seat: Flint

Adjacent counties: Tuscola, Lapeer, Oakland, Livingston, Shiawassee, and Saginaw.



Health Status Indicators	Genesee	MI	U.S.
All Invasive Cancer Incidence	480.06	450.9	448.0
Female Breast Cancer Incidence	131.24	124.0	125.2
Prostate Cancer Incidence	116.69	108.1	104.1
Lung/Bronchus Cancer Incidence	74.52	64.2	59.2
Colon/Rectum Cancer Incidence	37.49	37.5	38.7
Diabetes Prevalence	11.6%	9.8%	8.5%
HIV Prevalence	141.3	163.1	372.8
Chlamydia Rate	670.4	512.8	539.9
Gonorrhea Rate	217.0	169.3	179.1
P & S Syphilis Rate	N/A**	6.5	10.8
Acute HCV Rate	3.19	1.8	1.0
Preterm Births	12.6%	10.0%	9.8%
Low Birthweight	10.7%	8.6%	8.2%
Infant Mortality (x 1,000 live births)	8.2	6.7	5.9
Neonatal Abstinence Syndrome Rate	2,510.6	835.8	N/A
Total Mortality Rate (All Causes)	923.4	783.1	723.6
Heart Disease Mortality Rate	215.3	194.9	163.6
Cancer Mortality Rate	182.1	161.1	149.1
Chronic Lower Respiratory Diseases Mortality	60.7	44.2	39.7
Stroke Mortality Rate	59.7	39.9	37.1
Alzheimer's Disease Mortality Rate	38.5	34.3	30.5
Diabetes Mellitus Mortality Rate	37.0	21.9	21.4
Kidney Disease Mortality Rate	27.1	15.0	12.9
Pneumonia/Influenza Mortality Rate	11.8	14.5	14.9
Suicide Rate	17.3	15.0	14.2
Drug-induced Mortality Rate	55.1	29.3	21.8
Opioid Overdose Mortality Rate	46.4	21.1	N/A
Alcohol-induced Mortality Rate	8.4	9.2	9.6

Rates per 100,000 population, unless otherwise indicated.
 N/A= Data not available.
 *Different reporting period OR age group.
 ** Zero cases or small sample size, data do not meet standards of reliability or precision.
 Refer to **Appendix A** for full explanations of health indicators and data sources.

Social Determinants of Health	Genesee	MI	U.S.
Population < 5 y/o	6.0%	5.7%	6.1%
Population ≥ 65 years	16.6%	16.3%	15.2%
Population with a disability	16.7%	14.3%	12.6%
Adults without HS diploma	9.6%	9.5%	12.3%
Unemployment Rate	4.9%	4.1%	3.9%
Annual Median Income (\$)	47,006	54,938	60,293
Population below 100% FPL	19.8%	15.0%	14.1%
Population below 200% FPL	39.3%	32.7%	31.9%
Food Insecurity Rate	16.5%	13.7%	12.5%
Eviction Rate	3.2%	3.3%	2.3%
Obesity Prevalence	34.7%	56.1%*	39.6%*
Physical Inactivity	25.4%	36.7%	N/A
Late or No Prenatal Care	25.4%	24.1%	21.9%
Teen Births Rate	20.6%	15.8%	17.4%
Maternal Tobacco Use	20.8%	14.3%	6.5%
EBLL in Children	1.8%	3.1%	3.0%
Uninsured (<65 y/o)	6.7%	6.1%	10.6%
Preventable Hospitalizations Rate	22.8%	22.8%	10.1%*
MH/SUD Hospitalizations Rate	4787.9	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	40.0%	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	48.0%	46.0%	46.0%
Access to Fluoridated Water	69.0%	68.8%	62.4%
Pop to PC FTE Ratio	716	766	N/A
Female to OB/GYN FTE Ratio	1,602	1,198	N/A
Pop to Psychiatrist FTE Ratio	37,130	9,371	N/A
Pop to Dentist FTE Ratio	1,791	1,640	N/A

Current Shortage Designations	
Primary Care HPSA	2 partial county HPSAs
Dental Health HPSA	1 partial county HPSA
Mental Health HPSA	Low Income – Full County
Primary Care MUA/P	3 partial county MUA/P

Overall Rank 4: Gladwin County Profile

Health Status Rank: 12 of 83

Social Determinants of Health Rank: 3 of 83

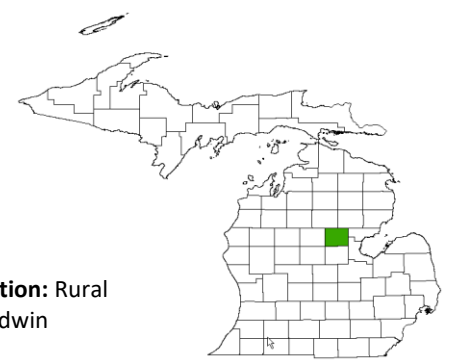
County Classification: Rural

Total Population: 25,289

rank 55 of 83

County Seat: Gladwin

Adjacent counties: Ogemaw, Arenac, Bay, Midland, Clare, Isabella, and Roscommon.



Health Status Indicators	Gladwin	MI	U.S.
All Invasive Cancer Incidence	446.8	450.9	448.0
Female Breast Cancer Incidence	121.8	124.0	125.2
Prostate Cancer Incidence	90.6	108.1	104.1
Lung/Bronchus Cancer Incidence	74.8	64.2	59.2
Colon/Rectum Cancer Incidence	35.1	37.5	38.7
Diabetes Prevalence	15.3%	9.8%	8.5%
HIV Prevalence	39.5	163.1	372.8
Chlamydia Rate	N/A**	512.8	539.9
Gonorrhea Rate	N/A**	169.3	179.1
P & S Syphilis Rate	N/A**	6.5	10.8
Acute HCV Rate	0.0	1.8	1.0
Preterm Births	8.3%	10.0%	9.8%
Low Birthweight	7.8%	8.6%	8.2%
Infant Mortality (x 1,000 live births)	6.8	6.7	5.9
Neonatal Abstinence Syndrome Rate	819.7	835.8	N/A
Total Mortality Rate (All Causes)	911.8	783.1	723.6
Heart Disease Mortality Rate	263.8	194.9	163.6
Cancer Mortality Rate	206.1	161.1	149.1
Chronic Lower Respiratory Diseases Mortality	59.9	44.2	39.7
Stroke Mortality Rate	54.3	39.9	37.1
Alzheimer's Disease Mortality Rate	N/A**	34.3	30.5
Diabetes Mellitus Mortality Rate	N/A**	21.9	21.4
Kidney Disease Mortality Rate	N/A**	15.0	12.9
Pneumonia/Influenza Mortality Rate	N/A**	14.5	14.9
Suicide Rate	N/A**	15.0	14.2
Drug-induced Mortality Rate	N/A**	29.3	21.8
Opioid Overdose Mortality Rate	N/A**	21.1	N/A
Alcohol-induced Mortality Rate	N/A**	9.2	9.6
<p><i>Rates per 100,000 population, unless otherwise indicated.</i> <i>N/A= Data not available.</i> <i>*Different reporting period OR age group.</i> <i>** Zero cases or small sample size, data do not meet standards of reliability or precision.</i> <i>Refer to Appendix A for full explanations of health indicators and data sources.</i></p>			

Social Determinants of Health	Gladwin	MI	U.S.
Population < 5 y/o	5.0%	5.7%	6.1%
Population ≥ 65 years	25.9%	16.3%	15.2%
Population with a disability	21.2%	14.3%	12.6%
Adults without HS diploma	13.3%	9.5%	12.3%
Unemployment Rate	5.6%	4.1%	3.9%
Annual Median Income (\$)	43,290	54,938	60,293
Population below 100% FPL	18.2%	15.0%	14.1%
Population below 200% FPL	42.9%	32.7%	31.9%
Food Insecurity Rate	13.9%	13.7%	12.5%
Eviction Rate	0.8%	3.3%	2.3%
Obesity Prevalence	43.1%	56.1%*	39.6%*
Physical Inactivity	24.1%	36.7%	N/A
Late or No Prenatal Care	38.0%	24.1%	21.9%
Teen Births Rate	N/A**	15.8%	17.4%
Maternal Tobacco Use	23.2%	14.3%	6.5%
EBLL in Children	N/A**	3.1%	3.0%
Uninsured (<65 y/o)	8.0%	6.1%	10.6%
Preventable Hospitalizations Rate	20.1%	22.8%	10.1%*
MH/SUD Hospitalizations Rate	3,797	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	23.0%	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	43.0%	46.0%	46.0%
Access to Fluoridated Water	2.0%	68.8%	62.4%
Pop to PC FTE Ratio	5,161	766	N/A
Female to OB/GYN FTE Ratio	No FTE	1,198	N/A
Pop to Psychiatrist FTE Ratio	252,890	9,371	N/A
Pop to Dentist FTE Ratio	6,322	1,640	N/A
Current Shortage Designations			
Primary Care HPSA	Geographic – Full County		
Dental Health HPSA	Low Income – Full County		
Mental Health HPSA	Geographic – Multiple Counties		
Primary Care MUA/P	MUA – Full County		

Overall Rank 5: Arenac County Profile

Health Status Rank: 14 of 83

Social Determinants of Health Rank: 2 of 83

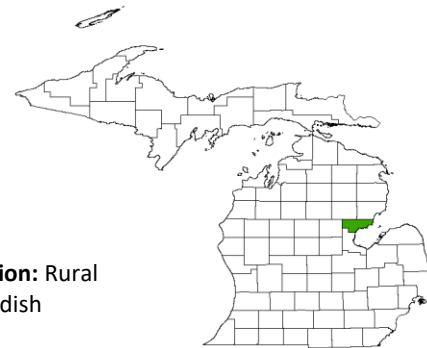
County Classification: Rural

Total Population: 15,165

rank 68 of 83

County Seat: Standish

Adjacent counties: Iosco, Bay, Gladwin, and Ogemaw.



Health Status Indicators	Arenac	MI	U.S.
All Invasive Cancer Incidence	503.9	450.9	448.0
Female Breast Cancer Incidence	143.7	124.0	125.2
Prostate Cancer Incidence	99.1	108.1	104.1
Lung/Bronchus Cancer Incidence	108.7	64.2	59.2
Colon/Rectum Cancer Incidence	39.4	37.5	38.7
Diabetes Prevalence	13.1%	9.8%	8.5%
HIV Prevalence	N/A**	163.1	372.8
Chlamydia Rate	N/A**	512.8	539.9
Gonorrhea Rate	N/A**	169.3	179.1
P & S Syphilis Rate	N/A**	6.5	10.8
Acute HCV Rate	0.0	1.8	1.0
Preterm Births	7.4%	10.0%	9.8%
Low Birthweight	7.1%	8.6%	8.2%
Infant Mortality (x 1,000 live births)	N/A**	6.7	5.9
Neonatal Abstinence Syndrome Rate	885.0	835.8	N/A
Total Mortality Rate (All Causes)	765.7	783.1	723.6
Heart Disease Mortality Rate	192.7	194.9	163.6
Cancer Mortality Rate	160.7	161.1	149.1
Chronic Lower Respiratory Diseases Mortality	72.9	44.2	39.7
Stroke Mortality Rate	N/A**	39.9	37.1
Alzheimer's Disease Mortality Rate	N/A**	34.3	30.5
Diabetes Mellitus Mortality Rate	N/A**	21.9	21.4
Kidney Disease Mortality Rate	N/A**	15.0	12.9
Pneumonia/Influenza Mortality Rate	N/A**	14.5	14.9
Suicide Rate	N/A**	15.0	14.2
Drug-induced Mortality Rate	N/A**	29.3	21.8
Opioid Overdose Mortality Rate	N/A**	21.1	N/A
Alcohol-induced Mortality Rate	N/A**	9.2	9.6
<p><i>Rates per 100,000 population, unless otherwise indicated.</i> <i>N/A= Data not available.</i> <i>*Different reporting period OR age group.</i> <i>** Zero cases or small sample size, data do not meet standards of reliability or precision.</i> <i>Refer to Appendix A for full explanations of health indicators and data sources.</i></p>			

Social Determinants of Health	Arenac	MI	U.S.
Population < 5 y/o	4.5%	5.7%	6.1%
Population ≥ 65 years	23.6%	16.3%	15.2%
Population with a disability	21.0%	14.3%	12.6%
Adults without HS diploma	12.6%	9.5%	12.3%
Unemployment Rate	7.1%	4.1%	3.9%
Annual Median Income (\$)	40,769	54,938	60,293
Population below 100% FPL	18.2%	15.0%	14.1%
Population below 200% FPL	41.3%	32.7%	31.9%
Food Insecurity Rate	14.3%	13.7%	12.5%
Eviction Rate	0.9%	3.3%	2.3%
Obesity Prevalence	36.0%	56.1%*	39.6%*
Physical Inactivity	28.4%	36.7%	N/A
Late or No Prenatal Care	32.4%	24.1%	21.9%
Teen Births Rate	N/A**	15.8%	17.4%
Maternal Tobacco Use	36.0%	14.3%	6.5%
EBLL in Children	N/A**	3.1%	3.0%
Uninsured (<65 y/o)	8.1%	6.1%	10.6%
Preventable Hospitalizations Rate	23.1%	22.8%	10.1%*
MH/SUD Hospitalizations Rate	5204.5	3,675.5	3,087.7
Annual Medical Exams (≥65 y/o)	33.0%	30.0%	27.0%
Annual Flu Shot (≥65 y/o)	39.0%	46.0%	46.0%
Access to Fluoridated Water	10.0%	68.8%	62.4%
Pop to PC FTE Ratio	2,708	766	N/A
Female to OB/GYN FTE Ratio	22,060	1,198	N/A
Pop to Psychiatrist FTE Ratio	15,165	9,371	N/A
Pop to Dentist FTE Ratio	3,791	1,640	N/A
Current Shortage Designations			
Primary Care HPSA	Low Income – Multiple Counties		
Dental Health HPSA	Low Income – Full County		
Mental Health HPSA	Geographic – Multiple Counties		
Primary Care MUA/P	MUA – Full County		

IV. Implementation Plan

This needs assessment serves as a source of reliable and accurate information for our community and stakeholders to improve accessibility of primary care resources, particularly for underserved and vulnerable populations in Michigan.

In response to the key findings and barriers to care discussed in this report, Michigan PCO will establish priorities that will support its diverse efforts to strengthen primary care in the state, including:

- Using the data/rankings for resource allocation and insight into future healthcare interventions.
- Strengthening current partnerships and building new strategic partnerships to reduce disparities, barriers to care, and improve the overall health of all Michiganders across the state.
- Addressing primary health care needs by prioritizing resources through shortage designation coordination, collaboration and reducing barriers to primary health care by leveraging existing federal, state, and other programs including the Michigan State Loan Repayment Program
 - Update current shortage designations and reassess high-need areas and underserved populations for new HPSA/MUA/P applications in the state.
 - Continue supporting health care facilities interested in expanding access to primary health care to underserved areas through the RHC certification, free clinics program, NHSC site certification, loan repayment programs, and other recruitment and retention programs.
- Conducting key informant interviews/surveys and revise provider data regularly to supplement future needs assessment update and for the development of statewide rational service areas plans based on health care utilization patterns.

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Appendix A

Table 5: PCNA Data Sources and Key Measures Description

Key Measure	Description	Year (s)	Source
HEALTH STATUS			
Morbidity			
Invasive Cancer Incidence Rate	New cases of All sites Invasive Cancer per 100,000 population, age-adjusted rates.	2012-2016	Michigan Cancer Surveillance Program: https://www.cancer-rates.info/mi/ . CDC U.S. Cancer Statistics: https://www.cdc.gov/cancer/uscs/
Female Breast Cancer Incidence Rate	New cases of Female Breast Invasive Cancer per 100,000 population, age-adjusted rates.	2012-2016	Michigan Cancer Surveillance Program: https://www.cancer-rates.info/mi/ . CDC U.S. Cancer Statistics: https://www.cdc.gov/cancer/uscs/
Prostate Gland Cancer Incidence Rate	New cases of Prostate Gland Invasive Cancer per 100,000 population, age-adjusted rates.	2012-2016	Michigan Cancer Surveillance Program: https://www.cancer-rates.info/mi/ . CDC U.S. Cancer Statistics: https://www.cdc.gov/cancer/uscs/
Lung and Bronchus Cancer Incidence Rate	New Cases of Lung and Bronchus Invasive Cancer per 100,000 population, age-adjusted rates.	2012-2016	Michigan Cancer Surveillance Program: https://www.cancer-rates.info/mi/ . CDC U.S. Cancer Statistics: https://www.cdc.gov/cancer/uscs/
Colon Rectum Cancer Incidence Rate	New Cases of Colon Rectum Invasive Cancer per 100,000 population, age-adjusted rates.	2012-2016	Michigan Cancer Surveillance Program: https://www.cancer-rates.info/mi/ . CDC U.S. Cancer Statistics: https://www.cdc.gov/cancer/uscs/
Diabetes Prevalence (%)	Percent of adults with diagnosed diabetes, age adjusted. USDSS restricted county estimates to adults aged 20 years or older to be, while MI and U.S. data are among adults aged 18 years or older.	2016	U.S. Diabetes Surveillance System (USDSS); CDC Division of Diabetes Translation. www.cdc.gov/diabetes/data
HIV Prevalence Rate	Total number of people currently living with HIV (PLWH) per 100,000 population.	2018	Michigan Statewide HIV Surveillance Report, New Diagnoses and Prevalence Tables – July 2019 CDC NCHHSTP AtlasPlus. Updated 2019. https://www.cdc.gov/nchhstp/atlas/index.htm
Chlamydia Rate	Reported diagnosed cases of Chlamydia per 100,000 population.	2018	MDHHS Disease Surveillance System. CDC NCHHSTP AtlasPlus: https://www.cdc.gov/nchhstp/atlas/index.htm , https://www.cdc.gov/std/stats18/tables/1.htm
Gonorrhea Rate	Reported diagnosed cases of Gonorrhea per 100,000 population.	2018	MDHHS Disease Surveillance System. CDC NCHHSTP AtlasPlus: https://www.cdc.gov/nchhstp/atlas/index.htm , https://www.cdc.gov/std/stats18/tables/1.htm
Primary & Secondary Syphilis Rates	Reported diagnosed cases of Primary & Secondary (P & S) Syphilis per 100,000 population.	2018	MDHHS Disease Surveillance System. CDC NCHHSTP AtlasPlus: https://www.cdc.gov/nchhstp/atlas/index.htm , https://www.cdc.gov/std/stats18/tables/1.htm
Acute Hepatitis C Rate	Reported diagnosed cases of acute Hepatitis C (HCV) per 100,000 population.	2018	MDHHS Viral Hepatitis Surveillance and Prevention Unit. Hepatitis B and C Annual Surveillance Report . CDC Surveillance for Viral Hepatitis – U.S., 2017: https://www.cdc.gov/hepatitis/statistics/2017surveillance/index.htm
Maternal-Infant Health			
Preterm Live Births (%)	Infants born prior to 37 completed weeks of gestation per 100 live births, 5-year average.	2014-2018	Geocoded Michigan Birth Certificate Registry, MDHHS Division for Vital Records & Health Statistics CDC Natality Files Natality public-use data 2007-2018, on CDC WONDER Online Database, September 2019. http://wonder.cdc.gov/natality-current.html
Low Birthweight (%)	Live births weighing less than 2,500 grams per 100 live births. 5-year average.	2014-2018	Geocoded Michigan Birth Certificate Registry, MDHHS Division for Vital Records & Health Statistics CDC Natality Files Natality public-use data 2007-2018, on CDC WONDER Online Database, September 2019. http://wonder.cdc.gov/natality-current.html
Infant Mortality Rate	Number of deaths per 1,000 live births of children under one year of age, 5-year average.	2014-2018	MDHHS Division for Vital Records & Health Statistics. CDC WONDER On-line Database. Linked Birth / Infant Death Records 2007-2017. http://wonder.cdc.gov/lbd-current.html

Key Measure	Description	Year (s)	Source
Neonatal Abstinence Syndrome (NAS) Rate	Infants discharged from Hospitals for Treated Drug Withdrawal Syndrome per 100,000 births.	2017	MDHHS Division for Vital Records & Health Statistics. HCUP Fast Stats - Map of Neonatal Abstinence Syndrome (NAS) Among Newborn Hospitalizations. Retrieved from https://www.hcup-us.ahrq.gov/faststats/NASMap
Mortality			
Total Mortality Rate (All Causes)	All causes of death per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Heart Disease Mortality Rate	Heart Disease deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Cancer Mortality Rate	Cancer (malignant neoplasms) deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Chronic Lower Respiratory Diseases Mortality Rate	Chronic Lower Respiratory Disease deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Stroke Mortality Rate	Stroke deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Alzheimer's Disease Mortality Rate	Alzheimer's Disease deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Diabetes Mellitus Mortality Rate	Diabetes Mellitus deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Kidney Disease Mortality Rate	Kidney Disease deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Pneumonia/ Influenza Mortality Rate	Pneumonia/ Influenza deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Intentional Self-harm (Suicide) Mortality Rate	Intentional Self-harm deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics. Geocoded Michigan Death Certificate Registry Mortality in the U.S., 2018. NCHS Data Brief, no 355. https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf
Drug-Induced Mortality Rate	All drug-induced deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics CDC WONDER Online Database. Data are from the Multiple Cause of Death Files, 1999-2018: http://wonder.cdc.gov/ucd-icd10.html
Opioid Overdose Mortality Rate	Opioid poisoning deaths per 100,000 population, age-adjusted rates.	2018	MDHHS Division for Vital Records & Health Statistics
Alcohol-Induced Mortality Rate	Alcohol-induced deaths per 100,000 population, age-adjusted rates	2018	MDHHS Division for Vital Records & Health Statistics CDC WONDER Online Database. Data are from the Multiple Cause of Death Files, 1999-2018: http://wonder.cdc.gov/ucd-icd10.html
SOCIO DETERMINANTS OF HEALTH			
Demographics and Socio-Economic Factors			
Population under 5 y/o (%)	Percent of children under 5 years old.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S0101
Population 65 years and over (%)	Percent of people 65 years of age and older.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S0101

Key Measure	Description	Year (s)	Source
Population with a disability (%)	Percent of people who exhibit difficulty with specific functions: hearing, vision, cognitive, ambulatory, self-care, or independent living difficulty.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S1810
Population with no high school diploma (%)	Percent of adults (people 25 years old and over) who have not completed high school.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S1501.
Unemployment Rate (%)	Number of unemployed people as a percentage of the civilian labor force (16 years and over). Annual averages.	2018	U.S. Bureau of Labor Statistics (BLS), Local Area Unemployment Statistics (LAUS). https://www.bls.gov/lau/#tables
Annual Median Household (\$)	Income of the householder and all other individuals 15 years old and over in the household for the past 12 months.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S1903.
Percent of population below 100% FPL	Percent of people below 100% poverty level.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S1701
Percent of population below 200% FPL	Percent of people below 200% poverty level.	2014-2018	U.S. Census Bureau, 2018 ACS 5-year Estimates. Table S1701
Food Insecurity Rate (%)	Percent of population (overall) who lack adequate access to food.	2017	Feeding America – Map the Meal Gap (overall and child data available): https://map.feedingamerica.org/
Eviction Rate (%)	Number of evictions per 100 renter homes.	2016	The Eviction Lab at Princeton University: https://evictionlab.org/
Health Risk Factors and Behaviors			
Obesity Prevalence (%)	The percentage of adults with self-reported diabetes who were obese (BMI >=30), age adjusted.	2016	U.S. Diabetes Surveillance System; Division of Diabetes Translation – CDC. www.cdc.gov/diabetes/data 2017 CDC Data Briefs https://www.cdc.gov/nchs/data/databriefs/db288.pdf
Physical Inactivity (%)	The percentage of adults with self-reported diabetes who also reported doing no physical activity in the past 30 days.	2016	U.S. Diabetes Surveillance System; Division of Diabetes Translation – CDC. www.cdc.gov/diabetes/data
Late or No Prenatal Care, PNC (%)	Percent of mothers who did not begin prenatal care in first trimester.	2018	MDHHS Division for Vital Records & Health Statistics. CDC Natality Files on CDC WONDER Online Database https://wonder.cdc.gov/nativity.html
Maternal Tobacco Use (%)	Percent of women who used tobacco during pregnancy.	2018	Geocoded Michigan Birth Certificate Registry, MDHHS Division for Vital Records & Health Statistics CDC Natality Files Natality public-use data 2007-2018, on CDC WONDER Online Database. http://wonder.cdc.gov/nativity-current.html
Teen Births (%)	Number of births per 1,000 female population ages 15-19.	2018	Geocoded Michigan Birth Certificate Registry, MDHHS Division for Vital Records & Health Statistics CDC Natality Files Natality public-use data 2007-2018, on CDC WONDER Online Database. http://wonder.cdc.gov/nativity-current.html
Blood Lead Levels in Children (%)	Percent of children with elevated blood lead level (EBLL).	2017	MDHHS Division of Environmental Health. Childhood Lead Poisoning Prevention Program (CLPPP) 2017 Annual Report.
Health Care Access and Preventive Services			
Population uninsured (%) (under 65 y/o)	Percent of persons under age 65 uninsured.	2017	U.S. Census Bureau, Small Area Health Insurance Estimates (SAHIE) Program. https://www.census.gov/programs-surveys/sahie.html
Preventable Hospitalizations Rate (%)	Percent of all hospitalizations that were categorized as ambulatory care sensitive hospitalizations.	2017	Michigan Resident Inpatient Files created by the MDHHS Division for Vital Records and Health Statistics https://www.mdch.state.mi.us/pha/osr/CHI/HOSP/FRAME.HTML National HCUP Statistical Brief #99. Potentially Preventable Hospitalizations for Acute and Chronic Conditions (2008): http://www.hcup-us.ahrq.gov/reports/statbriefs/sb99.pdf
Hospital Stays Related to Mental and/or Substance Use Disorders	Age/sex adjusted rate of discharges (stays) due to Alcohol and Other Drugs per 100,000 population.	2016	Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUPnet): https://hcupnet.ahrq.gov/#setup

Key Measure	Description	Year (s)	Source
Annual Medical Exams	Percentage of fee-for-service (FFS) Medicare enrollees that had an annual wellness visit, age-adjusted.	2017	CMS Office of Minority Health's Mapping Medicare Disparities (MMD) Tool: https://data.cms.gov/mapping-medicare-disparities
Annual Flu Shot (%)	Percentage of fee-for-service (FFS) Medicare enrollees that had an annual flu vaccination, age-adjusted.	2017	CMS Office of Minority Health's Mapping Medicare Disparities (MMD) Tool: https://data.cms.gov/mapping-medicare-disparities Other Source (State/National Level): CDC National Center for Immunization and Respiratory Diseases (NCIRD): https://www.cdc.gov/flu/fluview/interactive.htm
Access to Fluoridated Water (%)	Percent of total population with access to optimally fluoridated water. Fluoridated water includes adjusted and optimal natural systems.	2018	Michigan Water Fluoridation Reporting System, 2018. Numerator: Michigan residents accessing optimally fluoridated water. Denominator: Total Michigan residents in the county. National Water Fluoridation Statistics (2016). CDC Division of Oral Health. https://www.cdc.gov/fluoridation/statistics/2016stats.htm
Population to One PCP FTE Ratio	Population to one Primary Care Physician (PCP) full time equivalent (FTE) Ratio. PCP include MDs and DOs in General or Family Practice, Internal Medicine, Obstetrics and Gynecology, and Pediatrics. Ratio based on total estimated direct patient care provider hours/ FTE and total county population.	2020	Provider data come from the Michigan Shortage Designation Management System (SDMS), as of 02/2020. Population estimates are from the 2018 American Community Survey 5-year estimates. U.S. Census Bureau.
Population to One OBGYN FTE Ratio	Women of reproductive age (aged 15-44 years) to one OBGYN Physician full time equivalent (FTE) Ratio. Ratio based on total estimated direct patient care provider hours/ FTE and total county population.	2020	Provider data come from the Michigan Shortage Designation Management System (SDMS), as of 02/2020. Population estimates are from the 2018 American Community Survey 5-year estimates. U.S. Census Bureau.
Population to One Psychiatrist FTE Ratio	Population to one Psychiatrist full time equivalent (FTE) Ratio. Ratio based on total estimated direct patient care provider hours/ FTE and total county population.	2020	Provider data come from the Michigan Shortage Designation Management System (SDMS), as of 02/2020. Population estimates are from the 2018 American Community Survey 5-year estimates. U.S. Census Bureau.
Population to One Dentist FTE	Population to one Dentist full time equivalent (FTE) Ratio. Ratio based on total estimated direct patient care provider hours/ FTE and total county population.	2020	Provider data come from the Michigan Shortage Designation Management System (SDMS), as of 02/2020. Population estimates are from the 2018 American Community Survey 5-year estimates. U.S. Census Bureau.

Appendix B

Table 6: PCNA Rankings by County and Category

County	Urban -Rural	PCNA Overall Rank	Health Status Rank	Morbidity	Maternal- Infant Health	Mortality	SDOH Rank	Demographic and Socio- Economic	Risk Factors	Access and Preventive Services
Wayne	Urban	1	2	1	3	19	11	3	12	55
Clare	Rural	2	4	7	48	5	1	2	9	9
Genesee	Urban	3	1	3	2	1	40	19	36	60
Gladwin	Rural	4	12	27	43	6	3	8	8	6
Arenac	Rural	5	14	2	62	34	2	9	6	7
Roscommon	Rural	6	10	14	10	22	5	4	54	4
Oscoda	Rural	7	15	12	14	40	4	5	26	8
Calhoun	Urban	8	5	22	22	3	16	16	5	51
Osceola	Rural	9	13	4	41	44	9	18	48	1
Ogemaw	Rural	10	8	30	38	2	15	7	44	24
Muskegon	Urban	11	3	5	5	15	39	13	10	75
Iosco	Rural	12	26	60	50	7	6	11	3	27
Montmorency	Rural	13	7	10	19	8	30	6	60	47
Baraga	Rural	14	9	42	4	13	21	31	27	19
Cheboygan	Rural	15	23	21	28	39	8	15	42	2
Kalkaska	Rural	16	17	29	47	10	12	24	13	13
Lake	Rural	17	43	79	13	12	7	1	66	18
Saginaw	Urban	18	16	8	12	56	29	14	19	52
Schoolcraft	Rural	19	18	37	6	35	24	10	45	35
Shiawassee	Rural	20	6	18	30	4	53	61	20	49
Crawford	Rural	21	31	73	1	46	20	29	29	16
Alcona	Rural	22	57	67	20	49	10	12	32	10
Jackson	Urban	23	11	15	15	16	49	42	11	70
Chippewa	Rural	24	39	32	69	33	19	23	22	29
Wexford	Rural	25	20	16	42	27	42	32	43	46
Missaukee	Rural	26	46	24	75	47	23	25	74	3
Gratiot	Rural	27	19	31	52	9	45	34	16	64
Mackinac	Rural	28	48	56	18	52	22	20	52	12
Van Buren	Urban	29	25	19	65	28	34	46	23	34
Ontonagon	Rural	30	32	54	11	41	31	30	49	22
St. Joseph	Rural	31	61	59	59	45	14	45	4	14
Branch	Rural	32	62	77	60	14	13	52	1	15
Iron	Rural	33	56	75	16	30	17	40	33	5
Luce	Rural	34	21	49	8	20	47	17	78	30
Tuscola	Rural	35	28	43	74	11	36	36	31	38
Montcalm	Urban	36	34	38	45	29	35	37	21	45
Cass	Urban	37	55	64	23	48	27	59	2	28
Ionia	Rural	38	29	34	31	37	41	69	25	11
Berrien	Urban	39	22	6	39	69	50	35	34	61
Oceana	Rural	40	47	47	21	59	33	22	68	20
Sanilac	Rural	41	38	51	34	31	38	28	57	33
Gogebic	Rural	42	58	50	27	71	28	41	15	26
Newaygo	Rural	43	66	78	32	43	18	21	35	17
Bay	Urban	44	54	53	51	42	32	39	17	37
Hillsdale	Rural	45	65	71	80	18	26	44	7	32
Presque Isle	Rural	46	51	66	9	55	43	27	65	40
Mecosta	Rural	47	70	65	67	58	25	26	30	25
Isabella	Rural	48	50	62	49	17	48	33	61	42
Lenawee	Rural	49	27	26	56	24	57	62	14	63
Delta	Rural	50	44	35	26	62	54	50	38	58

County	Urban -Rural	PCNA Overall Rank	Health Status Rank	Morbidity	Maternal- Infant Health	Mortality	SDOH Rank	Demographic and Socio- Economic	Risk Factors	Access and Preventive Services
St. Clair	Urban	51	33	45	40	21	56	64	40	41
Huron	Rural	52	42	36	63	32	55	49	63	44
Alpena	Rural	53	53	58	55	25	51	43	39	56
Menominee	Rural	54	59	33	83	50	46	58	41	21
Alger	Rural	55	37	57	7	53	59	47	62	62
Houghton	Rural	56	67	68	70	51	37	38	46	23
Antrim	Rural	57	64	41	61	72	44	56	18	36
Otsego	Rural	58	35	20	77	38	62	48	76	53
Ingham	Urban	59	30	9	24	76	63	54	58	69
Manistee	Rural	60	49	48	25	57	60	51	56	59
Benzie	Rural	61	60	40	64	65	58	71	24	43
Keweenaw	Rural	62	71	61	68	66	52	55	51	31
Kalamazoo	Urban	63	45	11	36	75	67	57	47	74
Lapeer	Urban	64	36	46	46	23	68	72	67	48
Macomb	Urban	65	24	17	17	68	73	66	73	67
Eaton	Urban	66	41	23	57	54	69	74	50	57
Marquette	Rural	67	52	39	33	64	71	60	59	79
Mason	Rural	68	73	80	58	36	61	53	69	54
Monroe	Urban	69	74	74	53	60	65	67	28	66
Allegan	Rural	70	77	76	54	67	64	73	53	39
Barry	Urban	71	75	82	72	26	66	76	37	50
Charlevoix	Rural	72	63	44	76	61	74	68	64	72
Dickinson	Rural	73	72	55	73	70	70	63	72	65
Emmet	Rural	74	69	63	66	63	72	65	71	71
Grand Traverse	Rural	75	40	13	44	73	78	78	77	78
Kent	Urban	76	68	25	35	79	75	70	55	77
Midland	Urban	77	78	69	71	77	77	75	75	83
Clinton	Urban	78	81	81	82	78	76	77	70	68
Oakland	Urban	79	76	28	29	81	81	82	81	80
Leelanau	Rural	80	80	83	81	74	80	81	82	73
Washtenaw	Urban	81	79	52	37	82	82	80	83	82
Ottawa	Urban	82	83	72	79	83	79	79	79	81
Livingston	Urban	83	82	70	78	80	83	83	80	76