

Upper Peninsula Community Health Needs Assessment 2021



**Reporting on the Health Status of
Michigan's Upper Peninsula Residents**

Upper Peninsula Community Health Needs Assessment 2021

Downloadable at www.wupdhd.org



"Si Quaeris Peninsulam Amoenam Circumspice"

(Michigan's Motto: If you seek a pleasant peninsula, look about you)

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The data and analyses in this report may be excerpted and used for the public good with appropriate



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Aspirus Iron River Hospital	Munising Memorial Hospital/Baycare Medical Center
Aspirus Ironwood Hospital	MyMichigan Medical Center - Sault
Aspirus Keweenaw Hospital	NorthCare Network
Aspirus Ontonagon Hospital	Northern Michigan Center for Rural Health
BCBS Foundation of Michigan	Northpointe Behavioral Health Systems
Baraga County Memorial Hospital	OSF St. Francis Hospital
Bellin Health Hospital and Clinics	Pathways Community Mental Health
Chippewa County Health Department	Portage Health Foundation
Copper Country Community Mental Health	Public Health of Delta & Menominee Counties
Dickinson-Iron District Health Department	Schoolcraft Memorial Hospital
Gogebic County Community Mental Health	Superior Health Foundation
Great Lakes Recovery Center	Upper Great Lakes Family Health Center
Helen Newberry Joy Hospital	Upper Peninsula Health Care Solutions
Keweenaw Bay Indian Community	Upper Peninsula Health Group
Luce-Mackinac-Alger-Schoolcraft District Health Department	Upper Peninsula Health Plan
Mackinac Straits Health System	U P Health Systems - Bell
Marshfield Clinic Health System - Dickinson	U P Health Systems - Marquette
Marquette County Health Department	U P Health Systems - Portage
Michigan Department of Health and Human Services	War Memorial Hospital
Michigan Health Endowment Fund	Western U P Health Department
Michigan Technological University	Western U P Planning & Development Region

This report is intended to inform health practitioners, planners, policymakers, and the public. It can be read as a snapshot of the region's health status and used to identify priorities for community health improvement. If knowledge is power, it is hoped that this report will empower citizens and health care professionals alike to work effectively for improved health and wellbeing in the Upper Peninsula.

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ABBREVIATION LIST

ACE = adverse childhood experience
ACIP = Advisory Committee on Immunization Practices
ACS = American Community Survey
ADHD = attention deficit hyperactivity disorder
adjOR = adjusted odd ratio
ADT = admission, discharge, and treatment
AHRQ = Agency for Healthcare Research and Quality
AIDS = acquired immune deficiency syndrome
ALICE = Asset Limited, Income Constrained, Employed
ARDS = acute respiratory distress syndrome
BRFS = Behavioral Risk Factor Surveillance System
BMI = body mass index
BPD = bipolar disease
CBD = cannabidiol
CDC = Centers for Disease Control and Prevention
CHIP = Children's Health Insurance Program
CHNA = community health needs assessment
CI = confidence interval
CKD = chronic kidney disease
CMH = community mental health
CMHSPs = county-based community health mental health services programs
CMS = Centers for Medicare & Medicaid Services
COPD = chronic obstructive pulmonary disease
COVID-19 = coronavirus disease 2019
DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition*
DTaP = diphtheria, tetanus, acellular pertussis
EDRS = electronic death reporting system
FBI = Federal Bureau of Investigation
FTE = full time equivalent
HAV = hepatitis A virus
HCV = hepatitis C virus
HIV = human immunodeficiency virus
HKD = Healthy Kids Dental
HPSAs = Health Professional Shortage Areas
HPV = Human papillomavirus
HRSA = Health Resources & Services Administration
HSPA = Health Shortage Population Area
HUD = United States Department Housing and Urban Development
ICD-9CM = International Classification of Diseases, Ninth Revision, Clinical Modification
IHS = Federal Indian Health Service
IMU = Index of Medical Underservice
IUD = intrauterine device
LARC = long-acting reversible contraceptive
LSD = lysergic acid diethyl amide
MBDR = Michigan Birth Defects Registry

MCIR = Michigan Care Improvement Registry
MERS-CoV = coronavirus responsible for Middle East Respiratory Syndrome
MDHHS = Michigan Department of Health & Human Services
MDSS = Michigan Disease Surveillance System Syndrome
MenACWY = meningococcal vaccine
MiBRFS = Michigan Behavioral Risk Factor Survey
MIChild = Michigan Child Health Insurance Program
MIPHY = Michigan Profile for Health Youth
MUAs = Medically Underserved Areas
MIS-A = multisystem inflammatory syndrome - adult
MIS-C = multisystem inflammatory syndrome - children
MMR = measles, mumps, rubella
mRNA = messenger RNA
NAS = neonatal abstinence syndrome
NHSC = National Health Services Corps
NASH = non-alcoholic steatohepatitis (fatty liver)
NICU = neonatal intensive care unit
NSDUH = National Survey on Drug Use and Health
OECD = Organization for Economic Coordination and Development
OR = odds ratio
OUIL = operating under the influence of liquor
OWPD = operating with presence of drugs
PAP = Papanicolaou test/smear
PCR = real-time reverse transcription polymerase chain reaction
PID = pelvic inflammatory disease
PRAMS = Pregnancy Risk Assessment Monitoring System
PSA = prostate-specific antigen
PTSD = post-traumatic stress disorder
SARS-CoV = coronavirus responsible for Severe Acute Respiratory Syndrome
SARS-CoV-2 = coronavirus responsible for COVID-19
SCRIPT® = Smoking Cessation and Reduction in Pregnancy Treatment Program
SD = standard deviation
SE = standard error
SIDS = sudden infant death syndrome
SSP = syringe service programs
STI = sexually transmitted infection
TB = tuberculosis
Tdap = booster for tetanus, diphtheria, and acellular pertussis
THC = tetrahydrocannabinol
UCR = Federal Bureau of Investigation's Uniform Crime Reporting
UPCHIPS = Upper Peninsula Community Health Issues and Priorities Survey
UPHP = Upper Peninsula Health Plan
USPSTF = United State Preventive Services Task Force
VA = Veteran's Health Administration
WIC = Special Supplemental Nutrition Program for Women, Infants, and Children
WUPHD = Western Upper Peninsula Health Department
YRBS = Youth Risk Behavior Surveillance System

1 EXECUTIVE SUMMARY

1.1 Introduction

The objective of the 2021 Upper Peninsula Community Health Needs Assessment (CHNA) is to gather accurate, actionable, local information to advance our knowledge of our current health status, our future health needs, and identify our health-related priorities. With the input of community members, this information can be used to generate plans, develop policies, and allocate resources to improve the health of our local communities.

This endeavor began in 2012 with an innovative and unique partnership between the institutions responsible for promoting, treating, and safeguarding the health of residents in our region. The 2012 CHNA, [1] which included Baraga, Gogebic, Houghton, Keweenaw, and Ontonagon counties, was repeated in 2015[2] adding Iron County and expanded to include the entire Upper Peninsula in 2018. [3] Since 2012 the CHNA has expanded to include 42 area local public health departments, health systems, community mental health agencies, and substance abuse services coordinating agencies, which serve the Upper Peninsula of Michigan.

The foundation of this CHNA is a resident survey, the Upper Peninsula Community Health Issues and Priorities Survey (UPCHIPS), that was distributed in August 2021. The survey is based on the Behavioral Risk Factor Surveillance System (BRFS) survey conducted annually by the Centers for Disease Control and Prevention (CDC). Although county-level data, even for small, rural communities, is often included in state and national surveys, the sample sizes from many counties are too small to extract enough useful information for local health agencies to develop policies or to plan for the future. Most Upper Peninsula counties are lightly populated, so we distributed enough 2021 UPCHIPS surveys in each county to develop a thorough understanding of their residents' health needs priorities and to measure changes in factors that impact their health over time.

This survey, completed by over 3,500 adults, including residents from every county in the Upper Peninsula, provides a robust assessment of the health determinants and priorities in each county and the ability to evaluate similarities and differences across the region.

Like its predecessors, this CHNA will provide Upper Peninsula policymakers, stakeholders, and residents with a plethora of data that can serve as a springboard for thoughtful, data-driven Community Health Improvement Plans. Updated data identify our current position on a number of community health issues, and, when used in conjunction with previous CHNAs, allow evaluation of the progress made through the implementation of community-level programs and policy changes. Ongoing CHNAs, scheduled to be published every three years, will continue to inform regional efforts going forward.

This document contains data and information from a wide range of indicators that either describe or impact the health of local residents. Although no single indicator tells a complete story, each contributes to an overall understanding of our community health needs. The reader will find data ranging from pollution levels, to exercise practices, to how often vegetables are eaten, to household incomes, to how often residents see a healthcare provider, to how many adults have dental insurance, and hundreds of other indicators that impact health. Not surprisingly, many indicators identified in Upper Peninsula residents reflect state and national trends. The regional survey data should allow us to address questions specific to our community such as: What does our population look like? Is cancer more or less

prevalent here than elsewhere? How does economic status impact the health of our residents? Are local citizens able to access the health care services they need? Are these services readily available and accessible? Taken as a whole, the results of this assessment, along with the results of previous assessments, allow us to highlight past and current health conditions and enable us to identify trends for the future and plan accordingly.

This CHNA was undertaken in the midst of a once-in-a-century pandemic that tested the resources of the local health departments, health care organizations, health care professionals, and the resolve of our population. Because the community was “shut down” at points, some data sources dried up as the pandemic ran, and continues to run, its course. The divisive political views regarding the pandemic have disrupted the delivery of effective health measures and may have interfered with obtaining a robust response to the 2021 UPCHIPS. Despite working under these adverse conditions, the Upper Peninsula CHNA will deliver on its mission.

1.2 Key Themes

The most important take-away messages from this report will differ for each reader. However, four relevant themes have emerged for service providers, policy-makers, and other stakeholders to consider when planning for the future.

1.2.1 The COVID-19 Pandemic

The COVID-19 pandemic had provided an opportunity to realistically assess the capacities of health care systems and public health agencies to deliver services. While emergency training, planning, and procedures had been put in place prior to the pandemic, it was decided at the federal and state level not to implement these in response to this pandemic. State-level agencies discovered how reliant they are on federal support for supplies and services. Local public health agencies, whose staffing and resources had been depleted prior to the pandemic, were expected to rise to the challenge without sufficient resources. Often public health departments were expected to provide services that health care providers in the community were unwilling to perform. Public health efforts were further undermined by a lack of support by some politicians and members of their community. This lack of support resulted in an unnecessary prolongation of the pandemic and unnecessary morbidity and mortality.

The ability of health care systems to absorb surges of patients with a serious, deadly contagious disease was also tested. Maintaining a healthy, happy, engaged workforce provided previously unanticipated challenges. The psychological burden placed on health care workers also extended into the community as the opportunities to socialize were limited. Many preventative screening procedures and vaccinations were postponed during the pandemic.

The COVID-19 pandemic provided us with an opportunity to come together as a community to address a challenge head-on with each individual doing what was needed to protect themselves, their families, and members of their community. Instead the individualism that we are known for led to a colossal failure with over a million deaths nationwide from COVID-19.

The long-term damage resulting from the pandemic has yet to be determined.

1.2.2 Impact of Aging Population

Age is the number one risk factor for most chronic diseases. With the advent of sanitation measures, vaccines, and antibiotics, fewer people die in infancy, childhood, and childbirth, allowing more people to live long enough to develop progressive diseases that can take decades to emerge. Examples include cardiovascular disease, cancer, and chronic diseases of the lungs, kidneys, and other organs. In the Upper Peninsula older adults account for a higher percentage of the total population than the in rest of the state or the nation as a whole. Consequently, the management of chronic disease will continue to be a priority for regional health care.

Long-term economic stagnation has historically led many young people to emigrate from the area in search of economic opportunity. This, combined with a nationwide trend toward declining birth rates, has resulted in a local population that is considerably older. For example, there were 2499 births in 2019 to Upper Peninsula residents, which represents a 14.4% decrease since 2009. All counties have seen a decrease in the birth rate since 2009, with the exception of a 16.8% increase in Mackinac County. The trend may be shifting as there are signs of an infusion of people from the outside in response to climate change and the increase in opportunities to work from home.

In Michigan, 17.7% of residents are aged 65 years or older, while in the Upper Peninsula 22.9% fit this description. All counties in the Upper Peninsula have a higher percentage of residents aged 65 years or older than the state average, ranging from Houghton County, with its large college population, with 17.9%, to Ontonagon County with 37.7%.

The shift of a community's age distribution toward older cohorts will have profound implications on the needs for health care and elder services. Seniors face a complex set of needs and must balance a loss of earnings, increased health concerns, service shortages, decreased mobility, and limited housing options. Since the chronic disease burden is higher in older adults, aging adults can be expected to have greater needs for home health services, assisted living, and nursing home care. Conversely, many communities will face declining school enrollment, declining tax bases, reduced services, and a dearth of younger caregivers for the burgeoning aging population.

1.2.3 Importance of Prevention

Prevention is a cost-effective strategy that must be utilized to address the crisis of exploding healthcare costs and chronic disease burden. Of the 30-year increase in the average survival seen in the past century, 25 of those years can be attributed to prevention measures, such as improved sanitation and vaccination programs. With better control of infectious diseases, prevention measures have shifted to focusing on the leading root causes of preventable death — tobacco use and obesity, which are often the basis for chronic diseases.

Chronic diseases such as heart disease, cancer, stroke, diabetes, and arthritis, are the leading causes of death and disability in the Upper Peninsula, as well as in the state and the nation. Heart disease and cancer are responsible for half of local deaths. About 11% of Upper Peninsula adults has diabetes. Diabetes mortality rates in Chippewa, Delta, Houghton, Iron, and Mackinac counties are substantially higher than the statewide rate. According to the 2021 UPCHIPS, an estimated 72.3% of Upper Peninsula adults are either overweight or obese, compared with 69.8% statewide and 66.7% nationwide. These estimates are increased from 2018 when the rates were 70.9% and 67.5% in the Upper Peninsula and the State of Michigan, respectively. The explosion in the rates of obesity and diabetes are of great

concern, both locally and nationally, yet obesity and the illnesses associated with it are largely preventable. Targeting the causes of obesity is a priority going forward.

High rates of tobacco and alcohol use in local residents contribute to the chronic disease burden locally. Fortunately, the percentage of current smokers among Upper Peninsula adults has decreased from 17.8% in the 2017 to 15.5% in the 2021 survey. The combination of current and former smokers has decreased from 50.0% to 45.9%. Unfortunately, there have been increases in the use of e-cigarettes, especially among young people, which may result in more individuals becoming addicted to nicotine. An estimated 16.2% (an increase from 14.0%) of local adults are heavy drinkers, compared with a 6.8% rate statewide.

Other factors that can significantly impact health and lend themselves to prevention and/or early intervention include:

- **Prenatal Care.** Pregnant women in the Upper Peninsula are more likely to have characteristics and behaviors that can negatively impact their own health and the health of their infants. While these women are less likely to be under 20 years of age than the state as a whole, births to single mothers are generally increasing across all counties, edging above 50% in Alger, Baraga, Gogebic, Ontonagon, and Schoolcraft counties. More concerning is that 40% of women smoked during pregnancy in Keweenaw County, with more than 30% of women smoking during pregnancy in Alger, Chippewa, Gogebic, Luce, Ontonagon, and Schoolcraft counties. The rates for the Upper Peninsula and Michigan were 24.9% and 13.6%, respectively.
- **Contagious Diseases.** Successful prevention strategies include vaccination, health screening, health education, quarantines, sanitation measures, and vector abatement.
- **Oral Health.** Dental disease is a common chronic illness that disproportionately affects low-income adults and children. It contributes to many negative health outcomes, and in spite of this, 28.2% of adults received no dental services in the past year and 28.1% did not have dental insurance. Data from the 2021 UPCHIPS indicates disruption in oral health services in localities. Fortunately, nearly all children in Michigan have dental coverage, but geographic barriers exist to access to dental care.
- **Mental Health.** An estimated 25.9% of Upper Peninsula adults report having been told by a physician, nurse, or health professional that they had depression: a treatable condition with multiple negative health consequences. The prevalence of mental illness combined with a reported shortage of mental health services for adults and children indicates an unmet community health need.
- **Substance Abuse.** The emerging opioid epidemic continues to take its toll in the region with its broad impact on maternal and child health, child abuse and neglect, neonatal drug addiction/withdrawal, overdoses, incarceration, and employment.

1.2.4 Social Determinants of Health

Historically, when addressing community health, the focus has been on specific diseases, prevention measures, specific programs, and personal health behaviors. As important as these factors are to health outcomes, attention has increasingly been shifted towards the environmental conditions in which we live, work, and go to school that contribute to our quality of life and health outcomes. These “Social Determinants of Health (SDOH)” often explain why some individuals face more difficult challenges in achieving and maintaining good health.

The CDC has identified five key areas of SDOH: economic stability, poverty/education, social and community context, health care access/literacy, and neighborhood/housing. In other words, the

neighborhood you live in, whether you experience racism or other discrimination, have access to a decent job or a quality education, are safe walking down your sidewalk, or even have a sidewalk upon which to travel, may be as important, or even more important, to your lifelong health than whether you have a doctor to call when you are sick. Differences in SDOH lead to health disparities not only between individuals but also between large groups. Health equity for all requires understanding and addressing these health determinants. To address SDOH, this assessment includes data assessing poverty levels, levels of education, employment rates, race, and rates of childhood abuse and neglect.

Although the Upper Peninsula spans over 16,000 square miles and comprises approximately one third of Michigan's land mass, its residents are more alike than they are different. A cursory analysis of county-level health statistics, such as leading causes of death, combined with a thorough review of the 2021 UPCHIPS results, confirms that health disparities are not primarily between regions, but instead closely correlate with socioeconomic factors like employment status, income level, and education level. The differences in health needs are more pronounced between socioeconomic levels than between counties or between the Upper Peninsula and the rest of Michigan.

Within our region, low-income adults, and those with lower levels of education, report poorer physical and mental health, higher rates of disease and disability, and lower rates for annual physical exams and appropriately timed cancer screenings. Inequalities of socioeconomic status contribute to disparities in access to services, and socioeconomic factors (income and education) strongly correlate with health status.

With the exception of Marquette County, median income in each county is below the state median income. With the exceptions of Alger and Houghton Counties, all counties have a higher percentage of household with children 18 years and younger living in poverty than the statewide percentage.

One of the most striking and illustrative examples of health disparity based on socioeconomic status is that 44.9% of the region's adults who did not graduate high school are current smokers. By comparison, 4.2% of college graduates are current smokers. The impact of lower educational levels and lower socioeconomic status on disease risk, disability rates, and premature death may be amplified by the association of these factors with currently smoking.

1.3 Upper Peninsula Community Health Issues Priorities Survey

The previous iteration of the UPCHIPS in 2017 demonstrated that Upper Peninsula residents intuitively understand that a wide variety of issues impact their health and the health of their community. The top four priority issues identified from among 16 listed concerns were:

- Health insurance is expensive or has high costs for co-pays and deductibles
- Drug abuse
- Lack of health insurance
- Unemployment, wages, and economic conditions

In the 2021 UPCHIPS, the same 16 priority items were listed for consideration and the top four priority issues (in order of frequency) were:

- Health insurance is expensive or has high costs for co-pays and deductibles

- Unemployment, wages, and economic conditions
- Drug use
- Shortage of mental health programs and services, or lack of affordable mental health care

These four selections reflect 3 of the 5 key areas of SDOH: health and health care, economic stability, and social/community context. The high profile of drug abuse as a community concern is one of growing concern in the Upper Peninsula and reflects the national, state, and local opioid epidemic. This pandemic is challenging not only our healthcare system with rapidly increasing needs for treatment but also local law enforcement, courts, support agencies assisting families impacted by substance use, public health, and employers who are struggling to hire a healthy workforce. There is some evidence that changes in laws concerning the prescription of opioids have reduced the number of prescriptions dispensed.

Of note, 12 of the 16 listed priorities, compared to the 2017 survey, saw a decrease in the percentage who identified the priority as “very important – should be a priority.” It may be that in the context of a pandemic, these other priorities may not appear to be as important. These issues included a lack of programs to support an aging population, lack of access to affordable healthy foods, obesity and overweight and a lack of facilities and programs for year round physical activity. Any or all of these areas of concern are worthy of attention when formulating a Community Health Improvement Plan.

1.4 Final Notes

Over the course of the last century, life expectancies lengthened dramatically as the result of developments in medical care, antibiotics, vaccines, and improved sanitation and worker safety. While there are parts of the developing world where infectious and vector-borne diseases like tuberculosis, HIV-AIDS, dysentery, and malaria are leading causes of death, increasingly mortality and morbidity worldwide are the result of chronic diseases. Heart disease, cancer, and diabetes are among the most prominent diseases of affluent countries. Tobacco use and obesity are the leading root causes of preventable death in the United States. Poor diet and lack of physical activity are becoming the leading killers of the 21st Century just as microbes were for most of human history. The prediction that children born today will not, on average, survive as long as their parents has been in part attributed to our collective poor dietary habits and the lack of physical activity.

Health is not something we achieve in isolation, instead, health is something we can and must help each other attain. This includes compliance with mitigation measures during a pandemic and implementing measures, such as vaccination, to protect others. This goal of the current Upper Peninsula CHNA is to serve as an important first step in a long and robust journey toward health equity for all.

As communities move forward in community health improvement planning, non-traditional partners in healthcare, such as educators, volunteer organizations, leaders in the business community, city council members, county commissioners, and legislators need to be at the table. Regardless of the government agency involved, the health implications should be considered during the policy development process.

This report provides the foundational information for pursuing funding for programs needed to attain health improvements in our communities and be used as a baseline assessment against which to measure future community health improvement efforts. We hope the Upper Peninsula CHNA will provoke a call to action to develop strategies to ensure that all Upper Peninsula residents have

opportunities to live healthier lives.

The Western U.P. Health Department wishes to thank the many people and organizations who backed this project and generously contributed their time and encouragement. The UPCHIP was initially designed and administered by former health department staff members Ray Sharp and Teresa Frankovich, MD, MPH, and this effort would not have been possible without their contributions. Above all, a debt of gratitude is owed to the over 3,500 Upper Peninsula residents who completed the lengthy health survey in the service of improving community health. May we honor their contributions by working together for healthier communities.

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References

- [1] Western Upper Peninsula Health Department. Western Upper Peninsula 2012 regional health assessment report to the community. Hancock, MI: Western U.P. Health Department; 2012.
- [2] Western Upper Peninsula Health Department. 2015 Western Upper Peninsula health needs assessment: Baraga, Gogebic, Houghton, Iron, Keweenaw, and Ontonagon counties and Wisconsin border counties. Hancock, MI: Western U.P. Health Department; 2016.
- [3] Western Upper Peninsula Health Department. Upper Peninsula community health needs assessment 2018: reporting on the health status of Michigan's Upper Peninsula residents. Hancock, MI: Western U.P. Health Department; 2018. Available at: <https://www.wupdhd.org/wp-content/uploads/2019/03/Upper-Peninsula-Community-Health-Needs-Assessment-2018-Second-Edition.pdf>

2 INTRODUCTION

How healthy are the inhabitants of the counties of the Upper Peninsula? How does one measure this? Several factors contribute to the health of our population, with some factors being easier to measure than others. Some organizations have taken it upon themselves to use available health, environmental, and demographic data to develop health rankings at a county level. For example, County Health Ranking & Roadmaps have ranked the 83 counties in Michigan for overall health *outcomes*, as shown in **Figure 2-1**.^[1] **Figure 2-2** provides their overall health factors *rankings* for the same counties. **Table 2-1** provides the 2020 rankings assigned by County Health Ranking & Roadmaps for the counties in the Upper Peninsula for health outcomes, length of life, quality of life, health factors, health behaviors, clinical care, social and economic factors, and physical environment. While it is reassuring that 10 of the top 15 counties for physical environment are in the Upper Peninsula, it is difficult to interpret the value or the importance of these rankings as they are based on calculations generated by scores assigned to data

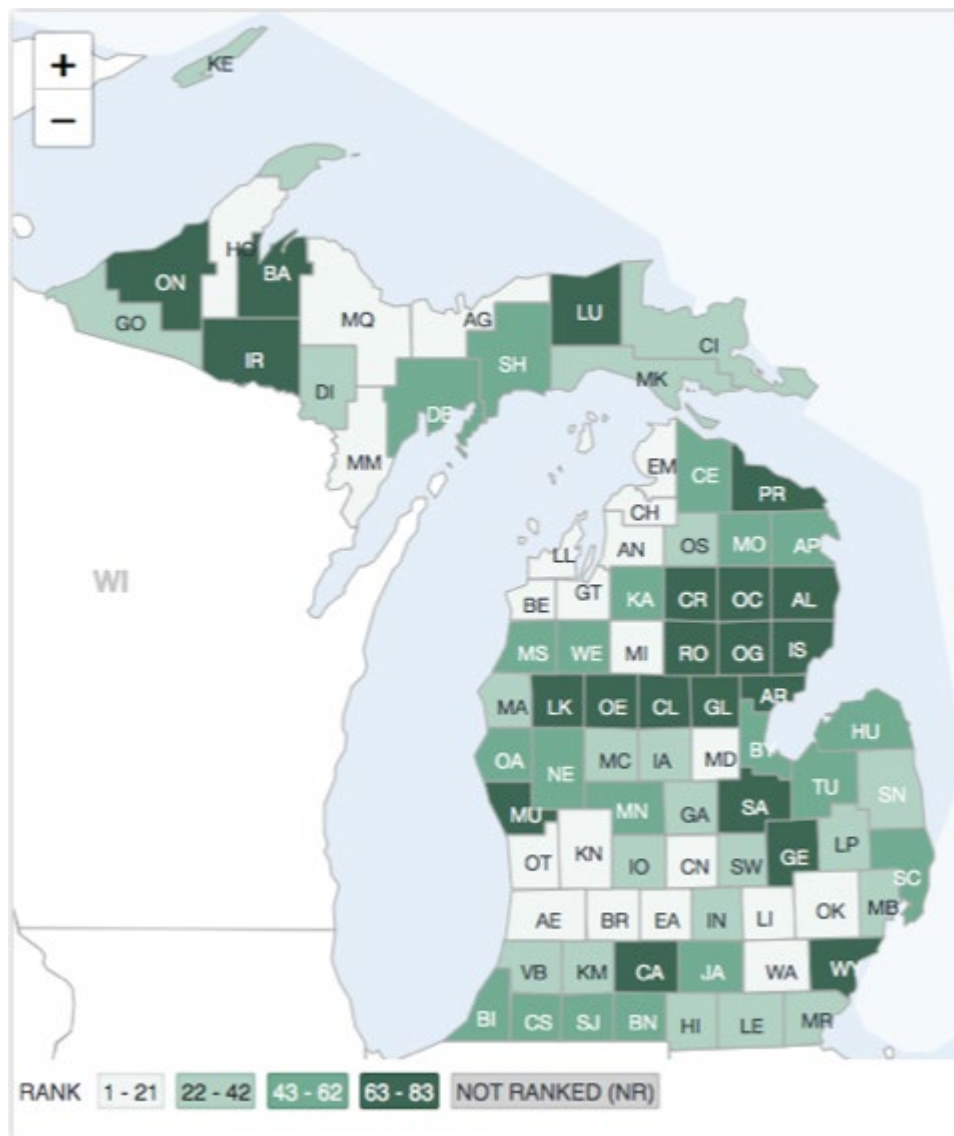


Figure 2-1: Overall Rankings of Michigan Counties in Health Outcomes

Table 2-1: Rankings among 83 Michigan Counties by County Health Rankings & Roadmaps, 2020

County	Health Outcomes	Length of Life	Quality of Life	Health Factors	Health Behaviors	Clinical Care	Social & Economic Factors	Physical Environment
Alger	19	6	39	35	7	28	78	1
Baraga	72	80	45	70	79	22	76	19
Chippewa	31	22	63	80	83	72	60	30
Delta	37	37	44	21	28	12	44	20
Dickinson	46	40	52	9	10	3	15	23
Gogebic	43	38	51	38	47	28	57	4
Houghton	25	29	31	22	34	34	36	2
Iron	78	74	72	33	13	42	58	10
Keweenaw	40	43	41	61	27	36	79	27
Luce	63	43	75	41	63	31	51	3
Mackinac	74	71	69	69	54	68	77	5
Marquette	23	24	35	12	37	2	16	15
Menominee	9	9	11	44	18	70	29	13
Ontonagon	66	69	50	44	18	70	61	8
Schoolcraft	47	7	79	58	43	49	68	9

2.1 Project Background

The foundation of this report are the findings from the Upper Peninsula Health Issues and Priorities Survey (UPCHIPS) regional community health needs assessment survey conducted in the summer of 2021 by the Western Upper Peninsula Health Department (WUPHD) in collaboration with 42 community partners (see page 5), including the local health departments, hospitals and clinics, behavioral health agencies, regional planners, health foundations, and our major funder: the Michigan Department of Health and Human Services. This assessment addresses the health condition and needs of the 300,000 residents in the 15 counties of Michigan’s Upper Peninsula.

Data for the UPCHIPS come primarily from the survey of 3,544 residents of the 15 Upper Peninsula counties. Secondary sources of data were gleaned from the following sources: Agency for Healthcare Research and Quality, America’s Health Rankings, American Academy of Child and Adolescent Psychiatry, American Community Survey, American Dental Association, American Psychiatric Association, American Society of Addiction Medicine, Center for Health Workforce Studies, Centers for Disease Control and Prevention, the Centers for Medicare & Medicaid Services, County Health Rankings & Roadmaps, Federal Bureau of Investigation, Feeding America, Lake Superior State University, MI School Data, Michigan Associations of United Ways, Michigan Department of Corrections, Michigan Department of Health and Human Services, Michigan Department of State Police, Michigan Disease

Surveillance System, Michigan League for Public Policy, Michigan Marijuana Regulatory Agency, Michigan Technological University, National Academies of Sciences, Engineering, and Medicine, National Alliance on Mental Illness, National Cancer Institute, National Center for Statistics and Analysis, National Center of Family Homelessness, National Institute of Alcohol Abuse and Alcoholism, National Institute on Drug Abuse, Northern Michigan University, Office of the Secretary of State of Michigan, Statistical Atlas, Substance Abuse and Mental Health Services Administration, Suicide Prevention Resource Center, United States Bureau of Labor Statistics, United States Census Bureau, United States Department of Health and Human Services, United States Department of Housing and Urban Development, United States Department of Justice's Drug Enforcement Agency, United States Environmental Protection Agency, United States Preventive Services Task Force, the World Health Organization, and other government and private agencies.

While state and national survey data achieve their objective of globally representing the national or state population, populations like those found in the counties of the Upper Peninsula are not large enough to accurately portray the situation at the county level. To address this shortcoming, surveys patterned after the Behavioral Risk Factor Surveillance System (BRFS) survey, used yearly by the Centers for Disease Control and Prevention (CDC) and state health departments, were first sent out to the residents served by the Western U.P. Health Department in 2012 and again, with addition of Iron County, in 2015. In 2017, the reach of the project was extended to all 15 counties in the Upper Peninsula and a section was added for ranking the perceived importance of 16 broad community health issues. The content of the local survey, after taking input from our partners in the community, included questions on mental health, substance abuse, access to care, dementia, and elder care.

The local survey data allows us to understand the health needs of our residents more thoroughly. Given that the 2021 survey used the same survey tool as in 2017, we can document and evaluate any changes in priorities over the past 4 years.

The Western U.P. Health Department would like to thank the many people and organizations who backed this project and generously contributed their time and encouragement. This iteration of the health needs assessment would not be possible without the foundation laid by Ray Sharp, the previous Program Director, and Teresa Frankovich, M.D., M.P.H., the former medical director for Western U.P. Health Department, Dickinson-Iron District Health Department, Marquette County Health Department, and Public Health Delta & Menominee Counties. Above all, a debt of gratitude is owed to the 3,500 or so Upper Peninsula residents who completed the lengthy health survey in the service of improving community health. We must honor their contributions by working together to use the information they have provided to secure a future with healthier communities.

2.2 Project Staff

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Kelly Kamm, PhD, Epidemiologist, Michigan Technological University

2.3 How to Use This Report

2.3.1 Report Organization

The early sections of this report contain information from secondary sources, beginning with a statistical description of the demographics (population counts, ages, racial makeup), which includes data on selected social determinants of health such as poverty, unemployment, and education levels. The ability of the population to access medical care is assessed next. From there measures of maternal and infant wellbeing, health data on young children and adolescents, and vaccination rates from the Michigan Care Improvement Registry (MCIR) are reported. A summary of reportable infectious diseases, including COVID-19 is then presented using data gathered from the Michigan Disease Surveillance System (MDSS). Chronic disease and mortality statistics are the next major topics, followed by data and statistics related to mental health and substance abuse. Finally, a chapter on public safety has been reintroduced.

Two final chapters of the report are devoted to the findings of the UPCHIPS. The first is the latest iteration of behavioral risk factor survey begun in the Western U.P. Health District in 2012, which estimates the prevalence of various health behaviors, medical conditions, and preventive health care practices. The second chapter is the second installment of respondents' rankings of 16 community health issues.

Finally, a dashboard of health statistics for each county is included.

2.3.2 Understanding Health Statistics

The data included in this report are generally summarized in one of four forms: trends over time, single-year tabulations, multi-year tabulations, or snapshots in time. Trends are identified when multiple years of data are available or when examining an indicator over time. Trends can provide meaningful insights into whether a problem/condition is increasing, being resolved, or not responding to interventions. Single-year tabulations or snapshots are used when a single year's worth of data or a snapshot gives a reasonably representative picture of the situation, or when trend data are not available. Multi-year tabulations are used for rare or low-probability events in which single-year calculated rates can fluctuate excessively with the addition of relatively few events. The distinction between a single-year tabulation and a snapshot is that a single-year tabulation is a count of events within a defined period, such as the number of new cases (incidence) of pertussis reported in a county within a calendar year; whereas a snapshot measures the percentage of people who fall into a category (prevalence) on a particular date (for instance, the percentage of completed immunization status for all children in a jurisdiction who are age 19-35 months on December 31).

2.3.2.1 Incidence versus Prevalence

Two main types of rates appear in this report: incidence and prevalence. *Incidence* is the rate of new (or newly diagnosed) cases of the disease occurring within a period of time (e.g., per month, per year). It is more meaningful, for comparison's sake, when the incidence rate is reported as a fraction of the population at risk of developing the disease (e.g., percentage or per 100,000 population per year). An example of this is the incidence of COVID-19 infections, which are often reported as cases per day per million population.

Cumulative incidence is the total number of cases per population that accumulate over time. Cumulative incidence is typically depicted in graphs that demonstrate the number of cases increasing with time. For example, **Figure 8-6** charts the number of confirmed and probable cases of COVID-19 per 1,000 population in each county over the course of the pandemic.

Prevalence is the number of cases alive with a particular disease or condition either during a period of time (period prevalence) or on a particular date in time (point prevalence). Period prevalence provides the better measure of the disease burden since it includes all new cases and all deaths between two dates, whereas point prevalence only counts those alive on a particular date who have not recovered from the illness. An example of point prevalence is the percentage of survey respondents ever told by a health professional they had diabetes. Another example is the percentage of survey respondents who report currently having asthma. This rate is a prevalence rate because it estimates the percentage of adults within the population currently living with asthma, but does not include those who had asthma in the past but do not have asthma currently.

2.3.2.2 Population Statistics

Several statistical concepts are useful in making the best use of the information in this report. Wherever possible, data resulting from an accounting of *all* individuals in a region appear in this report. Examples of these types of data are population statistics taken from the U.S. Census, as well as annual birth and death counts. For the time period in which they were collected, these data have little uncertainty associated with them.

2.3.2.3 Estimates and Confidence Intervals

When it is not possible or feasible to collect data on *all* individuals in a region, population estimates are made based on a survey administered to a random, hopefully representative, sample of the population. From this sample, one can make the inference that the results apply to the entire population. An example of this is political polling. Since not everyone in the population can be surveyed, only a sample of the population is contacted. Sampling error is unavoidable, so any estimate derived from the poll will have a degree of uncertainty, which is why results are reported with the qualification that “the margin of error is plus or minus X%.” The more people surveyed, the closer one gets to sampling the entire population, and the less uncertainty associated with the estimate. The degree of uncertainty in the estimates is conveyed to the reader by the use of confidence intervals.¹ A *confidence interval* is the range around an estimate that conveys the precision of the estimate. A narrow interval indicates a more precise estimate. In this report, 95% confidence intervals are reported, unless otherwise noted. In determining how to interpret a 95% confidence interval, the following example may be helpful.

Suppose a survey given to a random sample of Michigan adults indicated that $23.3\% \pm 1.3\%$ of those adults are current smokers. The 1.3% indicating the 95% confidence interval extends from 22.0% to 24.6%. While the best estimate, based on the data collected in the survey, is that 23.3% of Michigan adults are current smokers. If the survey was performed 100 times with the same number of respondents, the estimates from these 100 surveys would be within the range of 22.0% and 24.6% in 95 of the 100 surveys. This can also be interpreted as there being a 5% chance that the current adult smoking rate is lower than 22.0% or higher than 24.6%.

When comparing estimates that have confidence intervals associated with them, non-overlapping confidence intervals are an indication that a *statistically significant* difference exists between the two groups being compared. If confidence intervals overlap, then a statistically significant difference is unlikely to exist.

¹ These intervals do not take into account response errors, which result if data is incorrectly requested, provided, or recorded.

The span of the confidence interval is dependent principally on the number of people surveyed, so readers will note that Michigan rates given in this report, which are drawn from thousands of data points, generally have narrower confidence intervals than county estimates, which are drawn from only several hundred respondents each. As a result, state-level estimates are more trustworthy than county-level estimates.

2.3.2.4 Infrequent Events and Effect on Rates

A rate of a particular event occurring within a population is calculated by dividing the number of events by the number of persons in the population of interest (or at risk). A small number of events in the numerator of this calculation results in a rate that is highly sensitive to small changes in the numerator. For example, two events versus one double the observed rate, as does four events versus two. A current example, in calculating the 14-day average number of cases of COVID-19 per million per day in Keweenaw County, a single case increases the rate by 32.98 cases per million per day, while a single case in Marquette County increases the rate by 1.07 cases per million per day.

In general, having less than twenty events in the numerator is prone to yield an unreliable result because of random error. For this reason, some secondary sources do not publish rates for events with fewer than six, 10, or 20 occurrences over a specified time interval. Additionally, sensitive health data are often suppressed when there are few events in a given time period at the county level in order to protect individual privacy. When the number or rate is not available, that fact will be connoted by using the (*) symbol in data tables.

2.3.2.5 Weighting and Adjusting

Throughout this assessment, some estimates have been *weighted or adjusted*, most commonly for age, sex, income, educational achievement, or region, to make comparing numbers from two populations more meaningful. For example, the population in the Upper Peninsula is, on average, older than the population of Michiganders living below the bridge. Certain diseases, such as heart disease, lung disease, and diabetes, are more likely to affect people as they age. Similarly, some diseases, such as gonorrhea, some events – such as motor vehicle accidents and homicides, and some behaviors – such as binge drinking, are seen more frequently in younger people. The raw, unadjusted rate of deaths from heart disease in the Upper Peninsula is higher than the raw rate in the Lower Peninsula. Is the higher rate in the Upper Peninsula because people are older in the Upper Peninsula or because they were actually dying more frequently from heart disease? Weighting/adjusting involves taking the number of outcomes in each age group and multiplied this number by the percentage of the corresponding age groups in a standard population. So, if you had 200 heart disease deaths in the Upper Peninsula in those over 65, which made up 19% of the population, you would multiply the 200 deaths by the 12% of those over 65 in the standard population. As a consequence, the weight of the 200 deaths in a standard population would be less. On the other end, any events seen in younger populations would be weighted more to align with the standard population. After the weighting/adjustments are completed for both populations, the rates of disease that result are more comparable as they would no longer be influenced by the difference in age between the two populations.

2.4 Geographic Scope of Report

This community health needs assessment covers the 15 Upper Peninsula counties of Michigan: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft counties, an area bounded by Lake Superior to the north, and the state of Wisconsin and lakes Michigan and Huron to the south.

References

[1] County Health Rankings & Roadmaps. countyhealthrankings.org. Accessed March 1, 2021.

3. DEMOGRAPHICS

3.1 Introduction

Demography, the starting point for a community health needs assessment, is the study of the statistical characteristics of a population; of its various cohorts such as age, gender and ethnic groups; and of trends and rates of change. Demographics provide a count of people living in a county, region, or catchment area for health care services. Trends in population growth or decline are useful in planning for future programs and resource allocations. Furthermore, the distribution of a population among its subsets or cohorts can be used to understand the needs of residents in greater detail.

Age and gender are the two most important demographic characteristics in health assessment. Many health conditions, diagnoses, and procedures, such as pregnancy, prostate cancer, and mammography, are gender-exclusive. Similarly, age is a primary factor in planning for prevention and health care services. The health care needs of infants, pre-adolescents, teens, young adults, and older adults vary greatly. Guidelines for preventive services, including vaccinations and cancer screenings, are age-specific. In general, rates of disease, disability, and mortality increase with age. Regions, such as the Upper Peninsula, with a higher percentage of older adults can expect to have higher gross rates of the age-related diseases such as heart disease, cancer, stroke, and chronic obstructive pulmonary disease (COPD).

3.2 Population Change

The decennial census is a count of everyone residing in the United States, both citizens and non-citizens. A person's "usual residence" determines the address at which he or she is counted during the census. Usual residence is defined as the place where a person lives and sleeps most of the time. This place is not necessarily the same as the person's voting residence or legal residence. Two notable outcomes of the "usual residence" principle are that full-time college students are counted toward the population of the county in which the campus is located, and incarcerated persons are counted toward the population of the county in which the correctional facility is located. The most sizable college student populations include those attending Northern Michigan University in Marquette County (7736 students enrolled in Fall 2017[1]), Michigan Technological University in Houghton County (6867 students enrolled in the 2019-2020 academic year [2]), and Lake Superior State University in Chippewa County (2100 students enrolled in the 2016-2017 academic year [3]). Other institutions of higher learning — Bay College, Bay Mills Community College, Finlandia University, Gogebic Community College, and Keweenaw Bay Ojibwa Community College/Niiwin Akeaa Center — have smaller enrollments. The Upper Peninsula is home to six state correctional facilities, which house only men.² Given several of these facilities are located in counties with relatively small populations, the demographic characteristics of these men impact county-level demographic measures. **Table 3-1** provides information from the Michigan Department of Corrections *2019 Statistical Report*. [4]

² Alger Correctional Facility, Baraga Correctional Facility, Chippewa Correctional Facility, Kinross Correctional Facility, Marquette Branch Prison, Newberry Correctional Facility. The Ojibway Correctional Facility was closed in November 2018.

Table 3-1: Upper Peninsula Department of Correction Facilities					
Facility	County	Number of inmates	Identify as White	Percentage	Median Age
Alger Correctional Facility	Alger	877	281	32.0	31
Baraga Correctional Facility	Baraga	832	195	23.4	31
Chippewa Correctional Facility	Chippewa	2313	748	32.3	37
Kinross Correctional Facility	Chippewa	1549	626	40.4	42
Marquette Branch Prison	Marquette	1035	473	45.7	35
Newberry Correctional Facility	Luce	1086	546	50.3	39
Total		7692	2869	37.3	

The population in the Upper Peninsula continues to decline. **Table 3-2** lists the population by county in 2000, 2010, and 2020. The percentage change in population by county from 2010 is shown in **Figure 3-1**. [5]

Overall, the Upper Peninsula has seen a 6.75% population decrease since 2000 and a 4.88% decrease since 2010. Michigan’s population has seen slight increases and decreases over this period but is up 0.49% since 2000 and 1.02% since 2010. The counties with the largest declines in population were Ontonagon, Gogebic, Iron, Luce, and Menomonee counties with decreases of 27.65%, 20.31%, 15.77%, 12.78%, and 10.73%, respectively. Marquette County has seen an increase (1.86%) since 2000, but a decrease (1.85%) since 2010. The sudden drop in population in Gogebic County from 2018 to 2019 may reflect the closure of the Ojibway Correctional Facility.

Table 3-2: Population Changes from 2000 through 2020

Year	2000	2010	2015	2020	Percent Change from 2000
Michigan	9,938,444	9,883,640	9,900,571	9,984,795	0.47%
Upper Peninsula	317,616	311,361	309,071	296,181	-6.75%
Alger	9,862	9,601	9,476	9,015	-8.59%
Baraga	8,746	8,860	8,690	8,164	-6.65%
Chippewa	38,543	38,520	38,586	36,958	-4.11%
Delta	38,520	37,069	36,712	35,612	-7.55%
Dickinson	27,472	26,168	26,012	25,112	-8.59%
Gogebic	17,370	16,427	15,824	13,842	-20.31%
Houghton	36,016	36,628	36,660	35,126	-2.47%
Iron	13,138	11,817	11,507	11,066	-15.77%
Keweenaw	2,301	2,156	2,198	2,119	-7.91%
Luce	7,024	6,631	6,477	6,126	-12.78%
Mackinac	11,943	11,113	11,044	10,839	-9.24%
Marquette	64,634	67,077	67,582	65,834	1.86%
Menominee	25,326	24,029	23,717	22,608	-10.73%
Ontonagon	7,818	6,780	6,298	5,656	-27.65%
Schoolcraft	8,903	8,485	8,288	8,104	-8.97%

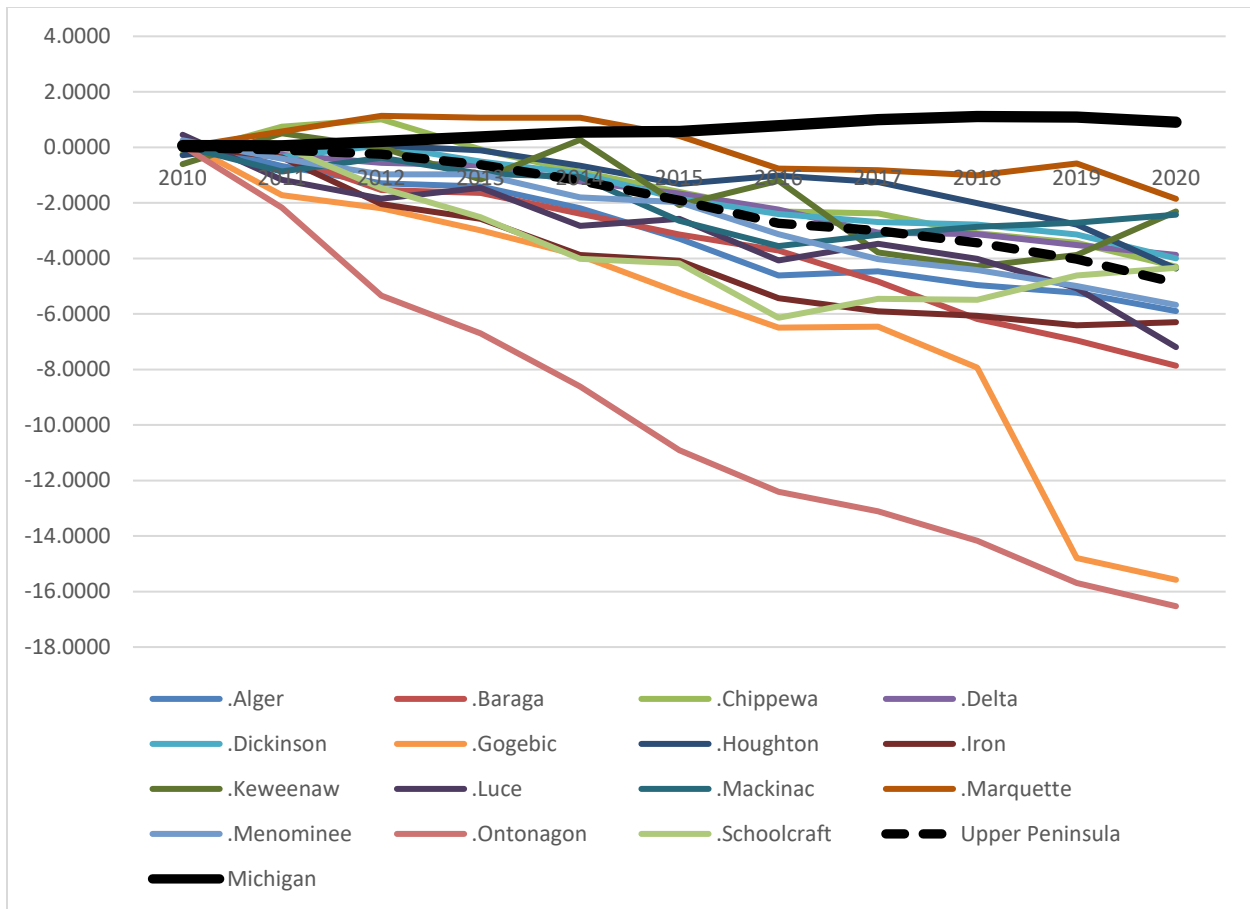


Figure 3-1: Percentage Change in Population by County Beginning 2010.

3.3 Age Distribution

The Upper Peninsula has a higher percentage of persons 65 years and older (22.9%) than the entire state of Michigan (17.7%). Alger, Delta, Gogebic, Iron, Keweenaw, Mackinac, Menominee, Ontonagon, and Schoolcraft counties are among the demographically oldest counties in Michigan. The age distribution for the counties in the Upper Peninsula are shown in **Table 3-3** and **Figure 3-2**. If the college populations in Chippewa, Houghton, and Marquette Counties and the prison populations in Alger, Baraga, Chippewa, Luce, and Marquette counties are subtracted, the percentage of those 65 years and older increases from 26.3% to 29.0% in Alger County, from 22.7% to 25.1% in Baraga County, from 18.8% to 22.2% in Chippewa County, from 17.9% to 22.1% in Houghton County, from 21.1% to 25.1% in Luce County, and from 19.6% to 22.5% in Marquette County. Making this adjustment for the entire Upper Peninsula, the percentage of persons 65 years and older increases from 22.9% to 24.9%.

Statewide, the median age for Michigan increased from 2010 through 2019. [6] Men increased from 37.7 to 38.5, women increased from 40.1 to 41.4. For both sexes combined, it increased from 38.9 to 39.9.

Table 3-3: Age Distribution by County			
	Percentage less than 5 years of age	Percentage less than 18 years of age	Percentage 65 years and older
Michigan	5.7%	21.5%	17.7%
Upper Peninsula	4.6%	18.0%	22.9%
Alger	3.8%	15.0%	26.3%
Baraga	3.9%	17.0%	22.7%
Chippewa	4.6%	17.8%	18.8%
Delta	5.0%	19.5%	24.9%
Dickinson	5.1%	20.1%	22.8%
Gogebic	4.4%	16.8%	28.6%
Houghton	5.3%	20.3%	17.9%
Iron	4.3%	16.8%	31.2%
Keweenaw	3.5%	14.3%	38.1%
Luce	4.5%	16.1%	21.1%
Mackinac	4.1%	15.7%	28.6%
Marquette	4.6%	17.8%	19.6%
Menominee	4.3%	17.6%	25.6%
Ontonagon	2.6%	12.5%	37.7%
Schoolcraft	4.3%	17.2%	27.5%

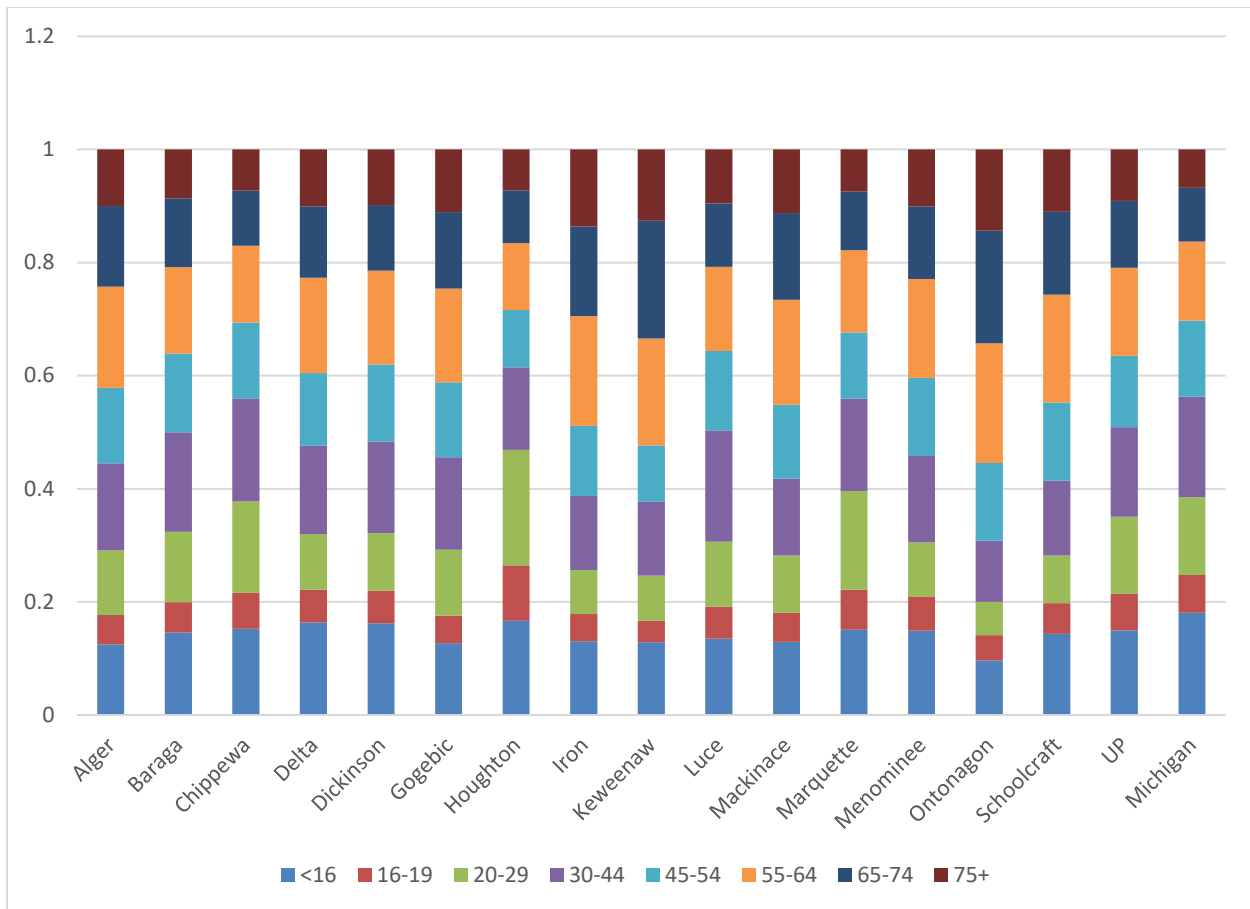


Figure 3-2: Percentage of Population by Age Group, 2020.

3.4 Housing

Using U.S. Census terminology, the household refers to the person in whose name the housing unit is owned or rented. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is intended to be occupied as separate living quarters. Not included are group quarters, such as dormitories, prisons, or nursing homes where ten or more unrelated persons live.

Housing units across the Upper Peninsula increased from 184,320 units in 2000 to 186,824 units in 2019. [7] All counties experienced an increase, with the exception of Gogebic county, which lost 5 housing units going from 10,793 to 10,788 units.

The percentage of housing units that are owner-occupied, the median value of owner-occupied housing, the median gross rent payments by county, [8] and the percentage whose rent or housing costs exceed 35% of household income [9] are shown in **Table 3-4**. The percentage of households with at least one of four problems (overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities) between 2013 and 2017 for each county is shown in **Table 3-5**. [10,11]

Table 3-4: Housing Statistics by County

Region	Percent housing units owner-occupied	Median value of owner-owned housing	Median gross rent (2014-2018)	Percentage of those with rent more than 35% of household income	Percentage of those with housing cost, with a mortgage, more than 35% of income	Percentage of those with housing cost, without a mortgage, more than 35% of income
Michigan	71.0%	\$146,200	\$850	40.9%	17.9%	11.4%
Upper Peninsula						
Alger	84.9%	\$123,500	\$649	49.6%	24.8%	8.0%
Baraga	81.0%	\$102,700	\$550	43.2%	24.9%	9.5%
Chippewa	69.2%	\$112,300	\$667	38.4%	21.2%	9.0%
Delta	79.5%	\$110,500	\$561	36.3%	18.2%	8.4%
Dickinson	77.7%	\$99,600	\$665	36.4%	14.1%	10.4%
Gogebic	78.7%	\$69,900	\$494	38.2%	18.9%	12.6%
Houghton	67.9%	\$106,900	\$662	46.6%	18.2%	7.2%
Iron	80.8%	\$77,800	\$516	30.4%	24.2%	12.6%
Keweenaw	88.4%	\$113,500	\$503	20.6%	15.2%	13.8%
Luce	81.1%	\$83,800	\$710	34.1%	23.4%	8.5%
Mackinac	73.9%	\$135,000	\$594	35.8%	25.3%	7.6%
Marquette	69.3%	\$149,900	\$705	40.3%	16.6%	8.4%
Menominee	78.4%	\$95,800	\$561	31.6%	16.2%	8.5%
Ontonagon	88.1%	\$68,300	\$512	29.8%	23.9%	9.4%
Schoolcraft	82.4%	\$109,300	\$626	46.4%	27.4%	8.2%

Table 3-5: Percentage of Households with Housing Problems

Location	Percentage of households with at least 1 of 4 housing problems: overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities (2013-2017)
Michigan	15%
Alger	12%
Baraga	14%
Chippewa	13%
Delta	14%
Dickinson	13%
Gogebic	12%
Houghton	17%
Iron	13%
Keweenaw	16%
Luce	13%
Mackinac	15%
Marquette	14%
Menominee	11%
Ontonagon	12%
Schoolcraft	14%

In general, those living in the Upper Peninsula are more likely to live in owner-occupied housing than Michigan as a whole. The median value of owner-occupied homes ranged from \$68,000 in Ontonagon County to \$149,900 in Marquette County. Marquette County is the only county where median home values are higher than the \$146,200 median value for the State of Michigan. Median gross rent was uniformly lower in counties in the Upper Peninsula than in Michigan as a whole.

Typically housing costs should not exceed 30% of the household income. Not surprisingly, renters were much more likely to exceed the recommended portion of income dedicated to housing, followed by those with mortgages, and then by those without mortgages. Property taxes are included in owner housing costs, so a senior citizen living on a fixed income could have no mortgage but still have high costs because of property taxes.

The 2017 and 2021 UPCHIPS inquired how many adults were living in the household. In the 2017 survey the raw average number of adults in household was 1.72 and 1.75 in 2021. There was no statistically

significant difference between these estimates ($t=1.53$, $p=.1272$) There was no difference based on the gender of the people completing the survey (2017: $t=1.07$, $p=.2860$; 2021: $t=-0.08$, $p=.9392$). The number of adults in household decreased with the age of the person completing the survey (2017: $t=-15.33$, $p<.0001$; 2021: $t=-14.88$, $p<.0001$). The average was 1.89 (2017) and 2.02 (2021) in those 18 to 39 years of age, 1.83 (2017) and 1.89 (2021) in those 40 to 64 years, and 1.63 (2017) and 1.64 (2021) in those 65 years and older. The trend is statistically significant (2017: $t=-11.70$, $p<.0001$; 2021: $t=-11.57$, $p<.0001$). As annual income increases, the raw average number of people in the household also increases. In those earning less than \$25,000 per year, the average number of people in the household was 1.41 in 2017 and 1.42 in 2021, for those earning \$25,000 to \$49,999 the average was 1.75 in 2017 and 1.72 in 2021, and 1.98 in both 2017 and 2021 in those earning \$50,000 or more (2017: $t=26.45$, $p<.0001$; 2021: $t=19.55$, $p<.0001$). As education level increased, the number of adults in the home also increased ($t=5.50$, $p<.0001$). For those with less than a high school education the average number of adults in the home was 1.58 in 2017 and 1.56 in 2021, while those with a high school degree or equivalent the average was 1.68 (2017) and 1.69 (2021). For those with some college the average was 1.75 (2017) and 1.73 (2021) and for those with a bachelor's degree or higher it was 1.78 (2017) and 1.84 (2021). The trend was statistically significant (2017: $t=5.50$, $p<.0001$; 2021: $t=5.63$, $p<.0001$). The differences between counties was statistically significant in the 2017 survey ($F=2.10$, $p=.0114$), but not in the 2021 survey ($F=1.13$, $p=.3242$). When the data from the two surveys are combined and placed in a multivariate analysis, county of residence ($p=.8951$) was not a significant factor, but age ($p<.0001$), income level ($p<.0001$) and education level ($p<.0001$) were significant factors.

3.4.1 Seniors Living Alone

Most older adults live in private homes or apartments for the majority of their senior years and may need supportive services based on their health, level of independence, and the availability of relatives or friends to assist them. The region has a higher percentage of older adults living alone, highlighting the ongoing need for primary care, medical specialties, medical transportation, home nursing, and social and emotional supports for older adults. **Table 3-6** shows the percentage of occupied housing units for which the householder is age 65 or older and living alone, according to data collected in the American Community Survey from 2014 to 2018. [9] All counties in the Upper Peninsula had significantly higher percentages of occupied housing units with householders 65 and older living alone than Michigan as a whole or the 10.9% documented in the United States. [12]

In both the 2017 and 2022 UPCHIPS it was asked how many adults were living in the household, including the person completing the survey. For those 65 years of age and older, the percentage who responded that there was only one adult in the household at the county level is given in **Table 3-7**. Women who completed the survey were more likely than men completing the survey to report being the only adult in the household in both 2017 and 2021 (2017: 47.9% versus 33.4%, OR=1.83, 95%CI: 1.56, 2.16; 2021: 45.8% versus 34.0%, OR=1.62, 95%CI: 1.35, 1.94). The percentage of those reporting living alone in the UPCHIPS may be higher than reported in the American Community Survey because the question could be misinterpreted as asking for the number of *additional* adults in the household. It is unclear how many respondents 65 years and older misinterpreted the question. If the question was misinterpreted one would expect that it was misinterpreted consistently across the counties and across surveys.

Table 3-6: Percentage of Seniors Living Alone	
	Percent of those 65 years and older living alone
Michigan	11.6%
Alger	17.4%
Baraga	12.8%
Chippewa	13.2%
Delta	14.9%
Dickinson	19.0%
Gogebic	18.4%
Houghton	13.8%
Iron	20.5%
Keweenaw	17.0%
Luce	15.0%
Mackinac	14.3%
Marquette	12.2%
Menominee	15.9%
Ontonagon	18.0%
Schoolcraft	15.5%

Table 3-7: UPCHIPS: 65 Years and Older Living Alone, 2017, 2021

County	2017	2021
Alger	42.3%	37.4%
Baraga	37.6%	43.5%
Chippewa	35.8%	37.8%
Delta	42.2%	46.3%
Dickinson	51.0%	41.5%
Gogebic	54.4%	39.5%
Houghton/Keweenaw	39.0%	40.1%
Iron	42.8%	36.7%
Luce	44.4%	45.0%
Mackinac	38.0%	34.5%
Marquette	37.2%	38.0%
Menominee	45.6%	44.9%
Ontonagon	39.7%	44.7%
Schoolcraft	38.5%	43.0%

3.4.2 Homelessness in Children

A child is more likely to be impacted by homelessness than an adult. A child who experiences homelessness faces a number of additional barriers. For example, children experiencing homelessness while in preschool are more likely to have major delays in development than their peers who are housed (54% versus 16%). The impact extends to the third grade when these children have lower levels of classroom engagement and lower math proficiency. [13] By 17 years of age, half of formerly homeless children will have needed to repeat at least one grade, with over 21% having repeated two grades, a rate three times greater than children who had secure housing. [14]

Homelessness also impacts school attendance in Michigan. According to MI School Data, nearly half of children facing homelessness were chronically absent from school compared to 19% of housed children. Similarly, while 81% of high school seniors with stable housing graduated in four years, only 57% of those identified as homeless did so. [15]

The Department of Housing and Urban Development (HUD) considers an individual to be “literally homeless” if they are living in a shelter, in transitional housing, or in places not meant for human

habitation.[16] Educational institutions use the more expansive definition as laid out in the McKinney-Vento Homeless Assistance Act.³ This would include the chronically homeless, the episodically homeless, the transitionally homeless, and the provisionally occupied — often referred to as the “hidden homeless” who “couch surf,” double up in the homes of others, and live in hotels — who have no immediate prospects for acquiring permanent housing and temporarily live with others without a guarantee of being able to stay on a long-term basis.[17] Expanding the definition increased the number of children 0 to 4 years of age who were homeless in Michigan in 2017 from about 6,000 to 15,565. Using the expanded definition, the percentage of children who are experiencing homelessness in Michigan steadily rose from 2002 through 2016 (Figure 3-3). [18]

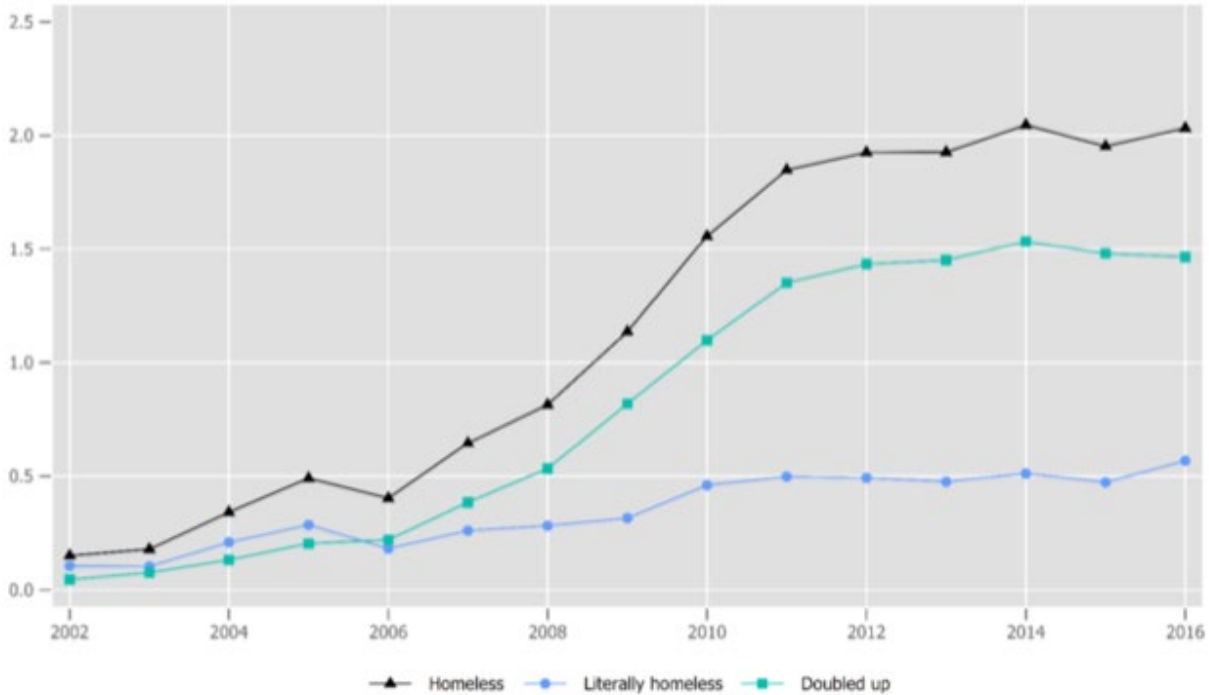


Figure 3-3: Percentage of Students in Kindergarten through Twelfth Grade who were (1) Homeless, (2) Literally homeless, and (3) Doubled up, SY 2002–2003 to 2016–2017

Poverty Solutions at the University of Michigan used Michigan Department of Education data from the 2016–2017 school year to estimate the percentage of children 0 to 4 years of age experiencing homelessness using the expanded definition of homelessness. A map of the rates in each Michigan county is shown in Figure 3-4. The counties in the Upper Peninsula included a county with one of the lowest rates (Dickinson County) and Alger County with the third highest rate in the state. The value for

³ According to the McKinney-Vento Homeless Assistance Act (42 USC [The Public Health and Welfare] Chapter 119 [Homeless Assistance] Subchapter VI [Education for Homeless] Part B [Education for Homeless Children and Youths] §11434a.(2)): the term “homeless children and youths”—“(A) means individuals who lack a fixed, regular, and adequate nighttime residence (within the meaning of section 11302(a)(1)); and (B) includes—(i) children and youths who are sharing the housing of other persons due to loss of housing, economic hardship, or a similar reason; are living in motels, hotels, trailer parks, or camping grounds due to the lack of alternative adequate accommodations; are living in emergency or transitional shelters; or are abandoned in hospitals; (ii) children and youths who have a primary nighttime residence that is a public or private place not designed for or ordinarily used as a regular sleeping accommodation for human beings (within the meaning of section 11302(a)(2)(C)); (iii) children and youths who are living in cars, parks, public spaces, abandoned buildings, substandard housing, bus or train stations, or similar settings; and (iv) migratory children (as such term is defined in section 6399 of title 20) who qualify as homeless for the purposes of this subtitle because the children are living in circumstances described in clauses (i) through (iii).” <https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter119/subchapter6/partB&edition=prelim>. Accessed July 7, 2021.

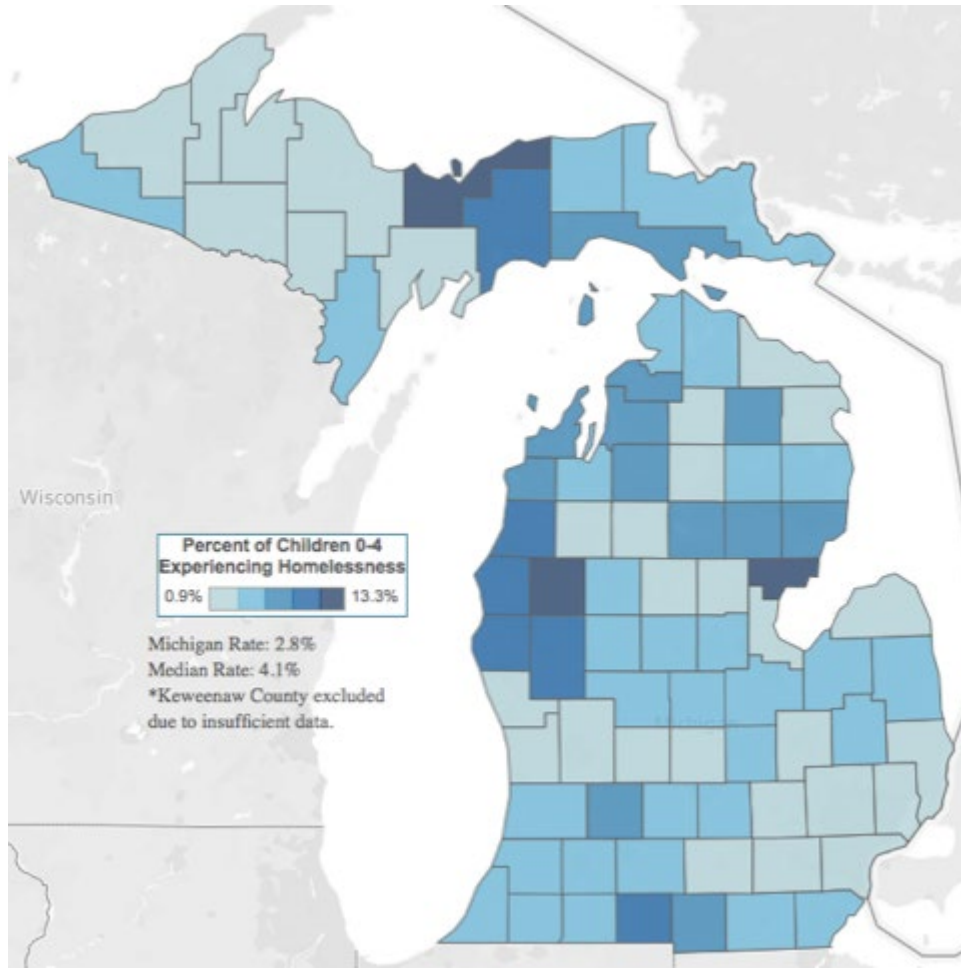


Figure 3-4: Percentage of Children 0-4 Experiencing Homelessness in Michigan.

each county is shown in **Table 3-8**. [19] Note that the homelessness rate for these young children was higher in rural counties than urban ones.

Homelessness in children is associated with rental costs, forced housing moves, and the opioid epidemic. The impact of homelessness on children is profound and helping families secure sustainable, stable housing may be the best intervention. HUD funds the Housing Choice Voucher program that subsidizes rent for very low-income families. For the entire state of Michigan, 28,000 vouchers were available in 2018 and 44% of the vouchers were given to adults with children. The program is not perfect. Unfortunately, landlords can choose not to accept vouchers, excluding some families from neighborhoods with quality schools and employment opportunities. [19]

Table 3-8: Percent Children 0-4 Years Homeless

Region	
Michigan	2.8%
Median for counties	4.1%
Urban Counties	2.4%
Midsized Counties	5.1%
Rural Counties	5.7%
Alger	11.1%
Baraga	2.5%
Chippewa	4.1%
Delta	2.5%
Dickinson	0.9%
Gogebic	5.1%
Houghton	1.1%
Iron	1.7%
Keweenaw	*
Luce	5.1%
Mackinac	7.8%
Marquette	2.4%
Menominee	5.8%
Ontonagon	2.9%
Schoolcraft	8.5%

3.5 Race and Ethnicity

In the UPCHIPS, people were not asked about their racial or ethnic identity, so local survey results by race or ethnicity are not available. Instead racial and/or ethnic identity data were gleaned from United State Census Bureau and presented in **Table 3-9**. [8] The Upper Peninsula is overwhelmingly White (88.9%), even more than Michigan as a whole (79.2%). While Michigan saw an 11% increase in population from 2010 through 2019, there was a 0.24% decrease in those identifying as White and a 0.49% decrease in those identifying as Black or African American. In Michigan, those identifying as Asian,

Table 3-9: Racial/Ethnic Identification by County

	White	Black	Native American	Asian	Two or more Races	Hispanic
Michigan	79.2%	14.1%	0.7%	3.4%	2.5%	5.3%
Upper Peninsula	88.9%	2.4%	5.0%	1.0%	2.7%	1.8%
Alger	84.7%	7.3%	4.5%	0.5%	3.1%	1.7%
Baraga	72.7%	8.0%	14.3%	0.4%	4.6%	1.7%
Chippewa	70.5%	7.0%	16.3%	0.9%	5.3%	2.0%
Delta	93.6%	0.4%	2.8%	0.5%	2.6%	1.6%
Dickinson	96.2%	0.5%	1.0%	0.7%	1.5%	1.7%
Gogebic	93.6%	0.6%	3.4%	0.5%	1.9%	1.8%
Houghton	93.5%	0.9%	0.8%	3.0%	1.7%	1.8%
Iron	95.8%	0.4%	1.6%	0.5%	1.7%	2.4%
Keweenaw	97.3%	0.4%	0.4%	0.1%	1.9%	1.7%
Luce	78.4%	12.0%	5.6%	0.2%	3.7%	1.7%
Mackinac	74.0%	3.5%	16.5%	0.9%	5.1%	2.0%
Marquette	93.2%	1.7%	2.0%	0.9%	2.2%	1.6%
Menominee	94.0%	0.7%	3.1%	0.5%	1.8%	2.0%
Ontonagon	96.0%	0.3%	1.5%	0.6%	1.6%	1.6%
Schoolcraft	86.2%	0.4%	9.3%	0.3%	3.8%	1.3%

two or more races, Native Hawaiian or other Pacific Islander, Hispanic, and American Indian or Alaskan Native increased 37.48%, 24.51%, 20.95%, 20.63%, and 7.79% respectively. [20] Houghton County’s population identifying as Asian (3.0%) is partly attributed to the diversity of students and staff associated with Michigan Technological University.

These data include students attending colleges and universities and men incarcerated at correctional facilities. The lower percentage of incarcerated white men may be responsible for the increased percentage of those identifying as Black/African Americans reported living in Alger, Baraga, Chippewa, and Luce counties.

Native Americans form the largest minority group in the region, with concentrated populations in Baraga, Chippewa, and Mackinac counties. In Baraga County, 14.3% of the population identified as “American Indian or Alaska Native,” while in Chippewa County the percentage was 16.3%. When excluding the incarcerated population housed at the correctional facilities in these counties, the figure

climbs to 15.9% and 18.2%, respectively.

3.6 Educational Attainment / Internet Access

The highest level of education achieved and access to computer and broadband internet according to the United States Census Bureau are listed in **Table 3-10**. [8] Persons in the Upper Peninsula were more likely to finish high school but less likely to earn a bachelor’s degree or higher than all those living in Michigan.

Table 3-10: Levels of Education and Broadband Internet Access				
	High School Education or Higher	Bachelor’s Degree or Higher	Percent Households with Computer	Percent Households with Broadband Internet
Michigan	90.5%	28.6%	88.0%	79.0%
Upper Peninsula	92.8%	24.4%	83.5%	73.2%
Alger	89.2%	17.4%	81.5%	71.2%
Baraga	88.8%	14.5%	79.8%	71.3%
Chippewa	89.8%	21.0%	83.9%	75.1%
Delta	93.9%	21.5%	83.0%	73.7%
Dickinson	94.8%	26.5%	83.4%	74.1%
Gogebic	93.3%	19.8%	77.8%	62.2%
Houghton	92.8%	33.2%	85.4%	77.0%
Iron	92.0%	18.8%	79.4%	61.3%
Keweenaw	96.1%	30.4%	80.4%	66.6%
Luce	88.0%	16.3%	79.9%	70.0%
Mackinac	90.2%	21.8%	83.6%	70.3%
Marquette	95.3%	31.5%	87.2%	76.9%
Menominee	92.4%	16.7%	81.2%	71.7%
Ontonagon	92.6%	17.5%	78.1%	64.6%
Schoolcraft	90.1%	15.8%	80.8%	69.0%

Access to broadband internet was lower in all counties of the Upper Peninsula than for Michigan as a whole. The rates of high school completion were lower in the counties with correctional facilities, which may reflect the highest level of education achieved by those incarcerated.

Not surprisingly, the two counties, Houghton and Marquette, with large universities and medical facilities had the highest percentage of the population with a bachelor's degree or higher. Such organizations often employ a significant number of persons possessing advanced degrees.

The levels of educational achievement reported in the UPCHIPS are shown in **Table 13-2** county level in **Tables 13-3** through **13-16**. In both the 2017 and the 2021 UPCHIPS men were found to have higher levels of education than women (2017: $\chi^2_3=19.88$, $p=.0002$; 2021: $\chi^2_3=9.82$, $p=.0201$). The level of education also varied significantly by county of residence (2017: $\chi^2_{26}=106.97$, $p<.0001$; 2021: $\chi^2_{26}=66.60$, $p<.0001$). The impact of the level of educational achievement on risk for chronic disease are discussed in Chapter 9.

3.7 Unemployment

The United States Department of Labor Bureau of Labor Statistics reports unemployment numbers and percentages. [21] In 2019, among Michiganders aged 16 years and older, 25% are employed in full-time salaried positions, 24% in full-time hourly positions, 8% in part-time hourly positions, 3% in part-time salaried positions, 3% unemployed, 20% not in the labor force for a variety of reasons (including being a student), and 18% not in the labor force because of retirement. [22]

After a prolonged recovery period following the 2008 recession, an economic downturn began in early 2020 that was worsened by the COVID-19 pandemic. State level unemployment numbers indicate that unemployment remained steady in 2019, ranging from 3.9% to 4.2%. In 2020, the unemployment at the beginning of the year was 3.8%, peaked at 24.0% in April, and returned to 5.5% by October. [23] In 2020, the highest average unemployment rates were reported in Mackinac (13.4%), Baraga (11.7%), Alger (10.7%), and Ontonagon (10.3%) counties. [24] **Figure 3-5** provides unemployment estimates over time by county. The unemployment rates in the Upper Peninsula are consistently higher than for Michigan as a whole.

3.8 Income and Poverty

Income and poverty are very strong social determinants of health. **Table 3-11** provides data on average household income, poverty rates, [8] income stratification, the percentage of families with children who live below the poverty level, [9] and the ratio of household income for those earning at the 80th percentile to those earning at the 20th percentile. [10,25] The median household income and the per capita income for all counties in the Upper Peninsula are below the Michigan values. Most counties have a higher percentage of households with an income less than \$25,000 than seen statewide. Chippewa, Gogebic, and Luce counties had the highest poverty rates.

The income levels reported in the UPCHIPS are shown in **Table 13-2** with county level values in **Tables 13-3** through **13-16**. In both the 2017 and the 2021 UPCHIPS men were found to have higher levels of income than women (2017: $\chi^2_2=14.67$, $p=.0007$; 2021: $\chi^2_2=15.64$, $p=.0004$). The level of education also varied significantly by county of residence (2017: $\chi^2_{26}=106.97$, $p<.0001$; 2021: $\chi^2_{39}=110.48$, $p<.0001$).

The impact on income level on the risk of chronic diseases is discussed in Chapter 9.

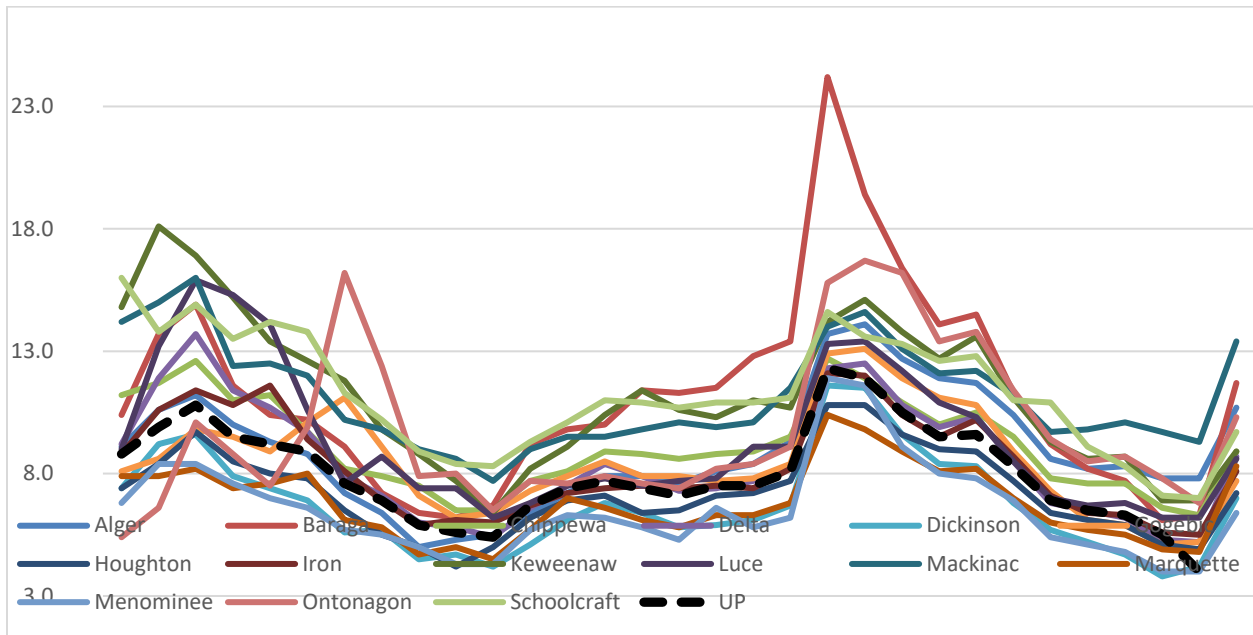


Figure 3-5: Annual Unemployment Rate by County from 1990 through 2020

While the government sets the poverty threshold, researchers have developed methods to identify the households with employed individuals that exceed the poverty threshold but unable to make ends meet financially. These households have been described as **Asset Limited, Income Constrained, Employed (ALICE)**. To fall into this category, a household's income must exceed the poverty threshold and fall below the Household Survival Budget, which is calculated based on the minimal combined local costs of housing, child care, food, transportation, health care, and a basic smartphone plan. In Michigan, the average Household Survival Budget for a single adult is \$1,950 per month, which would require a full-time wage of \$11.70 per hour to support. For a single senior the budget is \$2,187 per month supported by a \$13.12 per hour job. For a household with two adults, one preschooler, and one infant the budget is \$5,343 per month, which would require a full-time wage of \$32.06 per hour to support. Not surprisingly the largest expense for this young family is child care. [22]

Table 3-11: Income and Poverty by County

	Median Household Income (2018)	Per Capita Income	Percentage persons in poverty	Percentage of families with children less than 18 years of age in poverty	Household income less than \$25K	Household income \$25,000 to \$49,999	Ratio of household income at 80th percentile to income at the 20th percentile
Michigan	\$54,938	\$30,336	13.0%	17.5%	13.6%	20.7%	4.7
Alger	\$46,007	\$21,773	12.6%	15.6%	13.5%	24.8%	4.1
Baraga	\$42,444	\$20,698	13.7%	23.8%	29.1%	29.0%	4.7
Chippewa	\$44,483	\$23,310	18.3%	25.4%	27.8%	27.6%	4.3
Delta	\$46,490	\$26,852	13.8%	15.7%	14.1%	26.4%	4.5
Dickinson	\$48,966	\$28,020	9.9%	13.2%	24.1%	27.2%	4.6
Gogebic	\$38,798	\$24,325	17.1%	25.2%	33.1%	27.9%	4.8
Houghton	\$42,852	\$22,866	14.7%	14.8%	30.9%	24.6%	5.2
Iron	\$38,918	\$24,876	13.7%	21.1%	14.0%	30.1%	4.6
Keweenaw	\$49,779	\$31,830	10.3%	22.4%	25.4%	25.0%	4.2
Luce	\$42,255	\$20,745	19.2%	18.7%	21.4%	33.3%	3.4
Mackinac	\$46,507	\$28,941	14.1%	21.2%	26.4%	27.7%	4.2
Marquette	\$50,771	\$26,290	11.8%	16.0%	23.4%	26.1%	4.4
Menominee	\$45,508	\$27,609	13.5%	17.7%	26.5%	28.3%	4.1
Ontonagon	\$38,906	\$23,850	13.3%	21.7%	29.0%	32.4%	3.8
Schoolcraft	\$40,747	\$22,931	14.3%	23.0%	29.8%	28.7%	4.6

Figure 3-6 shows the percentages of those living below the poverty line and those meeting the ALICE criteria (between the poverty threshold and the Household Survival Budget) broken down by county and age group. Of note, the percentage of those living below the poverty threshold goes down with age, with those over 65 years of age living below the poverty level ranging from 7% to 12%, and the percentage of those meeting the ALICE criteria increasing with age. This may reflect that programs such as Social Security aim to limit the number below the poverty threshold, yet leaves seniors short of making ends meet financially. Overall, those below the Household Survival Budget, including those below the poverty threshold, increased with age group. For the Upper Peninsula as a whole, this

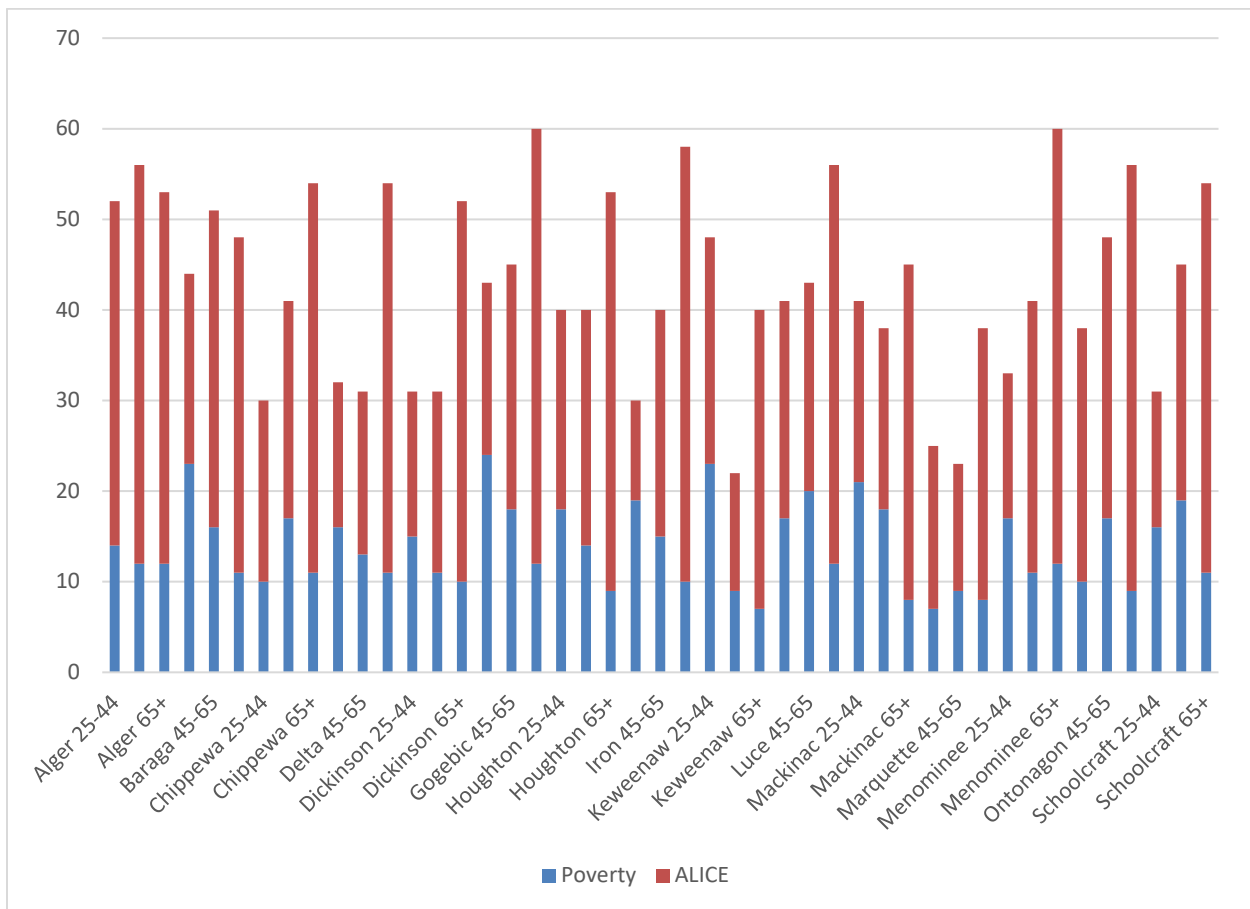


Figure 3-6: Percentages living below the poverty threshold and those meeting the ALICE criteria (between the poverty threshold and the Household Survival Budget) broken down by county and age group

increased from 33.9% in the 25-44-year-old group, to 46.0% in the 45-65 age group, to 50.9% in those over 65 years of age. **Table 3-12** provides the percentages of households below the poverty threshold, meeting the ALICE criteria, and below Household Survival Budget for each county in 2010, 2012, 2014, 2016, and 2019. **Table 3-13** shows the percentages of households below the poverty threshold, meeting ALICE criteria, and below Household Survival Budgets for each of the counties for families with children, married families with children, households headed by single women, and household headed by single men. Across the Upper Peninsula, married families fared the best (14.9% earning below the Household Survival Budget), while 77.7% of households headed by single women did not earn enough to meet the Household Survival Budget. [26]

Investigators using the estimates of minimal survival costs have found that the ALICE Essential Index has been growing at a quicker rate than the Consumer Price Index and that average wages are not keeping pace with expenses. [22]

Table 3-12: Percentage of Households Below Poverty Threshold and ALICE[a] from 2010 through 2019

Year	Poverty					ALICE[a]					Poverty & ALICE				
	2010	2012	2014	2016	2019	2010	2012	2014	2016	2019	2010	2012	2014	2016	2019
											0	0	0	0	0
Alger	12.8	13.4	13.4	14.2	12.2	29.6	36.0	34.3	33.1	42.2	42.4	49.4	47.7	47.3	54.4
Baraga	13.2	14.2	15.3	15.3	16.1	28.4	34.2	36.9	38.7	33.3	41.6	48.4	52.2	54.0	49.4
Chippewa	18.1	18.7	17.2	15.5	17.2	24.6	31.2	30.7	30.2	29.8	42.7	49.9	47.9	45.7	47.0
Delta	14.0	16.5	16.4	15.9	13.2	24.5	26.4	27.2	26.3	25.6	38.5	42.9	43.6	42.2	38.8
Dickinson	13.5	12.4	13.8	15.2	12.4	22.3	27.8	26.3	25.8	26.0	35.8	40.2	40.1	41.0	38.4
Gogebic	15.9	18.5	17.9	18.7	17.9	28.7	30.6	33.2	30.1	33.4	44.6	49.1	51.1	48.8	51.3
Houghton	22.3	21.1	21.0	21.2	19.3	27.9	29.9	30.7	27.6	30.2	50.2	51.0	51.7	48.8	49.5
Iron	13.2	13.3	14.5	17.6	14.0	31.1	36.2	34.5	34.6	32.1	44.3	49.5	49.0	52.2	46.1
Keweenaw	16.1	15.3	14.0	14.7	10.6	23.3	24.5	31.3	27.7	24.4	39.4	39.8	45.3	42.4	35.0
Luce	14.8	14.4	16.8	18.5	16.9	28.2	32.8	38.9	33.4	31.6	43.0	47.2	55.7	51.9	48.5
Mackinac	12.6	13.9	14.0	14.0	16.9	24.0	26.7	30.6	28.5	25.4	36.6	40.6	44.6	42.5	42.3
Marquette	15.5	19.8	16.0	13.8	13.1	20.2	19.8	27.2	24.2	20.5	35.7	39.6	43.2	38.0	33.6
Menominee	13.6	14.4	14.8	14.8	13.3	27.5	28.8	28.1	27.5	32.6	41.1	43.2	42.9	42.3	45.9
Ontonagon	14.5	16.5	16.5	15.4	12.9	30.3	27.6	33.0	38.0	37.9	44.8	44.1	49.5	53.4	50.8
Schoolcraft	16.8	17.1	18.9	19.5	15.8	23.4	27.5	30.4	31.7	30.7	40.2	44.6	49.3	51.2	46.5
Upper Peninsula	15.7	17.1	16.4	16.0	14.8	25.0	27.5	29.7	28.2	27.8	40.7	44.6	46.1	44.2	42.6

[a] Asset Limited, Income Constrained, **Employed** (ALICE).: Household income exceeds poverty threshold below the Household Survival Budget

Table 3-13: Percentage of Households Below Poverty Threshold and ALICE[a] by Household Type

Region	Families with Children			Married with Children			Household Headed by Single Woman			Household Headed by Single Man		
	Poverty	ALICE[a]	Poverty & ALICE	Poverty	ALICE[a]	Povert & ALICE	Poverty	ALICE[a]	Poverty & ALICE	Poverty	ALICE[a]	Poverty & ALICE
Alger	12	35	47	9	26	35	*	*		*	*	*
Baraga	22	27	49	5	17	22	54	38	92	*	*	*
Chippewa	30	17	47	12	9	21	60	25	85	33	41	74
Delta	17	11	28	8	4	12	44	32	76	16	12	28
Dickinson	14	11	25	1	6	7	47	20	67	10	25	35
Gogebic	24	20	44	12	9	21	47	36	83	*	*	*
Houghton	13	18	31	7	10	17	40	42	82	15	46	61
Iron	21	12	33	2	8	10	52	21	73	*	*	*
Keweenaw	28	11	39	0	14	14	*	*	*	*	*	*
Luce	17	26	43	11	27	38	*	*	*	*	*	*
Mackinac	24	14	38	12	10	22	47	25	72	34	14	48
Marquette	17	10	27	5	4	9	51	22	73	28	23	51
Menominee	18	16	34	8	8	16	50	33	83	19	29	48
Ontonagon	22	16	38	18	5	23	*	*	*	*	*	*
Schoolcraft	16	12	28	10	3	13	*	*	*	14	24	38
Upper Peninsula	18.9	14.4	33.3	7.3	7.6	14.9	49.9	27.8	77.7	21.5	24.8	46.3

[a] Asset Limited, Income Constrained, Employed (ALICE): Household income exceeds poverty threshold below the Household Survival Budget

3.9 Environment and Nutrition

The air we breathe, the water we drink, the food we eat, and the amount of exercise we get can have a strong impact on our health. The counties in the Upper Peninsula rank high in regards to the physical environment, and in 2019 none of the counties reported any drinking water violations.[10,27] However, our eating and exercise habits are less than ideal. **Table 3-15** lists the average daily density of fine particulate matter in micrograms per cubic meter collected in each county in 2016 by the Centers for Disease Control and Prevention’s National Environmental Public Health Tracking Network,[10] the data from 2018 providing the percentage of the population who lack adequate access to food,[10,28] the food environment index,⁴ and the percentage of the population with adequate access to locations for physical activity.[10,29] The level of physical activity and the consumption of fruits and vegetables were addressed in the UPCHIPS with the results available in **Tables 13-31A, 13-31B, 13-32A, and 13-32B**.

The impact on eating fruits and vegetables on chronic diseases is discussed in Chapter 9.

3.10 Future Implications

The skewing of the age distribution toward older cohorts has profound implications on the needs for health care and elder services, especially for the growing population of seniors living alone. An aging population will increase:

- the prevalence of many chronic diseases within our communities
- the need for assisted living and long-term care facilities, and home health, hospice and other services, and
- the need for social and transportation services

The declining population of children impacts school enrollments and other programs, services, and population-based funding streams related to youth. This could lead to closure and consolidation of schools. With fewer people in the workforce and more in retirement, the declining tax bases could further diminish a community’s resources and services. Younger people are also needed to be caregivers for the expanding elderly population.

According to the 2017 Michigan Behavioral Risk Factor Surveillance System (MiBRFS) survey, 21.6% Michigan adults currently provide care to family members or friends. Of these 35.6% of reported taking care of a parent or parent in-law. The care of mothers was the most prevalent in that group at 22.4%, followed by 6.9% caring for fathers (6.9%). In 14.9% the care recipient was a spouse or partner, 13.9% reported a non-relative, 11.1% reported a grandparent, 9.2% reported a child or grandchild, 8.9% reported a sibling, and 6.4% reported another relative. Of those receiving care, 22.3% experienced dementia, 15.1% had cancer, 14.4% had cardiovascular disease, 11.2% had diabetes, 11.0% had arthritis, 7.7% had mental illness, 6.6% had developmental disabilities, and 4.6% had organ failure. [30]

⁴ Index of factors that contribute to a health food environment, from 0 (worst) to 10 (best) using data collected in 2015 and 2018. [10,28]

Table 3-15: Air Quality and Access to Healthy Food and Exercise

Location	Average daily density of fine particulate matter in micrograms per cubic meter	Percentage of population who lack adequate access to food	Index of factors that contribute to a healthy food environment, from 0 (worst) to 10 (best)	Percentage of population with adequate access to locations for physical activity
Michigan	8.4	14%	7.1	85%
Alger	6.4	14%	6.9	94%
Baraga	6	15%	7.4	26%
Chippewa	6.9	16%	7.1	86%
Delta	7.1	14%	7.6	93%
Dickinson	7	13%	7.4	89%
Gogebic	6.4	15%	7.6	90%
Houghton	6.1	14%	7.5	79%
Iron	6.6	14%	7.9	88%
Keweenaw	5.7	13%	7.4	9%
Luce	6.3	16%	7.5	70%
Mackinac	7	17%	6.6	89%
Marquette	6.6	13%	7.8	84%
Menominee	7.9	13%	7.3	72%
Ontonagon	6	15%	7.1	72%
Schoolcraft	6.6	18%	6.9	75%

References:

- [1] Northern Michigan University. Enrollment by U.S. state counts, fall 2008 through fall 2017. https://www.nmu.edu/irarchive/sites/DrupalIRArchive/files/UserFiles/Files/Pre-Drupal/SiteSections/Student/EnrollmentByState/Fall_Enrollment_by_U.S._State_2008-17_final.pdf. Accessed December 10, 2020.
- [2] Michigan Technological University. Enrollment. <https://www.mtu.edu/about/facts/#enrollment>. Accessed December 10, 2020.
- [3] Lake Superior State University. 2016-2017 common data set. https://www.lssu.edu/wp-content/uploads/2017/06/common_data_set_2016_2017.pdf. Accessed December 10, 2020.
- [4] Michigan Department of Corrections 2019 Statistical Report. February 14, 2019. https://www.michigan.gov/-/media/Project/Websites/corrections/assets/Folder24/MDOC_2019_Statistical_Report.pdf?rev=80a09f2ffb8a4e59

81934e163fde65c7. Accessed May 3, 2022.

[5] County Population Totals. Annual Estimates of the Resident Population for Counties in Michigan: April 1, 2010 to July 1, 2019. Released March 2020. <https://www.census.gov/data/tables/time-series/demo/popest/2010s-counties-total.html>. Accessed December 9, 2020.

[6] United States Census Bureau. Annual Estimates of Housing Units for Counties in Michigan: April 1, 2010 to July 1, 2019. <https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-detail.html>. Accessed December 9, 2020.

[7] United States Census Bureau. National, State, and County Housing Unit Totals: 2000-2019. Annual Estimates of Housing Units for Counties in Michigan: April 1, 2010 to July 1, 2019. <https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-housing-units.html>. Accessed December 9, 2020.

[8] United States Census Bureau. Quick Facts. <https://www.census.gov/quickfacts>. Accessed December 9, 2020.

[9] American Community Survey. 2014-2018 ACS 5-Year Data Profile.

<https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>. Accessed December 9, 2020.

[10] County Health Rankings & Roadmaps. www.countyhealthrankings.org. Accessed March 1, 2021.

[11] Data source: U.S. Department of Housing and Urban Development's Comprehensive Housing Affordability Strategy (CHAS) data.

[12] United Health Foundation. America's Health Rankings. Risk of social isolation — Ages 65+.

https://www.americashealthrankings.org/explore/senior/measure/isolationrisk_sr/state/MI. Accessed December 9, 2020.

[13] Fantuzzo J, LeBoeuf W, Brumley B, Perlman S. A population-based inquiry of homeless episode characteristics and early educational well-being. *Child Youth Serv Rev* 2013 35(6): 966-72.

[14] National Center on Family Homelessness. America's youngest outcasts: State report card on child homelessness. 2009, cited in McCoy-Roth M, Mackintosh B, Murphey D. When the bough breaks: the effects homelessness on young children. *Child Trends: Early Childhood Highlights* 21012; 3(1): 1-11.

[15] MI School Data. Michigan's Official Education Data Source. <http://www.mischooldata.org>.

[16] U.S. Department of Housing and Urban Development. Homeless definition.

https://files.hudexchange.info/resources/documents/HomelessDefinition_RecordkeepingRequirementsandCriteria.pdf. Accessed July 7, 2021.

[17] Parker N. The many forms of homelessness. Join January 25, 2019. <https://joinpdx.org/the-many-forms-of-homelessness/>. Accessed July 7, 2021.

[18] Evangelist M, Shaefer HL. No place called home: student homelessness prevalence and structural correlates [working paper #6-19]. Poverty Solutions at the University of Michigan Working Paper Series; October 2019.

https://poverty.umich.edu/files/2019/10/evangelist_shaefer_homelessness_Oct2019.pdf. Accessed July 7, 2021.

[19] Michigan League for Public Policy. Homelessness in early childhood. 2021. mlpp.org/homelessness-in-early-childhood/. Accessed July 7, 2021.

[20] United States Census Bureau. State Populations by Characteristics: 2010-2019. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for Michigan: April 1, 2010 to July 1, 2019.

<https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-detail.html>. Accessed December 9, 2020.

[21] Bureau of Labor Statistics. County employment and wages full data update.

<https://www.bls.gov/web/cewdat.supp.toc.htm>.

[22] Michigan Association of United Ways. ALICE in Michigan: a financial hardship study: 2021 Michigan Report; 2021. https://www.michiganfoundations.org/sites/default/files/resources/2021ALICEReport_MI_FINAL.pdf. Accessed July 8, 2021.

Accessed July 8, 2021.

[23] Bureau of Labor Statistics. Databases, tables & calculators by subject.

<https://data.bls.gov/timeseries/LASST260000000000003>. Accessed December 9, 2020.

[24] Bureau of Labor Statistics. <https://www.bls.gov/lau/#tables>.

[25] Data source: American Community Survey (2015-2019).

[26] United for ALICE. Michigan State Overview: Data Sheet. <https://unitedforalice.org/michigan>. Accessed July 8, 2021.

[27] Data source: Environmental Protection Agency — Safe Drinking Water Information System.

[28] Data source: Map the Meal Gap by Feeding America.

[29] Data source: Business Analyst, Delorme map data, ESRI, & US Census Tigerline Files. These data from 2010 and

2019 were combined in ArcGIS Business Analyst looking at parks at the local, state and national level.

[30] Tian Y, Steiner S, Hines S, Leonardi K, McKane P. Health status of Michigan caregivers. Michigan BRFSS Surveillance Brief. 2021; 12(4). Lansing, MI: Michigan Department of Health and Human Services, Lifetime Epidemiology and Genomics Division.

4 ACCESS TO CARE

4.1 Introduction

One of the most important aspects of community health is access to care, which simply means creating conditions in which any person can get the health care they need. Access to care is important for promoting and maintaining health, preventing and managing disease, reducing unnecessary disability and premature death, and achieving health equity for all. Improving access to care involves addressing the interactions between insurance coverage, health services, timeliness of care for traditional health care, oral health care, mental health care, and the ability to obtain necessary prescription drugs.

According to the U.S. Department of Human Services' Agency for Healthcare Research and Quality (AHRQ), access to health services means "the timely use of personal health services to achieve the best health outcomes." [1] According to the AHRQ access to health care consists of four components:

- **Coverage** that facilitates entry into the health care system.
- Screening and prevention **services are** provided by having a usual source of care.
- Health care provided in a **timely** fashion with the need is recognized,
- A **workforce** of capable, qualified, culturally competent providers.

Access to care often varies based on race, ethnicity, socioeconomic status, age, sex, disability status, sexual orientation, gender identity, and residential location.

The five counties of Baraga, Gogebic, Houghton/Keweenaw (considered one region) and Ontonagon have local survey data available from the 2012, 2015, 2018, and 2021 surveys. From these surveys, among adults 18-64 years, the proportion who reported having no health insurance of any type went down precipitously from the 2012 to the 2015 survey from 18.6% to 8.5% in the western counties. For the entire Upper Peninsula those reporting not having health insurance dropped from 7.0% in the 2017 UPCHIPS to 4.4% in 2021 (**Table 13-22A**). The initial drop can be attributed to the passage and the implementation of the Affordable Care Act. Unfortunately, the proportion among all adults in these counties who reported they did not have anyone they thought of their personal doctor or health care provider showed little improvement and varied widely from county to county (**Table 13-22A**). While there have been improvements in health insurance coverage, the availability of primary care health professionals has not been able to keep up. Over this same time span, within the same counties, there has been continuous improvements in receiving dental care and having dental insurance (**Table 13-25A**). Estimates for the ratio of the population to primary care physicians, dentists, and mental health providers from 2018, 2019, and 2020, respectively are shown in **Table 4-1**. [2]⁵ The range within the region emphasizes the unevenness of access to basic health care.

⁵ Primary care physician ratio based on data from Area Resource File and physician listings in the American Medical Association Physician Masterfile. Dentist ratio based on Area Resource File and the National Provider Identification file. Mental health providers from the Centers for Medicare & Medicaid Services (CMS) and National Provider Identification file.

Table 4-1 Ratio of Population to Providers

	Primary Care Physicians (2018)[a]	Dentists (2019)[b]	Mental Health Providers (2020)[c]
Michigan	1,280:1	1,340:1	370:1
Alger	1,300:1	2,270:1	1,520:1
Baraga	940:1	1,390:1	760:1
Chippewa	1,640:1	1,630:1	310:1
Delta	1,330:1	1,430:1	650:1
Dickinson	1,110:1	1,020:1	320:1
Gogebic	1,100:1	2,160:1	560:1
Houghton	1,580:1	1,510:1	550:1
Iron	1,390:1	2,220:1	860:1
Keweenaw	*	2,110:1	*
Luce	790:1	2,090:1	700:1
Mackinac	1,340:1	1,200:1	570:1
Marquette	940:1	1,170:1	270:1
Menominee	2,880:1	1,640:1	880:1
Ontonagon	5,880:1	1,930:1	2,900:1
Schoolcraft	1,150:1	1,600:1	450:1
[a] Area Health Resource File/American Medical Association			
[b] Area Health Resource File/American Medical Association			

4.2 Health Shortage Population Area (HSPA) Designations

Health Professional Shortage Areas (HPSAs) and Medically Underserved Areas (MUAs) are areas, population groups, and facilities designated by the United States Department of Health and Human Services as having met criteria indicating a significant need for additional primary health care resources.⁶

⁶ Determining whether an area is medically underserved involves application of the Index of Medical Underservice to data on a service area to obtain a score for the area. The Index scale is from 0 to 100, where 0 represents completely underserved and 100 represents best served or least underserved. Under the established criteria, each service area found to have an Index of Medical Underservice (IMU) of 62.0 or less qualifies for designation as a Medically Underserved Area. The IMU involves four variables: ratio of primary medical care physicians per 1,000 population, infant mortality rate, percentage of the population with incomes below the poverty level, and percentage of the population age 65

The purpose of these designations is to identify areas of greatest unmet primary health care need in with the intention of prioritizing limited resources and directing them to those areas.

An area, population group, or facility designated as a HPSA or MUA has specific programs targeted at enhancing primary care infrastructure through recruitment and retention of health care providers and support for primary health care facilities. Federal and state programs utilizing shortage designations as criteria for eligibility include: National Health Service Corps, State Loan Repayment Program, Federally Qualified Health Center and Health Center Look-Alike Certification, Medicare Incentive Payment Program, CMS Rural Health Clinics Program, J-1 Visa Waiver, and the National Interest Waiver Programs, as well as scoring preferences for various Title VII and VIII grants. HPSA designations are granted to address shortages of providers in three disciplines: primary medical care, dental care, and mental health care.

Within each discipline, there are three types of HPSA designations:

- Geographic areas designations based on the ratio of an area’s resident civilian population (excluding those in institutions) to the number of full time equivalent (FTE) providers in the area.
- Population group designations are based on the ratio of a particular population group (i.e. the low-income population) to the number of FTE providers serving that population group. For example, members of federally recognized Native American tribes are automatically designated population groups.
- Facility designations granted to specific facilities based on unique criteria (general public or non-profit facility, state or federal correctional institution, state or county mental hospital, Federally Qualified Health Center, or Rural Health Clinic). These include:
 - Correctional Facilities
 - State Mental Hospitals
 - Automatic Facility HPSAs (Auto HPSAs) — facilities automatically designated as a HPSA by statute or through regulation without having to apply for a designation. These include:
 - Federally Qualified Health Centers
 - Federal Qualified Health Center Look-A-Likes — community-based health care providers that meet the requirements of the federal Health Resources & Services Administration (HRSA) Health Center Program, but do not receive Health Center Program funding.
 - Indian Health Facilities — Federal Indian Health Service (IHS), Tribally-run, and Urban Indian health clinics.
 - IHS and Tribal Hospitals—Federal Indian Health Service (IHS), Tribally-run hospitals.
 - Dual-funded Community Health Centers/Tribal Clinics—health centers that receive funding from Tribal entities and HRSA.
 - CMS-Certified Rural Health Clinics meeting National Health Service Corps (NHSC) site requirements
 - Other Facility—public or non-profit private medical facilities serving a population or geographic area designated as a HPSA with a shortage of health providers

All Upper Peninsula counties have multiple federal designations for health professional shortages (HPSAs) recognized by the Health Resources & Services Administration of the United States Department of Health and Human Services, either for the entire county, a part of the county, or a specific population

or over. The value of each of these variables for the service area is converted to a weighted value, according to established criteria. The four values are summed to obtain the area’s IMU score.

within the county. [3]

4.3 Health Insurance Coverage

As part of the 2021 UPCHIPS, people across the Upper Peninsula were asked whether they had health insurance. These results are shown in **Tables 13-22A** and **13-22B**. The United States Census Bureau also collects this data. The 2019 data are presented in **Table 4-2**. [4] Delta and Marquette counties had the lowest percentages uninsured (6.0%), while Mackinac County had the highest rate (12.4%).

Table 4-2: Health Insurance Coverage by County	
	Percentage of persons without health insurance
Upper Peninsula	6.9%
Alger	7.6%
Baraga	8.0%
Chippewa	9.6%
Delta	6.0%
Dickinson	5.7%
Gogebic	7.9%
Houghton	7.2%
Iron	7.6%
Keweenaw	6.2%
Luce	7.8%
Mackinac	12.4%
Marquette	6.0%
Menominee	6.9%
Ontonagon	8.1%
Schoolcraft	9.1%

Over the past decade the rate of uninsured adults in Michigan has seen a dramatic decline primarily the result of Medicaid expansion, implementation of the Affordable Care Act Marketplace insurance plans, young adults staying on their parents' insurance plans through age 25, and the availability of coverage for people with pre-existing conditions. For example, Medicaid enrollment numbers in Michigan increased by 20.7% (from 1,791,236 to 2,162,096) in 2014 and another 11.9% before leveling off

between 237,500 to 242,000 through June 2019. [5] Barriers to accessing health care in the region noted in the 2021 UPCHIPS can be found in **Tables 13-23A** and **13-23B**.

4.4 Healthy Michigan Plan / Michigan Medicaid Program

The Michigan Medicaid Health Care Program is intended to provide medical and health-related assistance to low-income individuals and families who have no medical insurance or have inadequate medical insurance.

The Healthy Michigan Plan provides health care coverage for individuals who:

- are age 19-64 years,
- have income at or below 133% of the federal poverty level,
- do not qualify for or are not enrolled in Medicare,
- do not qualify for or are not enrolled in other Medicaid programs,
- are not pregnant at the time of application, and
- are residents of the State of Michigan.

Per federal requirements, individuals eligible for services under the Healthy Michigan Plan must have access to the following Essential Health Benefits:

- Ambulatory patient services
- Emergency services
- Hospitalization
- Maternity and newborn care
- Mental health and substance use disorder treatment services
- Prescription drugs
- Rehabilitative services and devices
- Laboratory services
- Preventive and wellness services and chronic disease management
- Pediatric services, including oral and vision care

The Healthy Michigan Plan (Healthy MI) will cover other medically necessary services as appropriate. Healthy Michigan Plan participants may be subject to cost-sharing obligations.

In 2020, the federal poverty guideline was set at an annual income of \$12,880 for a one-person household with an increase of \$4,540 for each additional occupant. In 2021, there were 51,833 residents in the Upper Peninsula who were eligible for Medicaid, an additional 25,738 who were eligible for Health MI, and an additional 4,559 eligible for MI Health Link, a program for those on both Medicare and Medicaid. The number of those eligible for these programs at the county level in 2021 is shown in **Table 4-3**. [6]

Table 4-3: Eligible for Medicaid, Healthy MI, or MI Health Link, 2021

	Total Members	Average members per month
Upper Peninsula	81,303	73,456
Alger	2,345	2,034
Baraga	2,555	2,183
Chippewa	10,287	9,084
Delta	10,449	9,215
Dickinson	6,899	6,069
Gogebic	5,213	4,630
Houghton	9,456	8,450
Iron	3,970	3,450
Keweenaw	532	455
Luce	2,074	1,776
Mackinac	2,936	2,457
Marquette	16,305	14,456
Menominee	6,240	5,389
Ontonagon	1,612	1,401
Schoolcraft	2,709	2,406

4.5 Ambulatory Care Sensitive Hospitalizations

The Michigan Department of Health & Human Services tracks the number of hospitalizations for conditions that could have been reduced or avoided through effective ambulatory care at the onset of a condition or illness.[7] The number of admissions, days of inpatient care, and the average length of stay for ambulatory care sensitive conditions (based on a list of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9CM) diagnostic codes) for the counties and local health departments in the Upper Peninsula are shown in **Table 4-4**. The ten leading causes of ambulatory care sensitive hospitalizations for the State of Michigan in 2019 are shown in **Table 4-5**. It is unclear how many of these hospitalizations could have been avoided with better access to primary care health professionals earlier in the course of an illness/disease. In addition to limited access to care, the rates of these admissions in individual counties may also be impacted by the county’s average age as one would expect a younger population to have fewer hospitalizations of all types.

Table 4-4 Ambulatory Care Sensitive Conditions Hospitalizations, 2019

County	Hospital Admissions	Days of Care	Average Length of Stay	Hospitalization per 1,000 population
Michigan	286216	1657930	5.79	28.66
Alger	156	706	4.53	17.13
Baraga	249	1058	4.25	30.33
Chippewa	945	4838	5.12	25.3
Delta	523	2163	4.14	14.62
Dickinson	422	1824	4.32	16.72
Gogebic	304	1357	4.46	21.75
Houghton	605	2622	4.33	16.95
Iron	268	1018	3.8	25.14
Keweenaw	33	192	5.82	15.6
Luce	157	764	4.87	25.2
Mackinac	270	1225	4.54	25
Marquette	1069	5359	5.01	16.03
Menominee	416	1697	4.08	18.26
Ontonagon	140	510	3.64	24.48
Schoolcraft	159	858	5.4	19.74
Health Department				
PHDM	939	3860	4.11	16.03
DIDHD	690	2842	4.12	19
LMAS	742	3553	4.79	21.68
WUPHD	1331	5739	4.31	20.26

Table 4-5: Ten Leading Causes of Ambulatory Care Sensitive Hospitalizations — Michigan 2019

Ambulatory Care Sensitive Condition	Ambulatory Care Sensitive Hospitalizations	Percent
All	286,216	100%
Diabetes	50,432	17.6%
Chronic Obstructive Pulmonary	21,931	7.7%
Congestive Heart Failure	19,043	6.7%
Bacterial Pneumonia	18,901	6.6%
Grand Mal & Other Epileptic Conditions	10,136	3.5%
Cellulitis	9,382	3.3%
Asthma	6,080	2.1%
Dehydration	3,801	1.3%
Gastroenteritis	3,216	1.1%
Kidney/Urinary Infections	2,288	0.8%
All Other Ambulatory Care Sensitive Conditions	141,006	49.3%

4.6 Access to Dental Care

According to the American Dental Association and the Health Policy Institute, on a national level in 2015 among adults 19 to 64 years of age, 59.0% had private dental insurance, 7.4% had dental insurance through Medicaid, and 33.9% had no dental insurance. For children aged 2 through 18 years, 51.3% had private dental insurance, 38.5% had coverage through Medicaid or the Children’s Health Insurance Program (CHIP), and 10.3% had no insurance.[8] In 2013, of the children in Michigan who were Medicaid-eligible, 36.3% had received preventative oral health services and 39.7% had received dental service of any type.[9] The ratio of the population to dentists in each of the counties in the Upper Peninsula are listed in **Table 4-1**.

The American Dental Association has studied the geographic coverage of dentists. Maps depicting coverage and barriers to dental care in Michigan are shown in **Figures 4-1, 4-2, and 4-3**. [10] These maps demonstrate the scarcity of dentists within a short distance of residents living in the Upper Peninsula.

As seen in **Tables 13-25A, 13-25B, 13-26A, and 13-26B**, the 2021 UPCHIPS confirms that access to dental care remains a serious problem for the population of the Upper Peninsula, with only moderate improvement over the past decade. Many barriers remain, with the cost of care and lack of dental insurance topping the list. Access to dental care within certain counties changed dramatically between the 2017 and 2021 surveys.

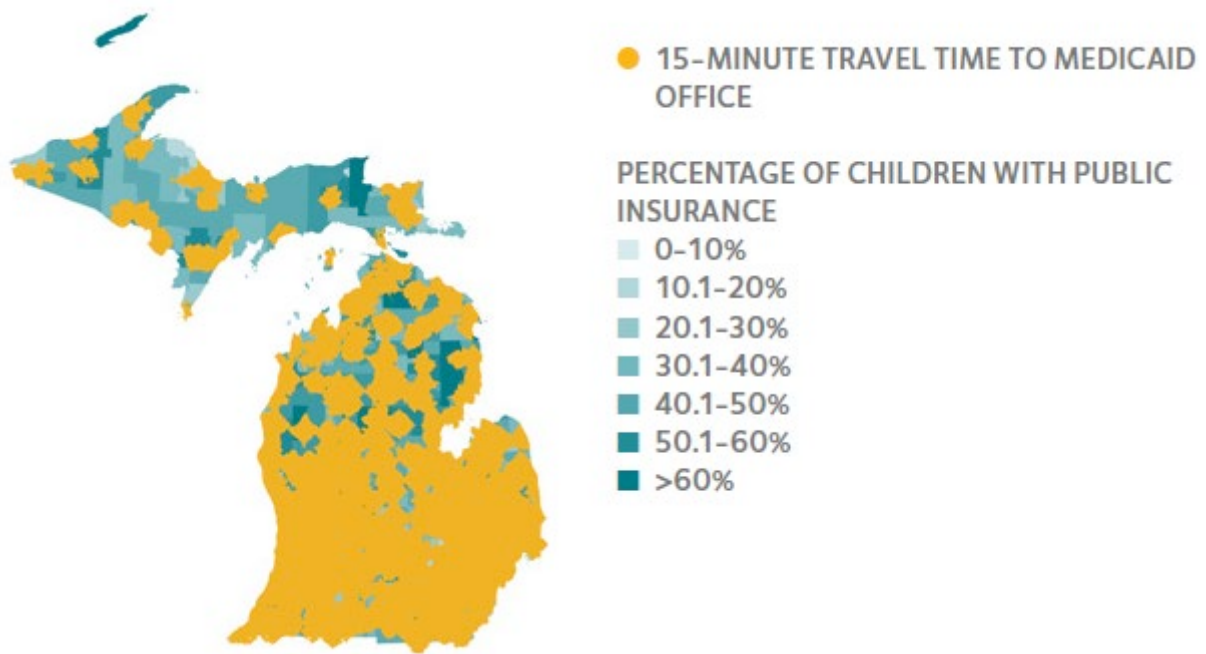


Figure 4-1: Geographic Coverage of Medicaid Dentists

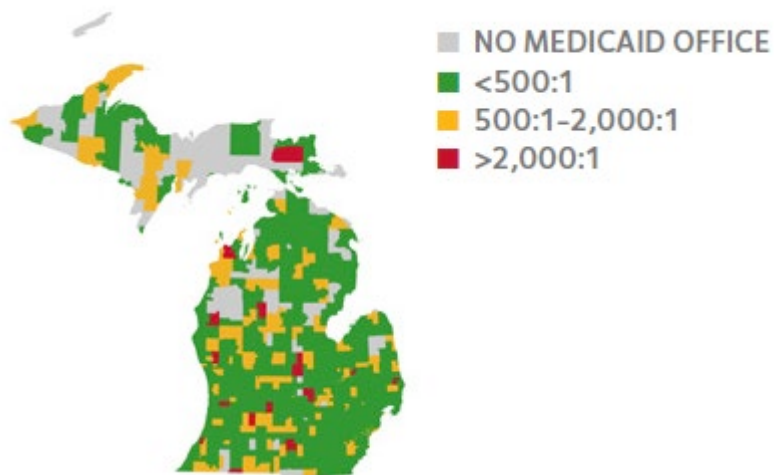


Figure 4-2: Publicly Insured Children per Medicaid Dentist within a 15-Minute Travel Time

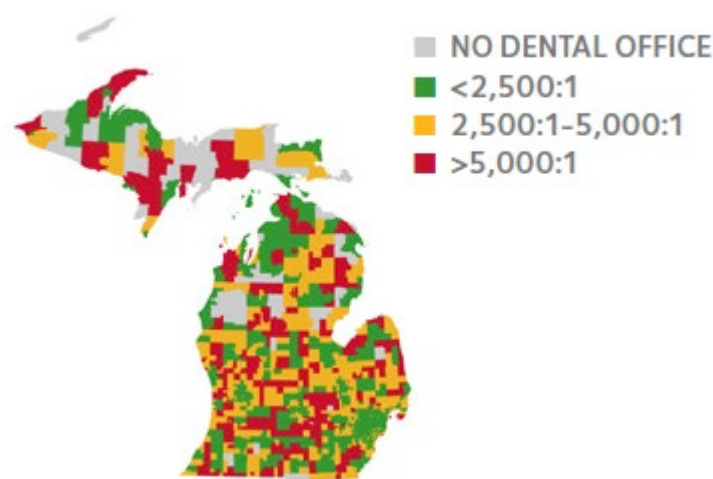


Figure 4-3: Population per Dentist within a 15-Minute Travel Time

While regional data for the access of children to dental care is not available, the Healthy Kids Dental (HKD) program is open to Medicaid-eligible children under the age of 21. [11] Participating dentists agree to accept Delta Dental’s payment for covered services as payment in full and do not charge the enrollee. Covered services include examinations, x-rays, teeth cleanings, fluoride treatments, sealants, fillings, and extractions. Eligible HKD enrollees can receive treatment from any dentist in Michigan who participates in Delta Dental.

4.7 Access to Mental Health Services

According to a 2019 study from the University of Michigan School Public Health Behavioral Health Workforce Research Center, the number of psychiatrists per population in Michigan (11.8 per 100,000 residents) is lower than the national number (12.9). The same report indicates the situation is worse in the Upper Peninsula. Of 10 counties in the state without either a psychiatric or a clinical psychologist, three (Keweenaw, Mackinac, and Ontonagon) are in the Upper Peninsula. Of the 15 counties in the state with a psychologist but no psychiatrists, six (Alger, Baraga, Iron, Luce, Menominee, and Schoolcraft) are in the Upper Peninsula. A child-adolescent psychiatrist could only be found in Marquette, and the Upper Peninsula had no psychiatrists who specializes in geriatric patients or patients with addictions. [12,13] Using data from CMS and the files of the National Provider Identification, the ratio of the population to mental health providers for each county in the Upper Peninsula are listed in **Table 4-1**. The wide range of availability of services underlines the inconsistencies in services noted in the UPCHIPS.

The numbers from the 2017 UPCHIPS and the 2021 UPCHIPS (Tables **13-44A**, **13-44B**, **13-45A**, and **13-45B**) are too small to draw any clear conclusions regarding access and barriers to mental health services.

Community Mental Health Service Programs (CMH) in Michigan are delivered through county-based community mental health services programs (CMHSPs) using public funds. [14] Community Mental Health Services in the Upper Peninsula are available through Copper Country CMH Services in Houghton,

Gogebic CMH Services in Wakefield, and Pathways in Marquette. [15]

4.8 Vulnerable Populations

Vulnerable populations, in terms of community health, are groups of people who are at greater risk of disease, disability, and difficulty accessing services, based on socioeconomic status or other social determinants of health. These determinants are “the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.” [16]. These can “affect a wide range of health and quality-of life-risks and outcomes.” [17]

Any policy or program that addresses the health care needs of the community needs to determine how the most vulnerable will be impacted.

4.9 Potential Future Implications

- Demographic information can be used to focus outreach and services on populations with poorer access to care, such as low-income residents, to improve their access to care with the efficient use of limited resources.
- Continue efforts to increase the number of those providing primary medical care.
- Expand efforts to improve access to dental care to include adults.

References

- [1] United States Department of Health and Human Services. Agency for Healthcare Research and Quality. Access to care. <https://www.ahrq.gov/topics/access-care.html>. Accessed December 11, 2020.
- [2] County Health Rankings Roadmaps. countyhealthrankings.org. Accessed March 1, 2020.
- [3] United States Department of Health and Human Services. Health Resources & Services Administration. HPSA find. <https://data.hrsa.gov/tools/shortage-area/hpsa-find>. Accessed December 11, 2020.
- [4] United States Census Bureau. Quick facts. <https://www.census.gov/quickfacts>. Accessed December 9, 2020.
- [5] United States Department of Health and Human Services. Centers for Medicare & Medicaid Services. <https://data.medicare.gov/Enrollment/Michigan/huam-4g6d>. Accessed December 11, 2020.
- [6] NorthCare Network. Demand & network adequacy report FY21. Marquette, MI: NorthCare Network; February 2022.
- [7] Michigan Department of Health & Human Services. Ambulatory Care Sensitive Hospitalizations. County and local health department comparisons. <https://vitalstats.michigan.gov/osr/chi/HOSP/frame.html>. Accessed June 18, 2021. Data source: Michigan Resident Inpatient Files created by the Division for Vital Records and Health Statistics, Michigan Department of Health & Human Services, using data from the Michigan Inpatient Database obtained with permission from the Michigan Health & Hospital Association Service Corporation (MHASC).
- [8] American Dental Association. Health Policy Institute. Dental benefits coverage in the U.S. (2015). https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIgraphic_1117_3.pdf?la=en. Accessed December 14, 2020.
- [9] The Center for Health Workforce Studies. Oral health in Michigan. School of Public Health, University of Albany, State University of New York; April 2015. midentalaccess.org Accessed December 14, 2020.
- [10] American Dental Association. Health Policy Institute. Geographic access to dental care. <https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/AccessToDentalCare-StateFacts/Michigan-Access-To-Dental-Care.pdf>. Accessed December 14, 2020. Based on ADA Health Policy Institute analysis of the 2015 ADA office database and 2011-2015 American Community Survey.
- [11] Michigan Department of Health & Human Services. Health Kids Dental. https://www.michigan.gov/mdhhs/0,5885,7-339-71547_2943_4845_77918---,00.html. Accessed December 11,

2020.

[12] Ray K. Shortage of psychiatrists hampers mental health services in rural Michigan. Spartan News Room. February 21, 2020. <https://news.jrn.msu.edu/2020/02/shortage-of-psychiatrists-hampers-mental-health-services-in-rural-michigan/>. Accessed December 14, 2020.

[13] Beck AJ, Page C, Buche J, Rittman D, Kaiser M. Estimating the distribution of the U.S. psychiatric subspecialist workforce. University of Michigan School Public Health Behavioral Health Workforce Research Center; December 2019. https://www.behavioralhealthworkforce.org/wp-content/uploads/2019/02/Y3-FA2-P2-Psych-Sub_Full-Report-FINAL2.19.2019.pdf. Accessed December, 14, 2020.

[14] Michigan Department of Health & Human Services. Community Mental health services programs. https://www.michigan.gov/mdhhs/0,5885,7-339-71550_2941_4868_4899---,00.html. Accessed December 14, 2020.

[15] Michigan Department of Health and Human Services[sic]. Community mental health services programs [list]. https://www.michigan.gov/documents/cmh_8_1_02_37492_7.PDF. Accessed December 14, 2020.

[16] World Health Organization. Social determinants of health. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1. Accessed December 11, 2020.

[17] Centers for Disease Control and Prevention. Social determinants of health: Know what affects health. <https://www.cdc.gov/socialdeterminants/index.htm>. Accessed December 11, 2020.

5 MATERNAL AND CHILD HEALTH

5.1 Introduction

According to the Centers for Disease Control and Prevention (CDC), improving the health of mothers, infants, and children is an important public health goal for the United States. Their wellbeing determines the health of the next generation and can help predict future public health challenges for families, communities, and the health care system. Reductions in maternal and infant mortality as well as preterm and low birthweight births, are important goals. Moreover, healthy birth outcomes and early identification and treatment of health conditions among infants can prevent death or disability and enable children to reach their full potential. Despite major advances in medical care, critical threats to maternal, infant, and child health continue to exist in the United States.

The risk of maternal and infant mortality and pregnancy-related complications can be reduced by increasing access to quality care before, during, and after pregnancy as well as addressing other social determinants of health.

5.2 Birth Demographics

Local birth rates have declined in the past ten years, as shown in **Table 5-1**. [1] This may reflect the shift in the age of the population in the Upper Peninsula with higher percentages of elderly and lower percentages of young people, as reported earlier (**Table 3-3, page 47**).

In Michigan, of the households with children, 65.8% of the adults in the home are married, 25.8% have a single mother, and 8.5% have a single father. [2] These data were not available at the county level. **Table 5-2** presents the percentages of households in each of the Upper Peninsula counties that have children and the percentage of married and living alone households. [3] The lower percentages reflect a high percentage of elderly households.

5.3 Maternal Risk Factors

A number of factors can increase a pregnant woman's risk of a less than optimal birth outcome. The following sections present data regarding several of them. According to the Michigan Pregnancy Risk Assessment Monitoring System (PRAMS) surveys from 2016 through 2018, 68.1% of pregnant women reported that their pregnancy was intended. This was higher than the state average (57.5%) and higher than any other region in the state. [4]

5.3.1 Births to Teens

Teen births are associated with poorer outcomes for both mother and child. Teen mothers are more likely to drop out of school with overall lower educational attainment, deliver a preterm or low birthweight infant, drop out of school, be incarcerated during adolescence, have poorer health status, have a lower income, and live in poverty. They are also more likely to be unemployed as young adults and to experience teen pregnancies themselves.

The percentages of births to women under 20 years of age by county are presented in **Table 5-3**. [5] The

Upper Peninsula reported a rate (5.0%) that was lower than the rate for Michigan (6.9%). Eight of the 11 counties with reliable data reported a lower rate than the state as a whole.

Table 5-1: Birth Rates in the Upper Peninsula, 2009, 2019

	2009			2019			Percent Decrease in Birth Rate from 2009 to 2019
	Number of Births	Population	Birth Rate per 1,000 Population	Number of Births	Population	Birth Rate per 1,000 Population	
Upper Peninsula	3042	311,370	9.77	2499	298,851	8.36	14.41%
Alger	69	9,580	7.20	59	9,108	6.48	10.06%
Baraga	74	8,861	8.35	59	8,209	7.19	13.94%
Chippewa	406	38,616	10.51	301	37,349	8.06	23.35%
Delta	403	37,047	10.88	333	35,784	9.31	14.45%
Dickinson	232	26,158	8.87	222	25,239	8.80	0.83%
Gogebic	140	16,396	8.54	115	13,975	8.23	3.63%
Houghton	405	36,730	11.03	323	35,684	9.05	17.91%
Iron	116	11,810	9.82	102	11,066	9.22	6.16%
Keweenaw	24	2,169	11.07	15	2,116	7.09	35.93%
Luce	61	6,601	9.24	55	6,229	8.83	4.45%
Mackinac[a]	81	11,108	7.29	92	10,799	8.52	-16.83%
Marquette	694	67,078	10.35	547	66,699	8.20	20.73%
Menominee	222	23,968	9.26	192	22,780	8.43	9.00%
Ontonagon	49	6,776	7.23	25	5,720	4.37	39.56%
Schoolcraft	66	8,472	7.79	59	8,094	7.29	6.43%
[a] Mackinac County saw a 16.83% increase in the birth rate.							

Table 5-2: Types of Households by County,

	Percent of households married	Percent of households with children	Percent of households single women	Percent of households single men
Michigan	47.5%	27.0%	12.6%	4.6%
Alger	54.9%	18.5%	5.9%	3.8%
Baraga	47.8%	18.9%	9.9%	3.4%
Chippewa	48.1%	24.2%	9.3%	4.3%
Delta	49.7%	23.4%	8.9%	4.9%
Dickinson	51.5%	22.9%	10.3%	4.2%
Gogebic	45.0%	18.1%	9.9%	3.7%
Houghton	46.6%	22.1%	7.2%	4.0%
Iron	43.5%	16.2%	7.9%	3.6%
Keweenaw	49.9%	15.7%	9.0%	3.0%
Luce	49.9%	23.8%	8.2%	4.6%
Mackinac	47.2%	18.8%	8.6%	4.5%
Marquette	48.1%	22.3%	8.3%	3.7%
Menominee	47.0%	20.9%	8.2%	5.0%
Ontonagon	49.3%	11.6%	4.5%	3.4%
Schoolcraft	52.7%	18.8%	7.7%	2.2%

Table 5-3: Maternal Demographics by County, 2019			
	Percent Birth to Mothers under age 20 years	Percent Births to Mothers with Less than 12 Years of Education	Percent Births to Mothers Not Married
Michigan	6.9%	10.2%	41.5%
Upper Peninsula	5.0%	8.4%	40.0%
Alger	*	*	54.2%
Baraga	*	18.6%	50.8%
Chippewa	5.3%	10.3%	46.5%
Delta	5.1%	6.9%	41.7%
Dickinson	5.0%	5.9%	33.8%
Gogebic	4.3%	7.0%	54.8%
Houghton	4.3%	5.3%	23.2%
Iron	4.9%	16.7%	49.0%
Keweenaw	*	*	*
Luce	9.1%	12.7%	45.5%
Mackinac	6.5%	17.4%	37.0%
Marquette	3.7%	6.6%	36.9%
Menominee	7.3%	8.9%	41.7%
Ontonagon	*	*	56.0%
Schoolcraft	8.5%	10.2%	57.6%
* = numbers too small to report.			

5.3.2 Births to Unmarried Women

Marital status has been statistically correlated to a variety of other factors that put infant health at risk. Unmarried mothers are less apt to receive early and adequate prenatal care, more likely to smoke during pregnancy, more likely to live in poverty, less likely to gain adequate weight during pregnancy, more likely to have a low birthweight baby, and less likely to breastfeed their newborns.

The rate of births to unwed mothers in the Upper Peninsula ranged from a low of 23.2% in Houghton County to 57.6% in Schoolcraft County. The rate across the Upper Peninsula (40.0%) was just slightly lower than the state rate (41.5%). Over half of the births in Alger, Baraga, Gogebic, Ontonagon, and Schoolcraft counties involved unmarried mothers (see **Table 5-3**). [5] These counties have historically been associated with poorer health outcomes.

5.3.3 Maternal Education

Mothers who have not graduated from high school are more likely to have difficulty finding employment and generally experience more economic stress than those with at least a high school diploma. As a result, children whose mothers have less than twelve years of education are more likely to live in poverty. Because of these links to young age and low income, there is a decreased probability of receiving early and adequate prenatal care, increased probability of smoking during pregnancy, and poor birth outcomes, such as preterm birth and low birthweight. Delta, Houghton, and Marquette counties have the lowest rates of low maternal educational attainment compared to the state average and the remainder of the Upper Peninsula. The Upper Peninsula performed better on this measure than Michigan as a whole (see **Table 5-3**). [5]

5.3.4 Early Prenatal Care

Adequate, early, quality prenatal care is widely recognized as a key strategy to improve maternal and infant health and to reduce maternal death, preterm birth, low birthweight, and infant mortality. The American College of Obstetricians and Gynecologists recommends monthly prenatal care visits beginning in the first trimester until 28 weeks of pregnancy and every two weeks thereafter. Delays in prenatal care are associated with certain maternal characteristics, such as age, education, income level, and whether or not the pregnancy was intended. Limited access to quality prenatal care may also decrease a woman's ability to receive care early in her pregnancy.

From 2015 through 2019, the percentage of women in the Upper Peninsula who had late entry (defined as beginning prenatal care in the seventh through the ninth month of pregnancy) into prenatal care was $4.6\% \pm 0.36$, compared to a 4.1% rate statewide. Broken down by race, late entry into prenatal care was seen in $4.4\% \pm 0.38$ (3.6% statewide) in White non-Hispanics, $10.1\% \pm 7.1$ (5.3% statewide) in Black non-Hispanics, $8.3\% \pm 3.3$ (5.8% statewide) in Hispanics, $5.2\% \pm 1.5$ (5.8% statewide) in Native Americans, and $6.7\% \pm 4.0$ (3.6% statewide) in Asian/Pacific Islanders.

The percentage of women who obtained prenatal care beginning in the first trimester ranged from 67.3% to 81.1% (see **Table 5-4**). [5] The counties with rates below 70% were Baraga, Luce, and Mackinac. The rates somewhat, but not entirely, correspond with the presence of birthing centers in counties. The percentage for the Upper Peninsula (76.1%) exceeds the Michigan rate (74.2%).

Compared to the previous report, the percentage of women who received prenatal care in the first trimester showed overall improvement since the last report in 2015.

Table 5-4: Maternal Prenatal Care			
	Percent with Prenatal Care in First Trimester	Percent Test for HIV during Pregnancy	Percent with “heavy weight” prior to pregnancy
Michigan	74.2%	86.4%	37.2%
Upper Peninsula	76.1%	77.2%	39.0%
Alger	72.9%	86.4%	39.0%
Baraga	69.5%	86.4%	57.6%
Chippewa	81.1%	91.0%	38.5%
Delta	76.6%	84.7%	34.2%
Dickinson	79.3%	52.3%	39.2%
Gogebic	78.3%	69.6%	40.0%
Houghton	76.8%	80.8%	44.6%
Iron	71.6%	56.9%	32.4%
Keweenaw	73.3%	86.7%	46.7%
Luce	67.3%	81.8%	41.8%
Mackinac	67.4%	62.0%	32.6%
Marquette	77.0%	93.8%	38.8%
Menominee	71.9%	25.0%	41.7%
Ontonagon	72.0%	100.0%	20.0%
Schoolcraft	74.6%	94.9%	33.9%

5.3.5 HIV Testing During Pregnancy

HIV can be transmitted from a mother to her baby during pregnancy, delivery, or breastfeeding. Early identification and treatment can reduce this risk of transmission from 25% to less than 2%. The CDC recommends all women get an HIV test early in each pregnancy to identify infections and start treatment in order to improve maternal health and prevent perinatal transmission.

Overall, the testing rate in the Upper Peninsula is 77.2%, which is below the Michigan rate of 86.4%. Many of the counties in the Upper Peninsula have rates higher than the state’s, but some counties have low rates of testing, such as Iron (56.9%), Dickinson (52.3%), and Menominee (25.0%). As women in Menominee County access prenatal care in Wisconsin, incomplete reporting may account for their low reported rate. The rates of HIV testing are listed in **Table 5-4**. [5] Rates of HIV testing during pregnancy

have generally improved since data was reported in 2015.

5.3.6 Smoking during Pregnancy

Tobacco use in pregnancy is a risk factor for delivery of low birthweight infants, as well as increased perinatal and neonatal loss. Nicotine impacts the developing fetus by reducing blood flow through the placenta, which retards growth and contributes directly to low birthweight. Data on smoking are collected from birth certificates and reflect smoking during any part or all of the pregnancy.

In 2016, in the United States 9.4% of women smoked prior to pregnancy and 7.1% during pregnancy. Hispanic women were less likely to smoke during pregnancy than white women, while those with less than a high school education were 13% more likely to smoke during pregnancy. [6]

In 2019, 10.39% of Michigan women reported smoking during their pregnancy. [7] From 2015 through 2019, 28.6% \pm 0.77 of mothers in the Upper Peninsula reported smoking during their pregnancy compared to 17.2% for the entire state. The ethnic breakdown for this time period was 26.9% \pm 0.81 (18.9% statewide) in White non-Hispanics, 15.9% \pm 7.9 (14.6% statewide) in Black non-Hispanics, 27.1% \pm 5.3 (12.6% statewide) in Hispanics, 48.7% \pm 3.3 (40.4% statewide) in Native Americans, and 4.7% \pm 3.4 (2.7% statewide) in Asian/Pacific Islanders. [4]

The smoking rates during pregnancy for the counties in the Upper Peninsula are presented in **Table 5-5**. [5] Remarkably, the smoking rates in every county in the Upper Peninsula are above, and often well above, the state rate. According to data gathered by the Michigan Maternal Infant Health Program prenatal exposure to smoking (defined as the combination of maternal smoking, smoking in the household, and visitors smoking in the home) was 67% in the Upper Peninsula in 2020 – a rate much higher than the other regions in Michigan. Infant exposure (defined as smoking in the home around the infant) in the Upper Peninsula was 57% in 2020, also a much higher rate than in other regions in the state. Infants can be exposed to the chemicals from cigarette smoke that accumulates in clothing, furniture, carpeting, and other surfaces (such as floors). These “third-hand” exposures are often overlooked. Cigarette smoke suppresses prolactin levels in nursing mothers, which can decrease the production of breast milk.

In the Upper Peninsula, the Upper Peninsula Health Plan (UPHP) and its partners helped to identify 160 women who were pregnant and smoking. They were contacted and given the option to participate in the Smoking Cessation and Reduction in Pregnancy Treatment Program (SCRIPT[®]) developed by the Society for Public Health Education (www.sophe.org). Booklets were requested by 105 women. Eleven women reported decreasing their smoking by more than 50% and 4 were able to quit completely. Incentives were offered for women meeting these goals. Incentives from UPHP are also offered to women who utilize smoking-cessation counseling sessions both before and after delivery.

5.3.7 Obesity and Pregnancy Weight Gain

Women who are obese entering pregnancy or gain an excessive amount of weight during the pregnancy place their infants at higher risk of being stillborn, arriving prematurely, having a high birthweight, or having a birth defect. The women are also at an increased risk for complications later in life including diabetes, heart disease, and some cancers, while their infants are twice as likely to be obese and to develop type 2 diabetes later in life.

Table 5-5: Maternal Risk Factors by County			
	Percent Smoking during Pregnancy	Percent Excessive Weight Gain during Pregnancy	Percent on WIC program
Michigan	13.6%	46.2%	35.0%
Upper Peninsula	24.9%	48.7%	44.3%
Alger	32.2%	45.6%	45.8%
Baraga	28.8%	41.8%	49.2%
Chippewa	30.6%	55.3%	56.1%
Delta	26.7%	48.3%	46.8%
Dickinson	17.1%	52.8%	46.4%
Gogebic	33.9%	44.2%	48.7%
Houghton	20.4%	53.5%	34.1%
Iron	19.6%	38.3%	55.9%
Keweenaw	40.0%	*	33.3%
Luce	38.2%	37.2%	65.5%
Mackinac	20.7%	47.6%	42.4%
Marquette	25.2%	45.2%	35.6%
Menominee	17.2%	51.6%	37.5%
Ontonagon	32.0%	48.0%	68.0%
Schoolcraft	30.5%	49.2%	61.0%

Recommendations for appropriate weight gain during pregnancy are based on pre-pregnancy body mass index (BMI); the recommended weight gain is higher for women who are underweight and lower for those women who are overweight or obese before they become pregnant. Gaining below or above the recommended weight gain guidelines can lead to health problems. Low weight gain is associated with the delivery of a low birthweight baby, which can lead to an increased risk of infant mortality, developmental delays, and other health complications.

The percentage of women with “heavy weight” prior to becoming pregnant are reported in **Table 5-4**. [5] Most counties, and the Upper Peninsula as a whole, had a rate that was higher than the statewide rate. The percentage of women entering pregnancy in Michigan as obese (BMI 30.0 or greater) has steadily increased over previous estimates. [7]

The percentage of women who experienced excessive weight gain during pregnancy, are reported in **Table 5-5**. [5] When compared to the last report (2015 data), decreases were seen in Iron, Luce, and Ontonagon counties, but increases in Delta, Houghton, and Marquette counties were identified. The percentages in the other counties remained stable.

5.3.8 WIC during Pregnancy

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program is a federally-funded health and nutrition initiative that provides supplemental food, health care referrals, and nutrition education to low-income pregnant and postpartum women and children under 5 years old. By improving the nutrition of pregnant women, postpartum women, and breastfeeding mothers, the WIC program seeks to improve maternal health, reduce the likelihood of a low birthweight infant, and reduce infant mortality. Participants must meet income guidelines. Research has shown that the WIC program plays a role in improving birth outcomes, such as reducing low birthweight, prematurity, and infant mortality, and containing health care costs. WIC also provides direct economic benefit to the counties through funding provided to these women for retail food purchases.

All counties in the Upper Peninsula, with the exception of Keweenaw County, which only recorded 15 births in 2019, reported WIC program participation rates by pregnant women that exceeded the state rate of 35.0% in 2019. The participation rate across the Upper Peninsula was 44.3% with the highest participation rates in Schoolcraft (61.0%), Luce (65.5%), and Ontonagon (68.0%) counties (see **Table 5-5**). [5] These counties have high rates of families meeting income eligibility which is set at 185% of the poverty threshold.

In 2019, 40.9% of births in Michigan were paid for by Medicaid. [7] Current county-level data are not available, so the percentage of mothers receiving support from WIC, can be used as an indirect measure of the economic status of the mothers in a region. The high percentage of WIC enrollment is consistent with the economic state of the Upper Peninsula as discussed in section §3.8.

5.3.9 Maternal Depression

Maternal depression has been associated with inadequate prenatal care, poor nutrition, higher preterm birth, and low birthweight and may have a profound impact on the social-emotional and cognitive development of infants. About 10% of women are depressed during any trimester of pregnancy or any month within the first year after delivery. Depression can inhibit a woman's ability to perform daily activities, bond with her infant, and relate to her family. Women should be routinely screened for depression during pregnancy and following delivery.

5.3.10 Maternal Vaccination

Routine vaccination of women before and during pregnancy as outlined by the CDC, can positively impact the health of their infants. The vaccination of pregnant women for COVID-19 is especially important as a COVID-19 infection during pregnancy is more likely to have severe consequences.

5.3.11 Access to Birthing Centers

Many communities in the Upper Peninsula are more than 60 minutes away from a birthing center. While the population may be sparse in many areas, the extended distance to a birthing center may limit a woman's ability to access pre- and postnatal care and impact her ability to obtain the needed level of

obstetrical and/or neonatal care in an expedient manner. This can impact outcomes for both mother and infant. In the Upper Peninsula, winter weather conditions may further constrain access to obstetric care. There are no birthing centers in Alger, Baraga, Iron, Keweenaw, Luce, Mackinac, Menominee, Ontonagon, and Schoolcraft, counties, but in most counties, satellite prenatal services are provided at least biweekly by providers from neighboring counties.

5.3.12 Proximity to a Neonatal Intensive Care Unit (NICU)

The only NICU in the Upper Peninsula is located in Marquette. For many hospitals in the Upper Peninsula, NICUs outside the Upper Peninsula may be closer. The distances from the hospitals in the Upper Peninsula to the closest NICU are listed in **Table 5-6**. The financial and emotional burdens placed on a family with an infant in the NICU are likely exacerbated by the distance from home.

Table 5-6: Closest NICU to Upper Peninsula Hospitals		
Hospital Location	Distance to Closest NICU (miles)	Closest NICU
Escanaba	67	MQT
Hancock	101	MQT
Iron Mountain	79/100	MQT/Green Bay
Iron River	88/122	MQT/Wausau
Ironwood	125/145	Wausau/MQT
Ishpeming	15	MQT
L’Anse	68	MQT
Laurium	112	MQT
Manistique	91	MQT
Marquette	0	MQT
Menominee	58	Green Bay
Munising	43	MQT
Newberry	104	MQT
Ontonagon	114	MQT
Saint Ignace	109	Traverse City
Sault Ste Marie	160/165	Traverse City/MQT
MQT = Marquette		

5.4 Birth Outcomes

5.4.1 Caesarean Birth Rates

The percentage of Caesarean deliveries steadily rose from 1996 and peaked in 2009. Significant efforts by the public health and medical communities have resulted in a reversal of the trend nationally, particularly among low-risk births. All Upper Peninsula counties, with the exception of Houghton County, had Cesarean rates higher than the state rate. The rates were highest in Alger and Delta counties. Compared to the previous report, the rate of delivery by Cesarean section has decreased with a drop in Marquette County from 40.1% to 37.1% (see **Table 5-7**). [5]

	Percent Delivered by Cesarean Section	Percent Low Birthweight	Percent Preterm Birth	Percent Initiating Breastfeeding
Michigan	32.0%	8.8%	10.3%	49.4%
Upper Peninsula	36.1%	7.4%	9.0%	56.5%
Alger	45.8%	*	*	55.9%
Baraga	35.6%	8.5%	*	61.0%
Chippewa	33.9%	6.6%	9.3%	41.0%
Delta	42.9%	9.6%	9.3%	51.4%
Dickinson	33.3%	7.7%	10.3%	62.6%
Gogebic	25.2%	*	7.8%	66.1%
Houghton	31.6%	5.9%	7.4%	80.5%
Iron	35.3%	7.8%	8.8%	65.7%
Keweenaw	40.0%	*	*	93.3%
Luce	36.4%	18.2%	21.8%	38.2%
Mackinac	39.1%	8.7%	7.6%	43.5%
Marquette	37.1%	6.8%	9.7%	62.3%
Menominee	38.0%	4.7%	6.3%	67.7%
Ontonagon	40.0%	*	0.0%	72.0%
Schoolcraft	35.6%	*	*	40.7%
* = numbers too small to make an estimate				

5.4.2 Severe Maternal Morbidity

In 2019, the rate of severe maternal morbidity per 10,000 inpatient delivery hospitalizations was 226.0 in the Upper Peninsula, with the rate being 205.5 in Native Americans and 234.8 in Whites. These rates were 194.3, 155.7, and 157.6, respectively, at the state level. [4]

5.4.3 Maternal Mortality Rate

In 2018, the maternal mortality rate in the United States was 17 for every 100,000 births. This rate is markedly higher than the rates in New Zealand (1.7), Norway (1.8), the Netherlands (3.0), Germany (3.2), Sweden (4.3), Switzerland (4.6), the United Kingdom (6.5), Canada (8.6), or France (8.7). [8] Data from 2014 through 2017 collected have revealed a steady increase in maternal mortality rates over the past several decades. The mortality rates are greater in non-Hispanic Black (41.7) and non-Hispanic “American Indian or Alaskan Native” (28.3) women. [9]

For the period from 2013 through 2017 maternal mortality (all death during pregnancy, at delivery, or within one year of pregnancy) was 58.0 per 100,000 live births in the Upper Peninsula and 67.6 per 100,000 live births in the State of Michigan. During this time frame there were 8 maternal deaths in the Upper Peninsula. [4]

5.5 Infant Risk Factors

5.5.1 Infant Mortality

Infant mortality rates are reported as the number of deaths per 1,000 live births. With an infant mortality rate of 5.8 per 1,000 live births, the United States ranks 33rd of the 36 Organization for Economic Cooperation and Development (OECD) countries, which have an average rate of 3.9. The country in this group with the lowest infant mortality rate is Iceland with 0.7 and Mexico has the highest rate of 12.1. Within the United States, New Hampshire and Vermont have the lowest rates at 3.9. Mississippi has the highest rate at 8.9. [10] In the United States, the top causes of infant mortality are birth defects, preterm birth, and low birthweight. Some have argued that infant mortality is a “social problem with health consequences,” as the main risk factor for infant mortality is poverty. [11]

The Michigan Department of Health and Human Services tracks infant mortality rates at a county-by-county level. The most recent report includes data from 2018 as a combination of numbers from 2014 through 2018. [12] None of the counties in the Upper Peninsula had more than 3 infant deaths in 2018, so county estimates of infant mortality rate were not provided. For the entire Upper Peninsula in 2018 the infant mortality rate was 5.3 ± 2.7 per 1,000 live births. This was lower than the Michigan rate of 6.6 ± 0.5 per 1,000 live births. In 2019, the rate for the entire Upper Peninsula was 7.2 ± 3.3 per 1,000 live births, while the state rate remained 6.4 per 1,000 live births.

Infant mortality in the Upper Peninsula from 2015 through 2019 was 4.7 ± 1.3 per 1,000 live births in White non-Hispanics and 6.8 ± 5.5 per 1,000 live births in Native Americans, with the state rates being 4.9 and 5.4, respectively.

During the same time period in the Upper Peninsula the infant mortality rate was 8.7 ± 6.9 per 1,000 live births for mothers under 20 years of age, 5.2 ± 1.6 per 1,000 live births for mothers 20 to 29 years of

age, and 4.9 ± 1.9 per 1,000 live births for mothers 30 years of age and older. For the state, the rates were 10.0, 7.1, and 5.6, respectively.

In the same time period, the infant mortality rate in the Upper Peninsula was 4.1 ± 1.6 per 1,000 live births for women with private insurance and 6.3 ± 1.9 per 1,000 live births for women on Medicaid, with the rates being 4.8 and 8.8 in the State of Michigan. [4] For the years from 2014 through 2018, there were no infant deaths in Alger, Keweenaw, or Schoolcraft counties. Baraga, Iron, Mackinac, Menominee, and Ontonagon counties did not have enough infant deaths to provide an infant mortality rate estimate. Only six Upper Peninsula counties have infant mortality rates reported for these years: Chippewa (3.5 ± 2.8), Delta (5.6 ± 3.5), Dickinson (4.7 ± 3.8), Gogebic (9.3 ± 7.4), Houghton (4.9 ± 3.2), and Marquette (3.6 ± 2.1). During this time span, the Michigan rate was 6.7 ± 0.2 . The infant mortality rate in the United States in 2017 was 5.8 per 1,000 live births. [13]

5.5.1.1 Sleep-Related Infant Death (formerly known as SIDS)

Between 2010 and 2018, there were 26 sleep-related infant deaths in the Upper Peninsula for a rate of 1.0 per 1,000 live births. This rate was lower than the rate of 1.3 per 1,000 live births seen in Michigan as a whole. The eleven counties in northeastern, Lower Peninsula Michigan, as a region, had the highest rate at 2.2 per 1,000 live births. [4]

5.5.2 Low Birthweight

Low weight birth describes infants who weigh less than 2,500 grams (about 5.5 pounds) at birth. Some low birthweight babies are healthy, despite being small, but being low birthweight can cause serious health problems.

Babies may be born at low birthweight because of prematurity or because of growth restriction during pregnancy from chronic maternal conditions (such as high blood pressure), maternal smoking or being exposed to smoke during pregnancy, and other factors. Many infants born under 5.5 pounds suffer from early health complications, such as breathing difficulties, and long-term impacts, such as developmental delays. Low birthweight babies are also at increased risk of vision loss, and chronic conditions later in life such as diabetes and high blood pressure.

Looking at the Upper Peninsula data from 2010 through 2019, the incidence of low birthweight infants has ranged from 5.6% in 2014 to 7.9% in 2016. In 2019, $7.1\% \pm 1.0$ of infants born in the Upper Peninsula were low birthweight. In the timespan from 2015 through 2019, low birthweight infants were seen in $7.0\% \pm 0.47$ of White non-Hispanic mothers, $11.6\% \pm 7.6$ of Black non-Hispanic mothers, $9.0\% \pm 3.4$ of Hispanic mothers, $7.1\% \pm 1.7$ of Native America mothers, and $6.7\% \pm 4.0$ of Asian/Pacific Islander mothers. The rates at the state level were 7.0%, 14.8%, 7.5%, 8.8%, and 8.1% respectively. Based on maternal age during the same time span in the Upper Peninsula, $7.2\% \pm 1.9$ of mothers under 20 years of age delivered a low birthweight infant, while this was also true of $7.0\% \pm 0.58$ of mothers 20 to 29 years of age and $7.3\% \pm 0.70$ of mothers thirty years and older. On a statewide level, the numbers are 10.7%, 8.5%, and 8.5%. By insurance coverage, $5.7\% \pm 0.57$ of low birthweight were born to mothers on private insurance and $8.5\% \pm 0.69$ to mothers on Medicaid. For the State of Michigan these rates were 7.2% and 10.5%. [4]

The data compiled indicate babies born in the Upper Peninsula were less likely to be underweight than

Michigan-born babies overall, but there were counties with higher rates of low birthweight babies than the state average (see **Table 5-7**). [5] Compared to the previous report, using 2015 data, the rates of preterm births and newborns with low birthweights remain approximately the same. [5]

5.5.3 Preterm Birth

Preterm birth is the birth of an infant before 37 weeks of gestation and is the greatest contributor to infant deaths, with most preterm-related deaths occurring among babies who were born before 32 weeks gestation. Preterm birth is also a leading cause of long-term neurological disabilities in children. Preterm birth increases the risk of death and disability for the infant. Preterm infants are more likely to be low birthweight, have respiratory difficulties, hearing and vision problems, and require advanced hospital care. Caring for a preterm infant is also expensive. A newborn delivered prematurely stays in the hospital an average of 11 days longer and costs 25 times more than a newborn born at term without complications.

From 2010 through 2019, the percentage of preterm births ranged from 7.1% in 2013 to 9.7% in 2016. In 2019, $8.6\% \pm 1.1$ of babies were born preterm. Taking all deliveries in the Upper Peninsula from 2015 through 2019, preterm births were seen in $8.6\% \pm 0.51$ of women identifying as White non-Hispanic, $13.0\% \pm 7.9$ of Black non-Hispanics, $10.5\% \pm 3.7$ of Hispanics, $7.6\% \pm 1.8$ of Native Americans, and $10.7\% \pm 4.9$ of Asian/Pacific Islanders. The state-level rates were 9.0%, 14.6%, 9.4%, 8.2%, and 10.2%, respectively. Preterm birth as related to maternal age as a factor during the same time period in the Upper Peninsula did not vary much with a rate of $9.3\% \pm 2.2$ in those under 20 years of age, $8.3\% \pm 0.63$ in the 20-29-year-olds, and $9.4\% \pm 0.79$ in those 30 years and older. The rates for Michigan were 10.6%, 9.6%, and 10.6%, respectively. By insurance type, the rates were $7.7\% \pm 0.66$ for private insurance and $9.6\% \pm 0.73$ for Medicaid with the rates being 9.2% and 11.3% on the state level. [5] The county level data show that the counties under study generally have lower rates of preterm births than the state overall (see **Table 5-7**). [5]

5.5.4 Birth Defects

Birth defects can be the result of genetics or environmental exposures. Statewide data on birth defects is collected by the Michigan Birth Defects Registry (MBDR). In 2017, the Upper Peninsula had 166 reported birth defects for a prevalence rate (based on the births to mothers living in Michigan at the time of delivery) of 622.9 per 10,000 live births. This rate was lower than the state rate of 1,387.2 per 10,000 live births and the lowest of any designated region in the state. The region consisting of Macomb, Oakland, and Wayne counties had a rate of 1,872.5 per 10,000 live births. [4]

5.5.5 Newborn Screening

Newborns are routinely screened for hearing loss, hypothyroidism, and several inherited illnesses because early detection can lead to early interventions that can make ameliorate diseases and serious health disorders that can have profound health effects throughout an infant's lifetime.

5.5.6 Breastfeeding Rates

Breastfeeding has multiple short and long-term benefits for infants and mothers. For example, breast milk is easy to digest and contains antibodies that can protect infants from bacterial and viral infections.

Breastfeeding reduces the risk of the infant becoming an overweight child with each additional month of breastfeeding, as well as lowering the risks of asthma, ear and respiratory infections, certain infections, gastrointestinal problems, eczema, type 2 diabetes, and SIDS (sudden infant death syndrome/crib death). Benefits to the breastfeeding mother include lower rates of diabetes, and certain breast and ovarian cancers.

Mothers who are less than 20 years old, have less than a high school degree, and are unmarried are less likely to breastfeed.

Given the significant drop-offs in breastfeeding that occur at two months and beyond, very few babies are likely to reach the recommended six months of exclusive breastfeeding. Less than 20% of infants are exclusively breastfed at 6 months, because many mothers stop breastfeeding after a few days, weeks or months. In research undertaken at Marquette General Hospital, infants who were breastfeeding at 2 months of age would also be breastfeeding at 6 months of age.⁷ Despite the need to support postpartum women with breastfeeding, there is a shortage of lactation consultants across the Upper Peninsula. Health departments are attempting to address this professional shortage by utilizing peer educators and increasing the trained consultant workforce.

According to the Michigan Pregnancy Risk Assessment Monitoring System (PRAMS) surveys from 2016 through 2018, breastfeeding initiation in the Upper Peninsula (94.1%) is higher than in the State of Michigan (86.3%). By three months of age the breastfeeding rate was 60.7% in the Upper Peninsula and 56.9% statewide. [4]

The initiation of breastfeeding (see **Table 5-7**) was highest in Houghton (80.5%) and Keweenaw (93.3%) counties, and lowest in Mackinac (43.5%), Chippewa (41.0%), Schoolcraft (40.7%), and Luce (38.2%) counties. The percentage of mothers initiating breastfeeding showed marked improvement in 13 of the 15 counties in the Upper Peninsula compared to 2015 data presented in the previous report. [5]

5.6 Child Health

Poverty is a social determinant of health that disproportionately impacts children (see **Table 5-8**). Between Medicaid and the Michigan Child Health Insurance Program (MIChild), the percentage of children who remained uninsured in the counties of the Upper Peninsula in 2018 ranged from 3% (Delta, Dickinson, and Marquette counties), to 4% (Baraga, Chippewa, Gogebic, Houghton, Iron, Keweenaw, Luce, and Menominee counties), to 5% (Alger, Ontonagon, and Schoolcraft counties), to 6% (Mackinac County). [14,15] Child health may also be impacted by living in single-parent households. The percentages of children living in single-parent households for each of the counties in the Upper Peninsula are shown in **Table 5-9**. [14,16]

⁷ Data available upon request from Robert S. Van Howe, MD.

Table 5-8: Economically Disadvantaged Students by County and ISD, 2019

County	Economically Disadvantage	Total Student	Percentage	95% Confidence LL	95% Confidence UL
Alger	533	973	54.8	51.7	57.9
Baraga	559	902	62	58.8	65.1
Chippewa	2585	4649	55.6	54.2	57
Delta	2588	5066	51.1	49.7	52.5
Dickinson	1520	3533	43	41.3	44.7
Gogebic	862	1509	57.1	54.6	59.6
Houghton/Keweenaw	2272	5051	45	43.6	46.4
Iron	795	1239	64.2	61.5	66.8
Luce	330	560	58.9	54.9	63
Mackinac	676	1285	52.6	49.9	55.3
Marquette	2903	7817	37.1	36.1	38.2
Menominee	1532	2790	54.9	53.1	56.7
Ontonagon	232	431	53.8	49.1	58.5
Schoolcraft	396	707	56	52.4	59.7
ISD/RESA					
Copper Country ISD	2876	6020	47.8	46.5	49
Delta-Schoolcraft ISD	3226	6065	53.2	51.9	54.4
Dickinson-Iron ISD	2352	4826	48.7	47.3	50.1
Eastern UP ISD	3552	6434	55.2	54	56.4
Gogebic-Ontonagon ISD	1121	1981	56.6	54.4	58.8
Marquette-Alger RESA	3382	8710	38.8	37.8	39.9

Table 5-9: Percentage of Children Living in Single-Parent Households	
Location	Percentage of children that live in a household headed by single parent
Michigan	34%
Alger	29%
Baraga	37%
Chippewa	34%
Delta	38%
Dickinson	30%
Gogebic	38%
Houghton	21%
Iron	40%
Keweenaw	45%
Luce	23%
Mackinac	36%
Marquette	28%
Menominee	35%
Ontonagon	25%
Schoolcraft	41%

5.6.1 Lead Screening

Lead, a heavy metal, is a toxin that can affect multiple organ systems in the body. The developing brains of young children are particularly vulnerable to the effects of lead. Even low levels of blood lead can cause decreased intelligence quotient, attention problems, and decreased academic achievement in children. Because these effects are irreversible, prevention is key. Sources of lead include paint in homes built before 1978 (when lead paint was banned) and especially in homes built before 1950 — when lead paint use was pervasive, water pumped through lead soldered pipes, imported items (including clay pots), certain home remedies, some cosmetics, jewelry, and even candy.

The high prevalence of older housing in the Upper Peninsula may place children at risk of lead exposure. American Community Survey data in 2019 only assessed the age of housing stock for Marquette County. In the county, 37.0% of the occupied housing was built before 1960, with 21.6% built before 1940. The age of Marquette County’s housing stock reflects that of the entire peninsula. For the State of Michigan

Table 5-10: Testing for Lead in Children by County			
	Total Population of Children < 72 Months of Age	Number of Children Tested < 72 Months of Age	Percentage of Children Tested < 72 Months of Age
Upper Peninsula	17,420	2458	14.1%
Alger	412	68	16.5%
Baraga	489	74	15.1%
Chippewa	2,251	287	12.7%
Delta	2,292	305	13.3%
Dickinson	1,513	192	12.7%
Gogebic	747	158	21.2%
Houghton	2,322	440	18.9%
Iron	543	75	13.8%
Keweenaw	110	3	2.7%
Luce	333	53	15.9%
Mackinac	500	86	17.2%
Marquette	3,988	440	11.0%
Menominee	1,301	185	14.2%
Ontonagon	176	36	20.5%
Schoolcraft	443	56	12.6%

45.5% was built before 1960 with 13.8% built before 1940. [17] Given the advanced age of the occupied housing stock in the Upper Peninsula, it is encouraging to see that blood-lead testing rarely (0.45%) identifies an elevated lead level (greater than 5 µg/dL⁸). This may reflect that older homes, to avoid becoming dilapidated, need to be painted on a regular basis, so lead-containing paint has likely been covered and sealed.

To help provide education and prevention when it can be most effective, children in Michigan who have risk factors on screening, and all Medicaid-insured children, should have routine lead testing done performed. All Medicaid enrolled children are considered by federal policy to be at high risk for blood-lead poisoning. In accordance with the Centers for Medicare and Medicaid Services (CMS) guidelines, Michigan Medicaid policy requires that all Medicaid enrolled children be blood-lead tested at 12 and 24

⁸ In October 2021, the blood lead reference level was lowered from 5.0 µg/dL to 3.5 µg/dL.

months of age, or between 36 and 72 months of age if not previously tested. [18] The most recent CDC guidance (October 2021) indicates that a child’s blood-lead level of 3.5 micrograms per deciliter (µg/dL) is considered in need of action.

In the latest county-level data available from the Centers for Disease Control and Prevention, in 2016 of children under 72 months of age, 14.1% had their blood lead level tested (see **Table 5-10**). Of those tested, 0.45% had a blood lead level above 5 µg/dL. All 11 cases were in Houghton County. Going back as far as 2013, only Houghton and Marquette Counties have seen children with an elevated lead level. [19]

	2015	2019
Michigan	13.1	
Alger	2.1	*
Baraga	*	*
Chippewa	5.1	5.4
Delta	0.9	5.7
Dickinson	0.8	4.1
Gogebic	*	*
Houghton	0.9	2.6
Iron	*	3.6
Keweenaw	*	*
Luce	3.8	*
Mackinac	10.7	9.8
Marquette	2.6	5.3
Menominee	*	3.6
Ontonagon	*	*
Schoolcraft	3.1	5.7
* = numbers too small to allow accurate reporting		

5.7 Induced Abortions

Nearly all induced abortions in the U.S. are related to unintended pregnancy. Unintended pregnancies may be a result of incorrect contraceptive use, lack of access to contraceptives, or lack of use of contraceptives. The abortion rate is calculated as the number of reported induced abortions per 1,000 women aged 15-44 years old. The abortion rate in the Upper Peninsula is significantly lower than the state average. This may, in part, reflect the very limited access to abortion services in the region. However, as can be seen in **Table 5-11**, compared to 2015 data, there has been an increase in the abortion rates in Delta, Dickinson, Houghton, Iron, Marquette, and Menominee counties. [20]

5.8 Potential Future Implications

Maternal-child health needs to remain a priority. While programs directed at improving the health of pregnant women, infants, and children are making a positive impact, efforts in the Upper Peninsula need to be focused on:

- Access and availability of early prenatal care,
- COVID-19 vaccination for pregnant women,
- Decreasing maternal smoking rates, and
- The social determinants of health that impact pregnancy outcomes, including poverty, obesity, and access to care.

References

- [1] 2019 Geocoded Michigan Birth Certificate Registry, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services. <https://www.mdch.state.mi.us/osr/natality/BirthsTrends.asp>. Accessed December 15, 2020.
- [2] Statistical Atlas. Household Types in Michigan. <https://statisticalatlas.com/state/Michigan/Household-Types#figure/county>. Accessed December 16, 2020.
- [3] Statistical Atlas. Household Types in Michigan. <https://statisticalatlas.com/state/Michigan/Household-Types>. Accessed December 16, 2020.
- [4] Michigan Department of Health & Human Services. Maternal Child Health Epidemiology Section. https://www.michigan.gov/documents/mdhhs/PR1_RPQC_Data_Meeting_Final_664111_7.pdf. Accessed June 15, 2021.
- [5] 2019 Geocoded Michigan Birth Certificate Registry, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services. <https://www.mdch.state.mi.us/pha/osr/chi/births14/frameBxChar.html>. Accessed December 15, 2020.
- [6] Kondracki AJ. Prevalence and patterns of cigarette smoking before and during early and late pregnancy according to maternal characteristics: the first national data based on the 2003 birth certificate revision, United States, 2016. *Reprod Health* 2019; 16: 142. <https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-019-0807-5>. Accessed December 15, 2020.
- [7] Centers for Disease Control and Prevention. WONDER. <https://wonder.cdc.gov/controller/datarequest/D149;jsessionid=E542BA4FEE40BC1992EECE49479A>. Accessed December 15, 2020.
- [8] Tikkanen R, Gunja MZ, FitzGerald M, Zephyrin L. Maternal mortality and maternity care in the United States Compared to 10 other developed countries. Commonwealth Fund. November 2020.

<https://doi.org/10.26099/411v-9255>. <https://www.commonwealthfund.org/publications/issue-briefs/2020/nov/maternal-mortality-maternity-care-us-compared-10-countries>. Accessed December 16, 2020.

[9] Centers for Disease Control and Prevention. Pregnancy Mortality Surveillance System. <https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm#trends>. Accessed December 16, 2020.

[10] America's Health Rankings 2018 Annual Report. <https://www.americashealthrankings.org/learn/reports/2018-annual-report/findings-international-comparison>. Accessed December 16, 2020.

[11] Wagner MG. Infant mortality in Europe: implications for the United States. *J Publ Health Pol* 1998: 473-84.

[12] Michigan Department of Health and Human Services. Number of infant deaths, live births and infant death rates by Michigan and Michigan county of residence, 2018 and 2014 - 2018 Average. <http://www.mdch.state.mi.us/pha/osr/indxmain/tab3.asp>. Accessed December 16, 2020.

[13] Michigan Department of Health and Human Services. Number and rate of infant deaths by race, Michigan and United States residents, 1989 - 2018. <http://www.mdch.state.mi.us/pha/osr/indxmain/InfDx.asp>. Accessed December 16, 2020.

[14] County Health Rankings & Roadmaps. www.countyhealthrankings.org. Accessed June 18, 2021.

[15] U.S. Census Bureau's Small Area Health Insurance Estimates.

[16] American Community Survey (2015-2019)

[17] United States Census Bureau. <https://data.census.gov/cedsci/all?q=S25&d=ACS%201-Year%20Estimates%20Subject%20Tables>

[18] Centers for Medicare & Medicaid Services. Lead screening. <https://www.medicare.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/lead-screening/index.html>. Accessed December 16, 2020.

[19] Centers for Disease Control and Prevention. Michigan. CDC Childhood Blood Lead Surveillance Data. <https://www.cdc.gov/nceh/lead/data/state/midata.htm>. Accessed December 16, 2020.

[20] Michigan Department of Health and Human Services. Michigan Health Statistics. Natality, pregnancy & abortion statistics. https://www.mdch.state.mi.us/osr/abortion/Tab_1.asp (numbers) <https://www.mdch.state.mi.us/osr/abortion/AbortionRates.asp> (rates). Accessed December 15, 2020.

6 ADOLESCENT HEALTH

Children are not small adults and adolescents are neither children nor adults. Adolescents are freer to act on their own, but do not have the maturity of most adults. They are exposed to the same temptations as adults but do not always have the wisdom to deal with them. Adolescents are presented with a number of health challenges that differ from those confronted by children and adults. Many of our lifetime health patterns are established during adolescence. Some, like eating nutritiously and engaging in regular physical activity, have positive lifetime effects. Other patterns of risky behavior, whether unsafe sex, smoking cigarettes or vaping, substance use, or alcohol use, can lead to poorer health and shorter longevity. Environmental influences, such as family, peer groups, schools, and community characteristics, also contribute to adolescents' current and future health and risk behaviors. Adolescence is a time of rapid change and development that needs to be monitored with well exams provided by a medical professional and screening for mental health and high-risk behaviors. The adolescent also needs to receive recommended vaccinations for meningococcus and human papillomavirus (HPV) and have access to reproductive health services to prevent unplanned pregnancies and sexually transmitted infections.

This chapter will discuss the challenges faced by adolescents, including their patterns of sexual activity, alcohol consumption, tobacco use, and illegal drug use. In the past, the Michigan Department of Education's Michigan Profile for Healthy Youth (MIPHY) survey was administered in the public schools across the Upper Peninsula. This survey was replaced by the Communities that Care Youth Risk and Protective Survey (also known as the Bach Harrison Survey). The combination of the loss of funding for Communities that Care and the disruptions associated with the COVID-19 pandemic has resulted in a paucity of local data regarding adolescent behaviors. Consequently, statewide data collected as part of the Michigan Youth Risk Behavior Surveillance System (YRBS) from 2019 are provided. [1] Local data are included when available.

6.1 The Brain in Adolescence and Young Adulthood

It takes longer for the brain to fully develop than previously thought, as biological brain maturation may not be complete until well into one's 20's. It usually takes the male brain longer to mature than the female brain. With the onset of puberty, the brain's socio-emotional system increasingly seeks rewards in the presence of peers. With time, as the brain matures, cognitive control systems help the individual to better self-regulate behaviors. Functional imaging of the brain has demonstrated that the adolescent's brain works differently from the adult brain when making decisions or solving problems. The adolescent's decisions are guided by the emotional and reactive part of the brain (amygdala), while the adult typically relies more on the thoughtful, logical frontal cortex. Exposure to drugs and alcohol during the teen years further delays brain maturation. This does not preclude young people from making good decisions, from differentiating between right and wrong, or from being held responsible for their actions. Awareness of the differences between how the adolescent brain functions and how the adult brain functions may assist parents, teachers, and other community members to understand, anticipate, and manage adolescent behavior.

6.1.1 Developmental Issues

Going through the transition from childhood to adulthood, the American Academy of Child and Adolescent Psychiatry has identified a number of developmental issues that every adolescent faces.

Middle School and Early High School Years [2]

Movement towards Independence

- Struggle with sense of identity
- Feeling awkward or strange about one's self and one's body
- An increased focus on self, alternating between high expectations and low self-esteem
- Interests and clothing style influenced by peer group
- Moodiness
- Improved ability to use speech to express one's self
- Realization that parents are not perfect; identification of their faults
- Less overt affection shown to parents, with occasional rudeness
- Complaints that parents interfere with independence
- Learning to drive and share family automobiles
- Tendency to return to childish behavior, particularly when stressed
- Resistance to following their parents' belief system or cultural traditions

Future Interests and Cognitive Changes

- Interested in present, with limited thoughts of the future
- Intellectual interests expand and gain in importance
- Greater ability to do work (physical, mental, emotional)

Sexuality

- Display shyness, blushing, and modesty
- Increased interest in sex
- Concerns regarding physical and sexual attractiveness to others
- Frequently changing relationships
- Worries about being normal

Morals, Values, and Self-Direction

- Rule and limit testing
- Capacity for abstract thought; beginning to understand the potential consequences of future behaviors
- Development of ideals and selection of role models
- Experimentation with sex and drugs (cigarettes, alcohol, and marijuana)

Late High School Years and Beyond [3]

The brain continues to develop throughout later adolescence.

Movement towards Independence

- Increased independent functioning
- Firmer and more cohesive sense of identity
- Examination of inner experiences

- Ability to think ideas through
- Conflict with parents begins to decrease
- Increased ability for delayed gratification and compromise
- Increased emotional stability
- Increased concern for others
- Increased self-reliance
- Peer relationships remain important and take an appropriate place among other interests
- Firmer religious and cultural belief system which may be different from their parents and family

Future Interests and Cognitive Changes

- Work habits become more defined
- Increased concern for the future and life beyond high school
- More importance is placed on one's role in life

Sexuality

- Feelings of love and passion
- Development of more serious relationships
- Firmer sense of sexual identity
- Increased capacity for tender and sensual love

Morals, Values, and Self-Direction

- Greater capacity for setting goals
- Capacity to use insight
- Increased emphasis on personal dignity and self-esteem
- Family, social and cultural traditions regain some of their previous importance

6.2 Adolescent Behaviors

Noting that adolescent behaviors differ from adults' behaviors, surveys of behaviors have isolated data collected from adolescents for separate analysis. Three major surveys [1,4,5] provide useful information in understanding changes in behaviors in this age group. The most recent information available is from 2019.

6.2.1 Sexual Behaviors

The adolescent years are a time of early sexual experimentation. The 2019 data for Michigan and the nation is seen in **Table 6-1**. [1] The numbers reflect the failings of some public health initiatives. Despite a large push to have sexually active adolescent females use long-acting reversible contraceptives (LARCs), such as intrauterine devices (IUDs), as their primary method of birth control, uptake of this method remains low. While the United States Preventive Services Taskforce (USPSTF) recommends routinely testing all sexually active females in this age group for chlamydia, [6] only 87.1% of females reported having not been tested for a sexually transmitted infection other than HIV.

Table 6-1: YRBS — Sexual Activity, Michigan & United States 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Ever had sexual intercourse	35.3 (30.6, 40.3)	34.8 (30.0, 39.8)	35.8 (30.4, 41.7)	38.4 (35.4, 41.6)
Had sexual intercourse for the first time before age 13 years	2.5 (1.8, 3.3)	1.5 (0.9, 2.4)	3.3 (2.4, 4.6)	3.0 (2.5, 3.6)
Had sexual intercourse with four or more persons (p=.08)	6.7 (5.2, 8.7)	5.4 (4.1, 7.1)	8.1 (5.8, 11.2)	8.6 (7.5, 9.9)
Were currently sexually active (had sexual intercourse with at least one person, in past 3 months)	24.4 (20.8, 28.4)	24.6 (20.4, 29.5)	24.1 (20.4, 28.3)	27.4 (25.2, 29.8)
Did not use a condom during last sexual intercourse (among students who were currently sexually active)	45.2 (39.5, 51.1)	48.3 (42.0, 54.7)	41.6 (33.9, 49.7)	45.7 (43.4, 48.0)
Did not use birth control pills before last sexual intercourse (among students who were currently sexually active)	73.4 (69.1, 77.3)	67.6 (61.7, 73.0)	79.5 (74.2, 83.9)	77.0 (73.4, 80.3)
Did not use an IUD or implant before last sexual intercourse (among students who were currently sexually active)	94.6 (92.4, 96.2)	93.6 (90.2, 95.8)	95.7 (91.3, 97.9)	95.2 (93.1, 96.8)
Did not use birth control pills; an IUD or implant; or a shot, patch, or birth control ring before last sexual intercourse (among students who were currently sexually active)	64.6 (59.6, 69.4)	56.5 (50.7, 62.2)	73.1 (67.6, 78.0)	69.1 (65.1, 72.8)
Did not use both a condom during last sexual intercourse and birth control pills; an IUD or implant; or a shot, patch, or birth control ring before last sexual intercourse (among students who were currently sexually active) (p=.06)	87.0 (82.8, 90.3)	82.6 (77.4, 86.8)	91.7 (85.8, 95.2)	90.9 (89.1, 92.5)
Did not use any method to prevent pregnancy during last sexual intercourse (among students who were currently sexually active)	13.6 (10.9, 16.8)	13.8 (10.4, 18.0)	13.2 (9.4, 18.4)	11.9 (10.3, 13.9)
Drank alcohol or used drugs before last sexual intercourse (among students who were currently sexually active)	21.5 (18.5, 24.8)	19.7 (15.5, 24.7)	23.2 (18.8, 28.2)	21.2 (18.8, 23.9)
Were never tested for human immunodeficiency virus (HIV) (p<.01)	86.6 (84.9, 88.2)	86.8 (84.2, 89.1)	86.3 (84.2, 88.2)	90.6 (89.5, 91.5)
Were not tested for a sexually transmitted disease (STD) other than HIV (p<.01)	87.3 (85.3, 89.1)	87.1 (84.5, 89.3)	87.7 (85.5, 89.5)	91.4 (90.3, 92.3)

6.2.2 Alcohol Consumption

Even though the national drinking age in the United States is 21, adolescents between the ages of 12 and 20 years are known to imbibe. Youth who drink are more likely to have school, social, legal, and physical problems related to their alcohol use. In 2019, according to the National Survey on Drug Use and Health (NSDUH), of those 12 to 20 years of age, 39.7% had at least one drink in their lives with 18.5% reporting having a drink in the past month (17.2% male, 19.9% female), with 11.1% reporting binge drinking (10.4% male, 11.8% female).[7] Among 12-17 year olds, 1.7% met the criteria for alcohol use disorder (1.3% male, 2.1% female).[8]

The University of Michigan’s Monitoring the Future Study of those in the eighth, tenth, and twelfth grades reported self-reported alcohol intake from 2017 through 2020 is documented in **Table 6-2**. Alcohol use may be trending up, especially in eighth and tenth graders. [4] The results of 2019 YRBS survey of Michigan and US youth regarding alcohol use are show in **Table 6-3**. [1] While the drinking rates among youth were lower in Michigan than the United States as a whole, female youth in Michigan showed a tendency toward higher rates of current and binge drinking than Michigan males.

Table 6-2: Monitoring the Future — Alcohol Use, 2017 - 2020

	Lifetime	Past Year	Past Month	Daily	5+ Drinks/Row
Eighth Grade					
2017	23.1	18.2	8	0.2	3.7
2018	23.5	18.7	8.2	0.1	3.7
2019	24.5	19.3	7.9	0.2	3.8
2020	25.6	20.5	9.9	0.4	4.5
Tenth Grade					
2017	42.2	37.7	19.7	0.6	9.8
2018	42.2	37.8	18.6	0.5	8.7
2019	43.1	37.7	18.4	0.6	8.5
2020	46.4	40.7	20.3	1	9.6
Twelfth Grade					
2017	61.5	55.7	33.2	1.6	16.6
2018	58.5	53.3	30.2	1.2	13.8
2019	58.5	52.1	29.3	1.7	14.4
2020	61.5	55.3	33.6	2.7	16.8

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Had their first drink of alcohol before age 13 years (other than a few sips)	13.6 (12.1, 15.3)	12.3 (10.7, 14.3)	14.5 (12.4, 16.7)	15.0 (13.7, 16.4)
Currently drank alcohol (at least one drink in past 30 days) (p=.03)	25.4 (22.6, 28.3)	27.0 (23.6, 30.6)	23.6 (20.2, 27.5)	29.2 (27.3, 31.2)
Currently were binge drinking in past 30 days (p=.05)	11.2 (9.3, 13.4)	12.3 (10.2, 14.8)	10.1 (7.9, 13.0)	13.7 (12.3, 15.2)
Usually obtained the alcohol they drank by someone giving it to them	39.5 (35.3, 43.8)	42.3 (36.7, 48.0)	36.7 (31.2, 42.7)	40.5 (38.2, 42.9)
Reported that the largest number of drinks they had in a row was 10 or more within a couple of hours in the past 30 days (p=.07)	2.2 (1.6, 3.1)	1.4 (0.7, 2.5)	3.1 (2.1, 4.5)	3.1 (2.5, 3.8)

The most recent local data was collected by Upper Peninsula Communities that Care in 2017 to 2019 are shown in **Table 6-4**. [9]

6.2.3 Tobacco Use

Tobacco use primarily begins and becomes a sustained or lifelong habit during adolescence. In response to the 2017 UPCHIPS, for those who had ever smoked, the average for starting smoking was 17.14 years (SD=4.47, median=17). In this survey, women started smoking 0.68 years later than males (17.43 versus 16.75, difference 0.68, 95%CI: 0.31, 1.04, t=3.67, p=.0003). Former and current smokers began smoking at nearly the same ages (t=1.22, p=.2245). 2017: Men started smoking, on average, 0.675 years younger than women (95%CI: 0.314, 1.036, t=3.67, p=.0003). Level of education was positively correlated with the age at which smoking was initiated (t=4.35, p<.0001). In those with less than high school the average age was 15.62 (SD=3.57) years. For those with high school or GED, those with some college, and those with a bachelor’s degree or more the averages were 17.04 (SD=4.82), 17.05 (SD=4.28), and 17.81 (SD=4.22), respectively. Using multivariate analysis, income level (p=.5775) and county of residence (p=.4050) were not significant, while gender (lower in women t=4.48, p<.0001), age (t=7.41, p<.0001), and education level (p<.0001) were statistically significant factors.

Table 6-4: CTC Youth Survey Alcohol Use* (%)

	Sixth Grade	Eighth Grade	Tenth Grade	Twelfth Grade
Alger (2020)	10.3	10.9	16.4	40.5
Baraga (2020)	5.9	13.6	38.2	49.3
Chippewa (2018)	2.1	13.3	20.2	46.2
Delta (2020)	4.1	14.0	31.8	32.5
Dickinson (2022)	4.9	14.1	22.0	33.9
Gogebic (2019)	5.0	20.6	14.9	39.3
Houghton/Keweenaw (2019)	*	10.9	12.5	26.6
Iron (2017)	3.9	20.8	43.7	50.8
Luce (2018)	0	7.9	23.1	47.1
Mackinac (2021)	3.5	11.3	32.0	31.7
Marquette (2020)	5.1	9.1	23.8	38.0
Menominee (2021)	9.4	19.3	29.8	42.1
Ontonagon (2019)	2.2	11.1	18.2	15.2
Schoolcraft (2019)	1.7	16.4	31.6	42.3
* Alcohol use in the last 30 days				

According to the NSDUH, nationally lifetime cigarette use increased in eighth graders from 9.1% (2018) to 11.5% (2020), while it decreased in tenth graders (16.0% (2018) to 13.9% (2020)) and in twelfth graders (26.6% (2017) to 24.0% (2020)). Use within the past month ranged from 1.9% to 2.3% in eighth graders, but decreased in tenth graders (5.0% (2017) to 3.2% (2020)) and twelfth graders (9.7% (2017) to 7.5%). Daily use shows a similar pattern with eighth graders steady at 0.8%, and decreases in the tenth graders (2.2% (2017) to 1.2% (2020)) and the twelfth graders (4.2% (2017) to 3.1% (2020)). The only positive note is that for twelfth graders use in the past year had dropped from 35.3% in 2019, use in the past month from 25.5% in 2019, and daily use from 16.6% in 2019. Unfortunately, these gains may have been offset by increased rates of vaping with products containing nicotine and THC.

In the Monitoring the Future survey, from 2017 through 2020, smoking rates appear to be decreasing (**Table 6-5**). [4] This drop-in smoking may also be compensated by an increase in the use of e-cigarettes for both nicotine and THC.

Table 6-5: Monitoring the Future — Smoking, 2017-2020				
	Lifetime	Past Month	Daily	1/2+ packs per day
Eighth grade:				
2017	9.4	1.9	0.6	0.2
2018	9.1	2.2	0.8	0.3
2019	10	2.3	0.8	0.2
2020	11.5	2.2	0.8	0.1
Tenth grade:				
2017	15.9	5	2.2	0.7
2018	16	4.2	1.8	0.7
2019	14.2	3.4	1.3	0.5
2020	13.9	3.2	1.2	0.6
Twelfth grade:				
2017	26.6	9.7	4.2	1.7
2018	23.8	7.6	3.6	1.5
2019	22.3	5.7	2.4	0.9
2020	24	7.5	3.1	1.4

The results of 2019 YRBS survey of Michigan and US youth regarding tobacco use are shown in **Table 6-6**. [1] Michigan youth had significantly lower rates of use of a number of tobacco products when compared to the nation as a whole. Michigan males were more likely to smoke cigarettes than Michigan females, but the females were more likely to have tried vaping products.

The most recent local data was collected by Upper Peninsula Communities that Care from 2017 to 2022 are shown in **Table 6-7**. [9] There has been a drop-in smoking in some counties, which may represent a shift to e-cigarette use (vaping).

6.2.3.1 E-cigarettes / Vaping

Since the release of e-cigarettes in 2006 and the marketing campaigns directed at young people (see Section §11.2.6), there has been an increase in vaping in young people. In 2017, 44.5% of those under 18 years of age have ever tried e-cigarettes (45.5% in males, 43.5% in females), with 14.8% reporting current use of e-cigarettes (16.3% in males, 13.1% in females). In their 2015 survey, the CDC reported 23.0% current use in this age group (26.3% in males, 19.7% in females). It is not clear if this is an actual decrease or a difference in the methodology used to collect data. [10]

The University of Michigan’s Monitoring the Future Study found that ever having tried vaping a nicotine product doubled in each of the grades sampled (**Table 6-8**). [4]

Table 6-6: YRBS — Tobacco Use, Michigan & United States 2019
Percentage (95% confidence interval)

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Ever tried cigarette smoking (even one or two puffs)	21.1 (18.4, 24.2)	20.2 (17.3, 23.5)	21.9 (18.5, 25.8)	24.1 (21.3, 27.0)
First tried cigarette smoking before age 13 years (even one or two puffs)	7.3 (5.8, 9.3)	6.4 (5.5, 7.5)	8.0 (5.8, 10.8)	7.9 (6.7, 9.1)
Currently smoked cigarettes (on at least 1 day during the past 30 days)	4.5 (2.9, 7.0)	3.2 (2.0, 5.2)	5.6 (3.5, 8.9)	6.0 (5.0, 7.2)
Currently smoked cigarettes frequently (on 20 or more days during the past 30 days)	1.0 (0.4, 2.7)	0.5 (0.2, 1.5)	1.3 (0.3, 5.2)	1.3 (1.0, 1.8)
Currently smoked cigarettes daily (p=.07)	0.6 (0.2, 1.3)	0.4 (0.1, 1.5)	0.6 (0.2, 2.2)	1.1 (0.8, 1.5)
Smoked more than 10 cigarettes per day	6.5 (3.1, 13.1)	NO DATA	NO DATA	8.1 (5.1, 12.8)
Ever used electronic vapor products	49.8 (46.5, 53.1)	52.1 (48.5, 55.6)	47.5 (43.8, 51.2)	50.1 (48.1, 52.2)
Currently used electronic vapor products in past 30 days (p<.01)	20.8 (17.2, 24.9)	21.5 (17.2, 24.9)	20.1 (16.1, 24.7)	32.7 (30.7, 34.8)
Currently used electronic vapor products frequently (on 20 or more days during the past 30 days)	9.9 (7.3, 13.4)	9.6 (6.8, 13.3)	10.3 (7.1, 14.5)	10.7 (9.5, 11.9)
Currently used electronic vapor products daily	7.2 (5.3, 9.6)	6.5 (4.7, 8.9)	7.7 (5.5, 10.7)	7.2 (6.2, 8.3)
Usually got their own electronic vapor products by buying them in a store	10.4 (7.1, 14.9)	7.6 (4.9, 8.9)	13.4 (8.4, 20.7)	8.1 (6.8, 9.6)
Currently used smokeless tobacco in the past 30 days (p=.07)	2.9 (2.2, 3.7)	1.0 (0.5, 2.3)	4.3 (3.3, 5.4)	3.8 (3.2, 4.6)
Currently smoked cigars in the past 30 days	5.2 (3.9, 6.9)	3.0 (2.0, 4.5)	7.2 (5.3, 9.5)	5.7 (4.8, 6.7)
Currently smoked cigars frequently (on 20 or more days during the past 30 days) (p=.07)	0.6 (0.3, 1.1)	0.4 (0.1, 0.9)	0.7 (0.3, 1.7)	1.1 (0.8, 1.4)
Currently smoked cigars daily (<.01)	0.3 (0.1, 0.6)	0.2 (0.0, 0.8)	0.3 (0.1, 0.7)	0.8 (0.6, 1.1)
Currently smoked cigarettes or cigars in the past 30 days	7.5 (5.6, 10.0)	5.1 (3.3, 7.9)	9.5 (7.2, 12.6)	9.2 (7.8, 10.8)
Currently smoked cigarettes or cigars or used smokeless tobacco in past 30 days	8.6 (6.5, 11.3)	5.9 (4.0, 8.6)	10.8 (8.2, 14.1)	10.5 (9.0, 12.2)
Currently smoked cigarettes or cigars or used smokeless tobacco or electronic vapor products in past 30 days (p<.01)	23.0 (19.4, 27.0)	22.6 (18.3, 27.6)	23.0 (19.1, 27.5)	36.5 (33.6, 39.5)
Currently smoked cigarettes or used electronic vapor products in past 30 days (p<.01)	21.7 (18.1, 25.7)	21.8 (17.6, 26.8)	21.3 (17.5, 25.8)	34.4 (32.1, 36.7)
Did not try to quit using all tobacco products in past 12 months (p=.02)	46.8 (42.9, 50.7)	43.6 (37.0, 50.5)	49.7 (43.5, 56.0)	52.4 (49.9, 54.9)

Table 6-7: CTC Youth Survey Cigarette Use* (%)

	Sixth Grade	Eighth Grade	Tenth Grade	Twelfth Grade
Alger (2020)	0	0	9.0	17.5
Baraga (2020)	5.8	3.4	16.9	18.7
Chippewa (2020)	0.9	1.5	2.4	5.3
Delta (2020)	3.0	5.4	2.5	2.5
Dickinson (2022)	0.8	2.8	5.7	3
Gogebic (2019)	0	2.9	1.5	15.4
Houghton/Keweenaw (2019)	*	5.1	14.1	16.4
Iron (2017)	0	2.8	7	16.7
Luce (2018)	0	10.5	7.9	11.4
Mackinac (2021)	1.7	1.6	1.4	6.7
Marquette (2020)	0.7	1.8	5.2	11.1
Menominee (2021)	1.4	2.2	3.6	6.2
Ontonagon (2019)	0	0	4.5	0
Schoolcraft (2019)	0	3.3	8.8	13.4
* Cigarette use in the last 30 days				

Table 6-8: Monitoring the Future — Vaping Nicotine, 2017 & 2020

	Ever Used	Past Year	Past Month	Daily
Eighth grade:				
2017	10.6	7.5	3.5	—
2020	22.7	16.6	10.5	2
Tenth grade:				
2017	21.4	15.8	8.2	—
2020	38.7	30.7	19.3	5.6
Twelfth grade:				
2017	25	18.8	11	—
2020	44.3	34.5	24.7	8.6

6.2.4 Marijuana Use

Teen brains are still developing and can be permanently damaged by marijuana use. Marijuana can negatively impact school performance through difficulty in thinking and problem solving, impaired coordination, and difficulty maintaining attention. Teens who use marijuana regularly are also at increased risk for mental health issues, impaired driving, and addiction.

The University of Michigan’s Monitoring the Future Study found marijuana use increased from 2017 through 2019, where it peaked and decreased in 2020 in all three grades. The only exception is that daily use continued to increase in twelfth graders (see **Table 6-9**). [4] By contrast there has been steady increase in vaping THC products in all three grades (see **Table 6-10**) [4]

The results of the 2019 YRBS survey of Michigan and US youth regarding marijuana use are shown in **Table 6-11**. [1] Young women in Michigan tried and continue to smoke marijuana at a rate greater than young men.

The most recent local data collected by Upper Peninsula Communities that Care from 2018 to 2022 are shown in **Table 6-12**. [9]

Table 6-9: Monitoring the Future — Marijuana Use, 2017-2020

	Lifetime	Past Year	Past Month	Daily
Eight grade				
2017	13.5	10.1	5.5	0.8
2018	13.9	10.5	5.6	0.7
2019	15.2	11.8	6.6	1.3
2020	14.8	11.4	6.5	1.1
Tenth grade				
2017	30.7	25.5	15.7	2.9
2018	32.6	27.5	16.7	3.4
2019	34	28.8	18.4	4.8
2020	33.3	28	16.6	4.4
Twelfth grade				
2017	45	37.1	22.9	5.9
2018	43.6	35.9	22.2	6.4
2019	43.7	35.7	22.3	6.4
2020	43.7	35.2	21.1	6.9

Table 6-10: Monitoring the Future — Vaping THC, 2017-2020

	Lifetime	Past Year	Past Month	Daily
Eighth grade				
2017	4	3	1.6	—
2018	5.5	4.4	2.6	—
2019	9	7	3.9	0.8
2020	10.2	8.1	4.2	0.7
Tenth grade				
2017	9.8	8.1	4.3	—
2018	14.2	12.4	7	—
2019	21.8	19.4	12.6	3
2020	22.7	19.1	11.3	1.7
Twelfth grade				
2017	11.9	9.5	4.9	—
2018	15.1	13.1	7.5	—
2019	23.7	20.8	14	3.5
2020	27.9	22.1	12.2	2.5

Table 6-12: CTC Youth Survey Marijuana Use* (%)

	Sixth Grade	Eighth Grade	Tenth Grade	Twelfth Grade
Alger (2020)	0	0	13.4	23.1
Baraga (2020)	5.9	1.7	21.7	43.8
Chippewa (2020)	1.7	9.2	18.4	19.3
Delta (2020)	1.5	7.0	14.9	13.8
Dickinson (2022)	0	8.8	14.5	20.5
Gogebic (2019)	0	10.4	1.5	29.8
Houghton/Keweenaw (2019)	*	5	8.9	13.5
Luce (2018)	0	10.8	7.9	26.5
Mackinac (2021)	0	3.3	14.7	25.9
Marquette (2020)	0.5	6.0	22.4	23.5
Menominee (2021)	1.1	5.9	13.0	14.1
Ontonagon (2019)	0	0	4.5	12.1
Schoolcraft (2019)	0	3.3	3.5	9.6
* Marijuana use in the last 30 days				

6.2.5 Opioid Use

The national opioid epidemic (see Section §11.5) has also included adolescents in Michigan. To assess drug use in students in the eighth, tenth, and twelfth grades, both in Michigan and nationally, the University of Michigan’ Monitoring the Future Study has sampled this population yearly from 2017 through 2020. The survey has documented decreases from 2017 to 2020 in twelfth graders of having ever used a narcotic (other than heroin) from 6.8% to 5.3%, use in the past year (4.2% to 2.1%), and use in the past month (1.6% to 0.7%). [4] These decreases may reflect the dramatic decrease in the number of opioid prescriptions dispensed (see **Table 11-7**).

The results of the 2019 YRBS survey of youth from Michigan and across the nation regarding opioid use are shown in **Table 6-11**. [1] The rates of opioid use in Michigan youth are similar to the rates seen in the country as a whole. The most recent local data was collected by Upper Peninsula Communities that Care from 2017 to 2022 are shown in **Table 6-13**. [9]

Table 6-11: YRBS — Drug Use, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Ever used marijuana	37.5 (33.7, 41.5)	40.8 (35.9, 45.8)	34.4 (30.4, 38.5)	36.8 (34.4, 39.2)
Tried marijuana for the first time before age 13 years	5.4 (3.9, 7.4)	4.0 (2.8, 5.8)	6.4 (4.5, 9.1)	5.6 (4.9, 6.5)
Currently used marijuana in past 30 days	21.6 (19.0, 24.4)	23.9 (20.8, 27.3)	19.3 (16.5, 22.4)	21.7 (19.9, 23.7)
Ever used synthetic marijuana	7.7 (6.8, 8.7)	7.8 (6.4, 9.4)	7.4 (6.1, 8.9)	7.3 (6.4, 8.4)
Ever took prescription pain medicine without a doctor's prescription or differently than how a doctor told them to use it	13.1 (11.5, 14.9)	13.9 (12.0, 16.1)	12.1 (10.2, 14.4)	14.3 (12.8, 15.9)
Currently took prescription pain medicine without a doctor's prescription in past 30 days	NO DATA	NO DATA	NO DATA	7.2 (6.3, 8.3)
Ever used cocaine	3.4 (2.4, 4.8)	2.0 (1.3, 2.9)	4.5 (3.0, 6.7)	3.9 (3.2, 4.7)
Ever used inhalants (p=.06)	7.5 (6.6, 8.5)	6.8 (1.3, 2.9)	8.1 (7.0, 9.4)	6.4 (5.8, 7.1)
Ever used heroin	2.2 (1.5, 3.1)	0.7 (0.4, 1.3)	3.3 (2.3, 4.8)	1.8 (1.3, 2.5)
Ever used methamphetamines	2.6 (1.8, 3.9)	0.9 (0.5, 1.5)	3.9 (2.6, 5.9)	2.1 (1.6, 2.8)
Ever used ecstasy	NO DATA	NO DATA	NO DATA	3.6 (2.9, 4.3)
Ever used hallucinogenic drugs	NO DATA	NO DATA	NO DATA	7.0 (5.8, 8.4)
Ever took steroids without a doctor's prescription	2.2 (1.6, 3.1)	0.9 (0.6, 1.04)	3.1 (2.1, 4.5)	1.9 (1.5, 2.4)
Ever injected any illegal drug	2.2 (1.6, 3.0)	1.1 (0.6, 1.9)	3.0 (2.1, 4.2)	1.6 (1.2, 2.3)
Were offered, sold, or given an illegal drug on school property in past 12 months (p=.01)	25.0 (23.2, 27.0)	24.1 (22.1, 26.2)	25.7 (23.0, 28.6)	21.8 (20.3, 23.4)
Ever used select illicit drugs	NO DATA	NO DATA	NO DATA	14.8 (13.0, 16.7)

Table 6-13: CTC Youth Survey Opioid Use* (%)

	Sixth Grade	Eighth Grade	Tenth Grade	Twelfth Grade
Alger (2020)	*	*	*	*
Baraga (2020)	0	1.7	8.5	1.4
Chippewa (2020)	1.6	0.8	1.6	5.6
Delta (2020)	1.1	1.3	2.0	2.5
Dickinson (2022)	1.6	1.4	4.4	2.3
Gogebic (2019)	0	2.9	1.5	6.9
Houghton/Keweenaw (2019)	*	4.3	1.2	3.9
Iron (2017)	1.3	5.7	21.1	27.3
Luce (2018)	2.7	0	0	0
Mackinac (2021)	0	0	0	5.1
Marquette (2020)	0.7	1.3	2.4	6.7
Menominee (2021)	0.3	1.4	3.0	1.9
Ontonagon (2019)	0	0	0	0
Schoolcraft (2019)	1.7	4.9	3.5	9.6
* Non-prescription opioid use ever				

6.2.6 Vehicle Safety

Teens face the greatest risk of being in a motor vehicle accident in their first year of driving with one in every five licensed 16-year-olds being in a crash. Not surprisingly, motor vehicles are one of the leading causes of death for teenagers. Driving is a learned skill, and inexperience leads to more accidents. For these reasons, Michigan has adopted graduated driver licensing in which young drivers are taught to drive by gradually increasing driving privileges. [11] Data on vehicle safety in the 2019 YRBS for Michigan and the United States are shown in **Table 6-14**. [1] Driving while drinking or being a passenger with a driver who has been drinking were lower in Michigan than in the country as a whole.

Table 6-14: YRBS — Vehicle Safety, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Rarely or never wore a seat belt	NO DATA	NO DATA	NO DATA	6.5 (5.3, 8.0)
Rode with a driver who had been drinking alcohol (p=.04)	14.6 (13.4, 16.0)	14.6 (12.9, 16.4)	14.4 (12.4, 16.6)	16.7 (15.2, 18.2)
Drove when they had been drinking alcohol one or more times in last 30 days (p=.02)	3.6 (2.6, 4.9)	2.1 (1.1, 3.7)	4.9 (3.4, 7.1)	5.4 (4.5, 6.5)
Texted or e-mailed while driving a car or other vehicle in last 30 days	38.9 (36.2, 41.7)	39.0 (35.8, 42.2)	38.8 (35.2, 42.5)	39.0 (36.4, 41.7)

6.3 Health Issues

Some health issues are more likely to impact adolescents more than adults. For example, a certain percentage of children and adolescents with asthma “outgrow” the condition in adulthood. Perhaps more importantly, one’s lifetime nutritional and exercise habits, which combined may contribute more than any other factor to the onset of diseases that result in early mortality, are established during one’s teens. Establishing good eating and exercise habits in this age group has been identified prime target for education.

6.3.1 Asthma

Asthma is chronic, recurrent reversible bronchospasm (tightening of airways often with wheezing). Triggers for chronic asthma and asthma attacks include respiratory infections, smoking in the household, air pollution, dry air (wood burning stoves), toxic chemicals/perfumes, allergies (pollen, mold, dust mites, pet dander), and stress. Active management of asthma directed at the severity of the individual patient’s illness is the hallmark of therapy. In addition to improving access to primary health care, public health measures are directed at the factors that trigger bronchospasm. These efforts include education, reduction of exposure to secondhand smoke, reduction in air pollution, and filtered ventilation systems in public places such as schools. In Michigan in 2019, according to the YRBS, 24.2% (95%CI: 22.6, 25.9) of youth (23.6% (95%CI: 22.1, 25.2) of females and 24.5% (95%CI: 22.1, 27.1) of males) had been told by a physician or nurse that they had asthma. This percentage was significantly higher (p=.03) than 21.8% (95%CI: 20.4, 23.2) of youth across the United States who reported being told they had asthma. [1] These are statewide figures and may reflect the experience in the population centers in the Lower Peninsula that have different pollution exposure and ethnic distributions than seen in the Upper Peninsula.

6.3.2 Physical Activity

The lack of physical activity has been linked to the development of obesity, heart disease, and diabetes. While exercise habits in adults are, in part, linked to an individual’s level of education, socio-economic status, and easy access to green spaces, these habits are often established during adolescence. The 2019 YRBS results from Michigan and the United States regarding physical activity-related questions are presented in **Table 6-15**. [1] Young females in Michigan were consistently less likely to be physically active than young males in Michigan.

Table 6-15: YRBS — Physical Activity, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Did not participate in at least 60 minutes of physical activity on at least 1 day in past 7 days	16.5 (14.9, 18.3)	19.2 (16.7, 22.0)	13.7 (12.0, 15.5)	17.0 (15.4, 18.7)
Were not physically active at least 60 minutes per day on 5 or more days in past 7 days	55.3 (51.6, 59.0)	62.5 (58.1, 66.7)	48.0 (44.2, 51.9)	55.9 (53.7, 58.1)
Were not physically active at least 60 minutes per day on all 7 days in past 7 days	78.2 (75.5, 80.6)	84.3 (81.3, 86.9)	72.1 (68.8, 75.2)	76.8 (75.4, 78.1)
Did not do exercises to strengthen or tone muscles on three or more days in past 7 days	NO DATA	NO DATA	NO DATA	50.5 (48.7, 52.4)
Played video or computer games or used a computer 3 or more hours per day (p=.01)	42.4 (40.0, 44.8)	42.0 (39.2, 44.9)	42.7 (38.9, 46.5)	46.1 (44.4, 47.9)
Watched television 3 or more hours per day (on an average school day)	18.5 (16.3, 20.9)	19.8 (16.7, 23.4)	17.1 (15.2, 19.2)	19.8 (18.3, 21.3)
Did not attend physical education (PE) classes on 1 or more days (in an average week) (p<.01)	68.8 (64.9, 72.6)	78.3 (75.2, 81.1)	59.8 (53.8, 65.5)	47.8 (42.6, 53.1)
Did not attend physical education (PE) classes on all 5 days (in an average week when in school)	75.9 (72.0, 79.5)	83.5 (80.2, 86.2)	68.4 (62.7, 73.7)	74.1 (69.0, 78.5)
Did not play on at least one sports team in past 12 months	NO DATA	NO DATA	NO DATA	42.6 (39.6, 45.7)
Had a concussion from playing a sport or being physically active in past 12 months	14.4 (12.6, 16.3)	11.5 (9.7, 13.6)	16.8 (14.7, 19.1)	15.1 (14.1, 16.3)

6.3.3 Adequate Sleep

According to the 2109 YRBS in Michigan 82.4% (95%CI: 80.2, 84.4) of youth (83.4% (95%CI: 81.1, 85.5) of females and 81.4% (95%CI: 78.3, 84.1) of males) reported they did not get 8 or more hours of sleep on an average school night. This percentage was significantly higher (p<.01) than the 77.9% (95%CI: 76.3, 79.4) of youth across the United States. [1] This calls attention to the need for High Schools to look at their hours of operation, keeping in mind that high school students are not able to learn much before 10 a.m. The adolescent brain tells the body to stay up later than when they were younger. With early start

times, the adolescent is sleep deprived during the week. They attempt to catch up on their sleep by sleeping in on the weekends. As a result, the student is living in one time-zone during the week and a different time-zone on the weekend. As one pediatric sleep specialist noted, these students are persistently jet-lagged.

Table 6-16: YRBS — Nutrition, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Did not eat fruit or drink 100% fruit juices in past 7 days	6.5 (5.7, 7.5)	5.2 (4.0, 6.8)	7.9 (6.6, 9.3)	6.3 (5.4, 7.3)
Did not eat vegetables (not counting French fries, fried potatoes, or potato chips) in past 7 days	8.3 (7.4, 9.3)	5.7 (4.6, 6.9)	11.0 (9.6, 12.4)	7.9 (7.1, 8.7)
Did not drink milk in past 7 days	30.8 (28.7, 33.0)	39.9 (37.1, 42.7)	22.0 (19.4, 24.8)	30.6 (29.0, 32.3)
Drank soda or pop in past 7 days (p=.09)	70.9 (68.7, 73.0)	65.0 (61.9, 68.0)	76.4 (74.1, 78.6)	68.3 (66.2, 70.4)
Drank a can, bottle, or glass of soda or pop (not counting diet soda or diet pop) one or more times per day in past 7 days	14.2 (12.5, 16.2)	10.0 (8.0, 12.5)	18.0 (16.1, 20.0)	15.1 (13.1, 17.2)
Drank a can, bottle, or glass of soda or pop (not counting diet soda or diet pop) two or more times per day in the past 7 days	8.3 (6.9, 10.0)	5.9 (4.8, 7.3)	10.4 (8.4, 12.7)	9.3 (7.7, 11.2)
Drank a sports drink in past 7 days	NO DATA	NO DATA	NO DATA	49.9 (46.7, 53.2)
Drank a can, bottle, or glass of a sports drink one or more times per day in past 7 days	NO DATA	NO DATA	NO DATA	10.6 (9.2, 12.3)
Drank a can, bottle, or glass of a sports drink two or more times per day in past 7 days	NO DATA	NO DATA	NO DATA	6.1 (5.0, 7.4)
Did not drink a bottle or glass of plain water in past 7 days	NO DATA	NO DATA	NO DATA	4.0 (3.2, 5.0)
Did not eat breakfast in past 7 days (p=.04)	19.3 (17.3, 21.4)	19.6 (17.1, 22.4)	18.7 (16.4, 21.3)	16.7 (15.3, 18.1)
Did not eat breakfast on all 7 days in past 7 days (p=.01)	71.0 (68.5, 73.4)	74.1 (70.9, 77.2)	67.8 (65.1, 70.3)	66.9 (64.5, 69.2)

6.3.4 Nutrition

Despite being the wealthiest country in the world, the United States has a high percentage of people that are poorly nourished. A lack of food is not the problem, but rather the types of foods that are eaten. Much of the American diet consists of highly processed foods, either purchased at fast food establishments or the supermarket, that are high in simple carbohydrates and salt. Meals made from scratch using fresh ingredients, including fruits and vegetables, are both more nutritious and more economical than processed foods. Lifetime eating habits are established in adolescence. Learning how

to eat only when hungry and only enough to fuel the body’s needs is an important life-skill. Ignoring the cues to eat based on time of day, mood (whether happy or sad), or social occasions can often be difficult. For high school students in Michigan surveyed in 2019, responses to nutritional questions posed in the YRBS are shown in **Table 6-16**. [1] Young females in Michigan were less likely to drink milk, which is essential for preventing osteoporosis later in life, and soda than males. It is not clear if these practices are related to body image differences and attention to sources of calories between males and females.

6.3.5 Weight

The United States is in the middle of an obesity epidemic (see Section §9.2.9). The epidemic also impacts adolescents. The obesity rates in high school students in Michigan in 2019 are shown in **Table 6-17**. [1] In reviewing the results on perception of weight and actual estimates of body mass index (BMI), high school females have a large gap between whether they consider themselves to be more overweight than their calculated BMI would indicate. Body image appears to be more important for females than males. This may explain why girls have higher rates of having tried nicotine containing products, which are believed to help keep weight under control, and lower consumptions of milk and soda, which are considered to be calorically dense.

Table 6-17: YRBS— Obesity, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Had obesity (students who were \geq 95th percentile for body mass index, based on sex and age-specific reference data from the 2000 CDC growth charts)	15.3 (13.0, 17.9)	13.8 (11.0, 17.3)	16.7 (14.2, 19.6)	15.5 (13.8, 17.3)
Were overweight (students who were \geq 85th percentile but $<$ 95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	16.1 (14.6, 17.6)	15.9 (13.9, 18.0)	16.3 (14.1, 18.8)	16.1 (14.9, 17.5)
Described themselves as slightly or very overweight	31.8 (29.8, 33.9)	36.0 (33.3, 38.7)	27.6 (24.9, 30.5)	32.4 (30.7, 34.1)
Were not trying to lose weight (p=.09)	54.4 (52.0, 56.8)	43.3 (39.8, 46.9)	65.2 (62.6, 67.8)	51.7 (49.7, 53.7)

6.3.6 Adolescent Well-Child Examinations

An important method of monitoring health habits, screening for health conditions, and providing health education is through regular visits with a primary healthcare professional. These visits are often missed as long as the child is up-to-date on vaccinations, but these visits are more than about being inoculated. While medical clearance is required for participation in sports or enrollment in summer camp programs, these clearances often do not include the overall evaluation of the adolescent’s health. More importantly, the adolescents at greater risk for developing chronic physical and mental illnesses often are not involved in sports or attend summer camp.

The 2019 YRBS in Michigan did not ask about encounters with the medical systems except noting 1.2% (95%CI: 0.8, 1.8) of youth (1.0% (95%CI: 0.7, 1.3) of females and 1.4% (95%CI: 0.8, 2.4) of males) reported having never seen a dentist. This percentage was significantly lower ($p=.05$) than 1.9% (95%CI: 1.4, 2.5) of youth across the United States who reported never having seen a dentist. [1]

Table 6-18: YRBS — Exposure to Violence, Michigan & United States, 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Carried a weapon in last 30 days	13.9 (12.1, 15.9)	6.5 (5.4, 7.9)	20.8 (18.0, 24.0)	13.2 (11.9, 14.5)
Carried a weapon on school property in last 30 days	2.5 (1.8, 3.5)	1.1 (0.7, 1.8)	3.6 (2.5-5.2)	2.8 (2.1, 3.5)
Carried a gun in last 12 month, not including hunting or target shooting	4.2 (3.1, 5.5)	1.3 (0.8, 2.1)	6.4 (4.7, 8.7)	4.4 (3.8, 5.3)
Were threatened or injured with a weapon on school property in last 12 months	7.4 (6.2, 8.8)	6.1 (4.5-8.1)	8.3 (7.0, 9.8)	7.4 (6.4, 8.5)
Were in a physical fight in last 12 months	19.7 (17.3, 22.3)	12.6 (10.6, 15.0)	26.3 (23.0, 29.9)	21.9 (20.3, 23.6)
Were in a physical fight on school property in last 12 months	6.8 (5.5, 8.4)	3.8 (2.8, 5.1)	9.7 (7.6, 12.3)	8.0 (7.1, 9.1)
Were electronically bullied in the last 12 months ($p=.01$)	18.1 (16.7, 19.7)	22.4 (20.7, 24.1)	14.0 (12.1, 16.2)	15.7 (14.6, 16.9)
Were bullied on school property in last 12 months	21.4 (19.3, 23.8)	23.1 (20.6, 25.7)	19.6 (17.2, 22.3)	19.5 (18.2, 20.9)
Did not go to school because they felt unsafe at school or on their way to or from school in last 30 days	9.3 (7.6, 11.2)	10.1 (8.2, 12.4)	8.1 (6.4, 10.2)	8.7 (7.5, 10.1)
Were ever physically forced to have sexual intercourse ($p<.01$)	9.9 (8.6, 11.4)	14.4 (12.4, 16.7)	5.4 (4.2, 6.8)	7.3 (6.5, 8.2)
Experienced sexual violence by anyone in last 12 months	11.7 (10.7, 12.8)	17.7 (15.6, 20.1)	5.8 (4.5-7.3)	10.8 (9.9, 11.7)
Experienced sexual dating violence in last 12 months ($p=.01$)	6.3 (5.3, 7.5)	9.4 (7.4, 11.9)	3.0 (2.0, 4.5)	8.2 (7.4, 9.1)
Experienced physical dating violence in past 12 months ($p=.04$)	6.5 (5.3, 7.8)	7.4 (5.7, 9.6)	5.2 (4.2, 6.5)	8.2 (7.2, 9.4)

6.4 Mental Health Issues

6.4.1 Violence

Exposure to stressful situations can have a negative impact on both physical and mental health. For adolescents bullying and exposure to violence are frequent causes of stress. The 2019 YRBS survey results for Michigan high school students regarding exposure to violence are shown in **Table 6-18**. [1] Females were more likely to be bullied online and the recipients of physical and sexual violence.

6.4.2 Adverse Childhood Events

Public Health has made the shift from concentrating on communicable diseases to identifying the underlying causes of chronic illnesses. Under the broader heading of social determinants of health, the impact of adverse childhood experiences is emerging as an important factor in determining the physical and mental health of both adults and adolescents.

Adverse childhood experiences (ACEs) are potentially traumatic experiences that occur before the age of 18. They can include violence, abuse, and growing up in a family with mental health or substance abuse problems. The 1998 ACE study [12] of 9,500 adults found that as the number of categories of childhood exposure increased, there were significant increases in ischemic heart disease, cancer, chronic lung disease, skeletal fractures, liver disease, depression, smoking, suicide attempts, alcoholism, drug use, having 50 or more sexual intercourse partners, and sexually transmitted diseases.

In data collected in 2019, 68% of Michigan adults surveyed reported one or more ACEs. Of these, 38% reported verbal abuse, 26% physical abuse, and 14% sexual abuse. A history of an ACE is associated with also reporting poor general health (21% versus 14%), poor physical health (15% versus 9%), poor mental health (20% versus 7%), smoking (22% versus 11%), current asthma (13% versus 8%), and binge drinking (20% versus 13%). As the number of ACEs reported increased, the risk of ever being diagnosed with depression increased (no ACEs 11% versus 4+ ACEs 41%). Likewise, a higher number of ACEs experienced correlates with taking part in risky health behaviors and experiencing chronic diseases like cancer, diabetes, stroke, and heart disease. [13]

6.4.3 Depression

Depression is common during adolescence. The data regarding depression from the 2019 YRBS for Michigan youth and US youth are seen in **Table 6-19**. [1] The percentage of Michigan youth reporting feeling “sad or hopeless almost every day for 2 or more weeks in a row in the past 12 months” was similar to the percentage of your reporting this across the nation. The percentage of females in Michigan providing a positive response to this question was nearly double that of males providing a positive response.

The most recent local data was collected by Upper Peninsula Communities that Care from 2017 to 2022 are shown in **Table 6-20**. [9]

Table 6-19: YRBS — Suicide, Michigan & United States 2019

Question	Michigan Total	Michigan Female	Michigan Male	US Total
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Felt sad or hopeless almost every day for 2 or more weeks in a row in past 12 months	36.4 (33.6, 39.3)	46.4 (42.5-50.4)	26.4 (24.1, 28.9)	36.7 (35.1, 38.3)
Seriously considered attempting suicide in past 12 months	18.7 (16.8, 20.9)	22.5 (20.0, 25.3)	14.6 (12.7, 16.8)	18.8 (17.6, 20.0)
Made a plan about how they would attempt suicide in past 12 months	14.6 (12.9, 16.4)	16.8 (14.9, 18.9)	12.0 (10.0, 14.3)	15.7 (14.6, 16.9)
Actually attempted suicide in past 12 months	7.8 (6.4, 9.5)	8.4 (6.8, 10.3)	6.7 (5.0, 8.9)	8.9 (7.9, 10.0)
Suicide attempt resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse in past 12 months	2.5 (2.0, 3.0)	2.9 (2.2, 3.7)	1.9 (1.4, 2.7)	2.5 (2.1, 3.0)

Table 6-20: CTC Youth Survey Depression Rates (%)

	Depressed or Sad Most Days			
	Sixth Grade	Eighth Grade	Tenth Grade	Twelfth Grade
Alger (2020)	47.4	43.6	59.1	60.4
Baraga (2020)	47.1	29.3	61.4	60.8
Chippewa (2020)	39.7	45.1	52.5	62.3
Delta (2020)	48.5	53.6	50.5	56.0
Dickinson (2022)	47.2	47.6	46.3	53.5
Gogebic (2019)	44.3	49.3	58.3	64.4
Houghton/Keweenaw (2019)	*	34.1	28.7	26.2
Iron (2017)	38.5	50.7	57.7	37.9
Luce (2018)	44.7	54.0	56.4	37.2
Mackinac (2021)	62.5	58.4	70.3	57.7
Marquette (2020)	34.5	42.7	44.2	50.0
Menominee (2021)	12.4	26.4	40.6	49.8
Ontonagon (2019)	40.0	54.0	54.5	42.5
Schoolcraft (2019)	26.7	39.3	68.5	51.0

6.4.4. Suicide

The data regarding suicide from the 2019 YRBS for Michigan youth and US youth are seen in **Table 6-18**.

[1] Given that females are more likely to report being sad or hopeless, females are more likely than males to contemplate and attempt suicide. These statistics may be skewed by survivor bias as males 2.5 times more likely to succeed when attempting suicide. [14] The impact of the COVID-19 on adolescent suicide rates has yet to be fully studied.

6.5 Potential Future Implications

- Experimentation with alcohol, tobacco and other drugs as well as sex begins in early adolescence for many local children and increases through the high school years. Without successful prevention efforts, this can lead to a variety of poor outcomes including teen pregnancy, motor vehicle accidents, sexually transmitted infections, low educational attainment, and chronic diseases associated with ongoing tobacco or alcohol use.
- Routine annual well-child care is an opportunity to identify and remediate health and developmental concerns, and to focus on prevention through immunization review and anticipatory guidance in the areas of nutrition, exercise, reproductive health, tobacco and other substance use and general safety concerns.

References

- [1] Centers for Disease Control and Prevention. Youth Online: High School YRBS. <https://nccd.cdc.gov/youthonline/App/Default.aspx>. Accessed December 29, 2020.
- [2] American Academy of Child and Adolescent Psychiatry. Adolescent Development Part I. https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Normal-Adolescent-Development-Part-I-057.aspx. Accessed May 28, 2021.
- [3] American Academy of Child and Adolescent Psychiatry. Adolescent Development Part II. https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Normal-Adolescent-Development-Part-II-058.aspx. Accessed May 28, 2021.
- [4] National Institutes of Health. National Institute on Drug Abuse. Monitoring the Future Study: Trends in Prevalence of Various Drugs. <https://www.drugabuse.gov/drug-topics/trends-statistics/monitoring-future/monitoring-future-study-trends-in-prevalence-various-drugs>. Accessed May 10, 2021.
- [5] SAMHSA. 2019 National Survey on Drug Use and Health (NSDUH).
- [6] U.S. Preventive Services Task Force. Chlamydia and gonorrhea: screening. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/chlamydia-and-gonorrhea-screening>. Accessed December 2, 2020.
- [7] SAMHSA. 2019 National Survey on Drug Use and Health. Table 7.16B—Alcohol Use in Lifetime, Past Year, and Past Month among Persons Aged 12 to 20, by Gender: Percentages, 2002-2019. Available at <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec7pe2019.htm#tab7-16b>. Accessed 9/15/20. Obtained at: From National Institutes of Health. National Institute of Alcohol Abuse and Alcoholism (NIAAA). Alcohol Facts and Statistics. https://www.niaaa.nih.gov/sites/default/files/publications/NIAAA_Alcohol_FactsandStats_102020.pdf. Accessed April 1, 2021.
- [8] SAMHSA. 2019 National Survey on Drug Use and Health (NSDUH). Table 5.4A—Alcohol Use Disorder in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Numbers in Thousands, 2018 and 2019. Available at: <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec>

- t5pe2019.htm#tab5-4a. Accessed 9/15/20. Obtained at: From National Institutes of Health. National Institute of Alcohol Abuse and Alcoholism (NIAAA). Alcohol Facts and Statistics. https://www.niaaa.nih.gov/sites/default/files/publications/NIAAA_Alcohol_FactsandStats_102020.pdf. Accessed April 1, 2021.
- [9] Upper Peninsula Communities That Care. CTC Youth Survey. www.upctc.com/data. Accessed April 27, 2022.
- [10] Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System (2014-2015). https://nccd.cdc.gov/STATESystem/rdPage.aspx?rdReport=OSH_State.CustomReports. Accessed December 15, 2020.
- [11] The Office of the Secretary of State of Michigan. Graduated Driver Licensing. https://www.michigan.gov/sos/0,4670,7-127-1627_60169_60175---,00.html. Accessed July 23, 2021.
- [12] Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults.: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med* 1998; 14(4): 245-58.
- [13] Tian Y, McKane P. Health risk behaviors within the State of Michigan: 2019 Behavioral Risk Factor Survey. 33rd annual report. Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division; 2021.
- [14] Miranda-Mendizabal A, Castellivi P, Parés-Badell O, et al. Gender differences in suicidal behavior in adolescents and young adults: systematic review and meta-analysis of longitudinal studies. *Int J Public Health* 2019; 64(2): 265-83.

7 VACCINATION

7.1 Introduction

The steady increase in life expectancy during the Twentieth Century resulted largely from reductions in infant and child mortality, primarily in the form of fewer childhood deaths from infectious diseases – primarily through improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs.

Vaccines are one of the most important public health triumphs in history and are responsible for eradicating smallpox and nearly eliminating polio from the world stage. Vaccines are irrefutably among the most cost-effective clinical preventive services we can provide and are a core component of preventive health care.

A robust vaccination program is one of the most important tools available to protect the health of children in our communities, but we must maintain high levels of vaccination within our communities to limit the spread of vaccine-preventable infectious diseases. When enough members of the community are vaccinated (usually 80% or 90% or more), an unvaccinated individual may be protected by “herd immunity.”⁹ Unfortunately, with the most contagious illnesses, if only 5% of the population fails to vaccinate, outbreaks among those not vaccinated can occur.

Unfortunately, some discredited “scientific research” has created unwarranted fears among many parents regarding vaccination safety. This has led to an increase in the number of children incompletely vaccinated or vaccinated on a delayed time schedule. Not surprisingly, a number of measles outbreaks have occurred in communities where vaccination was questioned.

Currently, the major barrier to the success of vaccination programs is that the Internet Age has provided a platform for discredited “scientific information” and untrue, misleading, and frightening anecdotal information, intended to discourage vaccination. The ongoing public health challenge is to counter this false information with credible, research-based evidence that confirms the safety and efficacy of vaccinations. While good information can empower adults to make sound choices to protect their own health and the health of their families through vaccination, it is also important to understand what motivates parents, who want what is best for their children, to put their children at increased risk to contract a vaccine-preventable illness.

One of the lessons learned from the COVID-19 pandemic is that increasing international travel carries with it the potential to bring both new and nearly-eradicated pathogens, back to the United States from places where they are still endemic. The emergence of a new pathogen or even a novel strain of a vaccine-preventable disease can result in a significant increase in serious illnesses and death. As long as there are communities with pockets of unvaccinated and under-vaccinated people at increased risk for outbreaks of these diseases and these people are allowed to travel, we will continue to see outbreaks of vaccine-preventable illnesses.

⁹ The percentage of vaccine coverage needed to prevent an outbreak of a vaccine-preventable disease depends on the infectivity of the virus or bacteria targeted. The more infectious the virus, the higher level of vaccination coverage needed avoid outbreaks. For example, measles, perhaps the most contagious virus, requires vaccination coverage of 93-94% of the population to be most effective. By contrast, mumps, which is less contagious, needs approximately 80% coverage to prevent outbreaks from spreading. COVID-19 is estimated to need a vaccination rate between 70% and 85% in order to provide herd immunity.

7.2 New Vaccines of Interest

7.2.1 Hepatitis A

Hepatitis A is of increased interest because of an outbreak beginning in southeast Michigan in 2016 continues. Southeastern Michigan is now considered a hepatitis A hot spot. Hepatitis A is a vaccine-preventable, communicable disease of the liver caused by the hepatitis A virus (HAV). It is typically transmitted from person-to-person through the fecal-oral route or consumption of contaminated food or water. Unlike hepatitis B or C, hepatitis A is a self-limited disease that does not result in chronic infection. Most adults with hepatitis A have symptoms, including fatigue, low appetite, stomach pain, nausea, and jaundice, that typically resolve within two months of infection; most children less than 6 years of age do not have symptoms or have an unrecognized infection, yet are able to spread illness to others. Antibodies produced in response to hepatitis A infection last for life and protect against reinfection. Routine childhood vaccination against hepatitis A is recommended by the CDC's Advisory Committee on Immunization Practices (ACIP) and for adults in high-risk groups, as well as for any adult desiring protection. Vaccination is highly effective at preventing disease and is the best tool to stop the spread of the virus within Michigan communities.

7.2.2 Human Papillomavirus (HPV)

Human papillomavirus (HPV) vaccine protects against cancers caused by HPV infection, the most common sexually transmitted infection. Despite its popularity, most people with HPV never develop symptoms or health problems. Nine out of ten HPV infections go away by themselves within two years. Unfortunately, some strains of HPV stay longer and can cause cancers of the cervix, vagina, and vulva in women; cancers of the penis in men; and cancers of the anus and back of the throat, including the base of the tongue and tonsils (oropharynx), in both women and men. Every year in the United States, HPV causes more than 30,000 cancers in men and women. HPV vaccination can prevent most of these cancers (about 28,000) from occurring. It is a powerful cancer prevention tool and all children should be vaccinated, beginning at 11 to 12 years of age.

7.3 Local Vaccination Rates

As with many aspects of our lives, the COVID-19 pandemic impacted vaccination rates across the United States, including Michigan and the Upper Peninsula. Early in the outbreak, for fear of spreading the virus responsible for COVID-19 to otherwise healthy patients, well-child visits and the vaccinations associated with these visits were postponed. Likewise, vaccination clinics at local public health departments were placed on hold. These lost opportunities to vaccinate explain the dip in vaccination rates in the first half of 2020. While the number of vaccines given has increased since this dip, this increase has failed to compensate for the vaccinations missed earlier in the year and has yet to reach the rates seen prior to the outbreak of the pandemic. Consequently, the region may be at risk for outbreaks of vaccine-preventable illnesses. The lack of such outbreaks to date may reflect the travel restrictions and other mitigation practices aimed at reducing the spread of COVID-19, which may have kept the spread of the vaccine-preventable illness at bay.

The trends in vaccination rates from the fourth quarter of 2013 through the second quarter of 2020 are shown in the graphs that follow.

7.3.1 Newborn Vaccinations

Newborns are routinely vaccinated for hepatitis B. **Figure 7-1** shows the trends in newborns receiving this vaccination by county. Data for the second quarter of 2020 was not collected.

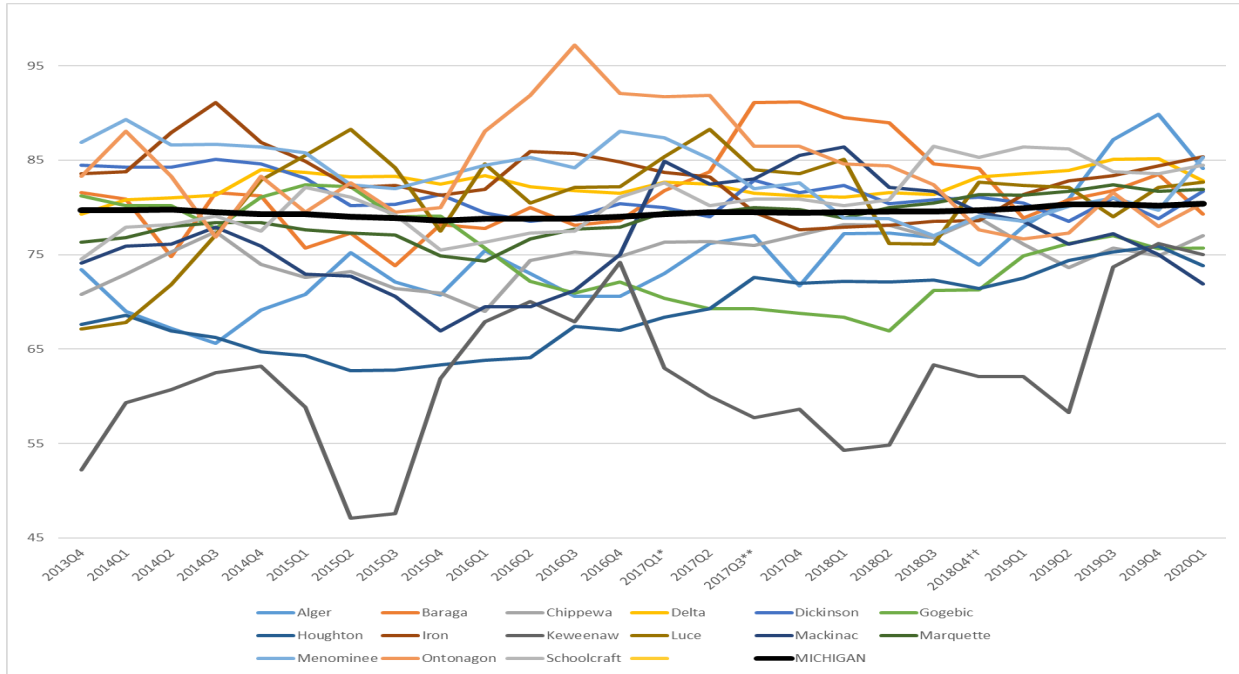


Figure 7-1: Hepatitis B Vaccine Administered to Newborns, 2013 Q4 through 2020 Q1

7.3.2 19-35 Months of Age

The primary series of vaccination through three years of age consists of receiving 4 DTaP (diphtheria, tetanus, acellular pertussis) vaccines, 3 polio vaccines, 1 MMR (measles, mumps, rubella (German measles)) vaccine, 3 Hemophilus influenza type b vaccines, 3 hepatitis B vaccines, 1 varicella (chicken pox) vaccine, and 4 pneumococcal vaccines and is abbreviated as 4313314. The percentages of children completing this series by 36 months of age is shown in **Figure 7-2**.

In data from the second quarter of 2020, Delta (78.4%) and Marquette (78.0%) counties ranked in the top 10 counties, while Gogebic County (61.7%) was among the lowest ranking counties.

Two doses of the vaccine for hepatitis A have been added to the primary series. The rates of completing the primary series with the addition of the hepatitis A vaccine (known as 43133142) are shown in **Figure 7-3**.

In data from the second quarter of 2020, Marquette County (63.7%) ranked in the top 10 counties, while Gogebic (41.0%) and Mackinac (37.8%) counties were among the lowest ranking counties.

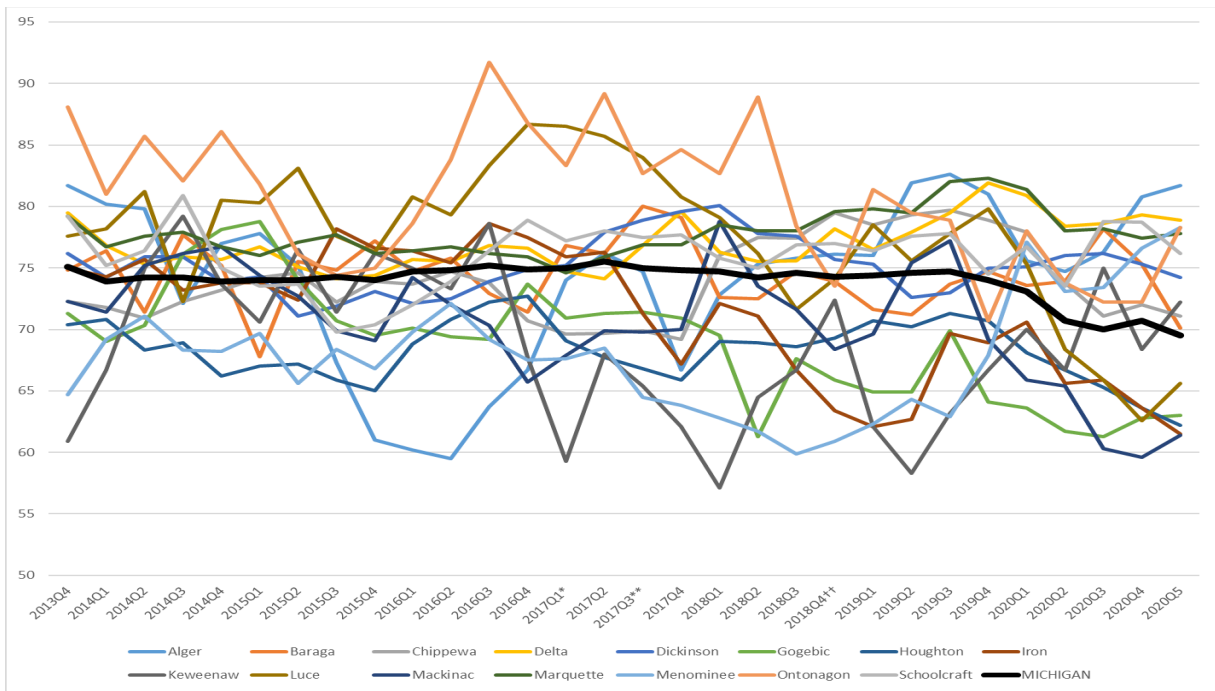


Figure 7-2: Primary Childhood Vaccines (4313314), 2013 Q4 through 2021 Q1

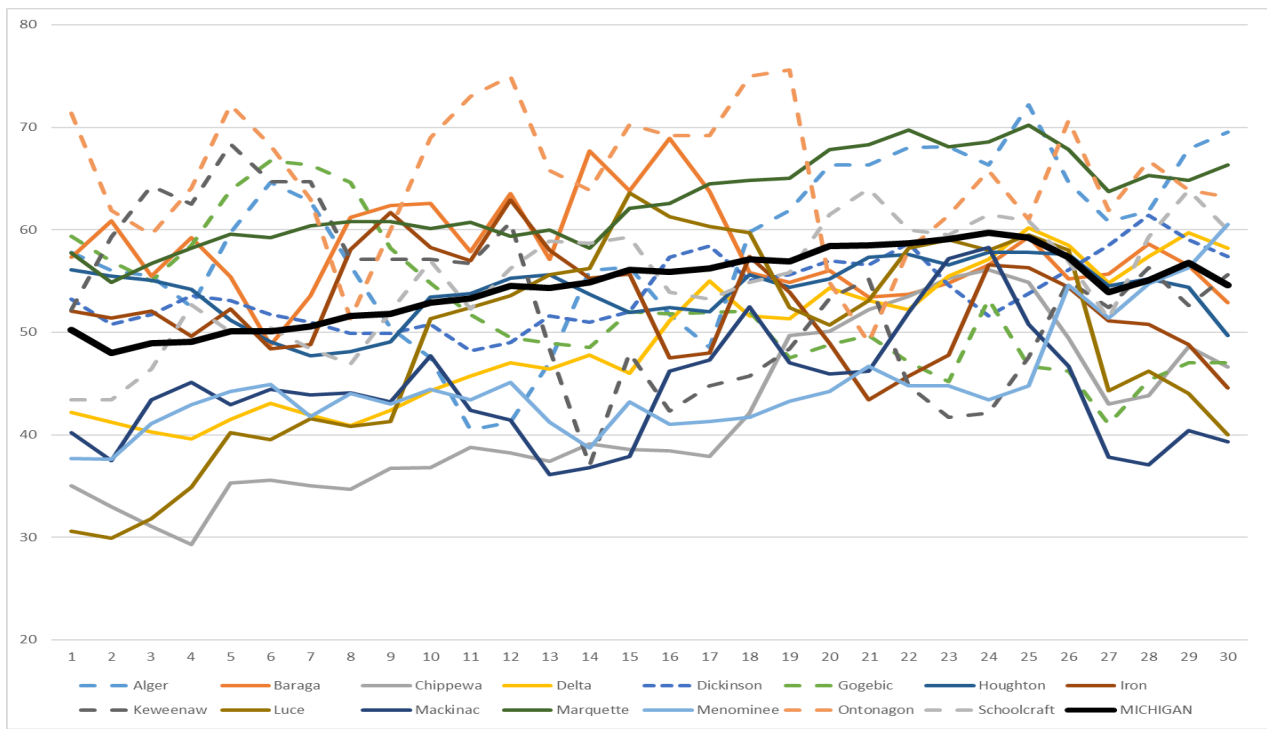


Figure 7-3: Primary Childhood Series plus Hepatitis A Vaccine (43133142), 2013 Q4 through 2021 Q1

Figure 7-4 shows the percentage of children under 36 months of age who received two or more injections of the hepatitis A vaccine, independent of whether other vaccines were given. In data from the second quarter of 2020, Marquette (64.9%) and Ontonagon (64.3%) counties ranked in the top 10 counties, while Chippewa (43.2%), Gogebic (41.0%), and Mackinac (38.6%) counties were among the lowest ranking counties.

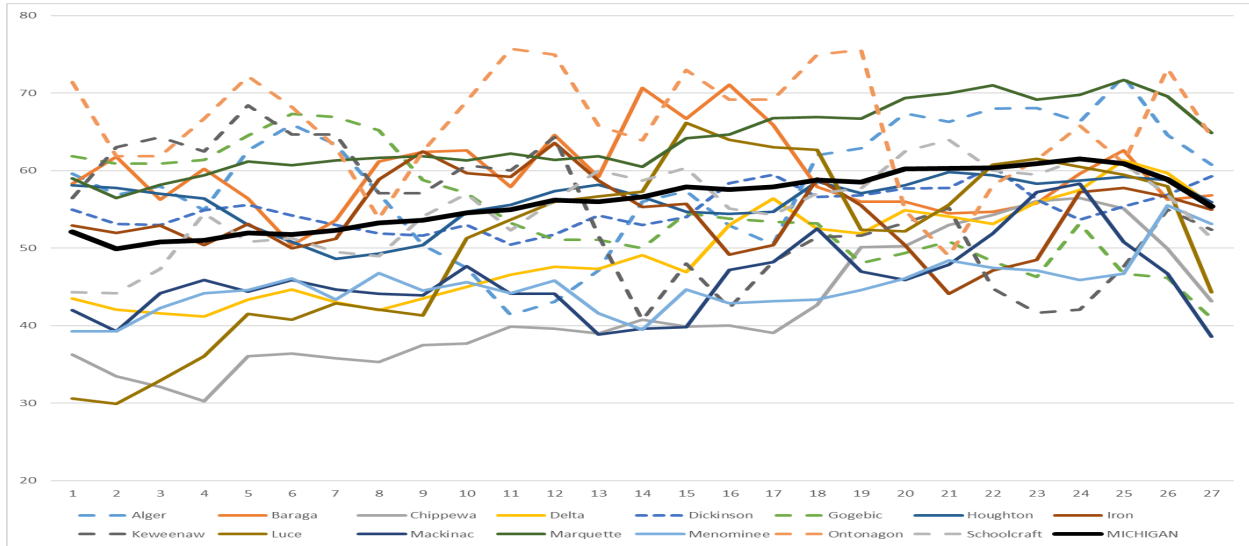


Figure 7-4: Hepatitis A Vaccination in Children, 2013 Q4 through 2020 Q2

Figure 7-5 shows the percentage of children under 36 months of age who received 4 or more injections of the DTaP vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Delta (80.8%) and Marquette (80.2%) Marquette (64.9%) and Ontonagon (64.3%) counties ranked in the top 10 counties, while Gogebic (63.4%) was among the lowest ranking counties.

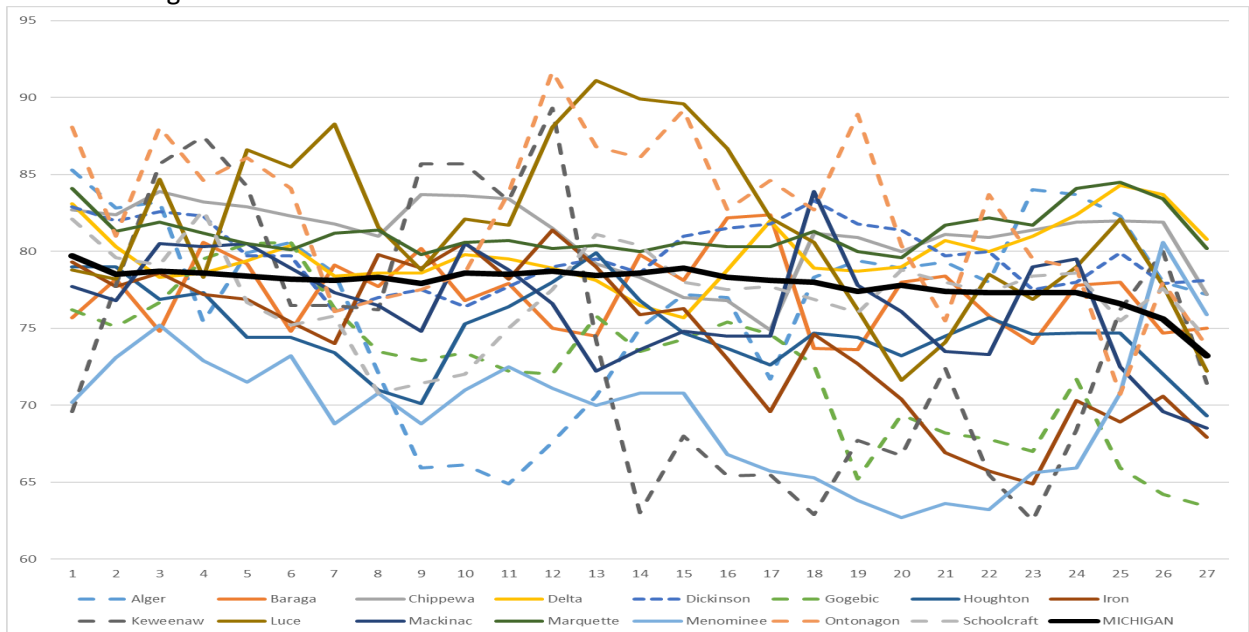


Figure 7-5: Children Receiving 4 or More DTaP Vaccinations, 2013 Q4 through 2020 Q2

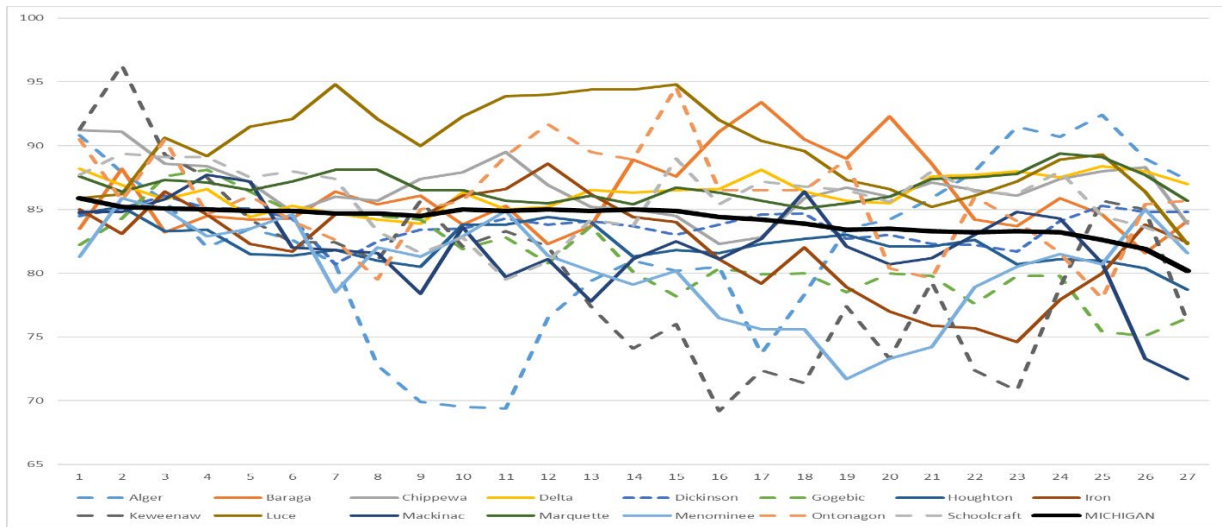


Figure 7-6: Children Receiving Full Pneumococcal Vaccine Series, 2013 Q4 through 2021 Q2

Figure 7-6 shows the percentage of children under 36 months of age who received the recommended number of doses of the pneumococcal vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Alger (87.3%) and Delta (87.0%) counties ranked in the top 10 counties, while Mackinac (71.1%) was among the lowest ranking counties.

Figure 7-7 shows the percentage of children between 8 and 24 months of age who completed the recommended series of doses of the rotavirus vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Marquette County (76.5%) ranked in the top 10 counties, while Chippewa (40.7%), Luce (51.7%), and Schoolcraft (52.0%) were among the lowest ranking counties.

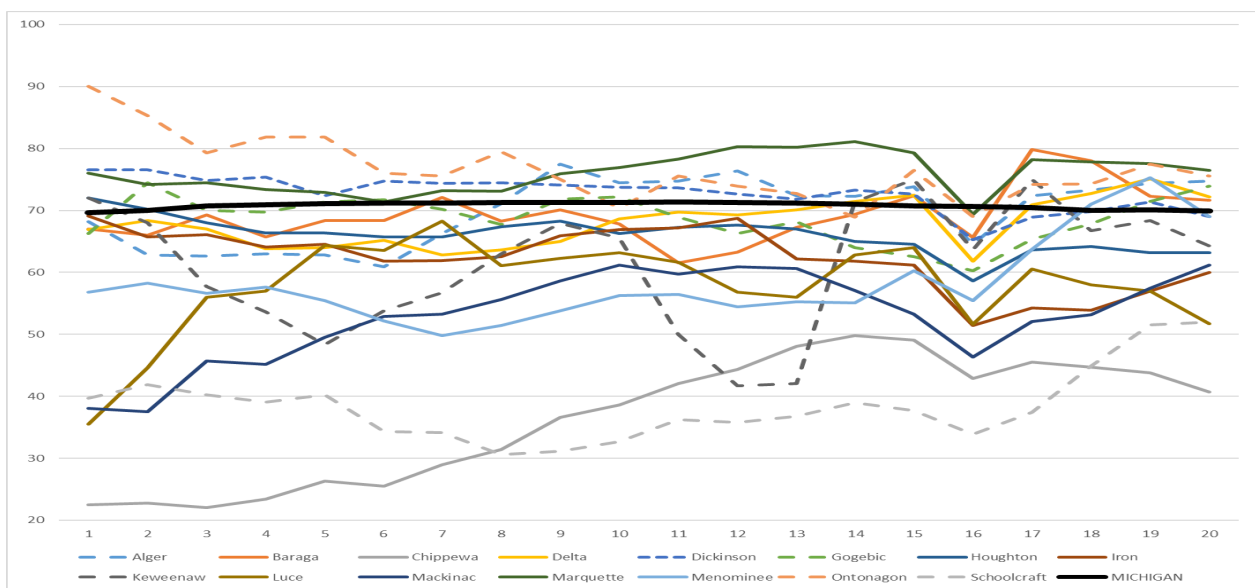


Figure 7-7: Children 8 to 24 Months Completing Rotavirus Series, 2015 Q3 through 2020 Q2

7.3.3 School-aged Children

Figure 7-8 shows the percentage of children in school who are up to date on their vaccinations, while Figure 7-9 shows the percentage of children in school who have obtained a waiver to allow them to attend school without being completely vaccinated. Data for Keweenaw County is not available because of its small population and the paucity of schools in the county.

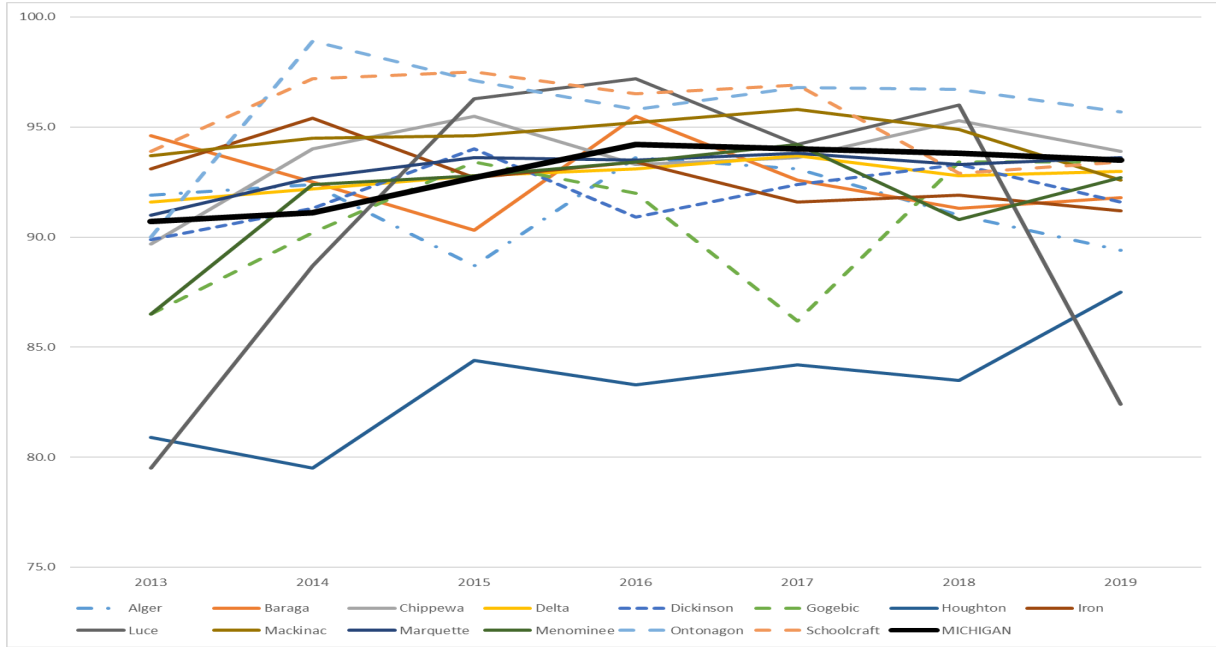


Figure 7-8: School age Children with Complete Vaccinations, 2013 through 2019

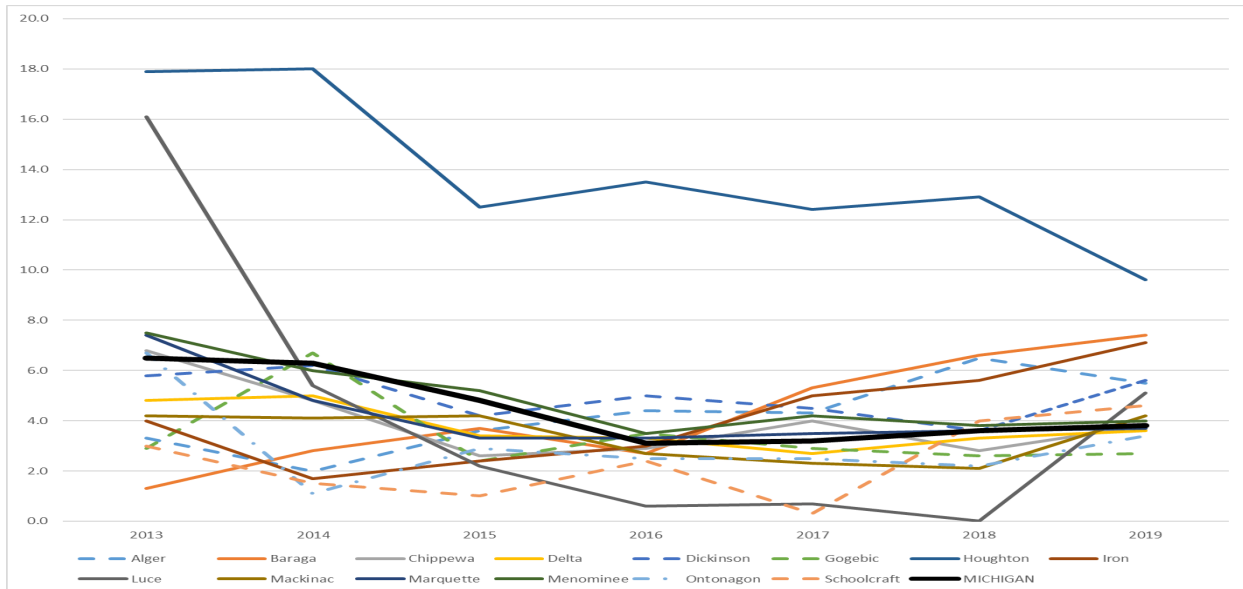


Figure 7-9: Percent Schoolchildren Waving Vaccine Requirement, 2013 through 2019

7.3.4 13-17 Years

The vaccination schedule for adolescents includes some booster vaccinations and a few new ones. The first completed series is considered one Tdap (booster for tetanus, diphtheria and pertussis) vaccine, three polio vaccines, two MMR vaccines, 3 hepatitis B vaccines, 2 varicella vaccines, and one MenACWY (meningococcal) vaccine. This has been abbreviated as 132321. **Figure 7-10** shows the percentage of adolescents having completed this series.

In data from the second quarter of 2020, none of the Upper Peninsula counties ranked in the top 10 counties, while Menominee County [1] (64.8%) was among the lowest ranking counties.

Data have also been collected for those who have completed the 132321 series as well as three doses of the HPV (human papillomavirus) vaccine, abbreviated 1323213. **Figure 7-11** shows the percentage of adolescents having completed this augmented series.

In data from the second quarter of 2020, Luce (51.8%), Marquette (55.3%), and Schoolcraft (51.6%) counties ranked in the top 10 counties, while Keweenaw (27.2%) and Menominee [1] (25.5%) were among the lowest ranking counties.

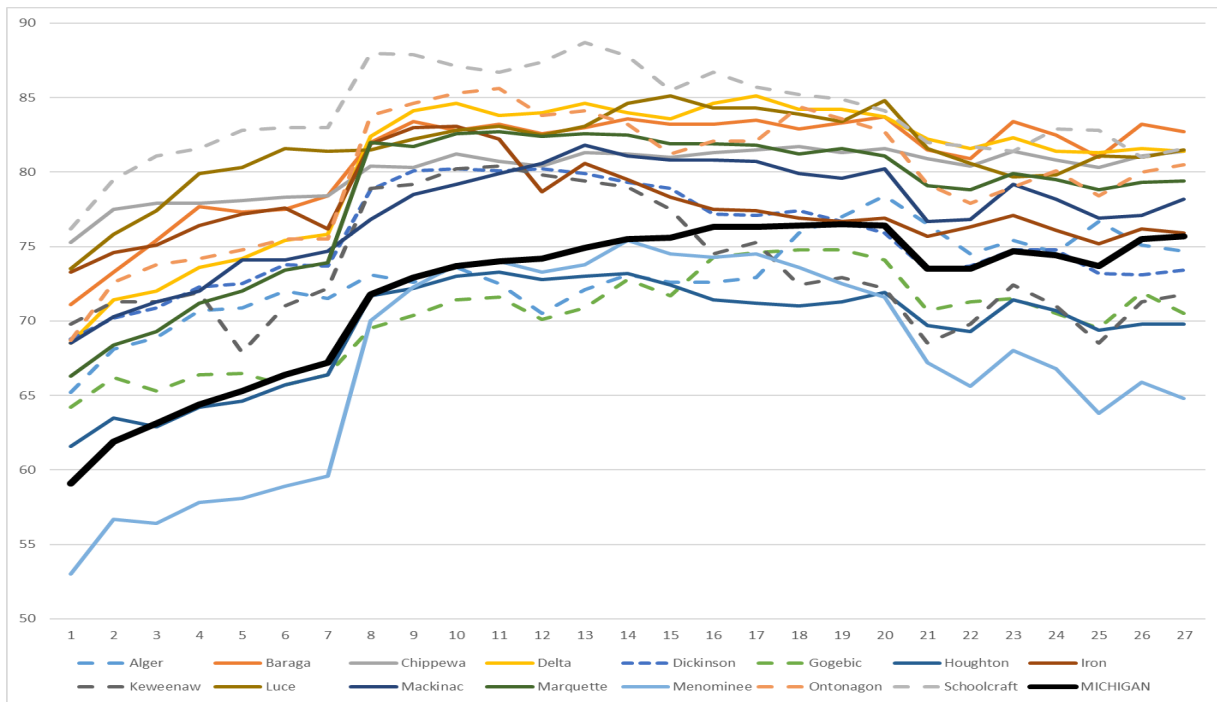


Figure 7-10: Adolescents Vaccines Up to Date (132321), 2013 Q4 through 2020 Q2

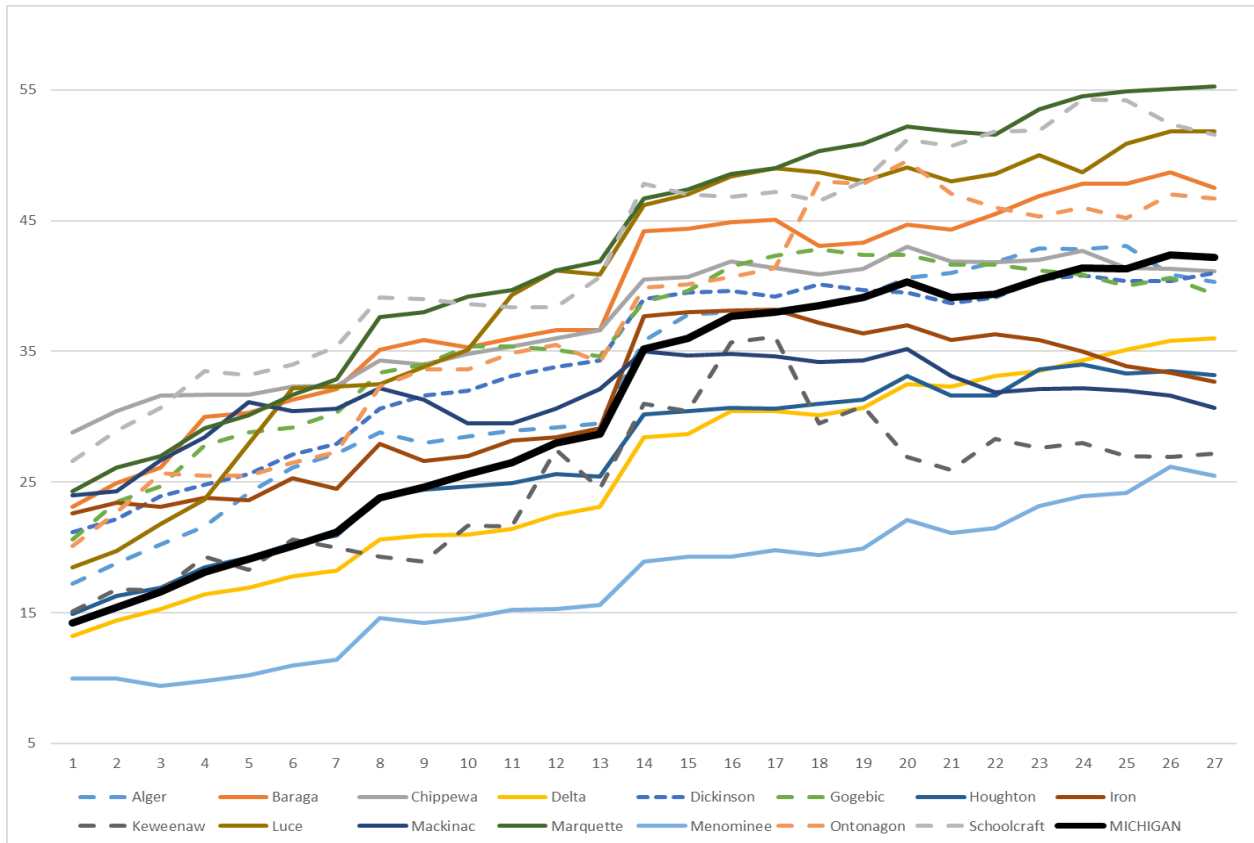


Figure 7-11: Adolescent Series plus HPV Vaccine, 2013 Q4 through 2020 Q2

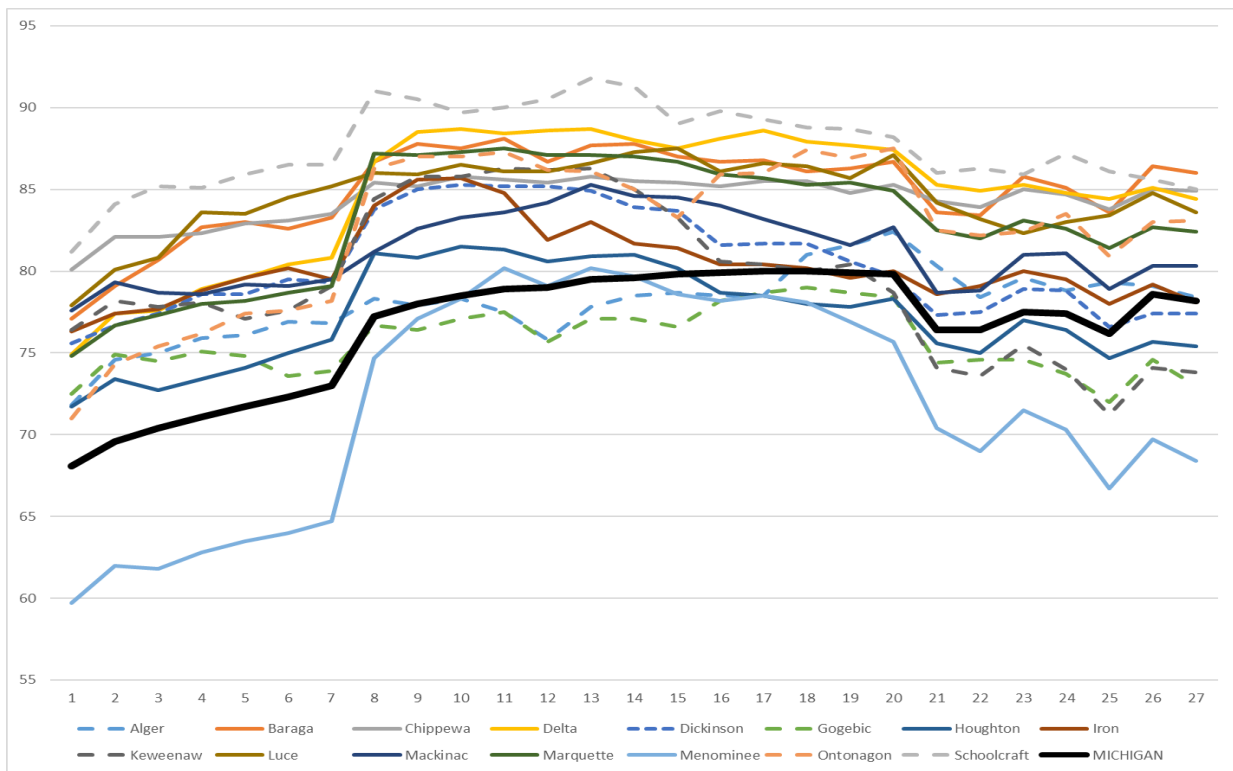


Figure 7-12: Adolescents Vaccinated with Tdap Booster, 2013 Q4 through 2020 Q2

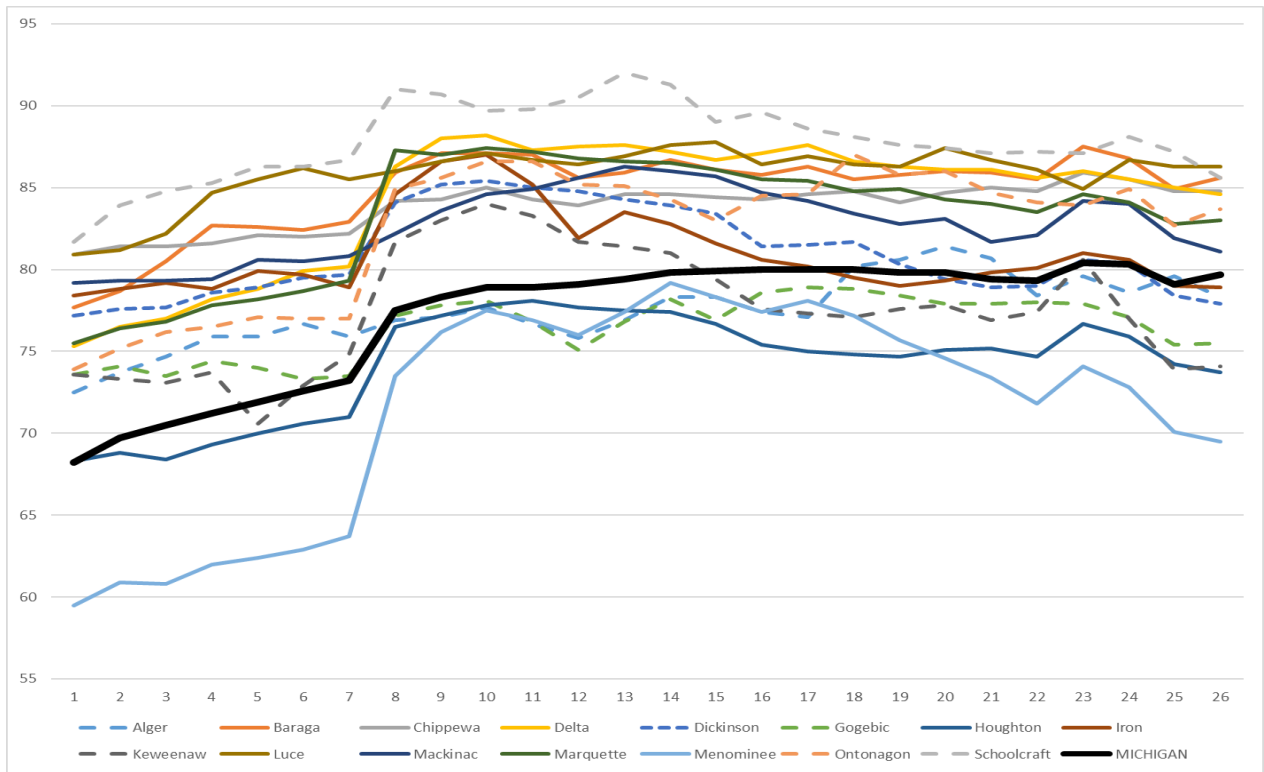


Figure 7-13: Adolescents with Any Meningococcal Vaccine, 2013 Q4 through 2020 Q2

Figure 7-12 shows the percentage of adolescents 13 to 17 years of age who received the Tdap booster vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Baraga County (86.0%) ranked in the top 10 counties, while Menominee [1] (68.4%) was among the lowest ranking counties.

Figure 7-13 shows the percentage of adolescents 13 to 17 years of age who received a dose of the meningococcal (MenACWY) vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Marquette County (56.7%) ranked in the top 10 counties, while Keweenaw (18.5%) and Iron (23.9%) were among the lowest ranking counties.

Figure 7-14 shows the percentage of female adolescents 13 to 17 years of age who completed the recommended number of doses of the HPV vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Marquette (58.1%), Luce (57.0%), and Ontonagon (56.0%) counties ranked in the top 10 counties, while Keweenaw (27.5%) and Menominee [1] (27.9%) were among the lowest ranking counties.

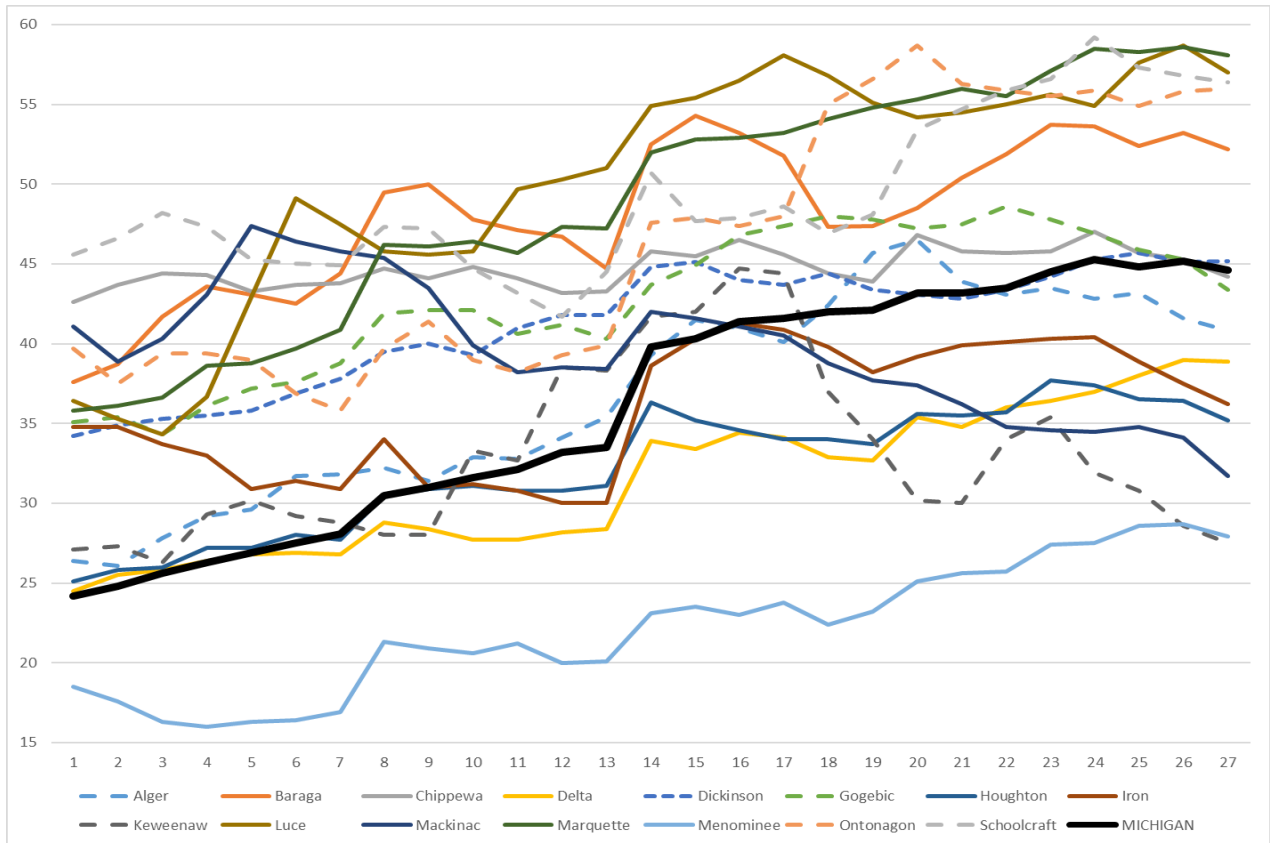


Figure 7-14: Adolescent Females Completing HPV Vaccinations, 2013 Q4 through 2020

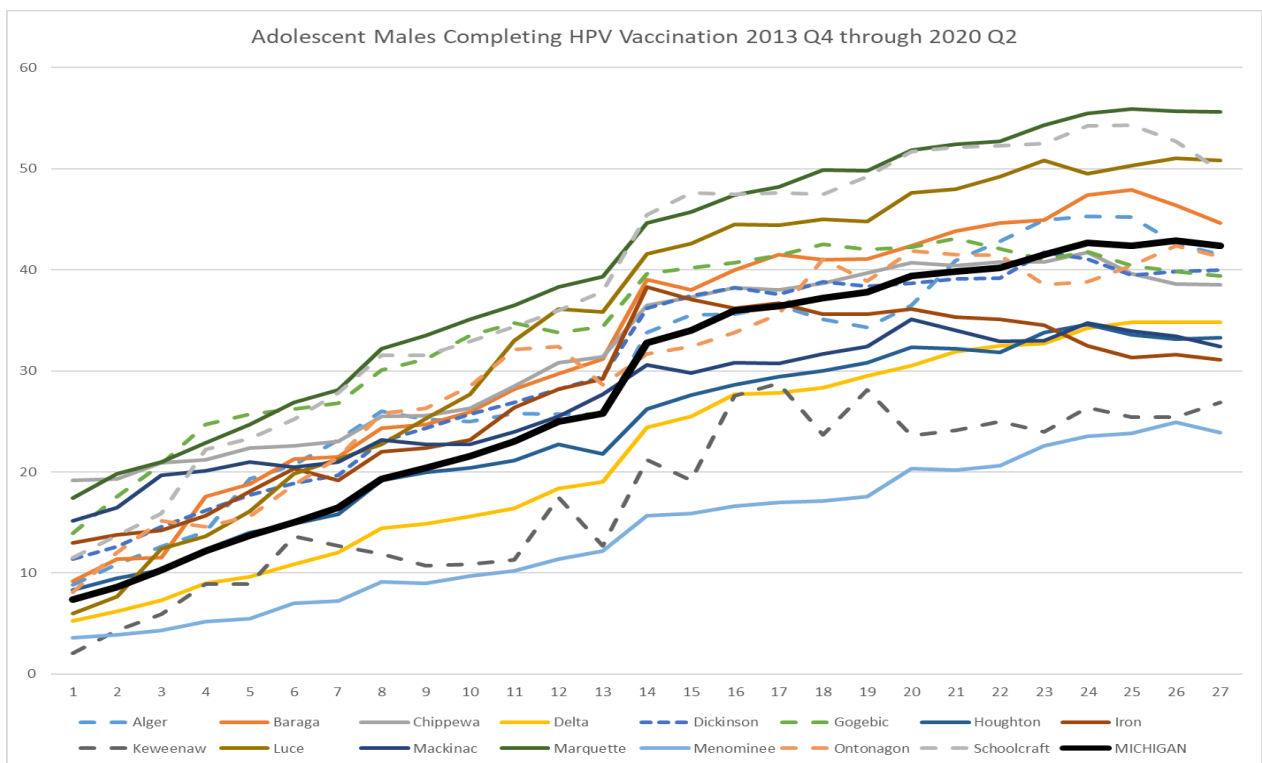


Figure 7-15: Adolescent Males Completing HPV Vaccination, 2013 Q4 through 2020 Q2

Figure 7-15 shows the percentage of male adolescents 13 to 17 years of age who completed the recommended number of doses of the HPV vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, Marquette (55.6%) and Luce (50.8%) counties ranked in top 10 counties, while Keweenaw (26.9%) and Menominee [1] (23.9%) were among the lowest ranking counties.

7.3.5 18 Years and Older

Figure 7-16 shows the percentage of adults aged 18 to 64 years who have received at least one dose of the Tdap booster vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, none of the Upper Peninsula counties ranked in top 10 counties, while Alger (42.8%), Baraga (43.1%), and Menominee [1] (40.0%) were among the lowest ranking counties.

Figure 7-17 shows the percentage of adults 65 years and older who have received at least one dose of pneumococcal polysaccharide vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, none of the Upper Peninsula counties ranked in top 10 counties, while Baraga (31.6%) and Menominee [1] (31.4%) were among the lowest ranking counties.

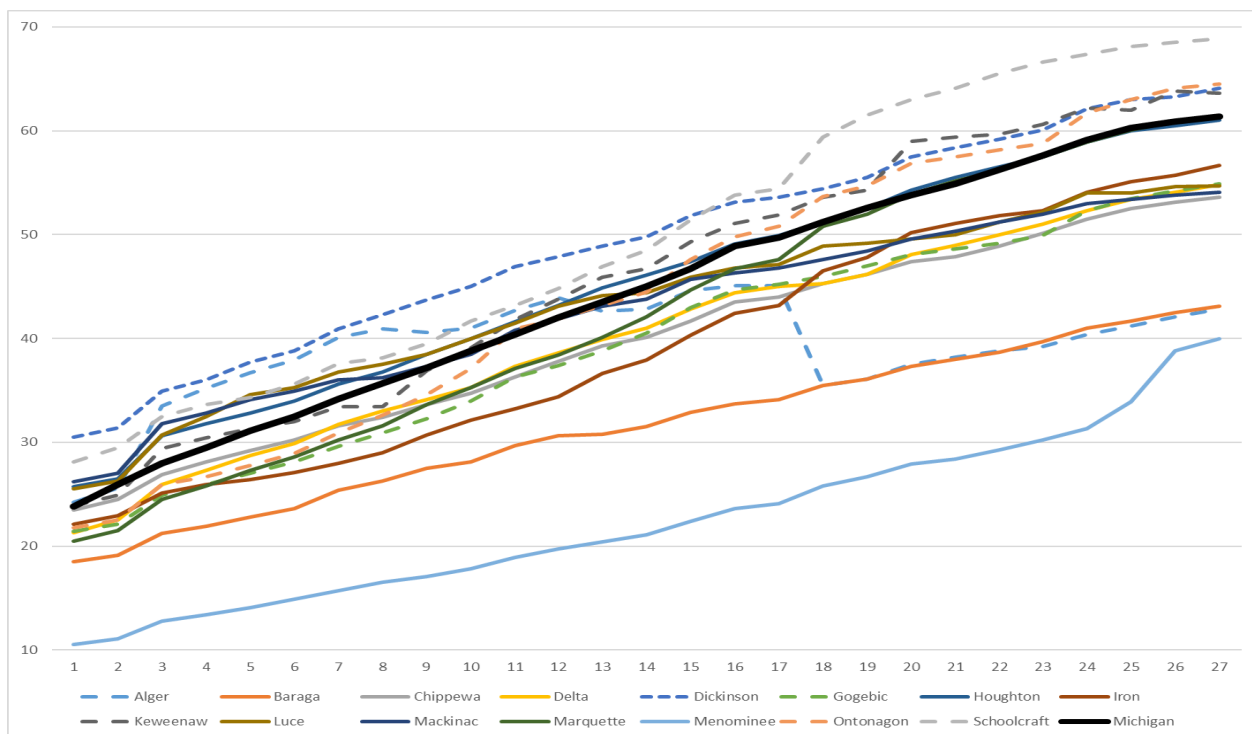


Figure 7-16: Adults (19-64 Years) with Tdap Booster, 2013 Q4 through 2020 Q2

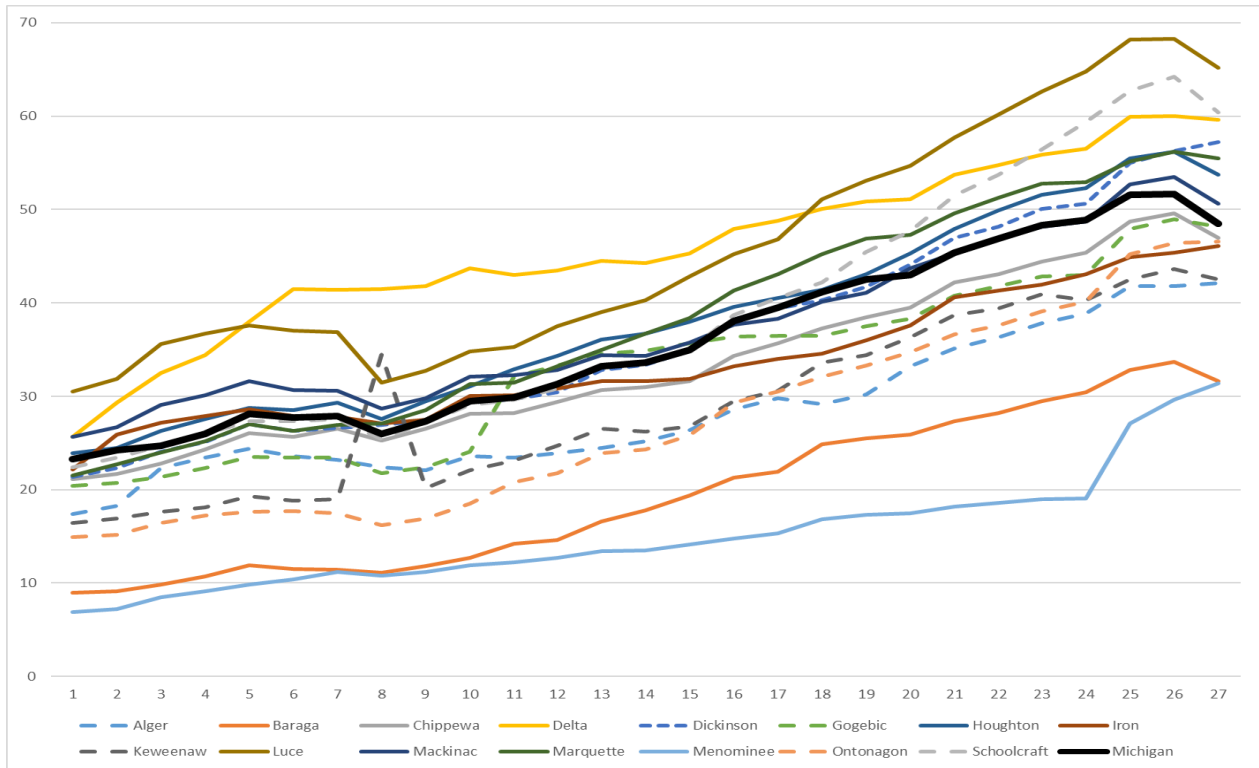


Figure 7-17: Adults 65 Years and Older Received Pneumococcal Vaccine, 2013 Q4 through 2020 Q2

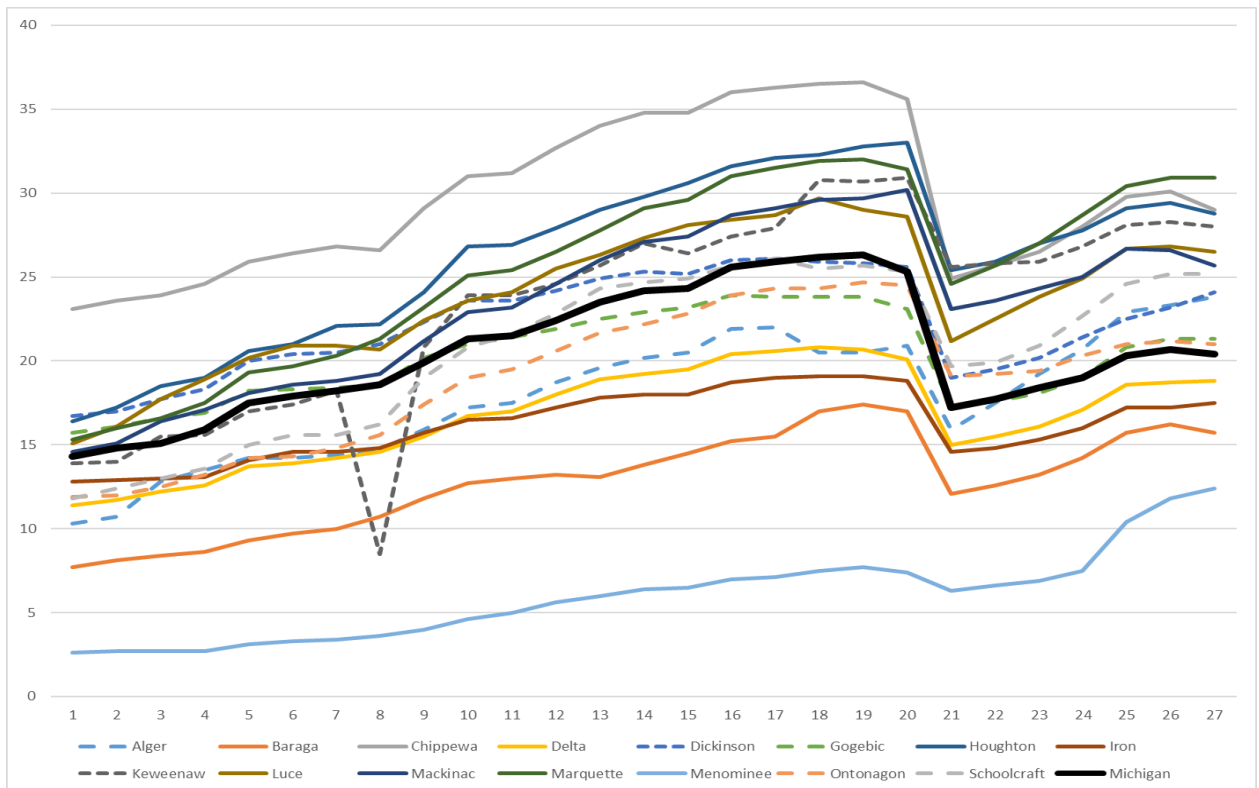


Figure 7-18: Elderly Receiving the Zoster Vaccine, 2013 Q4 through 2020 Q2

Figure 7-18 shows the percentage of adults 50/60+ years of age who have received the zoster (shingles) vaccine, independent of whether other vaccines were given.

In data from the second quarter of 2020, none of the Upper Peninsula counties ranked in the top 10 counties, while Baraga (15.7%), Delta (18.8%), and Menominee [1] (31.4%) were among the lowest ranking counties.

7.3.6 Influenza Vaccine

Each year influenza vaccines are offered to reduce the number of influenza infections. Because the strains of influenza change from year to year, new vaccines are provided each year aimed at the strain most likely to go through the community. An increased effort to increase the vaccination rate for the 2020-2021 influenza season was initiated to decrease the influenza burden on the health care system as it was anticipated, correctly so, that COVID-19 cases would likely increase.

Figure 7-19 shows the percentage of children between 6 months and 8 years of age who completed their influenza series in the current influenza season.

In data from the second quarter of 2020, Marquette County (46.9%) ranked in the top 10 counties, while none of the Upper Peninsula counties were among the lowest ranking counties.

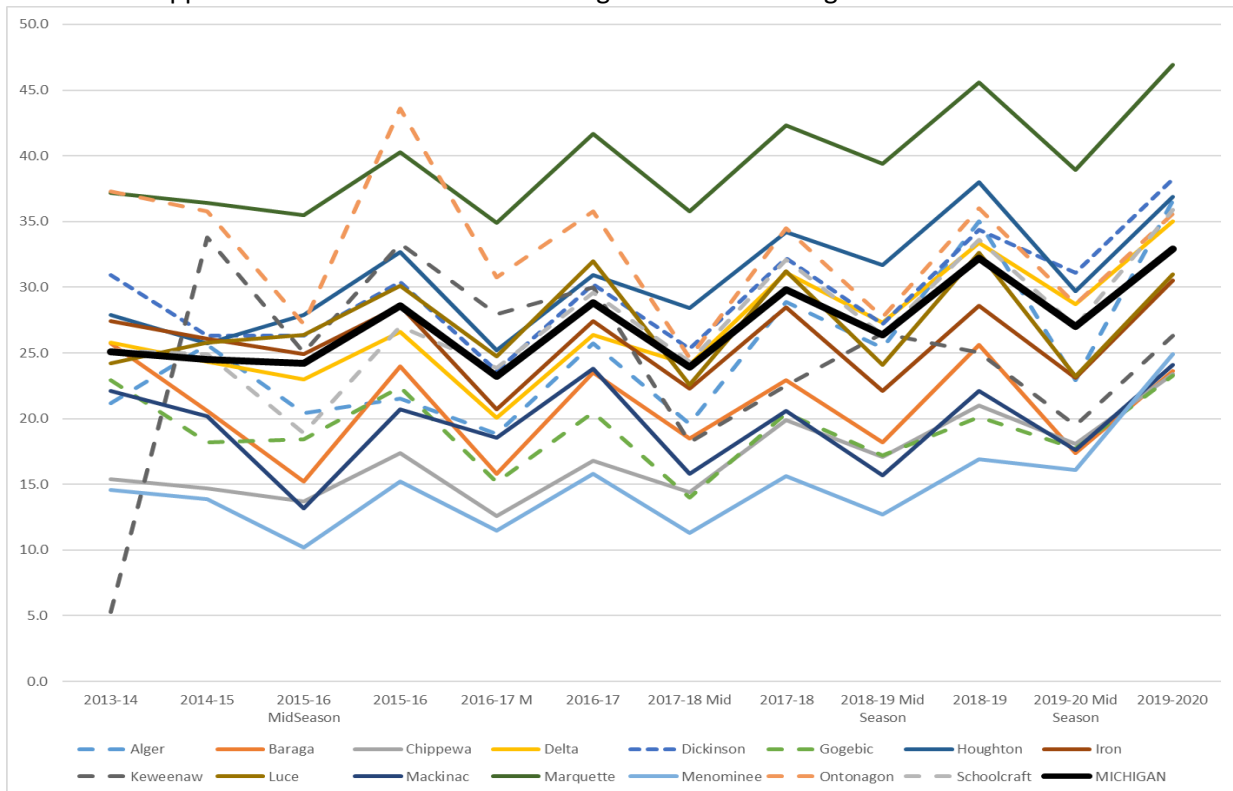


Figure 7-19: Complete Influenza Vaccination 6 months to 8 years, 2013 through 2020

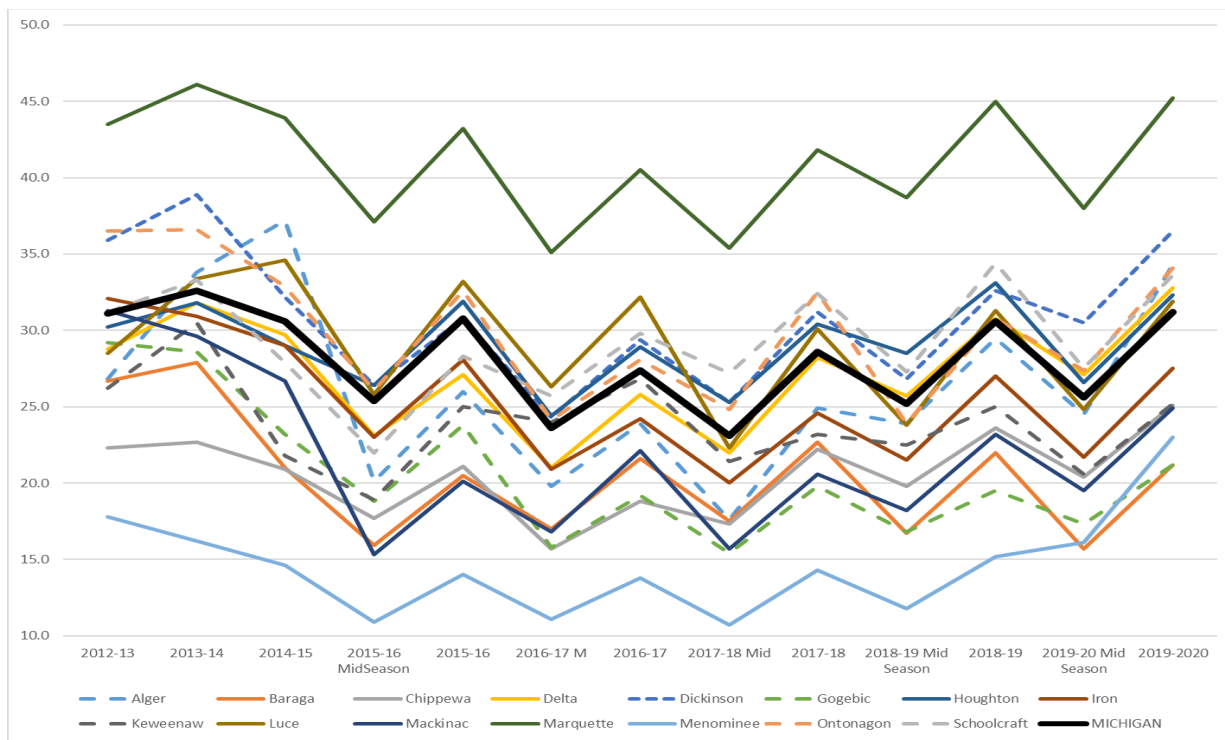


Figure 7-20: Influenza Vaccination in 6 Months to 17 Years, 2012 through 2020

Figure 7-20 shows the percentage of children and adolescents between 6 months and 17 years of age who received an influenza vaccine in the current influenza season.

In data from the second quarter of 2020, Marquette County (45.2%) ranked in the top 10 counties, while none of the Upper Peninsula counties was among the lowest ranking counties.

Figure 7-21 shows the percentage of adults 18 years of age and older who received an influenza vaccine in the current influenza season.

In data from the second quarter of 2020, none of the Upper Peninsula counties ranked in the top 10 counties, while Baraga (22.4) and Menominee [1] (21.5%) were among the lowest ranking counties.

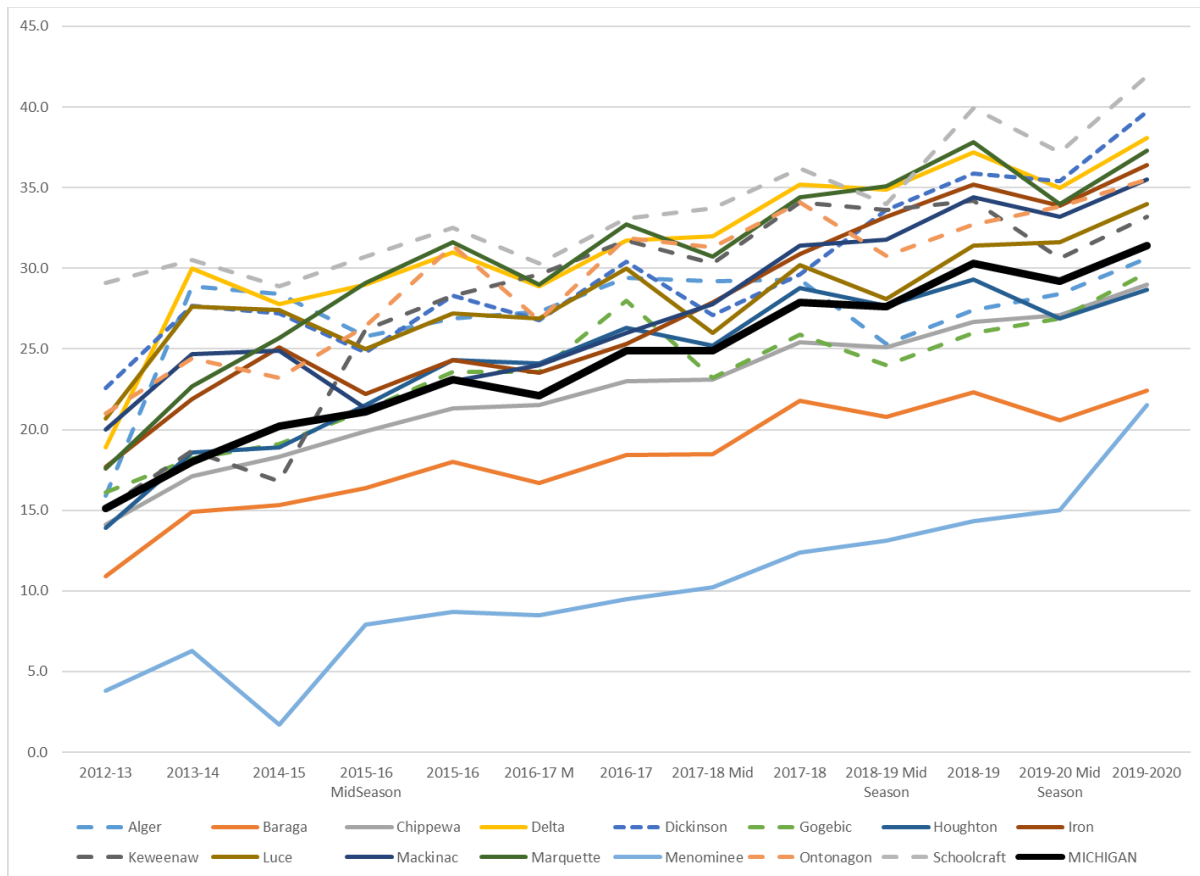


Figure 7-21: Influenza Vaccination in Adults 18 Years and Older, 2012 through 2020

Data were collected in the UPCHIPS in both 2017 and 2021 regarding whether the person completing the survey had been vaccinated for influenza and pneumococcus. These results are shown in **Table 13-42A** and **13-42B**.

7.3.7 COVID-19 Vaccine

The data related to the vaccines for COVID-19 are presented in Section §8.2.

[1] Most of the health care for people living in Menominee County is provided in Wisconsin, so the recording of vaccines delivered to this population is less likely to be captured when collecting this data.

8 CONTAGIOUS DISEASES

8.1 Introduction

Infectious diseases are caused by microscopic germs such as bacteria and viruses. When these infections can be transmitted from person to person, they are called communicable or contagious diseases. Examples of communicable diseases are influenza, chickenpox, chlamydia and hepatitis. Infectious diseases that are not transmitted person to person include Lyme disease (from deer/bear tick bites) and West Nile Virus (from mosquito bites).

The increase in life expectancy and reduction in death rates from infectious diseases was one of the great public health achievements of the last 100 years, owing to improved sanitation and hygiene, the development of vaccines for deadly communicable diseases like smallpox and polio, and the advent of antibiotics and other antimicrobial agents. Unfortunately, infectious diseases are still a leading cause of illness and death across the globe. This is because of a variety of factors, including inadequate vaccine coverage, poverty, poor sanitation, and the endless ability of microbes to adapt and survive when faced with environmental and technological changes.

The method of prevention of infectious diseases depends on the type of microbe and the mode of transmission. Common strategies include hygiene (i.e., hand-washing to prevent influenza and COVID-19), social distancing (i.e., restricting hospital visitation or cancelling public events during infection outbreaks), avoidance of risky behaviors (i.e., refraining from sharing needles or having unprotected sex), proper food handling (i.e., to reduce the spread of foodborne diseases such as salmonella), vector abatement (i.e., spraying of insecticides), and, of course, vaccination.

In Michigan, a wide range of infectious diseases are tracked through a web-based computer system called the Michigan Disease Surveillance System (MDSS). This system is overseen by the Michigan Department of Health and Human Services (MDHHS) and requires a collaborative effort of healthcare providers, laboratories, and public health departments to input data on individual cases of disease into the system. Once a laboratory, for example, enters patient demographics and a test result into MDSS, that information is seen by local public health department nurses who evaluate the data and collect additional information from the healthcare provider and the patient. Contact investigations are undertaken, as indicated, and final reports are submitted to the state. Information is also shared with the Centers for Disease Control and Prevention (CDC), which is then able to identify disease trends and outbreaks across the country. This system is critically important as a surveillance tool for well-established and emerging diseases. The list of diseases tracked is available at the Michigan.gov website and includes vaccine-preventable illnesses as well as foodborne, waterborne, insect-related, and sexually transmitted infections.

This chapter includes local data from MDSS on some of the more common communicable, blood-borne, tick-borne, sexually transmitted, and food/water borne diseases. While some infectious diseases on the reportable list are quite rare, others are being seen with increasing frequency in Upper Peninsula counties and the state as a whole. The northern creep of some diseases is likely the result of climate change.

8.2 COVID-19

The expanding outbreak of COVID-19 caused by a novel (new) coronavirus is believed to have started in an animal market in Wuhan City, China in 2019. Since then, sustained person-to-person spread in the community is occurring internationally. As of March 31, 2022 there have been 80,103,360 cases reported COVID-19 cases and 980,623 COVID-19-related deaths in the United States.[1,2] As of March 31, 2022 there were 2.38 million confirmed COVID-19 cases in Michigan with 35,622 COVID-19-related deaths reported.[3] The number of confirmed and probable cases of COVID-19 and COVID-19 deaths[4] for the Upper Peninsula and each of its counties, taken from the MDSS, are listed in **Table 8-1**. The national and statewide numbers are confirmed cases, which are only those with a positive *real-time reverse transcription polymerase chain reaction* (RT-PCR or PCR) test. Probable cases, which made up 30% of the cases seen in our region, are those cases with a positive antigen test or those that have not been tested but meet clinical criteria and have a direct epidemiologic link to a known case. Cases identified with a home antigen test and cases who never sought care or testing would not be considered either a confirmed or a probable case. Consequently, the number of cases reported nationally and statewide may underestimate the true number of cases by at least 30%. With this in mind, the national number of cases likely exceeds 100 million and the state number 3 million.

Coronaviruses are commonly found in several species of animals. Human coronaviruses are a common cause of mild to moderate upper-respiratory illness. Three coronaviruses have emerged to cause more severe illness: Severe Acute Respiratory Syndrome (SARS-CoV), Middle East Respiratory Syndrome (MERS-CoV), and now the virus (SARS-CoV-2) that causes COVID-19.

Person-to-person spread of the virus to people in close contact (within 6 feet for more than 15 minutes) through respiratory droplets produced when an infected person talks, coughs, sneezes, or sings. Those infected are thought to be most contagious when they are the most symptomatic.

The outbreak met the three criteria for a pandemic: a new virus, capable of person-to-person spread, and that spread internationally.

The most frequently reported symptoms of COVID-19 include fatigue, fever, cough, difficulty breathing, sore throat, myalgia, and loss of taste/smell. Risk factors for progressing to severe illness may include older age and underlying chronic medical conditions, yet otherwise healthy young people can develop severe illness and die from COVID-19. The risks of severe illness, hospitalization, and death are higher in those who have not been vaccinated against COVID-19.

Symptoms vary in severity from mild illness to severe or fatal illness. There is the potential for clinical deterioration during the second week of illness. Among hospitalized patients, some will develop acute respiratory distress syndrome (ARDS), the need for intensive care and respiratory support, pneumonia resulting in death, secondary infection, problems with blood clotting properly, and life-threatening inflammatory responses (cytokine storm). Children, many of whom were only mildly ill or asymptomatic with COVID-19, have developed a delayed auto-immune response with symptoms similar to Kawasaki's syndrome (high, prolonged fever, rash, conjunctivitis, peripheral edema, shock, cardiac damage, and elevated markers of inflammation) known as the COVID-19-associated Multisystem Inflammatory Syndrome in Children (MIS-C).[5] A similar syndrome (MIS-A) has now also been reported in adults.[6] Heart muscle inflammation and damage has been documented in a sizable percentage of otherwise healthy young athletes following infection. The long-term consequences of infection will become

evident over time.

Table 8-1: COVID-19 Cases (Confirmed & Probable) and Deaths through March 31, 2022

	Confirmed Cases*	Probable Cases† (%)	Confirmed and Probable Cases	Deaths
Upper Peninsula	48,327	21,679 (31.0%)	70,006	
Alger	974	724 (42.6%)	1698	13
Baraga	1656	328 (16.5%)	1984	53
Chippewa	3017	5411 (64.2%)	8428	103
Delta	7568	2223 (22.7%)	9791	155
Dickinson	4892	2355 (32.5%)	7247	108
Gogebic	2623	598 (18.6%)	3221	69
Houghton	6401	1300 (16.9%)	7701	90
Iron	2255	380 (14.4%)	2635	87
Keweenaw	443	68 (13.3%)	511	13
Luce	621	798 (56.2%)	1419	11
Mackinac	1480	893 (37.6%)	2373	30
Marquette	10,927	3939 (26.5%)	14,866	127
Menominee	3617	1843 (33.8%)	5460	70
Ontonagon	819	139 (14.5%)	958	38
Schoolcraft	1034	680 (39.7%)	1714	17
* positive PCR test				
† positive antigen test or meets clinical criteria with epidemiologic linkage				

Testing for the virus responsible for COVID-19 is performed using either PCR test or an antigen test. The PCR test is more accurate, but needs to be performed in a certified laboratory. In the early stages of the pandemic it often took weeks to get the results. Now most testing sites can perform the test on the same day. The antigen test can be performed at the point of care, takes less than an hour, but is not nearly as accurate as the PCR test. Interpretation of the results of these tests needs to take into consideration the setting in which the test was performed, the likelihood of disease in the individual (asymptomatic, close contact to an infected individual, etc.), and the prevalence of the infection in the

community or institution.

In addition to supportive treatment, such as oxygen and fever control, a number of approaches to reducing the severity of the infection have been developed. One class of drugs attempts to reduce the production of the virus in the body. Another approach is to inject antibodies specific to the virus into the body to help the immune system fight the infection. These monoclonal antibodies are given by infusion or injection to infected individuals who had a high potential of needing future hospitalization. As new variants of the virus responsible for COVID-19 have emerged, the combinations of the specific antibodies have changed. For infected individuals ill enough to require hospitalization and/or admission to the intensive care unit, anti-inflammatory medications, such as corticosteroids and immunomodulators, have been used in an effort to avoid a potentially fatal cytokine storm.

A number of the researchers have been working since the beginning of the outbreak to develop vaccinations against the virus responsible for COVID-19. As of March 31, 2022, three vaccines have been approved by the Federal Drug Administration. New technology for injecting messenger RNA (mRNA) into the body has been developed to help control this pandemic. mRNA induces the body to make a protein found specifically in the virus responsible for COVID-19 that the body's immune system can mount a response to. When exposed to the virus responsible for COVID-19, those vaccinated are able to neutralize the virus in the respiratory tract before it can spread further in the body.

When the first vaccines were released, healthcare providers were the first to be vaccinated, followed by those at high risk in long-term care facilities. As more vaccines became available, other age groups were vaccinated and currently the vaccine is available for the general public. Vaccine is currently available for those 6 months of age and older. In August 2021, a recommendation was made for immunocompromised individuals to receive an additional dose of vaccine and in October 2021 booster doses were available to be delivered 6 months following completion of the initial series of injections. In March 2022 a second booster was recommended for those over 50 years of age or who were immunocompromised.

Herd immunity can only be safely achieved through a vaccination program. Based on the infectivity of the virus responsible for COVID-19, the initial estimate was that herd immunity would be achieved when 60% to 70% of the population is immune (either through natural infection or vaccination). With the emergence of variants in the virus that are substantially more transmissible (more infectious), it may be that herd immunity will only be reached when 80% to 85% of the population is immune. Herd immunity through natural infection alone is not as effective as vaccination in preventing subsequent hospitalizations for COVID-19-like illness. [7] Until vaccination targets are achieved, a substantial percentage of the population will die from COVID-19 infection before herd immunity is reached.

While the vaccine has been well accepted in those old enough to remember the impact of vaccine-preventable diseases, vaccination rates have stalled well below the rate needed to obtain herd immunity. Vaccine uptake by census tract is available through a tool developed by the University of Michigan known as MI-Lighthouse. Access to the database is highly restricted. The cumulative vaccination rates for the counties in the Upper Peninsula all show a similar pattern of rapid acceptance followed by a plateau at different levels of vaccination prevalence. As an example, the cumulative vaccination rate in Chippewa county is shown in **Figures 8-1**. Vaccination rates in those 12 to 17 years of age with 1 or more doses through July 31, 2021 in the United States was 42.4%, with 31.9% receiving the full series. In Michigan, 38.1% have 1 or more doses with 30.3% having completed the full series. When broken down into 2-year groups, the vaccination rate increases with age. For the entire United States, 1

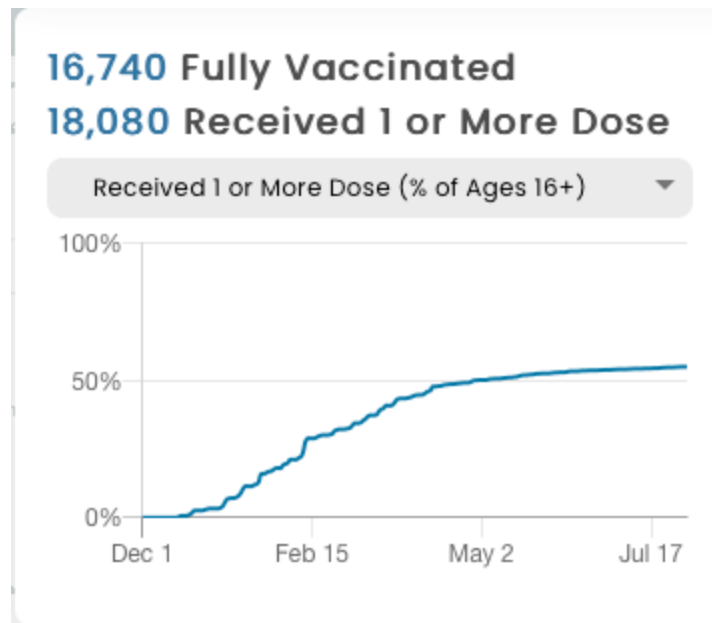


Figure 8-1: Cumulative Uptake of COVID-19 Vaccine in Chippewa County, December 2020 through August 2021

or more doses were seen in 36.0%, 40.9%, and 50.6% of 12-13-year-olds, 14-15-year-olds, and 16-17-year-olds, respectively. For completing the series, the percentages are 25.4%, 30.5%, and 40.3%. For the State of Michigan in these age groups, 1 or more doses were seen in 30.6%, 34.7%, and 42%, while a completed series was seen in 24.7%, 29.2%, and 37.5%. The state with the highest vaccination rate in this age group was Vermont (70.1% 1 or more doses, 60.3% completed series) with Mississippi having the lowest rate (20.2% 1 or more doses, 10.7% completed series). [8] Some of this differential is that vaccine has been available to those 16 and 17 years of age for longer than available for those younger.

Given the historical pattern seen with the 1918 influenza pandemic, only half of the population being vaccinated, and the emergence of more aggressive, virulent strains of the virus responsible for COVID-19, the outbreak, primarily among those not vaccinated, in the Fall of 2021 (Delta variant) has eclipsed the outbreak of in the Spring of 2021. Subsequently, the Omicron outbreak dwarfed the Delta outbreak.

8.2.1 History of Response to the Pandemic

WHO quickly declared this outbreak a Public Health Emergency of International Concern and the U.S. Department of Health and Human Services declared a public health emergency as the pandemic began to spread.

The initial response by the CDC to the COVID-19 pandemic was to keep the virus from coming into the United States. This containment approach included travel restrictions and evaluating the risk for infection in travelers returning to the United States from countries with ongoing outbreaks. Once it was clear that containment would not be successful, efforts to mitigate community spread were instituted. These included diligent hand hygiene; avoiding touching the mouth, nose, and eyes; coughing into tissues or sleeves; avoiding close contact with people that are sick; staying home when sick; cleaning and disinfecting frequently touched objects and surfaces; wearing a mask when expecting to encounter

others in public; and the quarantining of those who determined to be a close contact.

Close contacts of those infected were and continue to be instructed to go into quarantine, to monitor their health starting from the day of first close contact with the person. As more was learned about these infections, the length of recommended strict quarantine dropped from 14 days to 10 days and from 10 days to 5 days. If a close contact developed symptoms consistent with COVID-19, they have been instructed to be tested for the virus.

Likewise, as more is learned about the infectivity of the virus variants, the time those with symptoms who test positive for the virus are instructed to remain isolated has been shortened.

The local health departments took the lead role in identifying and contacting close contacts, following those infected, and providing education/recommendations to both those infected and close contacts. They also worked closely with schools and businesses to provide a safe environment. The goal of the local health departments, working with our local, state, and federal partners, has been to minimize introductions of this virus, detect new cases quickly, and reduce community spread of this virus in their localities. As public health experts and clinicians learned more about the course of the infection and the spread of the virus and the outbreak has expanded, the recommendations from the CDC, the MDHHS, and the local health departments have evolved.

The sporadic initial cases seen in the Upper Peninsula were primarily in people who had recently traveled outside the area. For several months, because of our geographic isolation and perhaps in part because of the Governor's Executive Orders, there was little COVID-19 activity in the Upper Peninsula. Near the end of May 2020, two concurrent events marked the beginning of the outbreak in the Upper Peninsula. The first was the Michigan Governor easing the restrictions in Regions 6 and 8 (the Upper Peninsula) and the Wisconsin Supreme Court ruling that Wisconsin's Governor did not have the authority to issue emergency orders to mitigate the spread of the infection. Within two to three weeks of these events, the typical time from exposure to this virus and the emergence of signs of infection, cases began appearing in the counties in Upper Peninsula that border Wisconsin. Looking at the number of cases per million per day in the various counties (see **Figure 8-2 through 8-5**),¹⁰ the number of infections in the first wave of the pandemic has slowly crept north from Wisconsin. **Figure 8-6** shows the cumulative incidence of COVID-19 infections per 1,000 population by county from September 1, 2020 through March 31, 2022. Of note, steep portions of the curves occur during times of increased numbers of cases and flat portions when few infections are being reported.

¹⁰ The graphs were split into four groups as 15 counties on one graph would be difficult to interpret.

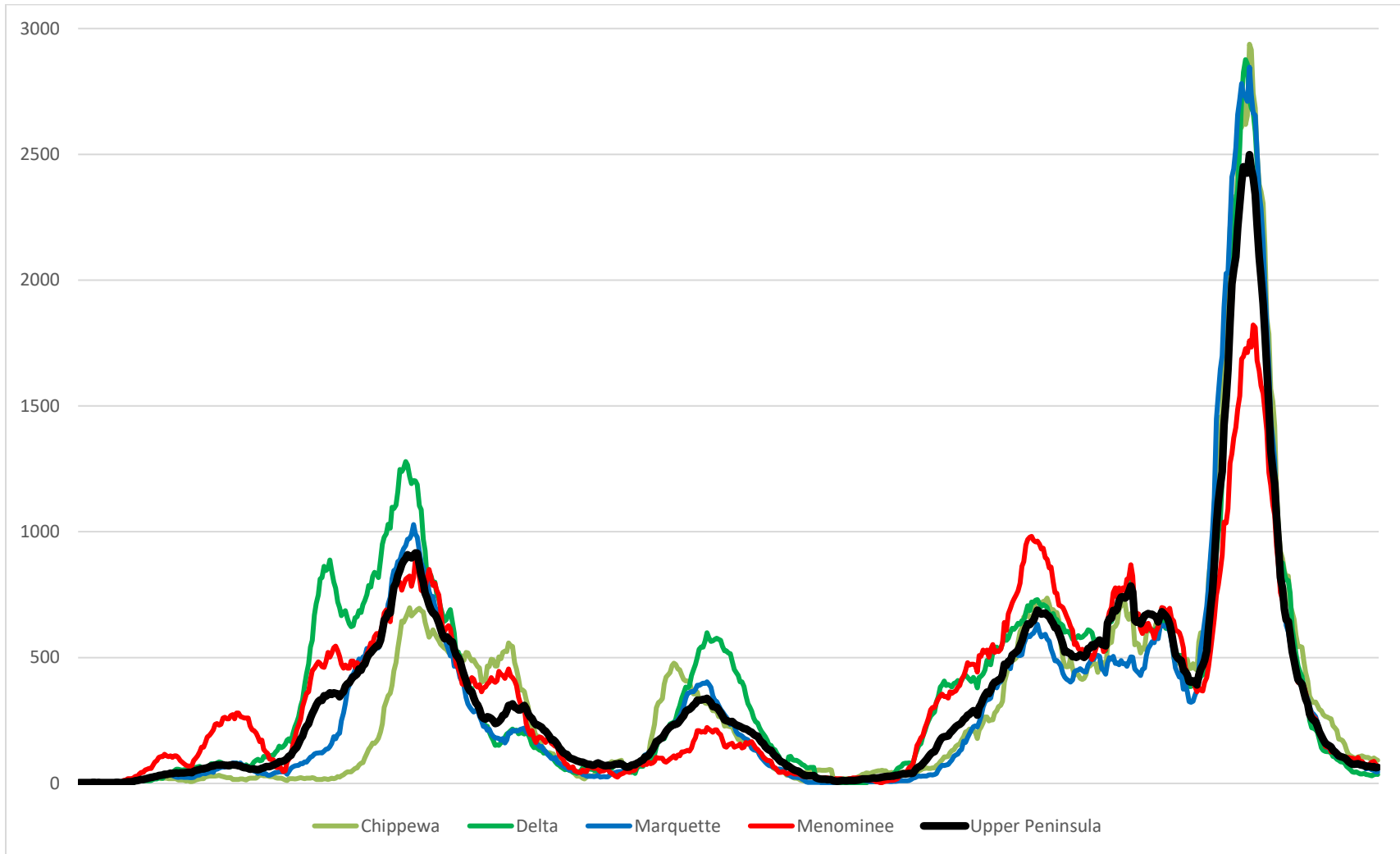


Figure 8-2: 14-day Average Confirmed & Probable COVID-19 Cases per Million per Day, May 1, 2020 through March 31, 2022 — Chippewa, Delta, Marquette, & Menominee Counties

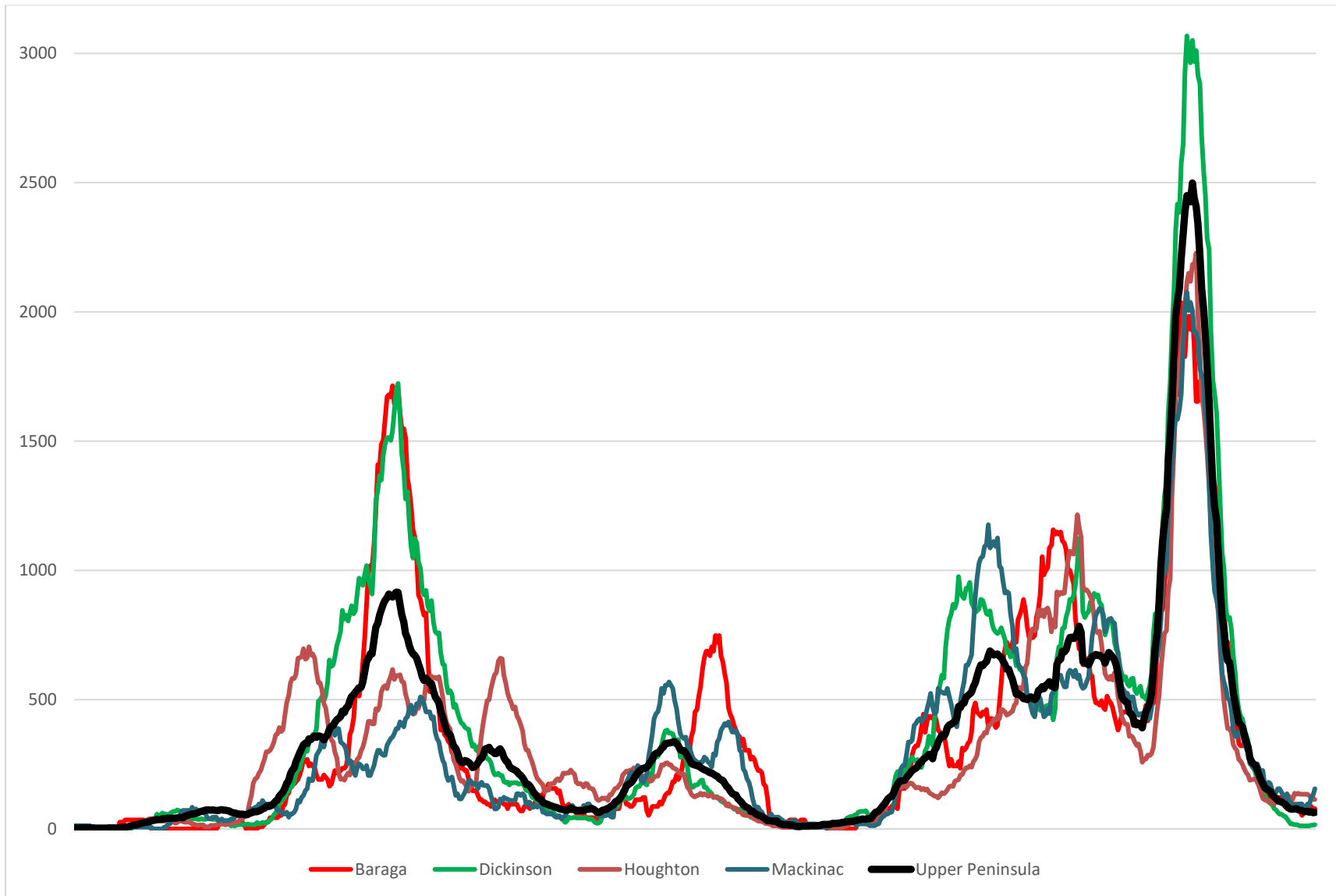


Figure 8-3: 14-day Average Confirmed & Probable COVID-19 Cases per Million per Day, May 1, 2020 through March 31, 2022—Baraga, Dickinson, Houghton, and Mackinac Counties

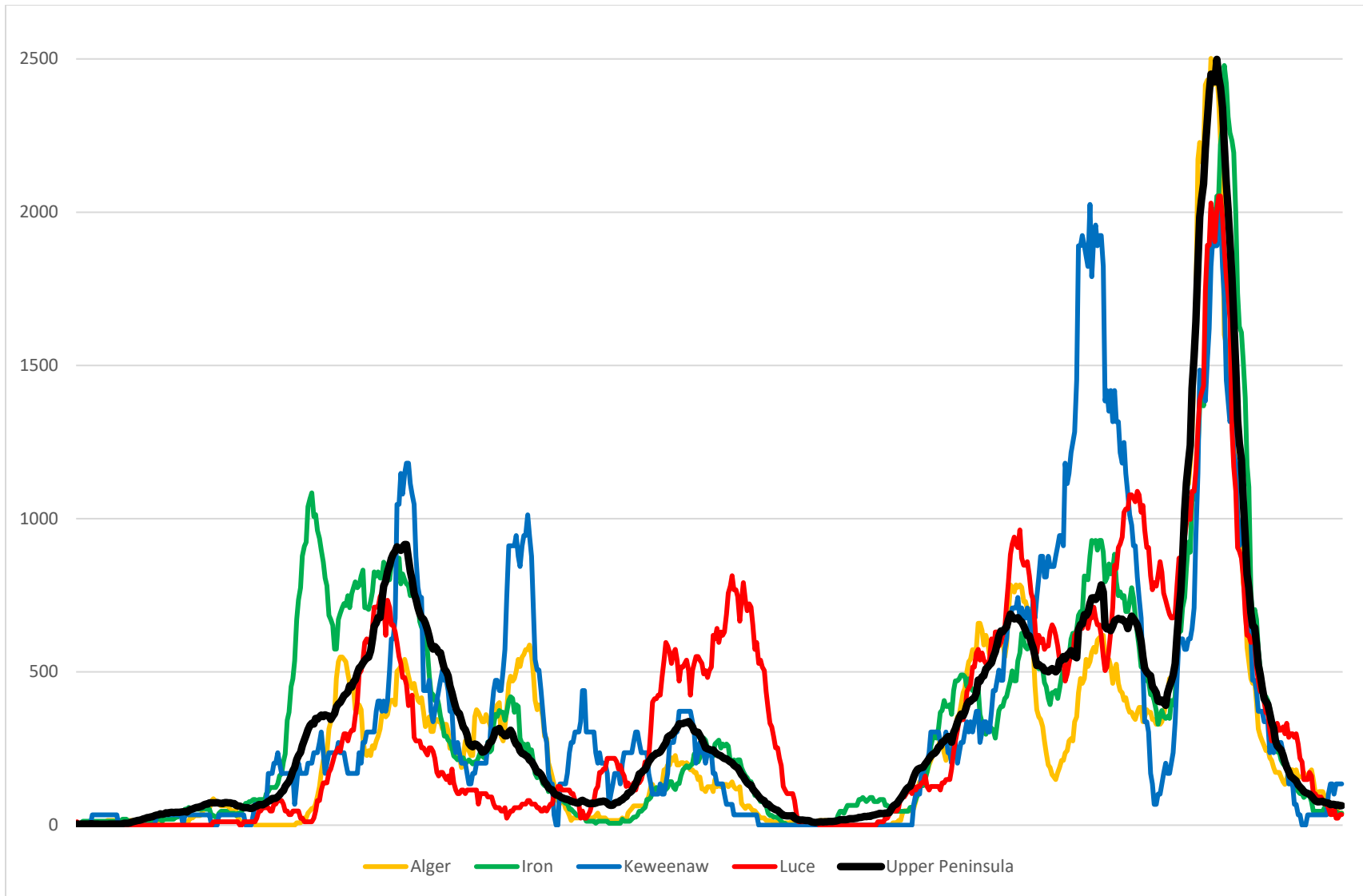


Figure 8-4: 14-day Average Confirmed & Probable COVID-19 Cases per Million per Day, May 1, 2020 through March 31, 2022 — Alger, Iron, Keweenaw, and Luce Counties

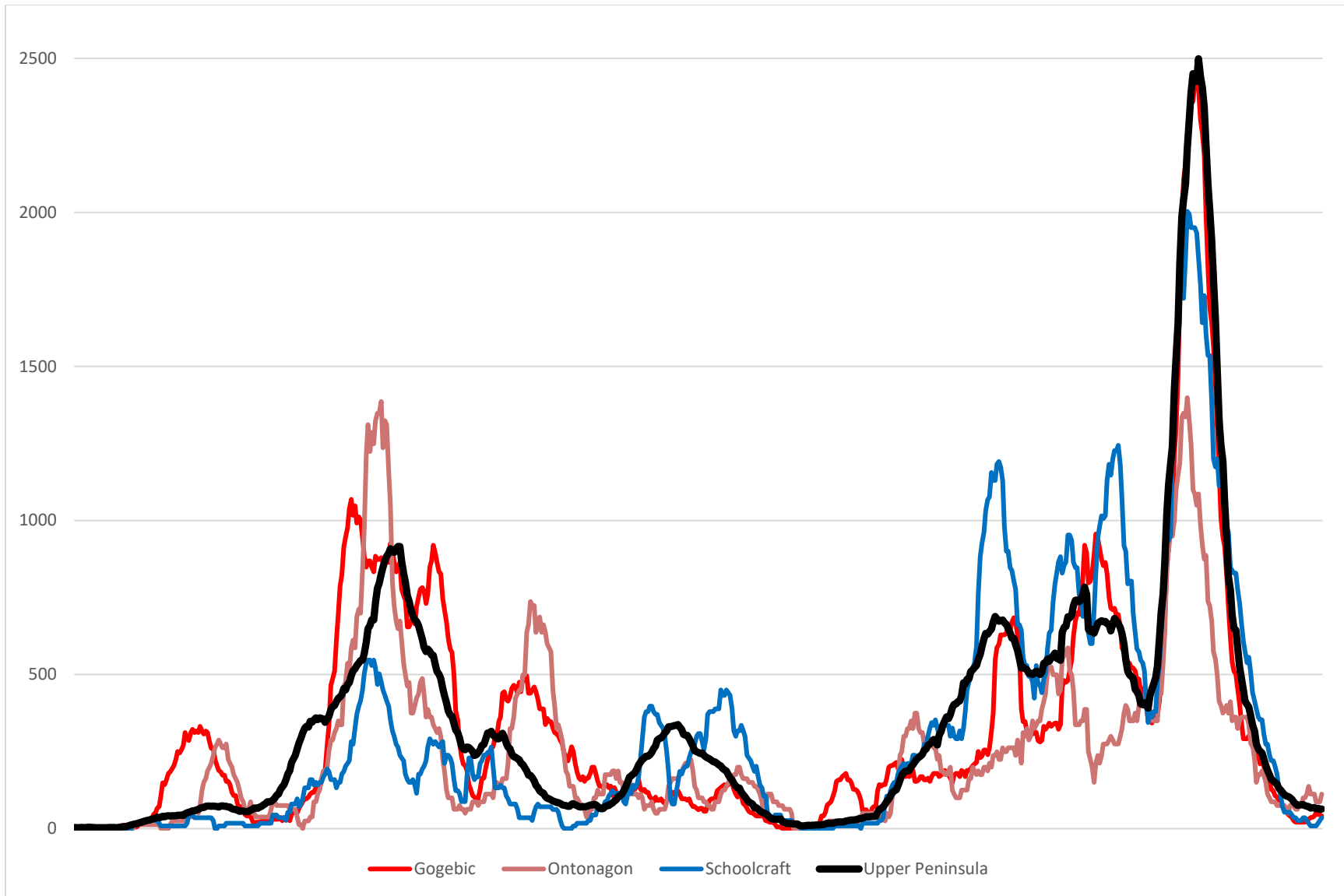


Figure 8-5: 14-day Average Confirmed & Probable COVID-19 Cases per Million per Day, May 1, 2020 through March 31, 2022 — Gogebic, Ontonagon, and Schoolcraft Counties

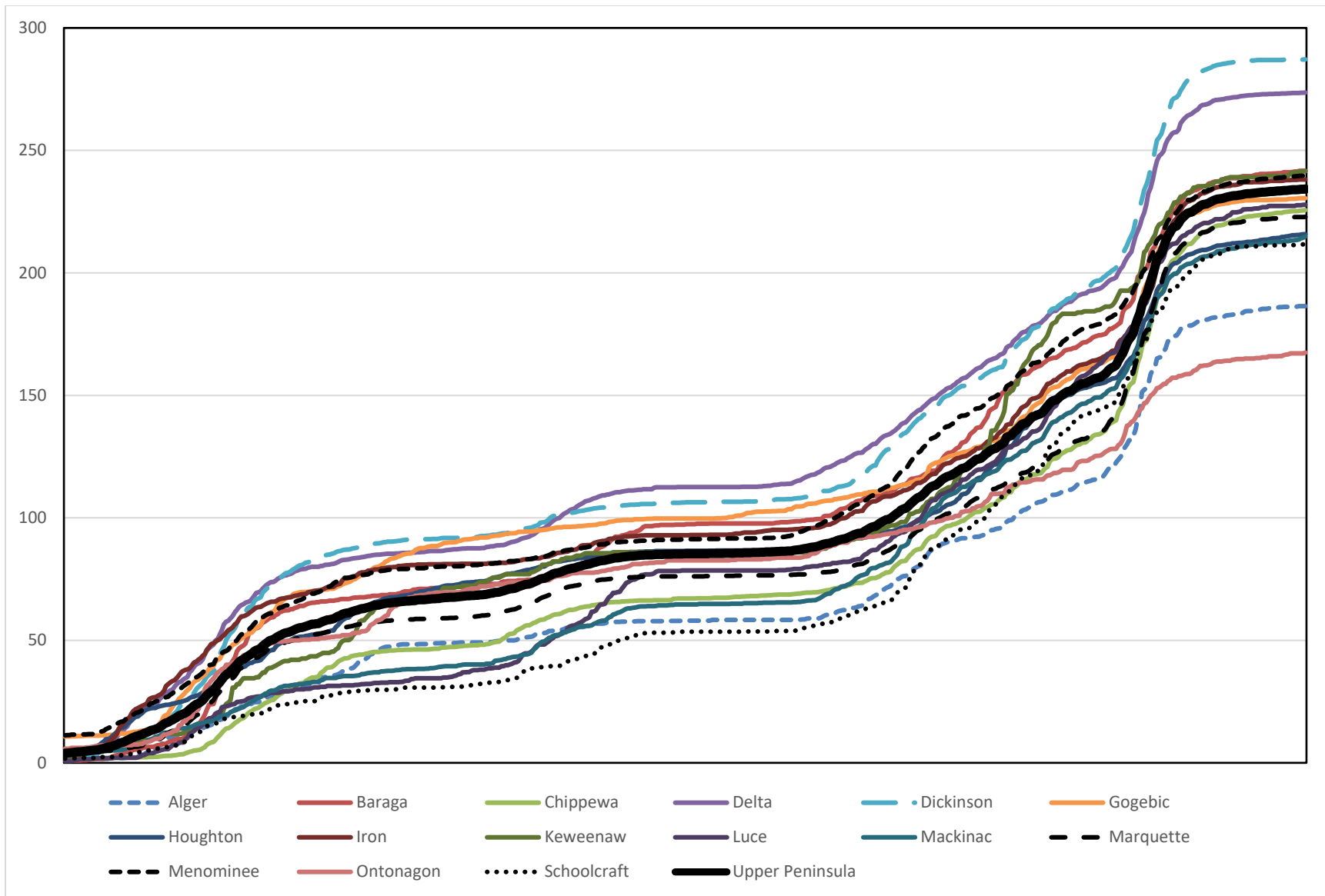


Figure 8-6: Cumulative Incidence per 1,000 of Confirmed & Probable COVID-19 Cases by County from September 1, 2020 through March 31, 2022

Several outbreaks are worthy of note. The early outbreak in Gogebic County centered around a single business. The early cases in Menominee were primarily linked to two employers in Wisconsin. In Houghton County, there was an uptick in cases associated with the arrival of students attending Michigan Technological University. As Houghton County was beginning to show signs of recovery, there was another uptick in cases two weeks following a political rally at the Hancock airport. A large outbreak in Baraga County resulted from infected individuals who attend an unofficial high school prom event. Outbreaks in the Fall of 2021 can be linked to specific schools. Some of the peaks in cases can be attributed to outbreaks in long-term care facilities in which most to nearly all residents became infected.

Each of the waves of the outbreak was accompanied by a change in the age group impacted. In the outbreak in the Spring of 2021, half of the cases were in individuals 29 years and younger (see **Figure 8-7**). This reflects that the vaccine was initially rolled out to those 65 years of age and older. This population had a high vaccination rate by the time of the Spring outbreak. If they had not been vaccinated, the number of infections and fatalities from this wave would have been much greater.

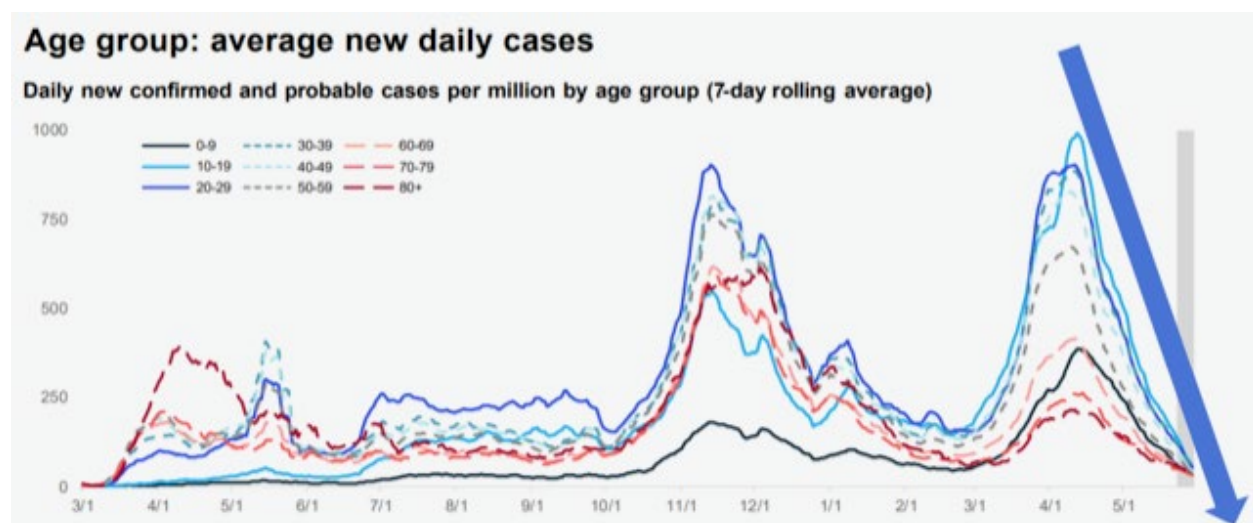


Figure 8-7: COVID-19 Confirmed and Probable Cases per Million per Day by Age Group, March 2020 through May 2021

The wave of COVID-19 infections in the Upper Peninsula beginning in the summer of 2021 has most impacted children under 18 years of age. **Figure 8-8** demonstrates those 3 to 17 years of age are largely responsible for the spike in cases in the Upper Peninsula seen since the end of June 2021. Similarly, **Figure 8-9** depicts the number of cases in those 3-17 years old beginning in August 2020. The shaded areas are the months of September 2020 and 2021. The rapid rise in cases in September 2021 compared to September 2020 may reflect either the relaxation of mitigation efforts (mask-wearing, quarantining close contacts, etc.) or a propensity for the Delta variant of the virus responsible for COVID-19 to infect younger individuals. Finally, the Omicron variant of the virus was accompanied by a spike of hospitalizations in children 0 to 4 years of age (**Figure 8-10**), [9] with hospitalizations markedly higher in children 6 months of age or younger (**Figure 8-11**). [10]

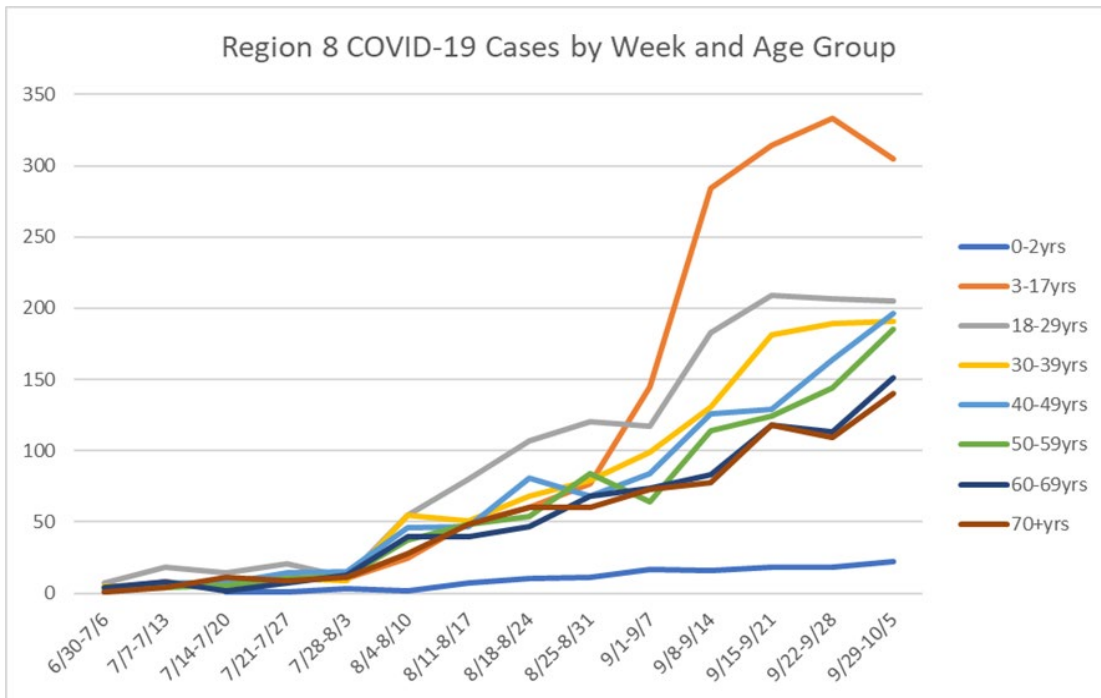


Figure 8-8: Weekly COVID-19 Cases by Age Group in Upper Peninsula, June 30 through October 5, 2021.

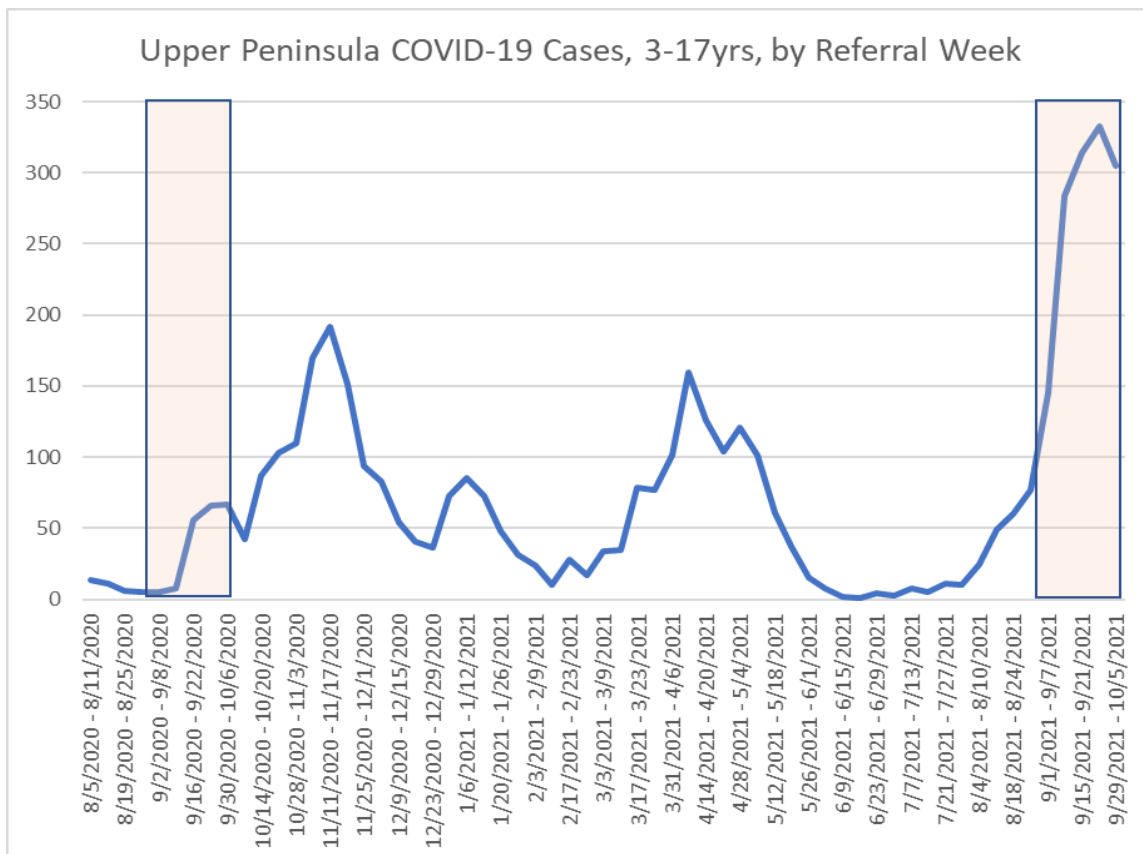
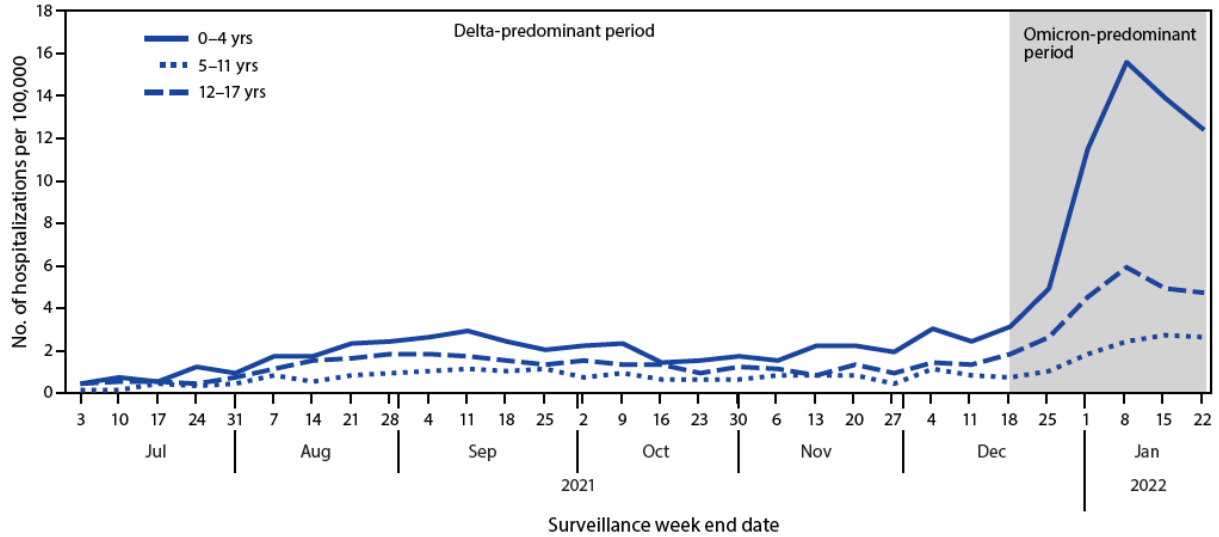
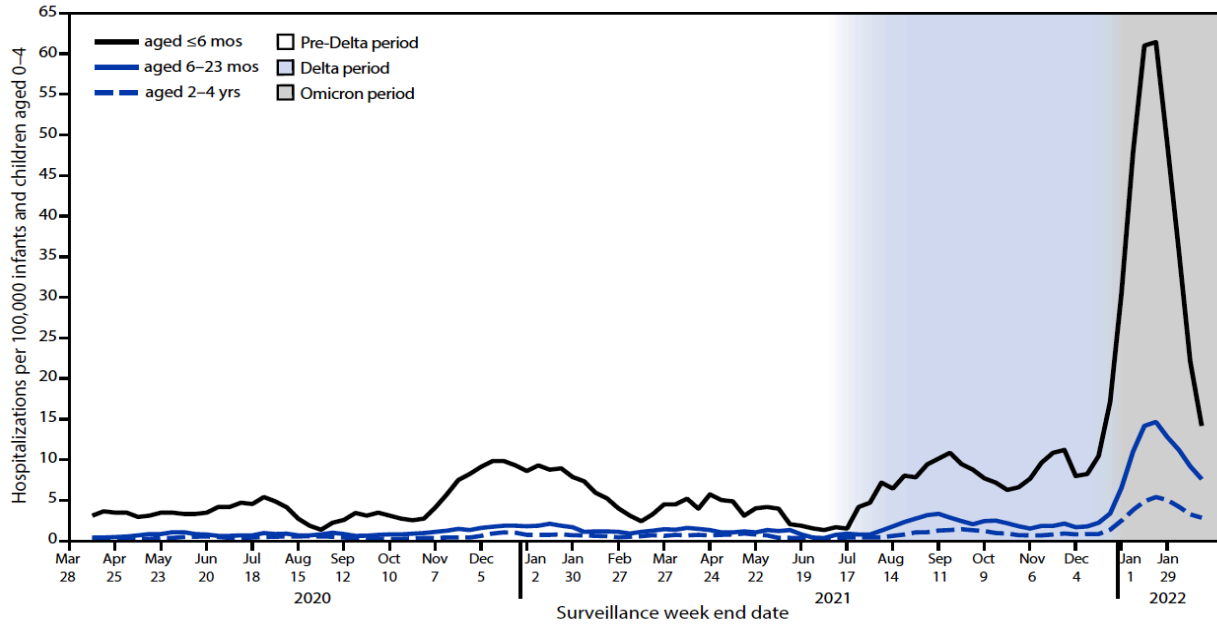


Figure 8-9: Weekly COVID-19 Cases in 3 to 17 years of age in Upper Peninsula, August 5, 2020 through October 5, 2021.



Abbreviation: COVID-NET = Coronavirus Disease 2019–Associated Hospitalization Surveillance Network.
 * Number of patients with laboratory-confirmed COVID-19–associated hospitalizations per 100,000 population; rates are subject to change as additional data are reported.
 † COVID-NET sites are in the following 14 states: California, Colorado, Connecticut, Georgia, Iowa, Maryland, Michigan, Minnesota, New Mexico, New York, Ohio, Oregon, Tennessee, and Utah. Starting the week ending December 4, 2021, Maryland data are removed from weekly rate calculations.

Figure 8-10: Weekly COVID-19–associated hospitalization rates* among children and adolescents aged 0–17 years, by age group — COVID-NET, 14 states, † July 3, 2021–January 22, 2022.



Abbreviation: COVID-NET = Coronavirus Disease 2019–Associated Hospitalization Surveillance Network.
 * Number of patients with laboratory-confirmed COVID-19–associated hospitalizations per 100,000 population; rates are subject to change as additional data are reported.
 † COVID-NET sites are in the following 14 states: California, Colorado, Connecticut, Georgia, Iowa, Maryland, Michigan, Minnesota, New Mexico, New York, Ohio, Oregon, Tennessee, and Utah. Starting the week ending December 4, 2021, Maryland data are removed from weekly rate calculations.
 § Periods of predominance are defined as follows: pre-Delta = March 1, 2020–June 26, 2021; Delta = June 27–December 18, 2021; Omicron = December 19, 2021–February 19, 2022.

Figure 8-11: COVID-19–associated hospitalization rates* among infants and children aged 0–4 years, by age group (3-week moving average) — Coronavirus Disease 2019–Associated Hospitalization Surveillance Network, 14 states, † March 2020–February 2022§

An interesting consequence of the mitigation efforts implemented in the spring of 2020 is that influenza infections, which typically continue from winter into spring, stopped abruptly (see **Figure 8-12**). [11] The 2019-2020 influenza season, depicted by the pink line, fell off precipitously when mitigation measures for COVID-19 were initiated. With little access to testing for COVID-19, patients with symptoms consistent with COVID-19 were routinely tested for influenza. The influenza tests were consistently negative. For the 2020-2021 influenza season, the dashed black line, saw virtually no cases of influenza. While it may be argued that the virus responsible for COVID-19 displaced the influenza virus, this is unlikely as multiple viruses will simultaneously go through a community each winter. In the 2021-2022 influenza seasons, some regions of the country reported simultaneous outbreaks of COVID-19 and influenza. Fortunately, Michigan saw few influenza cases in the 2021-2022 season. The impact of mitigation measures for COVID-19 on influenza may initiate discussions about whether these measures should be a permanent feature in environments where other viruses, including influenza, can spread rapidly. As there has been a movement to move away from mitigation measures, influenza may re-emerge.

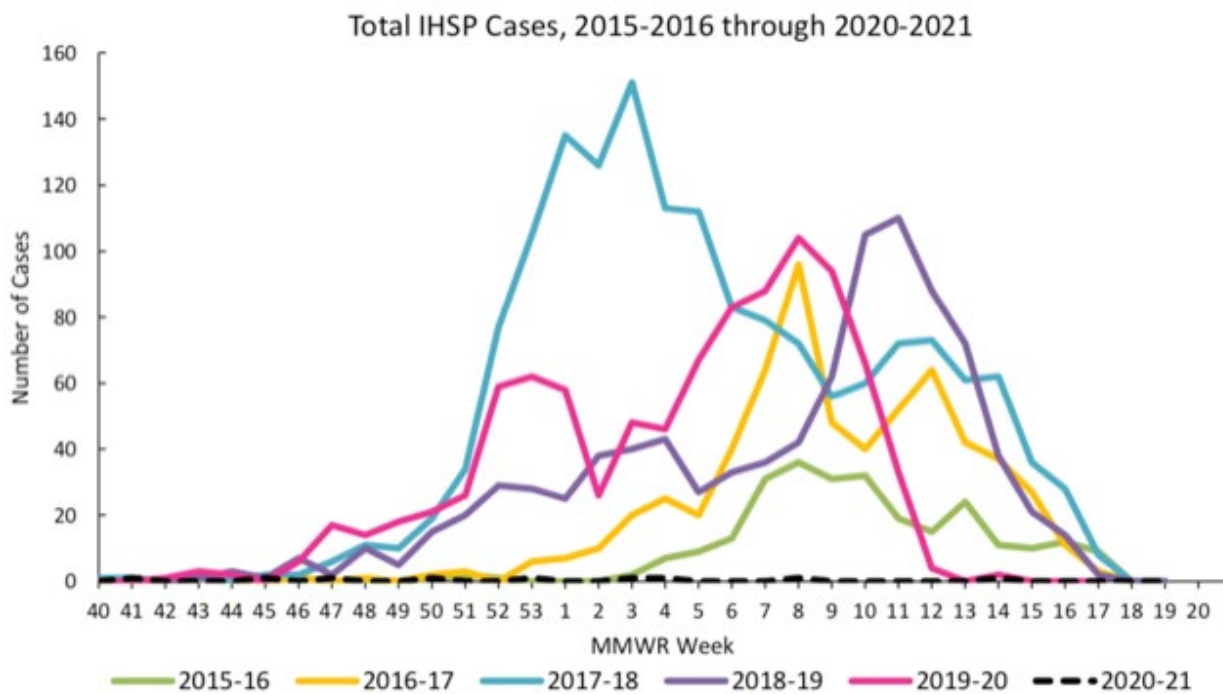


Figure 8-12: Weekly Influenza Cases in Michigan 2015-2016 Season through 2020-2021 Season

8.3 Selected Infectious Diseases by County

The tables below represent case counts for selected reportable diseases entered in MDSS, Michigan’s electronic disease registry, for residents of the Upper Peninsula, for the calendar years 2016 through 2021 with data from 2005 through 2021 for chlamydia, gonorrhea, and syphilis. Case counts reflect incidence — not prevalence — data; they tell how many cases were newly diagnosed or lab-confirmed in a year, not how many people overall may be currently living with the disease. Because reports in MDSS are generated when a person presents with symptoms and/or is tested by a health professional, the counts may reflect differences in medical practice and reporting. In general, these data indicate trends and relative risks of acquiring various common infectious diseases.

8.3.1 Foodborne Infections

8.3.1.1 *Campylobacter* (Table 8-2)

Campylobacter jejuni is a foodborne microbe that typically results from eating raw or undercooked poultry. Some infections are transmitted through contaminated water, contact with animals, or drinking raw (unpasteurized) milk. Although people with *Campylobacter* infection usually recover on their own, some require medical treatment. The most effective way to avoid a *Campylobacter* infection is to cook poultry completely and to keep food preparation work surfaces clean. Delta and Menominee counties have higher rates of *Campylobacter* infections than other counties. Infection rates peaked from 2015 through 2018, and have decreased since then.

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	4	1	1	0	1	1	2	0	0	3	13	14.27
Baraga	1	0	0	0	0	3	3	1	0	0	8	9.75
Chippewa	4	5	3	15	5	10	1	1	6	7	57	15.26
Delta	19	27	14	33	25	29	8	13	17	9	194	54.21
Dickinson	2	3	3	15	9	21	15	9	15	18	110	43.58
Gogebic	1	1	0	2	0	2	1	3	1	0	11	7.87
Houghton	7	6	3	3	5	4	10	4	2	1	45	12.61
Iron	1	1	0	3	2	1	1	1	0	2	12	10.84
Keweenaw	2	1	1	1	1	0	0	0	1	0	7	33.08
Luce	1	2	2	0	1	5	5	2	0	2	20	32.11
Mackinac	5	2	2	5	3	6	6	4	3	2	38	35.19
Marquette	12	13	11	9	17	18	18	4	5	9	116	17.39
Menominee	12	10	7	11	17	17	17	3	4	10	108	47.41
Ontonagon	1	1	0	1	1	0	0	0	2	1	7	12.24
Schoolcraft	3	1	0	0	4	3	3	3	2	3	22	27.18
Total	75	74	47	98	91	120	90	48	58	67	768	25.70
Incidence per 100,000 person-years	24.15	23.92	15.28	32.10	30.06	39.76	29.94	16.06	19.41	22.42		

8.3.1.2 Salmonellosis (Table 8-3)

Salmonellosis results from an intestinal infection with *Salmonella* species. Those infected typically have fever, diarrhea, and stomach cramps. Symptoms usually begin six hours to six days after exposure and last four to seven days. *Salmonella* infections can result from eating contaminated food, such as uncooked poultry, drinking contaminated water, or touching infected animals, such as turtles, their feces, or their environment. Other than providing adequate hydration, most cases do not need specific treatment. Chippewa and Luce counties report a higher rate of salmonellosis than the other counties. The years with the highest rates were 2017 and 2018.

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	1	4	1	1	0	3	0	0	0	0	10	10.98
Baraga	0	0	2	0	1	2	3	1	0	0	9	10.96
Chippewa	4	7	3	8	7	5	30	9	5	9	87	23.29
Delta	5	5	5	5	4	3	6	3	7	0	43	12.02
Dickinson	6	3	2	4	3	2	3	5	2	2	32	12.68
Gogebic	0	1	1	0	0	2	1	5	3	0	13	9.30
Houghton	5	9	4	4	6	4	2	6	4	3	47	13.17
Iron	2	1	4	0	0	0	4	0	1	0	12	10.84
Keweenaw	0	1	1	0	0	0	0	1	0	0	3	14.18
Luce	3	0	2	1	0	7	1	1	0	1	16	25.69
Mackinac	1	0	4	3	2	0	2	1	3	0	16	14.82
Marquette	4	10	16	7	8	17	6	10	12	9	99	14.84
Menominee	3	2	4	8	1	3	1	1	1	2	26	11.41
Ontonagon	0	0	1	1	2	0	2	2	2	0	10	17.48
Schoolcraft	0	0	0	1	1	1	0	1	4	0	8	9.88
Total	34	43	50	43	35	49	61	46	44	26	405	13.55
Incidence per 100,000 person-years	10.95	13.90	16.26	14.08	11.56	16.23	20.29	15.39	14.72	8.70		

8.3.2 Sexually Transmitted Infections

8.3.2.1 Chlamydia (Table 8-4)

Chlamydia is the most common lab-confirmed sexually transmitted infection (STI) in the United States and locally, yet true prevalence is even higher as many infected persons are asymptomatic. Although both women and men become infected with chlamydia, women, especially young women 15-24 years of age, experience the most significant health impact. Chlamydial infections are a frequent cause of pelvic inflammatory disease (PID). [12] PID may cause symptoms or be “silent.” Involvement of the upper structures of the female genital tract (fallopian tubes, uterus and surrounding tissues) can lead to permanent scarring and infertility. In its most recent recommendation statement, dated September 22, 2014, the United States Preventive Services Taskforce (USPSTF) recommends screening for chlamydia in sexually active women aged 24 years and younger and in older women who are at increased risk for infection. The current evidence is insufficient to assess the benefits and harms of screening for chlamydia in men. [13]

Prevention strategies, for sexually active individuals, include limiting the number of sexual partners and using condoms with every sexual encounter.

The table includes data from 2005 through 2021. The counties with the highest rates of infection were Chippewa, Marquette, and Keweenaw. The higher rates in Chippewa and Marquette counties may reflect that they have a younger population attending the local universities. The high rate in Keweenaw may reflect the high variability associated with small populations. The years with the highest rates were 2016 and 2018. The mitigation efforts implemented in response to the COVID-19 pandemic, or the limitations in access to health care services, may be responsible for the drop in Chlamydia cases in 2020.

The increase in Chlamydia incidence beginning in 2009 may reflect the 2008 requirement for Title X family planning clients 15 years and older to be screened for Chlamydia.

8.3.2.2 Gonorrhea (Table 8-5)

Gonorrhea is a sexually transmitted infection caused by *Neisseria gonorrhoeae*. Men with gonorrhea are typically symptomatic, complaining of painful urination and urethral discharge. Women with gonorrhea are often asymptomatic, and, like with Chlamydia discussed above, infection can spread within the abdomen resulting in pelvic inflammatory disease (PID), which can result in subsequent infertility. Gonorrhea can be treated with antibiotics. In its most recent recommendation state, dated September 22, 2014, the United State Preventive Services Taskforce (USPSTF) recommends screening for gonorrhea in sexually active women aged 24 years and younger and in older women who are at increased risk for infection. The current evidence is insufficient to assess the benefits and harms of screening for gonorrhea in men. [13]

The table includes data from 2005 through 2021. Gonorrhea is less common than Chlamydia. Mackinac County has the highest rate of gonorrhea among the counties. Peak years for gonorrhea were 2017 and 2019. The mitigation efforts implemented in response to the COVID-19 pandemic, or the limitations in access to health care services, may be responsible for the drop in Chlamydia cases in 2020.

8.3.2.3 Syphilis (Table 8-6)

Syphilis is a sexually transmitted infection caused by the bacterium *Treponema pallidum*. Syphilis is divided into stages (primary, secondary, latent, and tertiary), with different signs and symptoms associated with each stage. A person with primary syphilis, following initial exposure, typically presents with a firm, round, painless sore (chancre) or sores at the original site of infection. With time, those not treated can develop symptoms of secondary syphilis — skin rash, swollen lymph nodes, and fever. Because the signs and symptoms of primary and secondary syphilis can be mild and go untreated, those who remain untreated can enter a latent stage, during which there are no signs or symptoms. Tertiary syphilis can be associated with severe medical and neurological problems affecting the heart, brain, and other organs of the body. Syphilis is diagnosed using a combination of blood tests and can be treated with penicillin.

There has been an increase in cases of syphilis starting in 2018, but the increase in the Upper Peninsula has been much smaller than the increase in cases seen in the Lower Peninsula. The elevated rate in Keweenaw County may reflect the small population in the county.

Table 8-4: Chlamydia in the Upper Peninsula, 2005-2021

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence*
Alger	4	7	13	5	6	6	9	5	7	5	10	16	16	7	8	11	13	148	95.59
Baraga	13	12	9	11	8	9	7	11	13	13	16	16	13	14	31	20	24	240	171.98
Chippewa	75	43	46	59	51	52	88	103	136	96	105	113	103	84	59	67	78	1358	213.88
Delta	53	44	49	42	43	69	54	67	63	88	70	89	81	118	111	51	46	1138	187.07
Dickinson	20	26	28	49	48	40	47	67	49	52	52	48	48	61	70	43	61	809	188.55
Gogebic	10	17	22	29	43	33	26	36	17	34	30	36	40	26	30	24	35	488	205.41
Houghton	15	23	28	19	24	29	41	32	43	43	50	45	51	62	63	53	59	680	112.10
Iron	6	12	12	10	8	15	23	16	5	14	38	39	28	32	27	23	26	334	177.54
Keweenaw	9	9	9	11	12	12	10	8	9	5	5	7	8	3	3	4	3	127	353.05
Luce	9	8	2	5	8	1	7	2	10	7	9	8	18	19	11	6	2	132	124.65
Mackinac	19	10	12	9	8	8	17	16	26	17	11	23	18	26	24	16	24	284	154.70
Marquette	131	110	114	84	117	115	142	169	218	221	212	278	269	317	242	198	192	3129	275.95
Menominee	42	33	31	29	33	41	47	57	32	45	61	70	51	52	56	29	35	744	192.12
Ontonagon	3	5	5	2	10	4	7	3	3	2	5	9	10	4	9	3	7	91	93.58
Schoolcraft	4	7	4	3	6	6	5	14	8	10	6	24	27	12	14	10	10	170	123.55
Total	413	366	384	367	425	440	530	606	639	652	680	821	781	837	758	558	615	9257	182.21
Incidence*	132.6	117.5	123.3	117.9	136.5	141.3	170.4	195.1	206.6	212.0	222.7	271.2	258.8	278.4	253.6	186.7	205.8		

* per 100,000 person-years

Table 8-5: Gonorrhea in the Upper Peninsula, 2005-2021

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence*
Alger	0	0	0	0	0	0	1	0	0	0	0	0	2	0	2	0	1	6	3.88
Baraga	0	1	0	2	0	1	0	0	1	0	3	1	1	0	2	0	0	12	8.60
Chippewa	2	10	2	3	0	2	0	1	4	1	1	2	3	5	4	6	12	58	9.13
Delta	0	6	0	8	2	8	1	1	1	3	6	7	6	3	7	2	2	63	10.36
Dickinson	0	5	2	4	2	1	1	4	4	0	0	8	6	2	4	1	4	48	11.19
Gogebic	0	0	1	1	0	0	3	3	1	2	2	1	4	2	1	0	1	22	9.26
Houghton	0	0	0	2	0	1	0	0	2	3	5	6	5	8	5	3	7	47	7.75
Iron	0	2	2	0	0	0	1	1	0	0	1	3	1	1	2	2	2	18	9.57
Keweenaw	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	5	13.90
Luce	0	0	0	0	3	0	0	0	1	0	0	0	3	1	1	2	0	11	10.39
Mackinac	3	0	2	1	2	1	4	2	5	0	0	2	5	6	5	1	2	41	22.33
Marquette	9	5	7	5	2	3	10	2	7	18	8	8	8	6	7	9	17	131	11.55
Menominee	0	3	3	6	4	9	3	6	3	3	2	4	3	3	4	3	2	61	15.75
Ontonagon	2	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	5	5.14
Schoolcraft	0	0	0	0	1	1	0	0	1	1	0	1	0	1	1	0	1	8	5.81
Total	16	32	19	32	17	27	24	20	31	31	29	44	48	39	46	29	52	536	10.55
Incidence*	5.14	10.28	6.10	10.28	5.46	8.67	7.72	6.44	10.02	10.08	9.50	14.54	15.90	12.97	15.39	9.70	17.40		

Table 8-6: Syphilis in the Upper Peninsula, 2005-2021

County	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence*
Alger	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.65
Baraga	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Chippewa	2	0	1	0	1	2	0	0	0	1	0	0	1	9	5	4	0	20	3.15
Delta	0	1	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	1	0.16
Dickinson	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0.47
Gogebic	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.42
Houghton	0	0	0	0	0	0	0	0	0	0	1	1	4	0	0	0	0	6	0.99
Iron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.53
Keweenaw	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	5.56
Luce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Mackinac	0	1	1	0	0	0	0	0	0	0	1	1	1	0	2	1	0	6	3.27
Marquette	0	1	0	0	0	0	1	0	1	0	2	1	0	0	3	1	0	8	0.71
Menominee	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.00
Ontonagon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1.03
Schoolcraft	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	2.19
Total	2	3	2	1	1	2	8	0	1	2	5	5	7	10	11	11	0	52	1.02
Incidence*	0.64	0.96	0.64	0.32	0.32	0.64	2.57	0.00	0.32	0.65	1.64	1.65	2.32	3.33	3.68	3.68	0.00		

*per 100,000 person-years

8.3.3 Hepatitis

“Hepatitis” means inflammation of the liver. Toxins, certain drugs, some metabolic diseases, heavy alcohol use, and bacterial and viral infections can all cause hepatitis. Hepatitis is also the name of a family of viral infections that affect the liver; the most common types are hepatitis A, hepatitis B, and hepatitis C.

Table 8-7: Hepatitis A in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	0	0	0	0	0	1	1	0	0	2	2.20
Baraga	0	0	0	0	1	0	0	0	0	0	1	1.22
Chippewa	0	2	2	0	0	0	0	0	0	0	4	1.07
Delta	1	0	0	0	1	1	0	0	0	0	3	0.84
Dickinson	1	0	0	0	0	0	0	0	0	0	1	0.40
Gogebic	0	0	0	0	0	0	0	0	0	0	0	0.00
Houghton	2	1	0	0	0	0	0	0	0	1	4	1.12
Iron	0	0	0	0	0	0	0	1	0	0	1	0.90
Keweenaw	1	0	0	0	0	0	0	0	0	0	1	4.73
Luce	0	0	0	0	0	0	0	0	0	0	0	0.00
Mackinac	0	0	0	0	0	0	0	0	0	0	0	0.00
Marquette	0	0	0	1	1	0	0	0	0	2	4	0.60
Menominee	1	0	0	1	0	0	0	0	0	0	2	0.88
Ontonagon	0	0	0	0	0	0	0	0	0	0	0	0.00
Schoolcraft	0	0	0	0	0	1	0	0	0	0	1	1.24
Total	6	3	2	2	3	2	1	2	0	3	21	0.70
Incidence per 100,000 person-years	1.93	0.97	0.65	0.66	0.99	0.66	0.33	0.67	0.00	1.00		

8.3.3.1 Hepatitis A (Table 8-7)

Hepatitis A, which is primarily a foodborne illness but can be contracted from an infected individual, appears only as an acute or newly occurring infection and does not become chronic. People with Hepatitis A usually improve without treatment and only supportive treatment is needed. An effective vaccine for Hepatitis A is currently available and routinely recommended (see Section §7.2.1).

Fortunately, cases of Hepatitis A in the Upper Peninsula have been rare and sporadic. No cases were reported in 2020 and only 3 cases in 2021.

Table 8-8: Hepatitis B in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	0	0	1	0	0	0	0	0	0	1	1.10
Baraga	1	1	0	1	2	0	0	1	1	0	7	8.53
Chippewa	5	15	3	5	6	2	1	3	0	0	40	10.71
Delta	7	6	5	2	9	5	3	3	6	2	48	13.41
Dickinson	0	2	0	0	0	1	1	0	0	0	4	1.58
Gogebic	1	0	0	0	0	0	1	1	2	0	5	3.58
Houghton	4	1	0	1	1	3	1	2	2	3	18	5.04
Iron	0	0	0	0	0	0	1	0	0	0	1	0.90
Keweenaw	1	0	1	0	0	0	1	0	0	0	3	14.18
Luce	0	0	0	0	0	1	0	0	0	0	1	1.61
Mackinac	0	2	0	0	0	1	0	0	1	0	4	3.70
Marquette	1	0	1	4	2	3	3	2	3	1	20	3.00
Menominee	0	0	1	1	2	0	0	1	1	1	7	3.07
Ontonagon	0	1	0	0	0	0	0	0	0	0	1	1.75
Schoolcraft	0	0	0	0	0	2	0	1	0	1	4	4.94
Total	20	28	11	15	22	18	12	14	16	8	156	5.22
Incidence per 100,000 person-years	6.44	9.05	3.58	4.91	7.27	5.96	3.99	4.68	5.35	2.68		

8.3.3.2 Hepatitis B (Table 8-8)

Hepatitis B is spread when blood, semen, or other body fluids from a person infected with the virus enters the body of someone who is not infected. This can happen through sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to baby at birth. Hepatitis B begins as an acute infection, but in some people, the virus remains in the body, resulting in chronic disease and long-term liver problems. There are effective vaccines to prevent Hepatitis B.

The highest rates are seen in Delta and Keweenaw counties. The high rate in Keweenaw may reflect that county's small population. The years with the highest rates were 2013 and 2016.

8.3.3.3 Hepatitis C (Table 8-9)

Hepatitis C is an infectious liver disease that results from infection with the hepatitis C virus (HCV). The majority of individuals infected with HCV have no symptoms or symptoms so mild as to go unnoticed, yet most of those infected will develop chronic infection, the signs of which may take decades to show up. Others may develop liver cancer, which is one of the fastest growing causes of cancer mortality nationally. Until recently, hepatitis C was the leading reason for liver transplantation, but a 2020 study found non-alcoholic steatohepatitis (NASH) — a severe form of fatty liver — and alcoholic liver disease to be the most common reasons for liver transplantation. [14] Hepatitis C is usually spread when blood from a person infected with the hepatitis C virus enters the body of someone who is not infected. Hepatitis C cases are often associated with Baby Boomers who acquired the infection decades earlier but were recently tested and learned of their infected status. Today, most people become infected with the hepatitis C virus by sharing needles or other equipment used to inject drugs. Hepatitis C may also be transmitted in utero from mother to child and rarely through sexual contact.

There is no current vaccine to prevent Hepatitis C infection, but there is treatment available. Prevention of the majority of new hepatitis C infections will require the development of long-range strategies addressing the root causes of the opioid epidemic. An immediate impact on the transmission of hepatitis C can be made through the implementation of syringe service programs (SSPs), otherwise known as needle exchange programs. Through SSPs, individuals with injection drug addiction are offered sterile needles, syringes and other equipment; given options for safe disposal of used needles; offered naloxone (an injection used to treat overdoses) kits; offered human immunodeficiency virus (HIV) and hepatitis testing; provided education about safer practices and overdose prevention; offered test strips to test for potent synthetic opioids; referred to treatment programs; and linked with needed medical care and social services. These programs have been shown to reduce drug use by getting more people to enter into drug treatment, reduce drug overdose deaths, reduce needlestick injuries among local law enforcement officers, reduce new HIV and hepatitis infections, and reduce overall healthcare costs by preventing disease.

The CDC, in its most recent statement dated April 10, 2020, recommends hepatitis C screening at least once in a lifetime for all adults aged 18 years or older and for all pregnant women. Screening is not needed where the prevalence of HCV is less than 0.1%. In addition, all persons with risk factors should be tested for hepatitis C, with periodic testing while risk factors persist. Any person who requests hepatitis C testing should receive it. [15]

Baraga and Iron counties report the highest rates of hepatitis C. As screening programs for acute and

Table 8-9: Hepatitis C in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	4	4	4	5	4	11	11	10	4	2	59	64.78
Baraga	11	16	10	18	14	25	15	11	4	10	134	153.24
Chippewa	46	44	36	59	54	57	31	37	36	18	418	111.92
Delta	33	39	41	39	50	62	58	30	30	30	412	115.14
Dickinson	17	33	20	22	36	48	15	14	13	27	218	86.37
Gogebic	10	7	15	26	14	20	22	9	8	6	137	98.03
Houghton	6	9	11	16	23	31	23	14	16	10	159	44.56
Iron	7	21	16	14	31	30	24	12	9	9	173	156.33
Keweenaw	3	0	2	5	1	2	1	1	3	0	18	85.07
Luce	1	3	1	8	11	15	13	4	3	8	67	107.56
Mackinac	6	6	9	9	12	12	20	2	6	1	83	76.86
Marquette	54	36	52	67	71	92	84	53	40	42	591	88.61
Menominee	9	10	14	21	29	32	18	21	15	16	185	81.21
Ontonagon	2	3	0	3	9	5	2	2	3	5	34	59.44
Schoolcraft	6	6	11	6	10	9	18	4	2	2	74	91.43
Total	215	237	242	318	369	451	355	224	192	186	2603	87.10
Incidence per 100,000 person-years	69.23	76.61	78.69	104.16	121.90	149.43	118.08	74.95	64.25	62.24		

chronic cases of hepatitis C were ramped up, there was an increase in identified cases that peaked in 2016 and 2017. Since then the numbers have decreased as the backlog of undetected cases is being cleared. Further study is needed to determine if the SSPs have impacted the regional incidence of hepatitis C infections.

8.3.4 Tick-borne Illnesses

Increasingly, especially in the counties the border Wisconsin, we are seeing an increase in diseases spread by the bite of the black-legged tick (or deer/bear tick, *Ixodes scapularis*), pictured in **Figure 8-13**.

The black-legged tick is the second most commonly encountered tick in Michigan. The tick is small, with adult females measuring up to 5 millimeters, and is active when the outdoor temperatures are above 40°F. People who spend time outdoors in wooded areas are most likely to be bitten by these ticks. The tick is indigenous to the western portion of the Upper Peninsula (**Figure 8-14**), while the diseases the tick carries and transmits have spread recently from northern Wisconsin. [16] The tick is responsible for spreading Lyme disease, anaplasmosis, babesiosis (also known as Nantucket Fever), and Powassan virus. Fortunately, babesiosis and Powassan virus are rarely seen in Michigan.



Figure 8-13: Black-legged (deer/bear) Tick (*Ixodes scapularis*)

8.4.1 Lyme Disease (Table 8-10)

Borrelia burgdorferi is the spirochete responsible for Lyme disease. Lyme disease can produce a wide range of symptoms from rash, to arthritis, to permanent neurologic impairment. Since being discovered in Lyme, Connecticut, Lyme disease continues to be the most commonly reported vector-borne disease in the United States and is a more significant health concern in Upper Peninsula counties compared to many other areas in Michigan.

There are no currently available vaccines in the U.S. to prevent Lyme Disease, so prevention strategies are focused on avoidance of exposure. Lyme disease can be treated with antibiotics.

Lyme disease, which was endemic¹¹ in northern Wisconsin, has spread to the western and central Upper Peninsula as disease-carrying deer ticks expand their range (perhaps due to milder winters and changes in land use patterns) see **Figure 8-15**. [17]

¹¹ Endemic means that infected tick populations have been confirmed and/or two or more cases with local exposure have been confirmed.

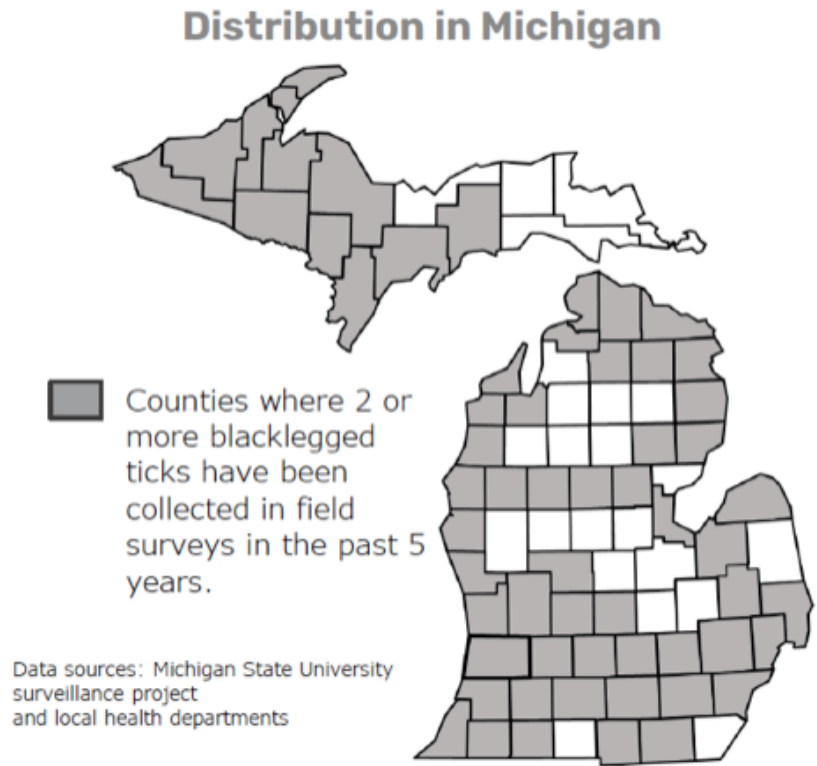


Figure 8-14: Distribution of Black-legged Tics in Michigan

While recognizing that both variation in county population and provider awareness may affect the number of reported cases, a clear pattern emerges from the data, with Lyme disease, which has been widespread for decades in Wisconsin and Minnesota, spreading into the western and central Upper Peninsula.

Not surprisingly, the highest rates of Lyme disease are seen in Dickinson, Menominee, and Ontonagon counties and the number of yearly cases in the Upper Peninsula continues to rise with the most cases reported in 2020. The number of cases each year may reflect the mildness of the previous winter.

For the period from 2016, the incidence per 100,000 residents per year for Lyme disease was 145 in Dickinson County, 52 in Ontonagon County, 52 in Menominee County, 27 in Keweenaw County, and 25 in Iron County. [17] The numbers presented may under-represent the total number of cases as not all cases are reported and many cases may be treated on the suspicion of infection without confirmatory testing being performed. If one assumes that practice patterns remain constant, the year-to-year numbers may provide a reasonable estimate of the trend over time.

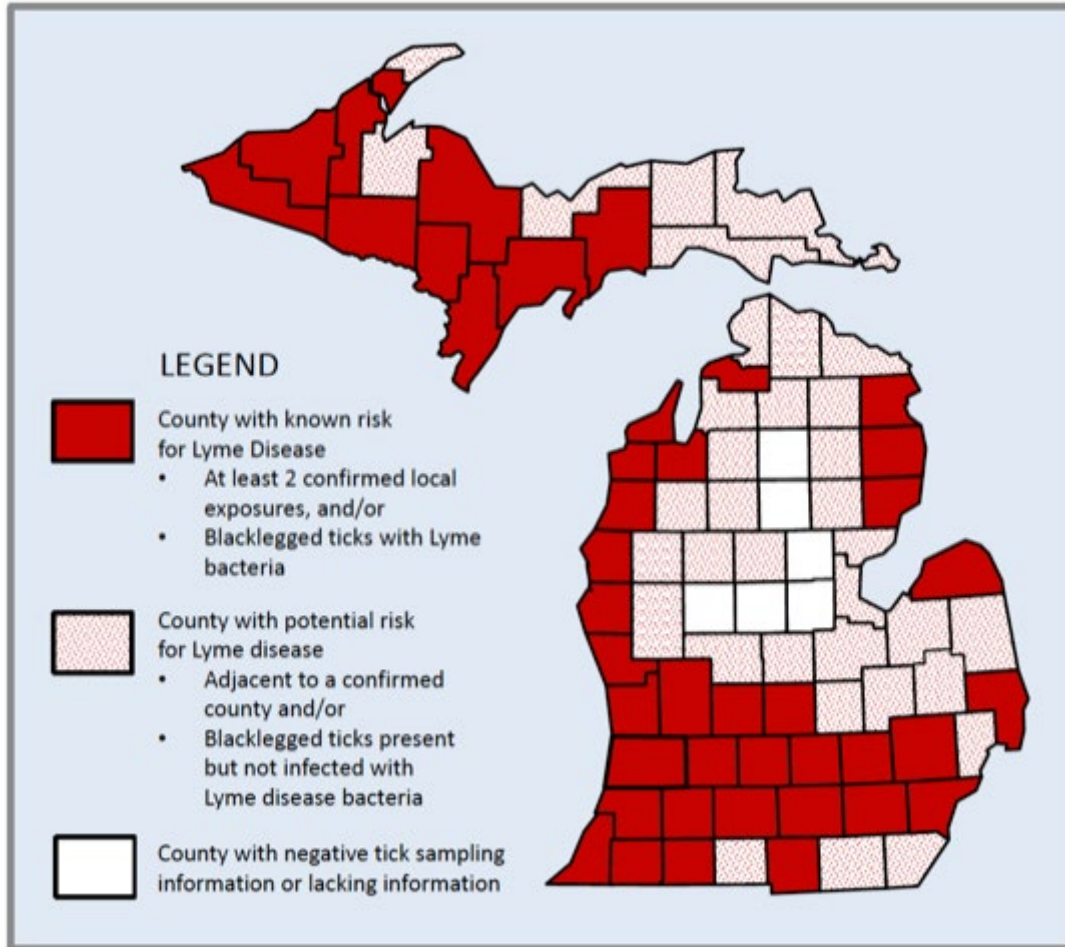


Figure 8-15: Risk for Lyme Disease in Michigan by County

Table 8-10: Lyme Disease in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	0	0	0	1	0	1	1	0	0	3	3.29
Baraga	0	0	0	1	1	0	0	4	5	9	20	24.36
Chippewa	1	0	0	0	1	4	1	3	1	1	12	3.21
Delta	5	11	4	1	4	4	4	8	6	3	50	13.97
Dickinson	6	18	15	6	28	60	34	50	55	63	335	132.73
Gogebic	3	5	1	6	6	2	2	4	4	3	36	25.76
Houghton	2	2	3	5	5	11	9	4	8	10	59	16.53
Iron	2	1	1	0	3	2	1	4	8	6	28	25.30
Keweenaw	0	0	1	1	2	1	0	0	0	0	5	23.63
Luce	0	0	0	0	0	2	0	0	1	0	3	4.82
Mackinac	0	0	0	0	0	0	1	3	1	1	6	5.56
Marquette	1	4	2	0	6	5	9	7	8	6	48	7.20
Menominee	18	39	17	8	7	23	14	22	23	7	178	78.14
Ontonagon	5	6	1	2	4	3	3	3	4	2	33	57.69
Schoolcraft	0	0	0	0	0	1	0	3	0	2	6	7.41
Total	43	86	45	30	68	118	79	116	124	113	709	23.72
Incidence per 100,000 person-years	13.85	27.80	14.63	9.83	22.46	39.10	26.28	38.82	41.49	37.81		

8.3.4.2 Anaplasmosis (Table 8-11)

Human granulocytic anaplasmosis, the second most common tick-borne disease in Michigan following Lyme disease, is caused by the rickettsia *Anaplasma phagocytophilum*. It was first recognized as a disease in humans in 1994 by physicians in Duluth, Minnesota [18] and is currently a reportable infection. Cases have been increasing in Michigan, with the most cases in the Michigan counties that share a border with Wisconsin (see **Figure 8-16**). Infections are primarily seen between April and August when the ticks are nymphs and difficult to detect as they are 2 to 3 millimeters in size. Symptoms are usually seen within one to two weeks following tick exposure, but 25% of those diagnosed with

anaplasmosis report no exposure to ticks. The symptoms include a non-specific fever, sweating, rigors, headache, myalgia (muscle aches), and arthralgia (painful joints) and are often similar to a viral infection. Laboratory findings included a drop in the white blood cell and platelet counts and a mild to moderate elevation in the liver function tests. Diagnosis is based on specific findings in a peripheral blood smear examined under a microscope, a PCR test for DNA specific to *Anaplasma phagocytophilum*, or a four-fold increase in the antibody (IgG) titers over time. In a study of men in northwestern Wisconsin, 14% had evidence of a previous infection, [19] suggesting that most infections go undetected. About 2% to 11.7% of those with Lyme disease will also have anaplasmosis. Of those who become infected, 36% may need hospitalization, of which 17% will require intensive care. Fortunately, the case fatality rate for these infections is low (<1%). [20] The treatment is oral doxycycline. The number of cases reported from year to year can vary given variations in winter severity and the populations of white-footed mice, white-tailed deer, and black-footed ticks. The winter of 2020-2021 was mild with 13 confirmed cases of anaplasmosis reported in 2021.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Delta				1									1
Dickinson			1				1	4	6	4	9	23	48
Gogebic			2				3					1	5
Houghton			1		1					1		2	5
Iron								1	1				2
Menominee	2	1	2			2		7	2	4	2	4	26
Ontonagon						1					2		3
Schoolcraft												1	1
Total	2	1	6	1	1	3	3	12	9	9	13	31	91

Incidence of Human Cases of Anaplasmosis, Michigan 2016-2020 by County of Residence

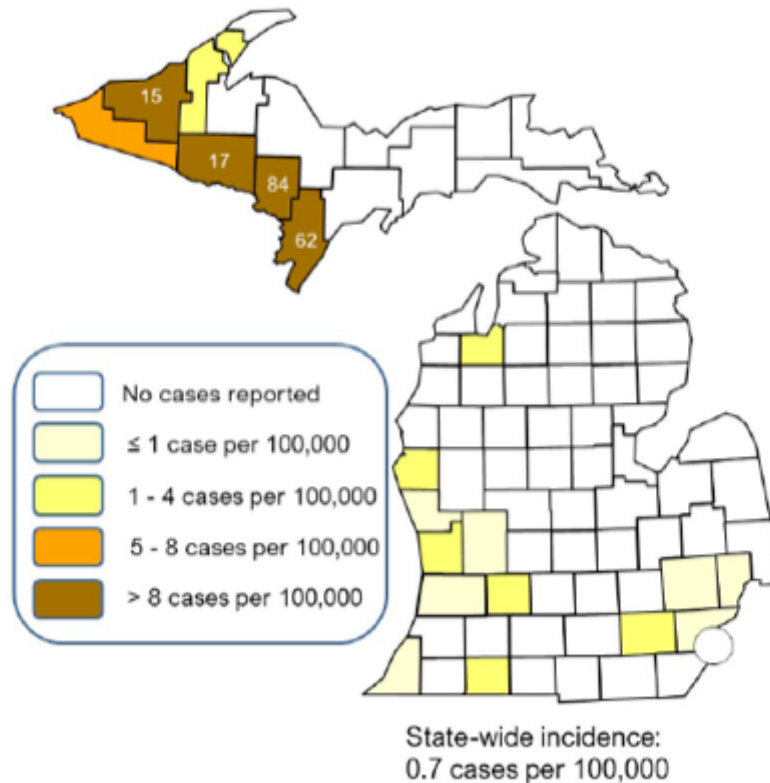


Figure 8-16: Incidence of Human Cases of Anaplasmosis, Michigan 2016-2020 by County of Residence

8.3.5 Mosquito-borne Infections

With climate change, there has been a shift in some of the mosquito-borne illnesses. While in 2020 the West Nile virus, Lacrosse Encephalitis virus, and the Jamestown Canyon virus, have only been reported in the Lower Peninsula of Michigan, the arbovirus responsible for Eastern Equine Encephalopathy has been found in animals in Baraga, Iron, Marquette, and Menominee counties and in one human case in Delta County (see **Figure 8-17**) In 2019 animal cases were reported only in Gogebic and Houghton counties.[17] While the numbers are small, the emergence of this infection in this region is concerning.

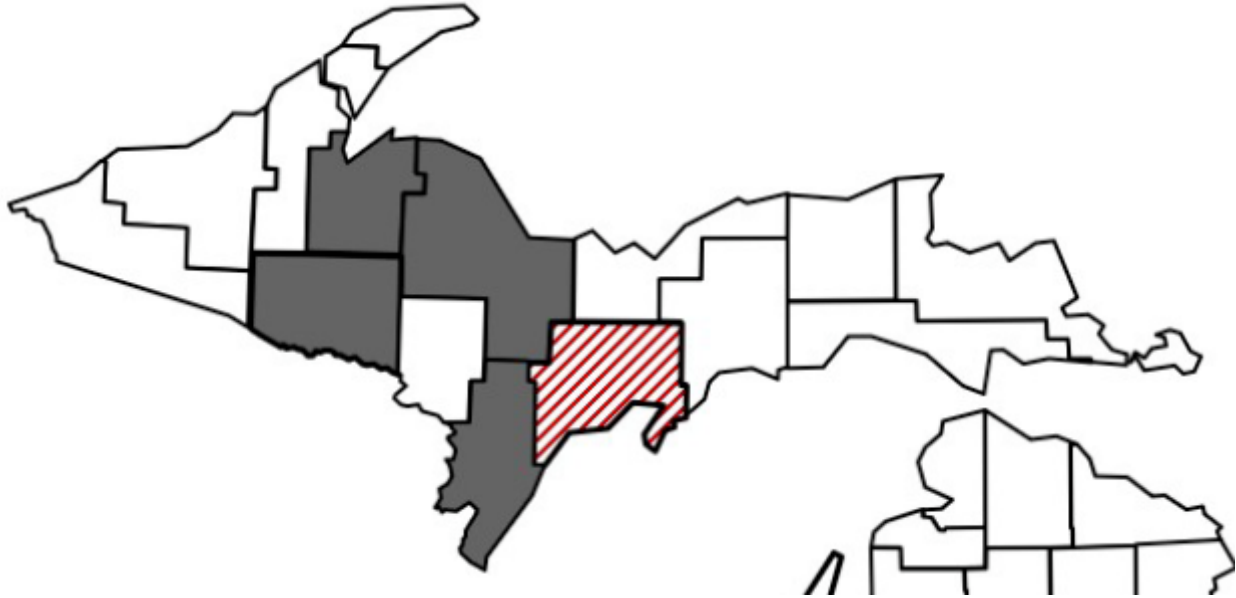


Figure 8-17: Distribution of Eastern Equine Encephalitis in Animals (gray) and Humans (red-striped), 2020

8.3.6 Other Infectious Diseases

8.3.6.1 Chickenpox (*Varicella*) (Table 8-12)

Chickenpox is vaccine-preventable disease caused by the varicella virus and is identified by the classic vesicles/pox on the skin. The cases reported in the Upper Peninsula represent small, localized outbreaks in unvaccinated children. For example, in 2012 there were 32 cases in Houghton County, 9 cases in Marquette County, and 8 cases in Chippewa County. Since then no county has seen more than 5 cases in a year. The higher rates seen in some counties reflects the small population of these counties.

8.3.6.2 Human Immunodeficiency Virus (*HIV*) (Table 8-13)

HIV (human immunodeficiency virus) is the virus that causes AIDS (Acquired Immune Deficiency Syndrome). Awareness of HIV infection status helps prevent the spread of the disease. Early detection and effective treatment can improve outcomes. In April 2013, the U.S. Preventive Services Task Force (USPSTF) issued the following recommendations: Clinicians should routinely screen adolescents and adults ages 15 to 65 years for HIV infection. Younger adolescents and older adults who are at increased risk should also be screened. Screening is recommended for all pregnant women, including those who present in labor whose HIV status is unknown. These recommendations remained unchanged in its most recent recommendation statement of June 11, 2019. [21] HIV infections have rarely been reported in the Upper Peninsula, so no clear pattern has emerged. With the development of effective antiviral therapy HIV is now considered a chronic illness. [22]

Table 8-12: Chickenpox in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	1	0	3	0	3	0	0	0	0	7	7.69
Baraga	0	0	1	0	0	0	1	2	0	0	4	4.87
Chippewa	8	0	4	1	3	2	2	0	7	0	27	7.23
Delta	2	0	7	0	1	0	4	2	1	0	17	4.75
Dickinson	5	0	0	0	0	0	0	0	0	0	5	1.98
Gogebic	2	2	1	0	5	2	2	0	0	0	14	10.02
Houghton	32	3	2	0	1	0	0	0	2	1	41	11.49
Iron	1	2	0	1	0	0	1	1	0	0	6	5.42
Keweenaw	4	0	0	0	0	0	0	0	0	0	4	18.90
Luce	0	3	0	5	0	0	1	0	1	0	10	16.05
Mackinac	1	0	0	3	3	0	1	0	0	0	8	7.41
Marquette	9	1	0	0	2	1	0	5	0	0	18	2.70
Menominee	1	1	1	2	0	2	0	1	2	0	10	4.39
Ontonagon	0	0	1	0	0	0	0	0	0	1	2	3.50
Schoolcraft	0	1	0	0	1	0	0	0	0	0	2	2.47
Total	65	14	17	15	16	10	12	11	13	2	173	5.79
Incidence per 100,000 person-years	20.93	4.53	5.53	4.91	5.29	3.31	3.99	3.68	4.35	0.67		

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	0	0	0	0	0	0	0	0	0	0	0.00
Baraga	0	0	0	0	0	0	0	0	0	0	0	0.00
Chippewa	1	0	0	0	0	0	0	0	0	0	1	0.27
Delta	0	1	1	1	0	1	0	0	1	1	6	1.68
Dickinson	0	1	0	0	0	0	0	0	0	0	1	0.40
Gogebic	0	0	0	0	0	0	0	0	0	0	0	0.00
Houghton	1	0	0	0	0	0	0	0	0	0	1	0.28
Iron	0	0	0	0	0	0	0	0	0	0	0	0.00
Keweenaw	0	0	0	0	0	0	0	0	0	0	0	0.00
Luce	0	0	0	0	0	0	0	0	0	0	0	0.00
Mackinac	0	0	0	0	0	0	0	0	0	0	0	0.00
Marquette	5	0	0	0	0	0	0	0	0	0	5	0.75
Menominee	0	0	0	0	0	0	0	0	0	0	0	0.00
Ontonagon	0	0	0	0	0	0	0	0	0	0	0	0.00
Schoolcraft	0	0	0	0	0	0	0	0	1	0	1	1.24
Total	7	2	1	1	0	1	0	0	2	1	14	0.47
Incidence per 100,000 person-years	2.25	0.65	0.33	0.33	0.00	0.33	0.00	0.00	0.67	0.33		

8.3.6.3 Meningitis (all types) (Table 8-14)

Meningitis is an infection of the membrane that coats the brain and spinal cord that can result in permanent neurologic damage and has a high fatality rate. Past meningitis outbreaks within college campuses have prompted vaccination of matriculating students for meningococcus serotypes A, B, C, and Y. Extremely effective vaccinations are also available for pneumococcus and *Hemophilus influenza* type B, which were once the most common cause of meningitis in young children. Meningitis can be caused by other infectious agents for which there is no vaccine.

Fortunately, other than 34 cases reported in 2016, meningitis has rarely been reported in the Upper Peninsula, so no clear pattern has emerged. The high rate in Keweenaw likely reflects the small population in that county.

Table 8-14: Meningitis in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	2	0	1	1	1	0	0	0	0	0	5	5.49
Baraga	0	0	0	0	1	0	1	0	1	0	3	3.65
Chippewa	0	0	2	4	6	2	0	1	0	0	15	4.02
Delta	3	0	1	0	6	2	2	2	4	5	25	6.99
Dickinson	1	1	1	2	2	2	0	1	2	0	12	4.75
Gogebic	3	0	1	0	1	1	0	0	0	0	6	4.29
Houghton	1	3	0	3	3	0	1	0	3	2	16	4.48
Iron	0	0	1	1	2	0	0	1	0	2	7	6.33
Keweenaw	3	0	0	1	0	0	1	0	0	0	5	23.63
Luce	0	0	0	0	0	0	0	0	0	0	0	0.00
Mackinac	0	1	0	0	2	0	0	0	0	1	4	3.70
Marquette	5	7	4	7	6	0	0	4	3	2	38	5.70
Menominee	1	3	4	3	3	0	0	0	3	1	18	7.90
Ontonagon	0	0	0	2	1	0	0	0	0	0	3	5.24
Schoolcraft	0	1	0	0	0	0	2	0	0	0	3	3.71
Total	19	16	15	24	34	7	7	9	16	13	147	4.92
Incidence per 100,000 person-years	6.12	5.17	4.88	7.86	11.23	2.32	2.33	3.01	5.35	4.35		

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	3	1	0	0	1	0	0	1	0	0	6	6.59
Baraga	4	0	0	0	0	0	0	0	0	0	4	4.87
Chippewa	0	0	0	0	0	0	1	2	0	0	3	0.80
Delta	23	1	0	4	1	0	0	5	3	0	37	10.34
Dickinson	5	0	10	1	0	0	3	5	0	0	24	9.51
Gogebic	20	0	0	4	0	1	0	0	0	0	25	17.89
Houghton	1	0	1	8	0	0	0	3	0	0	13	3.64
Iron	25	0	0	1	0	0	1	7	1	0	35	31.63
Keweenaw	0	0	0	1	0	0	0	0	0	0	1	4.73
Luce	0	0	1	0	0	0	0	0	0	0	1	1.61
Mackinac	1	1	0	0	0	2	0	0	0	0	4	3.70
Marquette	27	12	5	3	5	10	0	10	0	0	72	10.79
Menominee	16	0	1	1	0	0	0	6	1	0	25	10.97
Ontonagon	1	0	0	2	0	0	0	0	0	0	3	5.24
Schoolcraft	0	0	0	0	0	0	1	0	0	0	1	1.24
Total	126	15	18	25	7	13	6	39	5	0	254	8.50
Incidence per 100,000 person-years	40.57	4.85	5.85	8.19	2.31	4.31	2.00	13.05	1.67	0.00		

8.3.6.4 Pertussis (Whooping Cough) (Table 8-15)

Pertussis (whooping cough) is a vaccine-preventable respiratory illness caused by *Bordetella pertussis* that is easily spread by coughing and sneezing. Infants and children with the disease may cough violently and rapidly, over and over, until the air is gone from their lungs and they are forced to inhale with a loud “whooping” sound. The cough from pertussis often lasts for three months. Pertussis is most severe for infants: more than half of infants less than 1 year of age who become infected require hospitalization. Primary prevention is through vaccination. Before an infant can be vaccinated (at 2, 4, and 6 months of

age), it is critically important that parents and other individuals having close contact with newborns and infants, receive a one-time pertussis booster. Insufficient vaccination rates contribute to outbreaks of this disease documented in the table.

Pertussis is highly contagious and quickly spreads among those not vaccinated or whose immunity has waned. The outbreaks are typically in clusters of 10 to 25 cases. The peak year, 2012, saw 27 cases in Marquette County, 25 cases in Iron County, 23 cases in Delta County, 20 cases in Gogebic County, and 16 in Menominee County.

8.3.6.5 Tuberculosis (TB) (Table 8-16)

Tuberculosis (TB) is caused by a bacterium called *Mycobacterium tuberculosis*, which usually attacks the lungs but can attack any part of the body. Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection and active TB disease.

TB disease in the lungs or throat can be contagious. The bacteria is spread through the air if a person with the disease in the lungs or throat coughs, speaks, or sings and someone nearby breathes in the bacteria. The bacteria can settle in the lungs and begin to grow. From there, they can move through the blood to other parts of the body, such as the kidney, spine, and brain. People with active TB disease are most likely to spread it to people they spend time with every day — family members, friends, coworkers, and schoolmates. Sunlight kills the *Mycobacterium*.

Fortunately, cases of tuberculosis in the Upper Peninsula are infrequent with no clear patterns noted over the past nine years.

8.4 Potential Future Implications

- Mitigation efforts, such as staying home when ill, hand hygiene, facial coverings, and physician distancing, are effective against the spread of respiratory viruses and will be an important tool in limiting the spread of influenza, coronaviruses, and the virus responsible for the next pandemic.
- A well-vaccinated public will continue to be critically important in controlling the spread of many communicable diseases and even cancer (hepatitis B vaccine, human papillomavirus (HPV) vaccine).
- The COVID-19 pandemic underlines the importance of global travel in spreading infections. Other illnesses, such as measles, that have declined substantially in this country following successful vaccination programs can re-emerge through infections contracted and brought home from residents of the United States who visit other countries where vaccine preventable illnesses are still common.
- The territory of Lyme- and anaplasmosis-infected ticks continues to expand within the Upper Peninsula. Prevention efforts include increasing awareness, decreasing tick habitat and limiting exposure through the use of environmental measures (long clothing, tick repellent).
- The core functions of public health, including disease surveillance and protection of food and water supplies, will continue to be critically important in maintaining the health of the local population.

Table 8-16: Tuberculosis in the Upper Peninsula, 2012-2021

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Incidence per 100,000 person-years
Alger	0	0	0	0	0	0	0	0	0	0	0	0.00
Baraga	1	0	0	0	0	0	0	0	0	0	1	1.22
Chippewa	1	0	1	1	0	0	0	0	0	0	3	0.80
Delta	0	0	0	1	0	0	2	1	0	0	4	1.12
Dickinson	0	0	0	0	0	0	0	0	0	0	0	0.00
Gogebic	1	1	0	0	0	0	1	0	0	0	3	2.15
Houghton	0	1	0	0	1	0	0	1	0	1	4	1.12
Iron	0	0	0	0	0	0	0	1	0	0	1	0.90
Keweenaw	0	0	0	0	0	0	0	0	1	0	1	4.73
Luce	0	0	0	0	0	0	0	0	0	0	0	0.00
Mackinac	0	0	2	0	0	0	0	0	0	0	2	1.85
Marquette	0	0	1	1	0	0	3	1	0	0	6	0.90
Menominee	2	2	1	2	3	0	0	0	0	0	10	4.39
Ontonagon	0	0	0	0	1	0	0	0	0	0	1	1.75
Schoolcraft	0	0	0	0	0	0	0	1	0	0	1	1.24
Total	5	4	5	5	5	0	6	5	1	1	36	1.20
Incidence per 100,000 person-years	1.61	1.29	1.63	1.64	1.65	0.00	2.00	1.67	0.33	0.33		

References:

- [1] Ritchie H, Mathieu E, Rodés-Guirao L, Appel C, et al. Coronavirus (COVID-19) cases. Our World in Data. <https://ourworldindata.org/covid-cases>. Accessed April 1, 2022.
- [2] Ritchie H, Mathieu E, Rodés-Guirao L, Appel C, et al. Coronavirus (COVID-19) deaths. Our World in Data. <https://ourworldindata.org/covid-deaths>. Accessed April 1, 2022.
- [3] Tracking coronavirus in Michigan: map and case count. New York Times April 1, 2022. <https://www.nytimes.com/interactive/2021/us/michigan-covid-cases.html>. Accessed April 1, 2022.

- [4] Coronavirus. Michigan Data. COVID-19 deaths by county. https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html. Accessed April 4, 2022
- [5] Godfred-Cato S, Bryant B, Leung L, et al. COVID-19–Associated Multisystem Inflammatory Syndrome in Children — United States, March–July 2020. *MMWR* 2020; 69(32): 1074–80. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6932e2.htm>. Accessed December 8, 2020.
- [6] Morris SB, Schwartz NG, Patel P, et al. Case series of multisystem inflammatory syndrome in adults associated with SARS-CoV-2 infection — United Kingdom and United States, March–August 2020. *MMWR Morb Mort Wkly Rep* 2020; 69: epub ahead of print.
- [7] Bozio CH, Grannis SJ, Naleway AL, et al. Laboratory-confirmed COVID-19 among adults hospitalized with COVID-19–like illness with infection-induced or mRNA vaccine-induced SARS-CoV-2 immunity — nine states, January–September 2021. *MMWR Morb Mort Wkly Rep* 2021; 70: October 29, 2021.
- [8] Murthy BP, Zell E, Saelee R, et al. COVID-19 vaccination coverage among adolescents ages 12–17 years — United States. December 14, 2020 - July 31, 2021. *MMWR Morb Mort Wkly Rep* 2021; 70: epub ahead of print.
- [9] Marks KJ, Whitaker M, Anglin O, et al. Hospitalizations of children and adolescents with laboratory-confirmed COVID-19 — COVID-NET, 14 States, July 2021–January 2022. *MMWR Morb Mort Wkly Rep* 2022; 71: epub ahead of print.
- [10] Marks KJ, Whitaker W, Agathis NT, et al. Hospitalization of infants and children aged 0–4 Years with laboratory-confirmed COVID-19 — COVID-NET, 14 States, March 2020–February 2022. *MMWR Morb Mort Wkly Rep*; 2022; 71: epub ahead of print.
- [11] Michigan Department of Health & Human Services. Michigan Flu Focus: Weekly Influenza Surveillance Report. May 28, 2021. Volume 18; No. 34: page 3. https://content.govdelivery.com/attachments/MIDHHS/2021/05/28/file_attachments/1839959/MIFF%205.28.21.pdf. Accessed May 28, 2021.
- [12] Burnett AM, Anderson CP, Zwank MD. Laboratory-confirmed gonorrhea and/or chlamydia rates in clinically diagnosed pelvic inflammatory disease and cervicitis. *Am J Emerg Med* 2012; 30: 1114–7.
- [13] U.S. Preventive Services Task Force. Chlamydia and gonorrhea: screening. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/chlamydia-and-gonorrhea-screening>. Accessed December 2, 2020. An update for this recommendation is currently in progress.
- [14] Wong RJ, Singal AK. Trends in liver disease etiology among adults awaiting liver transplantation in the United States, 2014–2019. *JAMA New Open* 2020; 3(2): e1920294. Doc:10.1001/jamanetworkopen.2019.20294. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2760022>. Accessed December 2, 2020.
- [15] Schillie S, Wester C, Osborne M, Wesolowski L, Ryerson AB. CDC Recommendations for hepatitis C screening among adults — United States, 2020. *MMWR Recomm Rep* 2020;69(No. RR-2):1–17. DOI: <http://dx.doi.org/10.15585/mmwr.rr6902a1>. <https://www.cdc.gov/mmwr/volumes/69/rr/rr6902a1.htm>. Accessed December 2, 2020.
- [16] Michigan Department of Health & Human Services. Emerging & Zoonotic Infectious Disease: Michigan Trends in Tickborne Disease 2016–2020.
- [17] Michigan Department of Health and Human Services. Michigan emerging and zoonotic disease: surveillance summary 2020. Lansing, MI: 2021. *EZID_Annual_Surveillance_Summary_733399_7.pdf*. Accessed August 24, 2021.
- [18] Bakken JS, Dumler JS, Chen SM, Eckman MR, Van Etta LL, Walker DH. Human granulocytic ehrlichiosis in the upper Midwest United States: A new species emerging? *JAMA* 1994; 272: 212–8.
- [19] Bakken JS, Goellner P, Van Etten M, et al. Seroprevalence of human granulocytic ehrlichiosis among permanent residents of northwestern Wisconsin. *Clin Infect Dis*. 1998; 27: 1491–6.
- [20] Bakken JS, Dumler JS. Human granulocytic anaplasmosis. *Inf Dis Clin North Am* 2015; 29(2): 341–55.
- [21] United States Preventive Services Task Force (USPSTF). Human immunodeficiency virus (HIV) infection: screening. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/human-immunodeficiency-virus-hiv-infection-screening>. Accessed December 1, 2020.
- [22] Deeks SG, Lewin SR, Havlir DV. The end of AIDS: HIV as a chronic disease. *Lancet* 2013; 382(9903): 1525–33.

9 CHRONIC DISEASE AND MORTALITY

9.1 Introduction

According to the U.S. National Center for Health Statistics, a chronic disease is “one lasting 3 months or more.” Chronic diseases can generally be controlled but not cured and do not simply disappear on their own. Chronic diseases — such as heart disease, stroke, cancer, diabetes, and arthritis — are among the most common, costly, and preventable of all health problems in the United States, and the leading causes of death and disability. The top two causes of death — heart disease and cancer — account for about half of all deaths. From a public health perspective, the positive aspect of chronic disease is that it is, in large part, very preventable.

Four modifiable health risk behaviors — lack of physical activity, poor nutrition, tobacco use, and excessive alcohol consumption — are responsible for much of the illness, suffering, and early deaths related to chronic diseases. [1]

9.1.1 Health Risks in Rural America

Approximately 46 million (15%) of Americans live in rural areas, who, according to the Centers for Disease Control and Prevention (CDC), are more likely than their urban counterparts to die of all five leading causes of death: heart disease, cancer, unintentional injury, chronic lower respiratory disease, and stroke.

Rural health disparities can be linked to several causes, including limited access to healthy foods and fewer opportunities to be physically active, both of which can lead to obesity and high blood pressure. Rural residents also smoke more and wear seat belts less. Residents of rural areas tend to be older, with lower incomes, and less education — factors all linked to poorer health. In addition to individual risk factors, residents of rural counties have structural obstacles to overcome, such as fewer health care workers (both in number and per capita), medical specialists, hospital critical care units, emergency facilities, and transportation options. Residents are also more likely to be uninsured and live farther away from health services. [2]

One overall measure of health in a region is the number of potential life years lost before 75 years of age per 100,000 population. The age-adjusted rate of life years lost for the counties in the Upper Peninsula from 2017 through 2019 are shown in **Table 9-1**. [3]

To address the gap in health in rural areas, healthcare providers in rural areas can:

- Screen patients for high blood pressure.
- Increase cancer prevention and early detection.
- Encourage physical activity and healthy eating.
- Promote smoking cessation.
- Promote motor vehicle safety.
- Engage in safer prescribing of opioids for pain.

Table 9-1: Life Years Lost per 100,000 Population

Location	Age-adjusted Life Years Lost
Michigan	7,600
Alger	5,500
Baraga	10,500
Chippewa	6,400
Delta	7,400
Dickinson	7,500
Gogebic	7,400
Houghton	6,900
Iron	10,000
Keweenaw	*
Luce	*
Mackinac	9,500
Marquette	6,500
Menominee	5,800
Ontonagon	9,200
Schoolcraft	5,600

9.2 Chronic Illnesses

9.2.1 Heart Disease

The term “heart disease” refers to several types of heart conditions. The most common type in the United States is coronary artery disease, which can cause heart attack, angina, heart failure, and arrhythmias. When in heart failure, the heart cannot pump enough blood to meet the body’s needs. Consequently, fluid builds up in the lungs, liver, gastrointestinal tract, and limbs. While medications and medical procedures can address the symptoms of heart failure, the only cure for heart failure is a heart transplant. High cholesterol levels, high blood pressure, tobacco use, physical inactivity, and poor nutrition are examples of modifiable risk factors that contribute to heart disease. [4]

According to the Healthcare Cost and Utilization Project, the number of community hospital stays in 2017 per 100,000 population for “Diseases and Disorders of the Circulatory System” by county are shown in **Table 9-2**. [5]

Table 9-2: Community Hospital Admissions per 100,000

	Circulatory System [a]	Respiratory System [b]	Endocrine/Metabolic [c]
Region			
United States	1377	1004	385
Michigan	1758	1226	452
Alger	1366	1024	363
Baraga	*	*	*
Chippewa	1833	1557	414
Delta	1606	1382	267
Dickinson	1808	1213	231
Gogebic	1563	1372	468
Houghton	*	*	*
Iron	2223	2035	366
Keweenaw	1606	953	*
Luce	1870	1523	*
Mackinac	2078	1500	490
Marquette	1463	1087	285
Menominee	1831	1314	254
Ontonagon	*	*	*
Schoolcraft	1777	1395	322
* Information not available			
[a] Disease and Disorders of the Circulatory System			
[b] Diseases and Disorders of the Respiratory System			
[c] Endocrine, Nutritional & Metabolic Diseases and Disorders			

The incidence and prevalence of heart attack, heart disease, and stroke increase with age, with men more likely than women to report these events/illnesses. The results of the 2021 Upper Peninsula Community Health Issues and Priorities Survey (UPCHIPS) for the prevalence of heart disease are shown in **Tables 13-38A** and **13-38B**.

Looking at the UPCHIPS datasets more closely, and adjusting for age, sex, income level, education level, and county of residence, any associations with a number of factors, including intake of fruits and vegetables, elevated cholesterol levels, high blood pressure, history of smoking, diabetes mellitus, chronic obstructive pulmonary disease, lack of leisure time activities/exercise, adequate physical activity, body mass index (BMI), and heavy drinking, with heart attack and heart disease were explored. The association with heart attack and heart disease and reporting depression and anxiety were also measured. These individual factors were incorporated into a multivariate model (not including anxiety and depression) using backward selection¹² to identify only the factors that remain statistically significant ($p < .05$), was developed. The results of these analyses are shown in **Table 9-3** and **Table 9-4**.

9.2.2 Cancer

Despite tremendous financial investments in cancer research, mortality rates in recent decades have shown only modest declines. Improvements in therapies and survival rates have been largely offset by increases in the incidence of new cases. One contributing factor is that increasing life expectancy has allowed more people to live to an age at which cancer incidence is higher. Environmental factors may also be contributing to increased cancer incidence.

Cancer risk can be reduced by avoiding tobacco (in all its forms), maintaining a healthy weight, a healthy diet replete with fruits and vegetables, regular exercise, limited alcohol intake, safe sexual practices, vaccination against hepatitis B and human papillomavirus (HPV), reducing exposure to ultraviolet and ionizing radiation, and avoiding air pollution and indoor smoke.

Early detection of cancer greatly increases the chances of successful treatment. Recognizing possible warning signs of cancer and taking prompt action leads to early diagnosis. Increased awareness of possible warning signs of cancer, among physicians, nurses and other health care providers as well as among the general public, can have a great impact on disease progression. Aggressive screening across a healthy population with simple tests can lead to early detection in asymptomatic individuals with disease and earlier, more effective treatment. Cancer screening procedures include mammography, Pap smears, colonoscopy, and prostate-specific antigen (PSA) tests. [6]

The results of the 2021 UPCHIPS for cancer prevalence are shown in **Tables 13-39A** and **13-39B**, while the rates of women having a mammogram are shown in **Tables 13-50A** and **13-50B**, a PAP smear in **Tables 13-51A** and **13-51B**, men having PSA testing in **Tables 13-52A** and **13-52B**, and those over fifty years of age and older having had colonoscopy in **Tables 13-53A** and **13-53B**.

Looking at the UPCHIPS datasets more closely, and adjusting for age, sex, income level, education level, and county of residence, any associations with a number of factors, including intake of fruits and vegetables, elevated cholesterol levels, high blood pressure, history of smoking, diabetes mellitus, chronic obstructive pulmonary disease, lack of leisure-time activities/exercise, adequate physical activity, body mass index (BMI), and heavy drinking, with having had cancer were explored. The

¹² In backward selection, all factors are placed in a multivariate analysis. The factor with highest p-value is removed and the analysis is repeated. The factor with highest p-value is removed. This cycle is repeated until only factors with a p-value below .05 remain.

Table 9-3: UPCHIPS Heart Attack Associated Factors[a]

Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
Diabetes	2.48 (1.93, 3.20)	2.93 (2.18, 3.93)
COPD	2.94 (2.23, 3.88)	3.57 (2.61, 4.88)
Fruits & vegetables[b]	0.99 (0.68, 1.45)	0.49 (0.27, 0.89)
Elevated cholesterol	2.84 (2.14, 3.80)	2.66 (1.90, 3.73)
Ever smoked \geq 100 cigarettes	2.05 (1.59, 2.64)	1.54 (1.15, 2.05)
High blood pressure	2.45 (1.84, 3.27)	3.21 (2.26, 4.54)
Lack of leisure exercise[c]	1.66 (1.27, 2.17)	1.24 (0.90, 1.71)
Adequate physical activity[d]	0.68 (0.51, 0.91)	0.71 (0.51, 0.99)
Heavy drinker	0.67 (0.45, 1.01)	0.85 (0.55, 1.31)
Depression	1.46 (1.09, 1.95)	1.80 (1.30, 2.50)
Anxiety	1.32 (0.95, 1.85)	1.31 (0.90, 1.89)
Body mass index (BMI)	1.038 (1.019, 1.058)	1.024 (1.003, 1.046)
Backward Selection	Combined 2017 & 2021[e]	
COPD	2.51 (2.00, 3.15)	
Elevated cholesterol	2.05 (1.62, 2.58)	
Diabetes	1.97 (1.60, 3.15)	
High blood pressure	1.87 (1.47, 2.39)	
Ever smoked \geq 100 cigarettes	1.40 (1.13, 1.73)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

Table 9-4: UPCHIPS Heart Disease Associated Factors[a]		
Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
Diabetes	2.69 (2.19, 3.31)	2.37 (1.86, 2.99)
COPD	3.16 (2.51, 3.97)	3.84 (2.97, 4.97)
Fruits & vegetables[b]	0.93 (0.70, 1.25)	0.89 (0.63, 1.25)
Told elevated cholesterol	2.39 (1.94, 2.94)	2.43 (1.91, 3.08)
Ever smoked ≥ 100 cigarettes	1.85 (1.53, 2.23)	1.25 (1.02, 1.55)
High blood pressure	2.72 (2.19, 3.38)	3.53 (2.74, 4.55)
Lack of leisure exercise[c]	1.39 (1.12, 1.73)	1.96 (1.55, 2.49)
Adequate physical activity[d]	0.60 (0.48, 0.75)	0.90 (0.71, 1.16)
Heavy drinker	0.69 (0.51, 0.94)	0.90 (0.66, 1.24)
Depression	1.74 (1.40, 2.18)	1.89 (1.48, 2.42)
Anxiety	1.72 (1.34, 2.21)	1.50 (1.14, 1.97)
Body mass index (BMI)	1.043 (1.028, 1.058)	1.052 (1.036, 1.069)
Backward Selection	Combined 2017 & 2021[e]	
COPD	3.11 (2.56, 3.78)	
High blood pressure	2.28 (1.89, 2.76)	
Elevated cholesterol	1.80 (1.52, 2.14)	
Diabetes	1.69 (1.41, 2.03)	
Lack leisure exercise[c]	1.30 (1.08, 1.56)	
Ever smoked ≥ 100 cigarettes	1.19 (1.01, 1.40)	
BMI	1.014 (1.001, 1.026)	
Heavy drinker	0.70 (0.55, 0.90)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

Table 9-5: UPCHIPS Cancer Associated Factors[a]		
Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
Diabetes	1.28 (1.02, 1.61)	1.33 (1.03, 1.71)
COPD	1.41 (1.10, 1.82)	1.85 (1.42, 2.41)
Fruits & vegetables[b]	0.84 (0.64, 1.11)	0.83 (0.60, 1.14)
Elevated cholesterol	1.20 (0.99, 1.44)	1.24 (1.01, 1.54)
Ever smoked \geq 100 cigarettes	1.31 (1.10, 1.57)	1.17 (0.96, 1.43)
High blood pressure	1.22 (1.01, 1.47)	1.16 (0.95, 1.43)
Lack of leisure exercise[c]	1.12 (0.90, 1.41)	0.96 (0.74, 1.23)
Adequate physical activity[d]	0.74 (0.61, 0.91)	0.89 (0.71, 1.11)
Heavy drinker	1.08, (0.80, 1.45)	1.34 (1.04, 1.73)
Depression	1.30 (1.03, 1.65)	1.17 (0.94, 1.45)
Anxiety	1.23 (0.94, 1.60)	1.08 (0.84, 1.40)
Body of mass index (BMI)	1.003 (0.989, 1.017)	1.008 (0.992, 1.023)
Backward Selection	Combined 2017 & 2021[e]	
COPD	1.64 (1.30, 2.05)	
Diabetes	1.46 (1.19, 1.79)	
Adequate physical activity[d]	0.80 (0.69, 0.93)	
Model 2		
Diabetes	1.50 (1.23, 1.84)	
Ever smoked \geq 100 cigarettes	1.22 (1.05, 1.42)	
Adequate physical activity[d]	0.81 (0.70, 0.95)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

with having had cancer and reporting depression and anxiety were also measured. These individual factors were incorporated into a multivariate model (not including anxiety and depression) using backward selection to identify only the factors that remain statistically significant ($p < .05$), was developed. The results of these analyses are shown in **Table 9-5**.

9.2.3 Chronic Obstructive Pulmonary Disease (COPD)

Chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema, makes breathing difficult for 16 million Americans. The symptoms of COPD included frequent coughing or wheezing; excessive phlegm, mucus, or sputum production; shortness of breath; and difficulty taking a deep breath. COPD is more common in women; people 65 years and older; Native Americans; those with less than a high school education; those who were unemployed, retired, or unable to work; those who were divorced, widowed, or separate; those with a history of asthma; and current or former smokers. The key factor in the development of COPD is exposure to tobacco smoke and indoor pollutants.

The health impacts of COPD are limited activity (walking, climbing stairs), inability to work, need for supplemental oxygen, inability to engage in social activities, increased confusion, increased emergency room visits/hospitalizations, and increased rates of depression.

Since the damage to the lungs from COPD is not reversible, treatment aims at alleviating symptoms, decreasing the frequency and severity of exacerbations, and increasing exercise tolerance. Interventions include smoking cessation, avoiding tobacco smoke, pulmonary rehabilitation, medications to reduce wheezing, avoiding lung infections, and supplemental oxygen. [7]

According to the Healthcare Cost and Utilization Project, the number of community hospital stays in 2017 per 100,000 population for “Diseases and Disorders of the Respiratory System” by county are shown in **Table 9-2**. [5]

The results of the 2021 UPCHIPS for COPD prevalence are shown in **Tables 13-40A** and **13-40B**.

Looking at the UPCHIPS datasets more closely, and adjusting for age, sex, income level, education level, and county of residence, any associations with a number of factors, including intake of fruits and vegetables, elevated cholesterol levels, high blood pressure, history of smoking, diabetes mellitus, chronic obstructive pulmonary disease, lack of leisure-time activities/exercise, adequate physical activity, body mass index (BMI), and heavy drinking, with COPD were explored. The association with COPD and reporting depression and anxiety were also measured. These individual factors were incorporated into a multivariate model (not including anxiety and depression) using backward selection to identify only the factors that remain statistically significant ($p < .05$), was developed. The results of these analyses are shown in **Table 9-6**.

Table 9-6: UPCHIPS COPD Associated Factors[a]		
Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
Diabetes	1.62 (1.29, 2.04)	1.39 (1.06, 1.82)
Fruits & vegetables[b]	0.74 (0.53, 1.03)	0.52 (0.33, 0.82)
Elevated cholesterol	1.44 (1.17, 1.78)	1.45 (1.14, 1.85)
Ever smoked ≥ 100 cigarettes	5.52 (4.30, 7.07)	5.22 (3.94, 6.90)
High blood pressure	1.44 (1.17, 1.78)	1.28 (1.01, 1.62)
Lack of leisure exercise[c]	2.22 (1.79, 2.76)	1.90 (1.48, 2.43)
Adequate physical activity[d]	0.75 (0.57, 0.93)	0.69 (0.52, 0.90)
Heavy drinker	1.36 (0.99, 1.85)	1.31 (0.99, 1.73)
Depression	2.42 (1.95, 3.01)	2.60 (2.03, 3.34)
Anxiety	2.07 (1.63, 2.62)	2.47 (1.90,3.22)
Body mass index (BMI)	1.022 (1.008, 1.037)	1.010 (0.993, 1.027)
Backward Selection	Combined 2017 & 2021[e]	
Ever smoked ≥ 100 cigarettes	5.17 (4.29, 6.24)	
Lack of leisure exercise[c]	1.81 (1.53, 2.15)	
Diabetes	1.38 (1.15, 1.65)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

9.2.4 Diabetes Mellitus

Diabetes mellitus is a chronic disease that affects how your body turns food into energy. Because of a lack of insulin or a resistance to allowing insulin to function properly, sugar levels build up in the blood instead of going into the body's cells where it is needed. Diabetes has three main types: type 1

(primarily in children, 5-10% of all diabetes), type 2 (primarily in adults, 90-95% of all diabetes), and gestational (diabetes during pregnancy). More than 34 million Americans have diabetes. Pre-diabetes is estimated to affect 88 million Americans. Diabetes is the seventh leading cause of death in the United States. In the last 20 years, the number of adults diagnosed with diabetes has more than doubled as our population ages and becomes more overweight or obese.

Diabetes tends to run in families, with the risk for type 2 and gestational diabetes being associated with obesity and decreased physical activity. African Americans, Native Americans, and Hispanic Americans are at greater risk for developing type 2 diabetes.

Symptoms of diabetes include increased urination (often at night), increased thirst, unintended weight loss, increase hunger, fatigue, increase in the number of infections, blurry vision, and tingling/numbness in the hands or feet.

Treatment includes diet, exercise, insulin injections (primarily for type 1 and gestational diabetes), and medications that decrease blood sugar levels. Management of diabetes involves close management of blood sugar levels. [8]

Having diabetes increases one's risk of kidney failure, lower-limb amputations, blindness, heart disease, stroke, and early death.

According to the Healthcare Cost and Utilization Project, the number of community hospital stays in 2017 per 100,000 population for "Endocrine, Nutritional & Metabolic Diseases and Disorders" by county are shown in **Table 9-2**. [5]

The results of the 2021 UPCHIPS for the prevalence of diabetes are shown in **Tables 13-37A** and **13-37B**.

Looking at the UPCHIPS datasets more closely, and adjusting for age, sex, income level, education level, and county of residence, any associations with a number of factors, including intake of fruits and vegetables, elevated cholesterol levels, high blood pressure, history of smoking, diabetes mellitus, chronic obstructive pulmonary disease, lack of leisure-time activities/exercise, adequate physical activity, body mass index (BMI), and heavy drinking, with diabetes were explored. The association with diabetes and reporting depression and anxiety were also measured. These individual factors were incorporated into a multivariate model (not including anxiety and depression) using backward selection to identify only the factors that remain statistically significant ($p < .05$), was developed. The results of these analyses are shown in **Table 9-7**.

Table 9-7: UPCHIPS Diabetes Associated Factors[a]

Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
COPD	1.62 (1.29, 2.04)	1.38 (1.05, 1.80)
Fruits & vegetables[b]	1.00 (0.77, 1.32)	0.77 (0.54, 1.08)
Elevated cholesterol	2.60 (2.13, 3.17)	2.63 (2.09, 3.31)
Ever smoked \geq 100 cigarettes	1.32 (1.11, 1.58)	1.15 (0.95, 1.41)
High blood pressure	3.81 (3.07, 4.73)	3.85 (3.03, 4.91)
Lack of leisure exercise[c]	1.78 (1.45, 2.18)	1.85 (1.47, 2.32)
Adequate physical activity[d]	0.69 (0.56, 0.84)	0.65 (0.51, 0.82)
Heavy drinker	0.47 (0.34, 0.64)	0.38 (0.42, 0.81)
Depression	1.49 (1.22, 1.83)	1.55 (1.24, 1.95)
Anxiety	1.45 (1.16, 1.82)	1.22 (0.95, 1.57)
Body mass index (BMI)	1.101 (1.087, 1.115)	1.090 (1.075, 1.106)
Backward Selection	Combined 2017 & 2021[e]	
High blood pressure	2.49 (2.07, 2.98)	
Elevated cholesterol	2.02 (1.71, 2.38)	
Lack of leisure exercise[c]	1.40 (1.17, 1.66)	
COPD	1.23 (1.01, 1.51)	
Ever smoked \geq 100 cigarettes	1.20 (1.03, 1.40)	
BMI	1.072 (1.060, 1.084)	
Heavy drinker	0.49 (0.38, 0.63)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

9.2.5 Stroke

Stroke is a leading cause of long-term, severe disability and the fifth leading cause of death in the United States and Michigan. High blood pressure is a major risk factor. Controlling high blood pressure, cholesterol levels, and diabetes mellitus while treating heart disease can reduce the risk of stroke. Risk can also be reduced by maintaining a healthy weight, engaging in 150 minutes per week in moderate-intensity physical activity (i.e., brisk walking), not smoking, and limiting alcohol consumption. [9]

The results of the 2021 UPCHIPS for the prevalence of stroke are shown in **Tables 13-38A** and **13-38B**.

Looking at the UPCHIPS datasets more closely, and adjusting for age, sex, income level, education level, and county of residence, any associations with a number of factors, including intake of fruits and vegetables, elevated cholesterol levels, high blood pressure, history of smoking, diabetes mellitus, chronic obstructive pulmonary disease, lack of leisure-time activities/exercise, adequate physical activity, body mass index (BMI), and heavy drinking, with having had a stroke were explored. The association with having had a stroke and reporting depression and anxiety were also measured. These individual factors were incorporated into a multivariate model (not including anxiety and depression) using backward selection to identify only the factors that remain statistically significant ($p < .05$), was developed. The results of these analyses are shown in **Table 9-8**.

9.2.6 Alzheimer's Disease

Alzheimer's disease is the most common type of dementia. It is a progressive disease that begins with mild memory loss that can lead to the loss of the ability to carry on a conversation or respond to the environment. It can also seriously affect the ability to carry out the activities of daily living.

In 2014, approximately 5 million Americans were living with Alzheimer's disease. The symptoms usually begin after age 60, with the risk increasing with age. By 2060, it is estimated that 14 million Americans will have Alzheimer's disease.

Alzheimer's disease may run in families, with high blood pressure and elevated cholesterol levels increasing the risk of developing the disease. Physical, mental, and social activities may reduce the risk.

Interventions include helping people maintain mental function, managing behavioral symptoms, and slowing/delaying the symptoms of the disease. [10]

In the Michigan BRFSS surveys from 2017 to 2019, 11.3% of Michigan adults over the age of 60 reported having a subjective cognitive decline in the past 12 months. The rate was not impacted by gender or race/ethnicity. The prevalence of subjective cognitive decline was significantly higher in:

- Older adults (14.2% for adults 75 years and older versus 10.1% for adults aged 65-74 years)
- Adults with lower education (14.9% less than high school versus 8.2% college graduate)
- Adults with lower annual household income (19.2% less than \$20,000 versus 7.2% \$75,000 or more)
- Adults reporting disability (22.4% versus 4.3%).

Table 9-8: UPCHIPS Stroke Associated Factors[a]		
Factor	2017	2021
	adjOR (95%CI)	adjOR (95%CI)
Diabetes mellitus	1.76 (1.25, 2.46)	2.03 (1.42, 2.89)
COPD	1.57 (1.07, 2.28)	2.99 (2.08, 4.31)
Fruits & vegetables[b]	0.58 (0.33, 1.04)	0.63 (0.34, 1.15)
Elevated cholesterol	1.59 (1.14, 2.22)	1.25 (0.88, 1.77)
Ever smoked \geq 100 cigarettes	1.47 (1.07, 2.00)	1.64 (1.18, 2.29)
High blood pressure	2.23 (1.55, 3.21)	2.24 (1.54, 3.28)
Lack leisure exercise[c]	2.21 (1.60, 3.06)	1.93 (1.36, 2.74)
Adequate physical activity[d]	0.57 (0.38, 0.85)	0.99 (0.67, 1.48)
Heavy drinker	0.99 (0.61, 1.60)	0.79 (0.46, 1.34)
Depression	2.20 (1.57, 3.07)	1.57 (1.07, 2.28)
Anxiety	1.67 (1.14, 2.45)	2.01 (1.36, 2.95)
Body mass index (BMI)	1.026 (1.003, 1.049)	1.026 (1.002, 1.051)
Backward Selection	Combined 2017 & 2021[e]	
High blood pressure	1.98 (1.50, 2.60)	
Lack leisure exercise[c]	1.77 (1.38, 2.27)	
COPD	1.75 (1.33, 2.31)	
Diabetes	1.46 (1.13, 1.90)	
Ever smoked \geq 100 cigarettes	1.33 (1.04, 1.70)	
[a] Models control for level of education, income level, sex, and county of residence.		
[b] Averaged five or more servings of fruits (including juice) and vegetables per day for the past seven days.		
[c] Did not participate in any leisure-time physical activities or exercises.		
[d] Days per week of vigorous aerobic exercise for 20 minutes or more per day times 1.67 plus days per week of moderate aerobic activity for 30 minutes or more per day. If the sum is five or greater, the level of physical activity is considered adequate.		
[e] Models control for level of education, income level, sex, county of residence, and year of data collection.		

“Fair” or “poor” health was reported by 46.5% of those reporting subjective cognitive decline versus 20.7% of those not reporting it. The prevalence of depressive disorders, arthritis, current asthma, cancer, cardiovascular disease, and chronic obstructive pulmonary disease (COPD) was significantly higher among those reporting subjective cognitive decline than among those not reporting it. The prevalence of kidney disease, diabetes, and high blood pressure also appeared higher among those reporting a subjective cognitive decline, but those differences were not statistically significant. [11]

The results of the 2021 UPCHIPS for the prevalence of Alzheimer’s disease or dementia are discussed in section §13.3.13.7.

9.2.7 Chronic Kidney Disease

Chronic kidney disease (CKD) is a condition in which the kidneys are damaged and cannot filter the blood as well as they should. As a consequence, excess fluid and waste products build up in the body leading to other health problems such as heart disease and stroke. About 37 million Americans live with CKD. It is the ninth leading cause of death in the United States. The leading causes of CKD are diabetes mellitus and uncontrolled high blood pressure. Other risk factors include a family history of CKD, heart disease, and obesity.

Early CKD does not show any signs or symptoms, but gets worse with time and can progress to kidney failure. It can be treated, with early treatment having a greater impact.

Health consequences of CKD include anemia, increased occurrence of infections, electrolyte disturbances, loss of appetite, and depression. [12]

9.2.8 Hypertension

Tens of millions of adults in the United States have high blood pressure, which has no symptoms. Those at greater risk for developing hypertension include those diagnosed with diabetes mellitus, who eat an unhealthy diet, who are physically inactive, who are obese, who use tobacco, and who drink too much alcohol. High blood pressure can also run in families, increases with age, and is more common in African Americans.

Uncontrolled high blood pressure increases the risk of heart attack, heart disease, stroke, reduced cognitive function/dementia later in life, and kidney disease. Prevention measures include 150 minutes of exercise per week, not smoking, eating a healthy diet to obtain/maintain a healthy weight, and managing stress. In addition to lifestyle choices, hypertension can be controlled, under the supervision of a physician, with an array of medications. [13]

The results of the 2021 UPCHIPS for the prevalence of hypertension and treatment rates are shown in **Tables 13-34A** and **13-34B**.

The association between hypertension and other chronic diseases is shown in **Tables 9-3** through **9-8**.

9.2.9 Obesity

Obesity is defined by Body Mass Index (BMI): a person's weight in kilograms (2.2 kilograms per pound) divided by the square of the height in meters (one meter is approximately a yard or three feet). If the BMI is 30.0 or higher, the person is considered obese. The prevalence of obesity in the United States from 2017-2018 was 42.4%, an increase from 30.5% in 1999-2000. Obesity related conditions include heart disease, stroke, type 2 diabetes, and certain cancers. Prevalence of obesity is lower in those with college degrees, while higher in the middle-income group. [14]

Obesity is a major predictor of subsequent illness, such as diabetes, hypertension, and heart disease. These relationships are confirmed in the 2017 and 2021 UPCHIPS data (**Tables 9-3 through 9-8**). The obesity rates in the UPCHIPS are shown in **Tables 13-27A and 13-27B**.

The raw BMI data from the 2017 and the 2021 UPCHIPS are broken down by demographic categories in **Table 9-9** and by county in **Table 9-10**. In the raw 2017 UPCHIPS data the average body mass index (BMI) was 28.91 (SD=6.40, median=27.89). Multivariate analyses of BMI for both the 2017 UPCHIPS and the 2021 UPCHIPS are shown in **Table 13-17**.

9.2.10 Comorbidities

The UPCHIPS collected data on six chronic conditions with sufficient numbers to provide meaningful analysis:¹³ heart attack, stroke, heart disease, COPD, diabetes mellitus, and cancer. When the 2017 and 2021 UPCHIPS survey data are combined, 4768 (59.6%) reported not having these diseases, 1979 (24.8%) reported having only one disease, 783 (9.8%) reported having two diseases, 313 (3.9%) reported having three diseases, 120 (1.5%) reported having four diseases, 28 (0.4%) reported having five diseases, and 4 (0.05%) reported having all six diseases. As noted above, depression and anxiety were common in those reporting these six diseases. As the number of diseases an individual reported increased, their likelihood of reporting depression and anxiety also increased. With each additional disease reported the odds of reporting depression increased 38% (OR=1.38, 95%CI: 1.30, 1.46) and the odds reporting anxiety increased 28% (OR=1.28, 95%CI: 1.02, 1.37).

9.3 Mortality Rates

Crude mortality rates are calculated by taking the number of deaths per year and dividing by the total population then multiplying this figure by 100,000. This per capita adjustment is needed to allow the experience in small jurisdictions to be compared with other jurisdictions, including the experience on the state and national levels. *Age-adjusted* rates weigh Michigan and county-level data to conform to the national age distribution tabulated in the United States Census. This allows the relative health of populations to be compared without the bias of an older or younger population distribution. The number of mortalities in the United States increased in 2020, but this increase in the number of deaths can be attributed to deaths from the COVID-19 pandemic (see **Figure 9-1**). [15] **Table 9-11** lists the overall crude and age-adjusted mortalities for each Upper Peninsula county obtained from 2018 data reported by the Michigan Department of Health and Human Services. [16]

¹³ Kidney disease and Alzheimer's disease at too low of a rate to provide useful information.

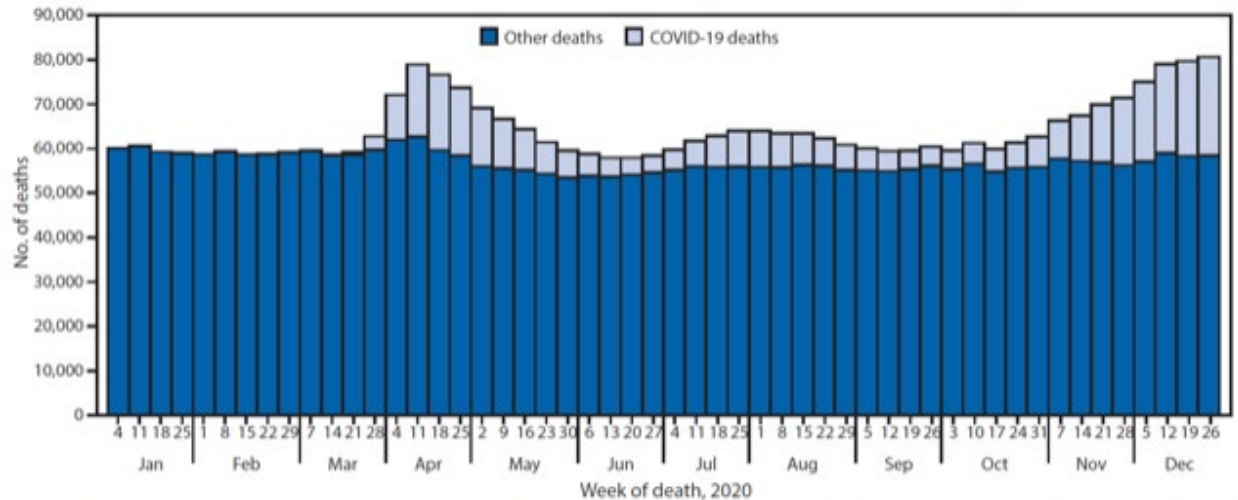
Table 9-9: Body Mass Index from UPCHIPS by Demographics, 2021, 2017

	2021	2017
	(standard deviation)	(standard deviation)
All respondents	28.73 (6.56)	28.91 (6.40)
Sex		
Female	28.64 (7.02)	28.74 (6.74)
Male	28.87 (5.71)	29.20 (5.74)
Difference[a]	0.223	0.453
Age		
18 to 49 years	28.51 (6.99)	27.89 (7.06)
50 to 64 years	29.38 (7.21)	29.44 (6.80)
65 years and older	28.40 (6.09)	28.70 (5.94)
Household Income[b]		
Less than \$25,000	29.23 (7.47)	29.44 (7.14)
\$25,000 to \$49,999	28.66 (6.42)	29.08 (6.27)
\$50,000 or higher	28.54 (6.06)	28.38 (5.83)
Educational Attainment[c]		
Less than 12th grade	29.16 (7.27)	29.48 (6.94)
High School graduate	28.85 (6.76)	29.01 (6.39)
1 to 3 years college	29.18 (6.81)	29.58 (6.73)
4-year degree or higher	28.13 (5.98)	27.95 (5.81)
[a] 2021: 95%CI: -0.207, 0.653, t=1.02, p=.3095; 2017: 95%CI: 0.089, 0.816, t=2.44, p=.0146.		
[b] 2021: t=-2.28, p=.0228; 2017: t=19.81, p<.0001.		
[c] 2021: t=-2.69, p=.0072; 2017: t=4.30, p<.0001.		

Table 9-10: Body Mass Index from UPCHIPS by County, 2021, 2017

County[a]	2021 (standard deviation)	2017 (standard deviation)
Alger	28.31 (6.33)	29.25 (7.07)
Baraga	29.34 (6.93)	29.43 (6.23)
Chippewa	28.43 (6.16)	28.70 (6.46)
Delta	29.00 (6.63)	28.84 (6.13)
Dickinson	28.31 (6.30)	27.85 (5.71)
Gogebic	29.97 (7.14)	29.19 (6.32)
Houghton/Keweenaw	27.98 (6.37)	28.29 (5.95)
Iron	28.34 (6.68)	28.69 (6.83)
Luce	29.81 (7.45)	29.76 (6.92)
Mackinac	28.03 (6.18)	28.32 (6.28)
Marquette	28.44 (6.74)	28.55 (6.88)
Menominee	28.65 (6.40)	29.20 (6.15)
Ontonagon	28.33 (5.70)	28.99 (5.72)
Schoolcraft	29.42 (6.54)	29.38 (6.82)
[a] Differences between counties 2021: F=2.49, p=.0022; 2017: F=2.17, p=.0084.		

FIGURE 1. Provisional* number of COVID-19–related deaths† and other deaths, by week — National Vital Statistics System, United States, 2020



* National Vital Statistics System provisional data are incomplete. Data from December are less complete due to reporting lags. Deaths that occurred in the United States among residents of U.S. territories and foreign countries were excluded.

† Deaths with confirmed or presumed COVID-19 as an underlying or contributing cause of death, with *International Classification of Diseases, Tenth Revision* code U07.1.

Figure 9-1: Provisional number of COVID-19- related deaths and other deaths, by week – National Vital Statistics Systems, United States, 2020

Table 9-11: 2018 Mortality Rates per 100,000

	Crude Mortality	Crude Mortality, Males	Crude Mortality, Females	Ade-adjusted Mortality	Age-adjusted Mortality, Males	Age-adjusted Mortality, Females
Michigan	990.3	1021.1	960.3	783.1	921.2	667.2
Alger	1297.1	1152.4	1476.4	778.8	832.3	737.3
Baraga	1262.0	1090.3	1473.0	822.9	826.2	766
Chippewa	1116.8	1115.3	1118.6	847.0	970.3	696.4
Delta	1305.2	1353.3	1257.7	790.1	945.6	665.5
Dickinson	1185.8	1163.2	1208.5	732.6	806.2	654.3
Gogebic	1165.9	1045.6	1305.6	622.4	703.1	514
Houghton	977.4	985.3	968.1	752.1	895.3	614.9
Iron	1727.1	1838.5	1616.1	803.5	994.3	635.9
Keweenaw	1325.1	1751.2	875.5	585.3	*	*
Luce	1225.5	784.0	1857.6	784.0	621.1	972.2
Mackinac	1436.9	1398.0	1477.6	848.4	896.0	803.3
Marquette	1071.9	1100.6	1043.0	775.6	874.6	678.4
Menominee	1305.3	1291.0	1320.1	730.0	800.1	674.3
Ontonagon	1656.6	1834.9	1472.7	831.7	1063.5	631.9
Schoolcraft	1462.6	1457.3	1467.7	799.7	928.7	692.5

While age-adjusted rates generally are similar between the Upper Peninsula and the state as a whole, crude death rates show that many Upper Peninsula counties have more deaths per 100,000 per year than Michigan because the Upper Peninsula has a higher percentage of elderly individuals. The drop-in age-adjusted mortality rate from the crude mortality rate for Michigan indicates that Michigan has a higher percentage of elderly individuals than the nation as a whole. Note that in smaller counties, single-year death rates exhibit more fluctuation based on the differences of only a few events.

Age is not the only factor that impacts mortality rates. Fluctuation between counties may also reflect other possible factors that may have contributed to higher death rates, including various combinations of population characteristics; social determinants of health; ethnic and racial determinants of health; alcohol, tobacco and drug use; obesity; variable access to medical care; and variable income-levels.

Table 9-12: 2018 Cardiovascular Mortality Rate per 100,000

	Crude Mortality Rate, Stroke	Crude Mortality Rate, Heart Disease	Age-adjusted Mortality Rate, Heart Disease	Age-adjusted Mortality Rate, Heart Disease — Male	Age-adjusted Mortality Rate, Heart Disease — Female
Michigan	51.8	253.6	194.9	244.7	154.3
Alger	*	274.8	162.5	*	*
Baraga	*	192.3	*	*	*
Chippewa	53.3	215.9	157.3	171	134.9
Delta	58.6	292.8	167.9	217.3	120.2
Dickinson	94.6	248.2	131.3	168.6	97.5
Gogebic	66.2	450.5	228.8	242.6	208.8
Houghton	58	204.3	148.8	234.7	72.9
Iron	152.9	476.7	192.1	258.5	150.4
Keweenaw	*	615.2	*	*	*
Luce	*	175.1	*	*	*
Mackinac	46.4	296.7	160.3	*	*
Marquette	55.6	234.5	163.7	221	112.6
Menominee	56.6	304.6	160.2	219.2	105.2
Ontonagon	86.3	414.2	167.3	*	*
Schoolcraft	99.2	235.5	*	*	*

Older populations experience higher crude rates of chronic disease and death because diseases progress over the course of a lifetime and most deaths occur in old age. Not surprisingly, the three counties with significant university populations and relatively fewer elderly — Chippewa, Houghton and Marquette — exhibit the lowest crude death rates in the region and approximate the state rate. Iron and Ontonagon counties have the highest crude death rates reflecting that populations in these counties are among the most elderly in the state. The low age-adjusted mortality rate in Keweenaw County, which has a high proportion of seniors, may reflect it having the smallest population of any county in Michigan (making any estimates more prone to variability) and the lack of long-term facilities within the county (leading to the most frail residents relocating to Houghton County prior to their demise).

In total, there were 3620 deaths among Upper Peninsula residents in 2018 (an increase from 3374 in 2015). Of these deaths, 1064 (29.4%) had heart disease as the cause of death (a slight decrease from 1072 (31.8%) in 2015). In 2018 835 (23.1%) had cancer as a cause (little change from 784 (23.2%) in 2015). Michigan in 2018 reported 32.9% of its deaths from heart disease, 21.2% of its deaths from cancer, and a combination of the two categories of 54.1%.

The mortality rates for deaths resulting from cardiovascular events are presented in **Table 9-12**. Only the crude mortality rates for deaths resulting from stroke are presented as most counties did not have enough such events to generate a reliable age-adjusted estimate. Deaths from heart disease, both crude and age-adjusted rates are provided. Iron and Ontonagon counties had the highest crude rates of heart disease mortality, reflecting their high elderly populations, while Delta and Ontonagon counties had the highest crude mortality rate following stroke. Of interest, Gogebic and Iron counties had the highest age-adjusted heart disease mortality rates.

Table 9-13: 2018 Cancer Mortality Rates per 100,000

	Crude Cancer Mortality Rate	Age-adjusted Cancer Rate	Age-adjusted Cancer Rate — Male	Age-adjusted Cancer Rate — Female
Michigan	210.3	161.1	191	139.6
Alger	296.8	175.5	*	*
Baraga	447.7	277.3	*	338.8
Chippewa	287.9	211.1	246.4	174.6
Delta	304	171.8	201.2	149.9
Dickinson	244.3	151.3	169.6	139.9
Gogebic	205.4	112.7	*	*
Houghton	201.6	155.3	195.8	123.8
Iron	422.8	199.7	251.5	*
Keweenaw	126.6	*	*	*
Luce	350.2	226.9	*	*
Mackinac	287.4	156.4	*	*
Marquette	222.5	158.5	184.7	139.7
Menominee	348	187.5	184.3	201.4
Ontonagon	448.7	185.7	*	*
Schoolcraft	384.2	191	*	*

Cancer mortality rates are presented in **Table 9-13**. Once again, crude rates are led by Iron and Ontonagon counties in large part because of the high percentage of elderly within their borders. The Baraga County rates stand out from the rest of the counties in both crude and age-adjusted forms. Baraga’s age profile cannot explain the results. The high cancer mortality rate among women may point to a specific diagnosis or exposure that warrants exploration.

	Chronic Lung Disease	Accidents	Diabetes Mellitus	Alzheimer’s Disease	Kidney Disease	Pneumonia / Influenza	Suicide
Michigan	57.9	55.7	28.3	44.8	19.4	18.7	15.5
Alger	66	*	*	98.9	*	87.9	*
Baraga	*	120.2	*	*	*	*	*
Chippewa	80	69.3	48	21.3	21.3	18.7	37.3
Delta	94.8	53	44.6	78.1	27.9	44.6	33.5
Dickinson	59.1	106.4	23.6	23.6	*	19.7	*
Gogebic	*	72.6	*	53	*	*	*
Houghton	69	63.5	49.7	80.1	*	*	22.1
Iron	90	*	54	72	*	*	*
Keweenaw	*	*	*	*	*	*	*
Luce	127.3	111.4	*	*	*	*	*
Mackinac	92.7	64.9	55.6	*	*	*	*
Marquette	73.7	46.6	28.6	58.6	10.5	16.5	27.1
Menominee	78.3	60.9	*	87	21.8	21.8	*
Ontonagon	*	138.1	*	103.5	*	*	*
Schoolcraft	*	62	*	74.4	*	*	*

Cancer and cardiovascular disease are the most common causes of mortality. Other common causes of death are listed in **Table 9-14**. At a county-level, these causes of death did not occur frequently enough to provide reliable age-adjusted rate estimates, so only crude rates are provided. The higher rate of mortality associated with diabetes mellitus seen in several counties may, in part, be because of the

region's older population, a higher rate of obesity, and the ethnic makeup of the population. Chronic lung disease, especially chronic obstructive pulmonary disease (COPD) are associated with smoking, so these deaths may reflect smoking rates. Not surprisingly, the mortality rates from Alzheimer's disease reflect a county's age profile. Of interest, the elevated rate in Houghton County may reflect an influx of patients with Alzheimer's disease from Keweenaw County, which has a paucity of facilities for patients with Alzheimer's disease.

9.4 Possible Future Implications

- In the Upper Peninsula, as in the rest of the United States, obesity combined with physical inactivity is projected to overtake tobacco use as the leading root cause of preventable mortality, morbidity, disability, and years of potential life lost. As a consequence, the prevalence of cardiovascular disease, diabetes, and other chronic illnesses will likely rise locally.
- The greater prevalence of high-risk health behaviors among low-income populations combined with lower utilization of recommended health screening and routine preventive health care, translates into a higher chronic disease burden and poorer health outcomes for many of our residents.
- Upper Peninsula rates for various behavioral risk factors including tobacco use, physical inactivity, and poor nutrition are troubling.
- Because much of chronic disease is preventable with behavior change, predictions of future health outcomes are not set in stone. Addressing social determinants of health that impact our residents as well as implementing targeted and effective prevention efforts can have an enormous impact on the health of our communities in future decades.

References

- [1] Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). About chronic disease. <https://www.cdc.gov/chronicdisease/about/index.htm>. Accessed December 22, 2020.
- [2] Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). Rural Health. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/rural-health.htm>. Accessed December 22, 2020.
- [3] County Health Rankings and Roadmaps. www.countyhealthrankings.org. Accessed March 1, 2021. Data source: National Center for Health Statistics — Mortality Files.
- [4] Centers for Disease Control and Prevention. Know Your Risk for Heart Disease. https://www.cdc.gov/heartdisease/risk_factors.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fheartdisease%2Fbehavior.htm. Accessed December 22, 2020.
- [5] HCUPnet, Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD. <https://hcupnet.ahrq.gov/>. Accessed June 18, 2021.
- [6] World Health Organization. Cancer. https://www.who.int/health-topics/cancer#tab=tab_1. Accessed December 22, 2020.
- [7] Centers for Disease Control and Prevention. Chronic Obstructive Pulmonary Disease (COPD). <https://www.cdc.gov/copd/index.html>. Accessed December 22, 2020.
- [8] Centers for Disease Control and Prevention. Diabetes. Diabetes Basics. <https://www.cdc.gov/diabetes/basics/index.html>. Accessed December 22, 2020.
- [9] Centers for Disease Control and Prevention. Stroke. <https://www.cdc.gov/stroke/index.htm>. Accessed December 22, 2020.
- [10] Centers for Disease Control and Prevention. Alzheimer's Disease and Healthy Aging. Alzheimer's Disease. <https://www.cdc.gov/aging/aginginfo/alzheimers.htm>. Accessed December 22, 2020.

- [11] Tian Y, McKane P, Steiner S, Hines S, Leonardi, K. Subjective Cognitive Decline Among Older Michigan Adults. Michigan BRFSS Surveillance Brief. 2021; 12(2). Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division.
- [12] Centers for Disease Control and Prevention. Chronic Kidney Disease Initiative. <https://www.cdc.gov/kidneydisease/index.html>. Accessed December 22, 2020.
- [13] Centers for Disease Control and Prevention. High Blood Pressure. <https://www.cdc.gov/bloodpressure/index.htm>. Accessed December 22, 2020.
- [14] Centers for Disease Control and Prevention. Overweight & Obesity. <https://www.cdc.gov/obesity/index.html>. Accessed December 22, 2020.
- [15] Ahmad FB, Cisewski JA, Miniño A, Anderson RN. Provisional mortality data — United States, 2020. MMWR Morb Mortal Wkly Rep 2021; 70 (14): 519-22. doi: 10.15585/mmwr.mm7014e1.
- [16] Michigan Department of Health and Human Services. Mortality 2000-2018. <https://www.mdch.state.mi.us/osr/CHI/deaths/frame.asp>. Accessed December 21, 2020.

10 MENTAL HEALTH

10.1 Introduction

The mind-body connection and the importance of mental health to overall wellbeing has been recognized since the time of the ancient Greeks. Mental health refers to emotional, psychological, and social well-being. It impacts our ability to think clearly, our mood, and our behavior. It also informs our relationships, our ability to deal with challenges, and whether we are capable of making healthy choices. A person can experience poor mental health without being diagnosed with a mental illness and a person with mental illness can experience periods of physical and mental well-being.

Mental health issues can indirectly impact families and communities, but these impacts can be difficult to identify and quantify for a variety of reasons.

- 1) Not everyone is screened for mental illness.
- 2) Diagnostic criteria are based on symptoms and behaviors either observed by the evaluator or reported by the patients rather than objective test results.
- 3) The stigma surrounding mental health makes patients reluctant to talk about mental health issues or to seek treatment.

10.2 National Mental Health Data

10.2.1 Prevalence

According to the National Alliance on Mental Illness [1]:

In 2020, approximately 52.9 adults in the United States experienced mental illness. In 2019, 13.1 million experienced *serious* mental illness. Approximately 9.5 million (3.8%) adults experienced a co-occurring substance use disorder and mental illness.

Half of all lifetime mental illness begins by 14 years of age, while 75% begins by age 24. Among those aged 6 to 17 years, 16.5% (7.7 million) experienced a mental health disorder in 2016.

Among demographic groups, non-Hispanic Asians have the lowest annual prevalence (14.4%) of mental illness, while non-Hispanic mixed/multiracial individuals (31.7%) and those identifying as lesbian, gay, or bisexual (44.1%) have the highest annual prevalence.

Annual prevalence among adult in the United States:

- Schizophrenia: <1% (estimated 1.5 million)
- Bipolar disorder (BPD): 2.8% (estimated 7 million)
- Major depressive episode: 7.8% (estimated 19.4 million)
- Anxiety disorders: 19.1% (estimated 48 million)
- Post-traumatic stress disorder (PTSD): 3.6% (estimated 9 million)
- Obsessive compulsive disorder: 1.2% (estimated 3 million)

- Borderline personality disorder: 1.4% (estimated 3.5 million)

10.2.2 Treatment

The average delay between onset of mental health symptoms and receiving treatment is 11 years.

In 2019, 43.8% of adults with mental illness in the United States received treatment while 65.5% of those with serious mental illness received treatment. Of those aged 6 to 17 years with a mental health disorder, 50.6% received treatment.

Among adults in the United States with mental illness, the annual treatment rates were highest in non-Hispanic Whites (50.3%) and lowest in non-Hispanic Asians (23.3%).

Barriers to treatment include a lack of health insurance coverage for 10.9% of those with mental illness and 11.9% for those with serious mental illness. Most (55%) counties in the United States do not have a single practicing psychiatrist.

In the United States, a number of reasons are given for not receiving mental health services. These include:

- Could not afford the costs (43.3%),
- Might cause neighbors/community to have a negative opinion (10.6%),
- Might cause have a negative effect on job (10.0%),
- Health insurance does not cover (7.8%),
- Health insurance does not pay enough (15.9%),
- Did not know where to go for services (25.0%),
- Concerned about confidentiality (9.6%),
- Concerned about being committed/having to take medicine (14.2%),
- Did not feel the need for treatment at the time (9.3%),
- Thought could handle the problem without treatment (26.5%),
- Treatment would not help (12.8%),
- Did not have time (21.3%),
- Did not want others to find out (7.5%), no transportation/inconvenient (6.3%), and
- Some other reason (11.6%).

10.2.3 Ripple Effect

The ramifications of mental illness extend well beyond the immediate impact of one person dealing only with their illness. For example:

- People with depression have a 40% higher risk of developing cardiovascular disease and metabolic diseases than the general population. Those with serious mental illness have double the risk.
- Of those with mental illness, 18.4% (9.5 million) also experienced a substance use disorder in 2019.
- High school students with significant symptoms of depression are twice as likely to drop out of school.

- At least 8.4 million people in the United States provide care to an adult with a mental or an emotional health issue. These caregivers spend an average of 32 hours per week providing unpaid care.
- Mental illness and substance abuse are involved in 1 of every 8 (estimated 12 million visits each year) emergency department visits by adults in the United States.
- Mood disorders are the most common cause of hospitalization (excluding those for pregnancy and birth) for all people in the United States under 45 years of age.
- 20.5% of homeless in the United States have a serious mental health condition.
- 41% of Veteran’s Health Administration (VA) patients have a diagnosed mental illness or substance use disorder.
- Serious mental illness results in \$193.2 billion in lost earnings each year across the U.S. economy.
- Depression and anxiety disorders cost the global economy \$1 trillion in lost productivity each year.

10.2.4 Mental Health and the Criminal Justice System

Given that mental health issues can have a negative impact on behaviors and the ability to interact appropriately with others, it is not surprising that those with mental health concerns are more likely to have interactions with the criminal justice system. For example:

- People with serious mental illness are booked into jails two million times a year.
- Among those incarcerated, 37% in state and federal prisons and 44% in local jails have a history of mental illness. Of women in prison, 66% report a history of mental illness.
- Nearly one in four people shot and killed by police officers between 2015 and 2020 had a mental health condition.
- Suicide is the leading cause of death for people held in local jails.
- An estimated 4,000 people with serious mental health illness are held in solitary confinement in prisons in the United States.
- Among incarcerated individuals with a mental health condition, non-whites are more likely to go to solitary confinement, be injured, and stay longer in jail.
- Of youth in the juvenile justice system, 70.4% have a diagnosed mental illness and youth in detention are 10 times more likely to suffer from psychosis than youth in the community.
- Of those incarcerated in state and federal prisons with a history of mental illness, 63% do not receive treatment. About 45% of those in local jails receive treatment.

Access to treatment is essential for people with mental illness who have interacted with the criminal justice system. Upon release from incarceration, having healthcare coverage increases the likelihood of engaging in services that reduce recidivism.

10.3 Common Mental Health Conditions

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) [2] provides the diagnostic criteria for hundreds of mental disorders. This section will address some of the more frequently encountered disorders.

10.3.1 Depression [3]

Depression, also referred to as a depressive disorder, is the leading cause of disability worldwide. [1] It is a serious mental health condition that requires understanding and medical care. More than merely feeling sad or going through a rough patch, depression, if left untreated, can have devastating consequences for individuals and their families. Fortunately, with early detection and an individualized treatment plan of medication, psychotherapy, and healthy lifestyle choices (diet and exercise), many with depression can and do get better. Without treatment, episodes can last a few months to several years.

Unfortunately, depressive episodes are often recurrent, with nearly 8% (19 million) of adults in the United States having at least one major depressive episode in the past year.

The results of the 2021 UPCHIPS for reporting depression are shown in **Tables 13-43A** and **13-43B**.

10.3.1.1 Symptoms

Depression needs to be considered in anyone who experiences changes in day-to-day functions for more than two weeks with the following symptoms:

- Changes in sleep
- Changes in appetite
- Difficulty concentrating
- Lack of interest in activities
- Changes in activity level (less activity or agitation)
- Physical aches and pains / headaches
- Suicidal thoughts
- Feelings of worthlessness

10.3.1.2 Causes / Triggers

Depression can be triggered by a life crisis, physical illness, other causes, or come on spontaneously. Several factors are believed to contribute to depression:

Trauma. Trauma experienced at an early age can cause long-term changes in how the brain responds to fear and stress, which may lead to depression.

Genetics. Mood disorders, such as depression, tend to run in families.

Life circumstances. Marital status, relationship changes, financial standing, and where a person lives influence whether a person develops depression.

Brain changes. The frontal lobe of the brain becomes less active when a person is depressed. Depression may impact how the pituitary gland and hypothalamus respond to physiologic hormone stimulation.

Other medical conditions. A history of sleep disturbances, other medical illness, chronic pain, anxiety, and attention deficit hyperactivity disorder (ADHD) makes it more likely to develop depression. Some medications can also cause symptoms of depression.

Drug and alcohol misuse. Of adults with a substance use disorder, 21% also experienced a major depressive episode in 2018. Alcohol use can worsen depressive symptoms.

10.3.1.3 Links to Obesity

As seen in Chapter Nine, depression was linked to chronic illnesses. This is unclear whether the depression led to the illness, or the individual's chronic illness impacted their mood. Depression is also linked to obesity. The UPCHIPS data from both 2017 and 2021 confirm this. In models controlling for age, sex, level of education, educational attainment, and county of residence, the average BMI was significantly higher in those reporting depression (2017: adjOR: 1.030, 95%CI: 1.019, 1.041, chi-square=29.8, p<.0001; 2021: adjOR=1.043, 95%CI: 1.031, 1.056, chi-square=46.6, p<.0001; Combined: adjOR=1.036, 95%CI: 1.028, 1.044, chi-square=75.0, p<.0001). Similar findings were seen for those meeting the criteria for obesity (2017: adjOR: 1.45, 95%CI: 1.25, 1.68, chi-square=24.7, p<.0001; 2021: adjOR=1.58, 95%CI: 1.34, 1.88, chi-square=28.4, p<.0001; Combined: adjOR=1.51, 95%CI: 1.35, 1.68, chi-square=52.8, p<.0001).

10.3.2 Bipolar Disease (Manic-Depressive) [4]

Those with bipolar disease experience both high and low moods (mania and depression) much more extreme than the typical ups-and-downs most people experience. Bipolar disorder causes dramatic shifts in a person's mood, energy, and ability to think clearly.

The average age-of-onset is about 25 years, but it can occur in the teens, or more uncommonly, in childhood. Bipolar disorder affects about 2.8% of the population in the United States, with men and women being impacted equally. Of those diagnosed with bipolar disease, nearly 83% are classified as severe. If left untreated, bipolar disorder typically worsens. However, with a good treatment plan including psychotherapy, medications, a healthy lifestyle, a regular schedule, and early identification of symptoms, many people live well with the condition.

10.3.2.1 Symptoms

Symptoms and their severity can vary. A person with bipolar disorder may have distinct manic or depressed states but may also have extended periods — sometimes years — without symptoms. A person can also experience both extremes simultaneously or in rapid sequence. Severe bipolar episodes of mania or depression may include psychotic symptoms such as hallucinations or delusions. Usually, these psychotic symptoms mirror a person's extreme mood and can lead to being wrongly diagnosed as having schizophrenia.

Teenagers with bipolar disease will often initially present in a depressed state, but administering medications targeted toward depression can trigger a manic response and an increase in suicidal ideation and suicide attempts.

The symptoms associated with bipolar disorder depend on whether the patient is in the manic or depressive phase.

Mania: To be diagnosed with bipolar disorder, a person must have experienced at least one episode of mania or hypomania (a milder form of mania that does not include any psychotic episodes and often allows the person to function well in social situations or at work). Some people with bipolar disorder will have episodes of mania or hypomania many times throughout their life; others may experience them only rarely.

Although someone with bipolar disease may find the elevated mood of mania appealing, the “high” does not stop at a comfortable or controllable level. Moods can rapidly become more irritable, behavior more unpredictable, and judgment more impaired. During periods of mania, people frequently behave impulsively, make reckless decisions, and take unusual risks. Most of the time, people in manic states are unaware of the negative consequences of their actions. With bipolar disorder, suicide is a concern as some people with bipolar disorder become suicidal even in manic states.

Depression: The lows of bipolar depression are often so debilitating that people may be unable to get out of bed. Typically, people experiencing a depressive episode have difficulty falling and staying asleep, while others sleep far more than usual. When people are depressed, even minor decisions such as what to eat for dinner can be overwhelming. They may become obsessed with feelings of loss, personal failure, guilt or helplessness — this negative thinking can lead to thoughts of suicide.

The depressive symptoms that obstruct a person’s ability to function must be present nearly every day for a period of at least two weeks for a diagnosis. Depression associated with bipolar disorder may be more difficult to treat and require a customized treatment plan.

10.3.3 Suicide

While not a mental disorder or illness, suicide, often a byproduct of mental illness, is the second leading cause of death in the United States among people aged 10 to 34 and the 10th leading cause overall. The overall suicide rate in this country has increased 35% since 1999. Of those who died from suicide, 46% had been diagnosed with a mental health condition and 90% had shown symptoms of a mental health condition.

Lesbian, gay, and bisexual youth are four times more likely to attempt suicide than straight youth, while transgender adults are nearly 12 times more likely to attempt suicide than the general population. Males account for 78% of suicide deaths, primarily because of the methods males employ.

The annual prevalence of thoughts of suicide in the United States is 4.9% in all adults, 11.8% in young adults (18-25 years), 18.8% of high school students, and 46.8% in lesbian, gay, and bisexual high school students. [1]

The age-adjusted suicide rate per 100,000 population for Michigan and the United States from 2009 through 2018[5] and 2019 Michigan demographic breakdown [6] and the 2019 national estimate [7] are presented in **Table 10-1**.

There are six crisis centers in Michigan: Dial Help (Houghton), Network 180 (Grand Rapids), Gryphon Place (Kalamazoo), Common Ground (Bloomfield Hills), Listening Ear Crisis Center (Mount Pleasant), Macomb County Crisis Center (Clinton Township). From January through June 2020, these centers received 25,609 calls. Of these only 43% were able to receive help in Michigan. [8] Within the Upper Peninsula, from October 1, 2019 through September 30, 2020, Dial Help received 2815 calls, texts, instant messages, or walk-ins. [9]

Table 10-1: Suicide Age-adjusted Rate per 100,000, Michigan & United States, 2009-2019

Year	Michigan	US
2019	14.3	13.9
2018	15.4	14.8
2017	14.5	14.5
2016	13.6	13.9
2015	14.1	13.7
2014	13.6	13.4
2013	13	13
2012	12.7	12.9
2011	12.3	12.7
2010	12.7	12.4
2009	11.7	12
Female*	6.2	
Male*	25.2	
Black*	9.5	
Hispanic*	12.3	
Asian*	6.7	
White*	16.8	
Native American*	Not provided	
* 2019 data		

10.3.4 Anxiety Disorders [10]

Anxiety disorders are the most common mental health concern in the United States. Over 40 million (19.1%) adults in the United States have an anxiety disorder. Most people develop symptoms before age 21, with approximately 7% of children aged 3 to 17 years experiencing issues with anxiety each year.

Anxiety disorders are a group of related conditions, each having unique symptoms. However, all anxiety disorders have one thing in common: persistent, excessive fear or worry in situations that are not threatening.

10.3.4.1 Symptoms

People with an anxiety disorder typically experience one or more of the following symptoms:

- Feelings of apprehension or dread
- Feeling tense or jumpy
- Restlessness or irritability

- Anticipating the worst and being watchful for signs of danger
- Pounding or racing heart and shortness of breath
- Sweating, tremors and twitches
- Headaches, fatigue and insomnia
- Upset stomach, frequent urination or diarrhea

There are many types of anxiety disorders, each with different symptoms, including:

Generalized Anxiety Disorder, which produces chronic, exaggerated worrying about everyday life that can consume hours each day, making it hard to concentrate or finish daily tasks. A person with generalized anxiety disorder may become exhausted by worry and experience headaches, tension, or nausea.

Social Anxiety Disorder is more than mere shyness and causes intense fear about social interaction, often driven by irrational worries about humiliation, leading to a failure to participate in conversations, contribute to classroom discussions, or offer their ideas. These fears can lead to self-imposed social isolation.

Panic Disorder is characterized by panic attacks and sudden feelings of terror that can strike repeatedly and without warning. Similar to a heart attack, a panic attack causes powerful physical symptoms including chest pain, heart palpitations, dizziness, shortness of breath, and stomach upset. Many people will go into social isolation to avoid an attack.

Phobias create powerful reactions of strong, irrational fear when encountering certain places, events, or objects. To avoid panic, people with specific phobias will work hard to avoid their triggers. Depending on the type and number of triggers, attempts to control fear can take over a person's life.

Other anxiety disorders include:

- Agoraphobia
- Selective mutism
- Separation anxiety disorder
- Substance/medication-induced anxiety disorder, involving intoxication or withdrawal or medication treatment

10.3.4.2 Causes / Triggers

Many factors combine to cause anxiety disorders. For example, studies support the evidence that anxiety disorders may “run in families,” and a stressful or traumatic event such as abuse, death of a loved one, violence, or prolonged illness is often linked to the development of an anxiety disorder.

Physical symptoms of an anxiety disorder can be easily confused with other medical conditions, like heart disease or hyperthyroidism, so making a diagnosis involves a physical examination, an interview, and laboratory tests. After ruling out an underlying physical illness, using the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) [2] a mental health professional should be able to identify the specific type of anxiety disorder causing symptoms as well as any other possible disorders that may be involved.

Different anxiety disorders have their own distinct sets of symptoms and their own treatment plan often including psychotherapy (including cognitive behavioral therapy), medications, and complementary health approach to decrease stress and prompt relaxation.

As seen in Chapter Nine, depression was linked to chronic illnesses. This is unclear whether the depression led to the illness, or the individual's chronic illness impacted their mood. Depression is also linked to obesity. The UPCHIPS data from both 2017 and 2021 confirm this. In models controlling for age, sex, level of education, educational attainment, and county of residence, the average BMI was significantly higher in those reporting depression (2017: adjOR: 1.030, 95%CI: 1.019, 1.041, chi-square=29.8, p<.0001; 2021: adjOR=1.043, 95%CI: 1.031, 1.056, chi-square=46.6, p<.0001; Combined: adjOR=1.036, 95%CI: 1.028, 1.044, chi-square=75.0, p<.0001). Similar findings were seen for those meeting the criteria for obesity (2017: adjOR: 1.45, 95%CI: 1.25, 1.68, chi-square=24.7, p<.0001; 2021: adjOR=1.58, 95%CI: 1.34, 1.88, chi-square=28.4, p<.0001; Combined: adjOR=1.51, 95%CI: 1.35, 1.68, chi-square=52.8, p<.0001).

10.3.4.3 Links to Obesity

Similar to depression, anxiety is linked to chronic illnesses. This is unclear whether the anxiety and stress led to the illness, or the individual's chronic illness impacted their anxiety level. Like depression, anxiety is also to obesity, but not to the same degree. The UPCHIPS data from both 2017 and 2021 confirm this. In models controlling for age, sex, level of education, educational attainment, and county of residence, the average BMI was significantly higher in those reporting anxiety (2017: adjOR: 1.023, 95%CI: 1.011, 1.035, chi-square=14.0, p<.0001; 2021: adjOR=1.016, 95%CI: 1.003, 1.029, chi-square=5.49, p=.0191; Combined: adjOR=1.019, 95%CI: 1.011, 1.028, chi-square=18.8, p<.0001). Similar findings were seen for those meeting the criteria for obesity (2017: adjOR: 1.40, 95%CI: 1.19, 1.65, chi-square=16.4, p<.0001; 2021: adjOR=1.17, 95%CI: 0.97, 1.41, chi-square=2.67, p=.1020; Combined: adjOR=1.29, 95%CI: 1.14, 1.46, chi-square=16.8, p<.0001).

10.3.5 Schizophrenia [11]

Schizophrenia is serious, complex, long-term mental illness that interferes with the ability to think clearly, make decisions, and relate to others.

While the exact prevalence is difficult to measure, schizophrenia is estimated to affect between 0.25% and 0.64% of adults in the United States. The average onset is in the late teens and early 20s for men and the late 20s to early 30s for women. A new diagnosis is unusual in those younger than 12 or older than 40.

Diagnosing schizophrenia in teenagers can be difficult as the first signs can be a change of friends, a drop-in grade, sleep problems, and irritability, all of which are common and nonspecific adolescent behaviors. Other indications of schizophrenia include isolating oneself and withdrawing from others, an increase in unusual thoughts and suspicions, and a family history of psychosis. This early stage of the disorder is called the "prodromal" period.

10.3.5.1 Symptoms

To make the diagnosis of schizophrenia, some of the following symptoms need to be present in the context of reduced functioning for at least 6 months:

Hallucinations. These include a person hearing voices, seeing things, or smelling things others cannot. The hallucinations are very real to the person experiencing it.

Delusions. These are false beliefs that do not change even when the person who holds them is presented with new ideas or facts.

Negative symptoms. These symptoms diminish a person's ability to function. These include being emotionally flat, speaking in a dull, disconnected way, an inability to start or follow through with activities, and showing little interest in life sustaining relationships.

Cognitive issues/disorganized thinking. This includes struggling to remember things, organize thoughts, or complete tasks. Commonly, people with schizophrenia lack insight, including being unaware that they have the illness, making treatment more challenging.

10.4 Impact of the COVID-19 Pandemic on Mental Health

The COVID-19 pandemic resulted in a number of community interventions that might be expected to impact mental health. To date, only a few studies have addressed this issue. The CDC, using U.S. Census Bureau Household Pulse Survey data, determined the average anxiety and depression severity scores.¹⁴ Nationally, average anxiety severity scores increased 13% from 2.0 during August 19-31, 2020 to 2.3 during December 9-21, 2020, but then decreased 26.8% to 1.7 when measured during May 26-June 7, 2021. Similarly, the average depression severity score increased from 1.6 to 2.0 (14.8%) in the first-time interval only to decrease by 24.8% to 1.4 in the second time interval. The frequency of anxiety and depression symptoms were positively correlated with the average number of daily cases of COVID-19. [12]

For the State of Michigan, the anxiety scores went from 2.01 (95%CI: 1.91,2.11) to 2.42 (2.29, 2.55) back to 1.49 (1.33, 1.66), while depression scores went from 1.62 (1.53, 1.71) to 2.07 (1.93, 2.20) back to 1.34 (1.18, 1.50) in the same time periods specified above. Data from the wave of cases following June 2021 have not been assessed. [12]

The impact of the COVID-19 pandemic on suicide rates is difficult to interpret. Suicide rates have steadily been climbing over the past decade. When the 2019 numbers were released at the end of 2020, they were consistent with this steady rise in rates. The "official" 2020 numbers have not been released. Tyler Black, a child and adolescent psychiatrist and suicidologist, has been tracking the number of suicides from data that have been available and found a dip in suicides in the spring of 2020, an overall 5.6% decrease for the entire year, and rates throughout the year have consistently been below 2019 levels. [13] In a separate study, the number of suspected suicide attempts presenting to emergency departments in adolescents and young adults has been a mixed bag. For all groups the number of emergency department visits for suspected suicide attempts decreased during the spring of 2020 compared to the numbers during the same weeks in 2019 before increasing. For men and women aged 18 to 25 years this was a 16.8% drop. Afterward, through the spring of 2021 the rate of suspected suicide attempts in this group was only slightly higher (1.1 to 1.3 times higher) than the rates in 2019.

¹⁴ Scores, based on the frequency of symptoms in the previous week, were assigned as follows: not at all = 0, several days = 1, more than on half of days = 2, and nearly every day = 3.

For males 12 to 17 years of age, the COVID-19 pandemic had little impact with a 3.7% increase seen in the winter of 2021. For females aged 12 to 17 years of age an increase of about 50% was seen in the winter of 2021. [14] It may be difficult to apply these findings to the Upper Peninsula as the timeframes for data collection did not include the timeframes when the region experienced the brunt of the outbreak.

To assess the impact of the COVID-19 pandemic on the mental health of children under 18 years of age the number of mental health related visits to emergency departments was tracked by the CDC. The diagnoses tracked included: depression, anxiety, behavioral and impulse-control disorder, attention-deficit/hyperactivity disorder, trauma and stressor-related disorder, bipolar disorder, eating disorders, tic disorders, and obsessive-compulsive disorder. Three periods of the pandemic (Period 1: March 15, 2020 through January 2, 2021, Period 2: January 3, 2021 through January 1, 2022, and Period 3: January 2, 2022 through January 29, 2022) were compared to the corresponding weeks in 2019. Total visits to emergency departments were down 27% during Period 1, down 8% in Period 2, and down 5% in Period 3. Mental health related visits were unchanged across all three periods for children 0 to 4 years of age and for males of any age. Among females, visits for tic disorders were increased (greater than a 10% increase) in females 5 to 11 years of age. During Period 1, females 12 to 17 years of age saw increases in visits for eating disorders and tic disorders. During Period 2, increases were seen in visits for depression, eating disorders, tic disorders, and obsessive-compulsive disorder. In Period 3, increases in visits were seen for anxiety, trauma and stress-related disorder, eating disorders, tic disorders, and obsessive-compulsive disorders. [15] Emergency department visits may or may not reflect the overall incidence/prevalence of those with mental health conditions as the pandemic may have interfered with access to other professionals who diagnose and treat these conditions.

10.5 Mental Health Screening

A mental health screening is an examination of emotional health and used to help diagnose a variety of mental disorders, including depression, anxiety disorders, eating disorders, attention deficit hyperactivity disorder, post-traumatic stress disorder (PTSD), substance abuse/addictive disorders, bipolar disorder, and schizophrenia/psychotic disorders.

Mental health screening may be indicated if any of the following symptoms and signs are present:

- Excessive worrying or fear
- Extreme sadness
- Major changes in personality, eating habits, and/or sleeping patterns
- Dramatic mood swings
- Anger, frustration, or irritability
- Fatigue and lack of energy
- Confused thinking and trouble concentrating
- Feelings of guilt or worthlessness
- Avoidance of social activities

A mental health screening performed by a medical provider often includes an interview (primarily about feelings, mood, behavioral patterns, and other symptoms), a review of the medical history, a physical examination, and blood tests (if indicated). Standardized questionnaires are often used to evaluate for specific diagnoses.

10.6 Treatment of Mental Illness

With the development of telemedicine, the number of psychiatrists practicing in the Upper Peninsula is difficult to determine. Most of the care provided by pediatric/adolescent psychiatrists is provided by physicians located in either the Lower Peninsula or Wisconsin who interact with patients remotely. Rural populations, for a variety of reasons, have been underserved by mental health specialists. Telemedicine minimizes the negative impact of geographical barriers to receiving care.

In October 2022, the NorthCare Network was awarded the contract to serve as the Prepaid Inpatient Health Plan for all Upper Peninsula Medicaid recipients who require specialty mental health services and substance use services. It works through five Community Mental Health agencies: Copper Country Community Mental Health, Gogebic County Community Mental Health, Hiawatha Behavioral Health, Northpoint Behavioral Health, and Pathways Community Mental Health. The data provided by the NorthCare Network includes both those on regular Medicaid and Healthy MI, which is a version of Medicaid for those who do not qualify for Medicaid but have enough of a financial need to qualify for Healthy MI.

NorthCare administers mental health services across the Upper Peninsula primarily for patients on Medicaid through five local agencies. The number of community mental health admissions at the county level by quarter from October 1, 2018 through September 30, 2021 are shown in **Figure 10-1**. The drop-in admissions note in 2020 coincide with the initial COVID-19 outbreak. By the end of fiscal year 2021, the number of admissions had not reached what was documented at the beginning of 2020. **Figure 10-2** shows quarterly number of the unduplicated mental health customers served by NorthCare Network by county over the same time period.

In fiscal year 2021, NorthCare completed 2,559 access screenings. These were followed by in-person biopsychosocial assessments. Of those assessed, 74.9% were admitted to the Community Mental Health agency for services. Of interest, those with Medicaid insurance received immediate evaluation and care, these agencies place non-Medicaid consumers on a waiting list.

In fiscal year 2021, 49 Intensive Crisis Stabilization for Children services were provided in the Upper Peninsula. This was an increase from 35 in fiscal year 2020. In the same time period there were 22 adult crisis residential admissions in 18 individuals. [16] In fiscal year 2021, 82 adults were diverted from jail into mental health treatment. [16]

The 2021 UPCHIPS reported on the access to mental health services and barriers to receiving these services in **Tables 13-44A, 13-44B, 13-45A, and 13-45B**.

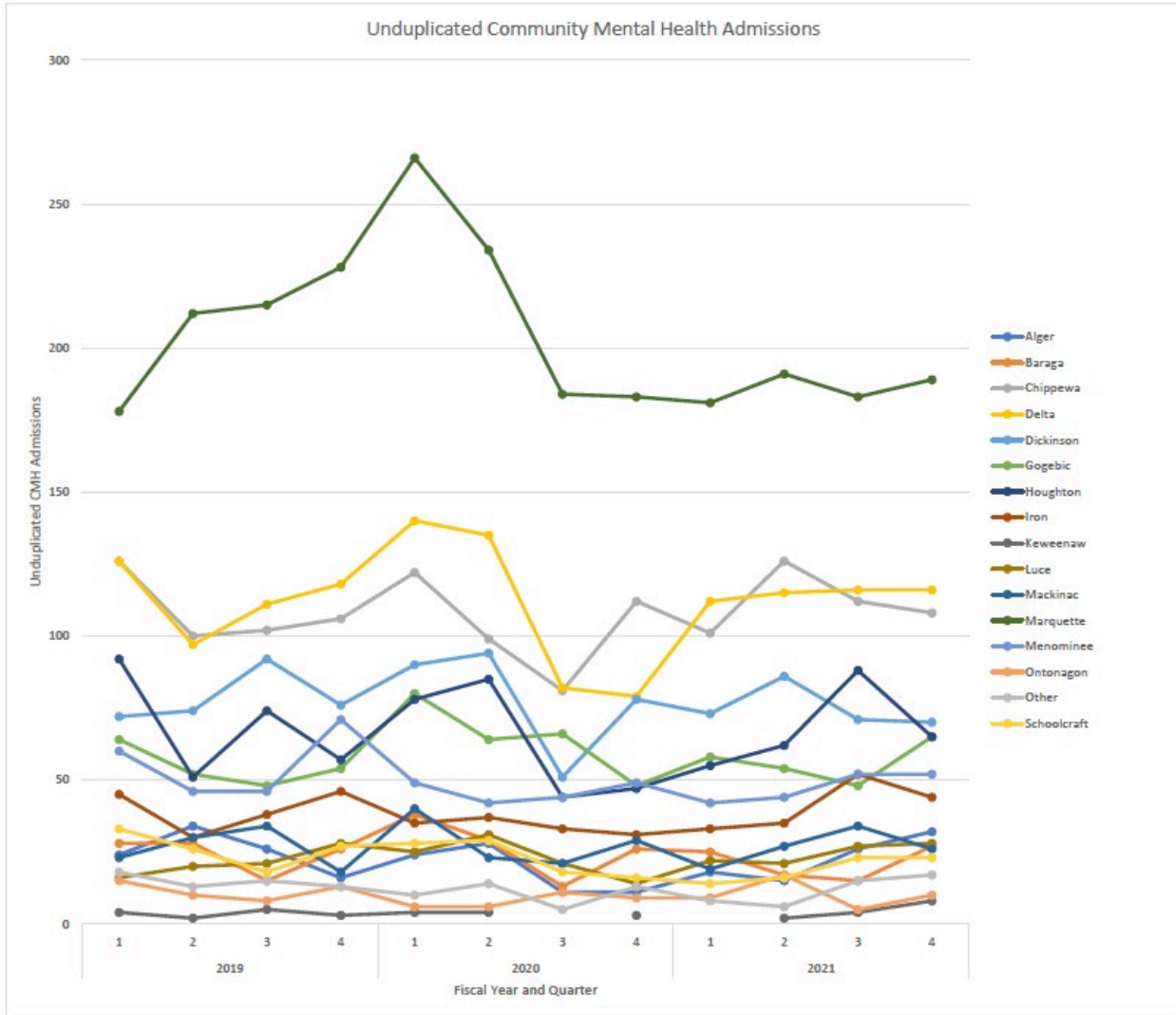


Figure 10-1: NorthCare Network — Community Mental Health Admissions by Quarter, 2019-2021¹⁵

¹⁵ SOURCE: Behavioral Health Treatment Episode Dataset (BH-TEDS) data from NorthCare ELMER Electronic Health Record system. Unduplicated count of BH-TEDS Mental Health start event ("M") records or crisis-only ("Q") records in the given time period. Only consumers who were eligible for Medicaid, Healthy Michigan, or MI Health Link on the date of admission are included. County is the county of residence listed on the BH-TEDS record. County of "Other" includes any county outside of the 15 Upper Peninsula counties.

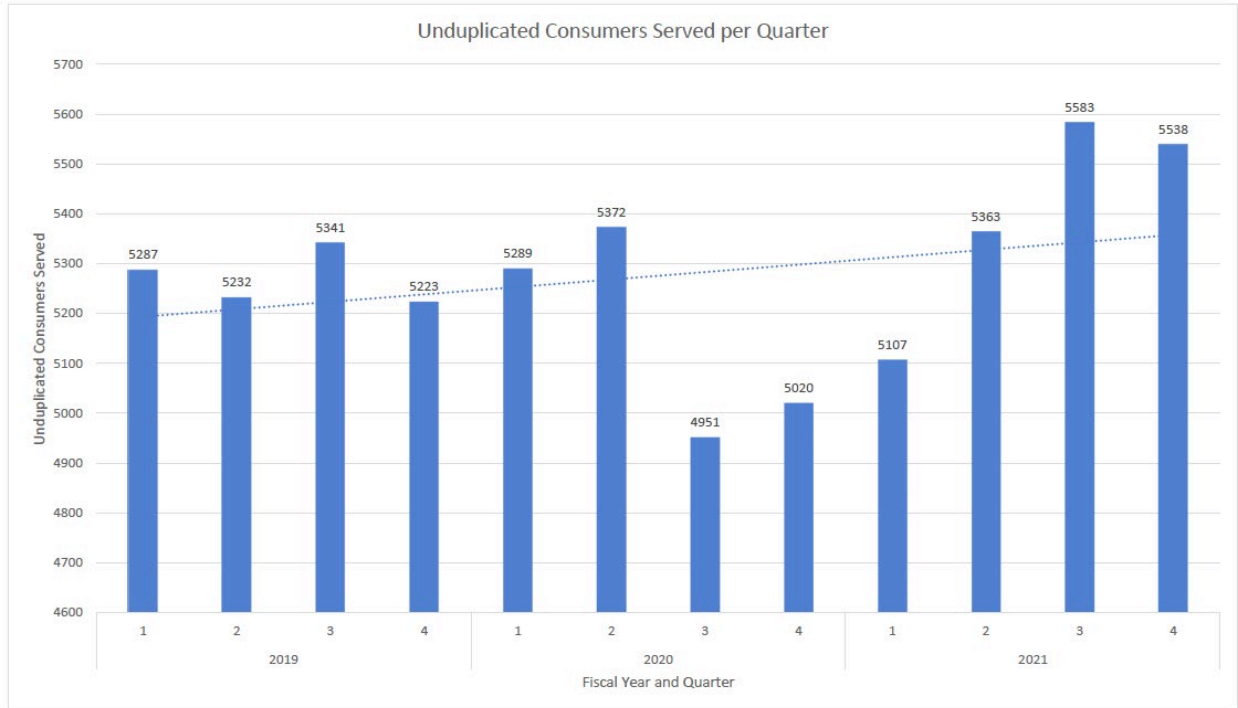


Figure 10-2: NorthCare Network – Unduplicated Mental Health Customers Served by Quarter, 2019-2021¹⁶

10.7 Future Implications

The barriers to mental health services identified in previous community health needs assessments persist. Improvements can be achieved by focusing on:

- Access to care. The paucity of mental health care professionals and the distance one must travel see one makes these services unattainable for a substantial number of people. This includes training and recruiting more mental health professionals and placing them in underserved regions. This would also include an expansion of services for children and adolescents. The Certificate of Need calculations indicate the need for 75 adult beds for the Upper Peninsula, but there are only 57 beds available. For pediatric/adolescents there are beds, but no pediatric/adolescent psychiatrists. [16]
- Training primary care health professionals to care for mental health issues in their patients to lessen the burden on our limited number of psychiatrists.
- Expanding telehealth and other technologies to alleviate distance and workforce shortages barriers to care.

¹⁶ SOURCE: Encounter data from Northcare ELMER Electronic Health Record system. Consumers included in count received a reportable service during the time period listed. For Community Mental Health (CMH) services, only consumers who were eligible for Medicaid, Healthy Michigan, or MI Health Link are included. For Substance Use Disorder (SUD) services, Medicaid, Healthy Michigan, MI Health Link and SUD Block Grant consumers are included. Eligibility is sourced from 270/271 eligibility data.

References:

- [1] National Alliance on Mental Illness. Mental health by the numbers. <https://www.nami.org/mhstats>. Accessed April 8, 2021.
- [2] American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 5th edition (DSM-5). Arlington, VA: American Psychiatric Publishing; 2013.
- [3] National Alliance on Mental Illness. Depression. <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Depression>. Accessed April 8, 2021.
- [4] National Alliance on Mental Illness. Bipolar disease. <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Bipolar-Disorder>. Accessed April 8, 2021.
- [5] United Health Foundation. America's Health Rankings. Suicide in Michigan. <https://www.americashealthrankings.org/explore/annual/measure/Suicide/state/MI>. Accessed April 1, 2021.
- [6] Centers for Disease Control and Prevention. National Center for Health Statistics. Suicide mortality by state. <https://www.cdc.gov/nchs/pressroom/sosmap/suicide-mortality/suicide.htm>. Accessed April 1, 2021.
- [7] Stone DM, Jones CM, Mack KA. Changes in suicide rates – United States, 2018-2019. MMWR Morb Mort Wkly Rep 2021; 70(8): 261-8.
- [8] Suicide Prevention Resource Center. Suicide lifeline reports January – June 2020. [Sprc.org/resources-programs/state-lifeline-reports](http://sprc.org/resources-programs/state-lifeline-reports). Accessed April 1, 2021.
- [9] Dial Help. Fiscal year 2020 annual report: October 1, 2019 – September 30, 2020. <https://img1.wsimg.com/blobby/go/2ad67e9e-7878-4a1f-b38e-eaedc2ad1e24/downloads/FY2020%20Annual%20Report.pdf?ver=1611676982037>. Accessed April 1, 2021.
- [10] National Alliance on Mental Illness. Anxiety disorders. <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Anxiety-Disorders>. Accessed April 8, 2021.
- [11] National Alliance on Mental Illness. Schizophrenia. <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Schizophrenia>. Accessed April 8, 2021.
- [12] Jia H, Guerin RJ, Barile JP, et al. National and state trends in anxiety and depression severity scores among adults during the COVID-19 pandemic — United States, 2020-2021. MMWR Morb Mort Wkly Rep 2021; 70: epub ahead of print (October 5, 2021).
- [13] Black T. Stop exploiting suicide for political gain — false claims have driven moral panic during the COVID pandemic. Medpage Today, June 15, 2021. https://www.medpagetoday.com/opinion/second-opinions/93120?xid=nl_mpt_DHE_2021-06-16&eun=g1204946d0r&utm_source=Sailthru&utm_medium=email&utm_campaign=Daily%20Headlines%20Top%20Cat%20HeC%20%202021-06-16&utm_term=NL_Daily_DHE_dual-gmail-definition. Accessed June 15, 2021.
- [14] Yard E, Radhakrishnan L, Ballesteros MF, et al. Emergency department visits for suspected suicide attempts among persons ages 12-25 years before and after during the COVID-19 pandemic — United States, January 2019 - May 2021. MMWR Morb Mort Week Rep 2021; 70: epub ahead of print June 11, 2021.
- [15] Radhakrishnan L, Leeb RT, Bitsko RH, et al. Pediatric emergency department visits associated with mental health conditions before and during the COVID-19 pandemic — United States, January 2019–January 2022. MMWR Morb Mort Wkly Rep 2022; epub ahead of print.
- [16] NorthCare Network. Demand & network adequacy report FY21. Marquette, MI: NorthCare Network; February 2022.

11 SUBSTANCE ABUSE

11.1 Introduction

Substance abuse is a pervasive issue in communities across the country. The number of people who abuse substances often reflects the underlying stress in the community from factors such as unemployment, wars, and pandemics. Underlying substance abuse is addiction.

11.1.1 Addiction

As defined by the American Society for Addiction Medicine in September 2019,

Addiction is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. People with addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences.

Prevention efforts and treatment approaches for addiction are generally as successful as those for other chronic diseases. [1].

Addiction is also characterized by diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.

Genetic factors may account for about half of the likelihood that an individual will develop an addiction. Interactions with environmental and cultural factors as well as acquired individual resiliencies also contribute to determining a predisposition towards addiction. The role of epigenetics¹⁷ in the development of addiction is currently being explored with multidimensional datasets that integrate genetic and epigenetic information. These datasets may allow researchers to identify individual genes or brain processes that may inform new prevention and treatment interventions. [3]

Up until recently, addiction was viewed as a weakness in self-discipline or moral character, but it is now considered a complex "disease" that merits therapeutic interventions. Drug use alters the brain in ways that make quitting difficult, even in those motivated to quit, yet addiction can be effectively prevented, treated, and managed by healthcare professionals in combination with family or peer support. [4] Unfortunately, addiction continues to carry a stigma of moral weakness.

The most common symptoms of addiction are severe loss of control, continued use despite serious consequences, preoccupation with using, failed attempts to quit, tolerance, and withdrawal. [5] If left untreated or treated inadequately, addiction may lead to disability or premature death as well as cause significant harm to families, relationships, schools, workplaces, and communities.

¹⁷ Epigenetics is the study of functional, and sometimes inherited, changes in the regulation of gene activity and expression that are not dependent on gene sequence. Environmental exposures can remodel DNA structure at the cellular level enabling developing of different cells types in response to the environment. The expression of these traits can be passed on through to children. [2]

Individuals may become addicted to many things including tobacco, alcohol, gambling, food, sex, and, of course, legal and illegal drugs. For the purposes of this report, we have focused on tobacco, alcohol, marijuana, and opioids.

11.2 Tobacco

More than 16 million people are living with a disease caused by smoking. Smoking causes many types of cancer, heart disease, stroke, lung diseases, diabetes, and chronic obstructive pulmonary disease (COPD) (emphysema and chronic bronchitis), while also increasing the risk for tuberculosis, certain eye diseases, and immune system related diseases such as rheumatoid arthritis. Secondhand smoke exposure contributes to 41,000 deaths each year in nonsmoking adults and 400 deaths in infants. Secondhand smoke increases the risk of stroke, lung cancer, and coronary heart disease in adults, and sudden infant death syndrome (SIDS), acute respiratory infections, middle ear disease (ear infections), severe asthma, respiratory symptoms, and slowed lung growth in children. [6,7] Third-hand exposure occurs when smoke residue on clothing, carpeting, and other surfaces is absorbed via direct contact through the mouth or skin.

11.2.1 Michigan Numbers

Data collected in 2014-2015 by the Centers for Disease Control and Prevention (CDC) recorded daily consumption of cigarettes in 13.3% of adults in Michigan, with 14.1% in male adults and 12.6% in females. [8] Exposure to secondhand smoke in the home was reported by 11.4% of Michigan adults in the 2019 Michigan BRFSS. The prevalence of secondhand smoke exposure was significantly higher among adults with high school graduate or less education (17.4%) than those with some college or more education (7.9%) and decreased with increasing household income (22.2% for household income less than \$25,000, 13.3% for \$25,000-49,999, and 6.1% for \$50,000 or above). Uninsured adults (24.1%) reported secondhand smoke exposure more frequently than insured adults (10.2%). [9] The 2020 Michigan BRFSS found that 18.4% (95%CI: 16.8, 20.1) reported being exposed to secondhand smoke. The rates decreased with age (25.5% in those 25 to 34 years of age to 7.7% in those 75 years and older) and household income (35.2% in those earning less than \$20,000 per year to 9.8% in those earning \$75,000 or more per year). Exposure was higher in males than females (20.9% versus 16.1%), and in those identifying as Black (non-Hispanic) (30.0%, 95%CI: 24.4, 36.3). [10]

E-cigarette use in adults in 2017 was 5.5% in males, 4.3% in females, and 4.9% overall. In those 18 to 24 years of age, the use of e-cigarettes increased from 11.6% in 2016 to 12.8% in 2017.

Smoking in adolescents is addressed in Section §6.2.3.

11.2.2 Local County Numbers

The results of the 2017 and UPCHIPS are available for viewing in **Tables 13-28A** and **13-28B**. The age of the onset of smoking is addressed in §6.2.3.

In the 2017 UPCHIPS, the average length of smoking among those who ever smoked was 46.92 years (SD=13.73, Median=49 years). This length of smoking was lower in those currently smoking (41.17 years) than those no longer smoking (41.17 versus 49.22, Difference=8.05, 95%CI:6.86, 9.24, t=13.27, p<.0001), but this may reflect that current smokers, on average, were 5.80 (SD=14.54) years younger (t=10.27,

p<.0001). 2017: Women smoked an average of 5.079 years shorter than men (95%CI: 3.99, 6.16, t=9.17, p<.0001). The number of years smoking decreased as education level increased (t=-5.56, p=.0004) with the average being 49.86 (SD=15.15) years in those with less than a high school education, 48.24 (SD=13.25) in those with a high school diploma or GED, 45.28 (SD=13.86) in those with some college, and 46.67 (SD=13.72) in those with a bachelor's degree or higher. In multivariate analysis, income level (p=.1812) and county of residence (p=.3345) were not significant factors, but gender (lower in females t=-4.48, p<.0001), age (p<.0001), and education level (p<.0001) remained statistically significant.

11.2.3 Smoking during Pregnancy

This topic is covered in the Maternal/Infant Health Chapter (see Section §5.3.6).

11.2.4 Smoking Cessation

Tobacco addiction can be managed with proper treatment; however, tobacco users tend to have high relapse rates. While in 2015, 55.1% of smokers reported they had tried to quit in the past year, [11,12] in 2018 only 7.5% of adult smokers were successful. [11,13] “The habitual use of tobacco is related primarily to psychological and social drives, reinforced and perpetuated by the pharmacologic actions of nicotine on the central nervous system” (USDHEW 1964, p. 354). [12,14] Not surprisingly, encountering environments and situations previously associated with smoking, such as establishments that serve alcohol or interacting with friends who smoke, has been demonstrated to increase the risk of relapse. [12,15] While aerobic exercise, resistance exercise, physical activity, and combined aerobic and resistance exercise had no impact on smoking cessation, research indicates that yoga plus cognitive-behavioral therapy may be helpful. [16] The role of e-cigarettes in smoking cessation is addressed in section §12.2.6.3 below. The results of the 2021 UPCHIPS are found in **Tables 13-29A** and **13-29B**.

11.2.5 Smokeless Tobacco

The use of “smokeless” tobacco in the United States, documented in 2019, varies by age and ethnicity as documented in **Table 11-1**. [17] Use appears to be highest in those 21 to 49 years of age and among those who identify as “American Indian/Alaskan Native.” The results of the 2021 UPCHIPS for the use of smokeless tobacco and vaping as in **Tables 13-30A** and **13-30B**.

11.2.6 E-cigarettes / Vaping¹⁸

E-cigarettes (electronic nicotine delivery systems), also known as vapes, vape pens, tanks, mods, and pod mods, are battery-powered devices that aerosolize a liquid for inhalation. The liquids typically contain nicotine, flavorings, and other compounds in a solvent (usually propylene glycol and vegetable glycerin). E-cigarettes were introduced in the United States in 2007, and although they were designed as delivery device for a potentially fatal chemical, the Food and Drug Administration took no action on the product until August 8, 2016, when it prohibited sales to minors. [18] E-cigarettes are designed to deliver nicotine to the body through the lungs, which provides rapid absorption and nearly instantaneous delivery of the substance to the brain. As the technology of e-cigarettes has progressed,

¹⁸ Nearly all of the information in this section were extracted from the 2020 Surgeon General's report. [10] Citations in this section are those used in the Surgeon General's report.

the arrival of nicotine to the brain of these devices rivals the pharmacological effects of conventional cigarettes.

	Lifetime	Last Year	Last Month
Total	15.5%	4.2%	3.1%
12-17	4.0%	2.5%	1.0%
18 and older	16.6%	4.3%	3.3%
50 and older	13.1%	2.5%	2.1%
26-49	20.6%	5.4%	4.2%
30-34	21.6%	6.2%	4.4%
21-25	18.9%	7.8%	5.4%
Native American/Native Alaskan 12-17	9.8%	4.2%	4.1%
Native American/Native Alaskan 18 and older	20.9%	7.6%	6.4%

The results of the UPCHIPS regarding e-cigarette use are shown in as in **Tables 13-30A** and **13-30B**. There was a 40% increase in use from 2017 to 2021 (**Table 13-54**). In the surveys, the average age of someone regularly using e-cigarettes was 53.69 years (standard deviation=16.42), while those who did not use e-cigarettes average 64.94 years of age (standard deviation=14.31). The differences in ages, 11.25 years, was statistically significant (95%CI: 8.71, 13.79, t=8.73, p<.0001).

11.2.6.1 Health Effects of E-cigarettes/Vaping

There are no safe tobacco products. For example, there was recently an outbreak of e-cigarette/vaping use associated with serious lung injury. [19] The vaping products used contained either tetrahydrocannabinol (THC), the psychoactive component of marijuana, or vitamin E acetate. [20] While some of the harmful chemicals in cigarette smoke are not delivered by e-cigarettes, there are chemicals aerosolized by e-cigarettes for which the health impact remains unknown. Those who smoke cigarettes and use e-cigarettes have similar exposure to toxins compared to those who only smoked conventional cigarettes. [21] There is evidence that the use of e-cigarettes increases exposure to heavy metals such as tin, nickel, and lead.

Because e-cigarettes are not regulated, the exposure to nicotine and potentially toxic substances varies widely. [22]

E-cigarettes are a relatively new product, so the long-term health effects are unknown. The documented short-term effects include acute endothelial cell dysfunction, formation of reactive oxygen

species/oxidative stress, and increased heart rate. [22] Some chemicals in e-cigarette aerosols can cause DNA damage and mutagenesis, which makes it plausible that long-term exposure could increase the risk of cancer and adverse reproductive outcomes. One review found that e-cigarettes had a negative impact on cellular and organ physiology and immune function. [23] Some studies have suggested that e-cigarette use is associated with an increased risk of having a myocardial infarction (heart attack). [24-26] Whether e-cigarette use is associated with heart disease, atherosclerosis, cancer, respiratory diseases, and pregnancy outcomes remains to be seen. [27]

11.2.6.2 E-cigarette Use in Adolescents

The data on e-cigarette use for nicotine and THC in adolescents are presented in Sections §6.2.3.1 and §6.2.4. In the 2020 Michigan BRFSS 6.4% (95%CI: 5.5, 7.6) of respondents reported regularly using e-cigarettes. The rates were highest in those aged 18 to 24 years (21.1%, 95%CI: 16.5, 26.5%) and those earning between \$20,000 and \$49,000 per year (9.1%, 95%CI: 6.1, 13.3). [10]

11.2.6.3 Role in Smoking Cessation

As a nicotine delivery device, it has been speculated that e-cigarettes, similar to nicotine gum and patches, might have a role in smoking cessation. It must be kept in mind, however, that nicotine gum and patches have been proven to be safe and effective but e-cigarettes have not been formally evaluated as a smoking cessation product.

The studies regarding whether e-cigarettes are helpful in smoking cessation have been of poor quality, with most showing little difference from other interventions. It appears that an absolute improvement in smoking cessation of about 5% may exist. Success appears to be related to using e-cigarettes daily (as opposed to sporadically), [28] higher nicotine levels in the aerosols, [29] and long-term e-cigarette use. The Surgeon General's report notes, "the current literature is limited by small numbers of trials, low event rates, and wide confidence intervals. Moreover, interpretation of results is further complicated by the wide variation in e-cigarette products (i.e., types of devices and components and levels of nicotine content in e-liquids) and the contexts in which they are used, including the motivation of smokers to quit and whether the products are used with behavioral support." [14(p530)] The Executive Summary of the report notes,

The evidence is inadequate to infer that e-cigarettes, in general, increase smoking cessation. However, the evidence is suggestive but not sufficient to infer that the use of e-cigarettes containing nicotine is associated with increased smoking cessation compared with the use of e-cigarettes not containing nicotine, and the evidence is suggestive but not sufficient to infer that more frequent use of e-cigarettes is associated with increased smoking cessation compared with less frequent use of e-cigarettes. [30(p10)]

11.2.6.4 Public Health Impact of E-cigarettes

The question remains whether e-cigarettes will have a negative or positive effect on public health. In the short run, the use of these devices may be of small benefit for the small number of smokers who may quit smoking and the decrease in exposure to toxic substances for those transitioning from conventional cigarettes. Unfortunately, with the increased initiation to nicotine products in youth seen with e-

cigarettes, more people in this cohort will become daily cigarette users by 35 to 39 years of age. Consequently, over time, e-cigarette use will result in more harm than benefit at the population level. [27,31]

11.3 Alcohol

People drink alcoholic beverages for many reasons: to socialize, to celebrate, and to relax. Yet, alcohol can have strong effects than can induce those who imbibe to act and feel differently. The effects of alcohol vary from person to person and may be impacted by:

- How much alcohol is consumed
- How often alcohol is consumed
- Age
- Health status
- Family history

Alcohol enters the bloodstream shortly after the first sip with immediate effects noticed within about ten minutes. With each drink, the blood alcohol level rises, and with increased blood alcohol concentrations the following can be seen:

- Reduced inhibitions
- Slurred speech
- Motor impairment
- Confusion
- Concentration problems
- Coma
- Breathing difficulties
- Death

While alcohol consumption is not necessarily a problem — drinking too much can have adverse consequences. Other indirect consequences include:

- Car crashes and other accidents
- Risky behaviors
- Violent behaviors
- Suicide and homicide

Those who drink too much over a long period of time may experience:

- Alcohol use disorder
- Health problems
- Increased risk of certain cancers
- Brain disorders (such as Wernicke-Korsakoff syndrome (thiamine/vitamin B1 deficiency) [32])

While many people drink alcohol in moderation without discernible harm or health impact, excessive drinking, as defined by the CDC, includes binge drinking, heavy drinking, and any drinking by pregnant women or people younger than age 21.¹⁹

The Dietary Guidelines for Americans do not recommend that individuals who do not drink alcohol start drinking for any reason. However, there are some people who should not drink any alcohol, including those who are:

- Younger than the legal age for drinking
- Pregnant or may be pregnant.
- Taking certain prescription or over-the-counter medications that can interact with alcohol.
- Suffering from certain medical conditions.
- Recovering from alcoholism or are unable to control the amount they drink. [33,34]

The economic costs of excessive alcohol consumption in 2010 were estimated at \$249 billion, or \$2.05 a drink, with three-fourths of the costs being related to binge drinking. [35,36]

11.3.1 Health Effects [37]

Alcohol can have a deleterious effect on many organ systems.

Central nervous system (Brain): Alcohol interferes with the brain's communication pathways, leading to trouble thinking, moving, and coordination. Alcohol consumption can lead to changes in mood and behavior.

Cardiovascular system (Heart and blood vessels): Long-term alcohol consumption or acute intoxication can result in cardiomyopathy (weakened, flabby heart muscle incapable of pumping blood), arrhythmia (irregular heartbeats), stroke, and elevated blood pressure (hypertension).

Liver: Heavy drinking can result in fatty liver (steatosis), alcoholic hepatitis (inflammation of the liver), fibrosis (scarring of the liver), cirrhosis, and liver failure.

Pancreas: Alcohol can induce the pancreas to release toxic substances that can lead to pancreatitis (a dangerous inflammation of the organ) and disruptions in proper digestion.

Cancer: The amount of alcohol consumed regularly over time directly correlates with the risk of cancer. In 2009, approximately 3.5% of all cancer deaths in the United States were alcohol related. Clear patterns between alcohol consumption and the development of cancer have been documented with the following types of cancer:

- Head and neck cancer, particularly cancers of the oral cavity (excluding the lips), pharynx (throat), and larynx (voice box). The risk of these cancers increases substantially among those who consume more than 50 grams of alcohol per day and also use tobacco.
- Esophageal cancer, particularly squamous cell carcinoma, which has a substantial fatality rate.
- Liver cancer, particularly hepatocellular carcinoma.
- Breast cancer. For every 10 grams of alcohol (slightly less than one drink) consumed per day, the risk of breast cancer increases by 12%.
- Colorectal cancer. For every 10 grams of alcohol consumed per day, the risk of colorectal increases by 7%.

Immune System: Chronic drinkers are more likely to contract pneumonia and tuberculosis than those

¹⁹ A graphic representation is available from the Centers for Disease Control and Prevention. https://www.cdc.gov/alcohol/pdfs/excessive_alcohol_use.pdf. Accessed May 19, 2021.

who do not drink too much. Even drinking too much on a single occasion slows the body's ability to ward off infections. This effect continues for up to 24 hours after getting drunk.

Death: During the period of 2011 through 2015, excessive drinking was responsible for an average of 93,296 deaths per year or 255 deaths per day in the United States. Approximately 2.7 million years of potential life were lost, an average of 29 years lost per death. [38]

The liver is the prime target of damage from alcohol abuse as it is responsible for clearing the body of this toxic substance. The impact of alcohol on liver disease is substantial. According to a 2018 report tabulating the causes of liver disease in those 12 years and older, of the 83,517 deaths from liver disease 42.8% involved alcohol. For males, there were 52,499 deaths, of which 45.4% involved alcohol, while for females there were 31,018 liver deaths, of which 38.5% involved alcohol.²⁰

11.3.2 Alcohol, Driving, and Crime

Alcohol consumption also has impacts in addition to the health concerns of the individual who imbibes. The two most notable examples are the impacts of driving while impaired and violent crimes. These topics are addressed in Section §12.3.

11.3.3 Demographics

11.3.3.1 Definitions

Before looking at the data on who drinks and how much, it is necessary to define two concerning patterns of alcohol use: binge drinking and heavy drinking.

- Binge drinking, the most common form of excessive drinking, is defined by the CDC as consuming
 - For women, 4 or more drinks during a single occasion.
 - For men, 5 or more drinks during a single occasion. [40]
- Heavy drinking is defined by the Centers for Disease Control and Prevention as consuming
 - For women, 8 or more drinks per week.
 - For men, 15 or more drinks per week. [41]
 - The Dietary Guidelines for Americans defines moderate drinking as up to 1 drink per day for women and up to 2 drinks per day for men. [33,34]

11.3.3.2 National Impact

In the United States each year 95,000 die from alcohol (68,000 male, 27,000 female), making it the third leading preventable cause of death behind tobacco and poor diet/physical inactivity. [39,42] As will be discussed further in Section §12.3. In 2014, alcohol-impaired driving accounted for 31% of driving fatalities (9967 deaths). [39,43]

According to the 2019 National Survey on Drug Use and Health (NSDUH) for those 18 years and older,

²⁰ Estimated liver disease deaths include deaths with the underlying cause of death coded as alcoholic liver disease (K70), liver cirrhosis, unspecified (K74.0–K74.2, K74.6, K76.0, K76.7, and K76.9), chronic hepatitis (K73), portal hypertension (K76.6), liver cancer (C22), or other liver diseases (K71, K72, K74.3–K74.5, K75, K76.1–K76.5, and K76.8). Number of deaths from Multiple Cause of Death Public-Use Data File, 2018 (<http://wonder.cdc.gov/mcd.html>). Alcohol-attributable fractions (AAFs) from CDC Alcohol-Related Disease Impact (http://nccd.cdc.gov/DPH_ARDI/Default/Default.aspx, accessed 8/3/20). Prevalence of alcohol consumption from the National Survey on Drug Use and Health, 2018, for estimating indirect AAFs for chronic hepatitis and liver cancer. [39]

85.6% reported they had drunk alcohol at some point ever in the past, 69.5% in the past year, 54.9 % in past months, while 5.6% met the criteria for alcohol use disorder (7.3% male, 4.0% female). [39,44,45]

The breakdown by age and ethnicity for alcohol use, binge drinking, and excessive alcohol intake for the United States in 2019 is shown in **Table 11-2**. [46] Of note, the highest rates of current drinking, binge drinking, and excessive drinking are among the 21 to 25-year-olds. The drinking patterns for “American Indian/Alaska Natives” were similar to the population as a whole.

	Lifetime	Last Year	Last Month Bing	Binge	Heavy
Total	0.803	0.651	0.508	0.239	0.058
12-17	0.267	0.212	0.094	0.049	0.008
18 and older	0.856	0.695	0.549	0.258	0.063
21-25	0.883	0.816	0.662	0.416	0.108
26-29	0.897	0.805	0.649	0.386	0.095
30-34	0.897	0.792	0.638	0.365	0.081
Native American/ Native Alaskan 12-17	0.303	0.195	0.067	0.057	0.014
Native American/ Native Alaskan 18 and older	0.762	0.534	0.353	0.228	0.059

	Upper Peninsula	95% CI	Michigan	95% CI
Illicit drug use in the past month	14.13	11.07, 17.86	13.99	13.03, 15.00
Marijuana use in the past year	17.96	14.24, 22.41	17.88	16.89, 18.91
Marijuana use in the past month	12.37	9.34, 16.21	12.18	11.27, 13.15
Average annual initiation of first use of marijuana	2.57	1.93, 3.43	2.63	2.40, 2.89
Perception of great risk for smoking marijuana once a month	19.61	15.80, 24.08	20.9	19.65-22.21
Cocaine use in the past year	1.71	1.07, 2.74	1.78	1.50, 2.11

Perception of great risk of using cocaine once a month	73.48	69.13, 77.42	72.5	71.23, 73.73
Heroin use in the past month	0.28	0.14, 0.55	0.26	0.15-1.42
Perception of great risk with trying heroin once or twice	87.17	84.22, 89.64	86.24	85.26, 87.16
Methamphetamine use in the past year	0.44	0.22, 0.87	0.35	0.24, 0.52
Pain reliever misuse in the past year	4.51	3.41, 5.96	4.16	3.70, 4.69
Alcoholic beverage in past month	57.02	51.25-62.67	53.72	52.21, 55.21
Binge drinking episode in past month	28.24*	23.86, 33.09	26.12	24.81, 27.49
Perception of great risk for having 5+ drinks 1 to 2 times per week	36.79	32.41, 41.39	40.07	38.58, 41.57
Alcoholic beverage in past month (12-20)	28.59*	23.13, 34.74	22.48	21.03, 24.00
Binge drinking episode in past month (12-20)	18.34*	14.07, 23.77	13.99	12.74, 15.33
Tobacco produce use in past month	32*	27.51, 36.85	25.32	24.04, 26.64
Cigarette use in past month	24.61*	20.44, 29.31	20.42	19.24, 21.65
Perception of great risk for smoking 1 pack per day or more	65.55*	61.73, 69.19	68.8	67.33, 70.23
Illicit drug use disorder in past year	2.83	2.02, 3.96	2.87	2.51, 3.92
Pain reliever use disorder in past year	0.64	0.36, 1.13	0.68	0.53, 0.87
Alcohol used disorder in past year	4.81	3.45-6.68	5.43	4.84, 6.10
Substance use disorder past year	6.66	5.02, 8.78	7.35	6.70, 8.07
Needing/not receiving treatment at a specialty facility past year				
For illicit drug use	2.21	1.57, 3.09	2.51	2.20, 2.88
For alcohol use	5	3.64, 6.82	5.14	4.58, 5.77
For substance use	6.07	4.46, 8.22	6.85	6.22, 7.53
Serious mental illness in past year	4.65	3.61, 5.97	4.62	4.06, 5.25
Any mental illness past year	18.51	15.46, 22.01	18.58	17.36, 19.86
Received mental health services past year	17	14.24, 20.17	16.43	15.32, 17.61
Serious thought of suicide in the past year	3.89	3.03, 4.97	4.04	3.55-4.59
Major depressive episode in the past year	7.52	5.94, 9.47	7.31	6.59, 8.10
* value either highest or lowest among Michigan regions				

Binge drinking is most common in those 18 to 34 years of age, but more than half of the total binge drinks are consumed by those 35 years of age and older.[47] Men are twice as likely to binge drink than women and consumed 80% of the binge drinks.[40,48] In the 2020 Michigan BRFSS survey, 17.4% (95%CI: 16.3, 18.7) reported binge drinking, with 22.0% (20.2, 24.0) of male reporting this behavior versus 13.1% (11.6, 14.7) in females. Rates were higher in those identifying as Hispanic 25.4%, 95%CI: 17.6, 35.2) and decreased with age. [10]

When full-time college students are compared to people the same age who are not full-time college students: 52.5% drank in the past month versus 44.0%; 33.0% were binge drinking versus 27.7%; 8.2% engaged in heavy alcohol use versus 6.4%; and 9% met the criteria for alcohol use disorder. [39,49] Data for youth drinking are found in Section §6.2.2.

11.3.3.3 Regional Impact

Regional data for the Upper Peninsula collected in 2016, 2017, and 2018 as part of NSDUH on people 12 years of age and older are shown in **Table 11-3**. [50] Data are broken down at a state level and at regional levels. Region 1 is the Upper Peninsula. Of note, the Upper Peninsula had drinking rates greater than all other regions, but a lower rate of alcohol use disorder. This may suggest that alcohol use disorder is under-diagnosed in the Upper Peninsula. They had a higher smoking rate, but a lower rate of considering smoking a pack or more of cigarettes a day as placing one at great risk.

The results of the 2021 UPCHIPS for alcohol consumption are given in **Tables 13-46A** and **13-46B**. The results of a multivariate regression analysis of the alcoholic drinks consumed per month are found in **Table 13-18**. Further discussion can be found in section §13.3.16.1.

The raw combined 2017 and 2021 UPCHIPS data on the number of drinks per month per respondent was an average of 21.76 (SD=51.47, median=3). The distribution is skewed because of the large percentage of people who do not drink. Men had more drinks than women (33.96 versus 14.51, difference 19.45, 95%CI: 16.83, 22.07, $t=14.6$, $p<.0001$). The raw averages of the number of monthly drinks by county is shown in **Table 11-4**. The differences between counties was statistically significant ($F=1.74$, $p=.0463$). Number of monthly drinks decrease with age ($p<.0001$), went up with income ($t=2.40$, $p=.0164$), but was not impacted by level of education ($F=0.13$, $p=.9438$; $t=0.29$, $p=.7746$).

11.3.4 Potential Future Implications

Continued high rates of alcohol abuse will cause acute and chronic disease in many individuals as well as have a broader potential impact on the community due to associated motor vehicle crashes and fatalities, domestic violence, and other societal problems.

Table 11-4: UPCHIPS Drinks per Month by County, 2017-2021

County	Drinks per month	Standard Deviation
Alger	23.97	53.02
Baraga	28.30	81.56
Chippewa	22.11	52.99
Delta	18.95	39.63
Dickinson	17.77	36.54
Gogebic	20.94	55.19
Houghton/Keweenaw	21.90	57.06
Iron	20.44	42.30
Luce	18.87	40.68
Mackinac	24.17	46.56
Marquette	22.40	42.50
Menominee	22.95	52.99
Ontonagon	22.63	51.43
Schoolcraft	18.21	46.40
[a] Variability between counties: F=1.74, p=.0463		

11.4 Marijuana

In late 2018, Michigan legalized the recreational use of marijuana within its borders, but with restrictions. Marijuana can only be smoked or consumed by those 21 years of age and older, it must be consumed in private (no public places), only 10 ounces can be in a residence at any given time, and only 2.5 ounces can be on someone’s person when in public. It is not allowed on school grounds or on school buses. Up to 2.5 ounces can be transferred to another person as long as there is no exchange of money or other things of value, in other words – a *bona fide* gift. Individuals are allowed to grow up to 12 plants for personal use, but the plants cannot be visible from a public place.

As of March 4, 2021, there are 13 business locations that sell marijuana for either medical or person-use indications. Mackinac, Delta, Dickinson, and Houghton counties each had one dispensary. Chippewa and Iron counties each had two. Marquette County had five. [51] Since then a cursory tour of the region suggests that the number of locations has doubled or tripled.

Under Federal law marijuana and its psychoactive ingredient (tetrahydrocannabinol (THC)) remains a Schedule I controlled substance “with no currently accepted medical use and a high potential for abuse.”

11.4.1 Impact on Health²¹

Research has been limited because, according to the U.S. Drug Enforcement Agency, marijuana remains on the list of Schedule I Controlled Substances. Other substances on the Schedule I list include heroin, lysergic acid diethyl amide (LSD), peyote, methaqualone, and 3,4-methylenedioxymethamphetamine (“Ecstasy”).²² This is a summary of what is currently known regarding marijuana’s health effects.

11.4.1.1 Brain Health

Marijuana use directly affects the parts of the brain responsible for memory, learning, attention, decision making, coordination, emotions, and reaction time. [54] The impact depends on many factors and is different for each person and the amount of tetrahydrocannabinol (THC) in the product, how often it is used, the age of first use, and whether other substances (i.e., tobacco and alcohol) are used at the same time. Heavy users can have short-term problems with attention, memory, and learning, which can affect relationships and mood.

Developing brains, like those in babies, children, and teenagers are especially susceptible to the hurtful effects of marijuana. Although scientists are still learning about the effects of marijuana on the developing brain, studies show that marijuana use by mothers during pregnancy may be linked to problems with attention, memory, problem-solving skills, and behavior in their children. When marijuana is used by teenagers, the impact on attention, memory, and learning functions affects how the brain builds connections between the different areas of the brain necessary to perform these functions. Marijuana’s effects on these abilities at this age be long-term or permanent. [55-59]

For adults with multiple sclerosis-related muscle spasms, short-term use of certain man-made and cannabinoid-based medications improved their reported symptoms. [52]

11.4.1.2 Cancer

The main active cannabinoid in marijuana is delta-9-THC. Another active cannabinoid is cannabidiol (CBD), which may relieve pain and lower inflammation without causing the “high” of delta-9-THC. Although marijuana and cannabinoids have been studied with respect to managing side effects of cancer and cancer therapies, there are no ongoing clinical trials of marijuana or cannabinoids in treating cancer in people. Studies so far have not shown that cannabinoids help control or cure the disease. [60]

Relying on marijuana alone as treatment or for managing side effects of cancer chemotherapy in lieu of conventional medical care may have serious health consequences. [61] Synthetic formulations of the chemicals found in the marijuana plant may be helpful in treating nausea and vomiting from cancer chemotherapy. [60] Currently, there is not enough evidence to recommend that patients inhale or ingest marijuana as a treatment for cancer-related symptoms or side effects of cancer therapy.

In addition to THC and other cannabinoids, marijuana delivers harmful substances, many also found in tobacco smoke, to users and those close by, that can have deleterious effects on the lungs and

²¹ Information for this section was gather at CDC’s website on marijuana health effects. [52] Additional citations are citations given at this source.

²² “Substances in this schedule have no currently accepted medical use in the United States, a lack of accepted safety for use under medical supervision, and a high potential for abuse.” [53] U.S. Department of Justice. Drug Enforcement Administration. Diversion Control Division. Controlled Substance Schedules. <https://www.deadiversion.usdoj.gov/schedules/#define>. Accessed May 21, 2021.

cardiovascular system. Researchers have found limited evidence of an association between current, frequent, or chronic marijuana smoking and testicular cancer. [62] Because marijuana plants come in different strains with different levels of active chemicals, a particular individual's risk is difficult to predict.

11.4.1.3 Chronic Pain

Even though pain management is one of the most common reasons people use medical marijuana in the United States, there is limited evidence of marijuana's impact on most types of chronic pain. Marijuana can be helpful in treating neuropathic pain (pain caused by damaged nerves). [61] More research is needed.

11.4.1.4 Heart Health

Smoking marijuana makes the heart beat faster, [63] and might also lead to an increased risk of stroke and heart disease. [64-68] Smoked marijuana delivers THC and other cannabinoids to the body along with the many of the harmful substances found in tobacco smoke, [65] so it's difficult to separate the effects of the compounds in marijuana on the cardiovascular system from the hazards posed by the irritants and other chemicals contained in the smoke.

11.4.1.5 Lung Health

Smoked marijuana, in any form, can harm lung tissues and cause scarring and damage to small blood vessels. [69,70] Smoke from marijuana contains many of the same toxins, irritants, and carcinogens as tobacco smoke, [7] so smoking marijuana can also lead to a greater risk of bronchitis, cough, and phlegm production, [61, 71-74] which generally improve when marijuana smokers quit. [75,76]

11.4.1.6 Mental Health

Marijuana use, especially frequent (daily or near daily) use and use in high doses, can cause disorientation and unpleasant thoughts or feelings of anxiety and paranoia. [61] Marijuana users are significantly more likely than nonusers to develop temporary psychosis and long-lasting mental disorders, including schizophrenia. [77] Marijuana use has also been linked to depression and anxiety as well as suicide among teens. However, it is not known whether this is a causal relationship or simply an association.

11.4.1.7 Poisoning

Edibles (food and drink products infused with marijuana and eaten) have some different effects/risks than smoking marijuana, including a greater risk of poisoning. Ingested THC takes longer (30 minutes to 2 hours) to take effect as opposed to inhaled THC, which has an almost immediate effect. Poisoning is more likely with ingested THC for two reasons: 1) the amount of THC in edible products is often unknown, and 2) because of the delayed effect, some, out of impatience, will ingest more THC before the effect of the initial ingestion is evident. Ingested THC can also have effects that last longer than expected. As a consequence, many users can be caught off-guard by the strength and long-lasting effects of edibles.

Marijuana affects children differently than adults. Since marijuana has become legal in some states, children have accidentally eaten marijuana products that looked like candy and treats, which made them sick enough to need emergency medical care. [78] Marijuana products must be kept in childproof containers out of the reach of children.

11.4.1.8 Secondhand Smoke

While there is very little data on the health consequences of breathing secondhand marijuana smoke, there is concern, especially for children, that it could cause harmful health effects. Recent studies have found strong associations between those reporting a cohabitant or caretaker in the home who used marijuana and a child in the home having detectable levels of THC.[72,79] Children exposed to the psychoactive compounds in marijuana are potentially at risk for negative health effects, including developmental problems for babies whose mothers used marijuana while pregnant.[61] Other research shows that marijuana use during adolescence can impact the developing teenage brain and cause problems with attention, motivation, and memory.[80]

11.4.1.9 Addiction

Overall, about 1 in 10 marijuana users will become addicted to the substance, but for those who begin using marijuana before the age of 18, the rate increases to 1 in 6. [81-83] Those who become addicted may be at a higher risk of the negative consequences of marijuana use, such as problems with attention, memory, and learning.

The potency of marijuana, based on THC content, has increased over the past few decades. The higher the THC content, the stronger the effects on the brain. Ingestible/edible forms of marijuana may deliver very high levels of THC to the user. The full extent of the consequences of exposure to high concentrations of THC or the increasing potency of the product on the body and brain (especially the developing brain) or the risk of becoming addicted is not known.

11.4.1.10 Risk of Using Other Drugs

The concept of marijuana as a “gateway drug” — where using marijuana leads a person to use other drugs — has generated ample disagreement. Researchers have not found a definite answer yet; [84,85] however, most people who use marijuana do not go on to use other, “harder” drugs. [84]

People of any age, sex, or economic status can become addicted to marijuana or other drugs. Things that can affect the likelihood of substance use include:

- Family history.
- Having another mental health illness (such as anxiety or depression).
- Peer pressure.
- Loneliness or social isolation.
- Lack of family involvement.
- Drug availability.
- Socioeconomic status. [85]

11.4.2 Marijuana Usage

According to the National Survey on Drug Use and Health (NSDUH), 2016-2018 survey, lifetime use of marijuana in 206 through 2018 ranged from 14.8% to 15.4% in the 12-17-year olds, 51.5% to 52.7% in the 18-25 group, and 46.2% to 47.8% in those 26+. Use in the past year increased from 13.9% (2016) to 15.9% (2018) in the 12-17 group, from 12.0% (2016) to 12.5% (2018) in the 18-25 group, and from 11.0% (2016) to 13.3% (2018) in the 26+ group. Use in the past month was between 6.5% and 6.7% in the 12-17 group, increased from 20.8% (2016) to 22.1% (2018) in the 18-25 group, and increased from 7.2% (2016) to 8.6% (2018) in the 26+ group. [86]

The results of the 2021 UPCHIPS regarding marijuana use are shown in **Tables 13-48A** and **13-48B**.

Marijuana use in youth is addressed further in Section §6.2.4.

11.5 The Opioid Epidemic

11.5.1 Background ²³

In the 1990s, pain specialists and advocacy groups began to argue that the United States was facing an epidemic of untreated pain and it became standard practice to incorporate pain as a “fifth vital sign,” (in addition to heart rate, respiratory rate, temperature and blood pressure) assessed at every medical encounter. Consequently, providers began to prescribe more opioids for pain management as pharmaceutical companies rolled out a number of new prescription opioid formulations. Marketing strategies downplayed the addictive potential of the newer drugs and targeted primary care providers with aggressive marketing campaigns. This led to widespread diversion (use of the medication by some for whom it was not prescribed) and misuse of these products, demonstrating that these formulations were highly addictive. [88,89]

The increased use and availability of prescription opioids within the population skyrocketed and may be responsible, at least in part, for a commensurate rise in the use of heroin, a cheaper alternative for the opioid addicted, and illicitly manufactured fentanyl, a powerful synthetic opioid.

In 2017, approximately 1.7 million people in the United States suffered from substance abuse disorder related to prescription opioid pain relievers and 6,520 from a heroin use disorder, with some having both. [90]

As prescribing increases, so does the risk of addiction. According to the National Institute on Drug Abuse:

- Roughly 21 to 29% of patients prescribed opioids for chronic pain misuse them. [91]
- Between 8 and 12% develop an opioid use disorder. [91]
- An estimated 4 to 6% who misuse prescription opioids transition to heroin. [92-94]
- About 80% of people who use heroin first misused prescription opioids. [92]

²³ Much of the information in this section was gleaned from the National Institute on Drug Abuse report on the opioid overdose crisis. [87]
Citations within this report are included.

- The good news is that between 2017 and 2018 17 of the 38 states providing overdose death data saw declines or not reported a significant increase. [95]
- In 2019, 50,000 Americans died from a drug overdose. [96]
- According to the Centers for Disease Control and Prevention the economic costs (healthcare costs, lost productivity, addiction treatment, criminal justice involvement) of opioid misuse in the United States is \$78.5 billion each year. [97]

11.5.2 National Data

From 1999 through 2019, there have been 841,000 drug overdose deaths. In 2019 alone, there were 70,630 drug-overdose deaths (age-adjusted rate 21.6/100,000 population — up from 20.7 in 2018). Of the drug-overdose deaths, 49,860 (70.6%) were opioid overdose deaths. Of the opioid overdose deaths, 72.9% involved synthetic opioids, a 67.9% increase in the death rate for synthetic opioids from 2018. [98]

In a national survey (NSDUH), the lifetime heroin use in those 12 to 17 years of age was 0.1% from 2016-2018. This increased to 1.3% to 1.8% in those 18 to 25 years of age, and 2.1% to 2.2% in those 26 years of age and older. Use in the past year was 0.1 in the 12-17 age group, 0.5% to 0.7% in the 18-25 age group, and 0.3% in the 26 years and older group. Use in the past month ranged from 0.1% to 0.3% in those aged 18 years and older. [86]

More opioid use in youth data are available in Section §6.2.5.

11.5.3 Michigan Data [98]

The number of opioid deaths in Michigan documented by the CDC from 2014 through 2019 are shown in **Table 11-5**. [98] From 2018 to 2019, decreases have been noted, suggesting that several interventions are showing signs of success. The number of opioid-related deaths in the individual counties in the Upper Peninsula were too low (less than 6 per year) to report. In a November 2021 report from the CDC, it was noted that there were 2,952 deaths in Michigan from drug overdoses from April 2020 to April 2021. This was an increase of 19% over the previous year. The United States saw a 28.5% increase compared to the previous year. Three-fourths of the deaths involved fentanyl, a powerful, synthetic opioid. [99]

11.5.4 Local Data

The number of medical encounters and deaths related to opioid use, opioid abuse, and opioid dependence are currently collected by the State of Michigan using the Michigan Disease Surveillance System (MDSS) platform. The program, MiCelerity, is an automated, real-time surveillance system created in 2019 designed to collect information regarding fatal and “non-fatal drug poisoning events” (overdoses) in Michigan. The surveillance system was designed as a repository for any poisonings resulting from the use of prescription or illicit drugs. Health professionals and health facilities are required to report these events within five working days. MiCelerity uses Admission, Discharge, and Transfer (ADT) messages to collect data on health encounters and the Electronic Death Reporting System (EDRS) to collect data on recent deaths related to substance use. In 2021, 3134 episodes related to opioids were reported in the Upper Peninsula. These episodes involved 1158 individuals. Multiple

reports on the same date for the same individual were not uncommon. The number of individuals and number of deaths in each county are reported in **Table 11-6**.

Year		
Opioid Overdose		
2019	2385	24.4
2018	2591	26.6
2017	2694	27.8
2016	2347	24.4
2015	1980	20.4
2014	1762	18
Prescription opioids		
2019	454	4.6
2018	556	5.6*
Heroin		
2019	477	4.9
2018	633	6.5**
Synthetic opioids		
2019	1458	15.2
2018	1531	16.0***
* 17.9% decrease — statistically significant		
** 24.6% decrease — statistically significant		
*** 5% decrease — not statistically significant		

The trend in opioid deaths in Michigan over time is illustrated in a graph from the National Institute on Drug Abuse (**Figure 11-1**). [100]

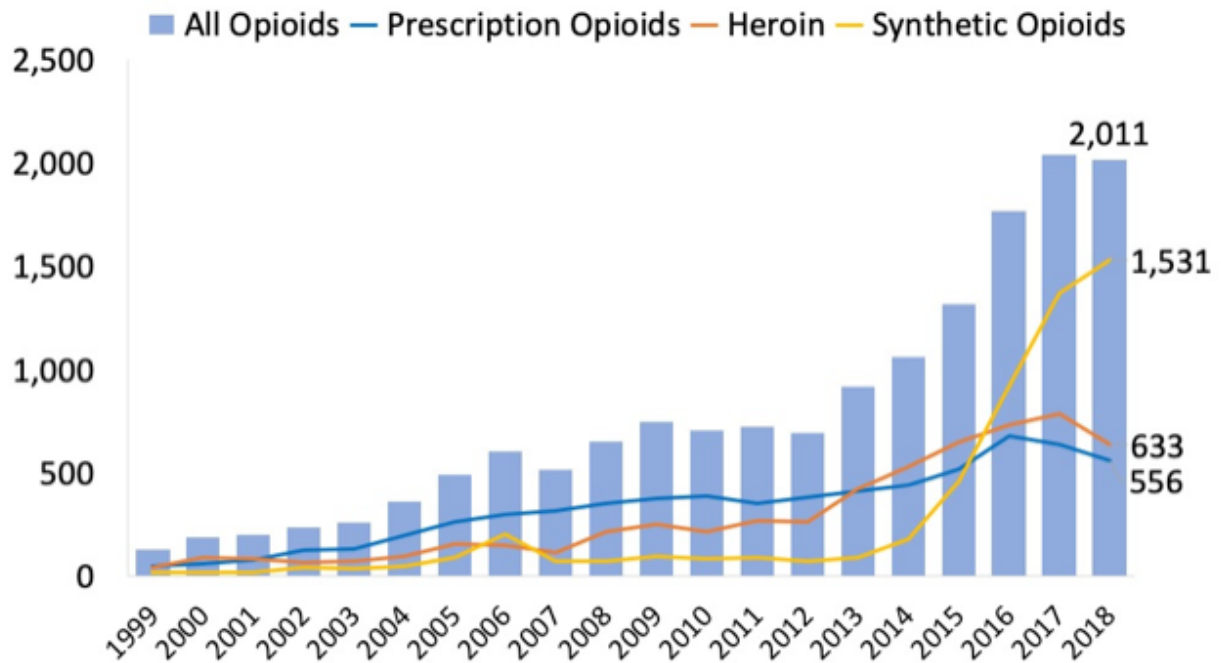


Figure 11-1: Number of drug and opioid-involved overdose deaths in Michigan, by opioid category. Drug categories presented are not mutually exclusive, and deaths may have involved more than one substance. Source: CDC WONDER, 2020

There were 83 overdoses reported in 77 individuals. In 2021, there were 17 deaths related to opioids. The accuracy and usefulness of this database remains to be seen. The veracity of any database is dependent on the quality and completeness of the data being submitted. In this case, appropriate diagnostic codes need to be submitted. A diagnosis code related to opioid use, which can be an ongoing condition, may be submitted for encounters unrelated to the medical encounter. Alternatively, an encounter related to opioid use may not be entered properly. For example, in the Upper Peninsula only 13 newborns with neonatal abstinence syndrome (NAS) (see section §11.5.6 page) were reported. The annual rate of NAS for the region is several times greater, suggesting that MiCelerity is not currently effective in capturing these cases.

Given these shortcomings the data reveal a number of items. Women were more likely than men to be captured by the database (54.4% versus 47.3%). This ratio was not impacted by the county of residence $\chi^2_{14}=14.47$, $p=.4156$). The average of those in the database was 41.3 (SD=14.58) years with men being older than women (42.6 versus 40.3 years: difference 2.24 years, 95%CI: 0.47, 4.01; $t=2.48$, $p=.0132$). Average age did vary significantly by county ($F=2.59$, $p=.0011$) with Luce County having the oldest group and Gogebic and Menominee counties having the youngest. When adjusted for county of residence, men were still older (difference 2.07 years, $t=2.29$, $p=.0223$).

Women were more likely to have more entries into the database than men (3.45 versus 2.44: difference 1.01, 95%CI:0.53, 1.49; $t=4.11$, $p<.0001$). The number of entries for a single individual varied significantly by county ($F=3.39$, $p<.0001$) with the highest average in Schoolcraft County and the lowest in Mackinac and Dickinson counties. When adjusted for county of residence, women still had more entries on average (difference 0.93, $t=3.69$, $p=.0002$).

Regarding reported overdoses, these occurred more frequently in men (OR=1.89, 95%=1.14, 3.12). The rate of overdosing was not significantly impacted by county of residence ($\chi^2_{14}=20.69$, $p=.1097$). When adjusted for county of residence the odds ratio for men having an overdose changed little (adjOR=1.84, 95%CI: 1.10, 3.07). Those who had a reported overdose were significantly older than those who did not (46.8 versus 41.0 years: difference 5.79 years, 95%CI: 2.22, 9.36; $t=2.36$, $p=.0208$). When a statistical model is developed to evaluate the risk for overdose by looking at sex and age, there is a significant interaction (multiplier effect) between sex and age ($\chi^2=5.55$, $p=.0184$). When only men are considered, the average age difference between those who overdosed (43.6 years) and those who did not (42.5 years) is not statistically significant ($t=0.3$, $p=.7091$). However, among women, the average age of those who overdosed (51.6 years) is significantly greater than those who did not (39.8 years) ($t=2.90$, $p=.0074$).

The average age for those who died from opioid use (45.5 years) was greater than the remainder of those in the database (41.3), this difference was not statistically significant ($t=0.99$, $p=.3365$), but the small number of deaths (17) limits the ability to draw any useful inferences.

Table 11-6 Opioid Users, Overdoses, & Deaths — MiCelerity, 2021

	Opioid users	Overdoses	Deaths
Upper Peninsula	1158	83	17
Alger	22	1	0
Baraga	37	3	1
Chippewa	268	10	0
Delta	176	5	1
Dickinson	103	20*	1
Gogebic	19	2	0
Houghton	85	5	1
Iron	73	6	0
Keweenaw	10	1	0
Luce	31	3	1
Mackinac	33	1	1
Marquette	201	20*	2
Menominee	27	2	0
Ontonagon	13	3	2
Schoolcraft	60	1	1
* Two individuals had more than one overdose			

11.5.4.1 Opioid Prescription Data

Many of those who become addicted to opioids begin their road to addiction with a prescription of opioids written by medical providers. Aggressive efforts have been made to limit the number of prescriptions of opioids. **Table 11-7** provides the number of prescriptions dispensed each year for opioids in each of the counties in the Upper Peninsula, the Upper Peninsula as a whole, and statewide from 2013 through 2019. The numbers peaked in 2015 and have come down considerably since then as awareness of the problem has infiltrated the medical community.

The amount of drug use documented in the 2021 UPCHIPS is shown in **Tables 13-47A** and **13-47B** and discussed in section §13.3.16.2.

Jurisdiction	2013	2014	2015	2016	2017	2018	2019
Alger	9,600	10,843	11,507	10,598	10,104	9,044	8,261
Baraga	9,149	9,289	10,132	9,211	8,574	7,678	7,024
Chippewa	35,398	37,281	39,027	38,096	35,649	29,339	25,519
Delta	43,790	45,432	47,915	46,755	42,514	36,976	33,289
Dickinson	26,826	27,828	29,781	38,148	25,311	20,841	18,457
Gogebic	12,949	13,080	15,479	15,654	13,876	10,520	8,568
Houghton	24,108	26,611	29,741	27,953	25,579	22,641	21,231
Iron	12,066	12,845	15,288	15,077	14,076	11,971	10,702
Keweenaw	1,626	1,673	1,772	1,843	1,659	1,411	1,390
Luce	8,115	8,340	8,622	7,513	6,635	5,539	5,011
Mackinac	13,194	13,834	14,158	14,037	13,146	10,722	9,532
Marquette	56,860	60,338	64,618	60,002	55,318	47,248	42,379
Menominee	16,923	19,027	19,362	17,610	14,739	12,571	11,318
Ontonagon	5,292	5,396	6,395	6,605	6,111	5,269	4,902
Schoolcraft	11,023	11,309	11,635	11,545	10,132	8,719	7,655
UP	286,919	303,126	325,432	320,647	283,423	240,489	215,238
Michigan	9,771,351	10,153,501	10,680,751	10,334,619	9,492,455	7,989,511	7,229,663

11.5.5 Maternal Opioid Use

In 2017, about one in five women with private insurance and one in four on Medicaid filled at least one opioid prescription. In 2019, 7% of women reported using prescription opioid pain relievers during pregnancy. Of which, 1 in 5 reported misuse (getting from a source other than a health care provider). The number of women with opioid use disorder at labor and delivery quadrupled from 1999 to 2014.

Maternal opioid use has been linked to maternal death, poor fetal growth, premature birth, stillbirth, specific birth defects, and neonatal abstinence syndrome. [101]

11.5.6 Neonatal Abstinence Syndrome

Neonatal abstinence syndrome (NAS) is a group of conditions in which newborns withdraw from certain substances, including opioids, they were exposed to before birth. Withdrawal symptoms usually begin within the first 72 hours of life and include: tremors, irritability – often with an excessive high-pitched crying, sleep problems, hyperactive reflexes, seizures, yawning, stuffy nose, sneezing, poor feeding/sucking, vomiting, loose stools, and increased sweating. Newborns with NAS have longer hospital stays and are more likely to be re-hospitalized within 30 days of birth. The long-term impact of NAS is unclear, but there is evidence of an increased risk of a developmental delay, or a speech or language impairment in early childhood. [101]

From 2003 to 2012, with a four-fold increase in the number of infants with NAS, the costs from NAS have markedly increased. A newborn with NAS stays an average of 16.57 days in the hospital at an average cost of \$16,893 while an infant without NAS has an average hospital stay of 4.98 days costing an average of \$5,610. At a national level, the cost of NAS increased from \$61 million in 2003 to \$316 million in 2012 with the number of hospital days from NAS increasing from 67,869 to 291,168. [102]

11.5.6.1 Michigan Data²⁴

According to State of Michigan 2018 data, the rate of neonatal abstinence syndrome for the entire state is 721.2 per 100,000 live births (95%CI: 671.2, 771.2). The breakdown by race/ethnicity is:

- White, non-Hispanic: 881.1 per 100,000 live births, (95%CI: 814.0, 948.2);
- Black, non-Hispanic: 298.4 per 100,000 live births, (95%CI: 223.7, 373.2);
- Hispanic: 687.2 per 100,000 live births, (95%CI: 499.3, 875.2); and
- Native American: 4691.4 per 100,000 live births, (95%CI: 2631.9, 6705.8).

Those identifying as White are more than twice as likely to have a newborn with NAS than other groups (OR=2.29, 95%CI: 1.90, 2.75). Those identifying as Native American are almost seven times more likely to have a newborn with NAS (OR=6.92, 95%CI: 4.34, 11.02), while those identifying as Black are at about one-third the risk (OR=0.36, 95%CI: 0.28, 0.47).

²⁴ Data for this section based on Michigan Resident Inpatient Files created by the Division for Vital Records and Health Statistics, Bureau of Epidemiology and Population Health, Michigan Department of Health and Human Services, using data from the Michigan Inpatient Database obtained with permission from the Michigan Health and Hospital Association Service Corporation (MHASC). All data analyses were conducted by the Michigan Department of Health and Human Services, Maternal and Child Health Epidemiology Section.

11.5.6.2 Regional/County Data

The number of cases of NAS in Michigan, the Upper Peninsula, and each of the counties in the Upper Peninsula from 2010 through 2019 is shown in **Table 11-8**. One of the caveats in interpreting the NAS data is that in 2015 the ICD-9 codes used to tabulate data changed, so the decreases following 2015 may be from this change in disease definition. Furthermore, the numbers reflect only those treated with pharmaceuticals. Those with NAS who were treated without medication are not included. The State saw a decrease of 14.8% in the number of cases from 2018 to 2019. The rates per 100,000 births is shown in **Table 11-9**. **Table 11-10** shows the number of Native Americans diagnosed with NAS in the Upper Peninsula and Michigan from 2010 through 2019.

When the cases from 2015 through 2019 in the Upper Peninsula are considered, the incidence rate of NAS in those identifying as White non-Hispanic was 2863.6 ± 305.9 per 100,000 live births, while Native Americans had an incidence rate of 7753.7 ± 1770.1 per 100,000 live births. [103]

Table 11-8: Hospitalizations for Infants with Treated NAS, 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Ten Year Total
Michigan	478	660	717	844	943	960	950	935	792	675	
Upper Peninsula	39	44	49	68	87	102	81	80	69	68	
Alger	2	1	0	1	3	2	0	4	5	0	18
Baraga	2	5	6	8	6	9	3	9	0	1	49
Chippewa	4	9	2	10	10	16	11	12	11	18	103
Delta	9	6	14	17	16	23	19	11	5	11	131
Dickinson	2	0	2	1	5	4	4	6	2	1	27
Gogebic	0	0	0	1	1	1	0	1	3	2	9
Houghton	4	2	5	6	7	8	6	6	5	5	54
Iron	0	2	2	1	1	3	5	1	1	3	19
Keweenaw	0	0	0	0	0	0	0	0	0	0	0
Luce	2	0	1	0	3	0	2	3	0	0	11
Mackinac	0	1	0	3	1	2	3	1	4	1	16
Marquette	13	16	14	16	27	25	20	20	21	23	195
Menominee	1	1	2	2	2	6	7	2	8	1	32
Ontonagon	0	0	0	2	1	2	0	2	0	0	7
Schoolcraft	0	1	1	0	4	1	1	2	4	2	16

Table 11-9: Hospitalization Rates (per 100,000 Live Births) for Infants with Treated NAS, 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Michigan	416.68	578.14	636.1	742.1	823.56	847.97	837.93	838.93	719.2	625.48
Upper Peninsula	1,395.35	1,564.17	1,741.91	2,476.33	3,068.78	3,766.62	2,929.48	3,016.59	2,595.94	2,737.52
Alger	3,571.43	1,886.79	0.00	1,408.45	5,357.14	3,278.69	0.00	6,349.21	9,259.26	0.00
Baraga	2,272.73	6,493.51	7,407.41	10,126.58	7,692.31	12,000.00	4,838.71	13,043.48	0.00	1,694.92
Chippewa	1,152.74	2,387.27	573.07	2,949.85	2,604.17	4,624.28	3,323.26	3,703.70	3,303.30	5,980.07
Delta	2,694.61	1,518.99	3,878.12	4,802.26	3,940.89	6,353.59	5,621.30	3,188.41	1,497.01	3,303.30
Dickinson	888.89	0.00	803.21	362.32	2,092.05	1,709.40	1,393.73	2,429.15	757.58	450.45
Gogebic	0.00	0.00	0.00	847.46	877.19	763.36	0.00	781.25	2,127.66	1,739.13
Houghton	934.58	546.45	1,291.99	1,626.02	1,928.37	2,133.33	1,666.67	1,612.90	1,319.26	1,547.99
Iron	0.00	2,105.26	2,173.91	1,136.36	1,030.93	3,703.70	4,950.50	1,052.63	1,234.57	2,941.18
Keweenaw	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Luce	3,125.00	0.00	1,818.18	0.00	5,172.41	0.00	4,651.16	5,000.00	0.00	0.00
Mackinac	0.00	1,315.79	0.00	3,125.00	1,111.11	2,380.95	3,488.37	1,234.57	4,301.08	1,086.96
Marquette	2,028.08	2,507.84	2,017.29	2,671.12	4,231.97	4,045.31	2,994.01	3,407.16	3,633.22	4,204.75
Menominee	531.91	515.46	1,020.41	909.09	892.86	2,912.62	3,517.59	1,117.32	4,347.83	520.83
Ontonagon	0.00	0.00	0.00	7,142.86	4,166.67	6,250.00	0.00	6,451.61	0.00	0.00
Schoolcraft	0.00	1,428.57	1,315.79	0.00	6,250.00	1,818.18	1,449.28	2,816.90	5,797.10	3,389.83

Year	Michigan	Upper Peninsula
2010	23	8
2011	27	8
2012	22	8
2013	23	7
2014	29	12
2015	34	16
2016	47	19
2017	40	21
2018	33	15
2019	31	19

11.5.7 Needle-Exchange Programs

Each of the six public health departments in the Upper Peninsula has implemented a needle-exchange program. The primary focus of these programs is to reduce the number of HIV and hepatitis C infections associated with needle sharing by intravenous drug users. It currently costs between \$63,000 and \$189,000 to treat a case of hepatitis C, [104] while the lifetime health costs of an HIV infection are \$379,668. [105] Preventing only a few infections makes the programs cost effective. The program provides unused (“clean”) syringes, collects used (“dirty”) syringes, distributes naloxone kits (used to treat overdoses), distributes naloxone test strips (to detect the presence of deadly high-potency synthetic opioids), delivers education on safe intravenous practices, and makes referrals for counseling and treatment. The programs were at various stages of development when the COVID-19 pandemic started. The services delivered by the health departments in 2020 and 2021 are shown in **Table 11-11**.

Table 11-11: Needle Exchange, 2020-2021

	Participants	Syringes distributed	Syringes collected	Naloxone kits	Fentanyl test strips	Treatment referrals	Overdose reversals
CCHD							
2020	274	39,774	38,245	99	132	15	13
2021	208	30,211	20,000	98	271	14	15
DIDHD							
2020	6	1,950	520	3	*	1	*
2021	98	25,660	15,660	50	28	10	*
LMAS							
2020	74	5,133	3,561	39	*	*	1
2021	146	23,031	14,691	59	5	1	*
MCHD							
2020	367	125,811	18,556	293	40	5	23
2021	630	145,813	42,461	331	689	8	12
PHDM							
2020	162	50,304	16,655	132	*	12	9
2021	423	161,580	56,283	196	239	20	25
WUPHD							
2020	1	450	41	4	*	*	*
2021	14	2,700	*	*	*	*	*
Upper Peninsula							
2020	884	223,422	77,578	570	172	33	46
2021	1,519	388,995	149,095	1,304	1,232	86	52
CCHD = Chippewa County Health Department, DIDHD = Dickinson-Iron District Health Department, LMAS = Luce, Mackinac, Alger, Schoolcraft Health Department, PHDM = Public Health Delta-Menominee, WUPHD = Western Upper Peninsula Health Department							

Table 11-12: SUD Admissions by Substance, Michigan & US, 2005-2015

	Michigan		United States
	Number of Admissions	per 100,000	per 100,000
Any Substance			
2005	57,311	676	756
2006	66,915	787	775
2007	66,944	788	770
2008	65,449	773	804
2009	64,563	764	790
2010	61,322	732	733
2011	58,077	691	728
2012	55,359	657	683
2013	54,726	647	650
2014	61,080	720	600
2015	55,180	649	557
Alcohol			
2005	25,172	297	298
2006	28,834	339	309
2007	28,702	338	315
2008	27,867	329	333
2009	26,847	318	329
2010	24,769	296	297
2011	22,676	270	285
2012	21,214	252	264
2013	20,613	244	242
2014	22,824	269	216
2015	19,441	229	189

Table 11-12: (Continued)			
	Michigan		United States
	Number of Admissions	per 100,000	per 100,000
Marijuana			
2005	10,035	118	121
2006	11,200	132	124
2007	11,244	132	123
2008	11,067	131	139
2009	11,158	132	143
2010	10,869	130	136
2011	9,375	112	132
2012	8,740	104	118
2013	8,858	105	108
2014	8,646	102	92
2015	5,957	70	77
Heroin			
2005	7,488	88	104
2006	9,311	110	106
2007	9,325	110	103
2008	10,470	124	110
2009	11,166	132	111
2010	10,627	127	102
2011	10,905	130	108
2012	11,604	138	113
2013	11,913	141	127
2014	15,097	178	134
2015	16,634	196	146

Table 11-12: (Continued)			
	Michigan		United States
	Number of Admissions	per 100,000	per 100,000
Cocaine			
2005	9,949	117	107
2006	11,822	139	110
2007	11,249	132	102
2008	8,430	100	93
2009	6,427	76	74
2010	5,252	93	60
2011	5,003	60	57
2012	4,113	49	47
2013	3,943	47	39
2014	3,874	46	32
2015	3,672	43	27
Meth/Amphetamines			
2005	797	9	68
2006	605	7	64
2007	452	5	58
2008	601	7	50
2009	706	8	46
2010	819	10	45
2011	817	10	43
2012	858	10	47
2013	807	10	52
2014	1,182	14	53
2015	936	11	49

Table 11-12: (Continued)			
	Michigan		United States
	Number of Admissions	per 100,000	per 100,000
Non-heroin opiates/synthetics			
2005	3,412	40	29
2006	4,599	54	34
2007	5,383	63	40
2008	6,301	74	49
2009	7,289	86	58
2010	8,007	96	66
2011	8,374	100	75
2012	7,807	93	68
2013	7,620	90	60
2014	8,413	99	49
2015	7,626	90	45

11.6 Substance Abuse Patients Receiving Treatment

The Treatment Episode Data Set compiled by the Substance Abuse and Mental Health Services Administration [106] provides important information on how many patients with substance abuse are being treated. For the Michigan data, required reporters in Michigan were “State licensed facilities that receive state/public funding” and “Medicaid providers of behavioral health services” and eligible clients included “Clients whose services are supported by state/public funds through Department of Health and Human Services, including Medicaid.”

The number, and rates per 100,000, of admissions for the abuse of various substances for the years 2005 through 2015 for Michigan and the United States are shown in **Table 11-12**. [107] The trend through 2015 is an increase in heroin admissions and a decrease in cocaine admissions.

A breakdown of treatments administered in 2015 by type and setting is shown in **Table 11-13** and the settings for treatments in Michigan and the United States in **Table 11-14**. [107] Data from 2018 and 2019 documented in the NSDUH survey, shown in **Table 11-15**, indicate how many of those 12 years and older received treatment in the past year in 2018 and 2019 by age categories. [107] The NorthCare

Network²⁵ tracks the numbers of adult patients on Medicaid admitted for treatment of substance use in the Upper Peninsula. The numbers of admissions in fiscal year 2020 by county and substance used are shown in **Table 11-16**.

Table 11-13: SUD Treatment by Where Treated (Percentage), 2015

	Illicit Drug Use		Alcohol Use		Substance Use	
	2018	2019	2018	2019	2018	2019
Hospital Inpatient	20.8	17.6	23.7	14.9	22.4	15.3
Rehabilitation Facility — Inpatient	24.5	25	37.2	21.4	25.8	24
Rehabilitation Facility — Outpatient	48.1	50	39.9	34.6	43.8	41.8
Mental Health Center — Outpatient	31.9	35.7	30.6	28.7	31.5	31.5
Emergency Room	12.9	12.7	13.7	9.6	14.4	12.3
Physician’s Office	25.7	22.8	22.1	19.2	25.3	22.6
Self-help Group	45.2	48.2	59.5	52.1	51.5	49.4
Prison/Jail	8.5	7.4	6.3	5.3	7.1	6.1

The number needing treatment for substance use but did not receive treatment at specialty facility (in thousands) in the United States in 2018 was 21,245 and rose to 22,550 in 2019. For alcohol use, the number in 2018 was 15,519 in 2018 and 15,267 in 2019. For illicit drug use the number was 7,351 in 2018 and rose to 7,490 in 2019. [107]

NSDUH survey data from 2018 and 2019 found the substances being used by those being treated (2018/2019) were: Marijuana (18.5%/19.8%), cocaine (13.4%/14.4%), heroin (18.0%/16.0%), hallucinogens (7.7%/6.8%), inhalants (3.5%/3.2%), methamphetamine (12.3%/15.2%), pain relievers (19.5%/17.5%), tranquilizers (5.7%/7.4%), stimulants (5.1%/4.6%), sedatives (3.9%/4.0%), and alcohol (56.8%/54.1%). [107] For Michigan residents, the substances of abuse resulting in admission to a treatment facility (in order of decreasing frequency) are alcohol, heroin, other opiates, marijuana, cocaine, and methamphetamine/amphetamines.

²⁵ NorthCare Network is the Prepaid Inpatient Health Plan (PIHP) for the Upper Peninsula and manages specialty mental health & substance abuse services & supports. NorthCare Network’s role is to assess the appropriate level of care needed, recommend treatment services, and refer the individual to a participating Substance Use Disorder Provider. Eligible clients include those with Healthy Michigan, Medicaid, or MI Health Link, or those who meet the NorthCare Network SUD sliding fee scale.

Substance abuse often goes unrecognized and when recognized there are substantial barriers to receiving treatment.

Table 11-14: SUD Treatment Locations, Michigan & US, 2015				
	Michigan	%	US	%
Total	55,346		1,537,025	
Ambulatory	23,711	43	577,631	37.6
Intense outpatient	2,890	5.2	182217	11.9
Detox				
Free-standing residential	7,624	13.8	280,004	18.2
Hospital			43,582	2.8
Ambulatory	146	0.3	10,392	0.7
Rehabilitation/Residential				
Short Term (<30d)	6,784	12.3	138,248	9
Long-term	3,572	6.5	103,914	6.8
Hospital				
Medication assisted therapy				
Outpatient	6,028	10.9	163,787	10.7
Detox	3,656	6.6	18,679	1.2
Residential	767	1.4	14,778	1

In the Upper Peninsula, NorthCare Network, which administers mental health and substance abuse treatment for the region’s population on Medicaid and Healthy MI reported 2087 admissions for substance use disorders in fiscal year 2019 (October 1, 2018 through September 30, 2019), 1924 for fiscal year 2020, and 2178 for fiscal year 2021.²⁶ The drop in 2020 may reflect the lack of face-to-face encounters during the COVID-19 pandemic. NorthCare also tallied 443 admissions for medication assisted treatment for substance dependence.

11.7 Adverse Childhood Experience and Substance Dependence

The allostatic load theory posits that the cumulative burden of chronic stress and life events can exceed an individual’s ability to cope and increases an individual’s risk of developing a chronic disease. Being the target of racism is a commonly cited example.[108] Adverse childhood experiences, as discussed in section §6.4.2, add to the allostatic load and have been linked to an increased risk of a variety of chronic illnesses.[109] The toxic stress from these experiences may damage the child’s developing brain, may alter their genetic structure, and may be passed from one generation to the next (see footnote 17 on page 225 regarding epigenetics).[110] Adverse childhood experiences have been linked to an increased and early onset of mood and anxiety disorders. Substance dependence is also increased with an onset

²⁶ SOURCE: SUD Admissions Detail PCE Standard Report of Behavioral Health Treatment Episode Dataset (BH-TEDS) admission data from Northcare ELMER Electronic Health Record system. Each admission corresponds to a BH-TEDS SUD admission ("A") record.

Table 11-15: SUD Treatment by Age Groups, 2018-2019								
	Illicit Drug Use		Alcohol		Both		Either/Or	
Ages	2018	2019	2018	2019	2018	2019	2018	2019
Total	2097	3212	2342	2503	1076	117	3723	4184
12-20	211	258	167	174	107	146	322	360
21 and older	1887	2054	2175	2356	969	1029	3402	3824
12-17	130	118	73	66	62	62	159	172
18 and older	1967	2194	2269	2464	1041	1113	3564	4012
18-25	311	369	314	339	161	217	547	578
26 and older	1656	1824	1955	2126	853	896	3018	3434
26-49	1260	1388	1236	1299	619	639	2020	2240
50 and older	395	437	719	827	234	257	998	1194
65 and older	49	70	134	170	42	57	235	284

approximately three years after being diagnosed with the mood or anxiety disorder. [111] While substance dependence is often linked to mood and anxiety disorders, adverse childhood experiences contribute to the risk of substance dependence beyond the impact of having a mood or anxiety disorder. [109] As the number of types of adverse childhood experiences increases, the risk of substance dependence also increases.

A history of adverse childhood experiences is so common (perhaps 11 out of 12) in those seeking treatment for substance dependence that screening for adverse childhood experiences has become routine. Daniel Sumrok, MD, an addiction specialist suggests that instead of using the term “addiction,” it should be called “ritualized compulsive comfort-seeking.” As part of therapy, an individual’s addiction is normalized as a coping behavior. At the time of these adverse experiences, these children did not have healthy alternative responses available to them. Given a child’s exposure to trauma, their subsequent substance use was a predictable result. [110] The brain of the addicted person is damaged and wants to heal. Resilience research indicates that trauma-informed and resilience-building practices are more likely to be met with success. Medications are often not helpful as the damage from adverse childhood experiences is not a brain-chemistry imbalance but is memory triggered. Individual and group therapy are aimed at normalizing their experiences and integrating other rituals into their lives such as exercise or pursuing spiritual awakening. [110]

Table 11-16: Medicaid SUD Admissions by County, Fiscal Year 2020

County	Alcohol	Heroin	Marijuana	Methamphetamine / Speed	Other Opiates	Grand Total
Alger	14	1	5	20	19	62
Baraga	34	2	5	31	37	111
Chippewa	124	12	14	19	99	276
Delta	110	34	10	46	156	348
Dickinson	72	5	11	53	52	229
Gogebic	79	10	14	23	23	155
Houghton	143	7	12	41	69	279
Iron	10		1	4	22	47
Keweenaw	6	2	1		2	9
Luce	15		2	9	4	33
Mackinac	30	22	2	4	6	43
Marquette	302	3	45	219	215	831
Menominee	30			15	26	76
Ontonagon	13		4	8	8	34
Schoolcraft	7		1	7	7	24

11.8 Future Implications

The way forward involves a multipronged approach:

- Improving access to treatment and recovery services
- Recognizing and addressing the conditions that lead to substance abuse such as mental health issues and adverse childhood experiences
- Decreasing overdose deaths through the distribution of overdose-reversing medications (naloxone)
- Better surveillance so resources can be directed where they are most needed
- More research on ameliorating pain and limiting addiction
- Identifying those at risk for substance abuse
- Improving pain management practices

References:

- [1] American Society of Addiction Medicine (ASAM). Definition of addiction. <https://www.asam.org/Quality-Science/definition-of-addiction>. Accessed May 14, 2021.
- [2] Chadwick LH. The NIH Roadmap Epigenomics Program data resource. *Epigenomics* 2012; 4(3): 317-24.
- [3] National Institutes of Health. National Institute of Drug Abuse. Genetics and epigenetic of addiction. DrugFacts. <https://www.drugabuse.gov/publications/drugfacts/genetics-epigenetics-addiction>. Accessed May 14, 2021.
- [4] National Institutes of Health. National Institute of Drug Abuse. Addiction science. <https://www.drugabuse.gov/drug-topics/addiction-science>. Accessed May 14, 2021.
- [5] Centers for Disease Control and Prevention. Opioid overdose. <https://www.cdc.gov/drugoverdose/pubs/featured-topics/treatment-recovery.html>. Accessed May 14, 2021.
- [6] Centers for Disease Control and Prevention. Smoking & tobacco use. Health effects. https://www.cdc.gov/tobacco/basic_information/health_effects/index.htm. Accessed May 19, 2021.
- [7] U.S. Department of Health and Human Services. The health consequences of smoking – 50 years of progress: A report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014.
- [8] Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) system (2014-2015). https://nccd.cdc.gov/STATESystem/rdPage.aspx?rdReport=OSH_State.CustomReports. Accessed December 15, 2020.
- [9] Tian Y, Shamo F, McKane P. Secondhand smoke exposure within the home and health outcomes among Michigan adults, 2019. Michigan BRFSS Surveillance Brief. 2021; 12(3). Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division.
- [10] Tian Y, McKane P. Health Risk Behaviors within the State of Michigan: 2020 Behavioral Risk Factor Survey. 34th Annual Report. Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division; 2021. Available at: https://www.michigan.gov/documents/mdhhs/MiBRFS_Annual_Report_2020_747938_7.pdf?utm_campaign=&utm_medium=email&utm_source=govdelivery.
- [11] Centers for Disease Control and Prevention. Smoking and tobacco use. Smoking cessation: Fast facts. https://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/smoking-cessation-fast-facts/index.html. Accessed May 18, 2021.
- [12] Department of Health and Human Services. Smoking cessation. A report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2020.
- [13] Creamer MR, Wang TW, Babb S, et al. Tobacco product use and cessation indicators among adults – United States, 2018. *MMWR Morb Mortal Wkly Rep* 2019; 68: 1013–9.
- [14] U.S. Department of Health, Education, and Welfare. Smoking and health: Report of the advisory committee to the Surgeon General of the Public Health Service. Washington: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, 1964. PHS Publication No. 1103.
- [15] Conklin CA, Salkeld RP, Perkins KA, Robin N. Do people serve as cues to smoke? *Nicot and Tobacco Res* 2013; 15(12): 2081–7.
- [16] Klinsophon T, Thaveeratitham P, Sitthipornvorakul E, et al. Effect of exercise type on smoking cessation: a meta-analysis of randomized controlled trials. *BMC Res Notes* 2017; (1): 42. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5585974/>. Accessed May 18, 2021.
- [17] SAMSA Center for Behavioral Health Statistics and Quality. National Survey on Drug Use and Health, 2018 and 2019.
- [18] Sharpless N. How FDA is regulating e-cigarettes. U.S. Food & Drug Administration. September 10, 2019. <https://www.fda.gov/news-events/fda-voices/how-fda-regulating-e-cigarettes>. Accessed May 19, 2021.
- [19] Siegel DA, Jatlaoui TC, Koumans EH, et al. Update: Interim guidance for health care providers evaluating and caring for patients with suspected e-cigarette, or vaping, product use associated lung injury—United States, October 2019. *MMWR Morb Mort Wkly Rep* 2019; 68: 919–27.
- [20] Blount BC, Karwowski MP, Shields PG, et al. Vitamin E acetate in bronchoalveolar-lavage fluid associated with EVALI. *N Engl J Med* 2020;382(8): 697-705.
- [21] Goniewicz ML, Boykan R, Messina CR, et al. High exposure to nicotine among adolescents who use JUUL and other vape pod systems (“pods”). *Tob Control* 2019; 28(6): 676-7.

- [22] National Academies of Sciences, Engineering, and Medicine. Public health consequences of e-cigarettes. Washington (DC): The National Academies Press; 2018.
- [23] Gotts JE, Jordt S-E, McConnell R, et al. What are the respiratory effects of e-cigarettes? *Br Med J* 2019; 366: 15275.
- [24] Alzahrani T, Pena I, Temesgen N, et al. Association between electronic cigarette use and myocardial infarction. *Am J Prev Med* 2018; 55(4): 455–61.
- [25] Alzahrani T, Glantz SA. The association between e-cigarette use and myocardial infarction is what one would expect based on the biological and clinical evidence. *Am J Prev Med* 2019; 56(4): 627.
- [26] Osei AD, Mirbolouk M, Orimoloye OA, et al. Association between e-cigarette use and cardiovascular disease among never and current combustible-cigarette smokers. *Am J Med* 2019; 132(8): 949-54.e2.
- [27] National Academies of Sciences, Engineering, and Medicine. Public health consequences of e-cigarettes. Washington (DC): The National Academies Press; 2018.
- [28] Berry KM, Reynolds LM, Collins JM, et al. E-cigarette initiation and associated changes in smoking cessation and reduction: the Population Assessment of Tobacco and Health Study, 2013–2015. *Tob Control* 2019; 28(1): 42–9.
- [29] Hajek P, Phillips-Waller A, Przulj D, et al. A randomized trial of e-cigarettes versus nicotine-replacement therapy. *N Engl J Med* 2019; 380(7):vc629–37.
- [30] U.S. Department of Health and Human Services. Public Health Service. Office of the Surgeon General. Smoking cessation: A report of the Surgeon General: Executive summary. Rockville, MD: DHHS; 2020. <https://www.hhs.gov/sites/default/files/2020-cessation-sgr-executive-summary.pdf>. Accessed May 18, 2021
- [31] Soneji SS, Sung HY, Primack BA, et al. Quantifying population-level health benefits and harms of e-cigarette use in the United States. *PLoS One* 2018; 13(3): e0193328.
- [32] National Institutes of Health. National Institute of Alcohol Abuse and Alcoholism (NIAAA). Overview of alcohol consumption. <https://www.niaaa.nih.gov/alcohols-effects-health/overview-alcohol-consumption>. Accessed April 1, 2021.
- [33] Centers for Disease Control and Prevention. Alcohol and public health. Dietary guidelines for alcohol. <https://www.cdc.gov/alcohol/fact-sheets/moderate-drinking.htm>. Accessed May 19, 2021.
- [34] U.S. Department of Agriculture and U.S. Department of Health and Human Services. 2020-2025 dietary guidelines for Americans. 9th Edition. Washington, DC; 2020. https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf. Accessed May 19, 2021.
- [35] Centers for Disease Control and Prevention. Alcohol and public health. Excessive drinking is draining the U.S. economy. <https://www.cdc.gov/alcohol/features/excessive-drinking.html>. Accessed May 19, 2021.
- [36] Sacks JJ, Gonzales KR, Bouchery EE, et al. 2010 National and state costs of excessive alcohol consumption. *Am J Prev Med* 2015; 49(5): E73-9. <https://www.ajpmonline.org/article/S0749-3797%2815%2900354-2/abstract>. Accessed May 19, 2021.
- [37] National Institutes of Health. National Institute of Alcohol Abuse and Alcoholism (NIAAA). Alcohol’s effect on the body. <https://www.niaaa.nih.gov/alcohols-effects-health/alcohols-effects-body>. Accessed April 1, 2021.
- [38] Esser MB, Sherk A, Liu Y, et al. Deaths and years of potential life lost from excessive alcohol use — United States, 2011-2015. *MMWR* 2020; 69(30): 981-7. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6930a1.htm>. Accessed May 19, 2021.
- [39] From National Institutes of Health. National Institute of Alcohol Abuse and Alcoholism (NIAAA). Alcohol facts and statistics. https://www.niaaa.nih.gov/sites/default/files/publications/NIAAA_Alcohol_FactsandStats_102020.pdf. Accessed April 1, 2021.
- [40] Centers for Disease Control and Prevention. Alcohol and public health. Binge drinking. <https://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm>. Accessed May 19, 2021.
- [41] Centers for Disease Control and Prevention. Alcohol and public health. Frequently asked questions. <https://www.cdc.gov/alcohol/faqs.htm#heavyDrinking>. Accessed May 19, 2021.
- [42] Mokdad AH, Marks JS, Stroup DF, et al. Actual causes of death in the United States 2000. [published erratum in: *JAMA* 293(3): 293–4, 298] *JAMA* 2004; 291(10): 1238–45.

- [43] National Center for Statistics and Analysis. 2014 crash data key findings (Traffic Safety Facts Crash Stats. Report No. DOT HS 812 219). Washington, DC: National Highway Traffic Safety Administration; 2015. Available at: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812219>. Accessed 9/19/16.
- [44] SAMHSA. 2019 National Survey on Drug Use and Health (NSDUH). Table 5.4A—Alcohol use disorder in past year among persons aged 12 or older, by age group and demographic characteristics: Numbers in thousands, 2018 and 2019. Available at: <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec5pe2019.htm#tab5-4a>. Accessed 9/15/20.
- [45] SAMHSA. 2019 National Survey on Drug Use and Health (NSDUH). Table 5.4B—Alcohol use disorder in past year among persons aged 12 or older, by age group and demographic characteristics: Percentages, 2018 and 2019. Available at: <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec>
- [46] Substance Abuse and Mental Health Services Administration (SAMHSA). 2019 National Survey on Drug Use and Health (NSDUH). Table 2.1B—Tobacco product and alcohol use in lifetime, past year, and past month among persons aged 12 or older, by age group: Percentages, 2018 and 2019. Available at: <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec2pe2019.htm#tab2-1b> Accessed 9/15/20.
- [47] National Institute of Alcohol Abuse and Alcoholism. NIAAA council approves definition of binge drinking. NIAAA Newsletter 2004; 3: 3.
- [48] Kanny D, Naimi TS, Liu Y, et al. Annual total binge drinks consumed by U.S. adults, 2015. *Am J Prev Med* 2018; 54: 486-96.
- [49] SAMHSA. 2019 National Survey on Drug Use and Health. Table 6.21B – Types of illicit drug, tobacco product, and alcohol use in past month among persons Aged 18 to 22, by college enrollment status and gender: Percentages, 2018 and 2019. Available at <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec6pe2019.htm#tab6-21b>. Accessed 9/15/20.
- [50] U.S. Department of Health & Human Services. Substance Abuse and Mental Health Services. 2016-2018 NSDUH substate region estimates — Tables. Published July 8, 2020. <https://www.samhsa.gov/data/report/2016-2018-nsduh-substate-region-estimates-tables>. Accessed May 17, 2021.
- [51] Michigan Marijuana Regulatory Agency. Michigan.gov/mra. Accessed March 4, 2021.
- [52] Centers for Disease Control and Prevention. Marijuana and public health. Health effects. <https://www.cdc.gov/marijuana/health-effects.html>. Accessed May 10, 2021.
- [53] U.S. Department of Justice. Drug Enforcement Administration. Diversion Control Division. Controlled substance schedules. <https://www.deadiversion.usdoj.gov/schedules/#define>. Accessed May 21, 2021.
- [54] Batalla A, Bhattacharyya S, Yücel M, et al. Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings. *PloS One* 2013; 8(2): e55821.
- [55] Goldschmidt L, Day NL, Richardson GA. Effects of prenatal marijuana exposure on child behavior problems at age 10. *Neurotoxicol Teratol* 2002; 22(3): 325-36.
- [56] Fried PA, Watkinson B, Gray R. Differential effects on cognitive functioning in 9- to 12-year olds prenatally exposed to cigarettes and marihuana. *Neurotoxicol Teratol* 1998; 20(3): 293-306.
- [57] Leech SL, Richardson GA, Goldschmidt L, et al. Prenatal substance exposure: effects on attention and impulsivity of 6-year-olds. *Neurotoxicol Teratol* 1999; 21(2): 109-18.
- [58] Goldschmidt L, Richardson GA, Willford J, et al. Prenatal marijuana exposure and intelligence test performance at age 6. *J Am Acad Child Adolesc Psychiatry* 2008; 47(3): 254-63.
- [59] El Marroun H, Hudziak JJ, Tiemeier H, et al. Intrauterine cannabis exposure leads to more aggressive behavior and attention problems in 18-month-old girls. *Drug Alcohol Depend* 2011; 118(2-3): 470-4.
- [60] National Cancer Institute. [Cannabis and Cannabinoids \(PDQ®\)](#). Rockville, MD: National Institutes of Health, National Cancer Institute; 2017.
- [61] National Academies of Sciences, Engineering, and Medicine. The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research. Washington, DC; 2017.
- [62] Gurney J, Shaw J, Stanley J, et al. Cannabis exposure and risk of testicular cancer: a systematic review and meta-analysis. *BMC Cancer* 2015; 15: 897.
- [63] Sidney, S. Cardiovascular consequences of marijuana use. *J Clin Pharmacol* 2002; 42(11 Suppl): 64S-70S.

- [64] Wolff V, Armspach J-P, Lauer V, et al. Cannabis-related stroke: myth or reality? *Stroke* 2016; 44(2): 558-63.
- [65] Wolff V, Zinchenko I, Quenardelle V, et al. Characteristics and prognosis of ischemic stroke in young cannabis users compared with non-cannabis users. *J Am Coll Cardiol* 2015; 66(18): 2052-3.
- [66] Franz CA, Frishman WH. Marijuana use and cardiovascular disease. *Cardiol Rev* 2016; 24(4): 158-62.
- [67] Rumalla K, Reddy AY, Mittal MK. Recreational marijuana use and acute ischemic stroke: A population-based analysis of hospitalized patients in the United States. *J Neurol Sci* 2016; 364: 191-6.
- [68] Rumalla K, Reddy AY, Mittal MK. Association of recreational marijuana use with aneurysmal subarachnoid hemorrhage. *J Stroke Cerebrovasc Dis* 2016; 25(2): 452-60.
- [69] Tashkin DP. Effects of marijuana smoking on the lung. *Ann Am Thorac Soc* 2013; 10(3): 239-47.
- [70] Moir, D, et al. A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions. *Chem Res Toxicol* 2008; 21(2): 494-502.
- [71] Aldington S, Williams M, Nowitz M, et al., Effects of cannabis on pulmonary structure, function and symptoms. *Thorax* 2007; 62(12): 1058-63.
- [72] Moore C, Coulter C, Uges D. et al. Cannabinoids in oral fluid following passive exposure to marijuana smoke. *Forensic Sci Int* 2011; 212(1-3): 227-30.
- [73] Tan WC, Lo C, Jong A, et al. Marijuana and chronic obstructive lung disease: a population-based study. *CMAJ* 2009; 180(8): 814-20.
- [74] Taylor DR, Poulten R, Moffitt TE, et al. The respiratory effects of cannabis dependence in young adults. *Addiction* 2000; 95(11): 1669-77.
- [75] Hancox RJ, Shin HH, Gray AR, et al. Effects of quitting cannabis on respiratory symptoms. *Eur Respir J* 2015; 46(1): 80-7.
- [76] Tashkin DP, Simmons MS, Tseng CH. Impact of changes in regular use of marijuana and/or tobacco on chronic bronchitis. *COPD* 2012; 9(4): 367-74.
- [77] Volkow ND, Swanson JM, Evins AE, et al. Effects of cannabis use on human behavior, including cognition, motivation, and psychosis: a review. *JAMA Psychiatry* 2016; 73(3): 292-97.
- [78] Colorado Department of Public Health and Environment. Monitoring health concerns related to marijuana in Colorado: 2016; 2017.
- [79] Wilson KM, Torok MR, Wei B, et al. Detecting biomarkers of secondhand marijuana smoke in young children. *Pediatr Res* 2017; 81: 589-92.
- [80] Broyd SJ, van Hell HH, Beale C, et al. Acute and chronic effects of cannabinoids on human cognition - a systematic review. *Biol Psychiatry* 2016; 79(7): 557-67.
- [81] Lopez-Quintero C, de los Cobos JP, Hasin DS, et al. Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Drug Alcohol Depend* 2011; 115(1-2): 120-30.
- [82] Hall W, Degenhardt L. Adverse health effects of non-medical cannabis use. *Lancet* 2009; 374(9698): 1383-91.
- [83] Budney AJ, Sargent JD, Lee DC. Vaping cannabis (marijuana): parallel concerns to e-cigs? *Addiction* 2015; 110(11): 1699-704.
- [84] National Institute on Drug Abuse. Is marijuana a gateway drug? Rockville, MD: National Institutes of Health, National Institute on Drug Abuse; 2017.
- [85] Robertson EB, David SL, Rao SA. Preventing drug use among children and adolescents. A research-based guide for parents, educators, and community leaders. National Institute on Drug Abuse, 2nd edn. NIH Publication no. 04-4212 (A). Bethesda, MD: US Department of Health and Human Services; 2003.
- [86] National Institutes of Health. National Institute on Drug Abuse. National Survey on Drug Use and Health (NSDUH), 2016-2018. <https://www.drugabuse.gov/drug-topics/trends-statistics/national-drug-early-warning-system-ndews/national-survey-drug-use-health>. Accessed May 10, 2021.
- [87] National Institutes of Health. National Institute on Drug Abuse. Opioid overdose crisis. <https://www.drugabuse.gov/drug-topics/opioids/opioid-overdose-crisis>. Accessed May 20, 2021.
- [88] Morone NE, Weiner DK. Pain as the fifth vital sign: exposing the vital need for pain education. *Clin Ther* 2013; 35(11): 1728-32.
- [89] Van Zee A. The promotion and marketing of OxyContin: Commercial triumph, public health tragedy. *Am J Public Health* 2009; 99(2): 221-7.
- [90] Center for Behavioral Health Statistics and Quality (CBHSQ). 2017 National Survey on Drug Use and Health: Detailed tables. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2018.

- [91] Vowles KE, McEntee ML, Julnes PS, et al. Rates of opioid misuse, abuse, and addiction in chronic pain: a systematic review and data synthesis. *Pain* 2015; 156(4): 569-76.
- [92] Muhuri PK, Gfroerer JC, Davies MC. Associations of nonmedical pain reliever use and initiation of heroin use in the United States. *CBHSQ Data Rev* August 2013.
- [93] Cicero TJ, Ellis MS, Surratt HL, et al. The changing face of heroin use in the United States: A retrospective analysis of the past 50 years. *JAMA Psychiatry* 2014; 71(7): 821-6.
- [94] Carlson RG, Nahhas RW, Martins SS, et al. Predictors of transition to heroin use among initially non-opioid dependent illicit pharmaceutical opioid users: A natural history study. *Drug Alcohol Depend* 2016; 160: 127-34.
- [95] Wilson N, Kariisa M, Seth P, et al. Drug and opioid-involved overdose deaths — United States, 2017–2018. *MMWR Morb Mortal Wkly Rep* 2020; 69: 290–7.
- [96] CDC/NCHS, [National Vital Statistics System](#), Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2019.
- [97] Florence CS, Zhou C, Luo F, et al. The economic burden of prescription opioid overdose, abuse, and dependence in the United States, 2013. *Med Care* 2016; 54(10): 901-6.
- [98] Centers for Disease Control and Prevention. Opioid overdose. [cdc.gov./drugoverdose/data/statedeaths.html](https://www.cdc.gov/drugoverdose/data/statedeaths.html). Accessed March 30, 2021.
- [99] Centers for Disease Control and Prevention, National Center for Health Statistics. Drug overdose deaths in U.S. top 100,000. November 17, 2021. https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2021/20211117.htm. Accessed November 18, 2021.
- [100] National Institutes of Health. National Institute on Drug Abuse. Michigan: Opioid-involved deaths and related harms. Drug-involved overdose deaths. <https://www.drugabuse.gov/drug-topics/opioids/opioid-summaries-by-state/michigan-opioid-involved-deaths-related-harms>. Accessed March 30, 2021.
- [101] Centers for Disease Control and Prevention. Pregnancy. About opioid use during pregnancy. <https://www.cdc.gov/pregnancy/opioids/basics.html>. Accessed May 19, 2021.
- [102] Corr TE, Hollenbeak CS. The economic burden of neonatal abstinence syndrome in the United States. *Addiction* 2017; 112(9): 1590-9. <https://pubmed.ncbi.nlm.nih.gov/28612362/>. Accessed May 19, 2021.
- [103] Michigan Department of Health & Human Services. Maternal Child Health Epidemiology Section. https://www.michigan.gov/documents/mdhhs/PR1_RPQC_Data_Meeting_Final_664111_7.pdf. Accessed June 15, 2021.
- [104] Nall R. How much does hepatitis C treatment cost? *Med News Today*. 2018. <https://www.medicalnewstoday.com/articles>. Accessed April 28, 2022.
- [105] Centers for Disease Control and Prevention. HIV. HIV cost-effectiveness. www.cdc.gov/hiv/programresources/guidance/costeffectiveness/index.html. Accessed April 28, 2022.
- [106] Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. Treatment Episode Data Set (TEDS): 2005-2015. State admissions to substance abuse treatment services. BHSIS Series S-95, HHS Publication No. (SMA) 17-4360. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2017.
- [107] United States Department of Health & Human Services. Substance Abuse and Mental Health Services Administration. 2019 National Survey on Drug Use and Health (NSDUH) Releases. <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect5pe2019.htm>. Accessed May 14, 2021.
- [108] Guidi J, Lucente M, Sonino N, Fava GA. Allostatic load and its impact on health: a systematic review. *Psychother Psychosom* 2021; 90: 11-27.
- [109] Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults.: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med* 1998; 14(4): 245-58.
- [110] Stevens JE. Addiction doc says: It's not the drugs. It's the ACEs ... adverse child experiences. ACEs Too High. May 2, 2017. <https://acestoohigh.com/2017/05/02/addiction-doc-says-stop-chasing-the-drug-focus-on-aces-people-can-recover/>. Accessed March 17, 2022.
- [111] Douglas KR, Chan G, Gelernter J, et al. Adverse childhood events as risk factors for substance dependence: Partial medication by mood and anxiety disorders. *Addict Behav* 2010; 35(1): 7-13.

12 PUBLIC SAFETY / CRIME

12.1 Introduction

One of the core functions of public health is the prevention of injuries. Crimes, whether intentional or not, are one form of injury that warrants attention. Public safety is a highly valued aspect of overall community health. Public safety data presented in this section include those pertaining to violent crimes (murder, domestic violence), motor vehicle crashes and arrests involving alcohol and/or illicit drugs, and crimes involving drugs or alcohol.

12.2 Violent Crimes

In the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting (UCR) Program violent crimes are defined in the UCR Program as those offenses that involve force or threat of force. The UCR Program notes that violent crime is composed of four offenses: murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault. [1]

The number of reported violent crime offenses per 100,000 population in 2014 and 2016 extracted from the FBI's UCR Program by county, [1] and the number of deaths from injury and the number of deaths due to firearms per 100,000 population from 2015 through 2019 were extracted from the National Center for Health Statistics — Mortality Files [2] are shown in **Table 12-1**.

12.2.1 Murder

The FBI's UCR Program defines murder and non-negligent manslaughter as the willful killing of one human being by another. The classification of this offense is based solely on police investigation as opposed to the determination of a court, medical examiner, coroner, jury, or other judicial body. The UCR Program does not include the following situations in this offense classification: deaths caused by negligence, suicide, or accident; justifiable homicides; and attempts to murder or assaults to murder, which are scored as aggravated assaults. Fortunately, murders are rare events in the Upper Peninsula, with only 5 murders reported in 2019. The number of murders and cases of aggravated/felonious assault by Upper Peninsula county tabulated by the Michigan State Police in 2019 are shown in **Table 12-2**. [3]

12.2.2 Domestic Violence

The State of Michigan defines domestic violence as "a pattern of learned behavior in which one person uses physical, sexual, and emotional abuse to control another person against a household or family member. You do not have to be married to someone to be a victim of domestic violence. Any crime can be an act of domestic violence if perpetrated as a means of controlling another person who is a family or household member including:

Table 12-1: Violent Crimes Reported, Injury Death, and Firearms Deaths, 2015-2019

Location	Reported violent criminal offense per 100,000 population	Deaths from injury per 100,000 population	Deaths from firearms per 100,000 population
Michigan	443	75	12
Alger	207	82	*
Baraga	333	87	*
Chippewa	288	71	15
Delta	187	69	22
Dickinson	*	84	13
Gogebic	100	74	*
Houghton	156	65	18
Iron	189	109	*
Keweenaw	206	102	*
Luce	389	79	*
Mackinac	274	92	*
Marquette	193	73	51
Menominee	222	81	18
Ontonagon	324	91	*
Schoolcraft	*	69	*

- Arson
- Assault
- Extortion
- Homicide or attempted murder
- Kidnapping or unlawful imprisonment
- Obstruction of justice
- Prohibited conduct against a pregnant woman causing death, miscarriage, stillbirth, or physical injury to the embryo or fetus.” [4]

Location	Murders reported	Reports of aggravated/felonious assault
Alger	1	12
Baraga	0	10
Chippewa	1	45
Delta	0	53
Dickinson	0	9
Gogebic	0	16
Houghton	0	9
Iron	0	25
Keweenaw	0	0
Luce	0	30
Mackinac	0	12
Marquette	0	93
Menominee	2	33
Ontonagon	0	10
Schoolcraft	1	10

Domestic violence can be an important contributor to poor health in the victims. It is estimated that a quarter of women will experience domestic violence in their lifetimes. Victims are at greater risk for mental health issues, including depression, anxiety, and post-traumatic stress disorder, as well as substance abuse and smoking. Because domestic violence is based on exerting power and control over the victim, escaping the relationship is often very complicated. Many of the victims fear they will be killed if they try to leave the relationship. The dynamics of power and control in domestic violence is shown in **Figure 12-1**. [5]

Episodes of domestic violence in 2019 by county in the Upper Peninsula are reported in **Table 12-3**. [6] These data are presumed to understate the scope of domestic violence, because studies show that a considerable percentage of abuse, harassment, and physical violence goes unreported and the state registry does not include all Children’s Protective Services cases or all clients in shelter homes – only the cases reported to police in which the officer determines a criminal offense has been committed.

Table 12-3: Domestic Violence in Upper Peninsula, 2019

Jurisdiction	Number	Females	White	Black	Native American
Michigan	55,016	40,913	28,912	26,138	99
Upper Peninsula	634	463	545	26	22
Alger	19	14	19	0	0
Baraga	10	7	6	1	2
Chippewa	55	34	41	2	6
Delta	88	64	72	1	2
Dickinson	23	17	22	1	0
Gogebic	73	58	62	2	7
Houghton	13	10	9	1	0
Iron	20	15	19	0	0
Keweenaw	0	0	0	0	0
Luce	33	25	32	1	0
Mackinac	15	12	11	3	0
Marquette	204	150	183	9	4
Menominee	34	23	26	3	0
Ontonagon	15	9	13	0	1
Schoolcraft	32	25	30	2	0

12.3 Crimes Involving Alcohol and Drugs

High rates of heavy drinking increase the risk of not only motor vehicle accidents²⁷ but also are associated with domestic violence [9] and other violent crime. [10]

²⁷ In 2016, 10,497 people died in alcohol-impaired driving crashes, accounting for 28% of all traffic-related deaths in the United States. [7,8]



Figure 12-1: Power and Control in Physical and Sexual Violence

12.3.1 Driving under the Influence

In the State of Michigan, driving under the influence falls into a couple categories for tabulation purposes. One category, “operating under the influence of liquor” (OUIL), combines the total arrests for operating a vehicle under the influence of liquor, unlawful bodily alcohol content, operating a vehicle while under the influence of drugs, and high blood alcohol content, while “operating with presence of drugs” (OWPD) is a separate offense. Implied Consent Suspensions are cases in which the driver is arrested, refused to submit to a chemical test, and, consequently had his/her license suspended. In Michigan, operating while intoxicated is defined as a blood alcohol level above 0.08% or higher. [11]

Table 12-4: Michigan Statewide Breath Testing Program, 2019

County	Breath							Blood						
	Total	0	0.01-0.07	0.08-0.09	0.10-0.16	0.17+	Total	0	0.01-0.07	0.08-0.09	0.10-0.16	0.17+	Refused	
Alger	49	25	0	0	3	15	7	20	9	0	0	6	4	4
Baraga	46	28	0	1	3	11	13	16	7	1	1	2	5	2
Chippewa	205	93	2	3	8	40	40	84	76	1	0	5	2	28
Delta	183	31	1	0	0	16	14	129	48	3	5	35	38	23
Dickinson	151	11	0	1	3	4	3	125	78	4	2	17	24	15
Gogebic	80	63	3	2	5	31	22	11	8	0	0	2	1	6
Houghton	149	61	1	2	0	40	18	73	56	1	0	5	11	15
Iron	51	31	1	0	4	15	11	14	9	0	0	2	3	6
Keweenaw	6	4	1	0	0	2	1	1	1	0	0	0	0	1
Luce	26	12	2	0	1	3	6	10	4	1	0	1	4	4
Mackinac	82	37	4	6	2	16	9	41	28	1	1	5	6	4
Marquette	353	144	4	2	9	88	41	173	116	3	4	14	36	36
Menominee	116	61	3	1	5	33	19	43	31	0	1	2	9	12
Ontonagon	20	17	0	0	1	9	7	3	2	0	0	1	0	0
Schoolcraft	24	6	0	2	0	2	2	13	7	0	1	3	2	5
Upper Peninsula Total	1541	624	22	20	44	325	213	756	480	15	15	100	145	161

Table 12-4 shows the breath and blood alcohol levels in those tested in 2019 in each Upper Peninsula county as part of the Michigan Statewide Breath Testing program.

The number of arrests per 10,000 population for these offenses in each of the counties in the Upper Peninsula in 2019 is presented in **Table 12-5**. Nine counties in the Upper Peninsula are in the top twenty counties in the State of Michigan, with Mackinac County being ranked number one! [10] The number of crashes by vehicle type and whether or not alcohol or drugs were involved for the Upper Peninsula and the State of Michigan in 2019 are presented in **Table 12-6**. The yearly tabulations (including deer crashes) are listed in **Table 12-7**. Crashes in 2019 by county are listed **Table 12-8**.

Table 12-5: Arrests for OUIL* and OWPD* per 10,000 Population, 2019

County	Number	per 10K	Rank	ICS*
Alger	49	53.8	14	8
Baraga	46	56.04	12	4
Chippewa	205	54.89	13	15
Delta	183	51.14	18	17
Dickinson	151	59.83	8	9
Gogebic	80	57.25	10	4
Houghton	149	41.79	31	13
Iron	51	46.09	22	5
Keweenaw	6	28.36	60	1
Luce	26	41.74	32	4
Mackinac	82	75.93	1	3
Marquette	353	52.92	15	22
Menominee	116	50.92	19	12
Ontonagon	20	34.97	46	0
Schoolcraft	24	29.65	58	3
Upper Peninsula Total	1541			120
* OUIL = Operating under the influence of liquor; OWPD = Operation with presence of drugs; ICS=Implied Consent Suspensions				

Table 12-6: Crashes by Vehicle Type and Alcohol Involvement, Upper Peninsula and Michigan, 2019

	Total	Alcohol		Drugs		Both		Either	
		OIC*	OD*	OIC	OD	OIC	OD	OIC	OD
Upper Peninsula									
Bicyclist	37	0	0	0	0	0	0	0	0
Killed	0	0	0	0	0	0	0	0	0
Drivers	13,024	333	258	111	70	77	53	521	381
Killed	31	8	8	2	2	4	4	14	14
Motorcycles	113	15	13	0	0	3	3	18	16
Killed	6	2	2	0	0	1	1	3	3
ATV	70	15	14	0	0	3	3	18	17
Killed	2	2	2	0	0	0	0	2	2
Pedestrians	34	4	3	2	0	2	2	8	5
Killed	3	2	2	0	0	1	1	3	3
Snowmobiles	92	11	11	0	0	0	0	11	11
Killed	5	1	1	0	0	0	0	1	1
Michigan									
Bicyclist	1,501	45	32	8	4	1	0	54	36
Killed	21	1	1	3	2	0	0	4	3
Drivers	535,721	12,947	8,416	2,227	1,369	1,886	1,179	17,060	10,964
Killed	631	114	100	76	55	80	67	270	222
Motorcycles	3,083	250	217	37	27	38	30	325	274
Killed	122	25	23	14	8	11	11	50	42
ATV	360	66	63	0	0	5	5	71	68
Killed	7	4	4	0	0	0	0	4	4
Pedestrians	2,403	230	174	31	10	38	27	299	211
Killed	149	34	23	14	9	20	14	68	46
Snowmobiles	163	18	18	0	0	1	1	19	9
Killed	8	2	2	0	0	1	1	3	3

* OIC=operator in crash; OD=operator drinking/drugs

Table 12-7: Motor Vehicle Accidents, Upper Peninsula and Michigan, 2010-2019

Year	Michigan				Upper Peninsula					
	Deer Crashes	Alcohol Deaths	Injuries	Fatal Crashes	All Deaths	Injuries	Fatal Crashes	Alcohol Deaths	Injuries	Fatal crashes
2010	55,867	283	5,458	264	42	1,944	40	14	250	14
2011	53,592	274	5,377	253	41	1,974	39	14	205	14
2012	48,918	281	5,475	260	30	1,827	30	14	178	14
2013	49,205	284	5,252	257	39	1,778	36	20	140	18
2014	45,690	236	4,883	222	23	1,696	20	5	152	5
2015	47,002	303	5,232	271	25	1,603	25	10	157	10
2016	46,870	274	5,507	254	32	1,541	29	12	161	10
2017	50,949	359	5,685	320	39	1,654	35	13	187	13
2018	53,464	315	5,392	287	35	1,538	33	8	157	8
2019	55,531	295	5,364	266	40	1,548	37	15	180	15

Table 12-8: Types of MVAs by County, 2019

	Crashes	Single Car	Percent SCC	Fatal Crash	Injuries	Fatalities	Injured	EtOH	Fatal	Ainj	Binj	Cinj	PDO	Deer	2018 ETFat	2018 Fat	FC rates*
Alger	285	162	56.8	4	48	5	64	15	0	3	3	3	6	81	0	0	0
Baraga	290	231	79.7	2	32	2	51	8	1	1	1	0	5	170	1	2	0.1218
Chippewa	934	525	56.2	3	109	3	142	36	2	7	4	5	18	356	0	5	0.1852
Delta	1316	764	58.1	3	137	3	192	25	1	4	4	3	13	576	1	4	0.0279
Dickinson	899	557	62	1	103	1	143	29	0	5	4	4	16	448	1	3	0
Gogebic	234	136	58.1	1	48	2	70	17	0	3	1	3	10	76	0	2	0.1748
Houghton	863	367	42.5	4	108	4	143	33	1	4	5	4	19	186	0	3	0.028
Iron	476	393	82.6	1	33	1	51	17	0	4	3	2	8	321	0	0	0
Keweenaw	61	52	85.2	0	10	0	41	3	0	0	0	0	3	18	1	1	0
Luce	180	135	75	0	25	0	38	10	0	1	1	2	6	84	0	0	0
Mackinac	660	539	81.7	3	58	4	77	19	2	2	4	3	8	356	0	5	0.1852
Marquette	1803	722	40	8	268	8	358	60	5	9	7	9	30	350	2	7	0.075
Menominee	428	229	53.5	4	90	4	124	24	1	4	6	1	12	117	1	1	0.0439
Ontonagon	289	252	87.2	2	21	2	27	4	1	1	0	0	2	184	1	1	0.1748
Schoolcraft	422	342	81	1	40	1	54	13	1	2	1	0	9	224	0	1	0.1235
Upper Peninsula	9,140	5,406	59.1	37	1,130	40	1,575	313	15	50	44	39	165	3,547			

* all with non-zero value were above the state average.

12.3.2 Production/Distribution of Drugs

In the Michigan Incident Crime Reporting, [11,13] two violations have been earmarked. The first, Violation of Controlled Substance Act (35001), is defined as “The unlawful cultivation, manufacture, distribution, sale, purchase, use, possession, transportation, importation, of any controlled drug or narcotic substance.” The second, Narcotic Equipment Violations (35002), is defined as, “The unlawful manufacture, sale, purchase, possession, or transportation of equipment or devices utilized in preparing and/or using drugs or narcotics. Includes cases with drug paraphernalia, equipment, chemicals, illegal labs, etc.” The number of these violations in 2019 by county are listed in **Table 12-9**.

Jurisdiction	35001*			35002*		
	# of incidences	# of offenses	# of arrests	# of incidences	# of offenses	# of arrests
Michigan	20,766	23,059	13,639	1,638	5,067	1,638
Alger	23	24	21	0	15	0
Baraga	46	50	23	1	26	0
Chippewa	121	125	62	0	31	0
Delta	144	145	89	0	46	0
Dickinson	30	32	6	0	17	0
Gogebic	31	32	28	0	4	0
Houghton	69	71	32	0	32	0
Iron	31	33	35	0	13	0
Keweenaw	3	3	0	0	0	0
Luce	42	42	24	1	14	1
Mackinac	37	37	23	0	11	0
Marquette	260	279	244	7	54	1
Menominee	103	112	67	0	31	0
Ontonagon	1	1	0	0	0	0
Schoolcraft	24	24	22	0	0	0
Upper Peninsula	965	1,010	676	9	294	2

* See text for definition of violation types

12.4 Future Implications

Being and feeling safe impact both physical and mental health. Accidental and non-accidental injuries can result in substantial morbidity and mortality. It is in the community's interest to limit these threats to health through laws, regulations, and local orders. As new vehicles are being designed to enhance their safety, the behavior issues that lead to accidents, violence, and crime remain to be addressed.

References

- [1] Department of Justice. Federal Bureau of Investigation 2018 Crime in the United States. <https://ucr.fbi.gov/crime-in-the-u.s/2018/crime-in-the-u.s.-2018/topic-pages/violent-crime>. Accessed May 18, 2021.
- [2] Rankings & Roadmaps. www.countyhealthranking.org. Accessed March 1, 2021.
- [3] Michigan State Police. Michigan Incident Crime Reporting. <http://www.micrstats.state.mi.us/MICR/Reports/Query.aspx>. Accessed June 23, 2021.
- [4] Find Law. Michigan Domestic Violence Laws. Last updated March 22, 2018. <https://statelaws.findlaw.com/michigan-law/michigan-domestic-violence-laws.html>. Accessed May 18, 2021.
- [6] Michigan State Police. Michigan Incident Crime Reporting. 2019 Domestic Violence Information Michigan.gov/documents/msp/Domestic_Violence_2019_697030_7.pdf. Accessed March 17, 2021.
- [7] National Highway Traffic Safety Administration. Traffic Safety Facts 2016 data: alcohol-impaired driving. U.S. Department of Transportation, Washington, DC; 2017. Accessed 16 April 2018.
- [8] Centers for Disease Control and Prevention. Transportation Safety: Impaired Driving: Get the Facts. https://www.cdc.gov/transportationsafety/impaired_driving/impaired-driv_factsheet.html. Accessed May 18, 2021.
- [9] Centers for Disease Control and Prevention. Violence Prevention. Intimate Partner Violence. Risk and Protective Factor for Perpetration. <https://www.cdc.gov/violenceprevention/intimatepartnerviolence/riskprotectivefactors.html>. Accessed May 18, 2021.
- [10] Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). Excessive Alcohol Use. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/alcohol.htm>. Accessed May 18, 2021.
- [11] Michigan Department of State Police. Criminal Justice Information Center. 2019 Michigan Annual Drunk Driving Audit. July 1, 2020. https://www.michigan.gov/documents/msp/2019_Drunk_Driving_Audit_FINAL_APPROVED_6-29-20_695564_7.pdf. Accessed March 18, 2021.
- [12] Michigan Department of State Police. Criminal Justice Information Center. Michigan Incident Crime Reporting. User and Technical Manual Version 1.4.0. September 2020. https://www.michigan.gov/documents/msp/MICR_Manual_653163_7.pdf. Accessed March 18, 2021.
- [13] Actual numbers: <http://www.micrstats.state.mi.us/MICR/Reports/Query.aspx>. Accessed March 18, 2021.
- [5] Domestic Abuse Intervention Project. Power and control wheel of physical and sexual violence. Duluth, MN: Domestic Abuse Intervention Project. <https://www.theduluthmodel.org/wp-content/uploads/2017/03/PowerandControl.pdf>. Accessed September 27, 2021.

13 REGIONAL ADULT HEALTH SURVEY

13.1 Introduction

On behalf of 42 local, regional, and state partners, the Western Upper Peninsula Health Department conducted a behavioral risk factor survey of Upper Peninsula adults in August 2021. Survey results, which follow this introduction, provide county-level and regional data on physical and mental health status; access to primary care, dental care, mental health counseling and substance abuse treatment services; use of screening and preventive health care services; the prevalence of chronic diseases and disabilities; and certain behaviors linked to health status, morbidity, and mortality, including diet, exercise, and use of alcohol, tobacco, and other drugs.

The survey was inspired by and modeled on the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFS). [1]

The smallest geographic area for which Michigan BRFS data are provided is at the level of the health department jurisdiction. Because of the small number of interviews conducted in each local health district each year, BRFS data must be aggregated over a three-year interval to produce meaningful estimates for prevalence rates. In the Upper Peninsula, only two of the 15 counties (Chippewa and Marquette) have health departments serving a single county. The remaining 13 counties are served by district health departments that cover between two and five counties each. The UPCHIPS was undertaken with enough participants to provide reliable estimates of the prevalence of chronic diseases, disabilities, health behaviors, and health access at the county level.

13.2 Local Survey Methodology

While the Michigan and nationwide BRFS surveys collect their data through phone calls, the UPCHIPS has been conducted by mail rather than by telephone for several reasons. In a 2019 survey, 60.3% of U.S. households only had cellular phones: [2] a situation that markedly reduces those available to complete the survey if only landlines are called. Given the increase in phone solicitations, people are reluctant to answer a call from a number with which they are not familiar. A 2005 study found estimates from BRFS surveys distributed by mail and those conducted over the telephone yielded roughly equivalent results, with the exception that self-administered surveys produced higher estimates than interviewer-administered surveys for questions about sensitive behaviors, such as binge drinking. [3]

13.2.1 Sample

The sample for the 2021 Community Health Survey of Upper Peninsula Adults was purchased from Marketing Systems Group. The sample was address-based and drawn from a database matched to the United States Postal Service's Delivery Sequence File. Prior to drawing the sample, 14 sampling frames were defined: Alger County, Baraga County, Delta County, Dickinson County, Gogebic County, Houghton and Keweenaw counties combined, Iron County, Luce County, Mackinac County, Marquette County, Menominee County, Ontonagon County, and Schoolcraft County. From each of these frames, 1700 addresses classified as residential and occupied were randomly selected with an equal probability of being chosen. Seasonal and educational addresses were eligible for selection. Households that received the survey were instructed to have the adult with the next birthday complete it. This instruction was intended to yield an approximately random sample of adults within each household.

13.2.2 Survey Design

Packets containing a cover letter, survey, and postage-paid pre-addressed return envelope were prepared and mailed to the entire sample of 23,800 addresses in August 2021. The packet included instructions for accessing an online version of the same survey, which was better utilized in 2021 than in 2017. Households that returned completed surveys early qualified for a prize drawing consisting of eight \$50 grocery gift cards. No reminders were sent.

The majority of the questions used in the survey were taken directly from the mail-out versions of the BRFSS piloted in several states. A few original questions were added to the 2012 survey after being piloted with 29 adult volunteers. The majority of the questions, wording, and format remained the same since 2012, although a small number of questions were replaced with new questions. The new questions added in 2017 were not piloted. The questions in the current survey are unchanged from the 2017 survey.

State-level data are available from the 2018-2020 and the 2020 survey cycles for most indicators presented here. These results have been included for rough benchmarking purposes in the tables that follow. If a Michigan rate is provided for a particular indicator, the year or years of the source data are noted in the table. Not all questions are included each year in the statewide BRFSS. There are a few questions developed locally or where the phrasing of the question varies significantly from the statewide BRFSS. In these cases, if no analogous Michigan standard is available or the wording of the question is different, this is noted in the table.

13.2.3 Response Rate

Table 13-1 summarizes the response rate for each sampling frame and the fourteen frames combined as well as the number of surveys completed online or returned by mail that were largely complete and had the necessary demographic data so that they could be included in the analysis. The estimate of 1,500 deliverable surveys per population frame (about 88% deliverable) was chosen based on rates of delivered versus return-to-sender surveys in 2012. [4] The response rate is calculated as the number of completed surveys within a frame divided by the number of surveys that appeared to be successfully delivered.

The trend in survey response rate for the four surveys is shown in **Figure 13-1**. The number of responses to the 2021 survey was 26.3% lower than the number of responses to the 2017 survey. The lower response rate compared to the past may reflect a couple of trends. First, the use of surveys has exploded in the past decade. It is difficult to make a purchase or engage in call support services without being asked to complete a survey. As a consequence, Americans are surveyed more frequently and may be less willing to complete “yet another” survey.

Second, the public health interventions have been highly politicized during the COVID-19 pandemic. As a consequence, there may be an overriding negative sentiment towards local health departments and an unwillingness to cooperate in providing information that will help guide future efforts to improve the health of our communities. This sentiment may be reflected by a marked increase in the number of surveys that were returned in which the questions were not answered, but instead, a number of inflammatory remarks were written. Thirty-four surveys were returned that could not be processed. Of

Table 13-1: UPCHIPS Responses by County, 2021, 2017

	2021		2017	
	Number	Percentage[a]	Number	Percentage[a]
Alger	271	18.0	336	22.4
Baraga	253	16.9	391	26.1
Chippewa	213	14.2	282	18.8
Delta	204	13.6	324	21.6
Dickinson	228	15.2	310	20.7
Gogebic	249	16.6	353	23.5
Houghton/Keweenaw	269	17.9	359	23.9
Iron	254	16.9	341	22.7
Luce	261	17.4	337	22.4
Mackinac	251	16.7	298	19.9
Marquette	277	18.4	325	21.7
Menominee	203	13.5	272	18.1
Ontonagon	370	24.7	524	34.9
Schoolcraft	249	16.6	368	24.5
[a] Based on 1500 of the 1700 surveys mailed being delivered.				
No difference in distribution of returned surveys by county: $\chi^2_{13} = 14.81, p=.6014$.				

these, 14 could not be processed because those completing the surveys did not include demographic information, including seven that did not indicate their county of residence. Six returned surveys were not completed because they were delivered after August 16, 2021. Four could not find the 5-digit code on the cover letter. One respondent checked both genders and all counties on the survey. Two blank surveys were returned. Six surveys failed to complete the survey expressing concerns regarding invasion of privacy, including one who believed the survey was a “corporate scam” to collect free confidential information. One questioned whether their household was chosen randomly. A couple of surveys included vulgar comments with suggestions that are anatomically impossible.

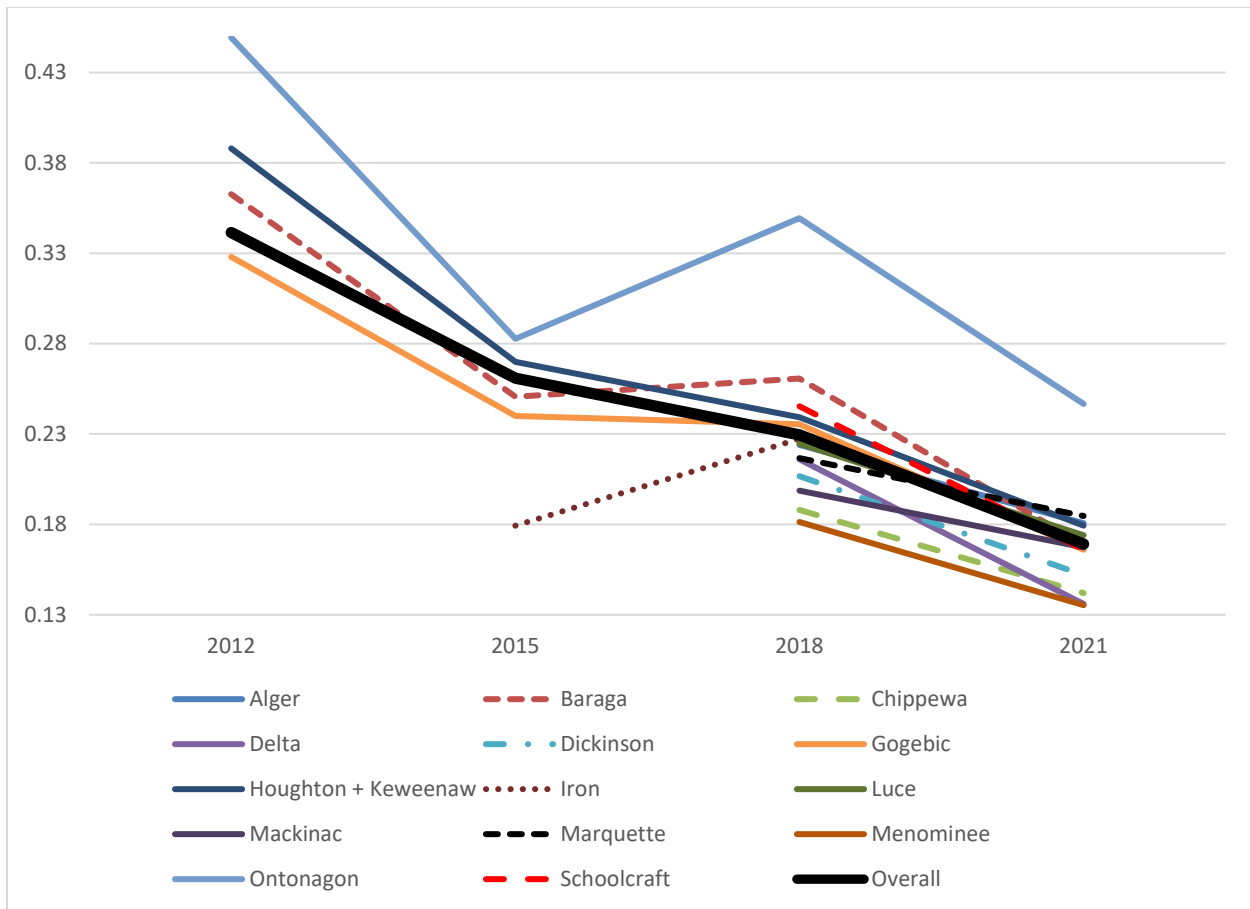


Figure 13-1: Response Rates to Regional Adult Health Surveys, 2012-2021

It is unfortunate that given the opportunity to provide input on how to improve a local institution that has drawn criticism, some critics have passed up an opportunity to provide useful feedback, but rather made suggestions that are anatomically impossible.

While our sample was organized by county, we suspected that in some cases zip codes that span multiple counties would result in a small percentage of addresses assigned to one sampling frame actually belonging in another. This prompted us to include a question in the survey asking the respondent to identify their county of residence. Accordingly, estimates are calculated based on the county of residence indicated by the respondent. Surveys were included in the analysis if they were largely complete and had the necessary demographic data for weighting.

13.2.4 Analysis

Data analysis was conducted by Kelly Kamm, PhD from the Department of Kinesiology and Integrative Physiology, Michigan Technological University in Houghton, and Robert S. Van Howe, MD, MS, the provisional Medical Director for the Western U.P. Health Department and the Dickinson-Iron District Health Department. All analyses were completed in SAS, version 9.4 (Cary, North Carolina). Survey data were assessed for completeness and consistency. Conflicting responses were adjudicated using standards developed by Ray Sharp and Kelly Kamm for the 2017 UPCHIPS. Survey data were weighted to

account for the probability of selection within the household (design weight) and for the overrepresentation of certain demographic characteristics among survey respondents (post-stratification weight). In order to prevent a specific respondent from contributing excessively to the overall estimate, the design weight was limited to a maximum of five adults per household. To correct for differences between the survey respondents and the population of the Upper Peninsula, post-stratification weighting was used for age, sex, education level, and income level. These characteristics are a subset of the weighting characteristics used by the BRFSS. Overall Upper Peninsula estimates were also weighted for the population of the identified county of residence, with Keweenaw and Houghton counties being combined because of the small population of Keweenaw County. Keweenaw County, by far the least populous county in Michigan, literally does not have the requisite 1,700 households employed in the survey sample design, and Keweenaw County residents access health care and social services primarily in adjacent Houghton County. The address sample for the combined two-county population frame was drawn proportionately to the numbers of household addresses in the Marketing Systems Group database, so with many times greater representation from residents of the more populous Houghton County, but the respondents among the two counties were combined and weighted according to the total two-county adult population, without further re-weighting for relative distribution between the counties.

County-level data from the 2020 American Community Survey were used to represent population estimates of the distribution of age, sex, education, and income. Weighting for each characteristic was calculated sequentially, with age and gender calculated together. The weight for age and gender was calculated and applied to the data. A weighted frequency for education was generated and an education weight was calculated. The product of the two weights was applied to the data and a weighted frequency for income was then generated. An income weight was calculated and the post-stratification weight was calculated as the product of the three weights for each observation. The weighted frequency of age, gender, education, and income were compared to the population data for each county. A second iteration was completed to improve comparability between the population data and weighted sample estimates. Observations missing a response to a weighting variable were assigned a weight of “1” for the missing response. Because of the variability in response rates to individual questions and differences in relevant subpopulations for particular questions, not all estimates are based on the same total sample size. Questions regarding health screening tests and knowledge of chronic disease diagnoses included a response option of “Don’t know.” Responses of “Don’t know” were categorized as “No.”

Statewide estimates are based on the Michigan BRFSS. Estimates for the Upper Peninsula are based on the UPCHIPS data weighted based on each county’s population. Where available, estimates for the Upper Peninsula, based on the Michigan BRFSS data collected from 2018 through 2020, are provided and labeled as such.

13.2.5 Results

13.2.5.1 Demographics

The raw (unadjusted) demographics of those who completed the UPCHIPS in both 2017 and 2021 are shown in **Table 13-2**. In 2017 the ratio of female respondents to male respondents was 1.74:1. In 2021 the ratio was 1.68:1. The ratio remained unchanged between the surveys ($\chi^2=0.27$, $p=.6014$). The men who answered were on average 2.4 years older in the 2021 UPCHIPS and 2.7 years older in the 2017 UPCHIPS. Statistically significant differences in both income level and education level were seen based

on gender and county of residence. Not surprisingly, the age of the respondents varied significantly from county to county ($p < .0001$ in both 2017 and 2021) (also see **Table 3-3**). Those who responded to the 2021 UPCHIPS had significantly higher levels of education and income than those who responded to the 2017 UPCHIPS. Given these differences, any comparisons between the responses given in 2021 and 2017 were controlled for age, sex, level of education, and income level. The raw demographics of those completing the surveys at the county level are shown in **Tables 13-3** through **13-16**.

13.2.5.2 Responses to Survey Questions

The responses to survey questions are broken down at the county level with data being weighted for age, sex, education level, and income level. An estimate for the Upper Peninsula as a whole is further weighted for the populations of the counties. Where available, weighted state-level [5 and national responses are provided for comparison. These estimates and 95% confidence intervals are provided in the “**A**” tables of **Table 13-19** through **Table 13-53**. The “**B**” tables of **Table 13-19** through **Table 13-53** break down the weighted responses by age group, sex, education level, and income level. Each table has a two-page spread with the “**A**” table on the left and the “**B**” table on the right. These tables include results from the previous surveys for comparison.

A comparison of the responses in the 2021 UPCHIPS and the 2017 UPCHIPS that control for age, sex, education level, income level, and county of residence are presented in **Table 13-54**. As noted in section §13.2.5.1, the demographics of those who completed and returned the surveys shifted from the 2017 UPCHIPS to the 2021 UPCHIPS. To improve the accuracy of any comparisons, age, sex, education level, income level, and county of residence was included in the modeling. The results are expressed in adjusted odds ratios and 95% CIs. The odds ratio represents how many times higher the odds of a positive response increased in the 2021 survey compared to the 2017 survey.

Age, level of education, and socioeconomic status powerfully correlate with many measures of health. Chronic diseases are diagnosed and worsen over time, so older adults as a group report poorer health and higher lifetime prevalence of conditions like heart disease, cancer, and disability. For many, but not all, of the indicators that follow, people of higher income and education report better health status and healthier behaviors.

For some conditions that are chronic, progressive, and strongly associated with aging, the local prevalence of these conditions will be influenced by the local age distribution. A county with more elderly will have rates that are statistically worse than Michigan’s or other, younger counties. To allow more accurate comparisons between counties and the entire State of Michigan, estimates are weighted to adjust for differences in age distribution in each county and the age distribution of those completing the surveys.

Table 13-2: Demographics of UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	65.5 (14.3) [67]	63.9 (14.7) [65]
Women	64.6 (15.0) [66]	62.9 (15.2) [64]
Men	67.0 (13.0) [69]	65.6 (13.6) [67]
Difference[b]	2.43	2.68
Sex[c]	(percentage)	(percentage)
Female	2,183 (62.6%)	3,024 (63.5%)
Male	1,302 (37.4%)	1,739 (36.5%)
Educational Attainment[d]		
Less than 12th grade	111 (3.19%)	202 (4.24%)
High School graduate	1,101 (31.61%)	1,688 (35.43%)
1-3 years of college	1,115 (32.01%)	1,533 (32.18%)
4-year degree or higher	1,156 (33.19%)	1,341 (28.15%)
Household Income[e]		
Less than \$25,000	853 (25.02%)	1,408 (30.27%)
\$25,000 to \$49,999	1,158 (33.97%)	1,713 (36.83%)
\$50,000 or higher	1,398 (41.01%)	1,530 (32.90%)
[a] The average age of respondents in 2021 was 1.63 years older (95% confidence interval:1.00, 2.26, t=5.05, p<.0001) than respondents in 2021. When adjusted for education level, income level, sex, and county of residence, the 2021 respondent was 2.18 years older.		
[b] 2021: 95% confidence interval: 1.48, 3.38; t=5.03, p<.0001. 2017: 95% confidence interval: 1.84, 3.51; t=6.25, p<.0001.		
[c] Difference between 2017 and 2021: $\chi^2=0.27$, p=.6030.		
[d] Difference between 2017 and 2021: $\chi^2_3= 31.48$, p<.0001.		
[e] Difference between 2017 and 2021: $\chi^2_2= 59.50$, p<.0001.		

Table 13-3: Demographics of Alger County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	65.5 (13.6) [67]	63.8 (13.5) [65]
Women	65.0 (14.6) [66]	62.1 (13.5) [63]
Men	66.3 (12.0) [67]	66.5 (13.0) [68]
Difference[b]	1.23	4.32
Sex[c]	(percentage)	(percentage)
Female	167 (61.6%)	207 (61.6%)
Male	104 (38.4%)	129 (38.4%)
Educational Attainment[d]		
Less than 12th grade	7 (2.69%)	19 (5.71%)
High School graduate	74 (28.46%)	98 (29.43%)
1-3 years of college	84 (32.31%)	110 (33.03%)
4-year degree or higher	95 (36.54%)	106 (31.83%)
Household Income[e]		
Less than \$25,000	39 (15.35%)	86 (26.46%)
\$25,000 to \$49,999	93 (36.61%)	129 (39.69%)
\$50,000 or higher	122 (48.03%)	110 (33.85%)
[a] The average age of respondents in 2021 was 1.69 years older (95% confidence interval: -0.51, 3.89, t=1.51, p=.1314) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 2.61 years older (t=2.34, p=.0197).		
[b] 2021: 95% confidence interval: -2.03, 4.50; t=0.74, p=.4575. 2017: 95% confidence interval: 1.40, 7.24; t=2.91, p=.0039)		
[c] Difference between 2017 and 2021: $\chi^2=0.00$, p=.9967.		
[d] Difference between 2017 and 2021: $\chi^2_3=4.05$, p=.2563.		
[e] Difference between 2017 and 2021: $\chi^2_2=16.66$, p=.0004.		

Table 13-4: Demographics of Baraga County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.5 (13.2) [68]	64.1 (13.2) [65]
Women	65.8 (13.5) [67]	63.3 (13.2) [63]
Men	67.7 (12.6) [70]	65.3 (13.1) [67]
Difference[b]	1.92	2.01
Sex[c]	(percentage)	(percentage)
Female	172 (68.3%)	245 (62.7%)
Male	80 (31.7%)	146 (37.3%)
Educational Attainment[d]		
Less than 12th grade	7 (2.83%)	16 (4.12%)
High School graduate	93 (37.65%)	148 (38.14%)
1-3 years of college	92 (37.25%)	138 (35.57%)
4-year degree or higher	55 (22.27%)	86 (22.16%)
Household Income[e]		
Less than \$25,000	63 (26.25%)	106 (27.75%)
\$25,000 to \$49,999	91 (37.92%)	169 (44.24%)
\$50,000 or higher	86 (35.83%)	107 (28.01%)
[a] The average age of respondents in 2021 was 2.41 years older (95% confidence interval: 0.30, 4.52, t=2.24, p=.0255) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 2.81 years older (t=2.59, p=.0098).		
[b] 2021: 95% confidence interval: -1.54, 5.39; t=1.10, p<.2747. 2017: 95% confidence interval: -0.73, 4.73; t=1.45, p=.1475)		
[c] Difference between 2017 and 2021: $\chi^2=2.10$, p=.1469.		
[d] Difference between 2017 and 2021: $\chi^2_3=0.82$, p=.8444.		
[e] Difference between 2017 and 2021: $\chi^2_2=4.44$, p=.1087.		

Table 13-5: Demographics of Chippewa County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.3 (14.0) [68]	63.3 (15.3) [65]
Women	64.6 (14.6) [66]	61.6 (15.8) [64]
Men	68.7 (12.5) [71]	66.0 (14.1) [67]
Difference[b]	4.04	4.39
Sex[c]	(percentage)	(percentage)
Female	131 (61.8%)	170 (60.3%)
Male	81 (38.2%)	112 (39.7%)
Educational Attainment[d]		
Less than 12th grade	7 (3.37%)	11 (3.96%)
High School graduate	68 (32.69%)	89 (32.01%)
1-3 years of college	51 (24.52%)	82 (29.50%)
4-year degree or higher	82 (39.42%)	96 (34.53%)
Household Income[e]		
Less than \$25,000	52 (25.37%)	59 (22.01%)
\$25,000 to \$49,999	63 (30.73%)	107 (39.93%)
\$50,000 or higher	90 (43.90%)	102 (38.06%)
[a] The average age of respondents in 2021 was 2.93 years older (95% confidence interval: 0.30, 5.55, $t=2.19$, $p=.0288$) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 3.37 years older ($t=2.49$, $p=.0130$).		
[b] 2021: 95% confidence interval: 0.27, 7.81; $t=2.11$, $p=.0358$. 2017: 95% confidence interval: 0.82, 7.96; $t=2.42$, $p=.0160$)		
[c] Difference between 2017 and 2021: $\chi^2=0.12$, $p=.7337$.		
[d] Difference between 2017 and 2021: $\chi^2_3=1.98$, $p=.5759$.		
[e] Difference between 2017 and 2021: $\chi^2_2=4.26$, $p=.1186$.		

Table 13-6: Demographics of Delta County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.6 (14.8) [68]	63.0 (15.6) [65]
Women	66.2 (15.0) [67]	61.6 (16.6) [64]
Men	67.7 (14.6) [69]	66.0 (12.8) [67]
Difference[b]	1.52	4.37
Sex[c]	(percentage)	(percentage)
Female	146 (71.6%)	219 (67.6%)
Male	58 (28.4%)	105 (32.4%)
Educational Attainment[d]		
Less than 12th grade	11 (5.45%)	7 (2.19%)
High School graduate	60 (29.70%)	128 (40.13%)
1-3 years of college	72 (35.64%)	111 (34.80%)
4-year degree or higher	59 (29.21%)	73 (22.88%)
Household Income[e]		
Less than \$25,000	54 (27.98%)	105 (33.87%)
\$25,000 to \$49,999	60 (31.09%)	97 (31.29%)
\$50,000 or higher	79 (40.93%)	108 (34.84%)
[a] The average age of respondents in 2021 was 3.61 years older (95% confidence interval: 0.93, 6.29, $t=2.65$, $p=.0084$) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 4.26 years older ($t=3.10$, $p=.0020$).		
[b] 2021: 95% confidence interval: -3.04, 6.08; $t=0.66$, $p=.5106$. 2017: 95% confidence interval: 1.04, 7.70; $t=2.58$, $p=.0104$.		
[c] Difference between 2017 and 2021: $\chi^2=0.93$, $p=.3356$.		
[d] Difference between 2017 and 2021: $\chi^2_3=9.48$, $p=.0235$.		
[e] Difference between 2017 and 2021: $\chi^2_2=2.50$, $p=.2871$.		

Table 13-7: Demographics of Dickinson County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	64.1 (14.9) [66]	63.8 (15.9) [65]
Women	62.7 (14.8) [64.5]	63.7 (16.3) [64.5]
Men	66.4 (14.9) [68]	63.8 (15.3) [65]
Difference[b]	3.73	0.09
Sex[c]	(percentage)	(percentage)
Female	138 (60.8%)	215 (69.4%)
Male	89 (39.2%)	95 (30.6%)
Educational Attainment[d]		
Less than 12th grade	2 (0.90%)	11 (3.56%)
High School graduate	75 (33.63%)	120 (38.83%)
1-3 years of college	79 (35.43%)	86 (27.83%)
4-year degree or higher	67 (30.04%)	92 (29.77%)
Household Income[e]		
Less than \$25,000	47 (21.96%)	91 (30.54%)
\$25,000 to \$49,999	81 (37.85%)	91 (30.54%)
\$50,000 or higher	86 (40.19%)	116 (38.93%)
[a] The average age of respondents in 2021 was 0.39 years older (95% confidence interval: -2.25, 3.04, $t=0.29$, $p=.7711$) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 1.20 years older ($t=0.90$, $p=.3710$).		
[b] 2021: 95% confidence interval: -0.29, 7.74; $t=1.83$, $p=.0687$. 2017: 95% confidence interval: -3.71, 3.88; $t=0.04$, $p=.9643$.		
[c] Difference between 2017 and 2021: $\chi^2=4.26$, $p=.0389$.		
[d] Difference between 2017 and 2021: $\chi^2_3=7.13$, $p=.0680$.		
[e] Difference between 2017 and 2021: $\chi^2_2=5.43$, $p=.0662$.		

Table 13-8: Demographics of Gogebic County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.3 (13.9) [69]	63.9 (14.6) [66]
Women	64.7 (15.8) [68]	63.1 (15.5) [65]
Men	68.4 (10.7) [69]	65.2 (12.8) [66]
Difference[b]	3.72	2.04
Sex[c]	(percentage)	(percentage)
Female	138 (55.4%)	224 (63.5%)
Male	111 (44.6%)	129 (36.5%)
Educational Attainment[d]		
Less than 12th grade	5 (2.04%)	7 (2.00%)
High School graduate	69 (28.16%)	94 (26.86%)
1-3 years of college	80 (32.65%)	137 (39.14%)
4-year degree or higher	91 (37.14%)	112 (32.00%)
Household Income[e]		
Less than \$25,000	74 (30.45%)	138 (39.88%)
\$25,000 to \$49,999	73 (30.04%)	109 (31.50%)
\$50,000 or higher	96 (39.51%)	99 (28.61%)
[a] The average age of respondents in 2021 was 2.47 years older (95% confidence interval: 0.15, 4.78, t=2.10, p=.0366) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 2.61 years older (t=2.20, p=.0282).		
[b] 2021: 95% confidence interval: 0.38, 7.07; t=2.20, p=.0290. 2017: 95% confidence interval: -0.98, 5.06; t=1.33, p=.1845.		
[c] Difference between 2017 and 2021: $\chi^2=3.93$, p=.0474.		
[d] Difference between 2017 and 2021: $\chi^2_3=2.87$, p=.4117.		
[e] Difference between 2017 and 2021: $\chi^2_2=8.74$, p=.0126.		

Table 13-9: Demographics of Houghton/Keweenaw Counties UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	63.5 (15.2) [66]	60.3 (16.4) [63]
Women	62.3 (15.3) [65.5]	59.4 (16.2) [62]
Men	65.5 (14.9) [68]	61.8 (16.6) [65]
Difference[b]	3.18	2.36
Sex[c]	(percentage)	(percentage)
Female	168 (62.5%)	215 (59.9%)
Male	101 (37.5%)	144 (40.1%)
Educational Attainment[d]		
Less than 12th grade	5 (1.89%)	11 (3.10%)
High School graduate	62 (23.40%)	97 (27.32%)
1-3 years of college	84 (31.70%)	113 (31.83%)
4-year degree or higher	114 (43.02%)	134 (37.75%)
Household Income[e]		
Less than \$25,000	60 (22.90%)	106 (30.64%)
\$25,000 to \$49,999	76 (29.01%)	105 (30.35%)
\$50,000 or higher	126 (48.09%)	135 (39.02%)
[a] The average age of respondents in 2021 was 3.10 years older (95% confidence interval: 0.60, 5.61, t=2.43, p=.0153) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 3.81 years older (t=2.96, p=.0032).		
[b] 2021: 95% confidence interval: -0.59, 6.95; t=1.66, p=.0978. 2017: 95% confidence interval: -1.15, 5.87; t=1.32, p=.1863.		
[c] Difference between 2017 and 2021: $\chi^2=0.43$, p=.5144.		
[d] Difference between 2017 and 2021: $\chi^2_3=2.83$, p=.4183.		
[e] Difference between 2017 and 2021: $\chi^2_2=6.22$, p=.0447.		

Table 13-10: Demographics of Iron County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.9 (14.4) [69]	65.8 (13.4) [66]
Women	66.5 (15.0) [69]	65.5 (14.3) [65]
Men	67.6 (13.5) [69]	66.3 (11.6) [67]
Difference[b]	1.05	0.82
Sex[c]	(percentage)	(percentage)
Female	157 (61.8%)	214 (62.8%)
Male	97 (38.2%)	127 (37.2%)
Educational Attainment[d]		
Less than 12th grade	4 (1.59%)	10 (2.96%)
High School graduate	87 (34.52%)	138 (40.83%)
1-3 years of college	89 (35.32%)	102 (30.18%)
4-year degree or higher	72 (28.57%)	88 (26.04%)
Household Income[e]		
Less than \$25,000	69 (27.71%)	111 (33.33%)
\$25,000 to \$49,999	89 (35.74%)	129 (38.74%)
\$50,000 or higher	91 (36.55%)	93 (27.93%)
[a] The average age of respondents in 2021 was 1.11 years older (95% confidence interval: -1.17, 3.40, t=0.96, p=.3395) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 1.85 years older (t=1.63, p=.1044).		
[b] 2021: 95% confidence interval: -2.54, 4.65; t=0.58, p=.5628. 2017: 95% confidence interval: -1.99, 3.63; t=0.57, p=.5660.		
[c] Difference between 2017 and 2021: $\chi^2=0.06$, p=.8138.		
[d] Difference between 2017 and 2021: $\chi^2_3=4.17$, p=.2438.		
[e] Difference between 2017 and 2021: $\chi^2_2=5.14$, p=.0764.		

Table 13-11: Demographics of Luce County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	66.1 (13.9) [67]	63.8 (15.9) [66]
Women	66.5 (14.3) [67]	62.8 (16.4) [65]
Men	65.4 (13.2) [67]	65.7 (14.6) [67]
Difference[b]	-1.13	2.94
Sex[c]	(percentage)	(percentage)
Female	159 (61.6%)	219 (65.0%)
Male	99 (38.4%)	118 (35.0%)
Educational Attainment[d]		
Less than 12th grade	13 (5.12%)	14 (4.24%)
High School graduate	86 (33.86%)	123 (37.27%)
1-3 years of college	76 (29.92%)	112 (33.94%)
4-year degree or higher	79 (31.10%)	81 (24.55%)
Household Income[e]		
Less than \$25,000	72 (28.80%)	104 (31.90%)
\$25,000 to \$49,999	80 (32.00%)	108 (33.13%)
\$50,000 or higher	98 (39.20%)	114 (34.97%)
[a] The average age of respondents in 2021 was 2.28 years older (95% confidence interval: -0.13, 4.69, t=1.86, p=.0641) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 2.12 years older (t=1.66, p=.0984).		
[b] 2021: 95% confidence interval: -4.59, 2.33; t=-0.64, p=.5201. 2017: 95% confidence interval: -0.54, 6.41; t=1.66, p=.0973.		
[c] Difference between 2017 and 2021: $\chi^2=0.71$, p=.3992.		
[d] Difference between 2017 and 2021: $\chi^2_3=3.68$, p=.2984.		
[e] Difference between 2017 and 2021: $\chi^2_2=1.19$, p=.5519.		

Table 13-12: Demographics of Mackinac County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	65.4 (13.4) [67]	64.7 (13.4) [66]
Women	64.1 (13.9) [66]	64.1 (13.7) [65]
Men	67.3 (12.6) [68]	65.9 (12.8) [68]
Difference[b]	3.2	1.88
Sex[c]	(percentage)	(percentage)
Female	155 (62.0%)	191 (64.1%)
Male	95 (38.0%)	107 (35.9%)
Educational Attainment[d]		
Less than 12th grade	10 (4.07%)	19 (6.46%)
High School graduate	64 (26.02%)	84 (28.57%)
1-3 years of college	69 (28.05%)	84 (28.57%)
4-year degree or higher	103 (41.87%)	107 (36.39%)
Household Income[e]		
Less than \$25,000	41 (17.08%)	72 (24.91%)
\$25,000 to \$49,999	77 (32.08%)	108 (37.37%)
\$50,000 or higher	122 (50.83%)	109 (37.72%)
[a] The average age of respondents in 2021 was 0.63 years older (95% confidence interval: -1.65, 2.91, $t=0.54$, $p=.5873$) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 0.94 years older ($t=0.81$, $p=.4176$).		
[b] 2021: 95% confidence interval: -0.18, 6.57; $t=1.87$, $p=.0365$. 2017: 95% confidence interval: -1.27, 5.03; $t=1.18$, $p=.2411$.		
[c] Difference between 2017 and 2021: $\chi^2=0.27$, $p=.6128$.		
[d] Difference between 2017 and 2021: $\chi^2_3=2.80$, $p=.4238$.		
[e] Difference between 2017 and 2021: $\chi^2_2=9.98$, $p=.0068$.		

Table 13-13: Demographics of Marquette County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	61.3 (16.5) [64.5]	59.9 (15.9) [63]
Women	59.8 (17.1) [63]	59.6 (15.8) [62]
Men	63.9 (14.9) [68]	60.4 (16.1) [64]
Difference[b]	4.11	0.78
Sex[c]	(percentage)	(percentage)
Female	180 (65.0%)	206 (63.4%)
Male	97 (35.0%)	119 (36.6%)
Educational Attainment[d]		
Less than 12th grade	6 (2.19%)	12 (3.73%)
High School graduate	62 (22.63%)	88 (27.33%)
1-3 years of college	87 (31.75%)	83 (25.78%)
4-year degree or higher	119 (43.43%)	139 (43.17%)
Household Income[e]		
Less than \$25,000	60 (22.06%)	74 (23.57%)
\$25,000 to \$49,999	85 (31.25%)	113 (35.99%)
\$50,000 or higher	127 (46.69%)	127 (40.45%)
[a] The average age of respondents in 2021 was 1.39 years older (95% confidence interval: -1.24, 4.00, t=1.04, p=.2990) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 1.92 years older (t=1.45, p=.1481).		
[b] 2021: 95% confidence interval: 0.19, 8.03; t=2.07, p=.0397. 2017: 95% confidence interval: -2.89, 4.44; t=0.42, p=.6766.		
[c] Difference between 2017 and 2021: $\chi^2=0.17$, p=.6838.		
[d] Difference between 2017 and 2021: $\chi^2_3=4.31$, p=.2296.		
[e] Difference between 2017 and 2021: $\chi^2_2=2.42$, p=.2975.		

Table 13-14: Demographics of Menominee County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	64.1 (15.0) [66]	65.2 (13.8) [66]
Women	64.1 (16.4) [67]	65.1 (14.3) [67]
Men	64.1 (12.6) [64]	65.4 (12.9) [65]
Difference[b]	-0.06	0.28
Sex[c]	(percentage)	(percentage)
Female	123 (60.6%)	173 (63.6%)
Male	80 (39.4%)	99 (36.4%)
Educational Attainment[d]		
Less than 12th grade	9 (4.50%)	21 (7.84%)
High School graduate	72 (36.00%)	117 (43.66%)
1-3 years of college	72 (36.00%)	79 (29.48%)
4-year degree or higher	47 (23.50%)	51 (19.03%)
Household Income[e]		
Less than \$25,000	60 (30.30%)	95 (37.25%)
\$25,000 to \$49,999	71 (35.86%)	96 (37.66%)
\$50,000 or higher	67 (33.84%)	64 (25.10%)
[a] The average age of respondents in 2021 was 1.14 years younger (95% confidence interval: -1.52, 3.80, t=0.84, p=.4016) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 0.13 years <i>older</i> (t=0.10, p=.9195).		
[b] 2021: 95% confidence interval: -4.11, 3.99; t=-0.03, p=.9762. 2017: 95% confidence interval: -3.10, 3.65; t=0.16, p=.8721.		
[c] Difference between 2017 and 2021: $\chi^2=0.45$, p=.5028.		
[d] Difference between 2017 and 2021: $\chi^2_3=6.25$, p=.0999.		
[e] Difference between 2017 and 2021: $\chi^2_2=4.62$, p=.0995.		

Table 13-15: Demographics of Ontonagon County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	68.3 (12.5) [69]	66.5 (13.6) [68]
Women	67.1 (13.0) [68]	65.2 (14.6) [67]
Men	70.2 (11.25) [71]	68.8 (11.5) [69]
Difference[b]	3.11	3.67
Sex[c]	(percentage)	(percentage)
Female	235 (63.5%)	330 (63.0%)
Male	135 (36.5%)	194 (37.0%)
Educational Attainment[d]		
Less than 12th grade	16 (4.42%)	21 (4.05%)
High School graduate	133 (36.74%)	228 (44.02%)
1-3 years of college	113 (31.22%)	178 (34.36%)
4-year degree or higher	100 (27.62%)	91 (17.57%)
Household Income[e]		
Less than \$25,000	105 (30.09%)	173 (34.53%)
\$25,000 to \$49,999	132 (37.82%)	207 (41.32%)
\$50,000 or higher	112 (32.09%)	121 (24.15%)
[a] The average age of respondents in 2021 was 1.71 years older (95% confidence interval: -0.03, 3.45, t=1.93, p=.0545) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 2.32 years older (t=2.56, p=.0108).		
[b] 2021: 95% confidence interval: 0.56, 5.68; t=2.39, p=.0173. 2017: 95% confidence interval: 1.39, 5.94; t=3.17, p=.0016.		
[c] Difference between 2017 and 2021: $\chi^2=0.03$, p=.8699.		
[d] Difference between 2017 and 2021: $\chi^2_3=13.38$, p=.0039.		
[e] Difference between 2017 and 2021: $\chi^2_2=6.60$, p=.0368.		

Table 13-16: Demographics of Schoolcraft County UPCHIPS Responses, 2021, 2017

	2021	2017
Age[a]	Mean (standard deviation) [Median]	Mean (standard deviation) [Median]
Total	65.2 (14.4) [68]	64.5 (13.8) [66]
Women	63.8 (15.4) [66.5]	62.1 (14.6) [63]
Men	67.9 (11.9) [69]	68.6 (11.4) [69]
Difference[b]	4.06	6.52
Sex[c]	(percentage)	(percentage)
Female	162 (65.3%)	233 (63.3%)
Male	86 (34.7%)	135 (36.7%)
Educational Attainment[d]		
Less than 12th grade	9 (3.67%)	23 (6.35%)
High School graduate	96 (39.15%)	136 (37.57%)
1-3 years of college	67 (27.35%)	118 (32.60%)
4-year degree or higher	73 (29.80%)	85 (23.48%)
Household Income[e]		
Less than \$25,000	57 (23.57%)	88 (24.58%)
\$25,000 to \$49,999	87 (36.25%)	145 (40.50%)
\$50,000 or higher	96 (40.00%)	125 (34.92%)
[a] The average age of respondents in 2021 was 0.73 years older (95% confidence interval: -1.57, 3.04, $t=0.62$, $p=.5323$) than respondents in 2017. When adjusted for education level, income level, and sex, the 2021 respondent was 1.31 years older ($t=1.17$, $p=.2425$).		
[b] 2021: 95% confidence interval: 0.57, 7.56; $t=2.29$, $p=.0229$. 2017: 95% confidence interval: 3.80, 9.23; $t=4.72$, $p<.0001$.		
[c] Difference between 2017 and 2021: $\chi^2=0.26$, $p=.6105$.		
[d] Difference between 2017 and 2021: $\chi^2_3=5.65$, $p=.1299$.		
[e] Difference between 2017 and 2021: $\chi^2_2=1.72$, $p=.4241$.		

13.2.5.3 Multivariate Analyses and Comparison Evaluations

The surveys from the 2017 and 2021 UPCHIPS provide a rich source of data. An ample number of questions were asked and enough people responded to provide robust analyses of the questions asked. For the questions in which there were a sufficient number of responses to provide reliable analysis, the impact of positive responses by the demographic factors of sex, education level, income level, age, and county of residence were all included in a logistic regression, multivariate model. The value reported for an individual factor is controlled for all of the other factors included in the model. For example, in the reports of poor or fair general health in the 2021 UPCHIPS the adjusted odds ratio for sex is 1.47, which meant that when adjusted for the other factors, the odds of a man reporting poor or fair health was 1.47 times higher than that of a woman reporting poor or fair general health. The 95% confidence interval (95%CI) ranging from 1.22 to 1.78 indicates that this same survey was repeatedly distributed to the same population, 95% of the survey results would fall within this range. The finding is statistically significant, using $p < .05$ as a standard because the value of 1.00 is not within the range reported. If the range included 1.00, the finding would not be statistically significant.

The adjusted odds ratio for reporting poor or fair general health for education level is 0.69 with a 95%CI of 0.61 to 0.77. In other words, going up *one* level of education resulted in the odds being 0.69 times higher – thus decreasing the odds. Going up a second level of education would result in the odds being another 0.69 times higher. So, going up two levels would result in the odds being 0.48 (0.69×0.69) times higher. A rough estimate of the percentage change using odds ratios is to take the reported odds ratio and subtract 1. In this example, $1.47 - 1 = 0.47$, or a 47% increase. $0.69 - 1 = -0.31$, or 31% decrease. For most questions, there was no significant impact on the county of residence. In models that found county of residence to be a significant factor, values for χ^2_{13} and p-values are provided.

13.2.6 Key Survey Findings

The tables and analyses that follow are self-explanatory a few items stick out.

13.2.6.1 Similarities between Surveys

When the responses given to the 2021 UPCHIPS are compared to those given to the 2017 UPCHIPS and surveys completed in 2015 and 2012, not much has changed. There have been few demographic shifts and the differences between counties persist. The negative impact of age, lower education level, and lower income level continue to make portions of population more prone to disease. The region continues to carry a heavy burden of illness, both physical and mental.

13.2.6.2 Differences between Surveys

While fewer residences are without health insurance, the COVID-19 pandemic limited access to medical professionals, which, in turn, led to a postponement of preventive screening opportunities. The region saw an increase in those reporting depressive disorders and anxiety disorders, which may have been provoked by the pandemic as well. Drug use increased for reasons that are not clear.

The legalization of marijuana in Michigan led to an almost three-fold increase in respondents reporting the use of marijuana products in the last month. This increase may reflect a willingness to admit to using these products now that it is legal, but it also may reflect a broadening of the population using these

products. Certainly, the proliferation of dispensaries may have had an influence.

A lack of leisure-time activities and exercising increased by 16%, perhaps the result of the lockdowns associated with the COVID-19 pandemic. Decreased access to physicians during the pandemic may also explain the decrease in those receiving health screening services and procedures.

The percentage of those diagnosed with depressive disorder and anxiety disorder increased as did the percentage of people taking medication and receiving treatment for mental health issues. The percentage of people calling or texting a crisis line also increased dramatically.

All forms of drug use increased from 2017. The nearly three-fold increase in those reporting using marijuana-containing products in the past month is likely the result of the legalization of recreational use of these products.

13.3 Topics

13.3.1 Health Status

General health was assessed by having respondents choose between “poor,” “fair,” “good,” “very good,” and “excellent.” A positive response was a combination of those responding either “poor” or fair.” A positive response for physical or mental health was reporting “poor” or “fair” health in 14 or more days in the past 30 days. The results of these questions are seen in **Tables 13-19A, 13-19B, 13-20A, and 13-20B**. From 2017 to 2021 there was an increase in positive responses regarding physical and mental health (see **Table 13-54**).

On multivariate analysis, those reporting “poor” or “fair” general health were more likely to be men (2021: adjOR=1.47, 95%CI: 1.22, 1.78; 2017: adjOR=1.30, 95%CI: 1.11, 1.54), be less educated (2021: adjOR=0.69, 95%CI: 0.61, 0.77; 2017: adjOR=0.75, 95%CI: 0.68, 0.83), and have lower income (2021: adjOR=0.50, 95%CI: 0.44, 0.57; 2017: adjOR=0.48, 95%CI: 0.43, 0.54).

On multivariate analysis, those reporting “poor” or “fair” physical health were more likely to be men in 2021 but not statistically significant in 2017 (2021: adjOR=1.46, 95%CI: 1.22, 1.76; 2017: adjOR=1.15, 95%CI: 0.98, 1.35), be less educated (2021: adjOR=0.69, 95%CI: 0.61, 0.77; 2017: adjOR=0.73, 95%CI: 0.67, 0.81), and have lower income (2021: adjOR=0.51, 95%CI: 0.45, 0.58; 2017: adjOR=0.51, 95%CI: 0.46, 0.57).

On multivariate analysis, those reporting “poor” or “fair” mental health were more likely to be women in 2021, but not 2017 (2021: adjOR=0.74, 95%CI: 0.60, 0.91; 2017: adjOR=1.07, 95%CI: 0.89, 1.29), be less educated in 2021 but not 2017 (2021: adjOR=0.76, 95%CI: 0.67, 0.88; 2017: adjOR=0.90, 95%CI: 0.79, 1.01), and have lower income (2021: adjOR=0.51, 95%CI: 0.44, 0.58; 2017: adjOR=0.44, 95%CI: 0.39, 0.50).

13.3.2 Disability

Based on the 2019 Michigan BRFSS survey, 30.4% of Michigan adults reported one or more disabilities:

- 7.9% reported a hearing disability
- 4.4% reported a vision disability

- 13.4 % reported a cognitive disability
- 15.2% reported a mobility disability
- 4.7% reported a self-care disability
- 8.7% reported an independent living disability

Generally, 17.0% of Michiganders with disabilities reported less than high school education; 29.2% reported low household income (below \$20,000), and 9.7% reported being uninsured. [6]

The UPCHIPS assessed disability by asking about activity limitations resulting from physical, mental, or emotional problems and about the required use of special equipment secondary to health problems. The results are shown in **Tables 13-21A** and **13-21B**. There was no statistically significant difference in the responses in the 2017 and 2021 UPCHIPS (see **Table 13-54**).

On multivariate analysis, those reporting their activities were limited secondary to illness were more likely to be men (2021: adjOR=1.31, 95%CI: 1.12, 1.53; 2017: adjOR=1.26, 95%CI: 1.10, 1.44), be less educated in 2021 but not 2017 (2021: adjOR=0.90, 95%CI: 0.82, 0.99; 2017: adjOR=0.95, 95%CI: 0.87, 1.03), and have lower income (2021: adjOR=0.56, 95%CI: 0.50, 0.62; 2017: adjOR=0.51, 95%CI: 0.47, 0.56).

On multivariate analysis, those reporting the required use of special equipment secondary to a health problem were similar in both men and women (2021: adjOR=1.10, 95%CI: 0.90, 1.34; 2017: adjOR=1.09, 95%CI: 0.91, 1.14), had received similar levels of education (2021: adjOR=0.98, 95%CI: 0.87, 1.11; 2017: adjOR=1.03, 95%CI: 0.93, 1.14), and have lower income (2021: adjOR=0.56, 95%CI: 0.49, 0.65; 2017: adjOR=0.52, 95%CI: 0.46, 0.59).

13.3.3 Health Care Access

The percentage of those uninsured, which decreased from 2012 to 2017, continued a statistically significant descent in 2021 (**Table 13-22A** and **Table 13-54**) following the implementation of the Affordable Care Act. Unfortunately, those who report not having anyone they thought of as their person health care provider remains high (**Table 13-22A**). This indicates the primary care needs of the community are not being met and an influx of professionals to provide these services is needed. The percentages who have found cost, lack of transportation as shown in **Tables 13-22A** and **13-22B**. The cost barrier to care decreased significantly from 2017 to 2021 (**Table 13-54**). About a quarter of those responding to the 2021 UPCHIPS did not have a routine checkup in the past year (**Tables 13-24A** and **13-24B**), which is consistent with the 2017 UPCHIPS (**Table 13-54**). Given the limited access to health care professionals during the height of the pandemic, this lack of change is remarkable.

On multivariate analysis, those from 18 to 64 years of age reporting no health insurance of any type were more likely to be men (2021: adjOR=2.26, 95%CI: 1.51, 3.37; 2017: adjOR=1.73, 95%CI: 1.28, 2.33), received similar levels of education (2021: adjOR=0.82, 95%CI: 0.64, 1.06; 2017: adjOR=0.88, 95%CI: 0.73, 1.06), and have lower income (2021: adjOR=0.52, 95%CI: 0.40, 0.69; 2017: adjOR=0.42, 95%CI: 0.33, 0.52).

On multivariate analysis, those reporting they did not have anyone they thought of as their personal doctor or health care provider were more likely to be men (2021: adjOR=1.74, 95%CI: 1.35, 2.24; 2017: adjOR=1.76, 95%CI: 1.43, 2.16), received similar levels of education (2021: adjOR=1.07, 95%CI: 0.91,

1.25; 2017: adjOR=0.94, 95%CI: 0.83, 1.07), and have lower income (2021: adjOR=0.76, 95%CI: 0.64, 0.90; 2017: adjOR=0.82, 95%CI: 0.71, 0.94).

On multivariate analysis, those reporting they could not see a doctor when they needed in the past 12 month due to costs were more likely to be women in 2017 but not 2021 (2021: adjOR=0.96, 95%CI: 0.71, 1.30; 2017: adjOR=0.80, 95%CI: 0.65, 0.99), to have received similar levels of education (2021: adjOR=0.96, 95%CI: 0.80, 1.15; 2017: adjOR=0.93, 95%CI: 0.82, 1.06), and have lower income (2021: adjOR=0.52, 95%CI: 0.43, 0.64; 2017: adjOR=0.55, 95%CI: 0.48, 0.64). There was a significant difference in the response rates between counties in 2017 ($\chi^2_{13} = 29.5$, $p=.0056$), but not in 2021.

On multivariate analysis, those reporting they could not see a doctor when they needed in the past 12 month due to a lack of transportation were as likely to be men as women (2021: adjOR=1.021, 95%CI: 0.86, 1.70; 2017: adjOR=0.86, 95%CI: 0.63, 1.17), be less educated 2021 but not 2017 (2021: adjOR=0.70, 95%CI: 0.56, 0.87; 2017: adjOR=0.99, 95%CI: 0.83, 1.19), and have lower income (2021: adjOR=0.31, 95%CI: 0.24, 0.40; 2017: adjOR=0.19, 95%CI: 0.14, 0.25).

On multivariate analysis, those reporting they had not had a routine checkup in the past year were more likely to be men in 2017 but not 2021 (2021: adjOR=1.16, 95%CI: 0.96, 1.40; 2017: adjOR=1.18, 95%CI: 1.01, 1.37), have received similar levels of education (2021: adjOR=0.99, 95%CI: 0.89, 1.12; 2017: adjOR=0.97, 95%CI: 0.88, 1.06), and have lower income (2021: adjOR=0.73, 95%CI: 0.65, 0.83; 2017: adjOR=0.79, 95%CI: 0.71, 0.88). There was significant variation in the answer to this question between the counties in both 2021 and 2017 (2021: $\chi^2_{13} = 38.4$, $p=.0003$; 2017: $\chi^2_{13} = 36.7$, $p=.0005$).

13.3.4 Oral Health Care Access

The UPCHIPS assess oral health care access by inquiring about dental care insurance, whether a dentist or dental clinic has been visited in the past year, and whether cost, lack of transportation, or lack of availability were barriers to care. The results are shown in **Tables 13-25A, 13-25B, 13-26A, and 13-26B**. While cost decreased as a barrier to care, lack of dental care, lack of dental insurance, and lack of available dentists all increased from 2017 to 2021 (**Table 13-54**). The differences in responses from various counties between the two surveys indicate local disruptions of oral health care. There were also notable shifts in the importance of access to dental care as a health priority in a number of counties (**Table 14-2A**).

On multivariate analysis, those reporting no insurance coverage for dental care were more likely to be men in 2017 but more likely to be women in 2021 (2021: adjOR=0.74, 95%CI: 0.64, 0.86; 2017: adjOR=1.26, 95%CI: 1.11, 1.44), be less educated in 2017 and more educated in 2021 (2021: adjOR=0.79, 95%CI: 0.73, 0.86; 2017: adjOR=1.21, 95%CI: 1.10, 1.32), and have lower income in 2017 and higher income in 2021 (2021: adjOR=1.44, 95%CI: 1.30, 1.59; 2017: adjOR=0.59, 95%CI: 0.54, 0.65).

On multivariate analysis, those reporting they had not visited a dentist or dental clinic for any reason in the past year were more likely to be women (2021: adjOR=0.61, 95%CI: 0.52, 0.72; 2017: adjOR=0.54, 95%CI: 0.47, 0.62), be less educated (2021: adjOR=0.73, 95%CI: 0.66, 0.81; 2017: adjOR=0.68, 95%CI: 0.62, 0.74), and have lower income (2021: adjOR=0.46, 95%CI: 0.41, 0.51; 2017: adjOR=0.45, 95%CI: 0.41, 0.49). There was significant variance between counties in the response to this question in 2017, but not 2021 (2017: $\chi^2_{13} = 25.3$, $p=.0210$).

On multivariate analysis, those reporting they could not see a dentist when they needed in the past 12

months due to cost were similar in men and women (2021: adjOR=1.02, 95%CI: 0.81, 1.29; 2017: adjOR=0.99, 95%CI: 0.83, 1.18), be less educated in 2021 but not 2017 (2021: adjOR=0.87, 95%CI: 0.76, 0.99; 2017: adjOR=0.94, 95%CI: 0.85, 1.05), and have lower income (2021: adjOR=0.41, 95%CI: 0.35, 0.48; 2017: adjOR=0.40, 95%CI: 0.36, 0.45).

On multivariate analysis, those reporting they could not see a dentist when they needed in the past 12 months due to a lack of transportation were similar in men and women (2021: adjOR=0.99, 95%CI: 1.63, 1.57; 2017: adjOR=1.01, 95%CI: 0.70, 1.47), be less educated in 2021 but not 2017 (2021: adjOR=0.64, 95%CI: 0.48, 0.86; 2017: adjOR=0.99, 95%CI: 0.80, 1.24), and have lower income (2021: adjOR=0.22, 95%CI: 0.15, 0.32; 2017: adjOR=0.14, 95%CI: 0.10, 0.21).

On multivariate analysis, those they could not see a dentist when they needed in the past 12 months because they could not find an available dental professional were more similar between men and women (2021: adjOR=0.95, 95%CI: 0.74, 1.21; 2017: adjOR=0.95, 95%CI: 0.74, 1.21), had received similar levels of education (2021: adjOR=1.06, 95%CI: 0.91, 1.23; 2017: adjOR=1.08, 95%CI: 0.93, 1.24), and have lower income (2021: adjOR=0.66, 95%CI: 0.56, 0.77; 2017: adjOR=0.43, 95%CI: 0.36, 0.50). Responses to this question varied significantly between counties in 2021 and 2017 (2021: $\chi^2_{13}=76.4$, $p<.0001$; 2017: $\chi^2_{13}=27.4$, $p=.0111$).

13.3.5 Weight Status

Body mass index (BMI) was calculated using the heights and weights provided by those completing the survey. Since BMI is a continuous variable (a number), the multivariate analysis takes a different form, using multivariate linear regression models. The results of the models run on the 2021 and 2017 UPCHIPS is shown in **Table 13-17**. The first column of the table is the variable of interest. The second column is the slope of line calculated by the model and is represented by the term “ β .” For the variable “Sex,” the β value is 0.376. This is interpreted that going from female to male the BMI value increases by 0.376. For the “education level variable” going up *one* level of income, the BMI decreases by 0.335. Going up *two* levels of income the BMI would decrease by 0.670 (0.335 + 0.335). The third column is the variation of the estimate in the second column expressed as the standard error (SE). The fourth column is the t-value which is the β divided by the SE. The fifth column is the p-value for each of the variables.

Respondents were categorized into those with obesity (BMI of 32 or greater) and overweight (BMI of 25 or greater and less than 32). Percentages of those falling into these categories are presented in **Tables 13-27A** and **13-27B**. The obesity rates noted in 2017 and 2021 were similar (**Table 13-54**). In a multivariate logistic regression analysis controlling for education level, income level, age, sex, and county of residence, the average BMI did not change between 2017 and 2021 ($\beta=-0.0432$, standard error=0.147, $t=-0.29$, $p=.7692$).

On multivariate analysis, those reporting weights and heights consistent with obesity (BMI of 32 or greater) were similar in both men and women (2021: adjOR=1.03, 95%CI: 0.88, 1.19; 2017: adjOR=1.10, 95%CI: 0.97, 1.25), be less educated (2021: adjOR=0.89, 95%CI: 0.81, 0.97; 2017: adjOR=0.88, 95%CI: 0.81, 0.95), and have lower income in 2021 but not 2017 (2021: adjOR=0.93, 95%CI: 0.85, 0.99; 2017: adjOR=0.92, 95%CI: 0.85, 1.004). The responses significantly varied between counties in 2021 but not 2017 (2021: $\chi^2_{13}=25.0$, $p=.0228$).

Table 13-17: Multivariate Linear Regression of Body Mass Index, 2021, 2017

Factor	β	Standard Error	t-value	P-value
2021				
Sex (male versus female)	0.376	0.235	1.6	0.1092
Education level	-0.322	0.144	-2.24	0.0252
Income level	-0.27	0.159	-1.67	0.0941
Age	-0.0396	0.00805	-4.91	<.0001
County of residence			F=2.35	0.004
2017				
Sex (male versus female)	0.529	0.197	2.68	0.0073
Education level	-0.335	0.119	-2.83	0.0047
Income level	-0.447	0.132	-3.39	0.0007
Age	-0.0269	0.00661	-4.06	<.0001
County of residence			F=1.99	0.0183

13.3.6 Cigarette Smoking (see Section §11.2)

The percentages of those who had ever smoked 100 or more cigarettes in their lifetime and those who are current smokers are shown in **Tables 13-28A** and **13-28B**, while the percentages of current smokers who attempted to quit in the past 12 months are shown in **Tables 13-29A** and **12-29B**. The rates of ever smoking, currently smoking, and attempting to quit smoking were similar in 2017 and 2021 (**Table 13-54**).

On multivariate analysis, those reporting ever smoking 100 or more cigarettes in their lifetime were more likely to be men (2021: adjOR=1.87, 95%CI: 1.62, 2.17; 2017: adjOR=1.73, 95%CI: 1.53, 1.96), be less educated (2021: adjOR=0.69, 95%CI: 0.63, 0.76; 2017: adjOR=0.79, 95%CI: 0.73, 0.85), and have lower income (2021: adjOR=0.89, 95%CI: 0.81, 0.99; 2017: adjOR=0.81, 95%CI: 0.75, 0.88). Responses to this question varied significantly by county in 2017 and not 2021 (2017: $\chi^2_{13}=28.5$, $p=.0078$).

On multivariate analysis, those reporting they currently smoke cigarettes now, either every day or some days, were as often men as women (2021: adjOR=1.11, 95%CI: 0.89, 1.38; 2017: adjOR=1.03, 95%CI: 0.87, 1.23), be less educated (2021: adjOR=0.61, 95%CI: 0.53, 0.69; 2017: adjOR=0.73, 95%CI: 0.66, 0.81), and have lower income (2021: adjOR=0.68, 95%CI: 0.59, 0.79; 2017: adjOR=0.58, 95%CI: 0.51, 0.65).

13.3.7 Other Tobacco Products (see Sections §11.2.5 & §11.2.6)

Percentages of those using other tobacco products, including chewing tobacco, snuff, or snus, regularly, and those currently using e-cigarettes or vaping are presented in **Tables 13-30A** and **13-30B**. Chewing tobacco, snuff, and snus are primarily used by men. E-cigarettes are used more frequently by younger respondents. While chewing tobacco, snuff, and snus use did not change from 2017 to 2021, but e-cigarette use increased by 40% (adjOR=1.40, 95%CI: 1.02, 1.92) (**Table 13-54**).

On multivariate analysis, those reporting they currently use chewing tobacco, snuff, or snus, either every day or some days, were more likely to be men (2021: adjOR=36.4, 95%CI: 13.12, 100.70; 2017: adjOR=43.42, 95%CI: 17.50, 107.73), be less educated (2021: adjOR=0.67, 95%CI: 0.49, 0.91; 2017: adjOR=0.65, 95%CI: 0.51, 0.84), but was impacted by income level (2021: adjOR=0.83, 95%CI: 0.60, 1.16; 2017: adjOR=0.98, 95%CI: 0.74, 1.29).

On multivariate analysis, those reporting they currently use e-cigarettes or vaping, either every day or some days, were the same in men and women (2021: adjOR=1.02, 95%CI: 0.62, 1.67; 2017: adjOR=1.48, 95%CI: 0.95, 2.29), be less educated (2021: adjOR=0.71, 95%CI: 0.53, 0.96; 2017: adjOR=0.65, 95%CI: 0.49, 0.85), and have lower income (2021: adjOR=0.59, 95%CI: 0.43, 0.80; 2017: adjOR=0.67, 95%CI: 0.50, 0.91).

13.3.8 Fruit and Vegetable Consumption

As seen in **Tables 13-31A** and **13-31B**, the recommendation to eat an average of five or more servings of fruits and vegetables is rarely followed. The likelihood of following the recommendation did not change from 2017 to 2021 (**Table 13-54**). The role of the intake of sufficient fruits and vegetables on chronic health discussions is assessed throughout Chapter Nine. The analysis is limited by the small percentage of respondents who reported eating a daily average of five or more servings of fruits and vegetables and the timing of following this recommendation. For example, someone may not have followed the recommendation before having a heart attack or being diagnosed with diabetes, but following these events/diagnoses, the respondents may now be following the recommendation.

On multivariate analysis, those reporting the intake of an average of five or more times per day in the past seven days were more likely to be men (2021: adjOR=0.58, 95%CI: 0.46, 0.74; 2017: adjOR=0.59, 95%CI: 0.48, 0.72), be more educated (2021: adjOR=1.49, 95%CI: 1.29, 1.73; 2017: adjOR=1.38, 95%CI: 1.23, 1.55), and have higher income in 2017 but not 2021 (2021: adjOR=1.16, 95%CI: 0.99, 1.36; 2017: adjOR=1.16, 95%CI: 1.01, 1.31). Responses to the question varied significantly by county in 2017 but not 2021 (2017: $\chi^2_{13}=23.7$, $p=.0342$).

13.3.9 Physical Activity

Physical activity was assessed using two approaches. The survey identified those who did not participate in any leisure-time activities or exercise. These results are shown in **Tables 13-32A** and **13-32B**. One caveat of note with this question is that people who are physically active as part of their employment, such as postal carriers who walk from house to house, may be less likely to report physical activity in their leisure time. Those who reported no leisure-time activities or exercise increased by 16% from 2017 to 2021 (adjOR=1.16, 95%CI: 1.02, 1.31) (**Table 13-54**). It is not clear if the lockdowns associated with the COVID-19 pandemic decreased the opportunities for leisure-time activities.

The second measure, termed “adequate physical activity,” based on reports of frequency of moderate and intense aerobic exercise,²⁸ may be a more precise measure. In going from the 2017 UPCHIPS to the 2021 UPCHIPS, the percentage of those reporting adequate physical activity decreased by 13% (adjOR=0.87, 95%CI: 0.79, 0.96) (**Table 13-54**). Likewise, it is not clear if this was a repercussion of the response to the COVID-19 pandemic.

In Chapter Nine, the relationship of “adequate physical activity” to the various chronic illnesses is assessed. These two measures of physical activity are highly correlated, so either one or the other can be included a multivariable logistic regression model. Including both variables makes any modeling unstable.

The questions address current physical activity levels. It is not clear if a lack of activity were responsible for developing a chronic illness or whether having a chronic illness decreased the capacity to be physically active.

On multivariate analysis, those reporting not participating in any leisure-time physical activities or exercises were similar for men and women (2021: adjOR=1.10, 95%CI: 0.91, 1.33; 2017: adjOR=1.03, 95%CI: 0.87, 1.23), be less educated (2021: adjOR=0.71, 95%CI: 0.63, 0.80; 2017: adjOR=0.72, 95%CI: 0.65, 0.80), and have lower income (2021: adjOR=0.68, 95%CI: 0.63, 0.80; 2017: adjOR=0.67, 95%CI: 0.59, 0.75). Responses to the question varied significantly by county in 2017 but not 2021 (2017: $\chi^2_{13}=24.2$, $p=.0287$).

On multivariate analysis, those reporting adequate physical activity were more likely to be men (2021: adjOR=1.39, 95%CI: 1.19, 1.64; 2017: adjOR=1.42, 95%CI: 1.24, 1.64), be more educated (2021: adjOR=1.20, 95%CI: 1.09, 1.32; 2017: adjOR=1.10, 95%CI: 1.01, 1.20), and have higher income in 2017 but not 2021 (2021: adjOR=1.08, 95%CI: 0.97, 1.21; 2017: adjOR=1.11, 95%CI: 1.01, 1.22).

13.3.10 Motor Vehicle Safety

Seatbelt use, as measured by reporting “always” wearing a seatbelt, is reported in Tables 13-33A and 13-33B. From 2017 to 2021 seatbelt use increased by 29% (adjOR=1.29, 95%CI: 1.10, 1.51) (**Table 13-54**). This is welcomed news, but an explanation is currently wanting.

On multivariate analysis, those reporting always wearing a seatbelt were more likely to be women (2021: adjOR=0.44, 95%CI: 0.34, 0.56; 2017: adjOR=0.44, 95%CI: 0.37, 0.53), to have received a similar level of education (2021: adjOR=1.14, 95%CI: 0.98, 1.34; 2017: adjOR=1.06, 95%CI: 0.94, 1.19), and have higher income in 2021 but not 2017 (2021: adjOR=1.23, 95%CI: 1.03, 1.46; 2017: adjOR=1.08, 95%CI: 0.95, 1.23). Responses to the questioned varied significantly between counties in 2017 but not 2021 ($\chi^2_{13}=29.2$, $p=.0060$).

13.3.11 Hypertension Awareness and Medication Use

The survey asked if the respondent had ever been told they had high blood pressure (hypertension) and if they were currently on medication for their high blood pressure. The responses are shown in **Tables**

²⁸ Calculated by taking the number of days per week with intense aerobic exercise for more than 20 minutes multiplied by 1.67 plus the number of days per week with moderate aerobic exercise for 30 minutes. Adequate physical activity was identified in those with a score of 5 or greater.

13-34A and **13-34B**. The rate of those reporting being told they had high blood pressure decreased from the 2017 UPCHIPS to the 2021 UPCHIPS by 11% (adjOR=0.89, 95%CI: 0.81, 0.98) (**Table 13-54**). This may reflect that decreased availability of primary health care during the COVID-19 pandemic.

There were a number of individuals who reported being on medication for high blood pressure who did not report having been told they had high blood pressure. Consequently, the usefulness of the response to the question regarding high blood pressure medication is limited.

The relationship between hypertension and a variety of chronic diseases is explored in Chapter Nine.

On multivariate analysis, those reporting ever being told they had high blood pressure were more likely to be men (2021: adjOR=1.41, 95%CI: 1.21, 1.64; 2017: adjOR=1.40, 95%CI: 1.23, 1.60), be less educated (2021: adjOR=0.90, 95%CI: 0.82, 0.99; 2017: adjOR=0.86, 95%CI: 0.80, 0.94), and have lower income in 2017 but not 2021 (2021: adjOR=0.94, 95%CI: 0.85, 1.04; 2017: adjOR=0.85, 95%CI: 0.78, 0.93).

13.3.12 Cholesterol Screening

The UPCHIPS asked if the respondent had ever had their cholesterol checked and whether they had been told they had high cholesterol levels. The results are shown in **Tables 35A** and **13-35B**. The percentage of those who had been screened for elevated cholesterol levels decreased by 14% (adjOR=0.86, 95%CI: 0.74, 0.99), while those who reported they had high cholesterol levels remained unchanged (**Table 13-54**). The drop in cholesterol testing is consistent with the drop in other health screening procedures and tests (see section §13.3.17).

The relationship between elevated cholesterol levels and a variety of chronic diseases is explored in Chapter Nine.

On multivariate analysis, those reporting ever being told they had elevated cholesterol levels were more likely to be men in 2017 but not 2021 (2021: adjOR=1.10, 95%CI: 0.94, 1.28; 2017: adjOR=1.29, 95%CI: 1.13, 1.47), be less educated (2021: adjOR=0.88, 95%CI: 0.80, 0.97; 2017: adjOR=0.92, 95%CI: 0.85, 0.99), and have lower income in 2017 but not 2021 (2021: adjOR=0.96, 95%CI: 0.86, 0.57, 1.07; 2017: adjOR=0.94, 95%CI: 0.88, 0.99).

13.3.13 Chronic Illnesses

The UPCHIPS surveys inquired as to whether the respondents had ever been told they had a number of particular illnesses. As noted in section §9.2.10, several people had experienced multiple diagnoses. The sections below highlight these findings.

13.3.13.1 Asthma

Asthma is a chronic inflammatory disorder of the lungs that is more common in children than adults. The surveys asked if the respondent had ever been told they had asthma and whether they currently have asthma. The results are shown in **Tables 13-36A** and **13-36B**. Both responses showed a 13% to 15% increase from 2017 to 2021 with the difference in reporting ever having asthma being statistically significant (adjOR=1.13, 95%CI: 1.00, 1.28) and the difference in current asthma not being statistically significant (adjOR=1.15, 95%CI: 0.99, 1.33) (**Table 13-54**).

One must interpret these numbers with caution. A high percentage of those reporting chronic lung disease (SECTIONS §§) also report either having had asthma or currently having asthma. This overlap may, in part, result in the overlap of medications used to treat these conditions. There is also a lack of distinction between asthma, bronchitis, chronic bronchitis, and emphysema when discussing these conditions.

On multivariate analysis, those reporting having ever been told they had asthma were more likely to be women (2021: adjOR=0.61, 95%CI: 0.50, 0.74; 2017: adjOR=0.66, 95%CI: 0.56, 0.79), have received similar levels of education (2021: adjOR=1.02, 95%CI: 0.91, 1.15; 2017: adjOR=0.99, 95%CI: 0.90, 1.11), and have lower income (2021: adjOR=0.79, 95%CI: 0.69, 0.90; 2017: adjOR=0.85, 95%CI: 0.76, 0.95).

On multivariate analysis, those reporting they still have asthma were more likely to be women (2021: adjOR=0.60, 95%CI: 0.47, 0.77; 2017: adjOR=0.73, 95%CI: 0.60, 0.90), have received similar levels of education (2021: adjOR=1.01, 95%CI: 0.88, 1.16; 2017: adjOR=0.98, 95%CI: 0.87, 1.10), and have lower income (2021: adjOR=0.73, 95%CI: 0.63, 0.85; 2017: adjOR=0.80, 95%CI: 0.70, 0.91).

13.3.13.2 Diabetes (see Section §9.2.4)

The percentages of those who reported being told they have diabetes are provided in **Tables 13-37A** and **13-37B**. The rates did not change from 2017 to 2021 (**Table 13-54**).

The interaction of diabetes with other chronic illnesses is discussed in Chapter Nine.

On multivariate analysis, those reporting having ever been told they have diabetes mellitus were more likely to be men (2021: adjOR=1.40, 95%CI: 1.15, 1.70; 2017: adjOR=1.48, 95%CI: 1.25, 1.75), be less educated (2021: adjOR=0.87, 95%CI: 0.77, 0.98; 2017: adjOR=0.86, 95%CI: 0.77, 0.96), and have lower income (2021: adjOR=0.74, 95%CI: 0.65, 0.85; 2017: adjOR=0.72, 95%CI: 0.64, 0.81).

13.3.13.3 Cardiovascular Disease (see §9.2.1)

Heart disease is the leading cause of death in Michigan and the United States (see Section §9.3). The UPCHIPS asked if respondents had ever been told they had a heart attack, heart disease, or a stroke. The results are shown in **Tables 13-38A** and **13-38B**. While the results from 2017 to 2021 remained stable for heart attack and heart disease, there was a 28% increase in those reporting having been told they had a stroke (adjOR=1.28, 95%CI: 1.03, 1.58) (**Table 13-54**).

The interaction between these illnesses is discussed in Chapter Nine. There is also some evidence of a possible disconnect of education regarding medical conditions. Over the two surveys, of those who were told they had a heart attack, 29.6% did not report having heart disease. Keep in mind that this survey depends on what the respondent remembers being told.

On multivariate analysis, those reporting ever being told they suffered a heart attack were more likely to be men (2021: adjOR=2.31, 95%CI: 1.76, 3.04; 2017: adjOR=2.87, 95%CI: 2.27, 3.63), be less educated (2021: adjOR=0.74, 95%CI: 0.63, 0.88; 2017: adjOR=0.78, 95%CI: 0.67, 0.90), and have lower income in 2017 but not 2021 (2021: adjOR=0.65, 95%CI: 0.53, 1.05; 2017: adjOR=0.75, 95%CI: 0.63, 0.89).

On multivariate analysis, those reporting ever being told they had heart disease were more likely to be men (2021: adjOR=2.47, 95%CI: 2.02, 3.04; 2017: adjOR=2.05, 95%CI: 1.71, 2.46), be less educated in 2017 but not 2021 (2021: adjOR=0.94, 95%CI: 0.83, 1.06; 2017: adjOR=0.89, 95%CI: 0.80, 0.99), and have lower income (2021: adjOR=0.78, 95%CI: 0.68, 0.90; 2017: adjOR=0.83, 95%CI: 0.72, 0.94). Responses to this question varied significantly between counties in 2021 but not 2017 (2021: $\chi^2_{13}=23.4$, $p=.0368$).

On multivariate analysis, those reporting ever being told they had suffered a stroke were more likely to be men (2021: adjOR=1.65, 95%CI: 1.20, 2.26; 2017: adjOR=1.63, 95%CI: 1.21, 2.20), had received similar levels of education (2021: adjOR=0.98, 95%CI: 0.81, 1.20; 2017: adjOR=1.00, 95%CI: 0.83, 1.20), and have lower income (2021: adjOR=0.67, 95%CI: 0.53, 0.84; 2017: adjOR=0.44, 95%CI: 0.35, 0.56).

13.3.13.4 Cancer (see Section §9.2.2)

Cancer is the second leading cause of death in the Upper Peninsula, Michigan, and the United States (see Section §9.2.2). UPCHIPS inquired regarding ever being told about having skin cancer or any other form of cancer, and any form of cancer. The results can be seen in **Tables 13-39A** and **13-39B**. Surprisingly, skin cancer was more common with increasing levels of education and income, but this may reflect having access to services in which these cancers can be identified. Those who had been told they had skin cancer increased by 23% from 2017 to 2021 (adjOR=1.23, 95%CI: 1.07, 1.41) but for all forms of cancer there was no difference (**Table 13-54**).

On multivariate analysis, those reporting ever being told they had skin cancer were more likely to be men (2021: adjOR=1.36, 95%CI: 1.11, 1.66; 2017: adjOR=1.42, 95%CI: 1.18, 1.72), be more educated (2021: adjOR=1.32, 95%CI: 1.16, 1.49; 2017: adjOR=1.33, 95%CI: 1.18, 1.50), and have higher income (2021: adjOR=1.16, 95%CI: 1.001, 1.34; 2017: adjOR=1.33, 95%CI: 1.15, 1.52). The response to this question varied significantly between counties in 2021 but not 2017 (2021: $\chi^2_{13}=36.6$, $p=.0005$).

On multivariate analysis, those reporting ever being told they had *any* form of cancer were as likely to be men as women (2021: adjOR=0.92, 95%CI: 0.75, 1.13; 2017: adjOR=0.88, 95%CI: 0.73, 1.05), be more educated in 2017 but not 2021 (2021: adjOR=1.01, 95%CI: 0.89, 1.14; 2017: adjOR=1.18, 95%CI: 1.06, 1.31), and have similar levels of income (2021: adjOR=1.004, 95%CI: 0.87, 1.15; 2017: adjOR=0.95, 95%CI: 0.84, 1.07).

13.3.13.5 Chronic Pulmonary Disease (see Section §9.2.3)

Chronic obstructive pulmonary disease (COPD) is a progressive disease that makes it hard to breathe. The condition comes on gradually and has a number of names such as emphysema, chronic obstructive lung disease, chronic obstructive pulmonary disease (COPD), chronic pulmonary disease, and chronic bronchitis. The lack of consistent appellation can lead to confusion. The percentage of those who report being told they have COPD is reported in **Tables 13-40A** and **13-40B**. The rate did not change between the two surveys (**Table 13-54**).

As shown in Chapter Nine, COPD is often a co-morbidity in those with other chronic illnesses.

On multivariate analysis, those reporting ever being told they had chronic obstructive pulmonary disease (COPD), emphysema, or chronic bronchitis were more likely to be men in 2021 but not 2017 (2021: adjOR=1.32, 95%CI: 1.06, 1.64; 2017: adjOR=1.20, 95%CI: 0.99, 1.45), be less educated (2021: adjOR=0.68, 95%CI: 0.60, 0.79; 2017: adjOR=0.83, 95%CI: 0.73, 0.93), and have lower income (2021:

adjOR=0.63, 95%CI: 0.54, 0.73; 2017: adjOR=0.57, 95%CI: 0.49, 0.65). Responses to the question varied significantly between counties in 2021 but not 2017 (2021: $\chi^2_{13}=25.2$, $p=.0218$).

13.3.13.6 Activity Limited by Arthritis

While arthritis and rheumatism are leading causes of disability in the United States, they rarely lead to mortality. The percentage of those reporting they were limited in their usual activities because of arthritis or joint symptoms is reported in **Tables 13-41A** and **13-41B**. Those reporting this increased by 13% from 2017 to 2021 (adjOR=1.13, 95%CI: 1.03, 1.24) (**Table 13-54**).

On multivariate analysis, those reporting they were limited in their usual activities because of arthritis or joint symptoms were as likely to be men as women (2021: adjOR=0.99, 95%CI: 0.86, 1.15; 2017: adjOR=0.94, 95%CI: 0.82, 1.07), be less educated (2021: adjOR=0.90, 95%CI: 0.82, 0.99; 2017: adjOR=0.91, 95%CI: 0.84, 0.98), and have lower income (2021: adjOR=0.67, 95%CI: 0.61, 0.74; 2017: adjOR=0.65, 95%CI: 0.60, 0.71). Responses to the question varied significantly between counties in 2017 but not 2021 (2017: $\chi^2_{13}=23.1$, $p=.0407$).

13.3.13.7 Alzheimer's Disease or Dementia (see Section §9.2.6)

The UPCHIPS asked if respondents were ever told by a doctor, neurologist, psychologist, or other health professional they had Alzheimer's disease or dementia. Only 42 reported having Alzheimer's disease or dementia in the 2017 UPCHIPS and 23 in the 2021. In 2017 the weighted percentage was 0.6% (95%CI: 0.3, 0.8), while in 2021 it was 0.3% (95%CI: 0.1, 0.5). The difference was not statistically significant (**Table 13-54**). Even if a true difference existed between 2017 and 2021, the number of positive responses would likely be insufficient to demonstrate a statistically significant difference. The UPCHIPS would be expected to underestimate the percentage of those with Alzheimer's disease or dementia as having these conditions would present a barrier to completing the survey and those with these conditions are more likely to be geographically concentrated in long-term care facilities, which would have been missed by randomizing distribution of the surveys using addresses. The small number of responses also precluded performing multivariate analysis.

Similarly, when asked whether a doctor, social worker, or other professional recommended they move to a nursing home, long-term care facility, or other alternative living as a consequence of declining physical or mental capacities, only 44 respondents in 2017 and 23 in 2021 answered in the affirmative. The weighted percentage in 2017 was 0.4% (95%CI: 0.2, 0.6) and 0.6% (95%CI: 0.2, 1.0) in 2021. There was no difference between surveys (**Table 13-54**). This question faced the same difficulties as asking about dementia that precluded any meaningful interpretation. A more reliable estimate would be obtained using different methodologies targeting more specific populations.

13.3.14 Vaccinations (see Sections §7.3.5 and §7.3.6)

The vaccination rates among those completing the surveys for influenza and pneumococcal vaccines are shown in **Tables 13-42A** and **13-42B**. Vaccination in the past year for influenza in both all adults and those 65 years and older increased from 2017 to 2021 (all adults: adj OR=1.33 95%CI: 1.20, 1.46; 65 years and older: adj OR= 1.18, 95%CI: 1.02, 1.36) (**Table 13-54**). This increase may reflect motivation provided by the COVID-19 pandemic and the vaccine was readily available without visiting a health care provider's office. The percentage of those 65 years and older who had ever received the pneumococcal

vaccine did not change from 2017 to 2021 (**Table 13-54**).

On multivariate analysis, those reporting having received an influenza vaccine in the past year were more likely to be women in 2021 but not 2017 (2021: adjOR=0.80, 95%CI: 0.68, 0.94; 2017: adjOR=1.04, 95%CI: 0.91, 1.19), be more educated (2021: adjOR=1.21, 95%CI: 1.09, 1.33; 2017: adjOR=1.10, 95%CI: 1.02, 1.19), and have higher income (2021: adjOR=1.35, 95%CI: 1.21, 1.50; 2017: adjOR=1.21, 95%CI: 1.11, 1.32).

On multivariate analysis, those 65 years of age and older reporting having received an influenza vaccine in the past year were as likely to be men as women (2021: adjOR=0.95, 95%CI: 0.76, 1.18; 2017: adjOR=1.09, 95%CI: 0.90, 1.34), had received similar levels of education (2021: adjOR=0.96, 95%CI: 0.84, 1.10; 2017: adjOR=1.01, 95%CI: 0.90, 1.14), and have higher income (2021: adjOR=1.66, 95%CI: 1.41, 1.95; 2017: adjOR=1.37, 95%CI: 1.19, 1.58).

On multivariate analysis, those 65 years and older reporting ever receiving a pneumococcal vaccine were more likely to be women in 2017 but not 2021 (2021: adjOR=0.95, 95%CI: 0.81, 1.12; 2017: adjOR=0.77, 95%CI: 0.63, 0.94), had received similar levels of education (2021: adjOR=1.07, 95%CI: 0.97, 1.18; 2017: adjOR=1.04, 95%CI: 0.92, 1.18), and have higher income in 2017 but not 2021 (2021: adjOR=0.97, 95%CI: 0.87, 1.08; 2017: adjOR=1.29, 95%CI: 1.11, 1.50).

13.3.15 Mental Health (see Section §10.1)

Mental illness is common in adolescents and adults and impacts their family members and the community. Several aspects of mental health were queried in the UPCHIPS.

13.3.15.1 Depression or Anxiety (see Sections §10.3.1 and §10.4.1)

Depression is a common and treatable mental health condition, while anxiety can have crippling results. The surveys asked if the respondent had ever been told they had a depressive disorder or an anxiety disorder (including phobias). The results are shown in **Tables 13-43A** and **13-43B**. From the 2017 UPCHIPS to the 2021 UPCHIPS those reporting a depressive disorder increased by 22% (adjOR=1.22, 95%CI: 1.09, 1.36) those reporting an anxiety disorder increased by 33% (adjOR=1.33, 95%CI: 1.18, 1.50) (**Table 13-54**). It is not clear how much of this increase can be attributed to the response to the COVID-19 pandemic (see Section §10.4).

On multivariate analysis, those reporting ever being told they had a depressive disorder, including major depression, dysthymia, or minor depression, were more likely to be women (2021: adjOR=0.46, 95%CI: 0.39, 0.56; 2017: adjOR=0.59, 95%CI: 0.50, 0.69), had received similar levels of education (2021: adjOR=1.10, 95%CI: 0.99, 1.23; 2017: adjOR=1.07, 95%CI: 0.98, 1.17), and have lower income (2021: adjOR=0.64, 95%CI: 0.57, 0.72; 2017: adjOR=0.64, 95%CI: 0.58, 0.71).

On multivariate analysis, those reporting ever being told they had an anxiety disorder, including generalized anxiety disorder, panic disorder, social anxiety disorder, or a specific phobia, were more likely to be women (2021: adjOR=0.53, 95%CI: 0.43, 0.64; 2017: adjOR=0.48, 95%CI: 0.40, 0.58), had received similar levels of education (2021: adjOR=1.05, 95%CI: 0.94, 1.19; 2017: adjOR=0.92, 95%CI: 0.83, 1.02), and have lower income (2021: adjOR=0.61, 95%CI: 0.54, 0.69; 2017: adjOR=0.66, 95%CI: 0.59, 0.74).

13.3.15.2 Mental Health Care Access (see Sections §10.2.2 and §10.6)

The percentage of those taking medications to help with mood, emotions, or mental health, those who received counseling, and those who contacted a crisis line are shown in **Tables 13-44A** and **13-B**. Between 2017 and 2021 the percentage taking medication increased 25% (adjOR=1.25, 95%CI: 1.12, 1.39), the percentage receiving counseling increased 45% (adjOR=1.45, 95%CI: 1.19, 1.75), and the percentage calling or texting a crisis line increased 64% (adjOR=1.64, 95%CI: 1.12, 2.42) (**Table 13-54**).

On multivariate analysis, those reporting taking medication to help with mood, emotions, or mental health in the past 12 months were more likely to be women (2021: adjOR=0.44, 95%CI: 0.36, 0.53; 2017: adjOR=0.46, 95%CI: 0.39, 0.54), had received similar levels of education (2021: adjOR=0.97, 95%CI: 0.87, 1.07; 2017: adjOR=0.99, 95%CI: 0.90, 1.08), and have lower income (2021: adjOR=0.75, 95%CI: 0.67, 0.84; 2017: adjOR=0.69, 95%CI: 0.63, 0.76).

On multivariate analysis, those reporting they had received counseling or other non-medication treatment from a mental health professional in the past 12 months were more likely to be women in 2021 but not 2017 (2021: adjOR=0.71, 95%CI: 0.52, 0.96; 2017: adjOR=0.76, 95%CI: 0.57, 1.01), be more educated (2021: adjOR=1.28, 95%CI: 1.07, 1.54; 2017: adjOR=1.20, 95%CI: 1.02, 1.42), and have lower income (2021: adjOR=0.60, 95%CI: 0.50, 0.73; 2017: adjOR=0.58, 95%CI: 0.49, 0.69). Responses to the question varied significantly between counties in 2017 but not 2021 (2017: $\chi^2_{13}=30.6$, $p=.0038$).

On multivariate analysis, those reporting they called or texted a crisis line one or more times in the past 12 months were as likely to men or women (2021: adjOR=1.14, 95%CI: 0.64, 2.00; 2017: adjOR=1.36, 95%CI: 0.77, 2.39), have received similar levels of education (2021: adjOR=1.37, 95%CI: 0.96, 1.96; 2017: adjOR=1.13, 95%CI: 0.80, 1.59), and have lower income (2021: adjOR=0.42, 95%CI: 0.29, 0.62; 2017: adjOR=0.52, 95%CI: 0.35, 0.77). The reliability of this model is limited by the small number of positive responses (55 in 2021 and 52 in 2017).

13.3.15.3 Mental Health Care Barriers

As the rate of receiving a mental health diagnosis increases and the demand for mental health services increases it is important to identify the barriers to receiving care. The UPCHIPS asked about costs, lack of transportation, and the lack of availability of services being a barrier to receiving care. The result is shown in **Tables 13-45A** and **13-45B**. From 2017 to 2021 cost (adjOR=1.38, 95%CI: 1.07, 1.79) and lack of availability (adjOR=1.79, 95%CI: 1.39, 2.29) as barriers to mental health care increased. Lack of transportation as a barrier remained unchanged (**Table 13-54**).

On multivariate analysis, those reporting they delayed or did not receive needed counseling in the past 12 months due to cost as barrier to receiving mental health care were more likely to be women (2021: adjOR=0.53, 95%CI: 0.34, 0.84; 2017: adjOR=0.63, 95%CI: 0.42, 0.94), be more educated in 2021 but not 2017 (2021: adjOR=1.48, 95%CI: 1.15, 1.91; 2017: adjOR=1.13, 95%CI: 0.91, 1.41), and have lower income (2021: adjOR=0.55, 95%CI: 0.43, 0.71; 2017: adjOR=0.53, 95%CI: 0.42, 0.67). The trend toward higher education may reflect that mental health care is more likely to be covered for those on Medicaid than those with private insurance.

On multivariate analysis, those reporting they delayed or did not receive needed counseling in the past 12 months due to a lack of transportation were more likely to be women in 2017 but not 2021 (2021: adjOR=0.85, 95%CI: 0.39, 1.86; 2017: adjOR=0.31, 95%CI: 0.13, 0.74), had received similar levels of education (2021: adjOR=0.76, 95%CI: 0.47, 1.21; 2017: adjOR=1.21, 95%CI: 0.83, 1.77), and have lower income (2021: adjOR=0.20, 95%CI: 0.11, 0.39; 2017: adjOR=0.44, 95%CI: 0.35, 0.57). The reliability of this model is limited by the small number of positive responses (32 in 2021 and 46 in 2017).

On multivariate analysis, those reporting they delayed or did not receive needed counseling in the past 12 months due to a lack of available mental health professionals were more likely to be women (2021: adjOR=0.30, 95%CI: 0.18, 0.48; 2017: adjOR=0.55, 95%CI: 0.36, 0.83), be more educated (2021: adjOR=1.83, 95%CI: 1.44, 2.33; 2017: adjOR=1.37, 95%CI: 1.10, 1.72), and have lower income in 2021 but not 2017 (2021: adjOR=0.57, 95%CI: 0.48, 0.95; 2017: adjOR=0.44, 95%CI: 0.35, 0.57).

13.3.16 Substance Use and Treatment (see Chapter 11)

Substance use continues to be a major health concern across our region as discussed in Chapter 11. The UPCHIPS explored alcohol consumption, drug use, and marijuana use.

13.3.16.1 Alcohol Consumption (see Section §11.3)

The UPCHIPS asked questions regarding the amount of alcohol beverages consumed on a daily basis. It also asked about binge drinking. The results of the surveys as provide in **Tables 13-46A** and **13-46B**. The percentage that reported driving after drinking are shown in **Tables 13-33A** and **13-33B**. Heavy drinking and driving after drinking did not change from 2017 to 2021, but those reporting binge drinking increased 43% (adjOR=1.43, 95%CI: 1.21, 1.68) (**Table 13-54**).

On multivariate analysis, those reporting heavy drinking (defined as consuming an average of more than two alcoholic drinks per day for men or more than one per day for women in the past months) were more likely to be men (2021: adjOR=1.22, 95%CI: 1.000, 1.50; 2017: adjOR=1.39, 95%CI: 1.16, 1.66), had similar levels of education (2021: adjOR=0.98, 95%CI: 0.87, 1.11; 2017: adjOR=0.99, 95%CI: 0.88, 1.10), and have higher income in 2021 but not 2017 (2021: adjOR=1.17, 95%CI: 1.01, 1.34; 2017: adjOR=1.13, 95%CI: 0.99, 1.27). Responses to this questioned varied significantly between counties in 2017 but not 2021 (2017: $\chi^2_{13}=26.5$, $p=.0155$).

On multivariate analysis, those reporting binge drinking (defined five or more drinks per occasion for men or four or more drinks per occasion for women at least once in the past month) were more likely to be men (2021: adjOR=2.06, 95%CI: 1.60, 2.67; 2017: adjOR=1.99, 95%CI: 1.63, 2.45), be less educated (2021: adjOR=0.79, 95%CI: 0.67, 0.93; 2017: adjOR=0.83, 95%CI: 0.73, 0.94), and no impact from income level (2021: adjOR=1.07, 95%CI: 0.90, 1.28; 2017: adjOR=1.09, 95%CI: 0.95, 1.26).

The number of drinks consumed in a month was calculated using information provided by those completing the survey. Since the number of drinks consumed in a month is a continuous variable (a number), the multivariate analysis takes a different form, using multivariate linear regression models. The results of the models run on the 2021 and 2017 UPCHIPS is shown in **Table 13-4**. An explanation of how to interpret the numbers in this table is provided in section §13.3.5.

Table 13-18: Multivariate Linear Regression of Drinks per Month, 2021, 2017

Factor	β	Standard Error	t-value	P-value
	2021			
Sex (male versus female)	18.83	1.79	10.53	<.0001
Education level	-0.337	1.09	-0.58	0.56
Income level	0.674	1.121	0.56	0.5778
Age	-0.353	0.0613	-5.76	<.0001
County of residence			F=0.45	0.9502
	2017			
Sex (male versus female)	21.67	1.62	13.36	<.0001
Education level	-1.53	0.979	-1.56	0.1192
Income level	0.643	1.09	0.59	0.5546
Age	-0.283	0.0546	-5.19	<.0001
County of residence			F=2.87	0.0004

13.3.29 Drug Use (see Section §11.5)

The UPCHIPS assessed the use of designer drugs, prescription drugs to get high, and drugs that were injected or snorted. The results are shown in **Table 13-47A** and **13-47B**. Going from 2017 to 2021 the use of drugs in all three categories increased (designer drugs: adjOR=2.04, 95%CI: 1.38, 3.00; prescription drugs: adjOR=1.71, 95%CI: 1.24, 2.35; injected/snorted: adjOR=1.56, 95%CI: 1.24, 1.96) (**Table 13-54**).

On multivariate analysis, those reporting ever using over the counter or synthetic/designer drugs such as K2/spice, Salvia, Bath Salts, or synthetic cannabinoids for the purpose of getting high were more likely to be men in 2017 but not 2021 (2021: adjOR=1.27, 95%CI: 0.75, 2.16; 2017: adjOR=2.35, 95%CI: 1.32, 4.19), had received similar levels of education (2021: adjOR=0.89, 95%CI: 0.64, 1.22; 2017: adjOR=1.02, 95%CI: 0.71, 1.46), and have lower income in 2021 but not 2017 (2021: adjOR=0.68, 95%CI: 0.48, 0.95; 2017: adjOR=0.73, 95%CI: 0.50, 1.07).

On multivariate analysis, those reporting ever using prescription drugs not prescribed to them for the purpose of getting high were more likely to be men (2021: adjOR=2.49, 95%CI: 1.58, 3.92; 2017: adjOR=2.23, 95%CI: 1.42, 3.50), be more educated in 2017 but not 2021 (2021: adjOR=0.85, 95%CI: 0.64, 1.12; 2017: adjOR=1.34, 95%CI: 1.01, 1.77), and have lower income (2021: adjOR=0.58, 95%CI: 0.43, 0.77; 2017: adjOR=0.48, 95%CI: 0.35, 0.66).

On multivariate analysis, those reporting ever injecting or snorting drugs for the purpose of getting high were more likely to be men (2021: adjOR=2.43, 95%CI: 1.75, 3.36; 2017: adjOR=2.99, 95%CI: 2.16, 4.13), had received similar levels of education (2021: adjOR=0.83, 95%CI: 0.68, 1.02; 2017: adjOR=1.20, 95%CI: 0.99, 1.47), and have lower income (2021: adjOR=0.78, 95%CI: 0.63, 0.97; 2017: adjOR=0.66, 95%CI: 0.53, 0.82).

13.3.16.3 Marijuana Use (see Section §11.4)

The UPCHIPS asked about marijuana-containing products in the past month. The results are shown in **Tables 13-48A** and **13-48B**. With the legalization of the recreational use of marijuana-containing products in Michigan between two Upper Peninsula-wide surveys, it is not surprising that reported use of these products nearly tripled (adjOR=2.93, 95%CI: 2.48, 3.46) (**Table 13-54**). With legalization, more respondents may have felt comfortable reporting their marijuana use. Also, more people may have been willing to try and use these products once they were legalized. Determining how much influence each of these factors had on the increased reports of use would be difficult.

On multivariate analysis, those reporting using marijuana, hashish, marijuana was, or marijuana-infused edibles were more likely to be men (2021: adjOR=1.86, 95%CI: 1.50, 2.30; 2017: adjOR=2.22, 95%CI: 1.72, 2.85), have received similar levels of education (2021: adjOR=0.98, 95%CI: 0.86, 1.12; 2017: adjOR=0.98, 95%CI: 0.84, 1.14), and have lower income (2021: adjOR=0.62, 95%CI: 0.53, 0.71; 2017: adjOR=0.48, 95%CI: 0.40, 0.57). Responses to this question varied significantly between counties in both surveys (2021: $\chi^2_{13}=22.4$, $p=.0500$; 2017: $\chi^2_{13}=23.6$, $p=.0348$).

13.3.16.4 Substance Abuse Treatment and Barriers (see Section §11.6)

The UPCHIPS assessed the percentage of those who had received treatment in the past 12 months for alcohol and/or drug use. In the 2017 UPCHIPS, 21 people identified as having received treatment for drug use. This increased to 22 in the 2021 UPCHIPS. The weighted percentage for receiving treatment for alcohol use in the past 12 months across the Upper Peninsula was 0.9% (95%CI: 0.1, 1.6) in the 2017 UPCHIPS and 0.7% (95%CI:0.2, 1.2) in the 2021 UPCHIPS. For treatment of drug use the percentages are 0.6% (95%CI: 0.008, 1.1) and 0.3% (95%CI: 0.0, 0.7). For treatment of either alcohol or drug use the percentages are 1.4% (95%CI: 0.5, 2.4) and 0.8% (95%CI: 0.3, 1.3). The number of people receiving treatment is too small to generate any reliable analysis.

Those identifying cost as barriers to receiving treatment for substance use disorder numbered 7 in 2017 and 4 in 2021. Similarly, those who identified transportation barriers and lack of services as barriers numbered 6 and 15 in 2017 and 8 and 12 in 2021. These numbers are too small to provide any meaningful analysis.

On multivariate analysis, those reporting having received substance abuse treatment services in the past 12 months were more likely to be men in 2017 but not 2021 (2021: adjOR=2.17, 95%CI: 0.91, 5.19; 2017: adjOR=4.84, 95%CI: 1.88, 12.48), have received similar levels of education (2021: adjOR=1.24, 95%CI: 0.74, 2.25; 2017: adjOR=1.10, 95%CI: 0.65, 1.86), and have lower income (2021: adjOR=0.39, 95%CI: 0.22, 0.70; 2017: adjOR=0.39, 95%CI: 0.21, 0.74).

13.3.17 Health Screening

Public and health are both served through preventative measures. The UPCHIP included several questions to determine how frequently these screening efforts are utilized. The rates of most screening tests and procedures decreased in the 2021 UPCHIPS compared to the 2017 UPCHIPS. This may reflect the limited availability of clinician encounters during the COVID-19 pandemic.

13.3.17.1 Hepatitis C Testing (see Section §8.3.3.3)

The percentages of those reported ever having been tested for hepatitis C is shown in **Tables 13-49A** and **13-49B**. The lifetime testing rate did not change between the two surveys (**Table 13-54**). The rates need to be interpreted based on the recent surge in hepatitis C testing.

On multivariate analysis, those reporting having been tested for hepatitis C were more likely to be men (2021: adjOR=1.66, 95%CI: 1.38, 2.00; 2017: adjOR=1.44, 95%CI: 1.23, 1.70), be more educated (2021: adjOR=1.18, 95%CI: 1.05, 1.33; 2017: adjOR=1.17, 95%CI: 1.06, 1.30), and have lower income in 2021 but not 2017 (2021: adjOR=0.87, 95%CI: 0.77, 0.99; 2017: adjOR=0.96, 95%CI: 0.86, 1.07).

13.3.17.2 Breast Cancer Screening

Periodic clinical breast exams coupled with mammography are breast cancer screening procedures. Recommended screening frequency for women between the ages of 40 and 50 is the subject of debate, and not all medical professionals advise universal annual screening for this age group. In the most recent recommendation statement of January 11, 2016, the USPSTF recommends biennial screening mammography for women aged 50 to 74 years. For women 40 to 49 years, the decision to start screening mammography should be an individual one. Women who place a higher value on the potential benefits than the potential harms may choose to begin biennial screening between the ages of 40 and 49 years. [7]

A woman with the BRCA1 or BRCA2 gene is more likely to develop breast or ovarian cancer at a young age. In the 2018 Michigan BRFSS survey, 35.7% of women reported a relative diagnosed with breast cancer. Of these women, 51.8% reported the breast cancer had been diagnosed before 50 years of age. Ovarian cancer in a relative was reported by 13.4% of the women surveyed. Approximately 11.7% of adult women had a significant family history of breast or ovarian cancer using the USPSTF family history guidelines for further hereditary breast and ovarian cancer genetic assessment and possible genetic testing. [8]

The percentages of women 40 years and older who reported ever having had a mammogram and having had a mammogram in the past two years are reported in **Tables 13-50A** and **13-50B**. Reports of ever having had a mammogram decreased from 2017 to 2021 (adjOR=0.72, 95%CI: 0.54, 0.97) (**Table 13-54**).

On multivariate analysis, those women 40 years and older reporting having ever had a mammogram had received similar levels of education (2021: adjOR=1.01, 95%CI: 0.80, 1.28; 2017: adjOR=1.12, 95%CI: 0.86, 1.45), and have higher income (2021: adjOR=1.61, 95%CI: 1.25, 2.08; 2017: adjOR=1.78, 95%CI: 1.36, 2.34).

On multivariate analysis, those women 40 years and older reporting having had a mammogram in the

past two years had received similar levels of education (2021: adjOR=0.98, 95%CI: 0.86, 1.11; 2017: adjOR=0.96, 95%CI: 0.85, 1.09), and have higher income (2021: adjOR=1.62, 95%CI: 1.41, 1.87; 2017: adjOR=1.52, 95%CI: 1.32, 1.74).

13.3.17.3 Cervical Cancer Screening

Cervical cancer screening, also called the Pap test, is used to detect abnormal cells on the cervix that could turn into cancer over time. In its most recent recommendation statement, USPSTF recommends screening for cervical cancer every three years with cervical cytology alone in women 21-29 years. For women aged 30 to 65 years, the USPSTF recommends screening every 3 years with cervical cytology alone, every 5 years with high risk human papillomavirus (hrHPV) testing alone or in combination with cytology. [9]

The percentages of women who ever had a PAP smear are reported in **Tables 13-51A** and **13-51B**. The percentage of women reporting ever had a PAP smear decreased 39% (adjOR=0.61, 95%CI: 0.45, 0.83) (**Table 13-54**).

On multivariate analysis, those women who had not had a hysterectomy reporting ever having had a PAP test were more educated (2021: adjOR=1.54, 95%CI: 1.16, 2.05; 2017: adjOR=1.48, 95%CI: 1.11, 1.98), and have higher income (2021: adjOR=1.98, 95%CI: 1.44, 2.72; 2017: adjOR=2.26, 95%CI: 1.60, 3.18).

13.3.17.4 Prostate Cancer Screening

Screening for prostate cancer in men begins at 50 years of age. Obtaining prostate-specific antigen (PSA) test can be ordered for men aged 50 and older as a marker for possible prostate cancer. The American Cancer Society now recommends that men make an informed decision about whether to be tested for prostate cancer. Current research does not suggest that the potential benefits of routine screening outweigh the risks of unnecessary testing and unnecessary treatment. According to the most recent recommendation statement of May 8, 2018, the USPSTF recommends for men aged 55 to 69 years, that the decision to undergo periodic prostate-specific antigen (PSA)-based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; over-diagnosis and over-treatment; and treatment complications, such as incontinence and erectile dysfunction. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, co-morbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening. The USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older. [10]

The percentage of men 50 years and older who discussed prostate cancer screening and every had a PSA test are shown in **Tables 13-52A** and **13-52B**. Prostate cancer discussion and ever having had a PSA level decreased from 2017 to 2021 (discussion: adjOR=0.84, 95%CI: 0.70, 0.99; PSA: adjOR=0.67, 95%CI: 0.55, 0.82) (**Table 13-54**).

On multivariate analysis, those men 50 years and older reporting ever discussing a prostate screening test with their health care provider were more educated (2021: adjOR=1.40, 95%CI: 1.20, 1.64; 2017: adjOR=1.23, 95%CI: 1.07, 1.42), and have a higher income (2021: adjOR=1.36, 95%CI: 1.14, 1.61; 2017: adjOR=1.67, 95%CI: 1.41, 1.97).

On multivariate analysis, those men 50 years and older reporting ever having a PSA level were more educated (2021: adjOR=1.56, 95%CI: 1.30, 1.88; 2017: adjOR=1.25, 95%CI: 1.06, 1.48), and have a higher income (2021: adjOR=1.36, 95%CI: 1.12, 1.66; 2017: adjOR=2.11, 95%CI: 1.74, 2.56).

13.3.17.5 Colorectal Cancer Screening

Regular colorectal cancer screening, beginning at age 50, was key to preventing colon cancer. The U.S. Preventive Services Task Force (USPSTF), a federal body, in a new draft (October 27, 2020) [11] recommends screening asymptomatic adults 45 years and older who are at average risk of colorectal cancer. For adults 76 to 85 years of age colorectal cancer screening should be selectively offered, as the benefits of screening all persons in this age group is small. Screening strategies include stool-based tests every year (including high sensitivity guaiac-based fecal occult blood test (HSgFOBT), fecal immunochemical test (FIT), or stool DNA test plus fecal immunochemical test (sDNA-FIT), which can also be used every three years) or direct visualization tests, such as colonoscopy every 10 years, computerized tomography colonography every 5 years, flexible sigmoidoscopy every 5 years, flexible sigmoidoscopy every 10 years with FIT every year.

Currently, there is genetic testing for those who are diagnosed with colon cancer under the age of 50 years looking for Lynch syndrome through the MLH1, MSH2, MSH6, PMS2, EPCAM genes. In the 2018 Michigan BRFSS survey, 9.8% of Michigan adults reported a positive family history of colorectal cancer. Of these 20.1% had heard of the genetic test, and 60% expressed interest in being tested. Generally, 59.0% of Michigan adults expressed interest in having genetic testing. Interest in testing increased with the income and educational levels and in women. [12]

The percentage of those 50 years of age and older who received appropriately timed colorectal cancer screening is reported in **Tables 13-53A** and **1353B**. Of the component of this screening testing stool for occult blood decreased from 2017 to 2021 by 12% (adjOR=0.88, 95%CI: 0.80, 0.98). Those who had ever had a screening colonoscopy increased by 22% (adjOR=1.22, 95%CI: 1.07, 1.39) (**Table 13-54**).

On multivariate analysis, those reporting ever having a fecal occult blood test for colorectal cancer screening were more as likely to be men as women (2021: adjOR=1.12, 95%CI: 0.96, 1.14; 2017: adjOR=1.06, 95%CI: 0.92, 1.22), be more educated (2021: adjOR=1.19, 95%CI: 1.08, 1.32; 2017: adjOR=1.20, 95%CI: 1.10, 1.31), and had similar levels of income (2021: adjOR=0.99, 95%CI: 0.89, 1.11; 2017: adjOR=1.10, 95%CI: 0.99, 1.21). Responses to this question varied significantly between counties in both surveys (2021: $\chi^2_{13}=51.5$, $p<.0001$; 2017: $\chi^2_{13}=45.3$, $p<.0001$).

On multivariate analysis, those 50 years and older reporting ever having colonoscopy for colorectal cancer screening were more likely to be women in 2021 but not 2017 (2021: adjOR=0.80, 95%CI: 0.66, 0.96; 2017: adjOR=0.95, 95%CI: 0.80, 1.12), be more educated (2021: adjOR=1.20, 95%CI: 1.06, 1.35; 2017: adjOR=1.19, 95%CI: 1.07, 1.32), and have higher income (2021: adjOR=1.44, 95%CI: 1.27, 1.64; 2017: adjOR=1.77, 95%CI: 1.57, 1.98).

	General Health, Fair, or Poor[a]			
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	14.3 (14.2, 14.4)			
US Weighted	14.1			
Michigan (2020)	15.5 (14.4, 16.7)	18.0 (17.2, 18.9)	16.8 (15.8, 17.8)	17.2 (16.2, 18.3)
Upper Peninsula (MiBRFS 2018-2020)	19.3 (16.2, 22.9)			
Upper Peninsula	14.0 (11.5, 16.6)	16.3 (13.8, 18.7)	14.3 (14.1, 14.5) [b]	19.6 (16.9, 22.5) [b]
Alger	16.1 (9.4, 22.8)	16.3 (10.2, 22.4)		
Baraga	16.9 (9.4, 24.5)	18.6 (10.6, 26.6)	19.2 (18.4, 19.9)	18.9 (14.8, 23.7)
Chippewa	15.6 (8.2, 23.0)	21.7 (12.6, 30.9)		
Delta	7.3 (0.7, 13.9)	13.5 (5.8, 21.3)		
Dickinson	16.8 (7.9, 25.6)	16.3 (9.9, 22.6)		
Gogebic	29.5 (12.5, 46.5)	13.8 (7.9, 19.8)	15.5 (14.6, 16.3)	24.3 (18.8, 30.8)
Houghton/Keweenaw	16.1 (8.9, 23.4)	14.5 (4.6, 24.4)	12.3 (12.0, 12.6)	17.0 (13.3, 21.6)
Iron	21.1 (13.5, 28.7)	23.3 (16.8, 29.7)	12.8 (12.3, 13.3)	
Luce	17.1 (11.2, 23.0)	22.3 (14.6, 29.9)		
Mackinac	17.6 (10.0, 25.1)	12.2 (5.6, 18.8)		
Marquette	9.4 (5.2, 13.7)	15.5 (9.8, 21.2)		
Menominee	12.2 (6.3, 18.1)	12.7 (6.6, 18.8)		
Ontonagon	15.4 (10.6, 20.1)	15.6 (11.8, 19.3)	19.8 (19.0, 20.6)	23.6 (19.2, 28.5)
Schoolcraft	18.9 (12.2, 25.7)	25.0 (13.8, 36.2)		
[a] Among all adults, the proportion who reported their health, in general, was either Fair or Poor. Other survey choices were Good, Very Good, and Excellent.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-19B: General Health Status by Population Group		
	General Health, Fair or Poor[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	14.0 (11.5, 16.6)	16.3 (13.8, 18.7)
Age		
18-39	7.7 (2.7, 12.6)	10.8 (5.0, 16.6)
40-65	16.2 (12.9, 19.5)	17.6 (14.2, 20.9)
65+	19.6 (16.8, 22.4)	21.5 (18.6, 24.4)
Gender		
Male	16.2 (11.2, 21.2)	16.6 (12.5, 20.7)
Female	11.9 (9.8, 14.0)	15.9 (13.1, 18.8)
Educational Attainment		
Less than 12th grade	45.6 (28.5, 62.7)	49.5 (36.4, 62.7)
High School Graduate	18.3 (11.8, 24.7)	17.2 (13.0, 21.4)
1-3 years of college	12.7 (9.5, 16.0)	12.0 (9.0, 15.0)
4-year degree or higher	5.8 (3.3, 8.3)	4.0 (2.8, 5.1)
Household Income		
Less than \$25,000	29.4 (15.5, 43.3)	29.9 (24.5, 35.2)
\$25,000 to \$49,999	13.0 (9.7, 16.2)	22.1 (15.8, 28.4)
\$50,000 or higher	7.6 (5.2, 10.1)	5.1 (3.4, 6.7)
[a] Among all adults, the proportion who reported their health, in general, was either Fair or Poor. Other survey choices were Good, Very Good, and Excellent.		

Table 13-20A: Health Status on at Least 14 Days in Past Month by County

	Poor Physical Health[a]		Poor Mental Health[b]		Activity Limitation[c]	
	2021	2017	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	13.8 (13.7, 13.9)		11.9 (11.8, 12.0)			
US Weighted	12.55		13.28			
Michigan (2000)	11.3 (10.4, 12.4)	14.1 (13.3, 14.9)	15.8 (14.7, 17.0)	13.4 (12.6, 14.3)	9.1 (8.3, 10.1)	9.7 (9.0, 10.4)
Upper Peninsula (MiBRFS 2018-2020)	16.8 (13.8, 20.4)		11.8 (9.3, 14.7)			
Upper Peninsula	15.2 (12.6, 17.8)	17.3 (15.0, 19.7)	16.3 (13.3, 19.3)	15.0 (12.6, 17.4)	10.3 (8.1, 12.6)	13.8 (11.2, 16.4)
Alger	19.4 (12.3, 26.5)	15.0 (9.7, 20.4)	15.5 (9.0, 22.1)	18.9 (11.9, 25.9)	15.4 (8.3, 22.5)	12.3 (5.6, 19.0)
Baraga	17.3 (10.0, 24.6)	20.1 (12.1, 28.2)	13.3 (7.9, 18.8)	13.9 (8.3, 19.6)	9.6 (4.7, 14.4)	14.1 (8.0, 20.2)
Chippewa	15.9 (9.0, 22.9)	21.7 (12.6, 30.9)	14.2 (7.0, 21.5)	27.2 (15.5, 38.8)	9.2 (3.4, 15.1)	17.4 (7.3, 27.5)
Delta	9.0 (1.4, 16.6)	18.0 (9.9, 26.1)	10.0 (1.4, 18.5)	10.6 (6.4, 14.9)	7.2 (0.4, 13.9)	11.0 (1.8, 20.2)
Dickinson	22.4 (13.3, 31.6)	16.2 (10.0, 22.4)	24.1 (13.8, 34.3)	10.7 (6.4, 15.0)	15.4 (6.5, 24.3)	10.3 (4.6, 16.1)
Gogebic	31.0 (14.2, 47.8)	22.6 (15.1, 30.1)	27.7 (10.3, 45.1)	16.7 (9.6, 23.8)	23.6 (5.9, 41.3)	14.0 (7.6, 20.5)
Houghton/Keweenaw	15.7 (9.1, 22.3)	12.8 (8.4, 17.1)	17.2 (9.3, 25.0)	8.7 (5.1, 12.2)	11.2 (5.4, 17.0)	8.0 (4.1, 11.9)
Iron	23.1 (14.9, 31.3)	22.5 (15.9, 30.8)	16.1 (9.3, 22.9)	16.9 (10.0, 23.7)	9.0 (4.8, 13.3)	19.9 (12.9, 26.9)
Luce	17.9 (11.9, 23.9)	23.1 (15.4, 30.8)	25.2 (15.0, 35.4)	17.6 (11.3, 23.9)	18.0 (9.5, 26.5)	16.3 (8.9, 23.7)
Mackinac	16.9 (9.4, 24.3)	13.3 (6.4, 20.1)	10.8 (5.9, 15.8)	6.7 (2.7, 10.7)	9.2 (3.5, 14.9)	14.4 (5.7, 23.2)
Marquette	7.8 (4.4, 11.3)	14.5 (9.0, 20.1)	17.6 (10.7, 24.5)	14.8 (8.3, 21.4)	7.6 (3.9, 11.3)	15.4 (8.5, 22.4)
Menominee	18.8 (10.9, 26.8)	20.3 (10.2, 30.4)	14.2 (7.7, 20.8)	16.5 (9.2, 23.9)	7.1 (3.2, 11.1)	17.5 (5.3, 29.7)
Ontonagon	19.4 (13.2, 25.6)	18.0 (14.0, 22.1)	11.0 (6.6, 15.5)	14.6 (10.6, 18.7)	9.2 (5.5, 13.0)	11.6 (7.8, 15.4)
Schoolcraft	19.9 (12.8, 27.0)	20.0 (13.3, 26.7)	16.9 (10.7, 23.1)	23.7 (12.0, 35.5)	14.8 (8.5, 21.2)	16.3 (8.9, 23.7)

[a] Among all adults, the proportion who reported 14 or more days of fair or poor physical health, which includes illness and injury, during the past 30 days.

[b] Among all adults, the proportion who reported 14 or more days of fair or poor mental health, which includes stress, depression, and problems with emotions during the past 30 days.

[c] Among all adults, the proportion who reported 14 or more days in the past 30 days in which either poor physical or poor mental health kept respondents from doing their usual activities.

Table 13-20B: Health Status on at Least 14 Days in Past Month by Population Group

	Poor Physical Health[a]		Poor Mental Health[b]		Activity Limitation[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	15.2 (12.6, 17.8)	17.3 (15.0, 19.7)	16.3 (13.3, 19.3)	15.0 (12.6, 17.4)	10.3 (8.1, 12.6)	13.8 (11.2, 16.4)
Age						
18-39	6.3 (1.9, 10.8)	10.1 (5.3, 14.9)	16.4 (8.9, 23.9)	16.0 (9.9, 22.1)	6.5 (1.8, 11.2)	9.5 (4.3, 14.8)
40-65	19.3 (15.9, 22.6)	19.8 (16.4, 23.2)	18.1 (14.7, 21.5)	15.3 (12.6, 18.0)	12.6 (9.7, 15.6)	16.7 (12.9, 20.6)
65+	21.4 (18.5, 24.2)	22.8 (19.8, 25.8)	13.4 (11.0, 15.7)	12.0 (9.8, 14.3)	12.1 (10.0, 14.3)	14.6 (11.8, 17.4)
Gender						
Male	16.4 (11.5, 21.2)	16.5 (12.9, 20.1)	13.2 (8.4, 17.9)	13.8 (10.0, 17.5)	9.8 (5.8, 13.7)	14.7 (10.1, 19.3)
Female	14.0 (11.7, 16.4)	18.1 (15.2, 21.1)	19.3 (16.1, 22.5)	16.1 (13.1, 19.1)	10.8 (8.7, 12.9)	13.0 (10.1, 15.5)
Educational Attainment						
Less than 12th grade	49.2 (31.2, 67.2)	49.2 (35.8, 62.6)	31.7 (15.7, 47.7)	31.9 (19.5, 44.4)	28.5 (13.3, 43.6)	31.2 (17.4, 44.9)
High School Graduate	21.4 (14.3, 28.6)	19.2 (15.5, 22.9)	18.8 (12.0, 25.6)	15.0 (11.8, 18.2)	14.8 (8.9, 20.7)	14.3 (10.4, 18.3)
1-3 years of college	12.5 (9.4, 15.5)	12.5 (9.7, 15.4)	18.3 (13.7, 23.0)	14.6 (10.1, 19.1)	8.5 (6.2, 10.8)	11.8 (7.6, 16.0)
4-year degree or higher	5.5 (3.8, 7.3)	5.2 (3.6, 6.7)	7.8 (4.9, 10.7)	5.1 (3.2, 7.0)	3.7 (2.2, 5.1)	5.3 (2.8, 7.8)
Household Income						
Less than \$25,000	29.2 (15.4, 43.0)	32.9 (27.1, 38.7)	30.8 (16.1, 45.4)	29.0 (23.1, 34.9)	21.3 (10.5, 32.1)	26.9 (20.5, 33.2)
\$25,000 to \$49,999	16.1 (12.4, 19.7)	19.9 (14.9, 24.9)	16.3 (12.0, 20.6)	15.0 (10.8, 19.2)	9.7 (6.7, 12.8)	14.6 (8.9, 20.2)
\$50,000 or higher	8.3 (6.0, 10.7)	7.1 (5.2, 9.0)	10.0 (7.0, 12.9)	6.5 (3.7, 9.2)	5.4 (3.3, 7.6)	5.0 (3.2, 6.9)

[a] Among all adults, the proportion who reported 14 or more days of fair or poor physical health, which includes illness and injury, during the past 30 days.

[b] Among all adults, the proportion who reported 14 or more days of fair or poor mental health, which includes stress, depression, and problems with emotions during the past 30 days.

[c] Among all adults, the proportion who reported 14 or more days in the past 30 days in which either poor physical or poor mental health kept respondents from doing their usual activities.

Table 13-21A: Disability by County

	Any Disability[a]		Any Activity Limitation[b]		Uses Special Equipment[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Michigan	ND	26.7 (25.7, 27.8)	ND	24.3 (23.3, 25.2)	ND	10.7 (10.0, 11.4)
Upper Peninsula	27.7 (23.7, 31.8)	29.1 (26.2, 32.0)	26.4 (22.5, 30.3)	27.7 (24.8, 30.6)	9.9 (8.1, 11.7)	10.1 (8.6, 11.7)
Alger	29.5 (21.4, 37.7)	33.0 (25.6, 40.5)	28.2 (20.1, 36.2)	32.0 (24.7, 39.4)	14.9 (8.2, 21.7)	8.5 (5.1, 11.9)
Baraga	27.7 (19.0, 36.3)	26.8 (17.9, 35.7)	26.4 (17.9, 34.9)	26.4 (17.5, 35.2)	11.0 (4.7, 17.3)	8.4 (4.6, 12.1)
Chippewa	22.8 (14.3, 31.3)	34.9 (24.2, 45.6)	22.1 (13.6, 30.5)	33.2 (22.6, 43.7)	9.5 (4.4, 14.7)	12.1 (7.0, 17.1)
Delta	19.8 (5.3, 34.2)	33.2 (23.9, 42.5)	18.5 (4.8, 32.3)	29.7 (20.6, 38.8)	7.9 (1.6, 14.2)	10.7 (6.2, 15.1)
Dickinson	32.8 (23.3, 42.3)	28.0 (20.2, 35.8)	30.8 (21.4, 40.3)	26.5 (19.3, 33.6)	8.8 (4.7, 12.9)	10.3 (5.9, 16.7)
Gogebic	33.0 (22.0, 43.9)	27.8 (20.5, 35.1)	29.9 (19.5, 40.2)	26.4 (19.3, 33.6)	13.9 (7.8, 20.1)	7.8 (4.0, 11.6)
Houghton/Keweenaw	27.4 (18.2, 36.5)	26.0 (16.2, 35.9)	24.9 (16.2, 33.5)	25.0 (15.1, 34.9)	10.5 (5.0, 16.0)	7.9 (4.6, 11.2)
Iron	30.3 (21.6, 38.9)	35.0 (27.4, 42.6)	26.9 (19.0, 34.8)	32.1 (24.8, 39.4)	14.4 (7.9, 20.9)	20.7 (14.4, 27.0)
Luce	34.1 (26.2, 42.1)	39.9 (31.0, 48.8)	32.7 (25.0, 40.5)	38.5 (29.6, 47.4)	16.2 (10.8, 21.6)	12.7 (8.3, 17.2)
Mackinac	29.7 (21.3, 38.1)	26.6 (18.1, 35.0)	28.4 (20.0, 36.7)	25.7 (17.3, 34.0)	16.0 (8.6, 23.4)	7.9 (4.3, 11.4)
Marquette	29.4 (20.0, 38.9)	23.9 (17.3, 30.6)	29.0 (19.6, 38.5)	23.6 (17.0, 30.2)	5.9 (2.7, 9.2)	7.9 (3.9, 11.9)
Menominee	31.7 (21.8, 41.6)	28.5 (18.3, 38.8)	31.3 (21.4, 41.1)	26.8 (16.6, 37.0)	11.9 (5.8, 18.1)	13.0 (3.9, 22.1)
Ontonagon	36.3 (28.1, 44.4)	28.5 (23.3, 33.7)	34.5 (26.4, 42.7)	27.3 (22.1, 32.4)	13.1 (9.0, 17.2)	11.3 (8.0, 14.5)
Schoolcraft	29.9 (21.2, 38.5)	40.0 (29.5, 50.5)	28.9 (20.3, 37.4)	37.5 (26.8, 48.2)	16.2 (10.2, 22.3)	13.7 (8.9, 18.5)
[a] Among all adults, the proportion who reported being limited in any activity because of physical, mental, or emotional problems, or reported they required use of special equipment (such as cane, wheelchair, a special bed, or a special telephone) due to a health problem						
[b] Among all adults, the proportion who reported being limited in any activities because of physical, mental, or emotional problems.						
[c] Among all adults, the proportion who reported they required use of special equipment (such as cane, wheelchair, a special bed, or a special telephone) due to a health problem.						

Table 13-21B: Disability by Population Group

	Any Disability[a]		Any Activity Limitation[b]		Uses Special Equipment[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	27.7 (23.7, 31.8)	29.1 (26.2, 32.0)	26.4 (22.5, 30.3)	27.7 (24.8, 30.6)	9.9 (8.1, 11.7)	10.1 (8.6, 11.7)
Age						
18, 39	16.0 (7.9, 24.1)	16.2 (9.6, 22.8)	15.5 (7.5, 23.5)	15.7 (9.1, 22.2)	1.3 (0.0, 2.8)	4.6 (1.2, 7.9)
40, 65	30.7 (26.5, 34.8)	33.4 (29.6, 37.2)	29.7 (25.6, 33.9)	32.3 (28.5, 36.1)	11.5 (8.6, 14.4)	9.2 (7.1, 11.2)
65+	39.5 (36.2, 42.7)	38.9 (35.6, 42.1)	36.4 (33.2, 39.6)	35.5 (32.3, 38.7)	19.6 (17.0, 22.2)	19.8 (17.2, 22.3)
Gender						
Male	29.0 (21.5, 36.5)	31.7 (26.6, 36.7)	28.1 (20.7, 35.5)	30.2 (25.2, 35.2)	9.8 (6.7, 12.9)	9.9 (7.4, 12.4)
Female	26.5 (22.8, 30.1)	26.7 (32.7, 29.7)	24.7 (21.1, 28.3)	25.3 (22.4, 28.3)	9.9 (8.0, 11.9)	10.4 (8.5, 12.3)
Educational Attainment						
Less than 12th grade	44.3 (27.5, 61.1)	47.9 (34.6, 61.1)	38.1 (22.3, 53.9)	45.4 (32.3, 58.5)	30.3 (15.8, 44.8)	15.7 (9.1, 22.2)
High School Graduate	32.9 (22.8, 42.9)	31.7 (26.7, 36.7)	31.8 (22.0, 41.6)	29.9 (25.0, 34.9)	12.5 (8.0, 16.9)	12.7 (9.6, 15.8)
1, 3 years of college	27.7 (22.6, 32.7)	27.0 (22.4, 31.7)	26.1 (21.1, 31.0)	26.2 (21.6, 30.7)	8.9 (6.5, 11.3)	8.3 (6.1, 10.5)
4-year degree or higher	18.1 (12.3, 23.9)	15.4 (12.5, 18.4)	17.3 (11.6, 23.1)	13.9 (11.2, 16.7)	5.1 (3.6, 6.7)	4.9 (3.4, 6.3)
Household Income						
Less than \$25,000	38.8 (21.4, 56.2)	47.0 (40.6, 53.3)	36.9 (20.2, 53.5)	44.8 (38.5, 51.1)	15.4 (8.0, 22.8)	19.4 (15.1, 23.7)
\$25,000 to \$49,999	32.6 (26.3, 38.8)	34.4 (28.2, 40.5)	31.7 (25.5, 38.0)	33.1 (27.0, 39.3)	11.8 (8.5, 15.2)	12.4 (9.0, 15.8)
\$50,000 or higher	20.1 (15.7, 24.5)	15.1 (12.2, 18.1)	18.9 (14.5, 23.2)	14.0 (11.2, 16.8)	6.2 (4.3, 8.1)	3.6 (2.4, 4.9)

[a] Among all adults, the proportion who reported being limited in any activity because of physical, mental, or emotional problems, or reported they required use of special equipment (such as cane, wheelchair, a special bed, or a special telephone) due to a health problem.

[b] Among all adults, the proportion who reported being limited in any activities because of physical, mental, or emotional problems.

[c] Among all adults, the proportion who reported they required use of special equipment (such as cane, wheelchair, a special bed, or a special telephone) due to a health problem.

Table 13-22A: Health Care Access by County

	No Health Insurance Age 18-64[a]				No Personal Health Provider[b]	
	2021	2017	2015	2012	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	7.8 (7.7, 7.99)				16.9 (16.8, 17.0)	
US Weighted	12.3				23.2	
Michigan (2020)	8.4 (7.3, 9.6)	9.9 (9.0, 10.8)	12.7 (11.6, 14.0)	18.3 (17.0, 19.6)	14.5 (13.3, 15.7)	14.8 (13.9, 15.7)
Upper Peninsula (MiBRFS 2018-2020)	13.6 (10.2, 17.9)				13.7 (10.9, 17.0)	
Upper Peninsula	4.4 (2.3, 6.5)	7.0 (4.6, 9.4)	8.5 (8.3, 8.7) [c]	18.6 (15.5, 22.2) [c]	11.3 (8.4, 14.3)	14.1 (11.5, 16.8)
Alger	5.0 (0.3, 9.8)	5.8 (1.3, 10.3)			11.5 (6.2, 16.8)	15.9 (10.0, 21.7)
Baraga	9.3 (0.0, 22.3)	8.5 (0.0, 17.3)	10.0 (9.1, 10.9)	18.8 (12.7, 26.7)	18.9 (8.3, 29.4)	16.0 (4.3, 27.6)
Chippewa	1.9 (0.0, 4.0)	5.8 (0.0, 13.2)			5.4 (0.4, 10.4)	18.9 (7.1, 30.7)
Delta	2.6 (0.0, 8.4)	4.4 (0.7, 8.1)			6.1 (0.1, 12.1)	5.7 (2.5, 8.9)
Dickinson	12.1 (3.8, 20.3)	1.0 (0.0, 2.2)			11.2 (2.3, 20.2)	10.4 (3.2, 17.6)
Gogebic	2.3 (0.0, 5.5)	7.1 (1.3, 12.8)	3.4 (3.2, 3.7)	22.4 (16.7, 29.3)	25.8 (6.9, 44.7)	18.5 (11.7, 25.3)
Houghton/Keweenaw	7.5 (0.0, 19.1)	14.7 (3.9, 25.5)	7.1 (6.9, 7.3)	15.5 (11.0, 21.2)	9.0 (0.0, 18.2)	9.2 (4.7, 13.7)
Iron	3.6 (0.0, 7.7)	9.9 (1.1, 18.6)	12.8 (12.1, 13.4)		20.1 (8.6, 31.5)	21.4 (11.6, 31.1)
Luce	8.1 (0.0, 17.9)	3.8 (0.0, 10.2)			7.1 (1.7, 12.5)	11.1 (4.8, 17.5)
Mackinac	3.8 (0.0, 8.4)	8.0 (1.9, 14.2)			17.0 (7.3, 26.6)	19.7 (11.6, 27.7)
Marquette	2.6 (0.0, 5.2)	8.0 (1.9, 14.2)			13.5 (5.3, 21.8)	19.7 (11.6, 27.7)
Menominee	2.5 (0.0, 6.2)	5.8 (0.7, 10.8)			12.5 (4.1, 21.0)	11.2 (4.9, 17.5)
Ontonagon	3.8 (0.0, 8.1)	7.8 (3.2, 12.5)	8.9 (8.2, 9.6)	28.3 (22.4, 35.0)	15.3 (8.9, 21.7)	19.3 (11.9, 26.7)
Schoolcraft	6.3 (1.4, 11.1)	3.0 (0.0, 6.8)			7.4 (3.6, 11.1)	7.5 (3.0, 12.0)

[a] Among adults 18, 64 years, the proportion who reported having no health insurance of any type.

[b] Among all adults, the proportion who reported they did not have anyone they thought of as their personal doctor or health care provider.

[c] Cumulative estimate for the counties surveyed.

Table 13-22B: Health Care Access by Population Group

	No Health Insurance Age 18-64[a]		No Personal Health Provider[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	4.4 (2.3, 6.5)	7.0 (4.6, 9.4)	11.3 (8.4, 14.3)	14.1 (11.5, 16.8)
Age				
18-39	4.4 (0.3, 8.6)	9.9 (4.7, 15.1)	17.0 (8.6, 25.4)	24.3 (17.1, 31.6)
40-65	4.4 (2.9, 5.9)	4.9 (3.5, 6.3)	11.1 (8.2, 14.1)	11.2 (8.8, 13.7)
65+	—	—	3.8 (2.8, 4.7)	5.5 (3.7, 7.4)
Gender				
Male	6.2 (2.1, 10.4)	8.3 (4.3, 12.3)	15.1 (9.2, 21.1)	16.7 (12.1, 21.3)
Female	2.6 (1.2, 4.1)	5.8 (3.1, 8.5)	7.7 (5.7, 9.7)	11.7 (8.9, 14.5)
Educational Attainment				
Less than 12th grade	33.4 (1.6, 65.3)	5.0 (0.5, 9.4)	6.5 (0.0, 15.4)	12.5 (5.2, 19.9)
High School Graduate	4.3 (1.5, 7.2)	7.1 (4.0, 10.2)	9.1 (4.6, 13.7)	15.1 (10.1, 20.1)
1-3 years of college	2.3 (1.1, 3.5)	8.2 (3.1, 13.4)	11.7 (7.4, 16.0)	13.8 (9.5, 18.1)
4-year degree or higher	1.5 (0.6, 2.4)	4.8 (2.2, 7.4)	12.2 (6.0, 18.4)	13.3 (9.4, 17.2)
Household Income				
Less than \$25,000	3.9 (0.9, 6.9)	10.6 (5.6, 15.6)	10.4 (2.8, 18.0)	13.4 (9.4, 17.4)
\$25,000 to \$49,999	13.4 (4.7, 22.1)	7.7 (3.7, 11.6)	12.8 (7.3, 18.4)	14.1 (9.4, 18.8)
\$50,000 or higher	1.3 (0.6, 2.0)	4.9 (1.2, 8.6)	11.3 (7.4, 15.1)	14.8 (10.0, 19.5)
[a] Among adults 18-64 years, the proportion who reported having no health insurance of any type.				
[b] Among all adults, the proportion who reported they did not have anyone they thought of their personal doctor or health care provider.				

Table 13-23A: Health Care Barriers by County				
	Unable to Access Health Care in Past 12 Months due to Cost[a]		Unable to Access Health Care in Past 12 Months due to Lack of Transportation[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	10.6 (10.5, 10.7)			
US Weighted	13.4			
Michigan (2020)	7.9 (7.1, 8.8)	12.8 (12.0, 13.6)		
Upper Peninsula (MiBRFS 2018-2020)	10.0 (7.7, 13.0)			
Upper Peninsula	8.0 (5.8, 10.1)	15.8 (12.8, 18.8)	4.6 (3.0, 6.3)	4.8 (3.3, 6.3)
Alger	11.0 (4.2, 17.8)	7.3 (3.7, 10.9)	4.3 (0.9, 7.8)	5.5 (1.0, 10.1)
Baraga	10.5 (3.7, 17.2)	14.2 (7.6, 20.7)	2.7 (0.4, 5.1)	8.8 (0.0, 19.5)
Chippewa	10.9 (1.9, 19.9)	8.2 (0.9, 15.5)	5.2 (0.5, 10.0)	10.5 (2.0, 19.1)
Delta	1.9 (0.0, 4.1)	13.9 (4.8, 23.0)	2.3 (0.0, 5.5)	2.2 (0.5, 5.5)
Dickinson	9.8 (4.1, 15.5)	13.3 (6.9, 19.8)	2.4 (0.02, 4.9)	3.0 (0.5, 5.5)
Gogebic	4.8 (1.3, 8.3)	13.3 (7.4, 19.2)	4.2 (1.3, 7.1)	3.3 (1.0, 5.6)
Houghton/Keweenaw	9.6 (3.0, 16.1)	19.0 (10.0, 28.1)	6.4 (1.0, 11.8)	3.5 (0.8, 6.1)
Iron	8.5 (3.9, 13.1)	21.8 (14.2, 29.4)	11.1 (4.4, 17.8)	6.2 (2.8, 9.5)
Luce	8.8 (2.4, 15.1)	10.8 (6.0, 15.6)	4.6 (2.0, 7.3)	10.7 (3.7, 17.7)
Mackinac	9.7 (2.8, 16.7)	21.3 (7.0, 35.5)	2.9 (0.8, 5.1)	5.0 (0.7, 9.2)
Marquette	8.1 (2.4, 13.7)	19.9 (11.2, 28.6)	5.2 (0.0, 10.6)	4.6 (0.4, 8.8)
Menominee	9.3 (3.6, 15.0)	19.0 (8.8, 29.2)	6.0 (1.4, 10.6)	3.0 (0.2, 5.7)
Ontonagon	9.3 (3.0, 15.6)	12.3 (8.3, 16.3)	3.6 (1.9, 5.4)	5.1 (2.5, 7.6)
Schoolcraft	6.4 (2.6, 10.2)	9.4 (4.4, 14.4)	2.9 (0.5, 5.2)	3.7 (1.5, 5.9)
[a] Among all adults, the proportion who reported they could not see a doctor when they needed in the past 12 months due to cost.				
[b] Among all adults, the proportion who reported they could not see a doctor when they needed in the past 12 months due to lack of transportation. This question is not part of the statewide BRFS.				

Table 13-23B: Health Care Barriers by Population Group

	Unable to Access Health Care in Past 12 Months due to Cost[a]		Unable to Access Health Care in Past 12 Months due to Lack of Transportation[b]	
	2021	2017	2021	2017
	% (95% C.I.)		% (95% C.I.)	
Upper Peninsula	8.0 (5.8, 10.1)		4.6 (3.0, 6.3)	
Age				
18-39	9.7 (4.1, 15.4)	24.8 (17.0, 32.7)	4.5 (0.6, 8.4)	6.1 (1.9, 10.4)
40-65	10.2 (7.6, 12.8)	15.3 (12.2, 18.4)	5.7 (3.5, 8.0)	4.7 (3.4, 6.0)
65+	2.2 (1.3, 3.1)	3.8 (2.4, 5.1)	0.6 (2.0, 4.3)	2.7 (1.6, 3.7)
Gender				
Male	6.3 (3.2, 9.4)	15.6 (10.5, 20.7)	5.5 (2.5, 8.5)	3.6 (2.0, 5.3)
Female	9.6 (6.7, 12.5)	15.9 (12.7, 19.1)	3.8 (2.3, 5.4)	5.9 (3.5, 8.4)
Educational Attainment				
Less than 12th grade	16.1 (2.5, 29.8)	16.4 (4.9, 27.9)	16.7 (4.8, 28.6)	15.7 (5.5, 25.8)
High School Graduate	8.6 (4.8, 12.4)	18.4 (13.1, 23.6)	4.3 (2.2, 6.5)	4.8 (2.8, 6.7)
1-3 years of college	9.2 (4.9, 13.6)	15.4 (10.4, 20.3)	5.9 (2.2, 9.7)	3.5 (1.1, 5.9)
4-year degree or higher	4.3 (2.5, 6.1)	9.3 (6.0, 12.6)	1.7 (0.0, 3.7)	0.9 (0.4, 1.5)
Household Income				
Less than \$25,000	13.0 (5.2, 20.9)	19.2 (14.0, 24.3)	8.7 (3.8, 13.6)	13.0 (8.8, 17.3)
\$25,000 to \$49,999	12.1 (7.2, 17.0)	20.4 (14.6, 26.2)	7.1 (2.1, 12.1)	2.1 (0.08, 4.1)
\$50,000 or higher	3.9 (2.2, 5.7)	11.3 (6.5, 16.1)	1.5 (0.2, 2.8)	1.6 (0.0, 3.5)
[a] Among all adults, the proportion who reported they could not see a doctor when they needed in the past 12 months due to cost.				
[b] Among all adults, the proportion who reported they could not see a doctor when they needed in the past 12 months due to lack of transportation. This question is not part of the statewide BRFSS.				

Table 13-24A: Most Recent Checkup by County

	No Routine Checkup in Past 12 Months[a]			
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	20.2			
US Weighted	24.3			
Michigan (2020)	23.4 (22.1, 24.8)	26.9 (25.9, 28.0)	28.2 27.0, 29.5	33.5 32.2, 34.9
Upper Peninsula (MiBRFS 2018-2020)	21.0 (17.7, 24.8)			
Upper Peninsula	24.0 (19.7, 28.3)	25.9 (22.8, 29.1)	29.8 (29.6, 30.0) [b]	39.8 (35.8, 44.0) [b]
Alger	21.3 (14.3, 28.3)	29.2 (20.6, 37.8)		
Baraga	26.3 (15.8, 36.8)	34.0 (23.3, 44.8)	29.1 (28.3, 30.0)	37.3 (30.9, 44.2)
Chippewa	27.9 (16.8, 39.0)	30.6 (17.6, 43.7)		
Delta	19.0 (4.0, 33.9)	19.8 (13.4, 26.2)		
Dickinson	15.9 (6.5, 25.2)	17.0 (9.7, 24.3)		
Gogebic	30.0 (13.1, 47.0)	32.9 (24.6, 41.1)	30.7 (30.0, 31.3)	39.9 (33.5, 46.6)
Houghton/Keweenaw	26.2 (13.7, 38.7)	21.4 (12.6, 30.2)	30.8 (30.4, 31.2)	39.6 (33.1, 46.5)
Iron	24.1 (15.4, 32.7)	28.8 (19.5 38.2)	26.6 (25.9, 27.3)	
Luce	17.0 (8.8, 25.2)	21.0 (12.4, 29.7)		
Mackinac	24.8 (15.2, 34.4)	31.2 (20.5, 43.9)		
Marquette	27.2 (16.7, 37.7)	28.5 (20.2, 36.9)		
Menominee	24.2 (14.2, 34.3)	27.5 (14.5, 40.4)		
Ontonagon	27.5 (19.7, 35.3)	32.6 (25.3, 39.8)	24.7 (23.8, 25.6)	43.7 (38.4 49.2)
Schoolcraft	12.8 (7.5, 18.1)	18.3 (11.4, 25.2)		
[a] Among all adults, the proportion who reported they did not have a routine checkup in the past year.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-24B: Most Recent Checkup by Population Group		
	No Routine Checkup in Past 12 Months[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	24.0 (19.7, 28.3)	25.9 (22.8, 29.1)
Age		
<i>18-39</i>	32.1 (19.7, 44.5)	40.2 (31.8, 48.5)
<i>40-65</i>	25.3 (21.1, 29.4)	23.2 (20.1, 26.3)
<i>65+</i>	10.9 (8.7, 13.1)	11.3 (8.8, 13.8)
Gender		
<i>Male</i>	28.0 (19.7, 36.2)	26.3 (21.1, 31.4)
<i>Female</i>	20.2 (16.5, 23.8)	25.6 (21.9, 29.4)
Educational Attainment		
<i>Less than 12th grade</i>	15.5 (3.4, 27.6)	24.7 (13.6, 35.8)
<i>High School Graduate</i>	20.5 (12.6, 28.4)	25.9 (20.6, 31.1)
<i>1-3 years of college</i>	25.1 (19.3, 30.9)	26.7 (21.0, 32.5)
<i>4-year degree or higher</i>	26.8 (19.1, 34.6)	24.9 (20.2, 29.7)
Household Income		
<i>Less than \$25,000</i>	25.2 (11.9, 38.4)	27.4 (21.6, 33.2)
<i>\$25,000 to \$49,999</i>	29.6 (21.5, 37.7)	24.9 (20.0, 29.9)
<i>\$50,000 or higher</i>	21.0 (16.3, 25.6)	25.8 (20.3, 31.4)
[a] Among all adults, the proportion who reported they did not have a routine checkup in the past year.		

Table 13-25A: Oral Health Care Access by County

	No Dental Care Past 12 Months[a]		No Dental Insurance[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Michigan (2020)	30.8 (29.3, 32.2)	29.9 (28.8, 31.0)		27.0 (25.1, 29.1)
Upper Peninsula (MiBRFS 2018-2020)	29.6 (22.1, 38.3)			
Upper Peninsula	28.2 (24.0, 32.5)	31.8 (28.7, 34.9)	28.1 (24.1, 32.1)	35.9 (32.9, 39.0)
Alger	37.2 (28.2, 46.2)	35.5 (27.2, 43.8)	31.1 (23.0, 39.3)	35.1 (27.7, 42.6)
Baraga	32.6 (22.0, 43.2)	23.6 (15.4, 31.9)	36.2 (26.1, 46.4)	33.6 (24.4, 42.7)
Chippewa	35.1 (24.0, 46.8)	30.6 (20.4, 40.8)	33.2 (21.2, 45.2)	25.7 (15.5, 35.9)
Delta	14.8 (3.4, 26.3)	38.4 (28.3, 48.5)	18.7 (5.2, 32.3)	38.6 (29.3, 47.8)
Dickinson	23.9 (16.2, 31.5)	31.2 (22.3, 40.1)	40.1 (30.8, 49.4)	43.7 (35.0, 52.4)
Gogebic	36.7 (20.5, 52.8)	29.6 (22.2, 36.9)	27.2 (18.1, 36.4)	42.7 (34.8, 50.7)
Houghton/Keweenaw	26.9 (17.3, 36.6)	32.9 (23.5, 42.4)	26.4 (15.6, 37.1)	38.8 (29.2, 48.3)
Iron	36.2 (25.2, 47.2)	41.7 (32.7, 50.7)	42.2 (31.7, 52.8)	41.7 (33.7, 49.7)
Luce	30.1 (21.0, 39.1)	32.9 (24.5, 41.2)	28.2 (19.9, 36.5)	28.0 (20.7, 35.2)
Mackinac	42.9 (33.0, 52.8)	25.6 (14.7, 36.5)	31.2 (22.6, 39.8)	38.3 (25.5, 51.1)
Marquette	31.2 (21.7, 40.7)	28.2 (20.2, 36.3)	22.5 (16.1, 28.9)	35.1 (27.0, 43.1)
Menominee	17.8 (11.3, 24.3)	28.0 (18.5, 37.5)	26.1 (17.8, 34.5)	29.3 (21.1, 37.5)
Ontonagon	33.1 (25.4, 40.8)	34.7 (28.4, 41.0)	39.4 (31.4, 47.3)	43.0 (36.5, 49.4)
Schoolcraft	33.0 (21.8, 44.2)	44.1 (33.7, 54.6)	38.0 (26.4, 49.6)	36.8 (28.2, 45.4)
[a] Among all adults, the proportion who reported they had not visited a dentist or dental clinic for any reason in the past year.				
[b] Among all adults, the proportion having no insurance coverage for dental care. Statewide survey question refers to the proportion who reported they did not have dental coverage for the entire past 12 months.				

Table 13-25B: Oral Health Care Access by Population Group

	No Dental Care Past 12 Months[a]		No Dental Insurance[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	28.2 (24.0, 32.5)	31.8 (28.7, 34.9)	28.1 (24.1, 32.1)	35.9 (32.9, 39.0)
Age				
18-39	28.3 (17.3, 39.2)	35.2 (27.3, 43.1)	16.4 (8.5, 24.3)	24.9 (17.7, 32.1)
40-65	28.9 (24.8, 33.1)	29.8 (26.1, 33.5)	27.3 (23.3, 31.2)	32.1 (28.4, 35.9)
65+	27.0 (24.1, 29.9)	30.8 (27.6, 33.9)	45.7 (42.4, 49.1)	58.1 (54.8, 61.4)
Gender				
Male	30.3 (22.3, 38.3)	37.2 (31.9, 42.5)	27.6 (20.5, 34.7)	37.2 (32.2, 42.3)
Female	26.2 (22.3, 30.0)	26.6 (23.3, 30.0)	28.4 (24.6, 32.2)	34.7 (31.2, 38.2)
Educational Attainment				
Less than 12th grade	62.9 (47.3, 78.5)	52.4 (39.4, 65.4)	48.3 (30.4, 66.2)	51.5 (38.4, 64.6)
High School Graduate	30.4 (20.9, 39.9)	35.8 (30.7, 40.9)	31.3 (21.9, 40.7)	38.8 (33.9, 43.7)
1-3 years of college	27.7 (22.4, 33.0)	28.3 (22.9, 33.6)	28.9 (23.8, 34.0)	33.7 (28.4, 39.1)
4-year degree or higher	22.1 (15.0, 29.2)	17.0 (12.8, 21.2)	17.3 (12.7, 21.9)	22.8 (19.0, 26.6)
Household Income				
Less than \$25,000	41.5 (22.7, 60.2)	55.1 (48.7, 61.4)	30.2 (16.3, 44.2)	46.1 (39.8, 52.3)
\$25,000 to \$49,999	31.2 (25.3, 37.2)	33.2 (27.4, 38.9)	42.1 (35.1, 49.1)	46.3 (40.5, 52.2)
\$50,000 or higher	20.9 (16.3, 25.5)	18.1 (13.9, 22.3)	20.3 (16.6, 24.0)	22.7 (18.6, 26.8)
[a] Among all adults, the proportion who reported they had not visited a dentist or dental clinic for any reason in the past year.				
[b] Among all adults, the proportion having no insurance coverage for dental care. Statewide survey question refers to the proportion who reported they did not have dental coverage for the entire past 12 months.				

Table 13-26A: Oral Health Care Barriers by County

	Unable to Access Dental Care in Past 12 Months Due to Cost[a]		Unable to Access Dental Care in Past 12 Months due to Lack or Transportation[b]		Delayed Dental Care in Past 12 Months Because Could Not Find Available Dentist[c]	
	2021	2017	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Upper Peninsula	12.1 (9.6, 14.6)	20.7 (17.6, 23.7)	3.4 (1.9, 4.9)	5.1 (3.2, 7.0)	17.5 (9.1, 25.8)	7.4 (5.6, 9.1)
Alger	13.5 (6.4, 20.6)	17.8 (11.0, 24.6)	3.5 (0.4, 6.7)	4.6 (0.2, 8.9)	8.6 (2.3, 15.0)	7.0 (2.7, 11.3)
Baraga	5.9 (2.6, 9.2)	13.9 (7.9, 19.8)	4.8 (0.0, 10.8)	1.8 (0.0, 3.8)	3.3 (0.6, 6.0)	3.1 (0.5, 5.7)
Chippewa	17.7 (7.2, 28.1)	13.9 (5.8, 22.0)	4.4 (0.0, 8.8)	11.7 (1.9, 21.5)	31.5 (19.6, 43.4)	5.3 (1.3, 9.3)
Delta	7.2 (0.8, 13.5)	19.4 (12.0, 26.9)	0.5 (0.0, 1.3)	3.2 (0.6, 5.9)	36.2 (0.0, 78.0)	8.4 (0.8, 15.9)
Dickinson	16.9 (9.0, 24.8)	14.5 (8.9, 20.1)	4.1 (0.0, 9.0)	1.5 (0.4, 2.7)	15.2 (5.4, 24.9)	5.3 (1.7, 8.9)
Gogebic	13.9 (7.1, 20.6)	13.5 (8.1, 18.9)	1.3 (0.0, 2.7)	2.2 (0.2, 4.3)	16.0 (7.9, 24.0)	3.8 (1.9, 5.7)
Houghton/Keweenaw	12.1 (5.0, 19.1)	21.8 (12.3, 31.3)	3.6 (0.0, 7.6)	2.7 (0.2, 5.2)	12.6 (5.3, 19.9)	8.7 (5.2, 12.1)
Iron	15.7 (9.2, 22.1)	24.9 (17.6, 32.3)	6.9 (1.3, 12.4)	4.4 (1.4, 9.5)	9.9 (5.0, 14.8)	9.6 (5.0, 14.3)
Luce	18.2 (8.6, 27.8)	23.2 (15.3, 31.1)	2.0 (0.2, 3.8)	9.9 (2.6, 17.2)	13.4 (4.1, 22.7)	12.2 (5.9, 18.6)
Mackinac	11.6 (4.7, 18.5)	21.9 (8.1, 35.7)	1.5 (0.0, 3.0)	11.9 (0.0, 26.6)	12.8 (6.6, 19.0)	15.3 (0.9, 29.6)
Marquette	11.5 (6.6, 16.3)	28.3 (19.2, 37.4)	5.1 (0.0, 10.5)	4.7 (0.2, 9.1)	10.4 (5.7, 15.0)	6.0 (1.6, 10.5)
Menominee	7.3 (3.4, 11.2)	19.0 (9.2, 28.8)	3.4 (0.7, 6.0)	8.4 (0.0, 17.7)	6.4 (2.1, 10.7)	8.2 (2.6, 13.8)
Ontonagon	12.9 (7.8, 17.9)	14.3 (10.1, 18.4)	3.2 (0.5, 5.9)	2.9 (0.7, 5.1)	15.2 (7.9, 22.4)	6.0 (3.7, 8.2)
Schoolcraft	9.4 (5.0, 13.8)	26.8 (15.2, 38.4)	1.4 (0.0, 2.8)	2.2 (0.6, 3.8)	8.3 (4.3, 12.4)	14.4 (7.6, 21.3)

[a] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months due to cost.

[b] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months due to lack of transportation.

[c] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months because they could not find an available dental professional.

These questions are not part of the statewide BRFS.

Table 13-26B: Oral Health Care Barriers by Population Group

	Unable to Access Dental Care in Past 12 Months Due to Cost[a]		Unable to Access Dental Care in Past 12 Months due to Lack or Transportation[b]		Delayed Dental Care in Past 12 Months Because Could Not Find Available Dentist[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	12.1 (9.6, 14.6)	20.7 (17.6, 23.7)	3.4 (1.9, 4.9)	5.1 (3.2, 7.0)	17.5 (9.1, 25.8)	7.4 (5.6, 9.1)
Age						
18-39	12.0 (6.0, 18.0)	29.6 (21.5, 37.7)	3.7 (0.04, 7.3)	9.5 (4.0, 14.9)	29.4 (8.9, 49.8)	7.1 (3.3, 10.9)
40-65	14.6 (11.4, 17.9)	19.1 (16.3, 22.0)	4.3 (2.3, 6.4)	3.6 (2.4, 4.9)	13.8 (10.4, 17.3)	9.4 (6.8, 12.0)
65+	8.4 (6.7, 10.1)	10.6 (8.8, 12.5)	1.6 (0.9, 2.3)	1.3 (0.5, 2.1)	6.4 (4.8, 7.9)	3.3 (2.1, 4.4)
Gender						
Male	9.3 (6.0, 12.6)	20.0 (15.0, 25.0)	4.0 (1.2, 6.7)	4.9 (2.1, 7.8)	19.8 (3.4, 36.1)	6.0 (3.4, 8.6)
Female	14.8 (11.4, 18.1)	21.3 (17.7, 24.8)	2.9 (1.6, 4.3)	5.3 (2.7, 7.9)	15.2 (11.8, 18.7)	8.6 (6.3, 10.9)
Educational Attainment						
Less than 12th grade	22.9 (7.8, 38.0)	17.2 (9.3, 25.1)	11.0 (1.2, 20.8)	11.7 (2.2, 21.2)	10.8 (0.0, 22.8)	14.9 (3.9, 25.8)
High School Graduate	13.4 (8.6, 18.3)	22.5 (17.2, 27.7)	3.3 (1.5, 5.0)	5.3 (2.3, 8.2)	24.4 (4.2, 44.6)	7.3 (4.8, 9.8)
1-3 years of college	13.7 (9.3, 18.1)	23.9 (18.4, 29.5)	5.0 (1.3, 8.7)	4.9 (1.6, 8.2)	13.6 (9.2, 18.1)	6.9 (4.2, 9.5)
4-year degree or higher	6.8 (3.6, 10.1)	9.6 (6.8, 12.3)	0.3 (0.04, 0.5)	0.7 (0.2, 1.2)	13.5 (8.6, 18.3)	3.4 (2.2, 4.6)
Household Income						
Less than \$25,000	19.4 (9.8, 29.0)	30.7 (24.8, 36.6)	7.9 (3.2, 12.6)	13.5 (8.0, 19.0)	36.0 (8.2, 63.8)	13.5 (9.4, 17.6)
\$25,000 to \$49,999	17.2 (11.8, 22.5)	24.0 (18.6, 29.4)	3.9 (0.0, 8.5)	2.8 (0.0, 5.8)	14.3 (8.9, 19.6)	9.1 (4.7, 13.5)
\$50,000 or higher	6.6 (4.1, 9.1)	12.4 (7.5, 17.3)	1.1 (0.0, 2.2)	1.6 (0.0, 3.5)	10.9 (7.6, 14.2)	2.5 (1.6, 4.1)

[a] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months due to cost.

[b] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months due to lack of transportation.

[c] Among all adults, the proportion who reported they could not see a dentist when they needed in the past 12 months because they could not find an available dental professional.

Table 13-27A: Weight Status by County

	Obese[a]		Overweight[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	32.3 (32.1, 32.4)		35.7 (35.6, 35.9)	
US Weighted	31.4		35.3	
Michigan (2020)	35.2 (33.7, 36.7)	32.5 (31.4, 33.6)	34.6 (33.1, 36.1)	35.0 (33.9, 36.2)
Upper Peninsula (MiBRFS 2018-2020)	35.9 (31.8, 40.2)		34.0 (29.8, 38.5)	
Upper Peninsula	37.7 (30.7, 44.7)	36.9 (33.7, 40.2)	34.6 (29.6, 39.5)	34.0 (30.8, 37.2)
Alger	42.0 (32.2, 51.8)	41.5 (33.1, 49.8)	31.5 (23.8, 39.3)	29.2 (22.1, 36.3)
Baraga	45.5 (34.8, 56.3)	43.5 (32.4, 54.7)	29.1 (20.2, 38.0)	36.4 (25.7, 47.1)
Chippewa	27.0 (17.3, 36.6)	43.7 (31.6, 55.8)	35.1 (23.9, 46.2)	26.9 (18.7, 35.1)
Delta	56.2 (26.2, 86.2)	41.7 (33.8, 50.5)	24.8 (6.4, 43.2)	36.7 (27.4, 46.0)
Dickinson	33.0 (24.1, 41.9)	31.8 (23.2, 40.3)	31.3 (22.5, 40.2)	32.9 (24.8, 41.1)
Gogebic	42.8 (29.1, 56.4)	42.1 (33.8, 50.5)	27.8 (18.0, 37.5)	33.3 (25.7, 40.9)
Houghton/Keweenaw	26.0 (12.9, 39.1)	29.6 (21.4, 37.8)	44.8 (31.8, 57.8)	35.6 (25.8, 45.4)
Iron	34.8 (23.8, 45.8)	40.3 (32.0, 48.7)	33.7 (24.2, 43.2)	30.8 (22.2, 39.5)
Luce	49.1 (39.3, 58.8)	53.4 (44.4, 62.5)	29.1 (21.1, 37.2)	28.5 (19.9, 37.1)
Mackinac	36.2 (27.0, 45.3)	35.2 (22.0, 48.5)	32.4 (23.7, 41.0)	29.3 (20.3, 38.4)
Marquette	32.5 (22.6, 42.4)	32.6 (23.7, 41.6)	40.6 (30.3, 50.9)	37.4 (28.3, 46.5)
Menominee	45.7 (33.4, 58.0)	35.8 (25.7, 45.9)	33.1 (23.0, 43.2)	36.1 (23.6, 48.6)
Ontonagon	39.7 (30.4, 49.0)	39.2 (32.2, 46.3)	33.6 (26.1, 41.1)	37.3 (30.8, 43.8)
Schoolcraft	47.5 (35.5, 59.5)	42.0 (31.5, 52.4)	34.1 (22.9, 45.3)	27.3 (20.1, 34.5)
Note: BMI (body mass index) is defined as weight (in kilograms) divided by height (in meters) squared [weight in kg/ (height in m) ^2. Weight and height are self-reported.				
[a] Among all adults, the proportion of respondents whose BMI was greater than or equal to 30.0.				
[b] Among all adults, the proportion of respondents whose BMI was greater than or equal to 25.0 but less than 30.0.				

Table 13-27B: Weight Status by Population Group

	Obese[a]		Overweight[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	37.7 (30.7, 44.7)	36.9 (33.7, 40.2)	34.6 (29.6, 39.5)	34.0 (30.8, 37.2)
Age				
18-39	40.1 (21.5, 58.6)	32.4 (24.2, 40.6)	30.9 (18.8, 42.9)	32.2 (23.9, 40.5)
40-65	36.4 (32.0, 40.8)	40.7 (36.7, 44.6)	37.0 (32.4, 41.6)	32.9 (29.2, 36.5)
65+	36.4 (33.1, 39.7)	36.3 (33.0, 39.6)	36.0 (32.8, 39.3)	38.6 (35.3, 41.9)
Gender				
Male	42.0 (29.2, 54.8)	39.0 (33.5, 44.6)	38.0 (28.5, 47.4)	38.4 (32.9, 43.9)
Female	33.5 (29.6, 37.4)	34.9 (31.4, 38.5)	31.2 (26.9, 35.5)	29.7 (26.3, 33.1)
Educational Attainment				
Less than 12th grade	35.1 (19.1, 51.0)	46.1 (32.9, 59.3)	29.7 (15.0, 44.3)	33.7 (20.8, 46.7)
High School Graduate	46.2 (31.1, 61.4)	39.1 (33.4, 44.8)	27.4 (18.7, 36.2)	33.1 (28.1, 38.1)
1-3 years of college	38.6 (32.1, 45.1)	35.7 (30.6, 40.8)	36.0 (29.9, 42.1)	36.5 (30.7, 42.4)
4-year degree or higher	24.1 (19.2, 29.1)	28.8 (23.9, 33.6)	43.0 (35.4, 50.6)	30.4 (25.8, 35.0)
Household Income				
Less than \$25,000	52.1 (30.7, 73.5)	35.3 (29.5, 41.1)	25.7 (12.9, 38.5)	31.0 (24.9, 37.0)
\$25,000 to \$49,999	36.6 (29.1, 44.1)	38.7 (33.0, 44.3)	30.4 (24.3, 36.6)	33.7 (28.1, 39.4)
\$50,000 or higher	32.0 (26.9, 37.1)	37.6 (32.2, 43.1)	40.4 (35.0, 45.9)	35.4 (30.2, 40.5)

Note: BMI (body mass index) is defined as weight (in kilograms) divided by height (in meters) squared [weight in kg/ (height in m) ^2. Weight and height are self-reported.

[a] Among all adults, the proportion of respondents whose BMI was greater than or equal to 30.0.

[b] Among all adults, the proportion of respondents whose BMI was greater than or equal to 25.0 but less than 30.0.

Table 13-28A: Cigarette Smoking by County

	Current Smoker[a]		Former Smoker[b]		Never Smoked[c]	
	2021	2017	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	33.5 (33.3, 33.7)		26.7 (26.6, 26.9)		57.5 (57.3, 57.6)	
US Weighted	38.6		22.8		60.09	
Michigan (2020)	18.4 (17.1, 19.7)	20.4 (19.4, 21.4)	27.1 (25.8, 28.5)	25.8 (24.8, 26.8)	54.4 (53.0, 56.0)	53.8 (52.6, 54.9)
Upper Peninsula (MiBRFS 2018-2020)	20.3 (16.9, 24.1)		31.1 (27.3, 35.2)		48.6 (44.4, 52.9)	
Upper Peninsula	15.5 (12.6, 18.3)	17.8 (15.3, 20.4)	30.4 (26.1, 34.7)	32.5 (29.6, 35.4)	54.2 (48.5, 59.8)	47.7 (46.4, 53.0)
Alger	23.5 (14.6, 32.4)	14.6 (9.0, 20.2)	36.6 (28.2, 45.0)	39.4 (31.6, 47.2)	39.9 (30.8, 49.0)	46.0 (37.5, 54.4)
Baraga	17.1 (10.0, 24.2)	17.3 (9.3, 25.4)	41.2 (31.3, 51.2)	42.0 (30.9, 53.1)	41.6 (31.2, 52.1)	40.7 (30.0, 51.3)
Chippewa	18.4 (8.5, 28.3)	24.4 (13.9, 34.8)	35.1 (24.0, 46.3)	26.5 (17.9, 35.2)	46.5 (34.2, 58.8)	49.1 (37.4, 60.8)
Delta	7.9 (0.5, 15.3)	10.0 (6.0, 13.9)	20.4 (5.0, 35.7)	32.8 (24.4, 41.2)	71.7 (51.5, 91.9)	57.2 (48.3, 66.2)
Dickinson	18.5 (10.8, 26.2)	12.8 (6.8, 18.8)	27.0 (17.7, 36.3)	32.6 (24.0, 41.2)	54.5 (44.6, 64.4)	54.6 (45.7, 63.5)
Gogebic	15.4 (7.2, 23.7)	20.1 (12.9, 27.4)	30.4 (20.1, 40.7)	37.4 (29.4, 45.3)	54.2 (40.6, 67.8)	42.5 (34.4, 50.6)
Houghton/Keweenaw	18.3 (10.0, 26.6)	11.5 (5.7, 17.3)	26.6 (17.7, 35.6)	28.8 (21.1, 36.5)	55.1 (42.9, 67.3)	59.7 (50.5, 69.0)
Iron	16.8 (8.8, 24.9)	19.0 (10.3, 27.8)	39.4 (28.9, 49.9)	37.3 (29.1, 45.5)	43.8 (33.9, 53.6)	43.7 (35.6, 51.8)
Luce	16.1 (6.4, 25.8)	22.0 (13.0, 31.0)	32.2 (24.1, 40.2)	38.0 (29.7, 46.4)	51.8 (42.1, 61.4)	40.0 (31.5, 48.4)
Mackinac	18.5 (9.5, 27.4)	18.0 (10.8, 25.3)	33.8 (25.5, 42.1)	41.3 (28.1, 54.5)	47.7 (38.4, 57.1)	40.7 (29.8, 51.6)
Marquette	11.8 (6.1, 17.5)	19.7 (12.5, 26.8)	31.6 (22.5, 40.6)	31.3 (23.3, 39.3)	56.7 (46.8, 66.5)	49.0 (39.9, 58.2)
Menominee	22.5 (13.0, 32.0)	27.0 (16.1, 37.8)	32.9 (22.9, 42.9)	30.6 (19.4, 41.9)	44.5 (32.5, 56.6)	42.4 (31.2, 53.6)
Ontonagon	13.1 (6.4, 19.7)	20.3 (13.2, 27.4)	35.6 (28.3, 43.0)	35.6 (29.5, 41.8)	51.3 (42.7, 59.9)	44.1 (37.5, 50.7)
Schoolcraft	15.9 (5.3, 26.4)	20.4 (13.1, 27.8)	38.3 (26.8, 49.7)	37.2 (26.6, 47.8)	45.9 (34.3, 57.4)	42.3 (33.0, 51.7)

[a] Among all adults, the proportion who reported they ever smoked at least 100 cigarettes (5 packs) in their life and they currently smoke cigarettes now, either daily or on some days.

[b] Among all adults, the proportion who reported they ever smoked at least 100 cigarettes (5 packs) in their life but they do not smoke cigarettes now.

[c] Among all adults, the proportion who reported they had never smoked.

Table 13-28B: Cigarette Smoking by Population Group

	Current Smoker[a]		Former Smoker[b]		Never Smoked[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	15.5 (12.6, 18.3)	17.8 (15.3, 20.4)	30.4 (26.1, 34.7)	32.5 (29.6, 35.4)	54.2 (48.5, 59.8)	49.7 (46.4, 53.0)
Age						
18-39	14.1 (7.4, 20.8)	21.3 (14.6, 28.1)	18.5 (10.0, 26.9)	22.2 (15.4, 28.9)	67.4 (55.5, 79.4)	56.5 (48.2, 64.8)
40-65	21.0 (17.3, 24.7)	20.4 (17.4, 23.3)	32.9 (28.5, 37.4)	32.5 (28.8, 36.2)	46.1 (41.6, 50.6)	47.2 (43.2, 51.1)
65+	8.8 (6.8, 10.8)	8.1 (6.3, 9.9)	43.0 (39.7, 46.4)	46.5 (43.1, 49.8)	48.2 (44.8, 51.5)	45.5 (42.1, 48.8)
Gender						
Male	12.4 (8.4, 16.3)	16.8 (13.0, 20.6)	35.2 (26.4, 43.9)	36.6 (31.6, 41.7)	52.5 (41.5, 63.4)	46.6 (40.9, 52.3)
Female	18.4 (14.7, 22.1)	18.8 (15.4, 22.1)	25.8 (22.5, 29.2)	28.5 (25.3, 31.7)	55.8 (51.5, 60.1)	52.7 (49.1, 56.4)
Educational Attainment						
Less than 12th grade	44.9 (26.4, 63.5)	30.2 (16.8, 43.7)	22.8 (10.9, 34.8)	31.2 (20.7, 41.6)	32.3 (16.9, 47.6)	38.6 (25.8, 51.4)
High School Graduate	19.7 (12.8, 26.7)	18.7 (15.0, 22.4)	30.3 (21.1, 39.4)	35.7 (30.7, 40.8)	50.0 (35.8, 64.2)	45.6 (39.9, 51.3)
1-3 years of college	16.1 (12.0, 20.1)	18.2 (13.8, 22.7)	33.5 (27.6, 39.4)	32.8 (27.7, 37.9)	50.5 (44.0, 56.9)	49.0 (43.3, 54.7)
4-year degree or higher	4.2 (1.9, 6.5)	7.1 (4.3, 9.9)	27.5 (21.2, 33.9)	23.8 (19.9, 27.7)	68.3 (61.7, 74.8)	69.1 (64.6, 73.6)
Household Income						
Less than \$25,000	17.8 (9.1, 26.5)	31.9 (25.4, 38.5)	28.1 (14.7, 41.4)	28.9 (24.0, 33.9)	54.1 (33.7, 74.5)	39.1 (32.8, 45.4)
\$25,000 to \$49,999	17.0 (12.1, 21.9)	17.3 (13.2, 21.3)	28.8 (23.0, 34.6)	33.2 (28.1, 38.4)	54.2 (47.1, 61.3)	49.5 (43.6, 55.4)
\$50,000 or higher	13.5 (9.7, 17.3)	10.5 (7.5, 13.5)	32.4 (27.7, 37.2)	33.6 (28.6, 38.5)	54.1 (48.7, 59.5)	55.9 (50.7, 61.2)
[a] Among all adults, the proportion who reported they ever smoked at least 100 cigarettes (5 packs) in their life and they currently smoke cigarettes now, either daily or on some days.						
[b] Among all adults, the proportion who reported they ever smoked at least 100 cigarettes (5 packs) in their life but they do not smoke cigarettes now.						
[c] Among all adults, the proportion who reported they had never smoked.						

Table 13-29A: Current Smokers Who Attempted to Quit by County

	Tried to Quit in Past Year[a]			
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	54.58 (54.2, 55.0)			
US Weighted	57.2			
Michigan (2020)	56.2 (52.2, 60.1)	58.8 (56.0, 61.5)	61.5 (58.1, 64.8)	62.4 (59.2, 65.5)
Upper Peninsula	55.4 (46.9, 63.8)	58.7 (50.8, 66.6)	54.6 (54.0, 55.2) [b]	51.2 (42.9, 59.5) [b]
Alger	68.8 (49.1, 88.5)	67.4 (47.9, 86.8)		
Baraga	42.4 (19.1, 65.6)	33.4 (12.8, 54.1)	67.9 (65.8, 69.9)	60.8 (46.1, 73.8)
Chippewa	67.7 (39.7, 95.7)	45.4 (20.5, 70.4)		
Delta	27.2 (2.7, 51.8)	44.3 (24.9, 63.7)		
Dickinson	63.2 (41.8, 84.6)	44.0 (18.1, 70.0)		
Gogebic	53.8 (25.6, 82.1)	61.6 (40.6, 82.6)	45.4 (44.0, 46.7)	57.0 (40.9, 71.8)
Houghton/Keweenaw	67.7 (47.3, 88.1)	54.0 (29.4, 78.5)	63.8 (62.9, 64.6)	47.9 (35.2, 60.8)
Iron	55.5 (28.0, 82.9)	79.1 (61.9, 96.3)	44.1 (42.3, 46.0)	
Luce	80.4 (63.0, 97.8)	79.4 (62.2, 96.6)		
Mackinac	64.6 (39.1, 90.1)	54.4 (33.7, 75.1)		
Marquette	45.1 (18.1, 72.1)	70.0 (49.3, 90.6)		
Menominee	38.5 (15.9, 61.1)	64.7 (43.1, 86.4)		
Ontonagon	39.3 (12.0, 66.6)	53.3 (32.5, 74.1)	45.2 (43.8, 46.5)	45.5 (35.8, 55.6)
Schoolcraft	68.9 (41.0, 96.8)	60.2 (41.0, 79.5)		
[a] Among all adults, the proportion who reported they had tried to quit smoking one day or longer in the past 12 months.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-29B: Current Smokers Who Attempted to Quit by Population Group		
	Tried to Quit in Past Year[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	55.4 (46.9, 63.8)	58.7 (50.8, 66.6)
Age		
<i>18-39</i>	56.2 (35.6, 76.9)	60.1 (42.1, 78.2)
<i>40-65</i>	57.2 (47.4, 67.0)	59.2 (51.7, 66.7)
<i>65+</i>	46.9 (35.2, 58.7)	52.7 (41.4, 64.0)
Gender		
<i>Male</i>	56.3 (43.3, 69.3)	57.1 (44.5, 69.7)
<i>Female</i>	54.8 (43.6, 66.0)	60.0 (50.1, 70.0)
Educational Attainment		
<i>Less than 12th grade</i>	53.7 (18.9, 88.5)	38.8 (13.3, 64.2)
<i>High School Graduate</i>	54.7 (41.7, 67.8)	59.8 (49.9, 69.6)
<i>1-3 years of college</i>	55.1 (42.0, 68.3)	64.6 (52.4, 76.7)
<i>4-year degree or higher</i>	71.4 (50.4, 92.4)	61.0 (41.1, 80.9)
Household Income		
<i>Less than \$25,000</i>	61.8 (49.7, 73.9)	52.5 (39.1, 65.9)
<i>\$25,000 to \$49,999</i>	33.7 (21.2, 46.1)	61.0 (49.6, 72.4)
<i>\$50,000 or higher</i>	64.2 (50.6, 77.7)	67.4 (54.5, 80.4)
[a] Among all adults, the proportion who reported they had tried to quit smoking one day or longer in the past 12 months.		

Table 13-30A: Other Tobacco Products by County				
	Smokeless Tobacco Use (Chew)[a]		Vaping or E- Cigarette Use[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	3.6 (3.6, 3.7)			
US Weighted	3.8			
Michigan (2020)	2.9 (2.4, 3.4)	3.6 (3.2, 4.1)	6.4 (5.5, 7.6)	4.9 (4.4, 5.5)
Upper Peninsula	3.9 (2.1, 5.8)	5.2 (3.2, 7.3)	5.0 (2.9, 7.1)	3.8 (2.1, 5.6)
Alger	5.8 (0.9, 10.7)	4.6 (0.8, 8.3)	7.2 (2.1, 12.4)	1.3 (0.0, 3.1)
Baraga	4.4 (0.8, 8.1)	10.9 (2.6, 19.2)	6.0 (0.0, 12.1)	3.6 (0.5, 6.7)
Chippewa	3.7 (0.0, 8.5)	3.4 (0.0, 6.9)	6.6 (0.0, 13.9)	1.5 (0.0, 3.5)
Delta	1.1 (0.0, 2.9)	4.2 (0.0, 10.1)	0.5 (0.0, 1.3)	1.1 (0.07, 2.0)
Dickinson	6.8 (0.3, 13.3)	1.7 (0.0, 3.9)	2.9 (0.0, 7.8)	2.2 (0.0, 5.2)
Gogebic	6.2 (0.0, 16.4)	3.2 (0.5, 5.9)	14.1 (0.0, 33.7)	3.1 (0.0, 7.1)
Houghton/Keweenaw	5.3 (0.7, 9.9)	2.3 (0.1, 4.5)	1.8 (0.2, 3.3)	8.6 (0.0, 18.7)
Iron	7.1 (0.0, 18.0)	4.0 (0.0, 8.2)	2.7 (0.0, 5.8)	4.3 (0.7, 7.9)
Luce	2.9 (0.3, 5.5)	8.2 (0.4, 16.1)	5.2 (0.0, 12.9)	7.0 (0.0, 14.7)
Mackinac	1.6 (0.0, 3.4)	8.2 (0.0, 23.0)	0.2 (0.0, 0.6)	2.4 (0.0, 4.8)
Marquette	4.9 (0.0, 11.3)	6.7 (1.1, 12.3)	8.9 (2.8, 15.0)	5.2 (0.2, 10.2)
Menominee	*	12.1 (0.0, 25.3)	6.1 (0.1, 12.1)	4.3 (0.0, 9.0)
Ontonagon	3.9 (0.5, 7.4)	5.7 (2.3, 9.2)	2.6 (0.0, 5.6)	2.2 (0.0, 5.4)
Schoolcraft	1.4 (0.0, 3.5)	2.3 (0.0, 5.0)	2.7 (0.003, 5.4)	1.5 (0.1, 2.9)
[a] Among all adults, the proportion who reported they currently use chewing tobacco, snuff, or snus, either every day or on some days.				
[b] Among all adults, the proportion who reported they currently use e, cigarettes or vaping, either every day or on some days.				

Table 13-30B: Other Tobacco Products by Population Group

	Smokeless Tobacco Use (Chew)[a]		Vaping or E-Cigarette Use[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	3.9 (2.1, 5.8)	5.2 (3.2, 7.3)	5.0 (2.9, 7.1)	3.8 (2.1, 5.6)
Age				
18-39	5.0 (0.4, 9.5)	8.9 (3.1, 14.6)	9.5 (3.6, 15.4)	6.8 (1.6, 12.0)
40-65	4.3 (2.0, 6.6)	3.9 (2.0, 5.7)	3.2 (1.7, 4.7)	3.3 (1.6, 5.0)
65+	1.9 (0.8, 3.1)	2.1 (0.9, 3.3)	1.4 (0.3, 2.5)	1.0 (0.4, 1.6)
Gender				
Male	7.9 (4.0, 11.8)	10.5 (6.4, 14.6)	5.4 (1.7, 9.1)	5.5 (2.0, 8.9)
Female	0.04 (0.0, 0.09)	0.2 (0.0, 0.4)	4.6 (2.7, 6.6)	2.3 (1.2, 3.4)
Educational Attainment				
Less than 12th grade	2.8 (0.07, 5.6)	9.1 (0.0, 20.0)	5.3 (0.0, 12.0)	14.0 (1.3, 26.7)
High School Graduate	3.4 (1.4, 5.4)	8.5 (4.2, 12.9)	4.3 (1.0, 7.5)	2.1 (1.0, 3.3)
1-3 years of college	2.8 (0.6, 4.9)	1.7 (0.9, 2.5)	6.7 (2.8, 10.6)	4.4 (1.0, 7.7)
4-year degree or higher	6.9 (0.7, 13.0)	1.6 (0.1, 3.1)	3.8 (0.0, 7.6)	1.0 (0.0, 2.6)
Household Income				
Less than \$25,000	2.3 (0.7, 4.0)	6.9 (1.9, 12.0)	12.6 (3.7, 21.4)	6.2 (1.6, 10.8)
\$25,000 to \$49,999	2.8 (1.0, 4.5)	5.1 (1.3, 9.0)	2.7 (0.8, 4.6)	3.1 (1.2, 4.9)
\$50,000 or higher	5.3 (1.9, 8.7)	4.2 (1.5, 7.0)	2.8 (1.2, 4.5)	3.2 (0.3, 6.0)
[a] Among all adults, the proportion who reported they currently use chewing tobacco, snuff, or snus, either every day or on some days.				
[b] Among all adults, the proportion who reported they currently use e-cigarettes or vaping, either every day or on some days.				

Table 13-31A: Fruit and Vegetable Consumption by County

5 or More Daily Servings Fruits and Vegetables[a]				
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Michigan		14.4 (13.5, 15.3)	15.3 (14.5, 16.2)	17.8 (16.8, 19.0)
Upper Peninsula	8.4 (6.6, 10.1)	10.6 (8.6, 12.5)	8.6 (8.4, 8.8) [b]	11.5 (9.5, 14.0) [b]
Alger	9.7 (6.0, 13.5)	7.7 (4.3, 11.0)		
Baraga	7.6 (4.1, 11.1)	6.9 (3.6, 10.2)	5.5 (5.1, 6.0)	9.5 (6.8, 13.1)
Chippewa	5.0 (1.8, 8.1)	17.2 (5.8, 28.7)		
Delta	4.9 (1.0, 8.8)	5.2 (2.4, 8.0)		
Dickinson	12.0 (6.0, 18.1)	5.1 (2.6, 7.6)		
Gogebic	18.6 (0.0, 37.3)	14.0 (7.8, 20.1)	7.3 (6.9, 7.6)	9.2 (6.5, 12.9)
Houghton/Keweenaw	8.1 (3.9, 12.3)	10.7 (6.4, 15.0)	9.9 (9.7, 10.2)	13.5 (10.2, 17.7)
Iron	8.6 (4.0, 13.1)	8.0 (4.6, 11.5)	10.4 (9.9, 10.2)	
Luce	8.8 (4.3, 13.4)	10.1 (5.2, 15.0)		
Mackinac	6.9 (3.1, 10.8)	11.4 (5.2, 17.6)		
Marquette	8.9 (5.4, 12.5)	14.5 (9.3, 19.7)		
Menominee	8.8 (2.9, 14.8)	6.5 (3.2, 9.8)		
Ontonagon	10.0 (5.6, 14.5)	7.4 (4.7, 10.0)	4.9 (4.4, 5.3)	7.9 (6.1, 10.1)
Schoolcraft	9.3 (4.9, 13.8)	9.1 (4.6, 13.6)		
[a] Among all adults, the proportion whose total reported of fruits (including juice) and vegetables averaged five or more times per day in the past 7 days.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-31B: Fruit and Vegetable Consumption by Population Group		
	5 or More Daily Servings Fruits and Vegetables[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	8.4 (6.6, 10.1)	10.6 (8.6, 12.5)
Age		
<i>18-39</i>	5.2 (1.5, 8.9)	10.8 (5.6, 15.9)
<i>40-65</i>	8.9 (6.7, 11.1)	9.6 (7.4, 11.7)
<i>65+</i>	12.0 (9.9, 14.2)	12.1 (9.9, 14.4)
Gender		
<i>Male</i>	6.4 (3.5, 9.3)	7.2 (4.1, 10.3)
<i>Female</i>	10.2 (8.3, 12.2)	13.8 (11.3, 16.2)
Educational Attainment		
<i>Less than 12th grade</i>	7.4 (0.9, 13.9)	5.3 (1.4, 9.2)
<i>High School Graduate</i>	6.9 (3.3, 10.4)	9.2 (5.4, 12.9)
<i>1-3 years of college</i>	7.1 (5.1, 9.2)	10.9 (7.8, 14.0)
<i>4-year degree or higher</i>	12.7 (9.3, 16.2)	17.0 (13.1, 20.8)
Household Income		
<i>Less than \$25,000</i>	6.7 (1.4, 12.0)	8.6 (5.6, 11.5)
<i>\$25,000 to \$49,999</i>	8.5 (6.1, 10.9)	9.1 (6.5, 11.7)
<i>\$50,000 or higher</i>	8.8 (6.7, 10.9)	12.8 (9.0, 16.6)
[a] Among all adults, the proportion whose total reported of fruits (including juice) and vegetables averaged five or more times per day in the past 7 days.		

Table 13-32A: Physical Activity by County		
	No Leisure, time Physical Activity[a]	
	2021	2017
	% (95%CI)	% (95%CI)
US Raw	25.8 (25.6, 25.9)	
US Weighted	24.5	
Michigan (2020)	20.8 (19.6, 22.1)	23.9 (22.9, 24.9)
Upper Peninsula (MiBRFS 2018, - 2020)	24.8 (21.3, 28.6)	
Upper Peninsula	14.0 (11.2, 16.7)	14.6 (12.4, 16.8)
Alger	16.2 (9.5, 22.9)	13.6 (8.5, 18.7)
Baraga	14.3 (8.9, 19.8)	12.2 (6.9, 17.5)
Chippewa	17.2 (7.1, 27.2)	20.8 (11.2, 30.5)
Delta	10.5 (1.4, 19.6)	11.6 (7.1, 16.1)
Dickinson	19.8 (12.2, 27.4)	14.8 (8.1, 21.5)
Gogebic	16.5 (9.1, 23.8)	17.3 (11.2, 23.4)
Houghton/Keweenaw	10.4 (5.3, 15.6)	9.9 (5.1, 14.7)
Iron	23.1 (11.9, 34.3)	17.8 (12.3, 23.3)
Luce	16.4 (10.9, 22.0)	15.9 (10.3, 21.5)
Mackinac	18.0 (10.6, 25.5)	14.1 (7.9, 20.3)
Marquette	9.1 (4.6, 13.7)	13.5 (7.1, 19.8)
Menominee	16.0 (2.8, 29.3)	16.9 (9.4, 24.4)
Ontonagon	16.7 (10.9, 22.6)	14.4 (8.1, 20.8)
Schoolcraft	22.1 (11.0, 33.1)	19.8 (12.0, 27.6)
[a] Among all adults, the proportion who reported not participating in any leisure-time physical activities or exercises, such as running, biking, golf, gardening, or walking for exercise during the last month.		

Table 13-32B: Physical Activity by Population Group		
	No Leisure-time Physical Activity[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	14.0 (11.2, 16.7)	14.6 (12.4, 16.8)
Age		
18-39	9.7 (3.4, 15.9)	7.4 (2.5, 12.4)
40-65	14.1 (11.1, 17.1)	14.9 (11.8, 17.9)
65+	19.7 (17.1, 22.3)	24.1 (21.1, 27.1)
Gender		
Male	14.7 (9.9, 19.4)	17.0 (13.1, 20.8)
Female	13.3 (10.3, 16.3)	12.3 (10.0, 14.7)
Educational Attainment		
Less than 12th grade	34.8 (16.9, 52.7)	29.2 (17.5, 40.9)
High School Graduate	19.5 (12.7, 26.2)	16.9 (13.6, 20.3)
1-3 years of college	11.8 (7.7, 15.9)	12.9 (9.0, 16.9)
4-year degree or higher	5.9 (3.8, 8.0)	3.8 (2.8, 4.9)
Household Income		
Less than \$25,000	18.1 (9.2, 27.0)	22.7 (17.5, 27.8)
\$25,000 to \$49,999	15.7 (11.3, 20.1)	13.3 (10.1, 16.4)
\$50,000 or higher	11.1 (7.5, 14.8)	10.4 (7.0, 13.9)
[a] Among all adults, the proportion who reported not participating in any leisure, time physical activities or exercises, such as running, biking, golf, gardening, or walking for exercise during the last month.		

	Always Uses Seat Belt[a]		Drove Vehicle after Drinking[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Michigan (2020)	89.6 (88.5, 90.6)	88.9 (88.0, 89.6)	2.2 (1.7, 2.8)	3.6 (3.0, 4.3)
Upper Peninsula (MiBRFS 2018-2020)	84.2 (79.1, 88.2)			
Upper Peninsula	90.7 (88.2, 93.2)	86.7 (84.2, 89.3)	6.9 (4.8, 8.9)	6.5 (4.5, 8.4)
Alger	88.8 (83.8, 93.8)	85.4 (79.2, 91.6)	2.0 (0.03, 3.9)	4.3 (1.4, 7.2)
Baraga	79.4 (68.6, 90.3)	78.2 (66.0, 90.4)	10.8 (2.6, 19.0)	17.1 (8.1, 26.1)
Chippewa	82.3 (71.8, 92.8)	89.8 (83.3, 96.3)	9.1 (0.7, 17.5)	8.3 (2.3, 14.4)
Delta	95.4 (89.9, 100.0)	88.4 (83.1, 93.6)	6.2 (0.0, 14.4)	7.2 (1.4, 13.0)
Dickinson	94.6 (90.3, 99.0)	87.7 (81.1, 94.3)	5.6 (0.0, 12.3)	5.6 (1.2, 10.0)
Gogebic	96.4 (93.3, 99.6)	88.0 (81.8, 94.1)	15.2 (4.0, 26.4)	4.2 (1.0, 7.4)
Houghton/Keweenaw	93.2 (89.2, 97.3)	82.6 (72.1, 93.0)	6.9 (0.4, 13.5)	4.9 (0.4, 9.3)
Iron	82.5 (71.4, 93.7)	84.5 (75.8, 93.2)	5.8 (0.0, 12.9)	8.5 (2.4, 14.6)
Luce	87.8 (79.4, 96.1)	85.1 (76.9, 93.3)	6.3 (1.2, 11.4)	6.9 (1.9, 11.9)
Mackinac	92.2 (87.3, 97.1)	89.3 (82.9, 95.7)	13.5 (2.8, 24.2)	5.0 (0.2, 9.8)
Marquette	91.7 (84.8, 98.5)	89.9 (84.2, 95.6)	5.9 (1.8, 9.9)	4.2 (0.4, 8.0)
Menominee	91.3 (86.8, 95.8)	81.8 (68.8, 94.8)	3.9 (0.1, 7.8)	12.2 (0.0, 25.7)
Ontonagon	88.3 (81.2, 95.3)	81.4 (73.9, 88.9)	6.4 (1.4, 11.4)	4.4 (1.7, 7.1)
Schoolcraft	86.4 (75.5, 97.3)	83.2 (71.2, 95.1)	2.6 (0.1, 5.1)	3.1 (0.5, 5.6)
[a] Among all adults who reported driving or riding in a car or truck, the proportion who reported always using a seatbelt when driving or riding in a car or truck.				
[b] Among adults who reported drinking at least one drink in the past month, the proportion who reported they drove when they had too much to drink at least once in the past month.				

Table 13-33B: Motor Vehicle Safety by Population Group

	Always Uses Seat Belt[a]		Drove Vehicle after Drinking[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Upper Peninsula	90.7 (88.2, 93.2)	86.7 (84.2, 89.3)	6.9 (4.8, 8.9)	6.5 (4.5, 8.4)
Age				
18-39	90.0 (84.1, 95.9)	82.0 (75.2, 88.8)	7.7 (2.8, 12.7)	6.3 (1.6, 11.0)
40-65	89.4 (85.9, 92.9)	88.9 (86.3, 91.4)	7.9 (4.7, 11.2)	7.4 (5.0, 9.8)
65+	93.4 (92.0, 94.9)	88.9 (86.4, 91.4)	4.0 (2.5, 5.4)	4.8 (1.9, 7.7)
Gender				
Male	86.8 (81.8, 91.8)	80.9 (76.3, 85.5)	9.2 (5.7, 12.7)	7.1 (4.1, 10.1)
Female	94.4 (92.6, 96.2)	92.2 (89.9, 94.6)	4.6 (2.3, 6.8)	5.8 (3.4, 8.2)
Educational Attainment				
Less than 12th grade	85.4 (74.1, 96.7)	84.1 (75.5, 92.6)	0.5 (0.0, 1.4)	7.1 (0.0, 18.1)
High School Graduate	92.2 (88.7, 95.6)	84.3 (79.2, 89.3)	9.4 (4.5, 14.2)	8.2 (4.1, 12.4)
1-3 years of college	90.7 (87.0, 94.3)	89.3 (85.8, 92.8)	4.9 (2.4, 7.4)	5.1 (2.7, 7.4)
4-year degree or higher	89.0 (82.4, 95.6)	88.3 (84.6, 91.9)	7.6 (3.7, 11.6)	5.8 (3.4, 8.2)
Household Income				
Less than \$25,000	91.0 (85.1, 96.9)	90.2 (87.1, 93.4)	2.2 (0.2, 4.3)	10.0 (2.3, 17.8)
\$25,000 to \$49,999	91.6 (88.4, 94.8)	84.7 (79.4, 90.0)	9.3 (5.2, 13.3)	6.7 (3.6, 9.8)
\$50,000 or higher	89.9 (86.2, 93.7)	86.1 (82.0, 90.3)	7.1 (4.2, 10.0)	5.5 (3.4, 7.6)

[a] Among all adults who reported driving or riding in a car or truck, the proportion who reported always using a seatbelt when driving or riding in a car or truck.

[b] Among adults who reported drinking at least one drink in the past month, the proportion who reported they drove when they had too much to drink at least once in the past month.

Table 13-34A: Hypertension Awareness and Medication Use by County

	Ever Told High Blood Pressure[a]		Taking Blood Pressure Medication[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	40.6 (40.4, 40.7)		63.8 (63.6, 64.1)	
US Weighted	32.52		57.43	
Michigan	35.1 (33.9, 36.3)	33.1 (31.9, 34.3)	76.3 (74.4, 78.2)	78.1 (76.2, 79.9)
Upper Peninsula	36.2 (31.5, 40.9)	40.8 (37.8, 43.9)	81.8 (77.8, 85.9)	83.1 (80.0, 86.2)
Alger	51.4 (42.1, 60.7)	44.8 (36.5, 53.0)	78.4 (68.2, 88.5)	83.7 (73.5, 93.9)
Baraga	48.3 (38.0, 58.5)	51.9 (40.7, 63.1)	82.5 (71.7, 93.2)	69.1 (56.1, 82.1)
Chippewa	43.3 (31.7, 54.9)	40.6 (30.0, 51.2)	82.7 (70.1, 95.4)	90.5 (84.1, 96.9)
Delta	24.0 (7.1, 41.0)	38.7 (29.8, 47.6)	93.1 (86.8, 99.4)	90.1 (84.2, 96.1)
Dickinson	36.9 (28.2, 45.6)	44.2 (35.5, 52.8)	89.6 (81.4, 97.7)	83.6 (74.8, 92.3)
Gogebic	40.7 (28.2, 53.1)	52.3 (44.1, 60.6)	92.0 (85.7, 98.3)	68.7 (57.4, 80.0)
Houghton/Keweenaw	31.4 (21.5, 41.4)	36.4 (27.7, 45.0)	75.9 (60.0, 91.8)	80.7 (68.8, 92.6)
Iron	39.1 (29.7, 48.6)	53.7 (45.2, 62.1)	72.4 (58.7, 86.1)	87.4 (80.8, 94.0)
Luce	44.4 (35.2, 53.5)	47.0 (38.2, 55.8)	85.0 (77.1, 92.8)	91.7 (86.8, 96.5)
Mackinac	44.5 (35.3, 53.6)	45.2 (32.8, 57.6)	83.9 (73.5, 94.3)	79.7 (68.0, 91.4)
Marquette	32.9 (24.6, 41.1)	33.9 (26.1, 41.7)	73.0 (59.8, 86.1)	77.3 (66.3, 88.3)
Menominee	36.1 (26.1, 46.2)	37.9 (28.1, 47.7)	83.7 (73.8, 93.6)	92.6 (86.8, 98.5)
Ontonagon	56.1 (47.6, 64.7)	53.0 (46.0, 59.9)	75.5 (60.7, 90.3)	83.2 (77.2, 89.2)
Schoolcraft	47.9 (36.2, 59.6)	55.0 (45.5, 64.6)	89.9 (82.3, 97.4)	84.0 (74.9, 93.0)
[a] Among all adults, the proportion who reported they were told by a doctor, nurse, or health professional they had high blood pressure (HBP). Women who had HBP only during pregnancy and adults who were borderline hypertensive were considered not to have been diagnosed.				
[b] Among adults who were ever told they had HBP, the proportion that reported they were currently taking blood pressure medicines for their HPB.				

Table 13-34B: Hypertension Awareness and Medication Use by Population Group

	Ever Told High Blood Pressure[a]		Taking Blood Pressure Medication[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	36.2 (31.5, 40.9)	40.8 (37.8, 43.9)	81.8 (77.8, 85.9)	83.1 (80.0, 86.2)
Age				
18-39	7.7 (3.6, 11.7)	13.6 (8.0, 19.1)	38.1 (15.0, 61.2)	65.7 (47.1, 84.2)
40-65	44.5 (39.9, 49.2)	45.9 (42.0, 49.9)	77.2 (70.5, 83.8)	77.9 (73.1, 82.8)
65+	63.6 (60.2, 66.9)	68.1 (65.0, 71.2)	94.1 (92.3, 96.0)	94.2 (92.6, 95.9)
Gender				
Male	38.7 (29.5, 47.9)	45.5 (40.1, 50.9)	80.1 (73.6, 86.6)	84.0 (79.3, 88.7)
Female	33.7 (30.0, 37.4)	36.4 (33.1, 39.6)	83.7 (79.2, 88.3)	82.1 (78.3, 85.9)
Educational Attainment				
Less than 12th grade	33.2 (18.6, 47.8)	56.5 (43.2, 69.7)	94.4 (88.6, 100.0)	97.4 (95.0, 99.7)
High School Graduate	38.0 (26.9, 49.2)	44.5 (39.2, 49.8)	81.3 (74.6, 88.0)	87.7 (83.5, 91.9)
1-3 years of college	37.7 (32.0, 43.5)	37.2 (32.3, 42.2)	86.2 (79.8, 92.6)	74.8 (68.4, 81.3)
4-year degree or higher	32.1 (26.4, 37.8)	29.1 (25.1, 33.2)	73.4 (64.2, 82.6)	73.9 (66.7, 81.1)
Household Income				
Less than \$25,000	34.6 (18.8, 50.4)	45.1 (39.0, 51.2)	86.0 (78.7, 93.3)	86.7 (82.3, 91.1)
\$25,000 to \$49,999	37.6 (31.5, 43.6)	45.4 (39.7, 51.1)	86.1 (81.0, 91.1)	87.8 (83.5, 92.2)
\$50,000 or higher	35.6 (30.9, 40.4)	34.6 (29.9, 39.3)	77.7 (70.9, 84.5)	76.0 (69.5, 82.4)

[a] Among all adults, the proportion who reported they were told by a doctor, nurse, or health professional they had high blood pressure (HBP). Women who had HBP only during pregnancy and adults who were borderline hypertensive were considered not to have been diagnosed.

[b] Among adults who were ever told they had HBP, the proportion that reported they were currently taking blood pressure medicines for their HPB.

Table 13-35A: Cholesterol Screening by County

	Cholesterol Ever Checked[a]		Ever Told High Cholesterol[b]			
	2021	2017	2021	2017	2015	2012
	% (95%C.I.)		% (95%C.I.)			
US Raw	94.3 (94.2, 94.3)		36.6 (36.5, 36.8)			
US Weighted	92.2		30.9			
Michigan	93.9 (93.1, 94.6)	79.2 (77.9, 80.3) [c]	32.3 (31.2, 33.5)	38.2 (36.8, 39.5) [c]	40.6 (39.4, 41.8)	41.8 (40.4, 43.3)
Upper Peninsula	77.9 (73.4, 82.4)	77.6 (74.2, 81.0)	48.4 (41.4, 55.4)	50.1 (46.7, 53.5)	46.7 (46.3, 47.0)	48.4 (43.9, 53.0)
Alger	86.7 (79.5, 93.9)	78.4 (69.4, 87.3)	49.6 (39.9, 59.4)	49.0 (40.9, 57.2)		
Baraga	85.2 (75.6, 94.9)	69.9 (57.0, 82.8)	58.5 (48.3, 68.6)	48.9 (39.3, 58.6)	53.8 (52.7, 54.9)	50.0 (42.7, 57.4)
Chippewa	76.0 (62.5, 89.4)	67.6 (54.5, 80.6)	56.0 (44.0, 68.0)	54.1 (42.9, 65.3)		
Delta	89.6 (80.6, 98.6)	78.6 (69.7, 87.5)	35.5 (8.2, 62.8)	58.2 (48.5, 67.9)		
Dickinson	83.8 (76.3, 91.2)	86.4 (78.8, 93.9)	55.4 (44.9, 65.9)	50.6 (41.6, 59.7)		
Gogebic	65.3 (47.8, 82.9)	84.1 (77.9, 90.4)	61.1 (51.6, 70.6)	55.5 (46.4, 64.6)	48.4 (47.6, 49.2)	62.3 (56.3, 68.0)
Houghton/Keweenaw	62.6 (48.5, 76.7)	71.7 (60.9, 82.6)	51.2 (38.6, 63.8)	42.5 (33.2, 51.8)	44.7 (44.2, 45.2)	42.2 (35.2, 49.4)
Iron	76.9 (64.9, 88.9)	85.8 (78.8, 82.6)	54.9 (45.6, 64.2)	61.2 (53.2, 69.2)	45.8 (44.9, 46.6)	
Luce	82.5 (72.3, 92.8)	83.8 (76.7, 91.0)	61.1 (52.5, 69.8)	58.8 (49.2, 68.4)		
Mackinac	80.0 (70.2, 89.8)	83.5 (75.8, 91.3)	54.1 (45.0, 63.3)	48.1 (34.3, 62.0)		
Marquette	73.2 (62.4, 83.9)	74.0 (64.8, 83.2)	37.2 (28.0, 46.3)	44.1 (34.7, 53.4)		
Menominee	88.2 (80.7, 95.8)	89.1 (82.6, 95.6)	57.2 (43.7, 70.7)	46.6 (34.5, 58.8)		
Ontonagon	83.3 (75.3, 91.3)	75.4 (67.7, 83.1)	63.3 (55.1, 71.5)	56.9 (50.7, 63.1)	47.7 (46.6, 48.8)	51.5 (46.5, 56.4)
Schoolcraft	79.8 (68.5, 91.1)	85.7 (79.0, 92.5)	52.2 (39.9, 64.4)	55.2 (44.9, 65.5)		

[a] Among all adults, the proportion who reported ever having their blood cholesterol checked. *Statewide estimates the proportion who reported every having their blood cholesterol checked in the past five years.*

[b] Among adults who ever had their blood cholesterol checked, the proportion who reported a doctor, nurse, or health professional told them their cholesterol level was high.

[c] Statewide estimates are from the 2015 Michigan BRFS.

Table 13-35B: Cholesterol Screening by Population Group

	Cholesterol Ever Checked[a]		Ever Told High Cholesterol[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	77.9 (73.4, 82.4)	77.6 (74.2, 81.0)	48.4 (41.4, 55.4)	50.1 (46.7, 53.5)
Age				
18-39	55.9 (40.9, 70.9)	50.7 (42.2, 59.1)	20.1 (7.2, 33.0)	22.1 (12.7, 31.5)
40-65	86.8 (83.9, 89.7)	88.3 (85.6, 91.0)	54.7 (49.8, 59.6)	52.1 (48.0, 56.3)
65+	94.7 (93.6, 95.9)	95.2 (93.8, 96.6)	63.0 (59.6, 66.4)	67.0 (63.9, 70.1)
Gender				
Male	78.2 (70.4, 86.0)	76.8 (70.9, 82.7)	48.5 (35.1, 61.9)	53.8 (48.0, 59.6)
Female	77.6 (73.1, 82.1)	78.4 (74.9, 82.0)	48.4 (43.8, 52.9)	46.7 (42.9, 50.5)
Educational Attainment				
Less than 12th grade	72.7 (57.0, 88.4)	65.4 (51.1, 79.6)	55.8 (33.4, 78.2)	69.5 (57.9, 81.1)
High School Graduate	80.6 (72.8, 88.5)	75.2 (69.2, 81.2)	47.3 (31.0, 63.7)	52.4 (46.8, 58.1)
1-3 years of college	75.4 (68.0, 82.8)	80.7 (75.4, 86.0)	53.8 (47.8, 59.8)	47.8 (41.8, 53.7)
4-year degree or higher	79.8 (73.2, 86.4)	83.7 (79.5, 87.9)	41.5 (34.3, 48.7)	40.2 (34.9, 45.5)
Household Income				
Less than \$25,000	77.8 (65.9, 89.6)	65.2 (58.2, 72.1)	45.4 (19.9, 70.9)	52.8 (46.0, 59.5)
\$25,000 to \$49,999	71.2 (62.1, 80.3)	79.4 (73.8, 85.0)	53.3 (47.8, 58.8)	54.6 (48.2, 60.9)
\$50,000 or higher	80.6 (75.4, 85.8)	83.5 (78.1, 88.9)	47.5 (41.9, 53.1)	45.5 (40.4, 50.7)

[a] Among all adults, the proportion who reported ever having their blood cholesterol checked.

[b] Among adults who ever had their blood cholesterol checked, the proportion who reported a doctor, nurse, or health professional told them their cholesterol level was high.

Table 13-36A: Asthma by County				
	Lifetime Asthma Prevalence[a]		Current Asthma Prevalence[b]	
	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	14.1 (14.0, 14.2)		9.3 (9.2, 9.4)	
US Weighted	14.5		8.9	
Michigan (2020)	15.4 (14.4, 16.6)	16.3 (15.4, 17.2)	11.0 (10.1, 12.0)	10.9 (10.2, 11.7)
Upper Peninsula (MiBRFS 2018-2020)	15.1 (12.1, 18.7)		10.9 (8.3, 14.2)	
Upper Peninsula	16.8 (13.7, 19.9)	17.8 (15.2, 20.5)	10.7 (8.4, 12.9)	11.2 (9.3, 13.1)
Alger	19.1 (12.3, 25.8)	18.2 (10.7, 25.7)	12.4 (6.8, 18.0)	10.3 (5.1, 15.4)
Baraga	19.0 (11.3, 26.7)	8.6 (4.9, 12.3)	13.7 (6.5, 20.9)	6.4 (3.3, 9.6)
Chippewa	12.9 (5.2, 20.6)	13.2 (7.1, 19.3)	5.1 (2.1, 8.1)	9.6 (4.5, 14.8)
Delta	9.2 (1.5, 16.8)	15.5 (9.5, 21.6)	6.1 (0.5, 11.6)	8.7 (4.2, 13.1)
Dickinson	13.6 (7.6, 19.7)	17.5 (11.2, 23.7)	7.9 (3.8, 11.9)	11.6 (6.5, 16.7)
Gogebic	11.5 (5.5, 17.6)	15.7 (8.8, 22.6)	9.2 (3.6, 14.8)	8.2 (2.8, 13.6)
Houghton/Keweenaw	17.2 (9.5, 25.0)	19.9 (9.5, 30.3)	13.3 (6.3, 20.3)	8.5 (4.3, 12.5)
Iron	17.2 (10.0, 24.4)	17.8 (11.7, 23.9)	12.2 (6.2, 18.1)	15.1 (9.3, 20.9)
Luce	14.3 (8.9, 19.7)	16.7 (11.1, 22.3)	9.2 (4.8, 13.7)	11.7 (7.1, 16.3)
Mackinac	18.1 (10.5, 25.7)	24.6 (9.3, 39.8)	9.0 (3.9, 14.1)	6.5 (2.8, 10.3)
Marquette	24.9 (16.1, 33.7)	22.9 (15.3, 30.5)	15.4 (8.5, 22.4)	15.8 (9.4, 22.2)
Menominee	14.2 (7.2, 21.2)	12.2 (6.2, 18.3)	9.5 (4.3, 14.6)	10.5 (4.6, 16.4)
Ontonagon	12.0 (7.0, 16.9)	16.2 (11.9, 20.6)	9.1 (4.5, 13.7)	10.2 (6.9, 13.6)
Schoolcraft	36.6 (22.8, 50.4)	18.9 (11.6, 26.2)	24.3 (11.0, 37.5)	15.7 (8.7, 22.8)
[a] Among all adults, the proportion who reported they were every told by a doctor, nurse, or health professional they had asthma.				
[b] Among all adults, the proportion who reported they still have asthma.				

Table 13-36B: Asthma by Population Group

	Lifetime Asthma Prevalence[a]		Current Asthma Prevalence[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	16.8 (13.7, 19.9)	17.8 (15.2, 20.5)	10.7 (8.4, 12.9)	11.2 (9.3, 13.1)
Age				
18-39	18.8 (10.5, 27.0)	19.7 (12.9, 26.5)	10.0 (4.6, 15.5)	9.7 (5.3, 14.0)
40-65	16.7 (13.6, 19.9)	18.4 (15.3, 21.5)	11.9 (9.2, 14.6)	12.8 (10.1, 15.5)
65+	13.8 (11.6, 16.0)	13.3 (11.1, 15.5)	9.3 (7.5, 11.1)	9.7 (7.8, 11.5)
Gender				
Male	12.3 (8.0, 16.7)	17.3 (12.6, 27.9)	6.9 (4.3, 9.5)	10.1 (6.9, 13.2)
Female	21.1 (17.4, 24.9)	18.4 (15.8, 21.0)	14.3 (11.1, 17.5)	12.3 (10.0, 14.5)
Educational Attainment				
Less than 12th grade	25.6 (10.4, 40.9)	23.4 (11.5, 35.4)	23.2 (8.0, 38.4)	13.8 (7.0, 20.7)
High School Graduate	14.3 (8.5, 20.0)	16.5 (12.1, 20.9)	9.5 (5.0, 14.0)	9.9 (7.4, 12.4)
1-3 years of college	17.2 (12.8, 21.6)	17.9 (13.8, 22.3)	10.9 (7.9, 14.0)	11.9 (7.9, 15.8)
4-year degree or higher	19.2 (13.7, 24.7)	17.6 (13.6, 21.6)	10.6 (6.8, 14.5)	10.7 (7.5, 13.9)
Household Income				
Less than \$25,000	20.2 (9.8, 30.7)	21.3 (15.9, 26.7)	12.2 (6.0, 18.4)	14.1 (10.5, 17.8)
\$25,000 to \$49,999	16.0 (11.8, 20.2)	16.5 (11.1, 21.9)	11.0 (7.7, 14.3)	8.5 (6.0, 11.1)
\$50,000 or higher	15.8 (11.9, 19.7)	16.2 (12.6, 19.9)	9.8 (6.5, 13.2)	10.5 (7.3, 13.7)

[a] Among all adults, the proportion who reported they were every told by a doctor, nurse, or health professional they had asthma.

[b] Among all adults, the proportion who reported they still have asthma.

Table 13-37A: Diabetes by County

	Ever Told Diabetes[a]			
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	13.7 (13.62, 13.82)			
US Weighted	11.1			
Michigan (2020)	12.3 (11.4, 13.3)	11.2 (10.5, 11.8)	10.4 (9.7, 11.1)	10.0 (9.3, 10.7)
Upper Peninsula (MiBRFS 2018-2020)	12.5 (9.8, 15.6)			
Upper Peninsula	11.0 (8.9, 13.0)	11.0 (9.3, 12.7)	10.9 (10.7, 11.1) [b]	9.8 (8.0, 11.8) [b]
Alger	11.4 (5.7, 17.2)	13.0 (8.0, 12.7)		
Baraga	13.0 (6.3, 19.8)	12.8 (7.8, 17.8)	12.1 (11.5, 12.7)	10.0 (7.1, 13.9)
Chippewa	10.2 (4.9, 15.5)	13.7 (8.0, 19.5)		
Delta	0.2 (1.0, 17.5)	15.7 (7.7, 23.7)		
Dickinson	10.4 (6.0, 14.9)	8.8 (4.4, 13.3)		
Gogebic	14.7 (8.2, 21.1)	15.6 (9.6, 21.6)	13.5 (13.0, 13.9)	8.6 (6.3, 11.6)
Houghton/Keweenaw	16.4 (8.7, 24.2)	7.9 (4.8, 11.1)	10.2 (9.9, 10.4)	9.8 (7.1, 13.5)
Iron	7.4 (3.8, 11.0)	12.5 (7.6, 17.5)	10.2 (9.7, 10.7)	
Luce	15.0 (9.3, 20.6)	14.3 (8.7, 19.9)		
Mackinac	12.6 (5.6, 19.5)	6.2 (3.1, 9.3)		
Marquette	6.0 (3.3, 8.8)	8.4 (4.7, 12.1)		
Menominee	12.3 (6.7, 18.0)	10.1 (5.8, 14.5)		
Ontonagon	18.2 (11.7, 24.8)	15.8 (11.1, 20.4)	13.6 (12.9, 14.3)	11.9 (9.1, 15.4)
Schoolcraft	22.3 (11.5, 33.1)	11.4, (7.3, 15.5)		
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had diabetes. Adults told they had prediabetes, borderline diabetes, and women who had diabetes only during pregnancy were classified as not having been diagnosed.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-37B: Diabetes by Population Group		
	Ever Told Diabetes[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	11.0 (8.9, 13.0)	11.0 (9.3, 12.7)
Age		
<i>18-39</i>	4.2 (1.0, 7.5)	1.7 (0.03, 3.4)
<i>40-65</i>	11.6 (8.8, 14.4)	13.2 (10.2, 16.2)
<i>65+</i>	19.3 (16.6, 22.1)	19.6 (16.9, 22.4)
Gender		
<i>Male</i>	11.2 (7.7, 14.6)	13.4 (10.4, 16.5)
<i>Female</i>	10.7 (8.4, 13.0)	8.7 (7.2, 10.3)
Educational Attainment		
<i>Less than 12th grade</i>	24.4 (10.0, 38.9)	22.3 (11.3, 33.3)
<i>High School Graduate</i>	13.9 (8.8, 19.0)	11.3 (9.0, 13.5)
<i>1-3 years of college</i>	10.5 (7.8, 13.2)	10.3 (7.5, 13.0)
<i>4-year degree or higher</i>	5.4 (3.8, 7.0)	5.3 (3.9, 6.6)
Household Income		
<i>Less than \$25,000</i>	16.9 (8.4, 25.3)	15.6 (12.3, 18.9)
<i>\$25,000 to \$49,999</i>	10.6 (7.6, 13.6)	13.7 (9.5, 17.9)
<i>\$50,000 or higher</i>	8.2 (6.0, 10.5)	6.5 (4.7, 8.4)
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had diabetes. Adults told they had prediabetes, borderline diabetes, and women who had diabetes only during pregnancy were classified as not having been diagnosed.		

Table 13-38A: Cardiovascular Disease by County

	Ever Told Heart Attack[a]		Ever Told Heart Disease[b]		Ever Told Stroke[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	5.83 (5.8, 5.9)		5.60 (5.5, 5.7)		4.48 (4.4, 4.5)	
US Weighted	4.2		3.9		3.4	
Michigan (2020)	5.1 (4.5, 5.8)	5.0 (4.5, 5.4)	5.0 (4.4, 5.7)	5.1 (4.7, 5.6)	3.5 (3.0, 4.0)	3.5 (3.2, 3.9)
Upper Peninsula (MiBRFS 2018-2020)	7.0 (5.2, 9.2)		7.4 (5.2, 10.5)		3.5 (2.4, 5.1)	
Upper Peninsula	4.4 (3.3, 5.4)	5.8 (4.4, 7.1)	8.7 (7.0, 10.4)	9.6 (8.0, 11.1)	2.9 (2.1, 3.7)	3.2 (2.4, 4.0)
Alger	7.2 (1.6, 12.7)	3.8 (1.5, 6.2)	11.4 (5.5, 17.2)	10.9 (6.6, 15.2)	3.8 (1.3, 6.4)	2.8 (0.0, 5.7)
Baraga	9.1 (2.0, 16.2)	7.2 (3.3, 11.0)	11.2 (5.1, 17.4)	8.2 (4.3, 12.0)	2.6 (1.0, 4.2)	1.8 (0.1, 3.6)
Chippewa	5.8 (1.1, 10.5)	7.3 (3.1, 11.5)	11.2 (5.3, 17.2)	10.4 (5.2, 15.6)	4.9 (1.5, 8.3)	4.2 (1.3, 7.2)
Delta	2.1 (0.1, 4.1)	9.5 (1.7, 17.2)	3.9 (0.1, 7.8)	12.4 (4.6, 20.3)	2.3 (0.2, 4.4)	4.2 (1.3, 7.1)
Dickinson	5.0 (1.9, 8.1)	5.8 (2.0, 9.6)	11.9 (6.8, 17.1)	9.0 (4.7, 13.3)	2.1 (0.8, 3.3)	1.5 (0.5, 2.5)
Gogebic	5.8 (2.7, 8.9)	7.0 (2.5, 11.4)	11.8 (7.0, 16.7)	12.8 (7.0, 18.5)	2.2 (0.5, 3.8)	4.8 (0.7, 9.0)
Houghton/Keweenaw	2.6 (0.6, 4.6)	3.9 (1.7, 6.1)	6.4 (3.4, 9.4)	8.8 (5.1, 12.4)	2.1 (0.3, 3.9)	1.9 (0.6, 3.2)
Iron	4.5 (1.4, 7.6)	9.3 (4.9, 13.7)	15.9 (3.7, 23.1)	14.4 (9.2, 19.6)	4.4 (0.5, 8.2)	4.2 (1.7, 6.6)
Luce	8.2 (3.9, 12.6)	8.4 (4.4, 12.5)	12.6 (7.4, 17.7)	12.3 (7.3, 17.3)	2.6 (0.8, 4.5)	2.3 (1.0, 3.7)
Mackinac	7.9 (3.8, 12.0)	3.9 (1.4, 6.4)	12.2 (5.2, 19.1)	8.9 (5.1, 12.7)	4.8 (1.2, 8.4)	7.5 (0.0, 17.3)
Marquette	3.2 (1.0, 5.3)	3.2 (1.2, 5.2)	6.9 (2.9, 11.0)	7.3 (4.0, 10.6)	1.1 (0.04, 2.1)	2.4 (0.7, 4.2)
Menominee	5.0 (2.0, 8.0)	4.8 (1.5, 8.1)	7.41 (3.6, 11.2)	7.8 (3.8, 11.8)	5.6 (1.1, 10.2)	3.8 (0.8, 6.8)
Ontonagon	7.9 (4.8, 11.0)	7.5 (4.7, 10.3)	16.5 (11.5, 21.5)	12.1 (8.6, 15.5)	4.9 (1.7, 8.1)	3.0 (1.5, 4.4)
Schoolcraft	4.8 (1.8, 7.7)	8.3 (3.4, 13.3)	8.2 (4.3, 12.0)	7.8 (4.7, 11.0)	5.3 (1.9, 8.6)	2.7 (0.7, 4.8)

Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had ...

[a] a heart attack or myocardial infarction.

[b] heart disease. *The Michigan estimate represents the proportion of respondents who reported ever being told they had angina or coronary heart disease. Same for UP 2018-2020 estimate.*

[c] a stroke.

Table 13-38B: Cardiovascular Disease by Population Group

	Ever Told Heart Attack[a]		Ever Told Heart Disease[b]		Ever Told Stroke[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	4.4 (3.3, 5.4)	5.8 (4.4, 7.1)	8.7 (7.0, 10.4)	9.6 (8.0, 11.1)	2.9 (2.1, 3.7)	3.2 (2.4, 4.0)
Age						
18-39	0.3 (0.0, 0.9)	0.04 (0.0, 0.1)	0.9 (0.0, 2.5)	0.02 (0.0, 0.07)	*	1.3 (0.0, 2.8)
40-65	4.4 (2.5, 6.3)	6.9 (4.2, 9.6)	8.2 (5.6, 10.7)	9.8 (6.9, 12.7)	3.0 (1.7, 4.4)	3.0 (1.9, 4.2)
65+	10.2 (8.1, 12.2)	11.8 (9.6, 13.9)	20.5 (17.5, 23.5)	22.0 (19.1, 25.0)	6.8 (5.1, 8.5)	6.4 (4.6, 8.3)
Gender						
Male	5.4 (3.5, 7.4)	9.2 (6.6, 11.8)	12.2 (8.6, 15.8)	13.0 (10.0, 16.0)	3.1 (1.9, 4.3)	3.8 (2.4, 5.3)
Female	3.4 (2.3, 4.4)	2.5 (1.8, 3.2)	5.2 (3.8, 6.7)	6.2 (5.0, 7.5)	2.7 (1.7, 3.7)	2.6 (1.7, 3.5)
Educational Attainment						
Less than 12th grade	10.1 (1.1, 19.0)	15.8 (5.1, 26.6)	24.9 (10.6, 39.2)	24.0 (12.7, 32.3)	15.1 (3.3, 26.9)	5.8 (2.1, 9.5)
High School Graduate	5.9 (3.6, 8.2)	6.1 (4.5, 7.8)	10.2 (6.5, 14.0)	9.8 (7.7, 11.9)	3.3 (1.7, 4.8)	3.8 (2.2, 5.4)
1-3 years of college	4.6 (2.7, 6.5)	4.4 (2.8, 5.9)	7.7 (5.3, 10.1)	7.2 (5.1, 9.3)	2.6 (1.6, 3.7)	2.5 (1.3, 3.7)
4-year degree or higher	1.2 (0.7, 1.7)	2.2 (1.3, 3.0)	6.0 (3.8, 8.3)	4.9 (3.6, 6.3)	1.4 (0.7, 2.1)	1.7 (0.5, 2.8)
Household Income						
Less than \$25,000	7.6 (3.3, 11.8)	8.2 (5.9, 10.6)	10.3 (4.9, 15.6)	12.0 (9.3, 14.8)	4.9 (2.1, 7.7)	6.8 (4.2, 9.3)
\$25,000 to \$49,999	6.2 (4.1, 8.3)	7.1 (3.5, 10.7)	12.1 (8.5, 15.8)	11.7 (7.8, 15.7)	3.1 (1.7, 4.5)	3.2 (1.9, 4.6)
\$50,000 or higher	2.0 (1.1, 2.9)	3.4 (2.0, 4.8)	6.3 (4.5, 8.1)	6.4 (4.5, 8.3)	1.9 (1.0, 2.8)	1.3 (0.4, 2.2)

Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had ...

[a] a heart attack or myocardial infarction.

[b] heart disease.

[c] a stroke.

Table 13-39A: Cancer by County

	Ever Told Skin Cancer[a]		Ever Told Any Other Cancer Type[b]		Ever Told Cancer[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	9.99 (9.9, 10.1)		10.2 (10.1, 10.3)			
US Weighted	6.4		7.1			
Michigan (2020)	6.2 (5.6, 6.8)	5.8 (5.4, 6.3)	7.6 (6.9, 8.3)	8.3 (7.8, 8.9)	12.4 (11.6, 13.3)	12.8 (12.1, 13.5)
Upper Peninsula (MiBRFS 2018-2020)					15.0 (12.2, 18.4)	
Upper Peninsula	9.3 (7.5, 11.0)	6.3 (5.4, 7.3)	8.9 (7.3, 10.6)	8.4 (7.2, 9.6)	16.0 (13.5, 18.5)	13.3 (11.8, 14.8)
Alger	10.9 (6.8, 15.0)	6.1 (3.0, 7.5)	12.0 (7.4, 16.7)	9.1 (4.6, 13.5)	19.7 (13.9, 25.6)	13.0 (8.1, 17.9)
Baraga	9.1 (5.1, 13.0)	4.6 (2.0, 7.1)	9.3 (4.3, 14.4)	11.0 (4.1, 17.8)	16.7 (10.6, 22.8)	14.4 (7.3, 21.6)
Chippewa	7.0 (3.3, 10.8)	5.0 (2.1, 7.9)	11.4 (5.6, 17.1)	7.1 (3.6, 10.7)	16.3 (9.6, 23.1)	11.4 (6.7, 16.1)
Delta	10.7 (1.7, 19.7)	6.5 (3.1, 9.9)	7.6 (1.4, 13.7)	9.4 (5.0, 13.8)	15.2 (3.7, 26.7)	14.8 (9.4, 20.2)
Dickinson	8.9 (5.0, 12.9)	8.2 (4.5, 11.9)	10.3 (5.6, 15.0)	6.3 (3.7, 9.0)	17.3 (11.4, 23.2)	13.2 (8.8, 17.7)
Gogebic	6.4 (2.9, 10.0)	6.7 (3.5, 9.9)	9.9 (5.4, 14.3)	6.5 (2.5, 10.5)	15.4 (9.3, 21.5)	12.3 (7.3, 17.2)
Houghton/Keweenaw	7.0 (2.7, 11.2)	5.0 (2.6, 7.5)	9.1 (4.5, 13.7)	6.9 (4.1, 9.7)	15.0 (8.7, 21.3)	11.2 (7.4, 15.1)
Iron	7.3 (4.0, 10.7)	10.0 (6.5, 13.5)	13.7 (8.5, 18.9)	10.4 (6.1, 14.7)	17.5 (11.7, 23.3)	19.0 (13.6, 24.4)
Luce	10.9 (6.2, 15.6)	6.9 (3.8, 10.0)	11.5 (6.8, 16.2)	6.6 (4.0, 9.2)	21.5 (15.0, 28.0)	12.1 (8.2, 16.0)
Mackinac	19.1 (13.3, 24.8)	11.4 (6.6, 16.2)	8.4 (5.2, 11.7)	9.4 (5.3, 13.5)	24.8 (18.4, 31.2)	17.6 (11.4, 23.7)
Marquette	8.2 (5.0, 11.5)	4.7 (2.5, 6.9)	5.1 (3.3, 9.0)	7.7 (4.6, 10.9)	11.8 (7.7, 15.9)	10.8 (7.2, 14.5)
Menominee	11.4 (6.2, 16.7)	7.0 (3.6, 10.4)	8.2 (3.6, 12.8)	10.3 (5.9, 14.8)	17.8 (11.0, 24.6)	15.2 (9.7, 20.7)
Ontonagon	9.0 (5.6, 12.5)	9.0 (6.3, 11.7)	11.7 (7.5, 15.9)	14.6 (10.4, 18.8)	18.7 (13.5, 23.9)	21.5 (16.7, 26.2)
Schoolcraft	18.8 (7.5, 30.1)	10.1 (6.0, 14.2)	9.5 (5.3, 13.8)	12.6 (7.5, 17.7)	26.4 (15.3, 37.4)	20.5 (14.1, 26.8)
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had skin cancer.						
[b] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had had a form of cancer other than skin cancer.						
[c] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had skin cancer or any other type of cancer.						

Table 13-39B: Cancer by Population Group

	Ever Told Skin Cancer[a]		Ever Told Any Other Cancer Type[b]		Ever Told Cancer[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	9.3 (7.5, 11.0)	6.3 (5.4, 7.3)	8.9 (7.3, 10.6)	8.4 (7.2, 9.6)	16.0 (13.5, 18.5)	13.3 (11.8, 14.8)
Age						
18-39	0.7 (0.0, 2.0)	0.5 (0.0, 1.1)	0.8 (0.0, 2.0)	1.5 (0.3, 2.8)	1.6 (0.0, 3.3)	6.3 (5.4, 7.3)
40-65	8.9 (6.1, 11.6)	5.4 (3.9, 6.9)	9.4 (6.8, 12.0)	8.0 (6.1, 9.9)	16.9 (13.4, 20.3)	12.5 (10.2, 14.8)
65+	22.0 (19.2, 24.9)	16.4 (14.0, 18.9)	19.5 (16.9, 22.2)	18.4 (15.9, 20.9)	35.0 (31.7, 38.2)	30.4 (27.3, 33.4)
Gender						
Male	11.0 (7.6, 14.4)	7.4 (5.8, 9.1)	8.0 (5.5, 10.5)	7.7 (5.8, 9.6)	16.1 (11.7, 20.5)	13.3 (10.8, 15.7)
Female	7.6 (6.1, 9.1)	5.2 (4.2, 6.2)	9.7 (7.8, 11.7)	9.0 (7.5, 10.5)	15.9 (13.4, 18.3)	13.3 (11.5, 15.1)
Educational Attainment						
Less than 12th grade	4.0 (0.0, 8.1)	5.0 (1.3, 8.8)	22.3 (8.5, 36.2)	6.3 (2.9, 9.7)	25.6 (11.4, 40.0)	10.4 (5.3, 15.5)
High School Graduate	9.2 (5.9, 12.5)	5.9 (4.4, 7.5)	10.2 (6.5, 13.9)	8.6 (6.8, 10.5)	16.9 (11.4, 22.3)	13.2 (10.8, 15.5)
1-3 years of college	8.7 (5.9, 11.5)	6.1 (4.4, 7.7)	8.4 (6.1, 10.7)	8.6 (6.3, 10.9)	15.1 (11.7, 18.6)	13.4 (10.7, 16.2)
4-year degree or higher	11.1 (8.1, 14.1)	8.6 (6.6, 10.7)	6.3 (4.6, 8.0)	7.5 (5.7, 9.2)	15.1 (11.7, 18.5)	14.0 (11.5, 16.6)
Household Income						
Less than \$25,000	5.1 (2.4, 7.7)	4.3 (2.9, 5.6)	8.7 (4.1, 13.2)	9.8 (7.4, 12.2)	12.6 (6.5, 18.7)	12.8 (10.0, 15.5)
\$25,000 to \$49,999	12.4 (9.4, 15.5)	7.0 (5.2, 8.8)	13.7 (10.1, 17.3)	9.1 (7.0, 11.1)	22.1 (17.7, 26.5)	14.5 (11.8, 17.2)
\$50,000 or higher	9.5 (7.0, 11.9)	6.9 (5.3, 8.6)	6.6 (4.9, 8.3)	6.9 (5.0, 8.7)	14.3 (11.4, 17.2)	12.4 (10.0, 14.8)

[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had skin cancer.

[b] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had had a form of cancer other than skin cancer.

[c] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had skin cancer or any other type of cancer.

Table 13-40A: Chronic Pulmonary Disease by County				
	Ever Told COPD, CLRD, or Chronic Bronchitis[a]			
	2021	2017	2015	2012
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	8.47 (8.4, 8.6)			
US Weighted	6.6			
Michigan (2020)	8.3 (7.6, 9.2)	8.9 (8.3, 9.6)	8.8 (8.1, 9.6)	8.0 (7.3, 8.7)
Upper Peninsula (MiBRFS 2018-2020)	8.7 (6.6, 11.4)			
Upper Peninsula	8.0 (6.4, 9.7)	7.7 (6.5, 8.9)	7.7 (7.5, 7.9) [b]	7.2 (5.7, 9.2) [b]
Alger	8.6 (4.8, 12.3)	11.7 (6.5, 16.8)		
Baraga	8.4 (4.1, 12.7)	7.1 (3.6, 10.5)	12.6 (11.9, 13.2)	5.1 (3.2, 8.1)
Chippewa	16.0 (8.1, 23.8)	7.3 (3.5, 11.0)		
Delta	3.7 (0.6, 6.8)	6.9 (3.0, 10.8)		
Dickinson	5.9 (1.0, 10.9)	8.5 (4.2, 12.7)		
Gogebic	8.4 (3.8, 13.0)	8.0 (3.5, 12.6)	5.6 (5.2, 5.9)	8.2 (5.5, 12.1)
Houghton/Keweenaw	6.9 (2.5, 11.2)	5.5 (3.1, 7.8)	6.9 (6.7, 7.1)	7.3 (4.9, 10.6)
Iron	14.6 (7.9, 21.3)	17.8 (11.8, 23.9)	9.4 (8.9, 9.8)	
Luce	12.5 (7.8, 17.2)	10.9 (5.0, 16.7)		
Mackinac	13.1 (6.1, 20.2)	9.1 (5.1, 13.1)		
Marquette	4.6 (2.4, 6.9)	5.2 (2.6, 7.8)		
Menominee	8.8 (4.7, 12.9)	10.9 (5.2, 16.7)		
Ontonagon	7.3 (3.6, 11.0)	8.9 (5.9, 12.0)	10.0 (9.3, 1.06)	7.3 (5.4, 9.7)
Schoolcraft	11.0 (5.9, 16.0)	10.6 (5.9, 15.2)		
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had chronic obstructive pulmonary disease *COPD), chronic lower respiratory disease (CLRD), or chronic bronchitis.				
[b] Cumulative estimate for the counties surveyed.				

Table 13-40B: Chronic Pulmonary Disease by Population Group		
	Ever Told COPD, CLRD, or Chronic Bronchitis[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	8.0 (6.4, 9.7)	7.7 (6.5, 8.9)
Age		
18-39	0.6 (0.0, 1.6)	1.0 (0.0, 2.2)
40-65	10.0 (7.0, 13.0)	8.2 (6.4, 10.1)
65+	15.4 (12.9, 17.9)	15.8 (13.1, 18.4)
Gender		
Male	9.0 (6.0, 12.0)	8.2 (6.2, 10.1)
Female	7.0 (5.3, 8.7)	7.3 (5.9, 8.7)
Educational Attainment		
Less than 12th grade	28.0 (11.9, 44.1)	18.6 (10.6, 26.6)
High School Graduate	11.6 (7.3, 15.8)	8.2 (6.4, 10.0)
1-3 years of college	6.6 (4.6, 8.6)	6.3 (4.7, 7.9)
4-year degree or higher	2.4 (1.3, 3.4)	2.4 (1.6, 3.3)
Household Income		
Less than \$25,000	13.3 (6.5, 20.1)	14.0 (10.8, 17.2)
\$25,000 to \$49,999	9.7 (6.9, 12.6)	9.0 (6.8, 11.3)
\$50,000 or higher	4.8 (3.0, 6.6)	3.0 (1.8, 4.2)
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had chronic obstructive pulmonary disease *COPD), chronic lower respiratory disease (CLRD), or chronic bronchitis.		

Table 13-41A: Activity Limited by Arthritis by County		
	Activity Limited by Arthritis[a]	
	2021	2017
	% (95%CI)	% (95%CI)
US Raw	41.4 (41.1, 41.6)	
US Weighted	42.0	
Michigan		
Upper Peninsula	31.0 (26.8, 35.3)	32.6 (29.7, 35.4)
Alger	37.3 (28.7, 45.9)	39.4 (31.7, 47.1)
Baraga	31.1 (22.5, 39.7)	29.2 (21.0, 37.4)
Chippewa	36.7 (25.4, 47.9)	41.0 (30.1, 52.0)
Delta	22.7 (6.2, 39.1)	35.8 (26.5, 45.1)
Dickinson	38.9 (29.3, 48.5)	37.5 (28.9, 46.0)
Gogebic	42.9 (32.7, 53.0)	30.6 (23.4, 37.8)
Houghton/Keweenaw	29.0 (19.2, 38.7)	25.5 (18.6, 32.4)
Iron	34.3 (25.3, 43.4)	37.8 (30.1, 45.6)
Luce	44.0 (34.8, 53.2)	41.5 (32.6, 50.3)
Mackinac	33.0 (25.2, 40.8)	40.6 (28.0, 53.3)
Marquette	24.6 (17.9, 31.3)	26.8 (20.0, 33.6)
Menominee	33.5 (23.5, 43.6)	26.5 (16.7, 36.4)
Ontonagon	43.1 (34.8, 51.5)	33.0 (27.4, 38.7)
Schoolcraft	33.1 (23.9, 42.3)	40.0 (31.0, 49.1)
[a] Among all adults, the proportion who reported they were limited in their usual activities because of arthritis or joint symptoms.		
[b] Among all adults the proportion who reported being told by a doctor that they have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia.		

Table 13-41B: Activity Limited by Arthritis by Population Group		
	Activity Limited by Arthritis[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	31.0 (26.8, 35.3)	32.6 (29.7, 35.4)
Age		
18-39	12.4 (6.3, 18.5)	15.2 (9.5, 21.0)
40-65	37.3 (32.9, 41.7)	38.4 (34.5, 42.2)
65+	47.2 (43.8, 50.6)	45.4 (42.0, 48.7)
Gender		
Male	31.4 (23.5, 39.4)	32.0 (27.3, 36.7)
Female	30.6 (27.1, 34.1)	33.1 (29.8, 36.4)
Educational Attainment		
Less than 12th grade	48.8 (31.4, 66.3)	52.5 (39.4, 68.7)
High School Graduate	34.4 (24.0, 44.8)	35.4 (30.5, 40.3)
1-3 years of college	30.8 (25.8, 35.7)	29.9 (25.5, 34.3)
4-year degree or higher	24.5 (19.1, 29.9)	18.4 (15.2, 21.6)
Household Income		
Less than \$25,000	38.2 (20.7, 55.7)	44.4 (38.2, 50.6)
\$25,000 to \$49,999	37.7 (31.3, 44.1)	39.0 (33.2, 44.7)
\$50,000 or higher	24.3 (20.3, 28.4)	21.4 (17.9, 24.9)
[a] Among all adults, the proportion who reported they were limited in their usual activities because of arthritis or joint symptoms.		

Table 13-42A Vaccination by County

	Had a Flu Shot past 12 Months (age 18+) [a]		Had a Flu Shot Past 12 Months (Age 65+) [b]		Ever Had a Pneumonia Vaccine[c]	
	2021	2017	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
US Raw	49.3 (49.2, 49.5)		57.3 (57.0, 57.5)		63.0 (62.8, 63.2)	
US Weighted	42.4		53.6		58.1	
Michigan (2020)	ND	36.4 (35.3, 37.5)	71.5 (69.4, 73.9)	56.1 (54.1, 58.0)	71.8 (69.4, 74.2)	71.8 (70.0, 73.6)
Upper Peninsula (MiBRFS 2018-2020)			56.2 (49.4, 64.6)			
Upper Peninsula	61.3 (56.0, 66.6)	51.9 (48.6, 55.3)	80.3 (77.6, 83.0)	76.9 (74.2, 79.7)	77.2 (74.5, 79.9)	77.9 (74.8, 80.9)
Alger	62.2 (53.2, 71.2)	55.6 (47.3, 63.8)	79.3 (71.4, 87.3)	67.5 (58.5, 76.6)	77.3 (68.7, 86.0)	72.3 (63.4, 81.1)
Baraga	49.8 (39.5, 60.1)	45.1 (34.1, 56.1)	77.9 (70.1, 85.7)	67.5 (58.5, 76.6)	77.5 (69.3, 85.6)	72.3 (63.4, 81.1)
Chippewa	47.7 (35.6, 59.7)	48.4 (36.6, 60.2)	73.9 (61.9, 85.9)	81.5 (74.1, 89.0)	84.1 (76.5, 91.7)	73.1 (63.1, 83.1)
Delta	76.6 (59.8, 93.5)	45.9 (36.7, 55.0)	86.0 (79.2, 92.8)	69.2 (58.1, 80.4)	81.6 (74.0, 89.1)	73.0 (61.4, 84.6)
Dickinson	62.8 (53.2, 72.4)	60.6 (52.0, 69.3)	84.5 (77.8, 91.2)	82.5 (74.7, 90.3)	74.6 (65.7, 83.6)	82.0 (73.8, 90.1)
Gogebic	53.2 (38.3, 68.0)	53.1 (44.8, 61.4)	78.2 (70.1, 86.3)	71.2 (62.2, 80.1)	71.7 (63.0, 80.4)	73.2 (64.6, 81.9)
Houghton/Keweenaw	55.9 (43.1, 68.8)	49.4 (39.3, 59.4)	79.3 (70.5, 88.1)	78.2 (70.9, 85.6)	79.6 (71.6, 87.7)	84.8 (78.7, 91.0)
Iron	51.5 (41.1, 62.0)	56.0 (47.6, 64.4)	75.3 (68.0, 82.7)	74.8 (66.9, 82.6)	72.9 (65.2, 80.5)	80.0 (73.7, 86.3)
Luce	64.5 (54.0, 74.9)	54.8 (45.6, 63.9)	81.6 (73.2, 90.0)	76.3 (67.9, 84.8)	71.4 (62.0, 82.9)	82.6 (74.9, 90.3)
Mackinac	62.5 (52.7, 72.3)	55.6 (43.7, 67.5)	79.7 (72.0, 87.3)	78.4 (70.0, 86.8)	83.2 (76.6, 89.7)	80.9 (72.9, 89.0)
Marquette	65.8 (55.2, 76.4)	57.2 (48.0, 66.3)	85.7 (79.6, 91.9)	82.2 (74.0, 90.4)	72.6 (63.6, 81.5)	74.8 (61.2, 85.4)
Menominee	57.8 (46.3, 69.3)	45.4 (34.1, 56.7)	73.7 (64.1, 83.2)	78.5 (70.5, 86.6)	71.9 (61.7, 82.1)	87.6 (81.1, 94.1)
Ontonagon	61.7 (53.0, 70.3)	47.2 (40.6, 53.8)	73.2 (66.9, 79.4)	73.2 (67.5, 78.9)	79.1 (73.3, 84.9)	75.7 (69.2, 80.1)
Schoolcraft	65.9 (54.4, 77.3)	47.0 (37.4, 56.6)	82.6 (75.3, 89.9)	66.9 (57.7, 76.1)	81.9 (74.5, 89.3)	76.0 (67.5, 84.4)
[a] Among all adults, the proportion who reported they had a seasonal flu shot in the past 12 months.						
[b] Among adults aged 65 years and older, the proportion who reported they had a seasonal flu shot in the past 12 months.						
[c] Among adults aged 65 years and older, the proportion who reported they had a pneumonia or pneumococcal vaccine.						

Table 13-42B: Vaccination by Population Group

	Had a Flu Shot past 12 Months (age 18+) [a]		Had a Flu Shot Past 12 Months (Age 65+) [b]		Ever Had a Pneumonia Vaccine[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	61.3 (56.0, 66.6)	51.9 (48.6)	80.3 (77.6, 83.0)	76.9 (74.2, 79.7)	77.2 (74.5, 79.9)	77.9 (74.8, 80.9)
Age						
18-39	54.9 (39.8, 70.1)	39.2 (30.9, 47.5)	—	—	—	—
40-65	55.0 (50.4, 59.5)	48.3 (44.3, 52.2)	—	—	—	—
65+	80.3 (77.6, 83.0)	76.9 (74.2, 79.7)	80.3 (77.6, 83.0)	76.9 (74.2, 79.7)	77.2 (74.5, 79.9)	77.9 (74.8, 80.9)
Gender						
Male	60.1 (50.3, 70.0)	52.8 (47.1, 58.4)	81.3 (77.1, 85.4)	78.0 (73.6, 82.4)	78.3 (74.4, 82.2)	75.3 (70.2, 80.4)
Female	62.4 (57.9, 66.9)	51.2 (47.5, 54.8)	79.5 (76.2, 82.9)	75.9 (72.5, 79.2)	76.3 (72.6, 80.0)	80.4 (77.0, 83.8)
Educational Attainment						
Less than 12th grade	47.3 (30.0, 64.7)	53.0 (39.5, 66.5)	69.7 (51.1, 88.3)	76.5 (65.3, 87.6)	66.4 (49.2, 83.7)	73.4 (61.7, 85.2)
High School Graduate	64.4 (53.4, 75.4)	51.8 (46.2, 57.4)	81.8 (78.1, 85.5)	76.1 (72.3, 79.9)	80.0 (75.9, 84.0)	79.6 (75.7, 83.4)
1-3 years of college	55.8 (49.2, 62.3)	48.7 (43.0, 54.4)	76.8 (71.4, 82.2)	78.0 (73.2, 82.3)	75.8 (70.8, 80.7)	76.0 (69.9, 82.2)
4-year degree or higher	68.2 (61.0, 75.3)	59.8 (54.8, 64.9)	86.2 (83.0, 89.5)	78.1 (73.8, 82.3)	76.8 (71.9, 81.8)	82.1 (78.2, 85.9)
Household Income						
Less than \$25,000	62.8 (45.5, 80.0)	47.9 (41.5, 54.3)	73.0 (67.6, 78.4)	72.9 (66.8, 79.0)	74.1 (68.7, 79.4)	74.9 (68.5, 81.2)
\$25,000 to \$49,999	51.4 (44.0, 58.8)	50.7 (44.8, 56.6)	79.2 (74.7, 83.7)	76.7 (72.7, 80.7)	78.7 (74.5, 82.8)	80.1 (76.2, 84.0)
\$50,000 or higher	65.3 (60.1, 70.5)	55.0 (49.6, 60.4)	86.0 (81.8, 90.3)	80.5 (75.7, 85.3)	79.0 (74.5, 83.5)	78.7 (72.4, 85.1)
[a] Among all adults, the proportion who reported they had a seasonal flu shot in the past 12 months.						
[b] Among adults aged 65 years and older, the proportion who reported they had a seasonal flu shot in the past 12 months.						
[c] Among adults aged 65 years and older, the proportion who reported they had a pneumonia or pneumococcal vaccine.						

Table 13-43A: Depression or Anxiety by County

	Ever Told Depressive Disorder[a]				Ever Told Anxiety Disorder[b]	
	2021	2017	2015	2012	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	18.9 (18.8, 19.0)					
US Weighted	18.7					
Michigan (2020)	19.5 (18.3, 20.8)	22.0 (21.1, 23.0)	20.5 (19.3, 21.6)	20.6 (19.5, 21.8)		
Upper Peninsula (MiBRFS 2018-2020)	21.4 (18.0, 25.1)					
Upper Peninsula	25.9 (21.8, 29.9)	25.6 (22.5, 28.7)	21.9 (21.7, 22.2) [c]	24.2 (21.0, 27.8) [c]	22.9 (19.0, 26.7)	21.3 (18.4, 24.3)
Alger	23.8 (16.8, 30.7)	27.7 (20.2, 35.2)			20.3 (13.7, 26.9)	24.2 (14.1, 28.3)
Baraga	21.9 (13.5, 30.3)	27.5 (15.9, 39.1)	22.0 (21.2, 22.7)	21.6 (16.6, 27.8)	18.4 (10.5, 26.4)	18.6 (11.3, 25.8)
Chippewa	30.7 (18.6, 42.8)	30.0 (19.6, 40.4)			25.5 (14.5, 36.5)	22.9 (12.9, 32.9)
Delta	16.3 (3.7, 28.8)	24.6 (16.8, 32.4)			16.6 (2.9, 30.4)	26.6 (18.4, 34.9)
Dickinson	26.9 (18.2, 35.6)	26.6 (18.7, 34.4)			24.3 (15.8, 32.8)	19.2 (12.2, 26.2)
Gogebic	25.7 (16.1, 35.2)	23.3 (16.1, 30.5)	22.9 (22.4, 23.5)	29.7 (23.8, 36.3)	21.9 (12.7, 31.0)	23.0 (15.6, 30.3)
Houghton/Keweenaw	33.5 (20.2, 46.7)	27.6 (16.8, 38.4)	22.0 (21.6, 22.3)	22.7 (17.8, 28.5)	31.7 (18.3, 45.1)	17.8 (10.2, 25.4)
Iron	20.1 (12.6, 27.7)	20.7 (14.8, 26.6)	18.3 (17.7, 18.9)		18.9 (11.6, 26.2)	18.1 (12.2, 24.1)
Luce	29.9 (20.0, 39.8)	24.4 (17.1, 31.8)			23.2 (13.4, 33.1)	24.6 (16.5, 32.8)
Mackinac	21.0 (13.6, 28.4)	27.1 (16.1, 38.0)			16.6 (9.7, 23.6)	20.8 (10.1, 31.4)
Marquette	27.0 (19.3, 34.6)	27.2 (18.1, 36.3)			21.1 (14.0, 28.2)	23.7 (14.8, 32.6)
Menominee	27.2 (17.3, 37.0)	17.2 (10.0, 24.3)			26.8 (17.1, 36.4)	15.0 (10.8, 19.2)
Ontonagon	18.2 (12.1, 24.2)	17.9 (13.5, 22.3)	23.9 (23.0, 24.8)	22.9 (18.5, 27.9)	17.5 (11.6, 23.5)	15.0 (10.8, 19.2)
Schoolcraft	28.6 (18.1, 39.1)	23.2 (15.6, 30.9)			28.3 (17.2, 39.4)	29.4 (17.8, 41.0)

[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had a depressive disorder including depression, major depression, dysthymic, or minor depression.

[b] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had an anxiety disorder including generalized anxiety disorder, panic disorder, social anxiety disorder, or a specific phobia. *This question was not part of the statewide BFRS.*

[c] Cumulative estimate for the counties surveyed.

Table 13-43B: Depression or Anxiety by Population Group

	Ever Told Depressive Disorder[a]		Ever Told Anxiety Disorder[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	25.9 (21.8, 29.9)	25.6 (22.5, 28.7)	22.9 (19.0, 26.7)	21.3 (18.4, 24.3)
Age				
18-39	28.6 (17.6, 39.7)	36.5 (28.2, 44.8)	30.6 (19.1, 42.2)	32.5 (24.7, 40.1)
40-65	28.7 (24.7, 32.7)	21.9 (19.0, 24.8)	22.7 (19.0, 26.4)	18.6 (15.7, 21.4)
65+	17.5 (14.8, 20.2)	17.7 (15.0, 20.4)	12.0 (10.0, 14.0)	11.0 (9.2, 12.9)
Gender				
Male	16.6 (10.8, 22.3)	21.0 (15.7, 26.3)	14.7 (9.0, 20.4)	15.2 (10.6, 19.8)
Female	34.9 (30.6, 39.2)	30.0 (26.4, 33.5)	30.7 (26.6, 34.9)	27.2 (23.6, 30.8)
Educational Attainment				
Less than 12th grade	35.0 (18.7, 51.3)	43.1 (29.5, 56.6)	31.4 (15.7, 47.2)	29.5 (17.0, 42.0)
High School Graduate	22.8 (15.1, 30.5)	26.1 (20.5, 31.5)	18.5 (11.8, 25.3)	20.4 (15.4, 25.3)
1-3 years of college	31.8 (25.5, 38.0)	23.7 (19.1, 28.3)	25.9 (19.9, 31.9)	22.2 (17.4, 27.0)
4-year degree or higher	21.5 (16.1, 26.8)	19.3 (15.3, 23.2)	24.6 (18.1, 31.1)	17.4 (12.9, 21.8)
Household Income				
Less than \$25,000	32.4 (17.4, 47.4)	37.6 (31.2, 44.1)	27.6 (14.5, 40.7)	28.4 (22.6, 34.3)
\$25,000 to \$49,999	24.6 (18.8, 30.4)	25.1 (19.5, 30.8)	18.1 (13.6, 22.5)	20.8 (15.8, 25.8)
\$50,000 or higher	23.9 (19.0, 28.9)	19.7 (14.9, 24.5)	23.2 (18.0, 28.4)	18.1 (13.3, 22.9)
[a] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had a depressive disorder including depression, major depression, dysthymic, or minor depression.				
[b] Among all adults, the proportion who reported they were ever told by a doctor, nurse, or health professional they had an anxiety disorder including generalized anxiety disorder, panic disorder, social anxiety disorder, or a specific phobia.				

Table 13-44A: Mental Health Care Access by County

	Contacted Crisis Line Past 12 Months[a]		Medication for Mood Past 12 Months[b]		Counseling Past 12 Months[c]	
	2021	2017	2021	2017	2021	2017
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Michigan[d]						
Upper Peninsula	1.7 (0.8, 2.5)	1.2 (0.5, 1.9)	26.6 (22.4, 30.8)	24.0 (20.9, 27.1)	10.7 (7.7, 13.6)	7.6 (5.7, 9.6)
Alger	3.1 (0.0, 7.8)	1.1 (0.0, 2.5)	27.7 (19.7, 35.8)	25.0 (17.9, 32.2)	8.0 (3.7, 12.3)	13.6 (7.0, 20.3)
Baraga	1.6 (0.0, 4.2)	0.5 (0.06, 1.0)	15.7 (9.7, 21.6)	18.7 (11.4, 26.1)	3.8 (0.7, 7.0)	2.8 (0.7, 4.9)
Chippewa	*	0.8 (0.0, 1.6)	33.1 (20.9, 45.3)	24.2 (14.5, 33.8)	13.6 (4.7, 22.6)	4.2 (0.3, 8.1)
Delta	2.8 (0.0, 7.5)	0.6 (0.0, 1.3)	21.7 (5.3, 38.2)	31.5 (21.3, 41.4)	8.9 (0.0, 18.6)	6.5 (2.4, 10.7)
Dickinson	2.8 (0.3, 5.2)	2.6 (0.0, 5.3)	27.4 (18.7, 36.1)	21.9 (14.8, 29.0)	10.2 (4.8, 15.6)	10.3 (3.9, 16.7)
Gogebic	*	0.9 (0.0, 2.1)	23.3 (13.8, 32.9)	23.7 (16.4, 31.0)	12.3 (5.0, 19.7)	6.0 (1.7, 10.3)
Houghton/Keweenaw	1.4 (0.0, 3.0)	0.4 (0.0, 1.1)	34.7 (21.3, 48.1)	24.9 (14.3, 35.6)	23.9 (9.8, 37.9)	9.9 (0.0, 20.0)
Iron	1.8 (0.0, 4.3)	0.2 (0.0, 0.7)	16.3 (10.0, 22.5)	18.7 (12.9, 24.4)	5.5 (1.5, 9.6)	6.8 (1.0, 12.6)
Luce	1.9 (0.1, 3.6)	1.0 (0.0, 2.6)	31.8 (21.8, 41.7)	25.7 (18.2, 33.2)	11.0 (1.3, 20.7)	7.8 (3.3, 12.2)
Mackinac	1.2 (0.0, 2.5)	8.4 (0.0, 23.2)	17.6 (11.6, 23.6)	23.3 (12.9, 33.8)	8.5 (1.7, 15.2)	10.1 (0.1, 20.1)
Marquette	2.2 (0.5, 3.9)	0.4 (0.0, 1.2)	25.3 (17.8, 32.8)	25.2 (16.7, 33.7)	7.1 (3.9, 10.3)	9.7 (5.2, 14.2)
Menominee	0.3 (0.0, 0.7)	2.0 (0.0, 4.4)	29.1 (19.6, 38.5)	16.8 (10.8, 22.8)	6.0 (0.5, 11.5)	4.5 (1.4, 7.7)
Ontonagon	0.5 (0.0, 1.4)	1.4 (0.1, 2.7)	20.2 (13.8, 26.6)	19.8 (15.3, 24.3)	4.2 (0.8, 7.5)	2.6 (1.0, 4.1)
Schoolcraft	2.6 (0.3, 4.9)	1.9 (0.0, 4.4)	27.1 (16.2, 38.0)	18.0 (11.4, 24.6)	7.9 (3.6, 12.1)	4.0 (1.1, 6.8)

[a] Among all adults, the proportion who reported they called or texted a crisis line one or more times in the past 12 months.

[b] Among all adults, the proportion who reported they took medication to help with mood, emotions, or mental health in the past 12 months.

[c] Among all adults, the proportion who reported they had received counseling or other non-medication treatment from a mental health professional the past 12 months.

[d] Questions not asked on Michigan BRFS.

Table 13-44B: Mental Health Care Access by Population Group

	Contacted Crisis Line Past 12 Months[a]		Medication for Mood Past 12 Months[b]		Counseling Past 12 Months[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	1.7 (0.8, 2.5)	1.2 (0.5, 1.9)	26.6 (22.4, 30.8)	24.0 (20.9, 27.1)	10.7 (7.7, 13.6)	7.6 (5.7, 9.6)
Age						
18-39	2.4 (0.2, 4.6)	1.2 (0.0, 3.1)	28.7 (17.3, 40.1)	29.6 (21.7, 37.6)	16.9 (8.5, 25.3)	12.9 (7.5, 18.3)
40-65	1.5 (0.7, 2.2)	1.6 (0.7, 2.5)	29.2 (25.1, 33.3)	24.0 (20.5, 27.4)	9.7 (7.2, 12.3)	6.2 (4.4, 8.0)
65+	1.0 (0.4, 1.5)	0.5 (0.2, 0.9)	19.9 (17.1, 22.6)	16.3 (14.0, 18.6)	3.3 (2.0, 4.6)	3.2 (2.1, 4.3)
Gender						
Male	1.7 (0.2, 3.1)	1.5 (0.1, 2.9)	17.4 (11.3, 23.5)	17.7 (12.6, 22.8)	8.0 (3.3, 12.8)	6.5 (3.2, 9.9)
Female	1.6 (0.8, 2.5)	0.9 (0.4, 1.4)	35.3 (31.0, 39.6)	30.0 (26.4, 33.6)	13.2 (9.9, 16.4)	8.7 (6.7, 10.8)
Educational Attainment						
Less than 12th grade	2.6 (0.0, 6.5)	0.9 (0.0, 2.2)	32.4 (16.3, 48.4)	39.1 (25.4, 52.7)	15.5 (2.4, 28.5)	4.3 (0.0, 8.7)
High School Graduate	1.8 (0.0, 3.7)	1.5 (0.0, 3.2)	24.9 (16.5, 33.3)	26.7 (21.1, 32.4)	8.2 (3.7, 12.7)	9.3 (5.1, 13.5)
1-3 years of college	1.7 (0.6, 2.8)	1.2 (0.4, 2.0)	29.9 (23.7, 36.1)	19.6 (15.7, 23.5)	11.5 (6.1, 16.9)	5.5 (3.8, 7.3)
4-year degree or higher	1.3 (0.5, 2.1)	0.6 (0.009, 1.2)	24.8 (18.3, 31.2)	19.1 (15.1, 23.0)	12.7 (7.6, 17.9)	10.8 (6.6, 15.0)
Household Income						
Less than \$25,000	5.4 (1.3, 9.4)	1.5 (0.6, 2.5)	30.0 (15.9, 44.2)	32.1 (26.2, 34.9)	14.7 (6.7, 22.6)	11.2 (7.6, 14.9)
\$25,000 to \$49,999	0.5 (0.1, 0.8)	2.1 (0.0, 4.4)	21.9 (16.4, 27.4)	28.6 (22.2, 34.9)	3.7 (2.2, 5.1)	9.7 (4.4, 15.0)
\$50,000 or higher	0.6 (0.2, 1.0)	0.5 (0.002, 1.0)	27.7 (22.4, 33.0)	17.3 (12.9, 21.6)	12.4 (7.7, 17.2)	4.5 (2.8, 6.3)
[a] Among all adults, the proportion who reported they called or texted a crisis line one or more times in the past 12 months.						
[b] Among all adults, the proportion who reported they took medication to help with mood, emotions, or mental health in the past 12 months.						
[c] Among all adults, the proportion who reported they had received counseling or other non-medication treatment from a mental health professional the past 12 months.						

Table 13-45A: Mental Health Care Barriers by County

	Delayed or Not Received Counseling in Past 12 Months Due to Cost[a]		Delayed or Not Received Counseling in Past 12 Months Due to Lack of Transportation[b]		Delayed or Not Received Counseling in Past 12 Months Because Could Not Find Provider[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Michigan[d]						
Upper Peninsula	4.8 (3.1, 6.5)	6.9 (4.2, 9.6)	1.1 (0.5, 1.7)	0.9 (0.4, 1.4)	5.5 (1.7, 7.3)	4.6 (2.5, 6.7)
Alger	3.4 (0.9, 5.8)	4.4 (0.4, 8.4)	0.9 (0.0, 2.3)	2.4 (0.0, 5.9)	5.2 (1.5, 8.9)	5.5 (0.2, 10.7)
Baraga	6.0 (1.1, 11.0)	0.9 (0.1, 1.7)	1.8 (0.0, 4.3)	0.4 (0.04, 0.7)	5.2 (1.5, 8.8)	0.9 (0.2, 1.6)
Chippewa	4.2 (0.0, 12.1)	7.9 (0.0, 16.8)	0.9 (0.0, 2.7)	1.9 (0.0, 5.0)	7.4 (0.0, 15.8)	8.1 (0.0, 17.0)
Delta	2.2 (0.0, 4.6)	5.4 (0.0, 11.4)	0.3 (0.0, 0.7)	0.9 (0.05, 1.7)	4.2 (0.0, 9.1)	0.9 (0.0, 2.0)
Dickinson	6.5 (1.4, 11.5)	4.3 (0.2, 8.4)	0.2 (0.0, 0.6)	0.7 (0.0, 1.4)	8.3 (2.2, 14.4)	2.3 (0.0, 4.7)
Gogebic	2.9 (0.3, 5.4)	3.0 (0.0, 6.1)	0.07 (0.0, 0.2)	0.30 (0.0, 0.9)	4.3 (1.3, 7.2)	3.8 (0.6, 7.1)
Houghton/Keweenaw	8.5 (1.7, 15.3)	11.0 (0.5, 21.5)	2.0 (0.0, 5.1)	0.9 (0.0, 2.1)	58.7 (2.1, 15.4)	2.6 (0.8, 4.5)
Iron	1.0 (0.0, 2.3)	4.2 (0.8, 7.5)	2.5 (0.0, 5.6)	0.7 (0.0, 1.4)	2.6 (0.4, 4.8)	5.3 (0.0, 10.6)
Luce	3.1 (0.7, 5.4)	7.2 (1.6, 12.7)	1.0 (0.0, 2.2)	2.7 (0.0, 7.0)	2.2 (0.5, 3.9)	6.9 (1.6, 12.2)
Mackinac	7.3 (1.6, 13.0)	4.3 (0.5, 8.2)	0.9 (0.0, 2.2)	1.0 (0.0, 2.4)	5.5 (1.5, 9.4)	2.2 (0.1, 4.3)
Marquette	5.6 (2.3, 8.9)	11.6 (3.6, 19.7)	1.4 (0.0, 3.0)	0.4 (0.0, 1.3)	4.7 (1.6, 7.9)	8.1 (0.4, 15.9)
Menominee	4.4 (0.0, 9.2)	1.2 (0.0, 2.6)	1.7 (0.0, 3.8)	1.2 (0.0, 3.5)	2.7 (0.0, 6.0)	3.6 (0.5, 6.6)
Ontonagon	2.4 (0.0, 5.3)	2.8 (1.1, 4.5)	0.9 (0.0, 1.9)	1.0 (0.1, 1.9)	3.7 (1.3, 6.0)	1.8 (0.7, 3.0)
Schoolcraft	2.4 (0.5, 4.2)	2.5 (0.1, 4.9)	*	0.9 (0.0, 2.1)	2.6 (0.8, 4.5)	3.5 (0.7, 6.3)

[a] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to cost.

[b] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to a lack of transportation.

[c] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to a lack of available mental health professionals.

[d] These questions are not part of the statewide BRFS.

Table 13-45B: Mental Health Care Barriers by Population Group

	Delayed or Not Received Counseling in Past 12 Months Due to Cost[a]		Delayed or Not Received Counseling in Past 12 Months Due to Lack of Transportation[b]		Delayed or Not Received Counseling in Past 12 Months Because Could Not Find Provider[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	4.8 (3.1, 6.5)	6.9 (4.2, 9.6)	1.1 (0.5, 1.7)	0.9 (0.4, 1.4)	5.5 (1.7, 7.3)	4.6 (2.5, 6.7)
Age						
18-39	8.3 (3.4, 13.1)	15.4 (7.8, 23.0)	1.0 (0.0, 2.2)	0.7 (0.0, 1.4)	9.1 (4.0, 14.2)	9.3 (3.2, 15.4)
40-65	4.1 (2.7, 5.6)	3.7 (2.1, 5.2)	1.7 (0.5, 2.8)	1.5 (0.5, 2.5)	5.1 (3.1, 7.1)	3.2 (1.7, 4.7)
65+	1.0 (0.5, 1.5)	0.8 (0.3, 1.3)	0.2 (0.0, 0.5)	0.3 (0.02, 0.7)	1.0 (0.5, 1.5)	0.8 (0.4, 1.1)
Gender						
Male	2.5 (0.9, 4.2)	8.6 (3.5, 13.7)	0.8 (0.1, 1.5)	0.3 (0.0, 0.6)	1.8 (0.4, 3.2)	5.4 (1.3, 9.6)
Female	7.0 (4.2, 9.7)	5.3 (3.5, 7.1)	1.3 (0.4, 2.3)	1.6 (0.6, 2.5)	9.0 (6.0, 12.0)	3.8 (2.6, 5.0)
Educational Attainment						
Less than 12th grade	1.0 (0.0, 2.3)	4.0 (0.0, 9.5)	6.4 (0.0, 14.9)	3.2 (0.0, 7.5)	0.7 (0.0, 1.9)	4.4 (0.0, 10.0)
High School Graduate	3.5 (1.1, 5.9)	9.0 (3.6, 14.5)	1.3 (0.2, 2.4)	0.7 (0.1, 1.2)	1.9 (0.2, 3.6)	4.0 (0.2, 7.8)
1-3 years of college	5.9 (2.5, 9.3)	6.8 (2.7, 10.8)	1.0 (0.0, 2.1)	1.0 (0.3, 1.8)	8.3 (4.4, 12.3)	5.6 (1.7, 9.5)
4-year degree or higher	5.9 (2.9, 8.8)	2.8 (1.4, 4.1)	0.3 (0.0, 0.5)	0.2 (0.0, 0.4)	7.7 (4.3, 11.0)	4.1 (2.1, 6.0)
Household Income						
Less than \$25,000	3.5 (1.0, 5.9)	7.6 (3.1, 12.0)	3.0 (0.8, 5.1)	3.3 (1.4, 5.3)	5.0 (1.8, 8.2)	7.3 (3.1, 11.5)
\$25,000 to \$49,999	8.4 (3.6, 13.1)	9.0 (3.2, 14.8)	0.7 (0.0, 1.8)	0.3 (0.0, 0.7)	5.4 (1.2, 9.6)	2.8 (0.8, 4.9)
\$50,000 or higher	3.8 (1.9, 5.8)	5.3 (1.2, 9.3)	0.4 (0.0, 1.1)	0.04 (0.0, 0.1)	5.9 (3.4, 8.4)	4.3 (0.3, 8.3)

[a] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to cost.

[b] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to a lack of transportation.

[c] Among all adults, the proportion who reported they delayed or did not receive needed counseling in the past 12 months due to a lack of available mental health professionals.

Table 13-46A: Alcohol Consumption by County

	Heavy Drinking[a]		Binge Drinking[b]	
	2021	2017	2021	2017
	% (95% C.I.)		% (95% C.I.)	
US Raw	5.57 (5.50, 5.64)		12.4 (12.3, 12.5)	
US Weighted	5.87		15.28	
Michigan (2020)	6.8 (6.0, 7.6)	6.9 (6.3, 7.5)	17.4 (16.3, 18.7)	19.0 (18.1, 20.0)
Upper Peninsula (MiBRFS 2018-2020)	9.8 (7.4, 13.0)		23.5 (19.8, 27.6)	
Upper Peninsula	16.2 (12.9, 19.5)	14.0 (11.7, 16.3)	15.8 (12.3, 19.3)	12.9 (10.7, 15.2)
Alger	17.0 (9.9, 24.0)	14.8 (9.6, 20.1)	13.6 (6.7, 20.5)	15.6 (8.3, 22.9)
Baraga	16.1 (8.8, 23.4)	18.3 (10.5, 26.1)	11.0 (5.1, 17.0)	19.9 (10.9, 28.8)
Chippewa	21.3 (9.5, 33.1)	16.1 (7.0, 25.3)	13.3 (5.1, 21.5)	13.5 (5.1, 21.8)
Delta	9.7 (1.9, 17.5)	10.4 (5.5, 15.2)	14.8 (1.8, 27.7)	10.6 (5.2, 16.1)
Dickinson	13.4 (6.2, 20.6)	9.1 (4.8, 13.4)	13.5 (5.9, 21.1)	11.4 (5.6, 17.1)
Gogebic	9.1 (4.6, 13.5)	15.2 (8.4, 13.4)	7.9 (3.3, 12.6)	9.2 (5.1, 13.2)
Houghton/Keweenaw	17.7 (9.5, 26.0)	12.5 (6.9, 18.1)	14.5 (6.8, 22.2)	11.4 (5.6, 17.1)
Iron	11.4 (5.0, 17.9)	19.2 (10.1, 28.2)	14.3 (2.7, 25.9)	20.5 (11.1, 29.9)
Luce	12.8 (7.5, 18.2)	14.4 (7.9, 21.0)	14.2 (6.0, 22.3)	19.7 (10.3, 29.1)
Mackinac	16.7 (9.4, 24.1)	13.6 (6.7, 20.5)	14.7 (7.3, 22.2)	14.5 (7.5, 21.4)
Marquette	20.1 (11.5, 28.7)	14.5 (8.6, 20.4)	23.2 (13.0, 33.5)	11.9 (5.9, 17.8)
Menominee	13.2 (7.1, 19.3)	18.3 (6.8, 29.8)	10.4 (4.5, 16.4)	16.0 (4.6, 27.4)
Ontonagon	15.3 (9.7, 20.8)	20.6 (13.0, 28.1)	14.7 (8.8, 20.7)	13.8 (6.5, 21.1)
Schoolcraft	27.6 (12.5, 42.6)	8.0 (4.0, 12.1)	28.1 (13.0, 43.2)	12.7 (6.3, 19.1)

[a] Among all adults, the proportion who reported consuming an average of more than two alcoholic drinks per day for men or more than one per day for women for the past month.

[b] Among all adults, the proportion who reported consuming five or more drinks per occasion for men or more than four or more drinks per occasion for women for the past month.

In the local survey, rather than use the phrase “per occasion” a time interval of 2 hours was used. This definition of binge drinking comes from http://www.cdc/alcohol/fact_sheets/binge_drinking.htm. The difference in question phrasing may account for some differences in the observed estimates between the local and state survey.

Table 13-46B: Alcohol Consumption by Population Group				
	Heavy Drinking[a]		Binge Drinking[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	16.2 (12.9, 19.5)	14.0 (11.7, 16.3)	15.8 (12.3, 19.3)	12.9 (10.7, 15.2)
Age				
18-39	16.2 (8.1, 24.2)	10.8 (5.8, 15.9)	21.5 (11.9, 31.2)	17.0 (11.0, 22.9)
40-65	20.2 (16.3, 24.1)	18.3 (15.0, 21.5)	18.2 (14.2, 22.1)	13.5 (10.9, 16.2)
65+	10.1 (8.3, 11.9)	10.5 (8.1, 12.9)	4.2 (3.1, 5.3)	6.3 (4.5, 8.1)
Gender				
Male	16.5 (11.0, 22.0)	15.7 (11.9, 19.4)	20.4 (13.7, 27.1)	15.6 (11.7, 19.5)
Female	15.9 (12.3, 19.6)	12.4 (9.9, 14.9)	11.4 (8.2, 14.6)	10.4 (7.9, 12.9)
Educational Attainment				
Less than 12th grade	10.7 (1.5, 19.9)	20.1 (7.9, 32.4)	9.6 (0.4, 18.8)	1.42 (3.5, 24.8)
High School Graduate	10.7 (6.6, 14.8)	15.2 (11.2, 19.2)	10.4 (5.9, 15.0)	12.5 (9.0, 15.9)
1-3 years of college	20.3 (14.6, 26.1)	11.6 (8.7, 14.6)	17.4 (12.1, 22.6)	13.0 (9.1, 17.0)
4-year degree or higher	19.9 (13.4, 26.5)	13.3 (9.9, 16.7)	22.9 (14.5, 31.3)	13.5 (9.2, 17.8)
Household Income				
Less than \$25,000	11.4 (4.6, 18.2)	12.8 (8.5, 17.0)	10.9 (3.9, 18.0)	12.2 (7.9, 16.5)
\$25,000 to \$49,999	10.9 (8.0, 13.7)	14.0 (10.0, 18.0)	6.3 (4.0, 8.5)	12.6 (8.2, 17.0)
\$50,000 or higher	21.1 (16.3, 26.0)	15.0 (11.3, 18.8)	23.0 (17.7, 28.3)	14.3 (10.7, 17.8)
[a] Among all adults, the proportion who reported consuming an average of more than two alcoholic drinks per day for men or more than one per day for women for the past month.				
[b] Among all adults, the proportion who reported consuming five or more drinks per occasion for men or more than four or more drinks per occasion for women for the past month.				
In the local survey, rather than use the phrase “per occasion” a time interval of 2 hours was used. This definition of binge drinking comes from http://www.cdc/alcohol/fact_sheets/binge_drinking.htm . The difference in question phrasing may account for some differences in the observed estimates between the local and state survey.				

Table 13-47A: Drug Use by County

	Ever Used Over-the-Counter or Synthetic Drugs[a]		Ever Used Prescription Drugs to Get High[b]		Ever Injected or Snorted to Get High[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Michigan		4.4 (3.4, 5.7)		4.7 (3.7, 6.1)		2.0 (1.4, 2.7)
Upper Peninsula	3.0 (1.6, 4.3)	2.6 (1.2, 3.9)	4.6 (2.9, 6.3)	3.3 (1.9, 4.7)	7.7 (5.4, 10.0)	5.5 (3.7, 7.3)
Alger	5.5 (1.3, 9.8)	2.8 (0.0, 6.1)	4.3 (0.7, 7.9)	1.7 (0.0, 3.5)	8.7 (3.8, 13.7)	4.9 (1.9, 7.9)
Baraga	3.6 (0.0, 8.2)	7.2 (0.0, 14.5)	6.2 (0.8, 11.6)	4.4 (1.4, 7.4)	6.7 (1.5, 11.9)	4.0 (1.1, 6.8)
Chippewa	5.3 (0.0, 12.4)	3.6 (0.0, 8.6)	8.5 (0.5, 16.5)	5.0 (0.0, 10.3)	8.5 (0.9, 16.1)	5.6 (0.4, 10.8)
Delta	0.3 (0.0, 0.7)	1.6 (0.0, 3.6)	0.1 (0.0, 0.3)	0.5 (0.0, 1.3)	5.0 (0.0, 11.1)	2.2 (0.2, 4.3)
Dickinson	2.3 (0.0, 4.9)	3.1 (0.0, 7.0)	3.2 (0.0, 7.7)	0.2 (0.0, 0.7)	6.0 (1.0, 11.1)	3.5 (0.0, 7.2)
Gogebic	4.6 (0.0, 10.5)	4.7 (0.0, 9.5)	4.1 (0.0, 8.3)	2.7 (0.0, 6.1)	4.3 (0.3, 8.4)	2.3 (0.3, 4.4)
Houghton/Keweenaw	2.2 (0.0, 5.1)	0.4 (0.0, 1.1)	7.5 (1.4, 13.5)	1.8 (0.0, 4.0)	6.5 (0.6, 12.5)	2.2 (0.5, 3.8)
Iron	1.7 (0.0, 4.2)	0	7.2 (1.4, 13.1)	6.1 (0.0, 12.5)	13.7 (5.9, 21.4)	7.1 (3.0, 11.4)
Luce	5.4 (0.0, 13.0)	2.3 (0.0, 4.6)	5.3 (0.0, 13.1)	1.2 (0.0, 2.4)	6.6 (0.0, 14.5)	2.2 (0.4, 4.1)
Mackinac	4.0 (0.9, 7.1)	5.8 (0.0, 15.5)	2.1 (0.0, 4.4)	6.8 (0.0, 16.5)	8.5 (1.6, 15.3)	9.9 (0.0, 19.9)
Marquette	4.1 (0.7, 7.4)	3.7 (0.0, 8.3)	4.2 (0.4, 8.0)	5.8 (0.9, 10.7)	10.7 (3.7, 17.6)	10.0 (3.3, 16.7)
Menominee	0.8 (0.0, 2.5)	0.06 (0.0, 0.2)	3.5 (0.0, 7.2)	2.5 (0.0, 5.6)	6.3 (1.5, 11.0)	4.4 (1.1, 7.8)
Ontonagon	2.3 (0.0, 4.8)	1.1 (0.04, 2.2)	3.1 (0.3, 5.9)	1.5 (0.4, 2.6)	7.5 (3.2, 11.8)	3.2 (1.0, 5.3)
Schoolcraft	2.4 (0.1, 4.6)	0.4 (0.0, 0.9)	7.6 (0.0, 17.9)	1.8 (0.0, 4.2)	8.8 (0.0, 19.2)	10.1 (0.0, 21.9)

[a] Among all adults, the proportion who reported ever using over the counter or synthetic/designer drugs such as K2/Spice, Salvia, Bath Salts, or synthetic cannabinoids for the purpose of getting high.

[b] Among all adults, the proportion who reported ever using prescription drugs not prescribed to them for the purpose of getting high.

[c] Among all adults, the proportion who reported ever injecting or snorting drugs for the purpose of getting high. *Statewide estimate is the proportion who reported ever injecting drugs for the purpose of getting high.*

Table 13-47B: Drug Use by Population Group

	Ever Used Over, the Counter or Synthetic Drugs[a]		Ever Used Prescription Drugs to Get High[b]		Ever Injected or Snorted to Get High[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	5.5 (1.3, 9.8)	2.6 (1.2, 3.9)	4.3 (0.7, 7.9)	3.3 (1.9, 4.7)	8.7 (3.8, 13.7)	5.5 (3.7, 7.3)
Age						
18-39	5.0 (1.4, 8.6)	6.1 (2.1, 10.2)	8.4 (3.5, 13.2)	6.9 (2.8, 11.1)	10.8 (4.6, 16.9)	7.2 (2.3, 12.2)
40-65	2.5 (1.2, 3.9)	1.2 (0.5, 1.9)	3.6 (1.9, 5.4)	2.1 (1.2, 2.9)	8.2 (5.5, 10.9)	6.0 (4.1, 7.9)
65+	0.8 (0.3, 1.4)	0.1 (0.007, 0.2)	0.8 (0.4, 1.2)	0.5 (0.5, 1.1)	2.9 (1.6, 4.2)	2.1 (1.0, 3.1)
Gender						
Male	2.8 (0.7, 4.9)	3.7 (1.1, 6.2)	6.4 (3.1, 9.7)	4.6 (2.0, 7.2)	11.1 (6.6, 15.5)	8.2 (4.7, 11.6)
Female	3.1 (1.5, 4.7)	1.5 (0.4, 2.6)	2.8 (1.5, 4.1)	2.0 (0.8, 3.3)	4.4 (2.4, 6.5)	3.0 (1.7, 4.2)
Educational Attainment						
Less than 12th grade	5.0 (0.0, 11.7)	1.6 (0.0, 3.8)	7.7 (0.09, 15.4)	1.1 (0.0, 2.3)	16.9 (0.0, 35.9)	7.3 (0.0, 18.2)
High School Graduate	2.1 (0.7, 3.6)	2.6 (0.4, 4.7)	2.6 (0.9, 4.2)	3.0 (0.8, 5.2)	6.5 (3.0, 10.0)	4.4 (2.1, 6.7)
1-3 years of college	2.4 (0.5, 4.3)	3.2 (0.4, 6.0)	5.3 (2.3, 8.2)	4.4 (1.5, 7.4)	9.8 (5.5, 14.1)	7.1 (3.7, 10.5)
4-year degree or higher	4.9 (0.9, 8.8)	1.6 (0.0, 3.1)	6.5 (1.8, 11.1)	2.6 (0.5, 4.8)	5.8 (1.9, 9.7)	3.7 (2.0, 5.4)
Household Income						
Less than \$25,000	5.7 (0.9, 10.5)	2.7 (0.6, 4.7)	10.1 (3.1, 17.1)	4.4 (2.0, 6.7)	11.7 (3.7, 19.8)	7.2 (2.8, 11.6)
\$25,000 to \$49,999	1.9 (0.4, 3.3)	3.0 (0.3, 5.7)	3.4 (1.3, 5.6)	4.0 (1.2, 6.9)	6.5 (3.1, 9.9)	5.7 (2.7, 8.6)
\$50,000 or higher	2.3 (0.9, 3.8)	2.4 (0.06, 4.7)	2.8 (1.1, 4.5)	2.3 (0.05, 4.6)	6.8 (4.0, 9.5)	4.7 (2.0, 7.4)
[a] Among all adults, the proportion who reported ever using over the counter or synthetic/designer drugs such as K2/Spice, Salvia, Bath Salts, or synthetic cannabinoids for the purpose of getting high.						
[b] Among all adults, the proportion who reported ever using prescription drugs not prescribed to them for the purpose of getting high.						
[c] Among all adults, the proportion who reported ever injecting or snorting drugs for the purpose of getting high.						

Table 13-48A: Marijuana Use by County

	Used Marijuana in Past 30 days[a]		Used Marijuana 10 or More Times in Past 30 days[b]		Has Medical Marijuana Card[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	8.9 (8.8, 9.1)					
US Weighted	13.3					
Michigan[d]						
Upper Peninsula	17.0 (13.8, 20.3)	7.7 (6.1, 9.3)	11.0 (8.4, 13.6)	4.7 (3.4, 5.9)	2.6 (1.3, 4.0)	3.7 (2.5, 4.8)
Alger	22.0 (15.2, 28.9)	8.5 (4.0, 13.1)	17.4 (11.2, 23.7)	5.2 (1.5, 8.8)	3.1 (0.4, 5.7)	4.4 (0.8, 7.9)
Baraga	14.2 (8.1, 20.4)	17.8 (8.0, 27.7)	9.9 (4.3, 15.4)	7.7 (0.9, 14.4)	5.0 (0.9, 9.2)	2.4 (0.0, 6.1)
Chippewa	23.9 (13.0, 34.8)	8.5 (2.7, 14.3)	16.9 (7.3, 26.6)	5.5 (0.2, 10.8)	7.4 (0.0, 15.1)	4.9 (0.0, 10.3)
Delta	14.0 (2.1, 25.9)	6.1 (2.3, 9.8)	9.0 (0.5, 17.5)	3.2 (0.4, 6.1)	2.8 (0.0, 7.4)	2.9 (0.8, 5.1)
Dickinson	14.6 (5.6, 23.7)	6.0 (1.5, 10.6)	9.6 (0.8, 18.4)	5.2 (0.8, 9.6)	1.9 (0.0, 3.9)	4.3 (0.3, 8.3)
Gogebic	15.0 (6.9, 23.0)	7.0 (1.8, 12.1)	10.3 (3.2, 17.3)	5.2 (0.3, 10.1)	3.3 (0.0, 6.9)	4.5 (0.0, 9.2)
Houghton/Keweenaw	12.2 (5.4, 19.0)	4.7 (1.5, 7.8)	7.9 (2.3, 13.5)	3.4 (0.5, 4.6)	0.4 (0.0, 1.3)	0.9 (0.07, 1.8)
Iron	14.4 (8.0, 20.8)	11.8 (4.9, 18.6)	8.5 (3.9, 13.0)	8.6 (2.3, 14.8)	3.7 (0.07, 7.4)	6.1 (1.4, 10.9)
Luce	17.0 (8.5, 25.6)	5.6 (1.4, 14.1)	13.7 (5.2, 22.1)	4.8 (1.6, 8.0)	2.3 (0.008, 4.5)	3.1 (0.4, 5.7)
Mackinac	19.2 (10.0, 28.4)	7.0 (1.3, 12.8)	11.3 (4.4, 18.3)	1.3 (0.01, 2.6)	1.9 (0.0, 3.9)	5.9 (0.0, 15.6)
Marquette	19.8 (12.0, 27.7)	9.3 (4.4, 14.1)	11.9 (5.8, 17.9)	4.8 (1.6, 8.0)	1.0 (0.0, 2.9)	3.1 (0.4, 5.7)
Menominee	15.6 (8.2, 23.0)	6.7 (1.7, 11.8)	8.4 (2.6, 14.3)	4.4 (0.0, 9.1)	2.9 (0.0, 6.3)	5.7 (0.4, 10.9)
Ontonagon	15.1 (9.0, 21.1)	6.8 (3.5, 10.0)	8.6 (4.2, 13.0)	4.2 (1.8, 6.7)	0.9 (0.0, 2.0)	1.8 (0.6, 2.9)
Schoolcraft	15.9 (5.2, 26.7)	9.2 (3.7, 14.8)	11.0 (0.5, 21.4)	7.6 (2.2, 13.1)	1.3 (0.0, 2.8)	7.0 (1.7, 12.2)
[a] Among all adults, the proportion who reported using marijuana, hashish, marijuana wax, or marijuana, infused edibles in the past month.						
[b] Among all adults, the proportion who reported using marijuana, hashish, marijuana wax, or marijuana, infused edibles 10 or more times in the past month.						
[c] Among all adults, the proportion who reported have a prescription for medical marijuana.						
[d] Questions not asked in Michigan BRFS.						

Table 13-48B: Marijuana Use by Population Group

	Used Marijuana in Past 30 days[a]		Used Marijuana 10 or More Times in Past 30 days[b]		Has Medical Marijuana Card[c]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	17.0 (13.8, 20.3)	7.7 (6.1, 9.3)	11.0 (8.4, 13.6)	4.7 (3.4, 5.9)	2.6 (1.3, 4.0)	3.7 (2.5, 4.8)
Age						
18-39	21.2 (12.3, 30.0)	9.0 (4.9, 13.2)	13.7 (7.0, 20.3)	6.3 (3.0, 9.6)	3.7 (0.3, 7.1)	5.4 (2.3, 8.6)
40-65	19.9 (16.0, 23.8)	9.3 (7.3, 11.3)	12.9 (9.6, 16.1)	5.1 (3.6, 6.6)	2.6 (1.0, 4.2)	3.8 (2.4, 5.1)
65+	6.8 (5.1, 8.5)	3.0 (1.7, 4.3)	4.3 (2.8, 5.8)	1.6 (0.6, 2.6)	1.1 (0.5, 1.7)	1.1 (0.5, 1.8)
Gender						
Male	20.9 (14.6, 27.3)	8.7 (6.3, 11.0)	14.5 (9.5, 19.4)	5.2 (3.2, 7.2)	4.0 (1.3, 6.7)	4.0 (2.1, 5.8)
Female	13.3 (10.3, 16.3)	6.8 (4.6, 9.1)	7.7 (5.3, 10.0)	4.1 (2.6, 5.7)	1.3 (0.6, 2.0)	3.4 (1.9, 4.9)
Educational Attainment						
Less than 12th grade	24.7 (6.2, 43.2)	12.3 (5.7, 18.9)	22.8 (4.1, 41.5)	9.1 (3.2, 15.0)	2.8 (0.0, 6.9)	7.2 (1.8, 12.6)
High School Graduate	14.5 (8.8, 20.2)	8.0 (5.3, 10.7)	9.7 (5.3, 14.0)	4.6 (2.3, 7.0)	3.0 (0.7, 5.3)	3.7 (1.6, 6.1)
1-3 years of college	19.4 (14.2, 24.7)	7.6 (4.7, 10.4)	12.4 (8.4, 16.5)	4.6 (2.7, 6.4)	1.9 (0.5, 3.3)	3.7 (2.0, 5.4)
4-year degree or higher	17.0 (11.5, 22.5)	5.1 (3.1, 7.0)	9.8 (4.8, 14.7)	2.6 (1.3, 3.9)	3.0 (0.0, 6.8)	1.2 (0.3, 2.0)
Household Income						
Less than \$25,000	24.7 (12.2, 37.1)	15.2 (10.8, 19.6)	18.0 (8.5, 27.5)	9.6 (6.4, 12.8)	6.7 (1.1, 12.3)	7.1 (4.1, 10.1)
\$25,000 to \$49,999	13.9 (9.5, 18.4)	6.7 (3.7, 9.7)	9.0 (5.4, 12.7)	4.4 (1.6, 7.1)	1.4 (0.4, 2.4)	4.5 (1.7, 7.2)
\$50,000 or higher	15.4 (11.5, 19.4)	4.5 (2.8, 6.3)	9.0 (5.7, 12.3)	2.3 (1.0, 3.6)	0.3 (0.0, 1.0)	1.4 (0.5, 2.4)
[a] Among all adults, the proportion who reported using marijuana, hashish, marijuana wax, or marijuana, infused edibles in the past month.						
[b] Among all adults, the proportion who reported using marijuana, hashish, marijuana wax, or marijuana, infused edibles 10 or more times in the past month.						
[c] Among all adults, the proportion who reported have a prescription for medical marijuana.						

Table 13-49A: Hepatitis C Testing by County

	Ever Tested for Hepatitis C[a]			
	2021		2017	
	%	95% CI	%	95% CI
Michigan			29.2	(27.2, 31.3)
Upper Peninsula	15.3	(12.7, 17.9)	18.2	(15.7, 20.6)
Alger	17.5	(11.6, 23.4)	17.5	(11.0, 24.1)
Baraga	14.9	(8.1, 21.8)	26.4	(14.2, 38.6)
Chippewa	15.3	(8.5, 22.1)	25.1	(15.3, 34.9)
Delta	8.8	(1.6, 16.1)	10.1	(6.0, 14.1)
Dickinson	13.4	(7.0, 19.9)	19.4	(12.2, 26.5)
Gogebic	17.2	(5.9, 28.6)	14.9	(9.2, 20.5)
Houghton/Keweenaw	13.7	(7.1, 20.3)	14.8	(9.6, 19.9)
Iron	17.1	(10.3, 23.9)	22.2	(15.7, 28.8)
Luce	16.4	(10.6, 22.3)	21.5	(14.3, 28.6)
Mackinac	22.1	(13.9, 30.3)	30.5	(15.6, 45.4)
Marquette	16.7	(10.7, 22.7)	20.2	(13.2, 27.3)
Menominee	20.1	(11.6, 28.6)	12.3	(6.8, 17.9)
Ontonagon	14.6	(9.0, 20.2)	11.8	(8.4, 15.2)
Schoolcraft	25.1	(14.2, 36.0)	16.9	(10.0, 23.9)

[a] Among all adults, the proportion who reported ever being tested for Hepatitis C.

Table 13-49B: Hepatitis C Testing by Population Group		
	Ever Tested for Hepatitis C[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	15.3 (12.7, 17.9)	18.2 (15.7, 20.6)
Age		
18-39	9.3 (4.7, 13.9)	19.0 (12.8, 25.2)
40-65	19.5 (16.0, 23.1)	20.4 (17.5, 23.4)
65+	17.5 (14.6, 20.4)	12.9 (10.7, 15.2)
Gender		
Male	15.3 (10.9, 19.8)	19.0 (15.1, 22.9)
Female	15.3 (12.5, 18.2)	17.4 (14.4, 20.4)
Educational Attainment		
Less than 12th grade	22.0 (7.5, 36.5)	23.0 (9.6, 36.3)
High School Graduate	14.0 (9.0, 19.0)	15.1 (11.4, 18.8)
1-3 years of college	16.4 (12.5, 20.2)	19.1 (15.3, 23.0)
4-year degree or higher	15.7 (11.5, 19.8)	21.4 (17.2, 25.5)
Household Income		
Less than \$25,000	15.7 (7.7, 23.8)	21.5 (15.5, 27.6)
\$25,000 to \$49,999	14.4 (10.6, 18.2)	20.4 (15.6, 25.2)
\$50,000 or higher	15.7 (12.5, 18.9)	15.5 (12.6, 18.4)
[a] Among all adults, the proportion who reported ever being tested for Hepatitis C.		

Table 13-50A: Breast Cancer Screening, Women Age 40+ by County

	Ever Had a Mammogram[a]		Had Mammogram in Past 2 Years[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	80.1 (78.8, 81.5)		78.6 (77.0, 80.1)	
US Weighted	68.2		77.2	
Michigan (2020)	92.8 (91.3, 94.1)	92.7 (91.6, 93.6)	72.7 (70.5, 74.7)	74.0 (72.4, 75.5)
Upper Peninsula (MiBRFS 2018-2020)			73.7 (63.1, 82.2)	
Upper Peninsula	94.4 (92.6, 96.3)	95.5 (93.9, 97.0)	79.6 (76.6, 82.6)	80.3 (77.6, 82.6)
Alger	95.7 (92.1, 99.3)	97.3 (94.5, 100.0)	76.1 (67.3, 84.9)	81.4 (74.6, 88.1)
Baraga	84.7 (76.8, 92.7)	95.9 (92.6, 99.3)	67.0 (57.3, 76.8)	76.9 (68.1, 85.6)
Chippewa	96.9 (91.9, 100.0)	96.4 (92.6, 100.0)	85.2 (73.6, 96.7)	81.5 (72.8, 90.2)
Delta	91.6 (84.4, 98.9)	95.3 (91.2, 99.4)	76.5 (67.7, 85.3)	79.0 (71.2, 86.8)
Dickinson	97.3 (94.3, 100.0)	96.3 (93.4, 99.2)	89.4 (84.0, 94.8)	77.8 (68.1, 87.5)
Gogebic	92.5 (80.4, 100.0)	96.2 (92.8, 99.5)	75.6 (62.3, 88.9)	80.6 (72.9, 88.2)
Houghton/Keweenaw	91.0 (84.1, 97.9)	93.9 (89.9, 97.8)	71.5 (60.7, 82.4)	76.5 (69.0, 84.0)
Iron	96.0 (92.2, 99.8)	95.2 (91.6, 98.8)	81.9 (74.7, 89.0)	80.2 (73.9, 86.5)
Luce	92.5 (87.4, 97.7)	97.3 (95.1, 99.5)	82.4 (75.1, 89.8)	77.3 (65.7, 88.9)
Mackinac	96.7 (92.4, 100.0)	97.7 (94.6, 100.0)	83.7 (76.1, 91.2)	85.3 (77.9, 92.6)
Marquette	98.2 (96.0, 100.0)	94.5 (88.6, 100.0)	84.9 (78.0, 91.7)	82.9 (74.9, 90.9)
Menominee	91.1 (82.4, 99.7)	96.0 (92.6, 99.3)	68.8 (55.5, 82.1)	80.2 (72.1, 88.3)
Ontonagon	94.1 (89.8, 98.4)	94.5 (90.9, 98.0)	75.1 (68.1, 82.0)	81.2 (75.8, 86.5)
Schoolcraft	95.7 (91.1, 100.0)	94.7 (88.1, 100.0)	80.9 (72.8, 89.1)	80.8 (72.4, 89.3)
[a] Among women aged 40 years and older, the proportion who reported ever having a mammogram.				
[b] Among women aged 40 years and older, the proportion who reported having a mammogram in the past two years.				

Table 13-50B: Breast Cancer Screening, Women Age 40+ by Population Group

	Ever Had a Mammogram[a]		Had Mammogram in Past 2 Years[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	94.4 (92.6, 96.3)	95.5 (93.9, 97.0)	79.6 (76.6, 82.6)	80.3 (77.6, 82.9)
Age				
18-39	—	—	—	—
40-65	92.0 (89.1, 95.0)	94.2 (91.9, 96.4)	80.8 (76.4, 85.2)	81.3 (77.7, 84.8)
65+	98.4 (97.6, 99.1)	98.1 (97.2, 99.0)	56.4 (74.2, 81.1)	78.3 (74.9, 81.6)
Gender				
Male	—	—	—	—
Female	94.4 (92.6, 96.3)	95.4 (93.9, 97.0)	79.6 (76.6, 82.6)	80.3 (77.6, 82.9)
Educational Attainment				
Less than 12th grade	92.0 (83.7, 100.0)	86.8 (79.3, 99.7)	73.4 (52.9, 94.0)	62.4 (46.9, 78.0)
High School Graduate	93.8 (90.4, 97.2)	96.1 (94.3, 97.9)	77.4 (72.6, 82.3)	80.0 (76.3, 83.8)
1-3 years of college	95.3 (92.5, 98.2)	97.0 (95.6, 98.4)	79.6 (74.2, 85.0)	83.8 (80.1, 86.9)
4-year degree or higher	95.7 (93.4, 98.1)	94.4 (91.7, 97.1)	86.2 (82.1, 90.3)	82.6 (78.2, 86.9)
Household Income				
Less than \$25,000	94.2 (91.1, 97.3)	92.0 (87.3, 96.7)	72.1 (65.6, 78.6)	71.3 (65.7, 77.0)
\$25,000 to \$49,999	96.8 (94.7, 99.0)	97.2 (95.5, 98.8)	77.8 (72.8, 82.8)	81.7 (77.3, 86.0)
\$50,000 or higher	93.6 (90.5, 96.7)	96.3 (94.5, 98.1)	83.6 (79.1, 88.2)	84.8 (80.8, 88.8)
[a] Among women aged 40 years and older, the proportion who reported ever having a mammogram.				
[b] Among women aged 40 years and older, the proportion who reported having a mammogram in the past two years.				

Table 13-51A: Cervical Cancer Screening, Women Age 18+ by County

	Ever Had Pap Test[a]		Pap test Past 3 Years[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
US Raw	92.26 (91.3, 93.2)		64.56 (62.8, 66.3)	
US Weighted	72.29		89.49	
Michigan (2020)	89.3 (87.4, 90.9)	88.1 (86.6, 89.6)	68.7 (66.4, 70.9)	72.5 (70.7, 74.3)
Upper Peninsula (MiBRES 2018-2020)			75.7 (59.9, 86.7)	
Upper Peninsula	91.6 (86.5, 96.6)	96.3 (94.6, 97.7)	67.8 (62.5, 73.0)	75.5 (71.8, 79.2)
Alger	87.8 (68.1, 100.0)	98.5 (96.8, 100.0)	60.7 (43.2, 78.2)	67.6 (54.3, 80.9)
Baraga	97.4 (94.5, 100.0)	85.4 (64.2, 100.0)	69.8 (57.6, 82.1)	51.7 (29.8, 73.6)
Chippewa	85.4 (67.9, 100.0)	93.7 (88.1, 99.3)	63.7 (44.0, 83.3)	63.9 (47.6, 80.2)
Delta	100.0	98.4 (96.5, 100.0)	63.4 (50.1, 76.6)	85.7 (78.3, 93.0)
Dickinson	98.1 (95.9, 100.0)	94.4 (87.3, 100.0)	87.2 (80.8, 93.7)	68.5 (55.7, 79.9)
Gogebic	98.3 (96.2, 100.0)	93. (96.9, 99.8)	72.3 (58.7, 85.8)	68.7 (57.5, 79.9)
Houghton/Keweenaw	86.1 (67.1, 100.0)	94.9 (90.0, 99.8)	61.2 (44.1, 78.3)	76.3 (67.1, 85.4)
Iron	93.3 (84.1, 100.0)	89.2 (79.2, 99.3)	63.7 (50.9, 76.4)	60.7 (46.9, 74.6)
Luce	90.1 (75.7, 100.0)	94.6 (86.2, 100.0)	74.5 (58.8, 90.3)	71.2 (58.2, 84.1)
Mackinac	97.8 (94.6, 100.0)	95.0 (87.2, 100.0)	71.9 (61.1, 82.6)	76.5 (64.7, 88.3)
Marquette	87.4 (73.3, 100.0)	99.1 (98.0, 100.0)	69.5 (55.9, 83.3)	86.0 (78.7 93.2)
Menominee	97.1 (92.7, 100.0)	98.9 (97.3, 100.0)	68.6 (54.9, 82.4)	78.3 (68.1, 88.4)
Ontonagon	93.6 (87.1, 100.0)	95.8 (93.5, 98.2)	62.6 (49.9, 75.3)	67.5 (59.4, 75.6)
Schoolcraft	92.4 (85.7, 99.1)	94.8 (90.8, 98.8)	65.2 (53.9, 76.4)	67.0 (55.1, 79.0)
[a] Among adult women reported they had not had a hysterectomy, the proportion who reported ever having a Pap test.				
[b] Among adult women reported they had not had a hysterectomy, the proportion who reported having a Pap test within the last three years.				

Table 13-51B: Cervical Cancer Screening, Women Age 18+ by Population Group

	Ever Had Pap Test[a]		Pap test Past 3 Years[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	91.6 (86.5, 96.6)	96.3 (94.9, 97.7)	67.8 (62.5, 73.0)	75.5 (71.8, 79.2)
Age				
18-39	83.1 (71.8, 94.5)	92.7 (88.7, 96.8)	71.9 (60.5, 83.4)	80.7 (73.4, 88.1)
40-65	98.0 (96.3, 99.6)	99.1 (98.5, 99.6)	78.6 (73.0, 84.3)	80.2 (75.6, 84.8)
65+	96.5 (94.4, 98.5)	95.8 (93.7, 97.9)	37.0 (31.8, 42.2)	53.4 (47.8, 59.0)
Gender				
Male	—	—	—	—
Female	91.6 (86.5, 96.6)	96.3 (94.9, 97.7)	67.8 (62.5, 73.0)	75.5 (71.8, 79.2)
Educational Attainment				
Less than 12th grade	94.4 (88.2, 100.0)	89.9 (81.4, 98.4)	67.1 (47.4, 86.8)	49.9 (29.9, 70.9)
High School Graduate	89.4 (79.6, 99.2)	95.6 (93.0, 98.1)	64.0 (54.1, 74.0)	72.7 (67.1, 78.4)
1-3 years of college	90.0 (80.7, 99.2)	97.7 (96.2, 99.2)	66.9 (57.6, 76.3)	79.7 (74.8, 84.7)
4-year degree or higher	96.8 (93.6, 100.0)	99.1 (98.2, 100.0)	74.9 (68.3, 81.4)	87.5 (83.9, 91.1)
Household Income				
Less than \$25,000	84.3 (68.9, 99.7)	90.2 (85.7, 94.8)	52.3 (39.5, 65.1)	63.3 (53.9, 72.7)
\$25,000 to \$49,999	90.8 (81.0, 100.0)	98.1 (96.6, 99.5)	64.5 (55.1, 73.8)	75.8 (70.2, 81.5)
\$50,000 or higher	94.0 (88.0, 100.0)	99.1 (98.3, 99.9)	74.9 (67.9, 81.9)	84.1 (79.8, 88.5)
[a] Among adult women reported they had not had a hysterectomy, the proportion who reported ever having a Pap test.				
[b] Among adult women reported they had not had a hysterectomy, the proportion who reported having a Pap test within the last three years.				

Table 13-52A: Prostate Cancer Screening, Men Age 50+ by County

	Ever Discussed Prostate Cancer Screening with Provider[a]		Ever Had PSA Test[b]			
	2021	2017	2021	2017	2015	2012
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Michigan (2020)	53.8 (50.7, 56.3)		57.2 (54.1, 60.3)	68.0 (65.8, 70.0)	71.7 (69.2, 74.1)	83.1 (81.0, 85.1) [c]
Upper Peninsula	63.1 (58.0, 68.1)	68.6 (63.5, 73.6)	66.1 (60.8, 71.5)	72.1 (67.1, 77.2)	70.8 (70.3, 71.2) [d]	79.5 (73.8, 84.3) [d]
Alger	64.4 (49.6, 79.3)	66.0 (51.6, 80.4)	67.4 (53.1, 81.7)	63.3 (51.3, 81.4)		
Baraga	63.0 (47.6, 78.3)	68.1 (54.9, 81.3)	58.8(41.1, 76.5)	63.4 (49.1, 77.8)	83.3 (82.0, 84.6)	74.7 (63.4, 83.4)
Chippewa	53.1 (34.2, 72.0)	80.0 (68.5, 91.5)	67.2 (48.6, 85.7)	67.8 (53.7, 82.0)		
Delta	71.9 (50.4, 93.5)	58.1 (39.4, 76.7)	76.0 (53.8, 98.2)	71.1 (51.0, 91.2)		
Dickinson	63.9 (48.1, 79.8)	70.7 (54.4, 86.9)	65.6 (48.5, 82.8)	81.6 (66.7, 96.5)		
Gogebic	66.7 (54.6, 78.9)	60.9 (46.6, 75.1)	65.6 (51.6, 79.6)	61.4 (47.2, 75.7)	69.7 (68.7, 70.7)	84.0 (72.4, 91.3)
Houghton/Keweenaw	43.8 (27.7, 59.9)	67.9 (56.3, 79.6)	49.8 (32.3, 67.3)	72.0 (60.1, 83.9)	70.6 (69.8, 71.3)	78.1 (67.8, 85.8)
Iron	70.5 (57.9, 83.0)	76.7 (65.6, 87.7)	70.3 (55.1, 85.5)	75.9 (64.4, 87.5)	62.2 (60.9, 63.9)	
Luce	73.4 (61.8, 85.1)	65. (50.4, 81.3)	77.4 (66.1, 88.6)	69.2 (54.0, 84.4)		
Mackinac	79.3 (68.9, 89.6)	67.8 (54.2, 81.3)	70.7 (57.6, 83.7)	68.1 (54.6, 81.6)		
Marquette	66.1 (52.5, 79.7)	73.1 (59.0, 87.2)	67.9 (51.9, 83.9)	79.3 (65.6, 93.0)		
Menominee	66.1 (52.7, 79.4)	65.6 (52.2, 79.1)	59.6 (44.8, 74.4)	65.2 (50.6, 79.7)		
Ontonagon	65.5 (53.0, 77.9)	61.8 (51., 71.8)	75.7 (63.6, 87.8)	76.8 (68.1, 85.4)	75.0 (73.6, 77.8)	81.6 (73.5, 87.6)
Schoolcraft	69.1 (56.2, 82.0)	66.4 (52.9, 79.8)	77.7 (65.0, 90.3)	63.2 (48.3, 78.0)		

[a] Among men aged 50 years or older, the proportion who reported ever discussing prostate screening test with their health care provider. *Statewide data for 2017 is not reported due to significant differences in the wording of the question.*

[b] Among men aged 50 years or older, the proportion who reported ever having a PSA (prostate screening antigen) test.

[c] Data collected in 2010

[d] Cumulative estimate for the counties surveyed.

Table 13-52B: Prostate Cancer Screening, Men Age 50+ by Population Group

	Ever Discussed Prostate Cancer Screening with Provider[a]		Ever Had PSA Test[b]	
	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	63.1 (58.0, 68.1)	68.6 (63.5, 73.6)	66.1 (60.8, 71.5)	72.1 (67.1, 77.2)
Age				
18-39	—	—	—	—
40-65	60.2 (52.0, 68.5)	67.3 (59.8, 74.7)	53.6 (44.7, 62.5)	65.6 (58.1, 73.2)
65+	66.3 (60.9, 71.7)	70.7 (65.6, 75.7)	80.9 (76.6, 85.2)	82.5 (78.0, 87.0)
Gender				
Male	63.1 (58.0, 68.1)	68.6 (63.5, 73.6)	66.1 (60.8, 71.5)	72.1 (67.1, 77.2)
Female	—	—	—	—
Educational Attainment				
Less than 12th grade	50.9 (21.2, 80.5)	54.0 (31.5, 76.5)	38.8 (8.9, 68.6)	52.8 (30.2, 75.4)
High School Graduate	57.7 (49.3, 66.0)	63.9 (56.6, 71.2)	60.1 (51.1, 69.1)	68.5 (61.2, 75.8)
1-3 years of college	63.9 (54.6, 73.2)	73.7 (65.8, 81.6)	67.9 (58.4, 77.5)	78.2 (70.6, 85.7)
4-year degree or higher	73.9 (66.5, 81.2)	81.5 (74.9, 88.1)	78.1 (69.2, 87.0)	83.7 (78.0, 89.4)
Household Income				
Less than \$25,000	53.6 (42.8, 64.5)	53.0 (44.3, 61.8)	55.5 (44.3, 66.7)	51.2 (42.5, 60.0)
\$25,000 to \$49,999	56.0 (47.2, 64.8)	64.0 (54.6, 73.5)	65.0 (55.4, 74.7)	73.3 (63.7, 83.0)
\$50,000 or higher	70.1 (62.5, 77.8)	79.5 (72.1, 87.0)	70.0 (61.9, 78.1)	80.8 (73.2, 88.4)

[a] Among men aged 50 years or older, the proportion who reported ever discussing prostate screening test with their health care provider.

[b] Among men aged 50 years or older, the proportion who reported ever having a PSA (prostate screening antigen) test.

Table 13-53A: Colorectal Cancer Screening, Age 50+ by County

	Appropriately Timed Colorectal Cancer Screening[a]			
	2021		2017	
	%	95% CI	%	95%CI
Michigan (2020)	75.6	(73.9, 77.3)	69.7	(68.3, 71.0)
Upper Peninsula (MiBRFS 2018-2020)	78.7	(70.2, 85.3)		
Upper Peninsula	78.6	(76.1, 81.2)	74.6	(71.7, 77.5)
Alger	73.2	(64.1, 82.3)	68.2	(60.4, 75.9)
Baraga	68.0	(59.0, 76.9)	68.9	(59.8, 78.1)
Chippewa	81.9	(72.7, 91.2)	83.6	(76.0, 91.2)
Delta	81.8	(74.3, 89.3)	69.9	(54.4, 81.3)
Dickinson	76.4	(68.3, 84.4)	72.2	(63.1, 81.5)
Gogebic	69.8	(61.1, 78.4)	63.0	(53.7, 72.3)
Houghton/Keweenaw	75.8	(68.2, 83.4)	75.7	(68.7, 82.8)
Iron	76.3	(67.7, 84.8)	78.9	(72.6, 85.2)
Luce	80.0	(73.6, 86.3)	78.9	(72.6, 85.2)
Mackinac	79.0	(71.1, 87.0)	75.1	(65.9, 84.4)
Marquette	83.2	(76.5, 89.8)	79.2	(71.4, 87.1)
Menominee	77.7	(69.3, 86.1)	77.6	(69.8, 85.5)
Ontonagon	78.6	(73.0, 84.2)	66.7	(60.2, 73.1)
Schoolcraft	75.6	(68.4, 82.9)	68.9	(59.5, 78.2)
<p>[a] Among adults aged 50 years and older, the proportion who reported having a blood stool test within the past two years, a sigmoidoscopy in the past five years, or a colonoscopy in the past 10 years. <i>Statewide estimate in 2017 includes a blood stool test within the past year, a sigmoidoscopy in the past five years, or a colonoscopy in the past 10 years.</i></p>				

Table 13-53B: Colorectal Cancer Screening, Age 50+ by Population Group		
	Appropriately Timed Colorectal Cancer Screening[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	78.6 (76.1, 81.2)	74.6 (71.5, 77.5)
Age		
18-39	—	—
40-65	78.2 (74.1, 82.2)	70.0 (65.8, 74.2)
65+	79.2 (76.7, 81.8)	82.4 (79.7, 85.1)
Gender		
Male	80.8 (77.2, 84.3)	72.7 (67.8, 77.7)
Female	76.8 (73.3, 80.3)	76.3 (71.3, 79.4)
Educational Attainment		
Less than 12th grade	59.2 (43.0, 75.3)	60.5 (45.5, 75.4)
High School Graduate	76.6 (72.3, 80.8)	72.0 (67.8, 76.2)
1-3 years of college	78.3 (73.8, 82.8)	78.7 (74.5, 82.7)
4 year degree or higher	87.1 (83.9, 90.3)	83.1 (78.9, 87.3)
Household Income		
Less than \$25,000	70.2 (64.9, 75.4)	64.6 (59.5, 69.8)
\$25,000 to \$49,999	77.8 (73.7, 81.8)	72.8 (67.1, 78.5)
\$50,000 or higher	82.9 (79.0, 86.8)	81.0 (76.7, 85.2)
[a] Among adults aged 50 years and older, the proportion who reported having a blood stool test within the past two years, a sigmoidoscopy in the past five years, or a colonoscopy in the past 10 years.		

13.4 Comparison of 2021 UPCHIPS Results to 2017 UPCHIPS Results

The responses gathered in the 2021 UPCHIPS were compared to those gathered in the 2017 UPCHIPS. The comparisons are controlled regarding education level, income level, age, sex, and county of residence. Questions with categorical (such as yes/no) responses are reported as an adjusted odds ratio of a positive response in 2021. These comparisons are shown in **Table 13-54**. For example, rating general health as being fair or poor was 10% more common in 2021, but this finding was not statistically significant as the 95% confidence intervals include a value of 1.0.

Of note, issues surrounding dental care showed marked changes. There were increases in reports of depression, anxiety, treatment of mental health, and barriers to mental health treatment. Reported marijuana usage nearly tripled, following its legalization in Michigan. This may reflect both an increase in use and a willingness to report usage. Injectable drug use and abuse of prescription medications have also increased. The decrease in health screening activities may reflect the postponement of preventive care services during the COVID-19 pandemic. Colonoscopy levels increased as this was an outpatient procedure that the pandemic did not interfere with.

Two questions provided continuous responses. Number of drinks per month increased by 0.77 (standard error = 1.17) in 2021 compared to 2017, but this difference was not statistically significant ($t=0.66$, $p=.5118$). The body mass index (BMI) decreased by 0.043 (standard error = 0.147) in 2021 compared to 2017. This difference was also not statistically significant ($t=0.29$, $p=.7692$).

The large number of comparisons (77) makes it likely that four of the comparisons would yield an estimate that was statistically significantly different when no actual difference existed. We allow a Type I error of 0.05. This means 5 times in 100 a difference will be detected when there is no difference. A Bonferroni adjustment (dividing the Type I error of 0.05 by the number of comparisons made) will provide a threshold that reduces the possibility of Type I error (a false positive result). In this case, the threshold would be a p-value of .0006. This may be a bit extreme, but it reduces the likelihood of reporting a false positive result.

Table 13-54: Changes in UPCHIPS Responses from 2017 to 2021

Question	χ^2	p-value	adOR (95%CI)
General health (fair or poor)	2.44	0.1182	1.10 (0.98, 1.25)
Physical health (fair or poor)	4.76	0.0292	1.14 (1.01, 1.29)
Mental health (fair or poor)	18.49	<.0001	1.34, (1.17, 1.53)
Any activity limitations	1.21	0.2711	1.06 (0.96, 1.17)
Use special health equipment	1.84	0.1751	1.09 (0.96, 1.24)
Lack of medical insurance	1.45	0.2293	0.86 (0.67, 1.10)
No personal health care provider	0.001	0.9746	0.99 (0.75, 1.17)
Cost as a barrier to health care	19.23	<.0001	0.68 (0.57, 0.81)
Transportation as barrier to health care	3.18	0.0746	1.22 (0.98, 1.52)
No routine checkup in past 12 months	0.19	0.6628	0.97 (0.87, 1.10)
More than 12 months since last dental visit	7.13	0.0076	1.16 (1.04, 1.28)
No dental insurance	221.88	<.0001	2.01 (1.84., 2.21)
Cost a barrier to dental care	10.84	0.001	0.79 (0.69, 0.91)
Transportation barrier to dental care	0.61	0.4356	1.12 (0.85, 1.47)
Lack of dental care available	37.21	<.0001	1.67 (1.42, 1.97)
Overweight	0.78	0.3769	0.96 (0.87, 1.06)
Obese	0.032	0.8562	0.99 (0.90, 1.09)
Ever smoked \geq 100 cigarettes	0.029	0.8644	1.01 (0.92, 1.11)
Currently smokes	1.2	0.2729	0.93 (0.81, 1.06)
Stopped smoking	3.09	0.0789	0.80 (0.62, 1.03)
Vaping of e-cigarette use	4.32	0.0376	1.40 (1.02, 1.92)
Smokeless tobacco use	0.3	0.5815	1.10 (0.79, 1.51)
Five or more fruits and vegetables servings per day	2.16	0.1416	0.90 (0.78, 1.04)
No leisure-time physical activity	5.35	0.0206	1.16 (1.02, 1.31)
Adequate physical activity (see text for formula)	7.07	0.0079	0.87 (0.79, 0.96)
Always wear a seatbelt	9.92	0.0016	1.29 (1.10, 1.51)
Drink and drive	0.08	0.7802	0.97 (0.75, 1.23)
Drink and drive (those who had drink in past 30 days)	0.0001	0.9909	0.99 (.078, 1.29)

Table 13-54: Changes in UPCHIPS (Continued)

Question	χ^2	p-value	adOR (95%CI)
Told have high blood pressure	5.53	0.0187	0.89 (0.81, 0.98)
Checked cholesterol level	3.93	0.0474	0.86 (0.74, 0.99)
Told have elevated cholesterol	1.08	0.2992	1.05 (0.96, 1.16)
Ever had asthma	3.99	0.0457	1.13 (1.00, 1.28)
Currently have asthma	3.58	0.0586	1.15 (0.99, 1.33)
Ever told diabetes	1.04	0.3067	1.07 (0.94, 1.22)
Ever told heart attack	0.008	0.9312	1.01 (0.84, 1.20)
Ever told heart disease	0.47	0.4951	1.05 (0.92, 1.20)
Ever told stroke	4.89	0.027	1.28 (1.03, 1.58)
Ever told skin cancer	8.9	0.0029	1.23 (1.07, 1.41)
Ever told cancer	0.0004	0.9844	1.00(0.88, 1.14)
Ever told COPD	1.7	0.1918	1.10 (0.95, 1.27)
Activities limited by arthritis	6.21	0.0127	1.13 (1.03, 1.24)
Ever told Alzheimer's or dementia	2.05	0.1525	0.65 (0.37, 1.17)
Long-term care recommended	1.42	0.2327	0.73 (0.43, 1.23)
Influenza vaccine past 12 months (all adults)	30.72	<.0001	1.33 (1.20, 1.46)
Influenza vaccine past 12 months (65+)	5.05	0.0246	1.18 (1.02, 1.36)
Pneumococcal vaccine ever (65+)	2.06	0.1508	0.90 (0.78, 1.04)
Told depressive disorder	12.36	0.0007	1.22 (1.09, 1.36)
Told anxiety disorder	21.43	<.0001	1.33 (1.18, 1.50)
Crisis line call in past 12 months	6.3	0.0121	1.64 (1.12, 2.42)
Medications for mental illness past 12 months	15.32	<.0001	1.25 (1.12, 1.39)
Counseling for mental illness past 12 months	14.25	0.0002	1.46 (1.19, 1.75)
Cost barrier to mental health care	6.08	0.0137	1.38 (1.07, 1.79)
Transportation barrier to mental health care	0.9	0.3438	1.26 (0.78, 2.01)
Lack of available mental health care	21.06	<.0001	1.79 (1.39, 2.29)
Any alcohol in past 30 days	0.96	0.3265	0.95 (0.86, 1.05)
Heavy drinking	0.67	0.4142	1.06 (0.93, 1.21)

Table 13-54: Changes in UPCHIPS (Continued)

Question	χ^2	p-value	adOR (95%CI)
Binge drinking	18.26	<.0001	1.43 (1.21, 1.68)
Ever used OTC or synthetic drugs to get high	13	0.0003	2.04 (1.38, 3.00)
Ever used prescription drugs to get high	10.94	0.0009	1.71 (1.25, 2.35)
Ever injected or snorted drugs to get high	14.55	0.0001	1.56 (1.24, 1.96)
Marijuana use in past 30 days	160.85	<.0001	2.93 (2.48, 3.46)
Card for prescription medical marijuana	0.27	0.6012	0.92 (0.67, 1.26)
Substance abuse treatment in past 12 months (n=43)	3.8	0.0511	1.85 (0.99, 3.44)
Cost barrier to substance abuse treatment (n=10)	0.05	0.8248	0.86 (0.23, 3.18)
Transport barrier to substance abuse treatment (n=11)	2.49	0.1146	2.73 (0.78, 9.52)
Lack of substance abuse treatment (n=26)	0.52	0.4723	1.33 (0.61, 2.93)
Ever tested for hepatitis C	0.15	0.6943	1.02 (0.91, 1.16)
Ever had a mammogram (40+)	4.75	0.0293	0.72 (0.54, 0.97)
Mammogram in past 2 years (40+)	2.65	0.1037	0.89 (0.77, 1.03)
Ever had a PAP smear	9.89	0.0017	0.61 (0.45, 0.83)
Prostate cancer screening discussed (50+)	3.88	0.0487	0.84 (0.70, 0.99)
Ever had a PSA test (50+)	15.37	<.0001	0.67 (0.55, 0.82)
Ever had a fecal occult test (50+)	5.26	0.0218	0.88 (0.80, 0.98)
Ever had a colonoscopy (50+)	8.61	0.0033	1.22 (1.07, 1.39)

References

- [1] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Survey Questionnaire. Atlanta, Georgia: U.S. Department of Health and Human Services; Methodologic changes in the Behavioral Risk Factors Surveillance System in 2011 and potential effects on prevalence estimates. MMWR 2012; 61(22): 410-3. <https://www.cdc.gov/brfss/index.html> Accessed November 30, 2020.
- [2] Blumberg SJ, Luke JV. Wireless substitution: early release of estimates from the National Health Interview Survey, July-December 2019. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics: September 2020. <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless202009-508.pdf>, accessed November 30, 2020.
- [3] Link MW, Battaglia MP, Frankel MR, Osborn L, Mokdad AH. Address-based versus Random-Digit-Dial Surveys: Comparison of Key Health and Risk Indicators. Am J Epidemiol 2006; 164(10): 1019-25.
- [4] Western Upper Peninsula Health Department. Western Upper Peninsula 2012 regional health assessment report to the community. Hancock, MI: Western U.P. Health Department; 2012.

- [5] Tian Y, McKane P. Health Risk Behaviors within the State of Michigan: 2020 Behavioral Risk Factor Survey. 34th Annual Report. Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division; 2021. Available at:
https://www.michigan.gov/documents/mdhhs/MiBRFS_Annual_Report_2020_747938_7.pdf?utm_campaign=&utm_medium=email&utm_source=govdelivery
- [6] Tian Y, McKane P, Lee C, Frame A, Wimberley R. Disability and Race/Ethnicity among Michigan Adults. Michigan BRFSS Surveillance Brief. 2021; 12(1). Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division.
- [7] United States Preventive Services Task Force (USPSTF). Breast cancer: screening.
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening>. Accessed December 1, 2020.
- [8] Fritzler J, Tian Y, Anderson B. Breast and ovarian cancer family history and genetic counseling. Michigan BRFSS Surveillance Brief. 2021; 12(5). Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division.
- [9] United States Preventive Services Task Force (USPSTF). Cervical cancer: screening.
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening>. Accessed December 1, 2020.
- [10] United States Preventive Services Task Force (USPSTF). Prostate cancer: screening.
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/prostate-cancer-screening>. Accessed December 1, 2020.
- [11] United States Preventive Services Task Force (USPSTF). Colorectal cancer: screening.
<https://uspreventiveservicestaskforce.org/uspstf/draft-recommendation/colorectal-cancer-screening3#bootstrap-panel--5>. Accessed December 1, 2020.
- [12] Fritzler J, Tian Y, Anderson B. Colorectal cancer family history and likelihood of genetic testing. Michigan BRFSS Surveillance Brief. 2021; 12(6). Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division.

14 COMMUNITY HEALTH ISSUES AND PRIORITIES

14.1 Introduction

The Patient Protection and Affordable Care Act (ACA) mandates tax-exempt hospitals conduct a community health needs assessment at least every three years and report on findings, including community health issues and priorities for health improvement. Data from such assessments can help hospitals, community health partners, and local health departments understand the needs of communities and underserved populations and work to address those needs. In addition to gathering prevalence estimates of individual health conditions and behaviors, most models for community health needs assessments also ask survey respondents or other stakeholders to identify health related needs of their communities. Sixteen health issues consistently identified as important by Upper Peninsula residents from a variety of data sources, including from local agency surveys of clients and providers, and several recent-year hospital and local health department led focus group meetings, were chosen for this survey. Respondents to the 2017 Health Survey of Upper Peninsula Adults were asked to rank their perceptions of each of these community health issues using a 4-point Likert-type scale. Respondents were asked to focus on the health of their community, not their individual or family health needs. Respondents to the 2021 UPCHIPS were asked to rank the same list of priorities.

14.2 Local Survey Methodology

14.2.1 Sample

Details of the sample selection can be found in section §13.2.1. Briefly, 1,700 household addresses from each county in the Upper Peninsula (Keweenaw and Houghton Counties were combined in one population frame) were randomly selected to receive a mailed survey packet. A single adult from each household was asked to complete the survey.

14.2.2 Survey Design

The survey design is detailed in section §13.2.2. The final page of the 12-page 2021 UPCHIPS asked respondents about 16 community health issues.

14.2.3 Response Rate

Details of the response rate can be found in section §13.2.3. Surveys were included in the analysis if they were largely complete and had the necessary demographic data for weighting.

14.2.4 Data Analysis

Data analysis methods are detailed in section §13.2.4. Due to variability in response rates to individual questions, not all estimates are based on the same total sample size.

14.2.5 Results

The demographics of those who completed the surveys are presented in section §13.2.5.1 and **Tables 13-2 through 13-16**. Respondents were asked to rank each of sixteen community health issues on a Likert-type scale with four options. The complete set of rankings appears on the pages that follow. The first set of tables (**Tables 14-1A through 14-6B**) are presented as a two-page spread for each community health issue or set of issues. The left page of each two-page spread contains the results for an issue or set of issues for the Upper Peninsula and by county. The right page of each two-page spread contains the results for the same issue or set of issues for the Upper Peninsula region combined, organized by population characteristic. The results listed represent the proportion of the population that identified the issue as “Very important – should be a priority.”

The second set of tables (**Tables 14-7 through 14-12**) show a single page for each county and the Upper Peninsula region. Each page shows all 16 community health issues and the weighted proportions for each of the four response options: “Not an issue or of very little importance,” “Fairly unimportant,” “Fairly important,” and “Very important – should be a priority.”

The results of multifactorial analyses of the impact of demographic factors on survey responses are shown in **Table 14-21**.

14.3 Summary of Findings

Among the 16 community issues, only four had an increase in the percentage of respondents who considered the issue to be “very important.” The decrease in the perceived importance of the other 12 issues may be the result of the COVID-19 pandemic. Compared to the pandemic these issues may appear less important, but the pandemic may have emphasized shortcomings in the delivery of services to those with mental illness and substance use issues.

- **Health insurance is expensive or has high costs for co-pays and deductibles:** Ranking this issue as “very important” dropped from 71.1% in 2017 to 58.4% in 2021 across the region, this issue continued to be ranked the highest priority (**Tables 14-1A and 14-1B**). Despite having fewer people without health insurance (see section §13.3.3), out-of-pocket medical expenses can still be substantial.
- **Unemployment, wages, and economic conditions:** This issue dropped from 54.5% in the 2017 survey to 49.4% in current survey to rank second in priority (**Tables 14-1A and 14-1B**). Unemployment surged and recovered in the time between the surveys fueling feelings of economic uncertainty across the region.
- **Drug abuse:** Third-ranked region wide at 48.7% in the 2021 survey (down from 48.7% in the 2017 survey) (**Tables 14-4A and 14-4B**). Alcohol abuse was ranked 14th in importance and tobacco use ranked 16th.
- **Shortage of mental health programs and services:** This priority went from 37.5% of respondents in the 2017 survey identifying it as “very important” to 47.5% in the 2021 survey

(Tables 14-2A and 14-2B). This surge of interest moves this issue from being sixth-ranked to fourth-ranked. Between 2017 and 2021 there was an increase in those diagnosed with mental illness and those receiving treatment (medication and counseling) for mental illness. This increase in demand for services may have brought attention to the shortages of these services we have in this region.

- **Lack of health insurance:** Dropped in importance from the third-ranked to fifth ranked (Tables 14-1A and 14-1B). This may reflect the persistent increase in the percentage of people with health insurance since enactment of the Affordable Care Act.
- **Personal context impacts priorities:** For each of the listed priorities, those who identified as female were significantly more likely to consider the priority to be “very important – should be a priority” than those identifying as male (Table 14-22). Likewise, when adjusting for age, sex, education level, income level, and county of residence, current smokers were less likely than others to consider tobacco use to be “very important” (2017: adjOR=0.74, 95%CI: 0.60, 0.89; 2021: adjOR=0.69, 95%CI: 0.53, 0.91). Those meeting the criteria as a “heavy drinker” were also less likely to consider alcohol abuse “very important” (2017: adjOR=0.65, 95%CI: 0.54, 0.78; 2021: adjOR=0.67, 95%CI: 0.54, 0.84), and those fitting the definition of obese were less likely to consider childhood obesity “very important” (2017: adjOR=0.86, 95%CI: 0.76, 0.98; 2021: adjOR=0.95, 95%CI: 0.82, 1.11). So, it is not surprising that those who ate at least 5 daily servings of fruits and vegetables were more likely to consider year-round access to fresh produce to be “very important” (2017: adjOR=1.32, 95%CI: 1.09, 1.61; 2021: adjOR=1.22, 95%CI: 0.97, 1.54). Those who had been told they had a depressive disorder or an anxiety disorder were more likely to consider the shortage of mental health services and treatment to be very important (depressive disorder: 2017: adjOR=1.63, 95%CI: 1.41, 1.89; 2021: adjOR=1.60, 95%CI: 1.35, 1.89; anxiety disorder: 2017: adjOR=1.76, 95%CI: 1.50, 2.07; 2021: adjOR=1.52, 95%CI: 1.26, 1.83).

14.4 Issue Ranking – Upper Peninsula Wide

Figure 14-1 illustrates the relative ranking of the 16 community health issues in order according to the perceptions of survey respondents from both the 2021 and 2017 surveys. The numbers correspond to rates of those among the weighted sample who answered “very important – should be a priority” for each community health issue. Of the 16 priorities, 12 showed a decrease in the percentage who answered “very important – should be a priority” and there was some shuffling of the order. The most notable surge was concern regarding the shortage of mental health programs and services going from 37.5% to 47.5% of the respondents considering the issue to be “very important.”

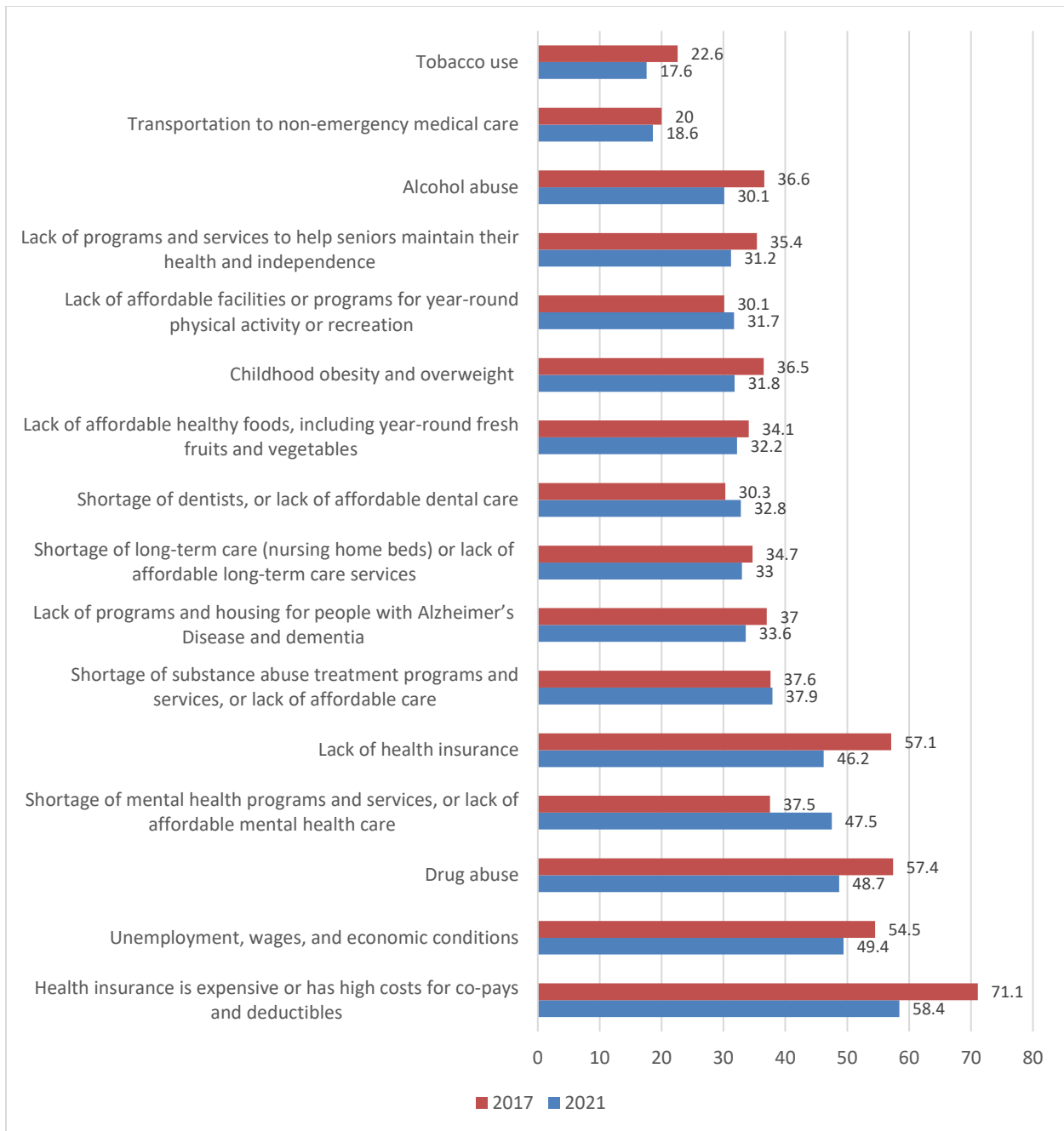


Figure 14-1: Issue Ranking – Upper Peninsula, 2017, 2021.

14.5 Priority Tables

The data tables begin on the next even-numbered page so that paired tables with county rates and rates by population group appear on facing pages. The six pairs of issue tables are then followed by 15 summary tables, with the 16 issues by region and then by each of the 14 county-level samples.

Below is a reproduction of the Community Health Issues and Priorities section of the survey, slightly reduced in size from the original, for your reference:

Table 14-1A: Economic Factors by County

	Unemployment Wages, and Economic Conditions[a]		Lack of Health Insurance[a]		Health Insurance is Expensive or Has High Costs for Co-pays and Deductibles[a]	
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	49.4 (43.2, 55.6)	54.5 (51.1, 57.9)	46.2 (40.4, 52.0)	57.1 (53.7, 60.4)	58.4 (51.6, 65.2)	71.1 (67.9, 74.3)
Alger	52.7 (43.3, 62.2)	49.9 (41.5, 58.3)	52.1 (42.5, 61.8)	52.0 (43.5, 60.6)	71.9 (64.2, 79.6)	68.7 (60.7, 76.7)
Baraga	52.4 (41.9, 62.8)	67.7 (56.7, 78.8)	43.4 (33.6, 53.2)	58.9 (48.4, 69.4)	53.6 (42.9, 64.2)	73.9 (64.2, 83.6)
Chippewa	55.7 (43.5, 67.9)	45.3 (34.0, 56.6)	59.0 (47.3, 70.7)	46.7 (35.3, 58.1)	66.2 (55.2, 77.1)	60.2 (47.6, 72.8)
Delta	61.4 (34.7, 88.2)	63.1 (54.4, 71.8)	30.9 (9.4, 52.3)	60.6 (51.2, 70.0)	41.4 (13.0, 69.9)	74.1 (65.0, 83.2)
Dickinson	50.6 (40.7, 60.5)	52.2 (43.3, 61.1)	42.8 (33.3, 52.3)	55.8 (46.9, 64.7)	56.2 (46.4, 66.1)	75.5 (68.3, 82.7)
Gogebic	53.0 (38.0, 68.0)	72.9 (65.6, 80.3)	47.5 (33.5, 61.6)	63.5 (55.6, 71.4)	59.3 (45.8, 72.8)	64.0 (55.8, 72.2)
Houghton/Keweenaw	47.8 (35.3, 60.4)	55.1 (44.9, 62.3)	57.1 (44.6, 69.6)	64.9 (56.4, 73.4)	65.9 (54.1, 77.7)	80.2 (74.0, 86.4)
Iron	46.4 (36.2, 56.5)	62.2 (53.9, 70.4)	42.2 (32.6, 51.8)	57.1 (48.2, 65.9)	61.1 (51.3, 71.0)	76.2 (69.6, 82.8)
Luce	45.5 (36.0, 55.1)	56.4 (47.2, 65.6)	55.6 (46.0, 65.2)	51.7 (42.6, 60.8)	55.1 (45.1, 65.1)	69.6 (60.7, 78.5)
Mackinac	49.4 (40.2, 58.6)	52.2 (39.6, 64.8)	48.2 (39.0, 57.4)	57.0 (45.0, 68.9)	59.8 (51.1, 68.6)	74.2 (63.5, 84.9)
Marquette	38.8 (28.9, 48.7)	45.6 (36.6, 54.5)	48.3 (38.1, 58.4)	55.0 (45.7, 64.3)	59.2 (48.6, 69.9)	66.4 (57.6, 75.2)
Menominee	40.9 (28.3, 53.5)	53.4 (41.5, 65.2)	33.0 (23.2, 42.7)	55.9 (44.0, 67.7)	64.0 (53.4, 74.6)	74.7 (62.8, 86.5)
Ontonagon	51.9 (43.0, 60.7)	74.9 (69.4, 80.3)	53.8 (45.1, 62.5)	60.1 (53.6, 66.7)	54.5 (45.5, 63.5)	71.0 (65.2, 76.8)
Schoolcraft	54.8 (42.5, 67.0)	68.5 (60.9, 76.2)	44.3 (33.1, 55.5)	66.0 (57.5, 74.5)	60.2 (48.5, 71.8)	78.8 (72.0, 85.7)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-1B: Economic Factors by Population Groups

	Unemployment Wages, and Economic Conditions[a]		Lack of Health Insurance[a]		Health Insurance is Expensive or Has High Costs for Co-pays and Deductibles[a]	
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age						
<i>18, 39</i>	50.0 (33.5, 66.5)	44.0 (35.8, 52.2)	31.8 (19.4, 44.2)	46.7 (38.2, 55.1)	48.7 (32.3, 65.1)	61.0 (52.7, 69.4)
<i>40, 65</i>	47.9 (43.2, 52.5)	60.7 (56.9, 64.2)	51.4 (46.8, 56.1)	61.7 (57.9, 65.5)	64.5 (60.2, 68.9)	78.3 (75.0, 81.6)
<i>65+</i>	50.9 (47.4, 54.3)	56.9 (53.5, 60.3)	58.0 (54.7, 61.3)	62.5 (59.2, 65.8)	62.1 (58.8, 65.4)	71.6 (68.6, 74.6)
Gender						
<i>Male</i>	48.0 (36.2, 59.9)	49.4 (43.8, 55.0)	36.8 (27.6, 46.0)	52.3 (46.7, 58.0)	50.3 (38.7, 61.9)	68.8 (63.4, 74.1)
<i>Female</i>	50.8 (46.3, 55.2)	59.4 (55.6, 63.2)	55.6 (51.4, 59.8)	61.6 (58.0, 65.3)	66.5 (62.7, 70.3)	73.4 (69.7, 77.0)
Educational Attainment						
<i>Less than 12th grade</i>	50.4 (32.9, 68.0)	54.0 (40.3, 67.6)	63.1 (44.6, 81.5)	64.6 (52.3, 77.0)	55.4 (37.0, 73.8)	68.8 (55.2, 82.3)
<i>High School Graduate</i>	58.7 (46.3, 71.0)	55.6 (49.9, 61.4)	45.1 (31.9, 58.4)	58.7 (52.9, 64.5)	61.1 (44.1, 78.2)	74.3 (69.0, 79.6)
<i>1, 3 years of college</i>	46.2 (39.9, 52.6)	54.6 (48.8, 60.5)	54.5 (48.3, 60.6)	58.0 (52.2, 63.7)	64.1 (58.3, 70.0)	71.6 (66.0, 77.1)
<i>4 year degree or higher</i>	40.3 (33.3, 47.3)	49.9 (44.7, 55.1)	35.4 (29.1, 41.7)	45.6 (40.4, 50.8)	48.2 (40.9, 55.4)	62.9 (57.6, 68.1)
Household Income						
<i>Less than \$25,000</i>	62.3 (44.6, 80.0)	51.6 (45.0, 58.2)	45.8 (24.9, 66.7)	61.9 (55.3, 68.5)	52.0 (28.4, 75.6)	65.2 (58.2, 72.2)
<i>\$25,000 to \$49,999</i>	46.7 (39.3, 54.1)	57.7 (51.8, 63.7)	49.6 (42.2, 57.0)	63.0 (57.5, 68.4)	60.4 (52.6, 68.1)	76.5 (71.8, 81.2)
<i>\$50,000 or higher</i>	45.1 (39.6, 50.6)	53.1 (47.6, 58.5)	44.6 (39.2, 50.0)	49.8 (44.4, 55.2)	60.2 (55.0, 65.5)	70.8 (65.7, 76.0)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-2A: Health Care by County

	Shortage of Mental Health Programs and Services, or Lack of Affordable Mental Health Care[a]		Shortage of Substance Abuse Programs and Services, or Lack of Affordable Care[a]		Shortage of Dentists or Lack of Affordable Dental Care[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	47.5 (41.5, 53.4)	37.5 (34.3, 40.6)	37.9 (32.8, 43.1)	37.6 (34.4, 40.8)	32.8 (28.1, 37.4)	30.3 (27.3, 33.3)
Alger	45.7 (36.2, 55.2)	37.7 (29.8, 45.6)	40.8 (31.3, 50.2)	34.3 (26.9, 41.6)	31.4 (22.7, 40.2)	24.9 (18.4, 31.4)
Baraga	43.5 (33.4, 53.5)	32.85 (23.2, 42.4)	42.2 (32.2, 52.3)	36.0 (26.0, 46.1)	23.6 (16.3, 30.8)	33.3 (21.8, 44.8)
Chippewa	48.8 (36.8, 60.9)	33.0 (22.3, 43.8)	44.3 (32.1, 56.4)	29.0 (19.3, 38.8)	59.8 (45.4, 71.3)	24.7 (16.2, 33.3)
Delta	36.4 (11.0, 61.7)	40.2 (31.2, 49.2)	29.5 (8.4, 50.7)	43.6 (34.3, 52.8)	17.2 (4.4, 29.9)	29.6 (20.9, 38.2)
Dickinson	53.0 (43.2, 62.8)	36.8 (28.7, 44.8)	40.5 (31.2, 49.8)	37.4 (28.9, 46.0)	33.5 (23.7, 43.2)	31.6 (23.6, 39.5)
Gogebic	45.0 (31.1, 58.9)	41.8 (33.6, 50.0)	36.1 (24.2, 48.0)	46.4 (38.1, 54.7)	50.8 (36.1, 65.5)	32.7 (24.8, 40.6)
Houghton/Keweenaw	64.9 (53.3, 76.5)	38.0 (28.7, 47.3)	49.7 (36.8, 62.5)	35.6 (25.2, 45.9)	44.7 (31.5, 57.9)	26.6 (18.5, 34.7)
Iron	43.5 (32.8, 54.2)	39.1 (29.9, 48.2)	39.3 (28.5, 50.1)	44.6 (35.6, 53.6)	32.8 (24.1, 41.5)	36.1 (28.2, 43.9)
Luce	46.4 (36.6, 56.1)	42.5 (33.9, 51.2)	38.9 (29.4, 48.4)	35.5 (27.5, 43.5)	39.7 (29.5, 49.8)	26.9 (19.9, 33.8)
Mackinac	41.5 (32.3, 50.6)	31.6 (21.8, 41.4)	37.1 (27.9, 46.2)	33.7 (23.5, 43.9)	29.8 (22.2, 37.4)	36.8 (23.7, 49.9)
Marquette	51.2 (40.9, 61.6)	38.8 (30.1, 47.6)	33.5 (24.7, 42.2)	37.5 (28.7, 46.3)	22.4 (15.8, 28.9)	31.6 (23.0, 40.2)
Menominee	37.2 (26.8, 47.7)	32.3 (21.6, 43.0)	36.6 (26.0, 47.2)	36.1 (24.9, 47.3)	23.2 (14.6, 31.8)	32.7 (21.8, 43.5)
Ontonagon	46.0 (37.3, 54.6)	39.1 (32.0, 46.1)	41.5 (32.9, 50.1)	39.5 (32.5, 46.6)	36.2 (28.4, 44.1)	32.3 (25.4, 39.2)
Schoolcraft	31.2 (22.4, 40.0)	45.7 (35.4, 56.1)	28.0 (19.7, 36.3)	45.2 (34.8, 55.5)	28.1 (19.7, 36.4)	34.1 (25.4, 42.8)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-2B: Health Care by Population Groups

	Shortage of Mental Health Programs and Services, or Lack of Affordable Mental Health Care[a]		Shortage of Substance Abuse Programs and Services, or Lack of Affordable Care[a]		Shortage of Dentists or Lack of Affordable Dental Care[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age						
<i>18-39</i>	47.1 (31.0, 63.1)	35.4 (27.6, 43.1)	34.3 (21.4, 47.2)	35.7 (27.7, 43.7)	26.2 (15.4, 37.0)	25.4 (18.2, 32.5)
<i>40-65</i>	52.4 (47.8, 57.0)	39.7 (35.9, 43.5)	42.2 (37.6, 46.8)	38.6 (34.8, 42.4)	35.4 (30.9, 39.8)	32.6 (28.8, 36.4)
<i>65+</i>	40.2 (36.9, 43.6)	35.2 (32.0, 38.4)	36.2 (32.9, 39.4)	37.7 (34.4, 41.0)	37.6 (34.3, 40.9)	32.3 (29.1, 35.4)
Gender						
<i>Male</i>	34.8 (25.7, 43.8)	28.9 (24.0, 33.9)	27.5 (19.8, 35.3)	30.2 (25.0, 35.4)	22.4 (15.8, 29.0)	22.7 (18.2, 27.2)
<i>Female</i>	60.1 (56.1, 64.2)	45.7 (42.0, 49.3)	48.4 (44.1, 52.7)	44.7 (41.0, 48.3)	43.1 (38.9, 47.4)	37.7 (34.0, 41.4)
Educational Attainment						
<i>Less than 12th grade</i>	52.2 (34.3, 70.1)	39.4 (27.0, 51.8)	43.2 (26.5, 59.9)	37.5 (25.7, 49.3)	42.2 (25.3, 59.0)	54.4 (41.3, 67.6)
<i>High School Graduate</i>	39.3 (27.5, 51.2)	33.4 (28.8, 38.0)	32.2 (22.3, 42.1)	35.5 (30.4, 40.6)	34.8 (24.1, 45.4)	30.6 (26.1, 35.2)
<i>1-3 years of college</i>	51.2 (45.0, 57.4)	42.3 (36.6, 48.1)	41.7 (35.3, 48.2)	41.7 (35.9, 47.5)	37.3 (30.9, 43.6)	30.2 (25.0, 35.4)
<i>4 year degree or higher</i>	55.7 (48.4, 63.1)	34.8 (30.0, 39.6)	42.0 (34.8, 49.1)	32.4 (27.8, 37.0)	22.8 (17.8, 27.8)	15.0 (11.7, 18.3)
Household Income						
<i>Less than \$25,000</i>	39.3 (21.1, 57.6)	39.0 (32.8, 45.1)	32.3 (16.9, 47.7)	40.5 (34.4, 46.6)	35.7 (19.0, 52.4)	41.9 (35.6, 48.2)
<i>\$25,000 to \$49,999</i>	46.7 (39.3, 54.0)	36.9 (31.3, 42.6)	38.7 (31.8, 45.6)	37.9 (31.8, 44.0)	36.6 (30.0, 43.2)	32.6 (26.8, 38.4)
<i>\$50,000 or higher</i>	51.6 (46.1, 57.0)	36.1 (31.2, 41.0)	39.8 (34.5, 45.2)	35.0 (30.1, 39.9)	29.5 (24.4, 34.7)	21.1 (17.1, 25.0)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-3A: Transportation to Care by County		
	Transportation to Non-Emergency Medical Care[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Upper Peninsula	18.6 (15.4, 21.7)	20.0 (17.4, 22.7)
Alger	24.6 (17.4, 31.9)	20.4 (14.4, 26.5)
Baraga	16.4 (10.8, 22.1)	24.2 (13.6, 34.8)
Chippewa	23.6 (14.0, 33.1)	20.8 (11.4, 30.3)
Delta	13.6 (2.6, 24.7)	18.4 (12.6, 24.3)
Dickinson	28.7 (19.0, 38.3)	20.1 (13.2, 27.0)
Gogebic	15.7 (9.2, 22.1)	22.5 (15.5, 29.5)
Houghton/Keweenaw	19.1 (11.2, 26.9)	18.0 (11.8, 24.2)
Iron	23.6 (16.0, 31.2)	20.5 (14.7, 26.2)
Luce	16.2 (10.6, 21.9)	22.0 (14.8, 29.3)
Mackinac	21.2 (15.0, 27.4)	20.6 (13.5, 27.7)
Marquette	14.9 (8.3, 21.6)	17.6 (10.3, 24.9)
Menominee	16.1(9.1, 23.0)	25.3 (12.4, 38.2)
Ontonagon	23.0 (17.0, 29.0)	27.5 (20.6, 34.4)
Schoolcraft	16.2 (10.1, 22.3)	20.0 (13.9, 26.0)
[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”		

Table 14-3B: Transportation to Care by Population Groups		
	Transportation to Non-Emergency Medical Care[a]	
	2021	2017
	% (95% CI)	% (95% CI)
Age		
<i>18-39</i>	12.5 (5.9, 19.1)	17.4 (10.8, 24.0)
<i>40-65</i>	20.1 (16.5, 23.7)	19.8 (16.7, 22.8)
<i>65+</i>	24.4 (21.5, 27.2)	23.2 (20.5, 25.9)
Gender		
<i>Male</i>	14.0 (9.3, 18.8)	17.7 (13.3, 22.1)
<i>Female</i>	23.1 (19.7, 26.4)	22.3 (19.4, 25.2)
Educational Attainment		
<i>Less than 12th grade</i>	39.0 (22.4, 55.6)	34.9 (21.3, 48.6)
<i>High School Graduate</i>	19.1 (12.6, 25.7)	23.8 (19.3, 28.2)
<i>1-3 years of college</i>	19.8 (14.9, 24.6)	16.2 (12.4, 20.0)
<i>4 year degree or higher</i>		9.1 (6.6, 11.7)
Household Income		
<i>Less than \$25,000</i>	26.5 (13.7, 39.4)	33.6 (27.3, 39.8)
<i>\$25,000 to \$49,999</i>	21.7 (16.0, 27.4)	17.1 (12.7, 21.5)
<i>\$50,000 or higher</i>	13.1 (10.0, 16.3)	13.8 (10.3, 17.3)
[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”		

Table 14-4A: Substance Abuse by County

	Tobacco Use[a]		Alcohol Abuse[a]		Drug Abuse[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	17.6 (14.8, 20.4)	22.6 (20.3, 25.0)	30.1 (25.8, 34.4)	36.6 (33.5, 39.6)	48.7 (42.6, 54.7)	57.4 (54.0, 60.8)
Alger	21.7 (15.1, 28.4)	23.7 (17.3, 30.0)	33.4 (25.0, 41.8)	39.4 (31.6, 47.2)	47.6 (37.9, 57.3)	55.2 (46.9, 63.6)
Baraga	26.2 (16.2, 36.2)	39.1 (27.9, 50.2)	44.3 (33.6, 55.0)	49.8 (38.9, 60.8)	72.9 (64.6, 81.2)	79.3 (71.6, 86.9)
Chippewa	22.6 (13.9, 31.3)	29.2 (19.2, 39.2)	32.7 (22.3, 43.2)	40.6 (29.6, 51.6)	57.1 (45.5, 68.7)	49.6 (37.8, 61.3)
Delta	12.9 (2.7, 23.0)	24.5 (16.6, 32.4)	22.6 (6.1, 39.2)	42.5 (33.0, 52.1)	38.0 (11.5, 64.5)	64.2 (54.7, 73.7)
Dickinson	16.0 (10.4, 21.6)	21.7 (15.4, 28.0)	31.6 (23.2, 40.0)	34.4 (26.3, 42.6)	56.0 (46.2, 65.8)	54.6 (45.7, 63.4)
Gogebic	19.8 (11.9, 27.7)	25.7 (18.6, 32.8)	32.9 (21.8, 43.9)	41.6 (33.5, 49.8)	41.3 (28.3, 54.4)	63.0 (55.1, 71.0)
Houghton/Keweenaw	19.5 (12.1, 26.9)	16.9 (10.5, 23.2)	44.9 (31.9, 57.9)	30.8 (22.8, 38.9)	53.8 (41.2, 66.4)	44.9 (35.3, 54.5)
Iron	20.7 (13.9, 27.5)	28.8 (21.4, 35.2)	34.8 (25.9, 43.7)	38.6 (30.6, 46.6)	50.8 (40.5, 61.1)	68.3 (60.9, 75.7)
Luce	26.7 (18.6, 34.9)	33.1 (24.6, 41.6)	39.6 (30.0, 49.2)	41.9 (33.1, 50.7)	61.2 (52.1, 70.4)	57.8 (48.5, 67.0)
Mackinac	14.8 (10.0, 19.5)	22.1 (14.1, 30.2)	32.4 (24.6, 40.2)	48.5 (36.0, 61.1)	40.7 (32.1, 49.2)	64.1 (53.9, 74.4)
Marquette	13.2 (7.9, 18.4)	18.3 (12.9, 23.8)	21.6 (15.2, 28.0)	29.5 (22.1, 36.9)	40.6 (31.4, 49.7)	56.9 (47.6, 66.2)
Menominee	17.9 (10.2, 25.6)	18.5 (11.9, 25.1)	25.4 (16.8, 34.1)	35.6 (24.1, 47.1)	54.8 (43.2, 66.4)	60.0 (48.7, 71.3)
Ontonagon	30.7 (21.5, 39.9)	24.9 (19.8, 30.0)	40.6 (31.6, 49.6)	35.7 (29.8, 41.6)	55.6 (47.2, 64.0)	60.3 (53.7, 66.8)
Schoolcraft	21.8 (14.5, 29.2)	24.1 (17.3, 31.0)	29.6 (20.9, 38.2)	40.0 (29.6, 50.5)	55.3 (43.2, 67.3)	64.0 (54.7, 73.2)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-4B: Substance Abuse by Population Groups

	Tobacco Use[a]		Alcohol Abuse[a]		Drug Abuse[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age						
<i>18-39</i>	7.9 (3.8, 11.9)	13.9 (8.7, 19.2)	21.2 (11.8, 30.6)	28.1 (21.0, 35.3)	41.0 (26.3, 55.8)	52.7 (44.2, 61.2)
<i>40-65</i>	20.4 (16.6, 24.2)	23.7 (20.7, 26.8)	32.1 (28.0, 36.3)	38.4 (34.6, 42.2)	50.7 (46.1, 55.3)	57.4 (53.4, 61.3)
<i>65+</i>	26.9 (23.9, 29.8)	32.5 (29.3, 35.7)	38.7 (35.5, 42.0)	44.3 (41.0, 47.7)	55.7 (52.3, 59.2)	63.8 (60.5, 67.1)
Gender						
<i>Male</i>	12.9 (9.0, 16.8)	20.1 (16.3, 23.9)	21.0 (14.7, 27.3)	33.0 (28.0, 38.0)	39.2 (29.5, 48.9)	53.3 (47.6, 59.0)
<i>Female</i>	22.4 (19.2, 25.5)	25.1 (22.2, 27.9)	39.1 (35.0, 43.1)	40.0 (36.5, 43.5)	58.1 (53.9, 62.4)	61.3 (57.6, 65.0)
Educational Attainment						
<i>Less than 12th grade</i>	19.9 (7.8, 32.1)	23.5 (14.8, 32.3)	43.0 (25.0, 61.0)	35.2 (23.7, 46.7)	55.1 (38.0, 72.2)	51.4 (38.0, 64.8)
<i>High School Graduate</i>	18.8 (12.5, 25.2)	24.5 (20.4, 28.6)	28.5 (19.5, 37.4)	38.0 (32.8, 43.1)	46.6 (33.0, 60.1)	57.0 (51.2, 62.9)
<i>1-3 years of college</i>	17.9 (14.0, 21.7)	21.9 (17.8, 25.9)	32.1 (26.2, 38.1)	37.2 (32.0, 42.5)	50.4 (44.0, 56.7)	61.0 (55.4, 66.7)
<i>4 year degree or higher</i>	15.3 (11.7, 19.0)	18.4 (14.8, 21.9)	28.0 (22.7, 33.4)	31.6 (27.1, 36.0)	50.0 (43.0, 56.9)	52.9 (47.6, 58.2)
Household Income						
<i>Less than \$25,000</i>	18.3 (9.1, 27.5)	30.5 (24.9, 36.2)	28.6 (14.9, 42.3)	39.4 (33.3, 45.5)	36.8 (19.6, 54.0)	57.4 (50.9, 63.9)
<i>\$25,000 to \$49,999</i>	21.2 (16.7, 25.6)	22.8 (18.6, 27.0)	35.7 (29.5, 41.8)	38.9 (33.3, 44.4)	52.1 (44.6, 59.5)	59.3 (53.3, 65.3)
<i>\$50,000 or higher</i>	15.4 (12.3, 18.6)	17.8 (14.7, 20.9)	27.9 (23.2, 32.6)	32.6 (28.0, 37.2)	52.3 (47.0, 57.7)	55.7 (50.2, 61.3)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-5A: Health and Wellness by County

	Childhood Obesity and Overweight[a]		Lack of Affordable Healthy Foods, Including Year-around Fresh Fruits and Vegetables[a]		Lack of Affordable Facilities or Programs for Year-round Physical Activity or Recreation[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	31.8 (27.3, 36.3)	36.5 (33.4, 39.5)	32.2 (27.5, 37.0)	34.1 (30.9, 37.4)	31.7 (27.0, 36.5)	30.1 (27.1, 33.2)
Alger	37.6 (28.4, 46.8)	31.8 (24.7, 38.8)	36.3 (27.3, 45.3)	35.0 (27.0, 42.9)	29.4 (20.8, 38.1)	24.0 (17.1, 30.9)
Baraga	35.1 (25.5, 44.6)	40.1 (29.9, 50.2)	29.6 (20.9, 38.3)	37.5 (26.8, 48.2)	25.4 (18.0, 32.8)	26.2 (17.4, 34.9)
Chippewa	34.7 (23.2, 46.3)	38.5 (27.2, 49.9)	38.2 (26.2, 50.2)	33.4 (22.3, 44.5)	44.0 (31.7, 56.2)	33.7 (23.2, 44.1)
Delta	26.2 (7.5, 44.9)	39.1 (29.8, 48.4)	13.3 (3.3, 23.3)	30.2 (21.4, 39.0)	15.8 (3.7, 27.8)	30.6 (21.1, 40.2)
Dickinson	38.5 (28.6, 48.3)	43.3 (34.3, 52.3)	32.5 (22.9, 42.2)	29.1 (21.4, 36.6)	32.3 (22.2, 42.4)	28.0 (23.0, 34.7)
Gogebic	23.0 (14.2, 31.7)	37.5 (29.5, 45.6)	41.0 (25.4, 56.7)	29.3 (21.8, 36.8)	45.4 (30.0, 60.8)	34.2 (26.1, 42.3)
Houghton/Keweenaw	34.2 (22.4, 46.0)	28.0 (20.2, 35.7)	48.2 (34.9, 61.5)	34.5 (25.4, 43.6)	42.2 (28.9, 55.5)	27.4 (19.0, 35.9)
Iron	32.5 (23.6, 41.4)	38.6 (30.5, 46.6)	44.1 (33.3, 54.8)	34.3 (26.8, 41.7)	37.7 (27.0, 48.3)	32.7 (24.9, 40.6)
Luce	31.7 (22.5, 40.9)	43.5 (34.7, 52.4)	38.8 (28.7, 48.9)	39.6 (30.8, 48.4)	37.7 (28.1, 47.2)	39.6 (30.8, 48.4)
Mackinac	29.4 (21.7, 37.1)	47.2 (34.5, 59.9)	30.6 (22.7, 38.6)	42.6 (29.6, 55.5)	34.5 (25.5, 43.5)	34.7 (21.4, 48.1)
Marquette	32.7 (23.6, 41.7)	34.4 (26.3, 42.4)	29.0 (20.1, 38.0)	33.1 (24.3, 41.9)	26.5 (17.6, 35.4)	29.1 (20.8, 37.5)
Menominee	27.2 (17.6, 36.7)	31.2 (21.9, 40.6)	28.1 (18.3, 37.9)	39.3 (27.0, 51.6)	29.5 (19.5, 39.6)	25.7 (17.0, 34.3)
Ontonagon	32.1 (23.7, 40.4)	34.4 (28.2, 40.7)	38.6 (29.9, 47.2)	38.3 (32.1, 44.6)	37.5 (29.2, 45.7)	30.8 (24.0, 37.5)
Schoolcraft	31.9 (22.7, 41.2)	45.1 (34.7, 55.4)	33.9 (24.3, 43.5)	47.1 (36.8, 57.4)	33.0 (23.5, 42.5)	41.0 (31.4, 50.6)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-5B: Health and Wellness by Population Group

	Childhood Obesity and Overweight[a]		Lack of Affordable Healthy Foods, Including Year-around Fresh Fruits and Vegetable[a]		Lack of Affordable Facilities or Programs for Year-round Physical Activity or Recreation[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age						
18-39	21.1 (11.8, 30.4)	30.2 (22.8, 37.5)	33.6 (20.9, 46.3)	37.2 (29.1, 45.3)	38.3 (24.4, 52.3)	34.2 (26.5, 41.9)
40-65	37.4 (32.8, 41.9)	40.0 (36.2, 43.9)	32.5 (28.3, 36.7)	34.3 (30.5, 38.1)	28.5 (24.5, 32.5)	29.9 (26.3, 33.5)
65+	37.8 (34.5, 41.1)	37.9 (34.7, 41.2)	29.6 (26.5, 32.6)	28.7 (25.7, 31.7)	27.7 (24.8, 30.7)	24.3 (21.6, 27.0)
Gender						
Male	23.8 (17.1, 30.4)	33.4 (28.3, 38.4)	21.9 (15.1, 28.7)	26.3 (21.1, 31.6)	24.6 (17.1, 32.0)	23.6 (18.7, 28.6)
Female	39.6 (35.3, 44.0)	39.4 (35.9, 43.0)	42.5 (38.0, 46.9)	41.7 (38.0, 45.4)	38.9 (34.6, 43.3)	36.5 (33.0, 40.0)
Educational Attainment						
Less than 12th grade	45.4 (27.4, 63.3)	45.8 (32.5, 59.2)	47.6 (30.4, 64.9)	54.5 (41.3, 67.7)	23.5 (11.3, 35.7)	41.5 (27.6, 55.5)
High School Graduate	29.1 (19.9, 38.3)	37.6 (32.5, 42.7)	32.0 (21.8, 42.2)	36.8 (31.4, 42.2)	30.7 (20.9, 40.6)	28.8 (24.5, 33.1)
1-3 years of college	33.8 (27.9, 39.8)	34.2 (29.0, 39.4)	36.1 (29.4, 42.8)	30.5 (25.4, 35.6)	35.3 (28.7, 41.9)	31.7 (26.3, 37.2)
4 year degree or higher	31.7 (25.0, 38.3)	33.0 (28.4, 37.6)	25.4 (20.1, 30.8)	23.1 (18.9, 27.2)	30.3 (23.7, 36.8)	22.6 (18.4, 26.8)
Household Income						
Less than \$25,000	27.4 (14.1, 40.8)	39.0 (32.8, 45.2)	36.4 (19.5, 53.3)	45.3 (38.9, 51.8)	31.1 (16.1, 46.1)	38.7 (32.5, 44.9)
\$25,000 to \$49,999	36.3 (29.6, 43.0)	41.9 (36.0, 47.8)	33.0 (26.2, 39.8)	35.7 (30.0, 41.5)	32.6 (25.6, 39.7)	33.0 (27.2, 39.1)
\$50,000 or higher	31.7 (26.9, 36.5)	31.2 (26.8, 35.6)	29.9 (24.6, 35.3)	25.9 (21.0, 30.7)	31.7 (26.3, 37.0)	23.0 (19.0, 27.1)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-6A: Elder Services by County

	Lack of Programs and Services to Help Maintain Their Health and Independence[a]		Shortage of Long-term Care (Nursing Home Beds) or Lack of Affordable Long-term Care Services[a]		Lack of Programs and Housing for People with Alzheimer’s Disease or Dementia[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Upper Peninsula	31.2 (26.7, 35.7)	35.4 (32.3, 38.4)	33.0 (28.4, 37.7)	34.7 (31.7, 37.7)	33.6 (28.8, 38.3)	37.0 (33.9, 40.0)
Alger	44.4 (34.8, 54.0)	36.2 (28.6, 43.7)	39.1 (29.9, 48.3)	37.9 (30.3, 45.5)	39.1 (29.9, 48.2)	42.1 (34.0, 50.3)
Baraga	29.8 (21.5, 38.0)	36.4 (26.9, 45.8)	33.3 (24.7, 41.9)	37.3 (27.7, 46.9)	36.3 (27.4, 45.2)	40.7 (30.7, 50.7)
Chippewa	40.7 (29.0, 52.5)	35.5 (25.5, 45.9)	47.1 (35.2, 59.1)	30.7 (21.3, 40.0)	52.3 (40.4, 64.3)	35.7 (25.7, 45.6)
Delta	16.9 (4.6, 29.2)	38.6 (29.0, 48.1)	19.9 (5.6, 34.1)	34.6 (26.1, 43.2)	20.8 (5.6, 36.0)	33.9 (25.4, 42.4)
Dickinson	37.7 (27.8, 47.5)	35.7 (27.1, 44.3)	38.6 (28.7, 48.4)	36.7 (28.2, 45.3)	41.7 (31.8, 51.7)	36.2 (27.8, 44.6)
Gogebic	42.9 (27.5, 58.3)	38.0 (29.9, 46.0)	39.9 (24.3, 55.6)	36.4 (28.5, 44.3)	42.1 (26.6, 57.6)	43.4 (35.3, 51.6)
Houghton/Keweenaw	36.3 (23.0, 49.6)	32.9 (24.1, 41.7)	38.4 (25.2, 51.6)	34.1 (25.3, 40.9)	38.2 (24.9, 51.4)	34.2 (25.4, 43.0)
Iron	39.7 (29.1, 50.2)	38.4 (30.4, 46.4)	23.5 (16.1, 30.9)	33.1 (25.3, 40.9)	27.1 (19.2, 35.1)	35.7 (27.7, 43.7)
Luce	39.2 (29.7, 48.8)	33.4 (25.5, 41.3)	39.3 (29.7, 49.0)	34.9 (26.8, 43.0)	47.4 (37.5, 57.3)	43.4 (34.6, 52.2)
Mackinac	35.9 (27.1, 44.6)	39.5 (26.5, 52.5)	38.7 (29.8, 47.5)	31.5 (21.7, 41.4)	32.3 (24.5, 40.2)	43.8 (30.9, 56.7)
Marquette	22.1 (15.7, 28.5)	32.7 (24.7, 40.8)	28.0 (20.3, 35.6)	37.9 (29.2, 46.6)	23.9 (17.0, 30.7)	34.4 (26.1, 42.8)
Menominee	30.8 (21.0, 40.6)	34.1 (24.7, 40.8)	28.0 (18.9, 37.1)	25.1 (17.2, 33.0)	26.5 (17.2, 35.7)	41.2 (29.9, 52.5)
Ontonagon	44.0 (35.7, 52.3)	40.6 (33.6, 47.7)	50.9 (42.1, 59.6)	48.9 (42.0, 55.7)	49.3 (40.7, 58.0)	47.3 (40.4, 54.1)
Schoolcraft	33.9 (24.3, 43.4)	37.0 (28.4, 45.7)	26.4 (18.5, 34.4)	36.4 (27.9, 45.0)	37.0 (27.0, 46.9)	39.4 (30.4, 48.4)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-6B: Elder Services by Population Groups

	Lack of Programs and Services to Help Maintain Their Health and Independence[a]		Shortage of Long-term Care (Nursing Home Beds) or Lack of Affordable Long-term Care Services[a]		Lack of Programs and Housing for People with Alzheimer’s Disease or Dementia[a]	
	2021	2017	2021	2017	2021	2017
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Age						
18, 39	20.9 (11.4, 30.4)	26.2 (19.3, 33.1)	21.1 (11.4, 30.8)	23.6 (16.8, 30.5)	22.1 (12.0, 32.1)	25.9 (18.7, 33.0)
40, 65	34.6 (30.3, 38.9)	39.8 (35.8, 43.7)	35.8 (31.3, 40.3)	38.5 (34.7, 42.3)	37.2 (32.8, 41.6)	39.5 (35.7, 43.2)
65+	40.4 (37.1, 43.8)	39.3 (36.0, 42.5)	45.1 (41.7, 48.6)	42.0 (38.7, 45.3)	43.5 (40.1, 46.9)	46.9 (43.5, 50.2)
Gender						
Male	23.1 (16.3, 29.8)	29.0 (24.2, 33.8)	26.8 (19.4, 34.3)	30.1 (25.3, 34.8)	25.3 (18.2, 32.4)	32.4 (27.5, 37.3)
Female	39.3 (35.1, 43.4)	41.5 (38.0, 45.1)	39.2 (35.1, 43.3)	39.2 (35.7, 42.7)	41.8 (37.5, 46.0)	41.4 (37.8, 44.9)
Educational Attainment						
Less than 12th grade	50.1 (32.5, 67.7)	45.3 (31.9, 58.7)	40.8 (24.5, 57.1)	46.7 (33.6, 60.3)	42.2 (25.8, 58.7)	51.8 (38.3, 65.4)
High School Graduate	35.9 (25.0, 46.9)	37.6 (32.7, 42.6)	38.3 (26.7, 49.9)	38.5 (33.6, 43.5)	39.6 (27.7, 51.6)	41.6 (36.4, 46.8)
1, 3 years of college	32.9 (26.7, 39.0)	36.4 (31.0, 41.7)	35.4 (29.2, 41.6)	33.4 (28.2, 38.5)	35.8 (29.6, 42.0)	33.8 (28.7, 38.8)
4 year degree or higher	19.9 (15.3, 24.4)	20.1 (16.5, 23.8)	21.2 (16.2, 26.2)	19.5 15.9, 23.2	20.3 (15.8, 24.9)	22.4 (18.6, 26.1)
Household Income						
Less than \$25,000	37.3 (20.1, 54.4)	45.3 (39.1, 51.6)	37.3 (19.9, 54.6)	42.1 (35.9, 48.3)	36.8 (19.4, 54.2)	43.7 (37.4, 50.0)
\$25,000 to \$49,999	33.7 (27.4, 40.1)	40.6 (34.7, 46.5)	38.1 (31.4, 44.8)	39.7 (34.0, 45.3)	38.2 (31.6, 44.9)	42.8 (37.1, 48.6)
\$50,000 or higher	26.9 (22.1, 31.7)	25.6 (21.5, 29.7)	28.3 (23.3, 33.2)	26.3 (22.1, 30.5)	29.5 (24.5, 34.5)	28.5 (24.2, 32.7)

[a] The proportion of respondents who indicated that the community health issue was “very important — should be a priority.” The other choices were “fairly important”, “fairly important,” “fairly unimportant,” and “not an issue, or of very little importance.”

Table 14-7: Community Health Issues and Priorities — Upper Peninsula

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	4.9 (3.4, 6.3) [3.9]	6.4 (4.1, 8.7) [4.2]	39.3 (34.0, 44.6) [37.5]	49.4 (43.2, 55.6) [54.5]
Lack of health insurance	4.9 (3.4, 6.5) [4.7]	8.5 (5.9, 11.1) [5.3]	40.3 (33.4, 47.2) [33.0]	46.2 (40.4, 52.0) [57.1]
Health insurance is expensive or has high costs for co-pays and deductibles	3.0 (2.0, 3.9) [3.1]	6.1 (3.7, 8.5) [3.2]	32.5 (25.1, 40.0) [22.6]	58.4 (51.6, 65.2) [71.1]
Shortage of mental health programs and services, or lack of affordable mental health care	6.9 (4.5, 9.3) [6.6]	8.5 (6.4, 10.5) [13.9]	37.2 (30.1, 44.3) [42.1]	47.5 (41.5, 53.4) [37.5]
Shortage of substance abuse treatment programs and services/lack of affordable care	12.2 (3.2, 21.2) [6.6]	13.3 (10.2, 16.4) [14.5]	36.5 (31.5, 41.6) [41.4]	37.9 (32.8, 43.1) [37.6]
Shortage of dentists, or lack of affordable dental care	11.2 (8.2, 14.1) [11.7]	19.7 (15.9, 23.5) [20.3]	36.4 (29.3, 43.5) [37.7]	32.8 (28.1, 37.4) [30.3]
Transportation to non-emergency medical care	18.1 (9.4, 26.7) [12.8]	23.2 (19.4, 27.0) [27.1]	40.2 (34.8, 45.6) [40.0]	18.6 (15.4, 21.7) [20.0]
Tobacco use	22.8 (14.4, 31.2) [15.2]	25.7 (21.4, 30.0) [24.0]	33.9 (29.1, 38.6) [38.2]	17.6 (14.8, 20.4) [22.6]
Alcohol abuse	15.8 (6.9, 24.6) [9.9]	19.0 (15.0, 23.0) [13.4]	35.1 (30.3, 39.9) [40.2]	30.1 (25.8, 34.4) [36.6]
Drug abuse	14.9 (6.0, 23.8) [7.8]	9.3 (6.5, 12.0) [6.6]	27.1 (23.1, 31.2) [28.2]	48.7 (42.6, 54.7) [57.4]
Childhood obesity	13.7 (4.8, 22.7) [7.2]	13.4 (10.4, 16.4) [16.8]	41.1 (35.6, 46.5) [39.5]	31.8 (27.3, 36.3) [36.5]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	16.1 (7.3, 24.8) [11.1]	18.1 (14.8, 21.3) [18.6]	33.6 (28.9, 38.3) [36.1]	32.2 (27.5, 37.0) [34.1]
Lack of affordable facilities or programs for year-round physical activity or recreation	12.2 (9.2, 15.2) [13.3]	19.4 (16.0, 22.8) [20.4]	36.6 (29.6, 43.7) [36.2]	31.7 (27.0, 36.5) [30.1]
Lack of programs and services to help seniors maintain their health and independence	11.8 (2.8, 20.8) [7.9]	17.9 (14.3, 21.6) [16.4]	39.1 (33.8, 44.3) [40.4]	31.2 (26.7, 35.7) [35.4]
Shortage of long-term care (nursing home beds)/lack of affordable services	14.1 (5.3, 23.0) [8.8]	17.7 (13.9, 21.6) [17.6]	35.1 (30.3, 39.9) [38.9]	33.0 (28.4, 37.7) [34.7]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	13.6 (4.6, 22.6) [7.1]	15.0 (11.9, 18.1) [15.9]	37.9 (32.7, 43.0) [40.1]	33.6 (28.8, 38.3) [37.0]

Table 14-8: Community Health Issues and Priorities — Alger County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	6.5 (2.6, 10.4) [3.2]	5.1 (1.6, 8.6) [5.8]	35.7 (26.4, 44.9) [41.1]	52.7 (43.3, 62.2) [49.9]
Lack of health insurance	8.8 (3.6, 14.0) [8.5]	3.6 (1.1, 6.0) [6.7]	35.5 (25.6, 45.4) [32.7]	52.1 (42.5, 61.8) [52.0]
Health insurance is expensive or has high costs for co-pays and deductibles	3.3 (0.8, 5.8) [2.1]	3.4 (0.06, 6.7) [3.3]	21.4 (14.7, 28.2) [25.9]	71.9 (64.2, 79.6) [68.7]
Shortage of mental health programs and services, or lack of affordable mental health care	4.7 (1.7, 7.7) [7.7]	10.4 (5.1, 15.7) [17.1]	39.2 (29.6, 48.8) [37.5]	45.7 (36.2, 55.2) [37.7]
Shortage of substance abuse treatment programs and services/lack of affordable care	8.1 (3.5, 12.7) [7.1]	9.0 (4.7, 13.2) [17.6]	42.2 (32.5, 51.9) [41.1]	40.8 (31.3, 50.2) [34.3]
Shortage of dentists, or lack of affordable dental care	11.7 (5.1, 18.3) [14.9]	9.8 (5.5, 14.1) [23.4]	47.0 (37.3, 56.7) [36.8]	31.4 (22.7, 40.2) [24.9]
Transportation to non-emergency medical care	11.9 (6.5, 17.3) [17.1]	21.0 (11.7, 30.3) [27.1]	42.5 (32.9, 52.1) [35.4]	24.6 (17.4, 31.9) [20.4]
Tobacco use	12.5 (6.6, 18.5) [12.6]	28.5 (18.7, 38.3) [24.6]	37.2 (27.9, 46.6) [39.2]	21.7 (15.1, 28.4) [23.7]
Alcohol abuse	8.9 (3.9, 13.9) [10.3]	21.2 (11.8, 30.6) [12.9]	36.4 (27.3, 45.5) [37.3]	33.4 (25.0, 41.8) [39.4]
Drug abuse	8.7 (3.7, 13.8) [5.6]	11.4 (6.1, 16.6) [8.5]	32.2 (23.5, 41.0) [30.6]	47.6 (37.9, 57.3) [55.2]
Childhood obesity	7.5 (2.8, 12.3) [4.8]	18.5 (9.4, 27.5) [16.6]	36.4 (27.6, 45.2) [46.8]	37.6 (28.4, 46.8) [31.8]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	8.8 (2.7, 15.0) [8.0]	17.2 (8.2, 26.2) [13.3]	37.6 (29.0, 46.3) [43.7]	36.3 (27.3, 45.3) [35.0]
Lack of affordable facilities or programs for year-round physical activity or recreation	10.5 (4.5, 16.4) [10.7]	20.2 (11.4, 29.1) [25.9]	39.9 (30.8, 49.0) [39.4]	29.4 (20.8, 38.1) [24.0]
Lack of programs and services to help seniors maintain their health and independence	4.6 (1.7, 7.4) [6.6]	9.6 (5.5, 13.6) [16.6]	41.5 (31.7, 51.2) [40.6]	44.4 (34.8, 54.0) [36.2]
Shortage of long-term care (nursing home beds)/lack of affordable services	6.5 (3.0, 10.0) [5.5]	12.2 (7.3, 17.2) [20.5]	42.1 (32.2, 52.0) [36.1]	39.1 (29.9, 48.3) [37.9]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	5.9 (2.6, 9.2) [4.7]	9.5 (5.6, 13.5) [18.2]	45.5 (35.7, 55.3) [35.0]	39.1 (29.9, 48.2) [42.1]

Table 14-9: Community Health Issues and Priorities — Baraga County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	8.3 (0.0, 17.6) [6.2]	2.5 (0.0, 5.2) [0.6]	36.8 (27.2, 46.3) [25.5]	52.4 (41.9, 62.8) [67.7]
Lack of health insurance	3.6 (0.9, 6.3) [7.9]	15.9 (4.4, 27.5) [4.0]	37.1 (27.4, 46.9) [29.3]	43.4 (33.6, 53.2) [58.9]
Health insurance is expensive or has high costs for co-pays and deductibles	3.9 (0.5, 7.4) [8.1]	7.6 (0.7, 14.6) [0.5]	34.8 (24.1, 45.6) [17.5]	53.6 (42.9, 64.2) [73.9]
Shortage of mental health programs and services, or lack of affordable mental health care	3.3 (1.2, 5.3) [9.3]	11.1 (4.2, 18.0) [13.7]	42.2 (31.5, 52.8) [44.2]	43.5 (33.4, 53.5) [32.8]
Shortage of substance abuse treatment programs and services/lack of affordable care	3.7 (1.6, 5.7) [7.2]	8.8 (2.3, 15.3) [10.1]	45.3 (34.6, 56.0) [46.7]	42.2 (32.2, 52.3) [36.0]
Shortage of dentists, or lack of affordable dental care	17.4 (9.4, 25.4) [11.8]	23.5 (12.3, 34.8) [24.2]	35.5 (26.3, 44.7) [30.8]	23.6 (16.3, 30.8) [33.3]
Transportation to non-emergency medical care	12.4 (5.3, 19.5) [10.4]	22.7 (12.2, 33.3) [27.9]	48.4 (38.0, 58.9) [37.5]	16.4 (10.8, 22.1) [24.2]
Tobacco use	16.0 (8.2, 23.9) [10.3]	20.1 (11.1, 29.2) [18.8]	37.6 (28.0, 47.2) [31.8]	26.2 (16.2, 36.2) [39.1]
Alcohol abuse	7.1 (2.1, 12.1) [3.7]	10.5 (3.3, 17.8) [12.5]	38.0 (28.2, 47.9) [33.9]	44.3 (33.6, 55.0) [49.8]
Drug abuse	5.6 (1.5, 9.7) [3.6]	2.1 (0.0, 4.7) [3.8]	19.4 (12.3, 26.5) [13.3]	72.9 (64.6, 81.2) [79.3]
Childhood obesity	2.9 (0.9, 4.9) [3.5]	14.7 (6.7, 22.7) [17.7]	47.4 (36.9, 57.9) [38.7]	35.1 (25.5, 44.6) [40.1]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	11.3 (1.5, 21.0) [9.2]	15.6 (7.1, 24.1) [12.7]	43.5 (33.5, 53.5) [40.6]	29.6 (20.9, 38.3) [37.5]
Lack of affordable facilities or programs for year-round physical activity or recreation	14.1 (3.9, 24.4) [4.8]	13.7 (6.5, 20.9) [17.5]	46.8 (36.4, 57.1) [51.6]	25.4 (18.0, 32.8) [26.1]
Lack of programs and services to help seniors maintain their health and independence	8.9 (0.0, 18.6) [4.6]	15.6 (5.9, 25.3) [18.0]	45.7 (35.6, 55.9) [41.0]	29.8 (21.5, 38.0) [36.4]
Shortage of long-term care (nursing home beds)/lack of affordable services	9.6 (0.0, 19.2) [8.7]	14.7 (5.4, 24.0) [8.2]	42.4 (32.5, 52.3) [45.8]	33.3 (24.7, 41.9) [37.3]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	8.6 (0.0, 18.3) [5.8]	10.3 (2.4, 18.3) [13.9]	44.8 (34.5, 55.0) [39.5]	36.3 (27.4, 45.2) [40.7]

Table 14-10: Community Health Issues and Priorities — Chippewa County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	3.0 (0.8, 5.2) [6.1]	9.3 (0.1, 18.5) [6.5]	31.9 (21.3, 42.6) [42.1]	55.7 (43.5, 67.9) [45.3]
Lack of health insurance	2.8 (0.5, 5.2) [12.8]	11.6 (3.7, 19.5) [7.4]	26.6 (16.2, 37.0) [33.1]	59.0 (47.3, 70.7) [46.7]
Health insurance is expensive or has high costs for co-pays and deductibles	1.5 (0.4, 2.5) [10.0]	9.1 (1.5, 16.8) [4.3]	23.2 (14.0, 32.4) [25.4]	66.2 (55.2, 77.1) [60.2]
Shortage of mental health programs and services, or lack of affordable mental health care	8.9 (2.9, 14.9) [9.2]	9.7 (4.1, 15.3) [14.7]	32.5 (21.3, 43.8) [43.2]	48.8 (36.8, 60.9) [33.0]
Shortage of substance abuse treatment programs and services/lack of affordable care	7.5 (1.8, 13.2) [10.5]	10.9 (5.0, 16.8) [13.2]	37.4 (25.8, 48.9) [47.2]	44.3 (32.1, 56.4) [29.0]
Shortage of dentists, or lack of affordable dental care	3.2 (0.8, 5.7) [17.9]	10.4 (2.7, 18.1) [23.7]	26.5 (16.6, 36.5) [33.7]	59.8 (48.4, 71.3) [24.7]
Transportation to non-emergency medical care	7.4 (1.7, 13.2) [15.6]	24.3 (13.5, 35.2) [28.0]	44.7 (32.7, 56.7) [35.6]	23.6 (14.0, 33.1) [20.8]
Tobacco use	15.0 (5.2, 24.7) [12.8]	29.5 (17.8, 41.2) [24.5]	32.9 (21.5, 44.4) [33.4]	22.6 (13.9, 31.3) [29.2]
Alcohol abuse	3.0 (1.1, 4.9) [10.3]	22.8 (11.7, 33.8) [19.8]	41.5 (29.4, 53.6) [29.3]	32.7 (22.3, 43.2) [40.6]
Drug abuse	2.7 (1.0, 4.5) [10.3]	10.3 (19.6, 40.1) [14.4]	29.8 (19.6, 40.1) [25.7]	57.1 (45.5, 68.7) [49.6]
Childhood obesity	7.8 (0.1, 15.5) [11.1]	22.2 (12.7, 31.7) [20.1]	35.3 (23.9, 46.6) [30.2]	34.7 (23.2, 46.3) [38.5]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	7.4 (2.0, 12.9) [17.0]	17.7 (8.7, 26.7) [21.4]	36.6 (25.4, 47.9) [28.2]	38.2 (26.2, 50.2) [33.4]
Lack of affordable facilities or programs for year-round physical activity or recreation	6.0 (2.5, 9.5) [20.3]	21.2 (11.8, 30.6) [23.2]	28.8 (19.1, 38.5) [22.9]	44.0 (31.7, 56.2) [33.7]
Lack of programs and services to help seniors maintain their health and independence	4.5 (1.5, 7.4) [16.7]	10.3 (4.2, 16.5) [18.0]	44.5 (32.5, 56.5) [29.8]	40.7 (29.0, 52.5) [35.5]
Shortage of long-term care (nursing home beds)/lack of affordable services	5.3 (2.1, 8.6) [12.5]	15.4 (5.8, 25.0) [23.0]	32.1 (21.3, 42.9) [33.8]	47.1 (35.2, 59.1) [30.7]
Lack of programs and housing for people with Alzheimer's Disease and dementia	4.2 (1.3, 7.2) [12.7]	11.8 (3.2, 20.5) [14.7]	31.6 (21.0, 42.2) [37.0]	52.3 (40.4, 64.3) [35.7]

Table 14-11: Community Health Issues and Priorities — Delta County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	2.1 (0.0, 4.3) [2.0]	6.3 (0.0, 13.2) [3.2]	30.2 (8.7, 51.6) [31.7]	61.4 (34.7, 88.2) [63.1]
Lack of health insurance	4.7 (0.0, 10.0) [1.7]	4.9 (0.0, 11.3) [5.5]	59.4 (31.7, 87.2) [32.2]	30.9 (9.4, 52.3) [60.6]
Health insurance is expensive or has high costs for co-pays and deductibles	2.0 (0.0, 4.1) [1.7]	5.3 (0.0, 11.8) [1.0]	51.4 (18.4, 84.3) [23.2]	41.4 (13.0, 69.9) [74.1]
Shortage of mental health programs and services, or lack of affordable mental health care	2.4 (0.05, 4.7) [4.4]	3.7 (0.0, 8.0) [12.1]	57.5 (28.4, 86.6) [43.3]	36.4 (11.0, 61.7) [40.2]
Shortage of substance abuse treatment programs and services/lack of affordable care	35.9 (0.0, 78.6) [6.9]	8.2 (0.1, 16.2) [9.7]	26.3 (7.5, 45.1) [40.8]	29.5 (8.4, 50.7) [43.6]
Shortage of dentists, or lack of affordable dental care	6.6 (0.3, 12.8) [14.8]	18.8 (3.4, 34.2) [15.2]	57.4 (28.1, 86.8) [40.5]	17.2 (4.4, 29.9) [29.6]
Transportation to non-emergency medical care	40.7 (0.8, 80.7) [13.4]	16.0 (3.7, 28.2) [31.2]	29.7 (8.3, 51.0) [36.9]	13.6 (2.6, 24.7) [18.4]
Tobacco use	47.2 (11.1, 83.2) [19.7]	15.6 (3.5, 27.6) [21.1]	24.4 (6.6, 42.1) [34.7]	12.9 (2.7, 23.0) [24.5]
Alcohol abuse	40.7 (0.7, 80.6) [11.9]	11.9 (0.9, 23.0) [12.3]	24.7 (7.0, 42.5) [33.3]	22.6 (6.1, 39.2) [42.5]
Drug abuse	40.0 (0.0, 80.3) [9.6]	3.5 (0.0, 7.3) [5.0]	18.5 (4.7, 32.3) [21.2]	38.0 (11.5, 64.5) [64.2]
Childhood obesity	36.0 (0.0, 78.7) [9.5]	5.0 (0.6, 9.4) [12.1]	32.8 (9.3, 56.2) [39.3]	26.2 (7.5, 44.9) [39.1]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	41.6 (2.1, 81.1) [9.9]	14.5 (2.9, 26.1) [18.3]	30.6 (8.5, 52.6) [41.6]	13.3 (3.3, 23.3) [30.2]
Lack of affordable facilities or programs for year-round physical activity or recreation	8.7 (0.8, 16.6) [12.9]	19.2 (3.9, 34.5) [16.7]	56.4 (26.5, 86.3) [39.8]	15.8 (3.7, 27.8) [30.6]
Lack of programs and services to help seniors maintain their health and independence	37.9 (0.0, 79.7) [7.2]	19.5 (3.9, 35.1) [14.9]	25.7 (7.0, 44.3) [39.4]	16.9 (4.6, 29.3) [38.6]
Shortage of long-term care (nursing home beds)/lack of affordable services	40.1 (0.0, 80.6) [6.4]	14.8 (2.1, 27.4) [21.2]	25.3 (6.7, 43.8) [37.8]	19.9 (5.6, 34.1) [34.6]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	39.5 (0.0, 81.2) [6.7]	14.8 (1.9, 27.8) [20.1]	24.8 (6.3, 43.4) [39.4]	20.8 (5.6, 36.0) [33.9]

Table 14-12: Community Health Issues and Priorities — Dickinson County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	7.4 (3.7, 11.0) [3.9]	6.2 (2.2, 10.2) [7.6]	35.8 (26.7, 45.0) [36.3]	50.6 (40.7, 60.5) [52.2]
Lack of health insurance	7.6 (2.6, 12.6) [5.7]	6.0 (2.4, 9.6) [4.5]	43.6 (33.5, 53.8) [33.9]	42.8 (33.3, 52.3) [55.8]
Health insurance is expensive or has high costs for co-pays and deductibles	1.9 (0.4, 3.5) [5.9]	4.9 (0.2, 9.6) [4.7]	37.0 (27.3, 46.6) [14.0]	56.2 (46.4, 66.1) [75.5]
Shortage of mental health programs and services, or lack of affordable mental health care	5.3 (2.3, 8.3) [6.7]	8.0 (2.8, 13.2) [17.7]	33.7 (24.5, 42.9) [38.8]	53.0 (43.2, 62.8) [36.8]
Shortage of substance abuse treatment programs and services/lack of affordable care	9.7 (4.3, 15.1) [9.3]	14.3 (7.5, 21.0) [16.4]	35.5 (25.3, 45.7) [36.8]	40.5 (31.2, 49.8) [37.4]
Shortage of dentists, or lack of affordable dental care	15.8 (9.6, 22.0) [11.8]	19.1 (11.0, 27.3) [20.1]	31.6 (22.6, 40.6) [36.5]	33.5 (23.7, 43.2) [31.6]
Transportation to non-emergency medical care	16.3 (9.0, 23.6) [15.8]	25.3 (16.6, 33.9) [22.1]	29.8 (21.3, 38.3) [41.9]	28.7 (19.0, 38.3) [20.1]
Tobacco use	17.6 (9.9, 25.3) [17.8]	24.6 (15.6, 33.6) [18.0]	41.8 (31.9, 51.7) [42.5]	16.0 (10.4, 21.6) [21.7]
Alcohol abuse	14.1 (6.8, 21.5) [11.0]	15.4 (7.7, 23.1) [11.2]	38.9 (29.1, 48.6) [43.5]	31.6 (23.2, 40.0) [34.4]
Drug abuse	8.6 (2.6, 14.6) [8.4]	8.5 (2.6, 14.4) [5.3]	26.9 (18.5, 35.2) [31.8]	56.0 (46.2, 65.8) [54.6]
Childhood obesity	8.1 (2.0, 14.2) [4.6]	12.4 (5.7, 19.2) [14.8]	41.0 (31.5, 50.6) [37.3]	38.5 (28.6, 48.3) [43.3]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	11.2 (4.3, 18.2) [13.3]	19.8 (12.1, 27.6) [20.8]	36.4 (27.2, 45.6) [36.8]	32.5 (22.9, 42.2) [29.1]
Lack of affordable facilities or programs for year-round physical activity or recreation	14.3 (7.4, 21.2) [13.3]	22.8 (15.4, 30.3) [25.0]	30.6 (22.0, 39.2) [33.8]	32.3 (22.2, 42.4) [28.0]
Lack of programs and services to help seniors maintain their health and independence	14.2 (6.7, 21.6) [5.9]	14.9 (7.8, 22.0) [21.8]	33.3 (24.5, 42.0) [36.5]	37.7 (27.8, 47.5) [35.7]
Shortage of long-term care (nursing home beds)/lack of affordable services	13.4 (5.6, 21.2) [11.8]	12.0 (5.8, 18.3) [17.8]	36.0 (27.0, 45.0) [33.6]	38.6 (28.7, 48.4) [36.7]
Lack of programs and housing for people with Alzheimer's Disease and dementia	11.3 (3.6, 19.1) [7.5]	9.2 (3.8, 14.5) [18.7]	37.8 (28.5, 47.1) [37.5]	41.7 (31.8, 51.7) [36.2]

Table 14-13: Community Health Issues and Priorities — Gogebic County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	14.3 (0.0, 33.5) [5.2]	3.6 (0.3, 6.9) [1.1]	29.2 (18.4, 39.9) [20.7]	53.0 (38.0, 68.0) [72.9]
Lack of health insurance	13.3 (0.0, 32.6) [4.1]	9.5 (0.0, 19.9) [7.3]	29.7 (19.1, 40.2) [25.1]	47.5 (33.5, 61.6) [63.5]
Health insurance is expensive or has high costs for co-pays and deductibles	1.8 (0.4, 3.2) [1.5]	10.8 (0.0, 21.8) [4.6]	28.1 (17.8, 38.4) [29.8]	59.3 (45.8, 72.8) [64.0]
Shortage of mental health programs and services/lack of affordable mental health care	15.7 (0.0, 34.6) [14.7]	9.1 (3.5, 14.8) [10.5]	30.2 (19.6, 40.8) [33.0]	45.0 (31.1, 58.9) [41.8]
Shortage of substance abuse treatment programs and services, or lack of affordable care	15.3 (0.0, 34.8) [11.1]	9.2 (4.1, 14.3) [10.7]	39.4 (26.0, 52.7) [31.8]	36.1 (24.2, 48.0) [46.4]
Shortage of dentists, or lack of affordable dental care	15.2 (0.0, 34.4) [13.1]	11.7 (1.0, 22.4) [16.9]	22.2 (13.2, 31.3) [37.3]	50.8 (36.1, 65.5) [32.7]
Transportation to non-emergency medical care	27.4 (8.5, 46.2) [15.3]	17.5 (9.2, 25.8) [19.8]	39.5 (27.0, 52.0) [42.4]	15.7 (9.2, 22.1) [22.5]
Tobacco use	32.0 (14.1, 50.0) [17.1]	23.7 (13.9, 33.5) [19.2]	24.5 (15.6, 33.4) [38.1]	19.8 (11.9, 27.7) [25.7]
Alcohol abuse	20.0 (1.6, 38.4) [10.4]	18.0 (6.2, 29.8) [11.1]	29.1 (18.8, 39.5) [36.8]	32.9 (21.8, 43.9) [41.6]
Drug abuse	19.0 (0.2, 37.8) [8.4]	5.4 (1.1, 9.7) [5.0]	34.3 (21.2, 47.3) [23.6]	41.3 (28.3, 54.4) [63.0]
Childhood obesity	16.9 (0.0, 35.8) [5.5]	9.5 (4.0, 15.0) [10.0]	50.7 (36.0, 65.4) [47.0]	23.0 (14.2, 31.7) [37.5]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	13.4 (2.7, 24.1) [11.9]	12.9 (6.7, 19.1) [18.6]	32.6 (21.5, 43.8) [40.2]	41.0 (25.4, 56.7) [29.3]
Lack of affordable facilities or programs for year-round physical activity or recreation	10.3 (4.7, 15.9) [10.8]	11.0 (5.2, 16.8) [15.2]	33.4 (22.1, 44.6) [39.8]	45.4 (30.0, 60.8) [34.2]
Lack of programs and services to help seniors maintain their health and independence	11.6 (0.9, 22.2) [11.2]	11.5 (4.4, 18.7) [13.6]	34.0 (22.7, 45.3) [37.3]	42.9 (27.5, 58.3) [38.0]
Shortage of long-term care (nursing home beds)/lack of affordable services	14.2 (3.2, 25.1) [12.4]	12.2 (5.5, 19.0) [17.1]	33.7 (22.4, 45.0) [34.1]	40.0 (24.3, 55.6) [36.4]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	12.3 (1.4, 23.2) [8.0]	14.5 (6.9, 22.1) [10.8]	31.1 (20.3, 41.9) [37.8]	42.1 (26.6, 57.6) [43.4]

Table 14-14: Community Health Issues and Priorities — Houghton/Keweenaw Counties

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	4.1 (0.6, 7.6) [6.7]	9.7 (0.0, 20.0) [2.2]	38.5 (25.3, 51.7) [36.0]	47.8 (35.3, 60.4) [55.1]
Lack of health insurance	3.6 (0.6, 6.6) [5.3]	11.9 (1.1, 22.8) [2.5]	27.4 (17.8, 37.0) [27.3]	57.1 (44.6, 69.6) [64.9]
Health insurance is expensive or has high costs for co-pays and deductibles	6.7 (1.0, 12.4) [1.3]	6.7 (0.0, 16.4) [0.9]	20.7 (12.8, 28.6) [17.6]	65.9 (54.1, 77.7) [80.2]
Shortage of mental health programs and services, or lack of affordable mental health care	9.7 (0.0, 19.6) [6.8]	4.1 (0.03, 8.2) [8.9]	21.3 (13.7, 28.9) [46.3]	64.9 (53.3, 76.5) [38.0]
Shortage of substance abuse treatment programs and services/lack of affordable care	6.4 (2.0, 10.7) [6.4]	5.5 (5.6, 27.3) [16.9]	4.7 (18.2, 36.8) [41.1]	6.5 (36.8, 62.5) [35.6]
Shortage of dentists, or lack of affordable dental care	5.1 (1.7, 8.5) [7.6]	18.8 (7.9, 29.7) [27.4]	31.4 (21.3, 41.5) [38.3]	44.7 (31.5, 57.9) [26.6]
Transportation to non-emergency medical care	13.0 (3.0, 23.0) [10.4]	20.0 (10.9, 29.2) [31.2]	47.9 (35.0, 60.8) [40.4]	19.1 (11.2, 26.9) [18.0]
Tobacco use	17.7 (7.1, 28.3) [14.5]	19.2 (10.4, 28.0) [35.6]	43.6 (30.4, 56.8) [33.0]	19.5 (12.1, 26.9) [16.9]
Alcohol abuse	8.5 (3.5, 13.5) [9.5]	12.3 (4.9, 19.7) [12.5]	34.3 (23.7, 45.0) [47.2]	44.9 (31.9, 57.9) [30.8]
Drug abuse	7.5 (2.9, 12.1) [8.9]	8.3 (2.2, 14.4) [7.8]	30.4 (18.9, 41.9) [38.3]	53.8 (41.2, 66.4) [44.9]
Childhood obesity	14.3 (4.1, 24.8) [7.8]	7.9 (2.9, 12.9) [27.5]	43.5 (30.3, 56.8) [36.8]	34.2 (22.4, 46.0) [28.0]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	13.0 (2.9, 23.1) [12.5]	11.7 (5.4, 17.9) [20.1]	27.1 (18.0, 36.2) [32.9]	48.2 (34.9, 61.5) [34.5]
Lack of affordable facilities or programs for year-round physical activity or recreation	13.6 (3.4, 23.9) [17.8]	12.9 (6.0, 19.7) [26.4]	31.3 (21.5, 41.1) [28.4]	42.2 (28.9, 55.5) [27.4]
Lack of programs and services to help seniors maintain their health and independence	6.0 (1.3, 10.7) [7.5]	16.8 (6.1, 27.5) [15.0]	40.9 (28.6, 53.2) [44.6]	36.3 (23.0, 49.6) [32.9]
Shortage of long-term care (nursing home beds)/lack of affordable services	10.0 (4.1, 15.9) [6.4]	15.0 (4.3, 25.6) [24.0]	36.6 (25.4, 47.8) [35.5]	38.4 (25.2, 51.6) [34.1]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	10.4 (0.7, 20.2) [6.3]	13.8 (6.1, 21.4) [21.1]	37.7 (26.3, 49.0) [38.4]	38.2 (24.9, 51.4) [34.2]

Table 14-15: Community Health Issues and Priorities — Iron County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	5.1 (2.6, 7.5) [2.7]	0.9 (0.0, 2.0) [3.3]	47.7 (37.1, 58.3) [31.8]	46.4 (36.2, 56.5) [62.2]
Lack of health insurance	10.1 (3.7, 16.5) [5.9]	5.9 (1.5, 10.2) [3.9]	41.8 (30.9, 52.6) [33.1]	42.2 (32.6, 51.8) [57.1]
Health insurance is expensive or has high costs for co-pays and deductibles	4.6 (0.0, 9.4) [3.7]	2.3 (0.3, 4.4) [1.8]	31.9 (22.6, 41.1) [18.3]	61.1 (51.3, 71.0) [76.2]
Shortage of mental health programs and services, or lack of affordable mental health care	5.7 (2.1, 9.3) [8.3]	13.8 (7.9, 19.7) [13.9]	37.0 (27.4, 46.5) [38.7]	43.5 (32.8, 54.2) [39.1]
Shortage of substance abuse treatment programs and services/lack of affordable care	6.3 (2.5, 10.1) [8.2]	13.1 (7.3, 18.9) [10.9]	41.3 (31.3, 51.3) [36.2]	39.3 (28.5, 50.1) [44.6]
Shortage of dentists, or lack of affordable dental care	14.5 (7.6, 21.4) [11.8]	23.3 (11.8, 34.9) [11.9]	29.4 (20.8, 38.1) [40.2]	32.8 (24.1, 41.5) [36.1]
Transportation to non-emergency medical care	13.1 (6.5, 19.7) [14.6]	24.8 (13.5, 36.1) [22.2]	38.5 (28.8, 48.1) [42.8]	23.6 (16.0, 31.2) [20.5]
Tobacco use	17.8 (9.8, 25.8) [13.9]	26.8 (15.3, 38.2) [21.3]	34.8 (25.7, 43.9) [36.0]	20.7 (13.9, 27.5) [28.8]
Alcohol abuse	12.4 (6.1, 18.6) [9.6]	19.5 (8.1, 31.0) [12.0]	33.3 (24.2, 42.4) [39.7]	34.8 (25.9, 43.7) [38.6]
Drug abuse	12.3 (5.7, 18.8) [7.9]	8.2 (3.4, 12.9) [17.4]	28.8 (20.1, 37.5) [16.4]	50.8 (40.5, 61.1) [68.3]
Childhood obesity	4.8 (1.1, 8.6) [4.2]	18.0 (10.9, 25.1) [14.1]	44.7 (34.0, 55.4) [43.1]	32.5 (23.6, 41.4) [38.6]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	7.5 (2.5, 12.6) [9.7]	12.2 (6.2, 18.2) [16.5]	36.2 (26.9, 45.5) [39.6]	44.1 (33.3, 54.8) [34.3]
Lack of affordable facilities or programs for year-round physical activity or recreation	8.4 (2.8, 14.0) [10.6]	15.1 (8.0, 22.2) [18.4]	38.9 (29.3, 48.4) [38.3]	37.7 (27.0, 48.3) [32.7]
Lack of programs and services to help seniors maintain their health and independence	7.1 (1.4, 12.8) [5.1]	14.8 (7.4, 22.2) [14.7]	38.4 (28.8, 48.0) [41.9]	39.7 (29.1, 50.2) [38.4]
Shortage of long-term care (nursing home beds)/lack of affordable services	11.3 (5.0, 17.6) [13.0]	20.6 (12.4, 28.7) [19.5]	44.6 (34.0, 55.2) [34.4]	23.5 (16.1, 30.9) [33.1]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	9.6 (3.4, 15.7) [7.4]	18.4 (10.8, 26.0) [17.4]	44.9 (34.2, 55.5) [39.5]	27.1 (19.2, 35.1) [35.7]

Table 14-16: Community Health Issues and Priorities — Luce County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	8.4 (1.8, 15.0) [4.2]	5.3 (2.2, 8.4) [6.0]	40.7 (30.5, 50.9) [33.4]	45.5 (36.0, 55.1) [56.4]
Lack of health insurance	2.1 (0.02, 4.2) [4.0]	4.5 (1.6, 7.4) [6.8]	37.8 (28.5, 47.1) [37.5]	55.6 (46.0, 65.2) [51.7]
Health insurance is expensive or has high costs for co-pays and deductibles	1.5 (0.3, 2.6) [3.8]	1.9 (0.2, 3.5) [2.0]	41.5 (31.4, 51.6) [24.5]	55.1 (45.1, 65.1) [69.6]
Shortage of mental health programs and services, or lack of affordable mental health care	7.0 (0.7, 13.4) [8.2]	8.7 (4.4, 13.0) [11.0]	37.9 (28.1, 47.7) [38.2]	46.4 (36.6, 56.1) [42.5]
Shortage of substance abuse treatment programs and services/lack of affordable care	13.1 (3.5, 22.7) [8.9]	11.8 (6.5, 17.2) [11.3]	36.1 (27.2, 45.1) [44.3]	38.9 (29.4, 48.4) [35.5]
Shortage of dentists, or lack of affordable dental care	6.1 (2.1, 10.1) [15.3]	12.4 (5.4, 19.4) [19.6]	41.8 (32.7, 51.0) [38.2]	39.7 (29.5, 49.8) [26.9]
Transportation to non-emergency medical care	21.4 (11.4, 31.5) [13.0]	19.2 (12.4, 26.0) [26.7]	43.1 (33.4, 52.8) [38.2]	16.2 (10.6, 21.9) [22.0]
Tobacco use	18.5 (10.5, 26.4) [14.7]	22.1 (13.5, 30.7) [19.7]	22.1 (23.5, 41.9) [32.5]	26.7 (18.6, 34.9) [33.1]
Alcohol abuse	14.5 (7.3, 21.7) []	12.5 (7.0, 18.0) [17.3]	33.4 (24.0, 42.8) [31.2]	39.6 (30.0, 49.2) [41.9]
Drug abuse	10.8 (4.1, 17.5) [6.5]	7.6 (3.3, 12.0) [7.3]	20.4 (13.8, 26.9) [28.4]	61.2 (52.1, 70.4) [57.8]
Childhood obesity	10.5 (3.6, 17.5) [5.8]	13.0 (7.2, 18.7) [19.9]	44.8 (35.0, 54.7) [30.7]	31.7 (22.5, 40.9) [43.5]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	7.2 (3.0, 11.4) [11.0]	16.2 (9.0, 23.4) [18.4]	37.8 (28.9, 46.7) [30.9]	38.8 (28.7, 48.9) [39.6]
Lack of affordable facilities or programs for year-round physical activity or recreation	7.3 (1.2, 13.4) [9.7]	17.3 (11.0, 23.7) [21.3]	37.7 (28.2, 47.2) [29.3]	37.7 (28.1, 47.2) [39.6]
Lack of programs and services to help seniors maintain their health and independence	4.9 (0.0, 10.8) [6.3]	16.2 (9.6, 22.8) [15.3]	39.6 (30.0, 49.3) [44.9]	39.2 (29.7, 48.8) [33.4]
Shortage of long-term care (nursing home beds)/lack of affordable services	11.3 (1.8, 20.8) [7.5]	10.3 (5.1, 15.5) [15.6]	39.1 (30.1, 48.1) [42.0]	39.3 (29.7, 49.0) [34.9]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	7.3 (1.1, 13.6) [7.5]	9.2 (4.6, 13.7) [12.9]	36.1 (27.3, 44.9) [36.2]	47.4 (37.5, 57.3) [43.4]

Table 14-17: Community Health Issues and Priorities — Mackinac County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	5.8 (1.7, 9.8) [2.4]	3.3 (0.01, 6.7) [9.3]	41.4 (32.4, 50.5) [36.2]	49.4 (40.2, 58.6) [52.2]
Lack of health insurance	4.1 (1.3, 7.0) [2.0]	2.8 (1.1, 4.5) [6.1]	44.8 (35.5, 54.1) [34.9]	48.2 (39.0, 57.4) [57.0]
Health insurance is expensive or has high costs for co-pays and deductibles	3.0 (0.6, 5.3) [0.5]	3.7 (1.0, 6.3) [6.8]	33.5 (25.0, 42.0) [18.5]	59.8 (51.1, 68.6) [74.2]
Shortage of mental health programs and services, or lack of affordable mental health care	4.8 (1.7, 8.0) [11.0]	13.8 (7.3, 20.3) [13.9]	39.9 (30.8, 49.0) [43.4]	41.5 (32.3, 50.6) [31.6]
Shortage of substance abuse treatment programs and services/lack of affordable care	7.8 (3.6, 12.0) [12.0]	12.5 (6.2, 18.8) [11.6]	42.6 (33.6, 51.7) [42.7]	37.1 (27.9, 46.2) [33.7]
Shortage of dentists, or lack of affordable dental care	9.9 (4.0, 15.8) [8.8]	21.9 (13.3, 30.6) [22.6]	38.4 (29.4, 47.3) [31.8]	29.8 (22.2, 37.4) [36.8]
Transportation to non-emergency medical care	10.9 (4.9, 16.9) [10.6]	27.0 (17.9, 36.0) [36.9]	41.0 (31.8, 50.1) [32.0]	21.2 (15.0, 27.4) [20.6]
Tobacco use	11.8 (6.8, 16.8) [10.6]	27.6 (18.7, 36.5) [24.8]	45.9 (36.6, 55.2) [42.4]	14.8 (10.0, 19.5) [22.1]
Alcohol abuse	8.3 (4.1, 12.6) [7.3]	15.7 (7.2, 24.3) [9.6]	43.5 (34.4, 52.7) [34.5]	32.4 (24.6, 40.2) [48.5]
Drug abuse	8.0 (3.8, 12.3) [4.6]	10.5 (3.8, 17.2) [5.9]	40.8 (31.3, 50.3) [25.4]	40.7 (32.1, 49.2) [64.1]
Childhood obesity	6.6 (3.0, 10.3) [5.0]	15.8 (8.4, 23.2) [9.3]	48.2 (38.9, 57.5) [38.6]	29.4 (21.7, 37.1) [47.2]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	5.9 (2.4, 9.4) [6.6]	25.2 (17.0, 33.4) [13.1]	38.3 (29.0, 47.5) [37.8]	38.3 (29.0, 47.5) [42.6]
Lack of affordable facilities or programs for year-round physical activity or recreation	9.8 (5.2, 14.4) [8.5]	19.7 (12.4, 27.0) [17.2]	36.0 (27.1, 44.9) [39.5]	34.5 (25.5, 43.5) [34.7]
Lack of programs and services to help seniors maintain their health and independence	4.2 (1.1, 7.2) [3.8]	16.9 (10.6, 23.1) [14.9]	43.1 (34.0, 52.3) [41.7]	35.9 (27.1, 44.6) [39.5]
Shortage of long-term care (nursing home beds)/lack of affordable services	9.1 (3.0, 15.1) [12.7]	15.7 (9.5, 21.8) [15.7]	36.6 (27.7, 45.4) [40.1]	38.7 (29.8, 47.5) [31.5]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	8.0 (2.0, 14.0) [9.4]	13.8 (7.2, 20.4) [11.7]	45.9 (36.6, 55.2) [35.1]	32.3 (24.5, 40.2) [43.8]

Table 14-18: Community Health Issues and Priorities — Marquette County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	4.6 (1.9, 7.4) [2.3]	5.0 (0.6, 9.3) [3.9]	51.6 (41.3, 61.8) [48.2]	38.8 (28.9, 48.7) [45.6]
Lack of health insurance	4.1 (1.4, 6.7) [2.0]	7.5 (1.0, 13.9) [4.2]	40.2 (29.6, 50.7) [38.8]	48.3 (38.1, 58.4) [55.0]
Health insurance is expensive or has high costs for co-pays and deductibles	2.6 (0.4, 4.9) [1.4]	5.9 (0.0, 12.3) [3.3]	32.2 (21.7, 42.6) [28.9]	59.2 (48.6, 69.9) [66.4]
Shortage of mental health programs and services, or lack of affordable mental health care	6.6 (0.2, 12.9) [2.7]	5.9 (2.5, 9.2) [14.7]	36.3 (25.8, 46.9) [43.8]	51.2 (40.9, 61.6) [38.8]
Shortage of substance abuse treatment programs and services/lack of affordable care	7.1 (0.8, 13.5) [1.7]	16.4 (8.1, 24.7) [18.0]	43.0 (32.7, 53.3) [42.8]	33.5 (24.7, 42.2) [37.5]
Shortage of dentists, or lack of affordable dental care	18.5 (8.4, 28.7) [7.7]	23.0 (14.1, 31.9) [20.5]	36.1 (26.4, 45.7) [40.2]	22.4 (15.8, 28.9) [31.6]
Transportation to non-emergency medical care	15.5 (7.7, 23.3) [11.0]	22.8 (14.9, 30.7) [29.2]	46.8 (36.4, 57.2) [42.2]	14.9 (8.3, 21.6) [17.6]
Tobacco use	21.4 (12.0, 30.8) [13.4]	31.8 (21.2, 42.3) [24.2]	33.7 (24.8, 42.6) [44.1]	13.2 (7.9, 18.4) [18.3]
Alcohol abuse	15.2 (6.2, 24.1) [9.8]	26.4 (15.7, 37.0) [10.7]	36.9 (27.6, 46.1) [50.0]	21.6 (15.2, 28.0) [29.5]
Drug abuse	17.1 (7.7, 26.4) [6.9]	14.7 (5.1, 24.3) [4.4]	27.6 (19.2, 36.0) [31.8]	40.6 (31.4, 49.7) [56.9]
Childhood obesity	10.7 (3.4, 18.0) [7.7]	15.2 (5.9, 24.5) [16.1]	41.5 (31.5, 51.5) [41.8]	32.7 (23.6, 41.7) [34.4]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	13.4 (5.0, 21.9) [10.4]	19.8 (11.9, 27.7) [20.0]	37.7 (27.8, 47.7) [36.5]	29.0 (20.1, 38.0) [33.1]
Lack of affordable facilities or programs for year-round physical activity or recreation	17.4 (8.8, 26.0) [13.8]	22.2 (14.1, 30.4) [19.8]	33.9 (24.2, 43.5) [37.2]	26.5 (17.6, 35.4) [29.1]
Lack of programs and services to help seniors maintain their health and independence	7.3 (0.8, 13.7) [6.4]	22.9 (13.7, 32.1) [15.4]	47.7 (37.3, 58.0) [45.4]	22.1 (15.7, 28.5) [32.7]
Shortage of long-term care (nursing home beds)/lack of affordable services	9.0 (2.2, 15.8) [7.4]	24.9 (14.3, 35.5) [12.6]	38.1 (28.4, 47.8) [42.1]	28.0 (20.3, 35.6) [37.9]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	11.2 (3.0, 19.4) [6.0]	16.1 (9.2, 22.9) [11.2]	48.9 (38.5, 59.2) [48.4]	23.9 (17.0, 30.7) [34.4]

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	3.9 (1.2, 6.6) [4.4]	11.1 (3.7, 18.5) [4.3]	44.1 (32.8, 55.4) [37.9]	40.9 (28.3, 53.5) [53.4]
Lack of health insurance	3.0 (0.3, 5.6) [2.7]	16.4 (7.5, 25.2) [9.1]	47.7 (35.7, 59.7) [32.3]	33.0 (23.2, 42.7) [55.9]
Health insurance is expensive or has high costs for co-pays and deductibles	2.9 (0.2, 5.7) [0.7]	6.9 (0.07, 13.8) [6.4]	26.2 (17.4, 35.0) [18.3]	64.0 (53.4, 74.6) [74.7]
Shortage of mental health programs and services, or lack of affordable mental health care	7.6 (2.7, 12.4) [6.8]	21.8 (7.9, 34.8) [20.4]	33.4 (23.2, 43.6) [40.5]	37.2 (26.8, 47.7) [32.3]
Shortage of substance abuse treatment programs and services/lack of affordable care	6.4 (2.1, 10.7) [4.5]	21.7 (8.1, 35.2) [15.9]	35.4 (24.9, 45.9) [43.5]	36.6 (26.0, 47.2) [36.1]
Shortage of dentists, or lack of affordable dental care	11.9 (5.8, 17.9) [13.4]	36.4 (23.3, 49.5) [17.7]	28.5 (19.4, 37.6) [36.2]	23.2 (14.6, 31.8) [32.7]
Transportation to non-emergency medical care	11.5 (5.8, 17.3) [10.4]	43.2 (30.6, 55.8) [19.1]	29.2 (19.7, 38.7) [45.2]	16.1 (9.1, 23.0) [25.3]
Tobacco use	15.2 (7.8, 22.5) [20.1]	38.1 (25.2, 51.0) [24.1]	28.8 (19.7, 37.8) [37.3]	17.9 (10.2, 25.6) [18.5]
Alcohol abuse	9.3 (4.0, 14.5) [7.3]	26.2 (12.2, 40.2) [21.5]	39.1 (28.4, 49.8) [35.5]	25.4 (16.8, 34.1) [35.6]
Drug abuse	8.5 (3.5, 13.5) [4.6]	10.1 (3.2, 17.0) [5.4]	26.6 (16.9, 36.3) [30.0]	54.8 (43.2, 66.4) [60.0]
Childhood obesity	8.8 (3.9, 13.7) [3.5]	18.3 (9.2, 27.4) [18.9]	45.7 (33.7, 57.8) [46.4]	27.2 (17.6, 36.7) [31.2]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	18.5 (5.3, 31.7) [8.3]	31.2 (20.7, 41.7) [17.2]	22.2 (14.7, 29.7) [35.3]	28.1 (18.3, 37.9) [39.3]
Lack of affordable facilities or programs for year-round physical activity or recreation	18.2 (4.7, 31.7) [8.2]	25.1 (16.7, 33.6) [16.4]	27.1 (17.6, 36.7) [49.8]	29.5 (19.5, 39.6) [25.7]
Lack of programs and services to help seniors maintain their health and independence	6.1 (1.4, 10.9) [5.9]	26.1 (12.5, 39.6) [20.8]	37.0 (26.4, 47.7) [39.2]	30.8 (21.0, 40.6) [34.1]
Shortage of long-term care (nursing home beds)/lack of affordable services	11.5 (4.9, 18.2) [6.9]	26.2 (12.6, 39.9) [14.5]	34.2 (24.1, 44.4) [53.5]	28.0 (18.9, 37.1) [25.1]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	9.4 (2.9, 15.8) [4.1]	27.0 (13.5, 40.5) [19.4]	37.2 (26.8, 47.5) [35.3]	26.5 (17.2, 35.7) [41.2]

Table 14-20: Community Health Issues and Priorities — Ontonagon County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	7.6 (2.7, 12.5) [3.2]	2.2 (0.4, 4.0) [1.6]	38.3 (28.9, 47.7) [20.3]	51.9 (43.0, 60.7) [74.9]
Lack of health insurance	6.5 (2.3, 10.8) [3.1]	7.6 (2.9, 12.3) [4.2]	32.1 (23.8, 40.5) [32.6]	53.8 (45.1, 62.5) [60.1]
Health insurance is expensive or has high costs for co-pays and deductibles	6.6 (2.0, 11.1) [2.0]	2.2 (0.5, 3.9) [1.7]	36.7 (27.3, 46.1) [25.2]	54.5 (45.5, 63.5) [71.0]
Shortage of mental health programs and services, or lack of affordable mental health care	9.9 (4.8, 15.1) [10.9]	6.2 (2.2, 10.1) [11.3]	37.9 (29.3, 46.5) [38.7]	46.0 (37.3, 54.6) [39.1]
Shortage of substance abuse treatment programs and services/lack of affordable care	11.6 (6.0, 17.2) [10.1]	10.2 (5.2, 15.2) [12.4]	36.7 (28.2, 45.2) [37.9]	41.5 (32.9, 50.1) [39.5]
Shortage of dentists, or lack of affordable dental care	9.1 (4.4, 13.8) [13.9]	9.4 (5.5, 13.2) [14.6]	45.3 (36.3, 54.2) [39.3]	36.2 (28.4, 44.1) [32.3]
Transportation to non-emergency medical care	11.1 (5.7, 16.4) [15.5]	16.8 (9.6, 24.0) [17.7]	49.1 (40.3, 57.9) [39.4]	23.0 (17.0, 29.0) [27.5]
Tobacco use	21.4 (14.3, 28.6) [20.9]	22.2 (15.3, 29.1) [21.1]	25.6 (19.6, 31.7) [33.0]	30.7 (21.5, 39.9) [24.9]
Alcohol abuse	12.2 (6.9, 17.5) [19.4]	15.3 (8.8, 21.8) [13.4]	31.9 (24.8, 39.0) [31.5]	40.6 (31.6, 49.6) [35.7]
Drug abuse	11.0 (5.9, 16.1) [12.8]	8.4 (3.6, 13.1) [7.2]	25.0 (18.6, 31.4) [19.8]	55.6 (47.2, 64.0) [60.3]
Childhood obesity	8.6 (3.9, 13.2) [10.2]	15.3 (8.1, 22.4) [12.6]	44.1 (35.6, 52.6) [42.8]	32.1 (23.7, 40.4) [34.4]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	11.6 (6.2, 17.0) [11.2]	16.5 (10.4, 22.7) [14.9]	33.3 (25.2, 41.4) [35.6]	38.6 (29.9, 47.2) [38.3]
Lack of affordable facilities or programs for year-round physical activity or recreation	8.7 (3.7, 13.7) [12.7]	15.5 (9.8, 21.2) [16.9]	38.3 (29.6, 47.1) [39.6]	37.5 (29.2, 45.7) [30.8]
Lack of programs and services to help seniors maintain their health and independence	7.8 (3.0, 12.7) [6.3]	13.6 (5.8, 21.4) [15.7]	34.5 (25.9, 43.2) [37.4]	44.0 (35.7, 52.3) [40.6]
Shortage of long-term care (nursing home beds)/lack of affordable services	7.9 (2.8, 13.0) [7.0]	6.3 (2.4, 10.2) [12.9]	34.9 (25.7, 44.1) [31.2]	50.9 (42.1, 59.6) [48.9]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	5.0 (1.1, 9.0) [5.6]	12.3 (6.1, 18.4) [12.6]	33.4 (24.3, 42.4) [34.5]	49.3 (40.7, 58.0) [47.3]

Table 14-21: Community Health Issues and Priorities — Schoolcraft County

Community Health Issues	Not an issue, or of very little importance	Fairly unimportant	Fairly important	Very important — should be a priority
	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]	% (95%CI) [2017 value]
Unemployment, wages, and economic conditions	2.2 (0.0, 4.4) [2.2]	3.1 (0.6, 5.6) [2.6]	40.0 (27.5, 52.4) [26.7]	54.8 (42.5, 67.0) [68.5]
Lack of health insurance	2.9 (0.4, 5.3) [5.2]	4.9 (0.7, 9.2) [4.7]	47.9 (35.5, 60.3) [24.2]	44.3 (33.1, 55.5) [66.0]
Health insurance is expensive or has high costs for co-pays and deductibles	1.3 (0.0, 3.0) [2.5]	5.4 (1.7, 9.1) [4.0]	33.2 (21.9, 44.5) [14.6]	60.2 (48.5, 71.8) [78.8]
Shortage of mental health programs and services, or lack of affordable mental health care	9.9 (0.0, 20.7) [4.8]	16.6 (5.6, 27.6) [9.4]	42.3 (30.6, 54.0) [40.0]	31.2 (22.4, 40.0) [45.7]
Shortage of substance abuse treatment programs and services/lack of affordable care	11.1 (0.3, 21.8) [9.7]	8.1 (3.3, 13.0) [11.7]	52.8 (40.9, 64.7) [33.4]	28.0 (19.7, 36.3) [45.2]
Shortage of dentists, or lack of affordable dental care	13.4 (2.7, 24.1) [13.3]	24.2 (11.3, 37.2) [13.3]	34.3 (24.0, 44.6) [39.3]	28.1 (807, 36.4) [34.1]
Transportation to non-emergency medical care	18.5 (7.7, 29.2) [15.5]	27.3 (15.6, 38.9) [21.5]	38.0 (26.7, 49.4) [43.1]	16.2 (10.1, 22.3) [20.0]
Tobacco use	18.0 (7.1, 28.8) [10.5]	22.7 (11.5, 33.9) [18.3]	37.5 (26.0, 48.9) [47.2]	21.9 (14.5, 29.2) [24.1]
Alcohol abuse	16.2 (5.4, 27.0) [6.6]	20.5 (8.1, 32.8) [10.7]	33.8 (23.0, 44.5) [42.6]	29.6 (20.9, 38.2) [40.0]
Drug abuse	7.9 (3.6, 12.2) [5.3]	12.1 (1.2, 23.1) [4.5]	24.7 (15.4, 33.9) [26.2]	55.3 (43.2, 67.3) [64.0]
Childhood obesity	4.7 (1.5, 7.8) [7.8]	11.3 (5.5, 17.1) [8.9]	52.1 (40.3, 63.9) [38.2]	31.9 (22.7, 41.2) [45.1]
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	6.8 (2.9, 10.8) [5.2]	27.2 (14.6, 39.8) [13.7]	32.1 (20.2, 44.0) [34.0]	33.9 (24.3, 43.5) [47.1]
Lack of affordable facilities or programs for year-round physical activity or recreation	5.6 (2.3, 8.8) [6.4]	22.0 (11.1, 32.8) [15.2]	39.5 (26.8, 52.2) [37.4]	33.0 (23.5, 42.5) [41.0]
Lack of programs and services to help seniors maintain their health and independence	3.2 (0.9, 5.5) [10.0]	29.1 (15.5, 42.8) [10.2]	33.8 (22.6, 45.0) [42.8]	33.9 (24.3, 43.4) [37.0]
Shortage of long-term care (nursing home beds)/lack of affordable services	5.4 (1.8, 9.0) [10.2]	25.2 (12.9, 37.4) [13.0]	43.0 (30.9, 55.1) [40.4]	26.4 (18.5, 34.4) [36.4]
Lack of programs and housing for people with Alzheimer’s Disease and dementia	2.9 (0.5, 5.3) [4.7]	26.4 (12.7, 40.2) [14.1]	33.7 (22.6, 44.8) [41.8]	37.0 (27.0, 46.9) [39.4]

Table 14-22: Demographic Factors Impact on Priorities, 2017, 2021

Priority	Education Level	Income Level	Age	Sex	County of Residence
	adjOR (95%CI)	adjOR (95%CI)	adjOR (95%CI)	adjOR (95%CI)	χ^2_{13} , p-value
Health insurance is expensive or has high costs for co-pays and deductibles					
2017	0.84 (0.78, 0.91)	0.95 (0.87, 1.04)	1.000 (0.996, 1.005)	1.40 (1.23, 1.59)	12.1, .5155
2021	0.82 (0.75, 0.90)	0.90 (0.81, 0.99)	0.996 (0.991, 1.001)	1.44 (1.25, 1.66)	21.5, .0633
Drug use					
2017	0.98 (0.91, 1.05)	1.10 (1.01, 1.20)	1.009 (1.005, 1.013)	1.36 (1.21, 1.55)	58.6, <.0001
2021	0.99 (0.91, 1.08)	1.04 (0.95, 1.15)	1.008 (1.003, 1.013)	1.67 (1.45, 1.93)	45.9, <.0001
Transportation to non-emergency medical care					
2017	0.77 (0.70, 0.84)	0.70 (0.63, 0.77)	1.007 (1.002, 1.012)	1.63 (1.40, 1.91)	23.2, .0391
2021	0.88 (0.79, 0.98)	0.68 (0.61, 0.76)	1.009 (1.003, 1.016)	1.87 (1.56, 2.24)	20.2, .0894
Tobacco use					
2017	0.91 (0.84, 0.99)	0.87 (0.79, 0.95)	1.015 (1.011, 1.020)	1.22 (1.07, 1.40)	29.2, .0061
2021	0.98 (0.88, 1.08)	0.92 (0.82, 1.03)	1.017 (1.011, 1.023)	1.52 (1.28, 1.80)	14.8, .3189
Lack of programs and services to help seniors maintain their health and independence					
2017	0.80 (0.75, 0.87)	0.84 (0.76, 0.93)	1.003 (0.998, 1.007)	1.70 (1.49, 1.94)	11.3, .5828
2021	0.84 (0.77, 0.92)	0.76 (0.68, 0.83)	1.007 (1.001, 1.012)	1.85 (1.59, 2.16)	23.5, .0357
Shortage of long-term care (nursing home beds)/lack of affordable services					
2017	0.77 (0.71, 0.83)	0.81 (0.75, 0.89)	1.012 (1.007, 1.016)	1.51 (1.33, 1.72)	13.4, <.0001
2021	0.81 (0.74, 0.89)	0.84 (0.76, 0.93)	1.015 (1.010, 1.020)	1.55 (1.34, 1.80)	45.3, <.0001
Lack of health insurance					
2017	0.82 (0.77, 0.89)	0.88 (0.81, 0.96)	1.010 (1.006, 1.015)	1.39 (1.23, 1.58)	16.7, .2126
2021	0.82 (0.75, 0.89)	0.88 (0.80, 0.97)	1.006 (1.001, 1.011)	1.65 (1.43, 1.90)	18.9, .1253
Unemployment, wages, and economic conditions					
2017	0.99 (0.91, 1.06)	1.00 (0.92, 1.09)	1.001 (0.997, 1.006)	1.40 (1.24, 1.58)	104.1, <.0001
2021	0.93 (0.85, 1.02)	0.99 (0.90, 1.10)	1.002 (0.997, 1.007)	1.53 (1.33, 1.77)	37.9, .0003

Table 14-22: Demographic Factors (Continued)

Priority	Education Level	Income Level	Age	Sex	County of Residence
	adjOR (95%CI)	adjOR (95%CI)	adjOR (95%CI)	adjOR (95%CI)	χ^2_{13} , p-value
Shortage of substance abuse treatment programs and services/lack of affordable care					
2017	0.93 (0.86, 1.01)	0.95 (0.88, 1.04)	1.000 (0.996, 1.004)	2.07 (1.82, 2.35)	15.8, .2593
2021	1.01 (0.92, 1.10)	0.93 (0.84, 1.03)	0.993 (0.989, 0.998)	2.30 (1.97, 2.68)	11.7, .5486
Shortage of mental health programs and services, or lack of affordable mental health care					
2017	0.96 (0.89, 1.04)	0.98 (0.90, 1.06)	0.993 (0.989, 0.997)	2.04 (1.79, 2.33)	14.8, .3183
2021	1.01 (0.93, 1.11)	0.98 (0.89, 1.08)	0.982 (0.978, 0.987)	2.53 (2.18, 2.94)	25.1, .0224
Lack of programs and housing for people with Alzheimer’s Disease and dementia					
2017	0.79 (0.74, 0.85)	0.82 (0.76, 0.90)	1.016 (1.012, 1.020)	1.57 (1.38, 1.78)	32.3, .0022
2021	0.77 (0.71, 0.84)	0.88 (0.79, 0.97)	1.013 (1.008, 1.018)	1.67 (1.44, 1.94)	43.7, <.0001
Alcohol use					
2017	1.03 (0.96, 1.11)	0.97 (0.90, 1.06)	1.013 (1.009, 1.017)	1.68 (1.48, 1.90)	40.4, .0001
2021	1.07 (0.98, 1.18)	0.91 (0.83, 1.01)	1.015 (1.010,1.020)	1.88 (1.62, 2.19)	18.2, .1515
Childhood obesity					
2017	0.96 (0.89, 1.03)	0.95 (0.88, 1.03)	1.004 (1.000, 1.008)	1.26 (1.11, 1.43)	26.7, .0137
2021	1.02 (0.93, 1.11)	0.97 (0.87, 1.07)	1.009 (1.003, 1.014)	1.49 (1.28, 1.73)	12.4, .4974
Lack of affordable healthy foods, including year-round fresh fruits and vegetables					
2017	0.81 (0.75, 0.88)	0.69 (0.63, 0.76)	0.981 (0.977, 0.985)	1.89 (1.64, 2.17)	33.0, .0017
2021	0.89 (0.81, 0.98)	0.72 (0.65, 0.80)	0.986 (0.981, 0.991)	2.17 (1.84, 2.55)	18.7, .1318
Shortage of dentists, or lack of affordable dental care					
2017	0.81 (0.75, 0.88)	0.64 (0.59, 0.70)	0.998 (0.994, 1.003)	1.77 (1.54, 2.04)	15.8, .2652
2021	0.81 (0.73, 0.88)	0.73 (0.66, 0.81)	0.995 (0.990, 1.000)	1.98 (1.69, 2.32)	118.7, <.0001
Lack of affordable facilities or programs for year-round physical activity or recreation					
2017	0.92 (0.85, 0.99)	0.73 (0.67, 0.80)	0.981 (0.977, 0.985)	1.83 (1.58, 2.11)	36.9, .0004
2021	0.96 (0.88, 1.06)	0.89 (0.80, 0.98)	0.985 (0.90, 0.990)	1.95 (1.66, 2.29)	32.7, .0019

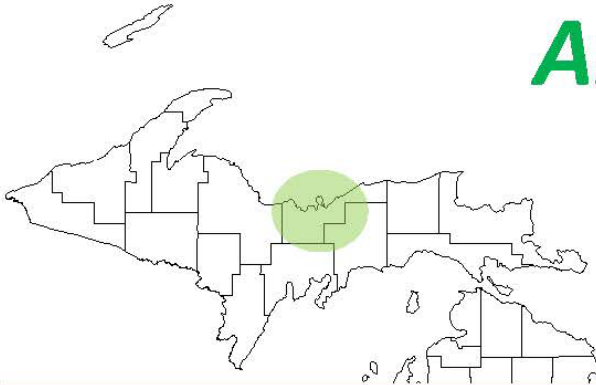
15 COUNTY DASHBOARDS

The following 30 pages feature fifteen 2-page County Dashboards, which are handy references that can be printed on two sides for use by citizens and planners. They appear alphabetically by county name. Each front page has basic demographics and economic data and selected health survey data. Each back page contains a table of health priorities as ranked by the county's residents and a spotlight on the health needs of the growing senior population.

Alger County

2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna2



Fast Facts

Indicator	Alger County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-8.59% (9,862 to 9,015)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	17.4%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	12.6%	13.0%
Percentage of Children Under 18 Living in Poverty (YEARS) ³	15.6%	17.5%
Birth Rate per 1,000 population ⁴	6.48	8.36*
Percent Change in Birth Rates from 2009 to 2019	-10.06%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1297.1	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	778.8	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Alger County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	16.1%	15.5%
Unable to Access Healthcare Due to Cost	11.0%	7.9%
No Routine Checkup in Past 12 Months	21.3%	23.4%
No Dental Care Past 12 Months	37.2%	28.2%
Obese (Body Mass Index 30.0 or Greater)	42.0%	35.2%
Current Cigarette Smoker	23.5%	18.4%
Former Smoker	36.6%	27.1%
5+ Daily Servings of Fruits and Vegetables	9.7%	NA
Ever Diagnosed With Diabetes	11.4%	12.3%
Ever Diagnosed With Heart Disease	11.4%	5.0%
Ever Diagnosed With Cancer	19.7%	12.4%
Ever Diagnosed With Depressive Disorder	23.8 %	19.5%
Took Medication for Mood Past 12 Months	27.7%	NA
Heavy Alcohol Drinker	17.0%	6.8%
Binge Alcohol Drinker	13.6%	17.4%
Used Marijuana Past 30 days	22.0%	NA
Ever Used Prescription Drugs to Get High	4.3%	NA
Had Flu Shot in Past 12 Months, Age 65+	79.3%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	73.2%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

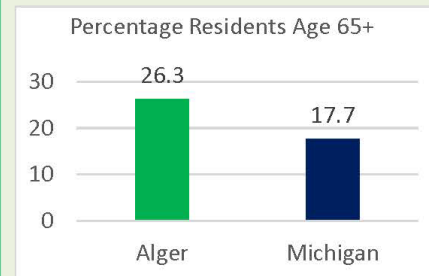
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

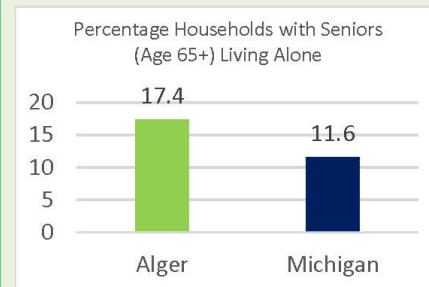
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Alger County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	71.9%
Unemployment, wages and economic conditions	52.7%
Lack of health insurance	52.1%
Drug abuse	47.6%
Shortage of mental health programs and services, or lack of affordable mental health care	45.7%
Lack of programs and services to help seniors maintain their health and independence	44.4%
Shortage of substance abuse treatment programs and services	40.8
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	39.1%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	39.1%
Childhood obesity	37.6%

Senior Spotlight³



Alger County has a much higher proportion of seniors than the state and nation, at more than one-fourth. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.

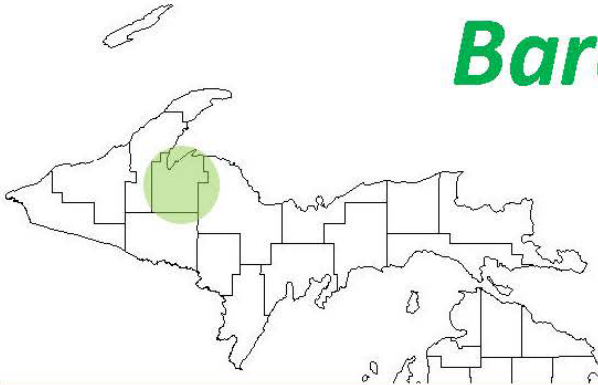


About 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) UPDATE 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Baraga County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna²

Fast Facts

Indicator	Baraga County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-6.65% (8,746 to 8,164)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	14.5%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.7%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	23.8%	17.5%
Birth Rate per 1,000 population ⁴	7.19	8.36*
Percent Change in Birth Rates from 2009 to 2019	-13.94%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1262.0	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	822.9	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Baraga County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	16.9%	15.5%
Unable to Access Healthcare Due to Cost	10.5%	7.9%
No Routine Checkup in Past 12 Months	26.3%	23.4%
No Dental Care Past 12 Months	32.6%	28.2%
Obese (Body Mass Index 30.0 or Greater)	45.5%	35.2%
Current Cigarette Smoker	17.1%	18.4%
Former Smoker	41.2%	27.1%
5+ Daily Servings of Fruits and Vegetables	7.6%	NA
Ever Diagnosed With Diabetes	13.0%	12.3%
Ever Diagnosed With Heart Disease	11.2%	5.0%
Ever Diagnosed With Cancer	16.7%	12.4%
Ever Diagnosed With Depressive Disorder	21.9%	19.5%
Took Medication for Mood Past 12 Months	15.7%	NA
Heavy Alcohol Drinker	16.1%	6.8%
Binge Alcohol Drinker	11.0%	17.4%
Used Marijuana Past 30 days	14.2%	NA
Ever Used Prescription Drugs to Get High	6.2%	NA
Had Flu Shot in Past 12 Months, Age 65+	77.9%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	68.0%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

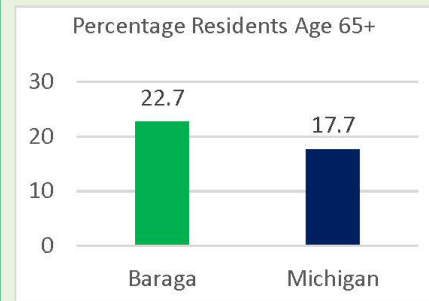
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

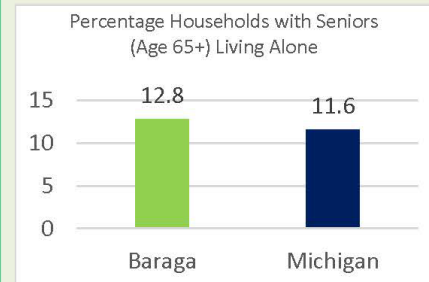
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Baraga County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Drug Abuse	72.9%
Health Insurance is expensive or has high costs for co-pays and deductibles	53.6%
Unemployment, wages and economic conditions	52.4%
Alcohol abuse	44.3
Shortage of mental health program and services	43.5%
Lack of health insurance	43.4%
Shortage of substance abuse treatment programs and services	42.2%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	36.3%
Childhood obesity and overweight	35.1%
Shortage of long-term care (nursing beds) or lack of affordable long-term care and services	33.3%

Senior Spotlight³



Baraga County has a larger proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-8 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Chippewa County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2

Fast Facts

Indicator	Chippewa County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-4.11% (38,543 to 36,958)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	21.0%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	18.3%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	25.4%	17.5%
Birth Rate per 1,000 population ⁴	8.06	8.36*
Percent Change in Birth Rates from 2009 to 2019	-23.35%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1116.8	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	847.0	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Chippewa County (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	15.6%	15.5%
Unable to Access Healthcare Due to Cost	10.9%	7.9%
No Routine Checkup in Past 12 Months	27.9%	23.4%
No Dental Care Past 12 Months	35.1%	28.2%
Obese (Body Mass Index 30.0 or Greater)	27.0%	35.2%
Current Cigarette Smoker	18.4%	18.4%
Former Smoker	35.1%	27.1%
5+ Daily Servings of Fruits and Vegetables	5.0%	NA
Ever Diagnosed With Diabetes	10.2%	12.3%
Ever Diagnosed With Heart Disease	11.2%	5.0%
Ever Diagnosed With Cancer	16.3%	12.4%
Ever Diagnosed With Depressive Disorder	30.7%	19.5%
Took Medication for Mood Past 12 Months	33.1%	NA
Heavy Alcohol Drinker	21.3%	6.8%
Binge Alcohol Drinker	13.3%	17.4%
Used Marijuana Past 30 days	23.9%	NA
Ever Used Prescription Drugs to Get High	8.5%	NA
Had Flu Shot in Past 12 Months, Age 65+	73.9%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	81.9%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

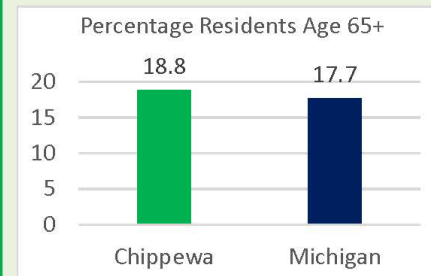
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

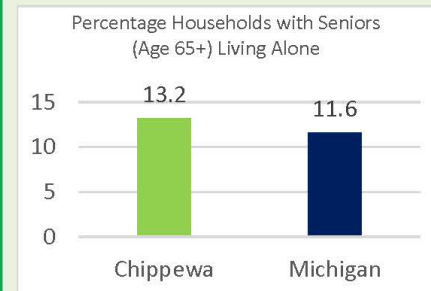
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Chippewa County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	66.2%
Short of dentists, or lack of affordable dental care	59.8%
Lack of health insurance	59.0%
Drug abuse	57.1%
Unemployment, wages and economic conditions	55.7%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	52.3%
Shortage of mental health programs and services	48.8%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	47.1%
Shortage of substance abuse treatment programs and services	44.3%
Lack of affordable facilities or programs for year-round physical activity or recreation	44.0%

Senior Spotlight³



Chippewa County has a larger proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.

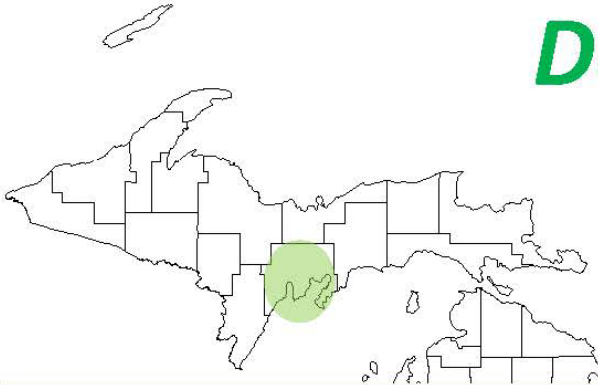


About 1-in-8 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Delta County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2

Fast Facts

Indicator	Delta County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-7.55% (38,520 to 35,612)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	21.5%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.8%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	15.7%	17.5%
Birth Rate per 1,000 population ⁴	9.31	8.36*
Percent Change in Birth Rates from 2009 to 2019	-14.45%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1305.2	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	790.1	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Delta County (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	7.3%	15.5%
Unable to Access Healthcare Due to Cost	1.9%	7.9%
No Routine Checkup in Past 12 Months	19.0%	23.4%
No Dental Care Past 12 Months	14.8%	28.2%
Obese (Body Mass Index 30.0 or Greater)	56.2%	35.2%
Current Cigarette Smoker	7.9%	18.4%
Former Smoker	20.4%	27.1%
5+ Daily Servings of Fruits and Vegetables	4.9%	NA
Ever Diagnosed With Diabetes	0.2%	12.3%
Ever Diagnosed With Heart Disease	3.9%	5.0%
Ever Diagnosed With Cancer	15.2%	12.4%
Ever Diagnosed With Depressive Disorder	16.3%	19.5%
Took Medication for Mood Past 12 Months	21.7%	NA
Heavy Alcohol Drinker	9.7%	6.8%
Binge Alcohol Drinker	14.8%	17.4%
Used Marijuana Past 30 days	14.0%	NA
Ever Used Prescription Drugs to Get High	0.3%	NA
Had Flu Shot in Past 12 Months, Age 65+	86.0%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	81.8%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

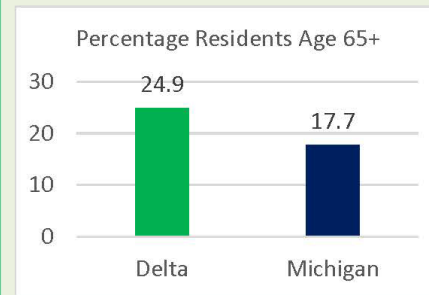
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

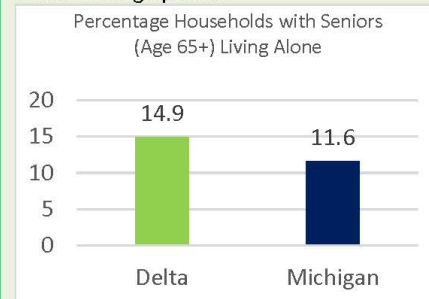
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Delta County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Unemployment, wages and economic conditions	61.4%
Health Insurance is expensive or has high costs for co-pays and deductibles	41.4%
Drug abuse	38.0%
Shortage of mental health programs and services, or lack of affordable mental health care	36.4%
Lack of health insurance	30.9%
Shortage of substance abuse treatment programs and services, or lack of affordable care	29.5%
Childhood obesity	26.2%
Alcohol abuse	22.6%
Lack of programs and housing for people with Alzheimer’s Disease and dementia	20.8%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	19.9%

Senior Spotlight³



Delta County has a much larger proportion of seniors than the state and nation, at nearly 25 percent. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-7 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Dickinson County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna2

Fast Facts

Indicator	Dickinson County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-8.59% (27,472 to 22,112)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	21.5%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.8%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	15.7%	17.5%
Birth Rate per 1,000 population ⁴	9.31	8.36*
Percent Change in Birth Rates from 2009 to 2019	-14.45%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1185.8	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	732.6	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Dickinson County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	16.8%	15.5%
Unable to Access Healthcare Due to Cost	9.8%	7.9%
No Routine Checkup in Past 12 Months	15.9%	23.4%
No Dental Care Past 12 Months	23.9%	28.2%
Obese (Body Mass Index 30.0 or Greater)	33.0%	35.2%
Current Cigarette Smoker	18.5%	18.4%
Former Smoker	27.0%	27.1%
5+ Daily Servings of Fruits and Vegetables	12.0%	NA
Ever Diagnosed With Diabetes	10.4%	12.3%
Ever Diagnosed With Heart Disease	11.9%	5.0%
Ever Diagnosed With Cancer	17.3%	12.4%
Ever Diagnosed With Depressive Disorder	26.9%	19.5%
Took Medication for Mood Past 12 Months	27.4%	NA
Heavy Alcohol Drinker	13.4%	6.8%
Binge Alcohol Drinker	13.5%	17.4%
Used Marijuana Past 30 days	14.6%	NA
Ever Used Prescription Drugs to Get High	3.2%	NA
Had Flu Shot in Past 12 Months, Age 65+	84.5%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	76.4%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

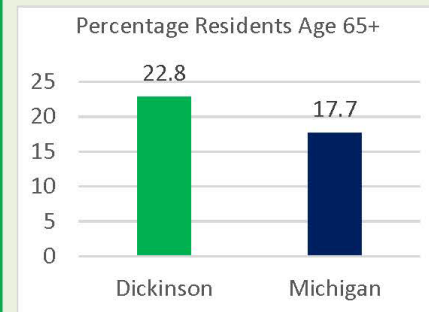
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

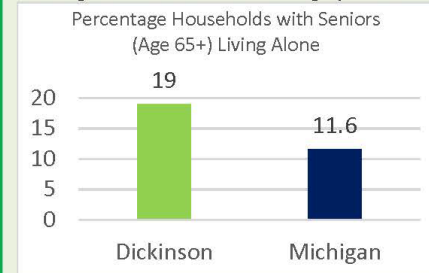
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Dickinson County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	56.2%
Drug Abuse	56.0%
Shortage of mental health programs and services, or lack of affordable mental health care	53.0%
Unemployment, wages and economic conditions	50.6%
Lack of health insurance	42.8%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	41.7%
Shortage of substance abuse treatment programs and services, or lack of affordable care	40.5%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	38.6%
Childhood obesity	38.5%
Lack of programs and services to help seniors maintain their health and independence	37.7%

Senior Spotlight³



Dickinson County has a much higher proportion of seniors than the state and nation, at nearly 23 percent. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-5 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Gogebic County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna2

Fast Facts

Indicator	Gogebic County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-20.3% (17,370 to 3,842)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	19.8%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	17.1%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	25.2%	17.5%
Birth Rate per 1,000 population ⁴	8.23	8.36*
Percent Change in Birth Rates from 2009 to 2019	-3.63%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1165.9	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	622.4	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Gogebic County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	29.5%	15.5%
Unable to Access Healthcare Due to Cost	4.8%	7.9%
No Routine Checkup in Past 12 Months	30.0%	23.4%
No Dental Care Past 12 Months	36.7%	28.2%
Obese (Body Mass Index 30.0 or Greater)	42.8%	35.2%
Current Cigarette Smoker	15.4%	18.4%
Former Smoker	30.4%	27.1%
5+ Daily Servings of Fruits and Vegetables	18.6%	NA
Ever Diagnosed With Diabetes	14.7%	12.3%
Ever Diagnosed With Heart Disease	11.8%	5.0%
Ever Diagnosed With Cancer	15.4%	12.4%
Ever Diagnosed With Depressive Disorder	21.9%	19.5%
Took Medication for Mood Past 12 Months	23.3%	NA
Heavy Alcohol Drinker	9.1%	6.8%
Binge Alcohol Drinker	7.9%	17.4%
Used Marijuana Past 30 days	15.0%	NA
Ever Used Prescription Drugs to Get High	4.1%	NA
Had Flu Shot in Past 12 Months, Age 65+	78.2%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	69.8%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

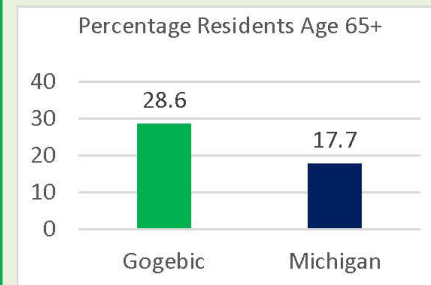
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

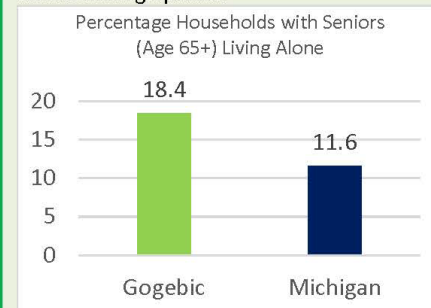
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Gogebic County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	59.3%
Unemployment, wages and economic conditions	53.0%
Shortage of dentists, or lack of affordable dental care	50.8%
Lack of health insurance	47.5%
Lack of affordable facilities or programs for year-round physical activity or recreation	45.4%
Shortage of mental health programs and services	45.0%
Lack of programs and services to help seniors maintain their health and independence	42.9%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	42.1%
Drug Abuse	41.3%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	41.0%

Senior Spotlight³



Gogebic County has a much higher proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



More than 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Houghton County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2

Fast Facts

Indicator	Houghton County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-2.5% (36,016 to 35,126)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	33.2%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	14.7%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	14.8%	17.5%
Birth Rate per 1,000 population ⁴	9.05	8.36*
Percent Change in Birth Rates from 2009 to 2019	-17.91%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	997.4	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	752.1	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Houghton and Keweenaw counties (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	16.1%	15.5%
Unable to Access Healthcare Due to Cost	9.6%	7.9%
No Routine Checkup in Past 12 Months	26.2%	23.4%
No Dental Care Past 12 Months	26.9%	28.2%
Obese (Body Mass Index 30.0 or Greater)	26.0%	35.2%
Current Cigarette Smoker	18.3%	18.4%
Former Smoker	26.6%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.1%	NA
Ever Diagnosed With Diabetes	16.4%	12.3%
Ever Diagnosed With Heart Disease	6.4%	5.0%
Ever Diagnosed With Cancer	15.0%	12.4%
Ever Diagnosed With Depressive Disorder	33.5%	19.5%
Took Medication for Mood Past 12 Months	34.7%	NA
Heavy Alcohol Drinker	17.7%	6.8%
Binge Alcohol Drinker	14.5%	17.4%
Used Marijuana Past 30 days	12.2%	NA
Ever Used Prescription Drugs to Get High	7.5%	NA
Had Flu Shot in Past 12 Months, Age 65+	79.3%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	75.8%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

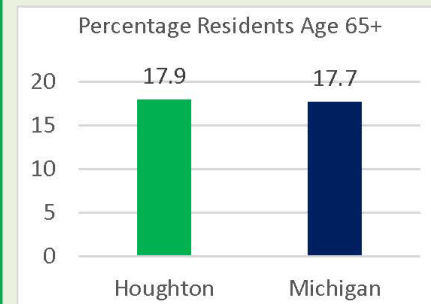
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

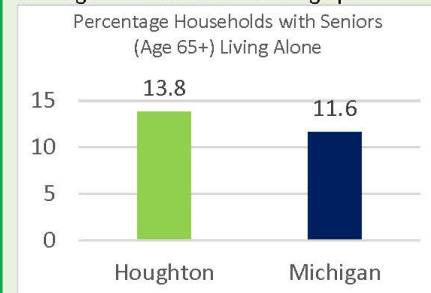
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Houghton and Keweenaw counties. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	65.9%
Shortage of mental health programs and services, or lack of affordable mental health care	64.9%
Lack of health insurance	57.1%
Drug abuse	53.8%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	48.2%
Unemployment, wages and economic conditions	47.8%
Shortage of substance abuse treatment programs and services, or lack of affordable care	46.5%
Alcohol abuse	44.9%
Shortage of dentists, or lack of affordable dental care	44.7%
Lack of affordable facilities or programs for year-round physical activity or recreation	42.2%

Senior Spotlight³



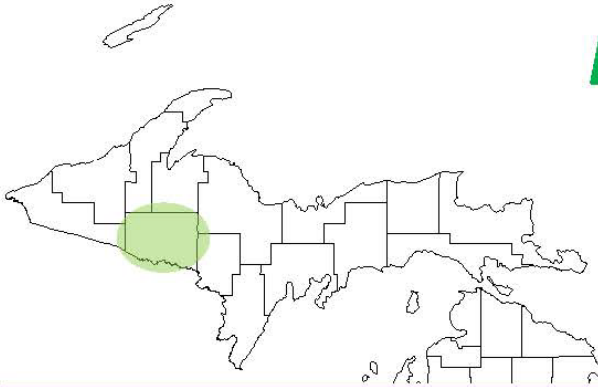
Houghton County has a similar proportion of seniors than the state and nation because of their college students. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



More than 1-in-7 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.



Iron County

2021 Upper Peninsula
Community Health Needs Assessment
(CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna2

Fast Facts

Indicator	Iron County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-15.8% (13,138 to 11,066)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	18.8%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.7%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	21.1%	17.5%
Birth Rate per 1,000 population ⁴	9.22	8.36*
Percent Change in Birth Rates from 2009 to 2019	-6.16%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1727.1	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	803.5	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Iron County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	21.1%	15.5%
Unable to Access Healthcare Due to Cost	8.5%	7.9%
No Routine Checkup in Past 12 Months	24.1%	23.4%
No Dental Care Past 12 Months	36.2%	28.2%
Obese (Body Mass Index 30.0 or Greater)	34.8%	35.2%
Current Cigarette Smoker	16.8%	18.4%
Former Smoker	39.4%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.6%	NA
Ever Diagnosed With Diabetes	7.4%	12.3%
Ever Diagnosed With Heart Disease	15.9%	5.0%
Ever Diagnosed With Cancer	17.5%	12.4%
Ever Diagnosed With Depressive Disorder	20.1%	19.5%
Took Medication for Mood Past 12 Months	16.3%	NA
Heavy Alcohol Drinker	11.4%	6.8%
Binge Alcohol Drinker	14.3%	17.4%
Used Marijuana Past 30 days	14.4%	NA
Ever Used Prescription Drugs to Get High	7.2%	NA
Had Flu Shot in Past 12 Months, Age 65+	75.3%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	76.3%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

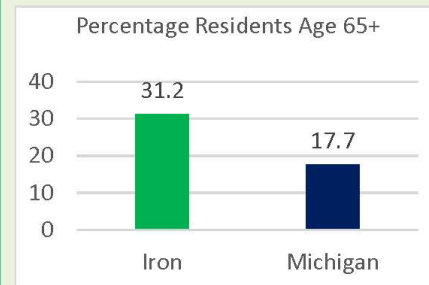
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

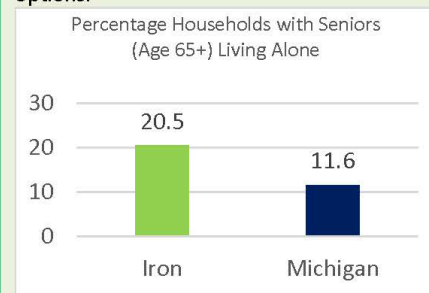
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Iron County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	61.1%
Drug abuse	50.8%
Unemployment, wages and economic conditions	46.4%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	44.1%
Shortage of mental health programs and services, or lack of affordable mental health care	43.5%
Lack of health insurance	42.2%
Lack of programs and services to help seniors maintain their health and independence	39.7%
Shortage of substance abuse treatment programs and services, or lack of affordable care	39.3%
Lack of affordable facilities or programs for year-round physical activity or recreation	37.7%
Alcohol abuse	34.8%

Senior Spotlight³



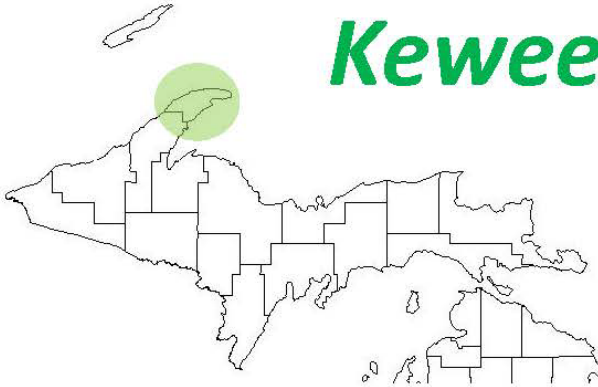
Iron County has nearly twice the proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-5 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.



Keweenaw County

2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2

Fast Facts

Indicator	Keweenaw County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-7.9% (2,301 to 2,119)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	30.4%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	10.3%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	22.4%	17.5%
Birth Rate per 1,000 population ⁴	7.09	8.36*
Percent Change in Birth Rates from 2009 to 2019	-35.93%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1325.1	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	585.3	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Houghton and Keweenaw counties (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	16.1%	15.5%
Unable to Access Healthcare Due to Cost	9.6%	7.9%
No Routine Checkup in Past 12 Months	26.2%	23.4%
No Dental Care Past 12 Months	26.9%	28.2%
Obese (Body Mass Index 30.0 or Greater)	26.0%	35.2%
Current Cigarette Smoker	18.3%	18.4%
Former Smoker	26.6%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.1%	NA
Ever Diagnosed With Diabetes	16.4%	12.3%
Ever Diagnosed With Heart Disease	6.4%	5.0%
Ever Diagnosed With Cancer	15.0%	12.4%
Ever Diagnosed With Depressive Disorder	33.5%	19.5%
Took Medication for Mood Past 12 Months	34.7%	NA
Heavy Alcohol Drinker	17.7%	6.8%
Binge Alcohol Drinker	14.5%	17.4%
Used Marijuana Past 30 days	12.2%	NA
Ever Used Prescription Drugs to Get High	7.5%	NA
Had Flu Shot in Past 12 Months, Age 65+	79.3%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	75.8%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

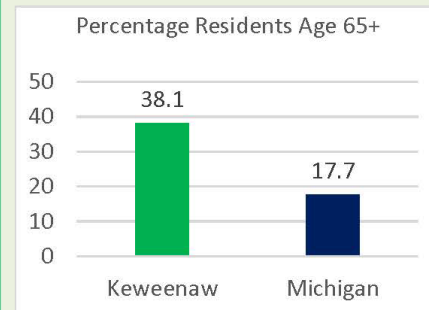
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

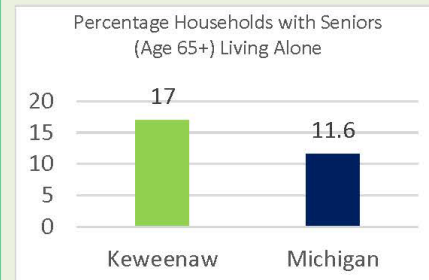
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Houghton and Keweenaw counties. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	65.9%
Shortage of mental health programs and services, or lack of affordable mental health care	64.9%
Lack of health insurance	57.1%
Drug abuse	53.8%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	48.2%
Unemployment, wages and economic conditions	47.8%
Shortage of substance abuse treatment programs and services, or lack of affordable care	46.5%
Alcohol abuse	44.9%
Shortage of dentists, or lack of affordable dental care	44.7%
Lack of affordable facilities or programs for year-round physical activity or recreation	42.2%

Senior Spotlight³



Keweenaw County has more than twice the proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



Almost 1-in-5 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

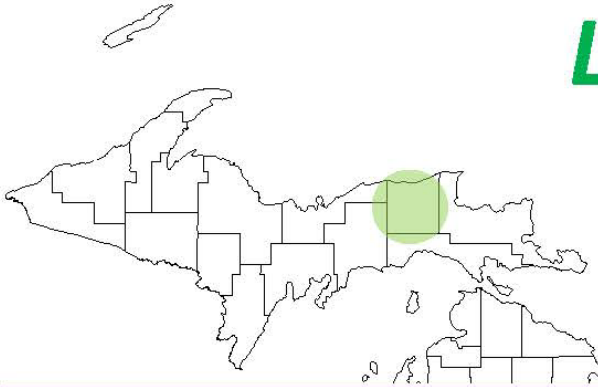
Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Luce County

2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2



Fast Facts

Indicator	Luce County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-12.8% (7,024 to 6,126)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	16.3%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	19.2%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	18.7%	17.5%
Birth Rate per 1,000 population ⁴	8.83	8.36*
Percent Change in Birth Rates from 2009 to 2019	-4.45%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1225.5	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	784.0	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Luce County (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	17.1%	15.5%
Unable to Access Healthcare Due to Cost	8.8%	7.9%
No Routine Checkup in Past 12 Months	17.0%	23.4%
No Dental Care Past 12 Months	30.1%	28.2%
Obese (Body Mass Index 30.0 or Greater)	49.1%	35.2%
Current Cigarette Smoker	16.1%	18.4%
Former Smoker	32.2%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.8%	NA
Ever Diagnosed With Diabetes	15.0%	12.3%
Ever Diagnosed With Heart Disease	12.6%	5.0%
Ever Diagnosed With Cancer	21.5%	12.4%
Ever Diagnosed With Depressive Disorder	29.9%	19.5%
Took Medication for Mood Past 12 Months	31.8%	NA
Heavy Alcohol Drinker	12.8%	6.8%
Binge Alcohol Drinker	14.2%	17.4%
Used Marijuana Past 30 days	17.0%	NA
Ever Used Prescription Drugs to Get High	5.3%	NA
Had Flu Shot in Past 12 Months, Age 65+	81.6%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	80.0%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

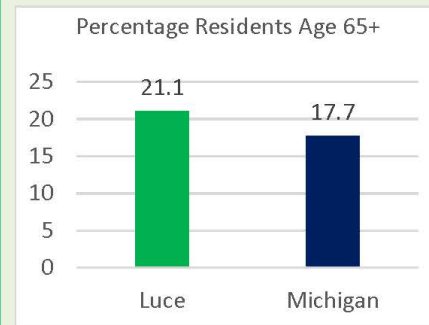
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

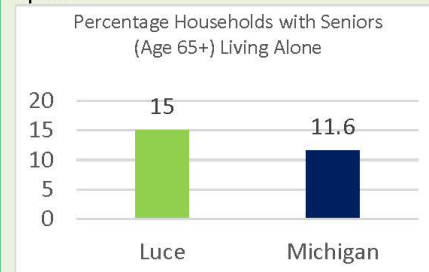
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Luce County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Drug abuse	61.2%
Lack of health insurance	55.6%
Health Insurance is expensive or has high costs for co-pays and deductibles	55.1%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	47.4%
Shortage of mental health programs and services, or lack of affordable mental health care	46.4%
Unemployment, wages and economic conditions	45.5%
Short of dentists, or lack of affordable dental care	39.7%
Alcohol abuse	39.6%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	39.3%
Lack of programs and services to keep seniors maintain their health and independence	39.2%

Senior Spotlight³



Luce County has a larger proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.

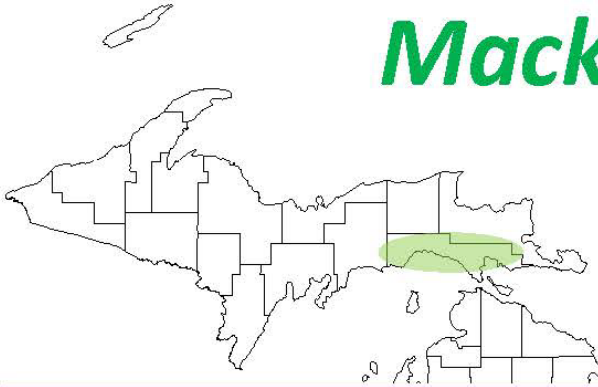


About 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Mackinac County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdh.org/upchna2

Fast Facts

Indicator	Mackinac County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-9.24% (11,943 to 10,839)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	21.8%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	14.1%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	21.2%	17.5%
Birth Rate per 1,000 population ⁴	8.52	8.36*
Percent Change in Birth Rates from 2009 to 2019	+16.83%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1436.9	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	848.4	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Mackinac County (definitions at wupdh.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	17.6%	15.5%
Unable to Access Healthcare Due to Cost	9.7%	7.9%
No Routine Checkup in Past 12 Months	24.8%	23.4%
No Dental Care Past 12 Months	42.9%	28.2%
Obese (Body Mass Index 30.0 or Greater)	36.2%	35.2%
Current Cigarette Smoker	18.5%	18.4%
Former Smoker	33.8%	27.1%
5+ Daily Servings of Fruits and Vegetables	6.9%	NA
Ever Diagnosed With Diabetes	12.6%	12.3%
Ever Diagnosed With Heart Disease	12.2%	5.0%
Ever Diagnosed With Cancer	24.8%	12.4%
Ever Diagnosed With Depressive Disorder	21.0%	19.5%
Took Medication for Mood Past 12 Months	17.6%	NA
Heavy Alcohol Drinker	16.7%	6.8%
Binge Alcohol Drinker	14.7%	17.4%
Used Marijuana Past 30 days	19.2%	NA
Ever Used Prescription Drugs to Get High	2.1%	NA
Had Flu Shot in Past 12 Months, Age 65+	79.7%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	79.0%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

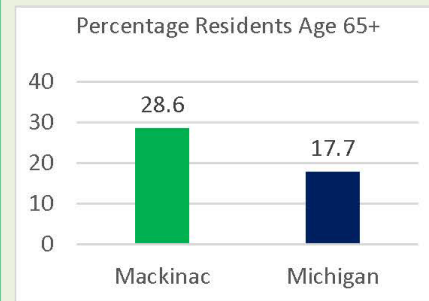
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

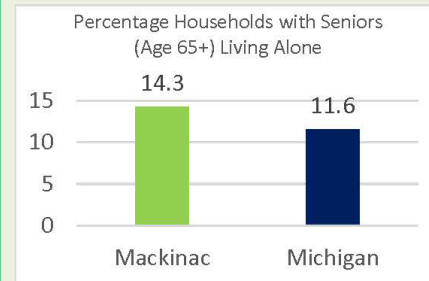
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Mackinac County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	59.8%
Unemployment, wages and economic conditions	49.4%
Lack of health insurance	48.2%
Shortage of mental health programs and services	41.5%
Drug abuse	40.7%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	38.7%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	38.3%
Shortage of substance abuse treatment programs and services	37.1%
Lack of programs and services to help seniors maintain their health and independence	35.9%
Alcohol abuse	32.4%

Senior Spotlight³



Mackinac County has a higher proportion of seniors than the state and nation, approaching 29 percent. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-7 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2018 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2017, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 4,800 surveys were completed, between 282 and 524 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Marquette County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wupdhd.org/upchna2

Fast Facts

Indicator	Marquette County	Michigan
Percentage Population Change Year 2000 to 2020 ³	1.9% (64,634 to 65,834)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	31.5%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	11.8%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	16.0%	17.5%
Birth Rate per 1,000 population ⁴	8.20	8.36*
Percent Change in Birth Rates from 2009 to 2019	-20.73%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1071.9	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	874.6	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Marquette County (definitions at wupdhd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	9.4%	15.5%
Unable to Access Healthcare Due to Cost	8.1%	7.9%
No Routine Checkup in Past 12 Months	27.2%	23.4%
No Dental Care Past 12 Months	31.2%	28.2%
Obese (Body Mass Index 30.0 or Greater)	32.5%	35.2%
Current Cigarette Smoker	11.8%	18.4%
Former Smoker	31.6%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.9%	NA
Ever Diagnosed With Diabetes	6.0%	12.3%
Ever Diagnosed With Heart Disease	6.9%	5.0%
Ever Diagnosed With Cancer	11.8%	12.4%
Ever Diagnosed With Depressive Disorder	27.0%	19.5%
Took Medication for Mood Past 12 Months	25.3%	NA
Heavy Alcohol Drinker	20.1%	6.8%
Binge Alcohol Drinker	23.2%	17.4%
Used Marijuana Past 30 days	19.8%	NA
Ever Used Prescription Drugs to Get High	4.2%	NA
Had Flu Shot in Past 12 Months, Age 65+	85.7%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	83.2%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

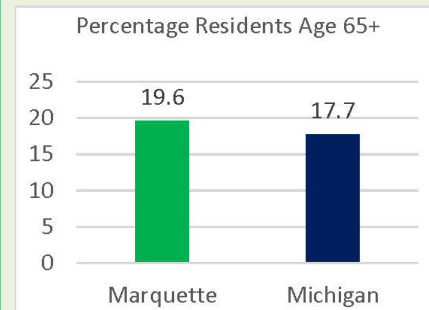
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

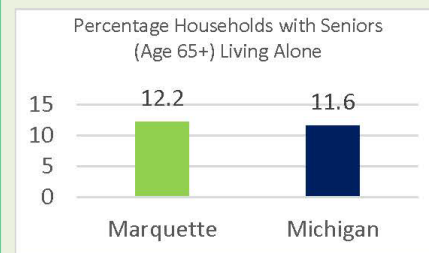
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Marquette County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	59.2%
Shortage of mental health programs and services, or lack of affordable mental health care	51.2%
Lack of health insurance	48.3%
Drug abuse	40.6%
Unemployment, wages and economic conditions	38.8%
Shortage of substance abuse treatment programs and services, or lack of affordable care	33.5%
Childhood obesity	32.7%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	29.0%
Shortage of long-term care (nursing beds) or lack of affordable long-term care and services	28.0%
Lack of affordable facilities or programs for year-round physical activity or recreation	26.5%

Senior Spotlight³



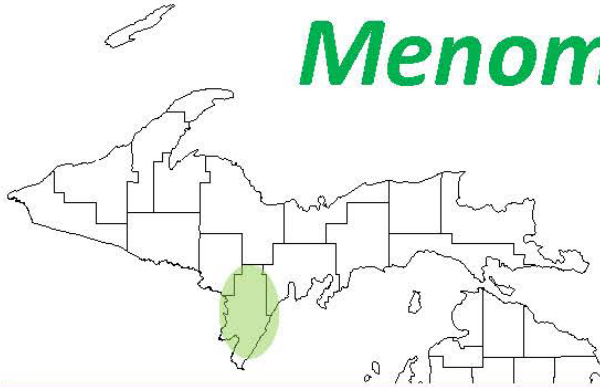
Marquette County has a larger proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



Almost 1-in-8 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.



Menominee County

2021 Upper Peninsula
Community Health Needs Assessment
(CHNA) County Dashboards¹

More information at
www.wupdh.org/upchna2

Fast Facts

Indicator	Menominee County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-10.7% (25,326 to 22,608)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	16.7%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.5%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	17.7%	17.5%
Birth Rate per 1,000 population ⁴	8.43	8.36*
Percent Change in Birth Rates from 2009 to 2019	-9.00%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1305.3	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	800.1	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Menominee County (definitions at wupdh.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	12.2%	15.5%
Unable to Access Healthcare Due to Cost	9.3%	7.9%
No Routine Checkup in Past 12 Months	24.2%	23.4%
No Dental Care Past 12 Months	17.8%	28.2%
Obese (Body Mass Index 30.0 or Greater)	45.7%	35.2%
Current Cigarette Smoker	22.5%	18.4%
Former Smoker	32.9%	27.1%
5+ Daily Servings of Fruits and Vegetables	8.8%	NA
Ever Diagnosed With Diabetes	12.3%	12.3%
Ever Diagnosed With Heart Disease	7.4%	5.0%
Ever Diagnosed With Cancer	17.8%	12.4%
Ever Diagnosed With Depressive Disorder	27.2%	19.5%
Took Medication for Mood Past 12 Months	29.1%	NA
Heavy Alcohol Drinker	13.2%	6.8%
Binge Alcohol Drinker	10.4%	17.4%
Used Marijuana Past 30 days	15.6%	NA
Ever Used Prescription Drugs to Get High	3.5%	NA
Had Flu Shot in Past 12 Months, Age 65+	73.7%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	77.7%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

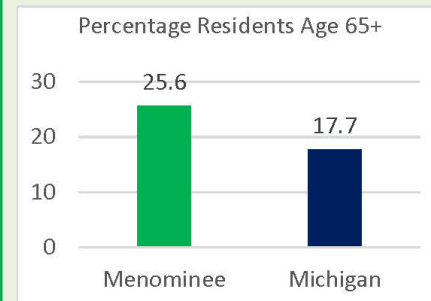
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

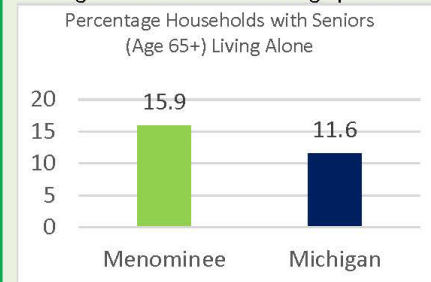
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Menominee County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	64.0%
Drug abuse	54.8%
Unemployment, wages and economic conditions	40.9%
Shortage of mental health programs and services	37.2%
Shortage of substance abuse treatment programs and services	36.6%
Lack of health insurance	33.0%
Lack of programs and services to help seniors maintain their health and independence	30.8%
Lack of affordable facilities or programs for year-round physical activity or recreation	29.5%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	28.1%
Shortage of long-term care (nursing home beds) or lack of affordable long-term care services	28.0%

Senior Spotlight³



Menominee County has a much higher proportion of seniors than the state and nation, at nearly 26 percent. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



Nearly 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.



Ontonagon County

2021 Upper Peninsula
Community Health Needs Assessment
(CHNA) County Dashboards¹

More information at
www.wuphdh.org/upchna2

Fast Facts

Indicator	Ontonagon County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-8.97% (8,903 to 8,104)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	17.5%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	13.3%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	21.7%	17.5%
Birth Rate per 1,000 population ⁴	4.37	8.36*
Percent Change in Birth Rates from 2009 to 2019	-39.56%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1656.6	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	831.7	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Ontonagon County (definitions at wuphdh.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	15.4%	15.5%
Unable to Access Healthcare Due to Cost	9.3%	7.9%
No Routine Checkup in Past 12 Months	27.5%	23.4%
No Dental Care Past 12 Months	33.1%	28.2%
Obese (Body Mass Index 30.0 or Greater)	39.7%	35.2%
Current Cigarette Smoker	13.1%	18.4%
Former Smoker	35.6%	27.1%
5+ Daily Servings of Fruits and Vegetables	10.0%	NA
Ever Diagnosed With Diabetes	18.2%	12.3%
Ever Diagnosed With Heart Disease	16.5%	5.0%
Ever Diagnosed With Cancer	18.7%	12.4%
Ever Diagnosed With Depressive Disorder	18.2%	19.5%
Took Medication for Mood Past 12 Months	20.2%	NA
Heavy Alcohol Drinker	15.3%	6.8%
Binge Alcohol Drinker	14.7%	17.4%
Used Marijuana Past 30 days	15.1%	NA
Ever Used Prescription Drugs to Get High	3.1%	NA
Had Flu Shot in Past 12 Months, Age 65+	73.2%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	78.6%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

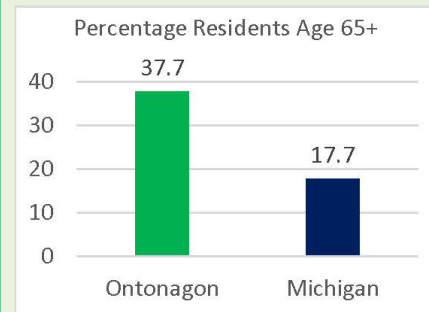
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

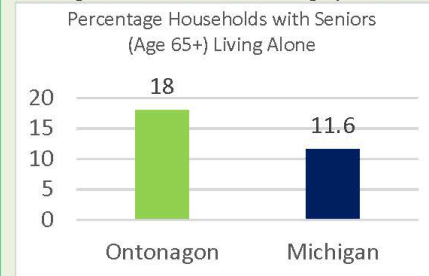
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Ontonagon County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Drug Abuse	55.6%
Health Insurance is expensive or has high costs for co-pays and deductibles	54.5%
Lack of health insurance	53.8%
Unemployment, wages and economic conditions	51.9%
Shortage of long-term care (nursing beds) or lack of affordable long-term care and services	50.9%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	49.3%
Shortage of mental health programs and services, or lack of affordable mental health care	46.0%
Lack of programs and services to help seniors maintain their health and independence	44.0%
Shortage of substance abuse treatment programs and services, or lack of affordable care	41.5%
Alcohol abuse	40.6%

Senior Spotlight³



Ontonagon County has more than double the proportion of seniors than the state and nation, at 37.7 percent. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



More than 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

Schoolcraft County



2021 Upper Peninsula Community Health Needs Assessment (CHNA) County Dashboards¹

More information at
www.wuphd.org/upchna2

Fast Facts

Indicator	Schoolcraft County	Michigan
Percentage Population Change Year 2000 to 2020 ³	-8.97% (8,903 to 8,104)	+0.47%
Percentage Residents Age 26+ With Bachelor's Degree/Higher (2019) ³	15.8%	28.6%
Percentage All Residents Living Under Poverty Line (2019) ³	14.3%	13.0%
Percentage of Children Under 18 Living in Poverty (2019) ³	23.0%	17.5%
Birth Rate per 1,000 population ⁴	7.29	8.36*
Percent Change in Birth Rates from 2009 to 2019	-6.43%	-14.41%*
Raw Mortality rate per 100,00 (2018) ⁴	1462.6	990.3
Age-Adjusted Mortality Rate per 100,000 (2018) ⁴	799.7	783.1

Adult Health Survey Results⁵

In the table below are weighted estimates for selected health indicators, from randomly sampled residents of Schoolcraft County (definitions at wuphd.org/upchna):

Health Indicator	Local	State
General Health Status Only Fair or Poor	18.9%	15.5%
Unable to Access Healthcare Due to Cost	6.4%	7.9%
No Routine Checkup in Past 12 Months	12.8%	23.4%
No Dental Care Past 12 Months	33.0%	28.2%
Obese (Body Mass Index 30.0 or Greater)	47.5%	35.2%
Current Cigarette Smoker	15.9%	18.4%
Former Smoker	38.3%	27.1%
5+ Daily Servings of Fruits and Vegetables	9.3%	NA
Ever Diagnosed With Diabetes	22.3%	12.3%
Ever Diagnosed With Heart Disease	8.2%	5.0%
Ever Diagnosed With Cancer	26.4%	12.4%
Ever Diagnosed With Depressive Disorder	28.6%	19.5%
Took Medication for Mood Past 12 Months	27.1%	NA
Heavy Alcohol Drinker	27.6%	6.8%
Binge Alcohol Drinker	28.1%	17.4%
Used Marijuana Past 30 days	15.9%	NA
Ever Used Prescription Drugs to Get High	7.6%	NA
Had Flu Shot in Past 12 Months, Age 65+	82.6%	71.5%
Colorectal Cancer Screening ⁶ , Age 50+	75.6%	75.6%

Health Disparities at a Glance⁵

Health status, access and behaviors vary by income, education, and other social determinants. The table shows differences among all U.P. residents, by household income group, for selected health indicators.

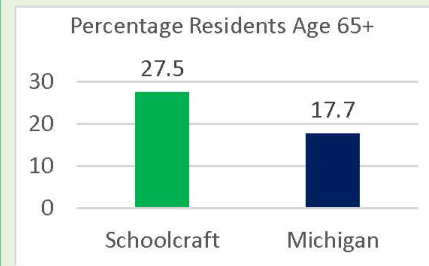
Health Indicator By Household Income	Less Than \$25,000	\$50,000+
Health Fair or Poor	29.4%	7.6%
Uninsured (18-64)	3.9%	1.3%
Unable to Access Care Due to Cost	13.0%	3.9%
No Dental in Past Year	41.5%	20.9%
Current Smoker	17.8%	13.5%
No Physical Activity	18.1%	11.1%
Diabetes Diagnosis	16.9%	8.2%
Heart Disease	10.3%	6.3%
Chronic Lung Disease	13.3%	4.8%
Current Asthma	12.2%	9.8%
Limited By Arthritis	38.2%	24.3%
Depressive Disorder	32.4%	23.9%
Marijuana Past Month	24.7%	15.4%
Prescription Abuse	10.1%	2.8%
Drove After Drinking	2.2%	7.1%

Community Issues and Priorities⁷

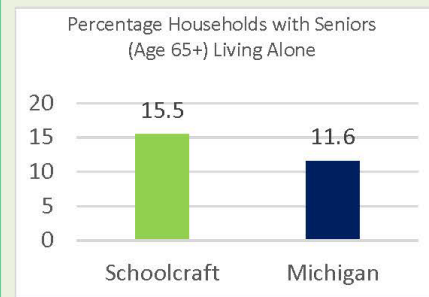
The table below lists the community health issues most frequently rated as “very important” by survey respondents from Schoolcraft County. Respondents chose from a list of 16 possible issues presented for ranking in the 2021 Regional Adult Health Survey.

Community Health Issue	Very Important
Health Insurance is expensive or has high costs for co-pays and deductibles	60.2%
Drug abuse	55.3%
Unemployment, wages and economic conditions	54.8%
Lack of health insurance	44.3%
Lack of housing and programs for people with Alzheimer’s Disease and dementia	37.0%
Lack of affordable healthy foods, including year-round fresh fruits and vegetables	33.9%
Lack of programs and services to help seniors maintain their health and independence	33.9%
Lack of affordable facilities or programs for year-round physical activity or recreation	33.0%
Childhood obesity	31.9%
Shortage of mental health programs and services, or lack of affordable mental health care	31.2%

Senior Spotlight³



Schoolcraft County has a much larger proportion of seniors than the state and nation. Health needs of older residents include chronic disease management, dementia care, and quality nursing home and assisted living options.



About 1-in-6 households in the county is occupied by a senior living alone. How will communities plan to meet their medical, social, housing, and transportation needs?

Data Sources/Footnotes

- (1) Data in this County Dashboard come from the 2021 Upper Peninsula Community Health Needs Assessment (CHNA), led by the region’s 6 local health departments in collaboration with multiple partners, including hospitals, clinics, behavioral health agencies, and other funders.
- (2) The full CHNA can be viewed and downloaded at the Western U.P. Health Department web site, at www.wuphd.org/upchna.
- (3) U.S. Census and American Community Survey counts and estimates.
- (4) Vital statistics collected by the Michigan Department of Health and Human Services.
- (5) 23,800 randomly sampled U.P. household addresses received 12-page health surveys in August 2021, 1,700 per county with Houghton and Keweenaw counties combined as one group. More than 3,500 surveys were completed, between 203 and 370 per county. Results were weighted and reported by county, age, gender, income and education. Full results are in the CHNA at www.wuphd.org/upchna.
- (6) Among adults age 50 and older, the proportion who reported having a blood stool test within the past 2 years, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years.
- (7) In the same health survey discussed in footnote (5) above, respondents ranked 16 community health issues on a 4-point scale: “not an issue”, “fairly unimportant”, “fairly important” and “very important”. The percentages of county residents choosing “very important” are shown in the table above left on this page.

The End