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Oral Health in Michigan

CHWS
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Oral Health in Michigan

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The Center for Health Workforce Studies is a not-for-profit research organization whose mission is to provide timely, accurate data and conduct policy-relevant research about the health workforce. The Center's work assists health, professional, and education organizations; policy makers and planners; and other stakeholders to understand issues related to the supply, demand, distribution, and use of health workers.

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Preface

The Center for Health Workforce Studies at the School of Public Health, University at Albany, performed an environmental scan and contextual assessment of the oral health of Michigan's residents. The research involved a literature review, analysis of available secondary data, and interviews with stakeholders in oral health. This report is a summary of the literature review and data analysis that were part of the study process.

This report was prepared by Margaret Langelier and Simona Surdu at the Center for Health Workforce Studies at the School of Public Health, University at Albany. The authors can be contacted with any questions regarding its content at (518) 402-0250. The authors acknowledge the contributions of oral health stakeholders in Michigan who provided data and information to inform the content of the report.

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The Center was established in 1996. It is a not-for-profit research organization whose mission is to provide timely, accurate data and conduct policy-relevant research about the health workforce. The Center's work assists health, professional, and education organizations; policy makers and planners; and other stakeholders to understand issues related to the supply, demand, distribution, and use of health workers. Today the Center is a national leader in the field of health workforce studies. It supports and improves health workforce planning and access to quality health care through its collection, tracking, analysis, interpretation, and dissemination of information about health professionals at national, state, and local levels. The Center was recently designated as the National Oral Health Workforce Research Center under a cooperative agreement with the National Center for Health Workforce Analysis at the US Health Resources and Services Administration (HRSA). Additional information about the Center can be found at http://chws.albany.edu.

Summary

In 2015, The Pew Charitable Trusts commissioned the Center for Health Workforce Studies, School of Public Health, University at Albany, to conduct a review of oral health in Michigan. The project entailed:

- an extensive literature review to understand current and past initiatives to improve access to oral health services in the state;
- analysis of secondary data obtained from national and state surveillance and reporting systems to understand oral health status and oral health outcomes of the state's population; and
- interviews of oral health stakeholders to understand the barriers and facilitators to oral health utilization, especially for populations experiencing difficulty accessing oral health services.

This report describes the findings from the literature review and the analysis of secondary data sources describing the oral health status of various population cohorts in Michigan. A separate report provides a summary of common themes from the interviews conducted in the state.

Michigan is the ninth most populous state in the US with approximately 9.9 million residents and the 11th largest state in geographic area. The population is diverse and dispersed with significant variation in population density by region. The state's manufacturing industry was significantly impacted by the economic recession in the US in 2008. Detroit, Michigan, known historically as the automobile capital of the world, and surrounding areas were severely impacted by the economic downturn. Employment in manufacturing industries across the state experienced loss of jobs and benefit reductions that had an effect on the ability of the population to obtain health and oral health services. Tourism is the second largest industry in Michigan due to the number of inland lakes and the proximity of much of the state to water boundaries. Tourism depends heavily on seasonal employment with downstream impacts on both unemployment and uninsurance rates.

The state has a seemingly adequate supply of dental professionals on a per population basis. In 2014, there were almost 7,700 dentists and approximately 10,500 dental hygienists licensed to practice in Michigan. Eighty-seven percent of dentists practiced general dentistry with the remainder licensed in 1 of the 9 dental specialties recognized by the American Dental Association. The supply of oral health professionals is not evenly distributed with the population, however, leaving areas of the state with limited access to needed oral health services.

Approximately 22% of the population is eligible for 1 of the many Medicaid insurance programs that include fee-for-service (FFS) and managed care insurance plans. There is an adult Medicaid dental benefit that was reinstated in Michigan in 2010. All Medicaid and Children's Health Insurance Program (CHIP) eligible children (MIChild in Michigan) are entitled to dental services under the early and periodic screening, diagnostic, and treatment benefit (EPSDT) in that program.

The following bullets and narratives summarize the findings from the contextual assessment and data analysis for the environmental scan. These findings are further elaborated in the technical report that follows this summary.

Michigan has been proactive in addressing barriers to oral health services for a variety of populations. However, there remain populations for whom access to oral health care is limited or nonexistent.

There is a long history in Michigan of stakeholder involvement in initiatives to improve the oral health of the state's population. Continuing efforts to identify barriers to utilization of services have resulted in the design and implementation of innovative programs across the state to increase the availability of oral health services and ultimately, to enhance oral health outcomes. Beginning in 2006, the state employed collaborative processes that included the active engagement of government representatives, health and oral health providers, and advocates for the underserved to build, implement, and review an oral health plan to achieve improvements in oral health literacy and service delivery for the state's population. The state continues to benefit from the work of these coalitions and the valuable programs that have resulted. However, there remain populations for whom access to oral health care is limited or nonexistent.

Michigan has a population that is diverse in heritage and primary language, socioeconomic status, and geographic location. The challenges of addressing the cultural, financial, and demographic barriers to oral health services for this diverse and dispersed population are great. It is widely recognized that solutions to limited oral health access are best designed and implemented at the local and regional levels where the particular needs within a community or area are best understood. However, local initiatives can only be successful when they are grounded in and facilitated by state policy and funding that provide the needed structural supports for their success.

Michigan has implemented benchmark programs and policy initiatives that have been useful in addressing barriers to access to oral health services for certain populations. There is a need to expand these policies and programs to further reduce unmet need for oral health services.

Michigan's policymakers and providers have taken a multifaceted, tiered approach to resolving oral health access issues that has been successful in noticeably improving access to oral health services for an increasing portion of the underserved population. The approach includes policy, payment, and program supports at the state level for local and regional initiatives targeted to improve access to services.

Policy levers at the state level include the following:

- The state provides an adult dental benefit with Medicaid FFS. By 2011, almost 90% of all Medicaid beneficiaries in Michigan were enrolled in a managed care health plan. However, those plans were not required to offer a dental benefit so dental insurance for the adult population was largely "carved out."

- The state embraced the Medicaid expansion opportunities in the Affordable Care Act (ACA) providing insurance coverage under the Healthy Michigan Program, which includes a dental benefit for qualifying individuals and families. This program is administered through managed care contracts with a variety of insurers in the state. In 2014, approximately 22.4% of the state's population was enrolled in various Medicaid insurance plans or MIChild. This represented a 15.87% increase in enrollees over 2013.

- The state migrated dental coverage for Medicaid-eligible children in 80 of the 83 counties to a managed care plan through an agreement with Delta Dental. Delta built the impactful Healthy Kids Dental (HKD) Program using its existing panel of dental providers to significantly increase the number of children receiving dental services. This program now covers approximately 565,000 children in Michigan. However, approximately half of all Medicaid-eligible children in

Michigan reside in the 3 counties where the program is not yet available. The governor's current budget proposal includes a phase-in plan for HKD in the remaining 3 counties beginning in 2016 for children from birth to age 8 residing in those counties.

- Federally qualified health centers (FQHCs) in Michigan were successful in negotiating an enhanced reimbursement rate from the state Medicaid agency for providing dental services to Medicaid-eligible people. The enhanced rate more accurately reflects the cost of providing oral health services and further enables access.

- Changes in scope of practice legislation were made by the state legislature and regulatory boards in support of expanded service delivery by dental hygienists working under the Public Dental Prevention Program, Public Act 161 (PA-161) of 2005. PA -161 enables dental hygienists to increase the settings in which preventive oral health services are delivered to high-risk populations. In addition, expanded function certification is available to registered dental assistants in Michigan to facilitate greater efficiencies in dental practice and a commensurate increase in capacity to provide services.

Initiatives by providers and other stakeholders to improve access at the local, county, and regional levels in Michigan are enabled by these state-level policies. Regional and local provider initiatives designed to improve oral health outcomes for safety-net patients include the following:

- The Michigan Community Dental Clinic (MCDC) network (including the former Dental Clinics North) continues to expand its reach through collaborations with local health departments. MCDC has been instrumental in establishing 26 dental clinics in various locations throughout the state to serve Medicaid-eligible populations, the uninsured, and the underinsured in both rural and urban settings. MCDC has also established partnerships with 10 hospitals in Michigan to provide dental services to special needs patients and to children and adults with extensive restorative needs. MCDC leverages robust electronic dental records to support quality care and monitor patient outcomes across the enterprise.
- Numerous FQHCs across the state are providing oral health services in their clinics. Some of these FQHCs recently increased capacity with funding available in the ACA to improve or expand dental infrastructure. Data submitted through the federally maintained Uniform Data System (UDS) in 2011, 2012, and 2013 showed that FQHCs in Michigan were providing a higher percentage of their patients with dental services than FQHCs in the US overall. In 2013, Cherry Health, the largest FQHC in Michigan, provided a higher proportion of their patients with oral health services (53.3%) than primary medical services (49.4%).
- Michigan's professional education programs for both dentists and dental hygienists are actively engaged in providing care to safety-net patients through student dental and dental hygiene clinics, dental specialty clinics, faculty practices, and extensive community outreach programs that include dental student externships and residencies in multiple community clinics throughout the state. The contributions of the 2 dental schools and the 12 dental hygiene programs to oral health safety-net capacity are substantial.
- Local initiatives have also had an impact on the oral health of particular communities. The Community Dental Access Initiative and its Dental Partnership in Calhoun County is an example of a locally conceived and successfully implemented service delivery program that has been remarkably successful in improving access to care for the uninsured. The program incorporates an element of patient responsibility in a pay-it-forward program design, which requires that patients complete volunteer work within the community in order to receive dental services. This initiative is reflective of the belief that the best strategies to increase oral health access are

those that are locally designed and tailored to meet the needs of particular underserved populations in a community. Over a 5-year period, over 57,000 volunteer service hours were accrued by patients who received oral health services from the numerous private practice community dentists participating with the program. As a result of the program, there was also a 70% decrease in the number of emergency department (ED) visits to the local community hospital for dental pain and infection.

- Points of Light is a grassroots initiative begun by a pediatric dentist that has expanded into a collaborative children's oral health project with participating dentists and pediatricians throughout Michigan and several additional states. The program has a goal of improving the oral health of infants and very young children through early prevention and establishment of a dental home. The initiative engages pediatric and general dentists to participate in care. The initiative also enlists pediatricians to perform oral health screening and assessment activities and to refer children for oral health services beginning early in life. Parents are encouraged to access the Points of Light website to identify dentists who will treat infants, Head Start students, and children with special health care needs.

Michigan has populations that do not have access to timely oral health services. People from lower socioeconomic groups, very young children, rural and city residents, the immigrant population, and underrepresented minorities continue to demonstrate poor oral health outcomes.

The surveillance and survey data examined for this study revealed that population oral health in Michigan compares favorably with population oral health in other states. Michigan is 15th in the nation for fluoridation of community water systems. Grand Rapids, Michigan was the first city in the world to supplement their community water supply with fluoride and today 90.9% of the state's population on community water systems receives fluoridated water. Michigan also ranked 18th in the nation for the percent of the population with a dental visit in the prior year with a higher percentage of the population in Michigan indicating a visit to an oral health professional than in the US. A lower percentage of adults in Michigan (42.5%) had 1 or more permanent teeth extracted than did adults in the US overall (44.9%). Adults older than age 65 in Michigan (12.4%) were also less likely to be edentulist than adults in that age group in the US (15.0%).

However, there were indications that certain population groups in the state were at risk for poor oral health outcomes. Males and Hispanics were less likely than females and non-Hispanics to have visited a dentist in Michigan in 2012. Adults with annual incomes of less than $15,000 or with lower levels of educational attainment in the age 65 and older cohort were more likely than their peers to report loss of all their teeth. And the percentage of the population in Michigan that reported not visiting a dentist in the prior year increased between 2002 and 2012, especially for adults age 25-34 (a 17.3% increase over the 10-year period).

Data about the oral health of children was somewhat promising. The 36.3% of Medicaid-eligible children receiving at least 1 preventive oral health service in 2013 represented a substantial increase over the 8.2% of Medicaid-eligible children who had a preventive service in 1999. Yet Michigan still lagged behind the national average percentage (38.5%) of Medicaid-eligible children receiving any preventive dental service in a year.

Particular populations of children were more at risk than others. Geographic and socioeconomic variations were evident in the quality of oral health outcomes. In a survey of third-grade children in Michigan conducted in the 2009-2010 academic year, 16.8% of the children screened in the city of Detroit were in need of immediate dental care versus 7.0% of third-grade children statewide. Children in suburban Detroit had lower rates of dental caries experience in their primary teeth (51.5%) than their

third-grade peers in the Upper Peninsula (62.9%) and the Northern Lower Peninsula (56.1%). While over half (55.9%) of third-graders in Michigan had caries experience in either their primary or permanent teeth, 70.3% of third-grade children in the Upper Peninsula had a history of dental decay in their primary and/or permanent dentition.

Overall, pregnant women, seniors (especially those in residential care settings), the uninsured, immigrants, those with lower levels of education and income, and children (especially very young children) appear to be at risk for poor oral health outcomes. In 2008, just 25.3% of new mothers in Michigan indicated they received any dental care during their most recent pregnancy. A screening survey of elders living in alternative long-term care facilities (ALTCF) in Michigan in 2010 found that 48.9% of screening participants reported they had not seen a dentist in the prior year.

Access barriers are linked to financial, logistical, cultural, and geographic factors. The low level of oral health literacy in the population generally and especially among high-risk populations further limits appropriate utilization of services even when access to services is reasonably available.

The overall cost of dental services, the percentage of the population without dental insurance, and the high cost of patient participation in dental care for some in the insured population create financial barriers to access to oral health services.

Nationally, utilization of oral health services is decreasing. In 2011, just 36.1% of working-age adults in the US visited a dentist compared to 41% in 2003. Coincidentally, the number of people insured by commercial/private dental insurance plans is also decreasing resulting in more children and adults moving to public dental insurance programs. Having dental insurance is predictive of utilization of oral health services. In 2013, more than 44% of Michigan's population lacked dental insurance, 45.3% was insured by a commercial dental plan (including Medicaid-eligible people with commercial dental coverage), and 10.5% was covered by public dental insurance.

Historically, a lower percentage of people in Michigan had any dental insurance than the US population. In 2012, 59.7% of the US population had either public or private dental insurance compared to 55.8% in Michigan in 2013. However, the percentage of the population with dental insurance is changing. The state embraced the Medicaid expansion opportunities available in the ACA, allowing individuals and families with incomes above the federal poverty level (FPL) to enroll in health plans that include dental benefits through the Healthy Michigan Program. In addition, in 2014, more than 55,000 people enrolled in a stand-alone dental plan through the State Partnership Marketplace.

The state of Michigan was especially affected by the most recent economic recession with job loss and benefit reductions impacting rates of dental uninsurance in the state. While Michigan's economy has been recovering and doing so more rapidly than some other states, the unemployment rate still remains above the national average.

Out-of-pocket expenses for those with dental insurance may be high when plans require co-payment and co-insurance participation. As a result, even those with dental insurance may not access dental services at desirable levels if the portion of dental expenditure for which the patient is responsible is burdensome. Informants participating in the interviews for this project commented on access issues for the working poor in Michigan; that is, people whose incomes exceed eligibility limits for public programs but who find the cost of dental services beyond their reach.

The safety net for delivery of oral health services in Michigan is robust. A wide array of providers is operating in the dental safety net. Still, current capacity is insufficient to address need.

Michigan has a number of designated dental health professions shortage areas (DHPSAs). The populations in DHPSAs are generally served by safety-net health and oral health providers. The dental safety net in Michigan is various in organizational attributes and developed in capacity to provide services. However, resources in the safety net are finite limiting the ability of safety net providers to substantially increase service volume.

The array of safety-net provider organizations in Michigan includes FQHCs, rural health clinics, professional education program student clinics, faith-based organizations, Indian Health Service providers, mobile dental vans, school-based and school-linked oral health programs, the Michigan Community Dental Clinic network, free dental clinics, hospitals, and other grassroots programs and initiatives serving safety net patients, including Points of Light and the Dentists' Partnership in Calhoun County. Private practice dentists are contributing to care for safety-net populations through participation with the state Medicaid program, HKD, and the Healthy Michigan Plan. Dentists also actively participate in volunteer and other community programs to address the needs of the underserved. It is, however, difficult to quantify the extent of the contributions to access made through private practices.

In interviews conducted as part of this research, safety-net providers commented about ongoing growth in organizational capacity to address unmet need for dental services. However, informants were clear that there remain people in Michigan who lack access to oral health services. The capacity of the safety net to meet need is finite. The majority of dental services in the US are provided through private dental practices so the participation of both safety-net and private practice providers in efforts to increase access is essential to further address unmet need.

Expansion in the safety net in Michigan was enabled by federal funds from the ACA and state legislative and policy initiatives, including PA-161, which permitted organizations to extend their reach to settings where underserved populations were more often found. Safety-net clinic expansions are ongoing. Michigan Community Dental Clinics recently opened several new clinics in collaboration with local health departments and also added a hospital affiliation. Cherry Health Services, an FQHC providing dental services in multiple counties, built and equipped additional dental operatories. School-linked oral health programs enabled by PA-161 continue to reach higher numbers of children in Michigan. In the 2010-2011 academic year, PA-161 programs reported providing services to 7,203 children throughout the state. In the 2012-2013 year, the number of children receiving services through a PA-161 program increased to 17,928 despite a decrease from the previous year in the actual number of programs operating as PA-161 entities.

Michigan appears to have a relatively ample supply of oral health professionals. Supply of professionals is only one factor in ensuring access to oral health services. Oral health professionals are not evenly distributed with the population resulting in differential access to care.

A key component to facilitating access to oral health services is the availability of oral health professionals with sufficient capacity to deliver services. However, low-income populations and other at-risk groups may lack access to dental services even when the supply of workforce is sufficient, especially if only a small percentage of dentists actively participate with public insurance programs. Simply producing and maintaining a supply of oral health professionals does not improve access to care when structural and environmental factors impose further barriers.

Michigan appears to have a reasonable supply of dentists and dental hygienists when benchmarked to national dentist-to-population ratios. According to the American Dental Association (ADA), in 2011, there were 62.0 dentists working in dentistry per 100,000 population in the US (6.2 per 10,000). In Michigan, the ratio was 62.3 dentists working in dentistry per 100,000 population (6.2 per 10,000). Dental hygienist distribution in a state generally mirrors that of dentists since dental hygiene professionals work under dental supervision. However, dental employment of dental hygienists may vary by practice preference, with some dentists employing multiple dental hygienists and others not employing any. As a result, the pattern of dental hygienist-to-population ratios may vary somewhat from dentist-to-population ratios.

While a state may appear to have an ample supply of oral health professions based on per capita metrics, the location of practice for oral health providers may limit the availability of dental providers especially in rural areas and inner cities. There are areas in Michigan where the number of oral health professionals is relatively small. Comparing the addresses of licensed dentists in Michigan in 2014 to each of the 83 counties' populations revealed that there were 21 counties in the state in which there were between 0 and 3.5 dentists per 10,000 population and another 20 counties with between 3.6 and 4.9 dentists per 10,000 people. A limited supply of professionals may not be the only impediment to care but it is a primary requirement for improved access.

Most dentists in Michigan practice in either solo or group practices, which is consistent with national practice patterns. The total supply of dentists in Michigan has grown only slightly over the recent decade with a net increase of 147 dentists between 2000 and 2011. This may be attributed to various factors, including the depressed economy during the most recent economic recession, the slow growth in overall population, and the outbound migration rate, all of which would dampen demand for dentists and dental services. These factors, coupled with the uneven geographic distribution of dentists, suggest that the availability of oral health services in some areas of the state may be limited.

The 2 dental schools and the 12 dental hygiene education programs in Michigan are a pipeline for new dental and dental hygiene professionals to both grow capacity and replace older professionals departing practice. Michigan has been remarkably successful in ensuring the state's supply of dentists with more than 80% of actively practicing dentists in the state indicating graduation from dental school at either the University of Michigan School of Dentistry or the University of Detroit Mercy School of Dentistry. For comparison, just 61% of actively practicing dentists in Wisconsin indicate graduation from Marquette University, the only dental school in Wisconsin. Data from the ADA showed that in the 2012-2013 academic year, 74.5% of all dental students in the US who were from Michigan were attending dental school in Michigan.

Dental care in the US is mainly delivered through the private practice business model. While this service delivery model works well for a large percentage of the population, there are people who are unable to or unwilling to seek care in private dental practices. Safety net providers are, therefore, critical to improving access to oral health services for these populations. Nationally and in Michigan, there is a limited supply of practicing dentists in safety net provider organizations. Effective recruitment and retention of oral health workforce is essential to sustaining and expanding oral health safety net service delivery.

Access initiatives that use workforce differently or expand functions enable delivery of services in safety net settings where people in need of services might be more easily reached and even improve capacity in traditional settings. As previously mentioned, dental hygienists practicing under the auspices of PA-161 provider organizations have delivered an increasing number of services, especially to children, in a variety of settings including school-based or school-linked oral health programs. In addition, according

to interview informants, registered dental assistants with expanded function certification have increased capacity in both the safety-net and private dental practices in Michigan.

Conclusions

The environmental assessment revealed that policymakers and oral health stakeholders from the public and private sectors in Michigan have been thoughtful about program and policy initiatives to improve access to oral health services in the state. Yet, despite ongoing collaborations and creative program initiatives from a variety of sources that have resulted in improvements in oral health access and outcomes, limited access to oral health services is a persistent problem in some geographic areas and for some populations. Improving access to oral health services is a difficult proposition that requires multifaceted strategies that contribute to improvements in oral health literacy in the population, secure adequate financing for oral health services, and encourage a well distributed and engaged professional workforce.

There is a fundamental need to improve population oral health literacy, reduce dental anxiety in the population, and encourage the public to adopt appropriate daily hygiene and dietary behaviors to improve personal oral health outcomes. Education to parents of young children about early oral health prevention activities, pregnant women about the risks of poor oral health to unborn children, and the general population about the interplay between oral and systemic health is a means to improve patients' oral health behaviors. Personal responsibility is an important contributor to good population oral health.

Financing for infrastructure, workforce, and dental insurance is the economic underpinning for a robust oral health services delivery system. Michigan is a benchmark state in its offering of an adult dental benefit in Medicaid and its use of managed care insurance to improve and expand access. Continued public financing for oral health services is an important and necessary support for access improvement efforts in the state.

Although measures of supply of professional workforce in Michigan compare favorably with national metrics, the state's dental workforce is not distributed evenly with the population. As a result, in some areas of the state there are no or very few general dentists. The distribution of specialty dentists, particularly pediatric dentists, is also a concern. The supply of pediatric dentists in Michigan appears to be wanting relative to the number of children in need of services and their practice locations are mainly in metropolitan areas.

Having an "adequate" supply of dentists does not assure availability of care. Low income populations and others are at risk for lack of access to dental services even in the presence of a sufficient number of providers. Few dentists actively participate in the care of publicly insured patients, especially those covered by fee for service Medicaid. Efforts to engage private practice dentists in the care of publicly insured patients continue to be important. Although the safety net for oral health services in Michigan is strong, improved oral health for the state's population cannot be achieved without the commitment of many private practice dentists.

Enabling workforce availability and service capacity in the oral health safety net is an important goal. The state loan repayment program encourages employment in safety-net organizations and is a means to enhance recruitment and retention of oral health workforce. The student dental externship programs at the University of Michigan and the University of Detroit Mercy are also valuable tools for introducing future dentists to the value of working with safety-net patients and the incumbent issues in community

and public oral health. Still, recruitment and retention of dentists for practice in the safety net is often a challenge.

Using team based approaches to effect oral health service delivery is now a common strategy in the safety net. Building effective teams requires maximum use of the professional competencies of team members. States have enabled various workforce to improve access to oral health services including encouraging primary care clinicians to provide oral health assessment and screening, expanding scopes of practice for dental hygienists and dental assistants, and creating new workforce with the ability to provide both preventive and restorative oral health services. These models often require higher levels of education to assure task competency of professionals. Many of these models have been shown to improve access to services while still maintaining quality of care.

Technical Report

Chapter 1. The State of Michigan

Michigan, which is located in the Great Lakes region of the US, is the ninth most populous state in the nation and the 11th largest in geographic area.[1] Michigan's land area consists of 2 peninsulas, known as the Upper and Lower Peninsulas. These peninsulas are separated by the Straits of Mackinac, which join Lake Huron with Lake Michigan. The state has the longest freshwater coastline in the US touching upon 4 of the 5 Great Lakes.[2] Michigan shares land and water boundaries with Ohio, Indiana, Illinois, and Wisconsin and water boundaries with Minnesota. Its northern and eastern borders are mainly with the Ontario Province of Canada. The capital of Michigan is Lansing and its largest and second largest cities are Detroit and Grand Rapids.

The estimated population of Michigan in 2013 was 9,895,622.[3] The population was 79.1% White, 13.9%, Black/African American, 0.5% American Indian/Alaska Native, 2.7% Asian, 1% other race, and 2.7% two or more races. About 5% of the population was of Hispanic/Latino origin,[3] and this percentage ranged from 0.8% in Schoolcraft County to 14.1% in Oceana County. Several counties in Michigan had populations that included more than 10% American Indian/Alaska Native, including Mackinac (17.5%), Chippewa (15.4%), Oakland (14.4%), and Baraga (13.6%). Wayne County with 1,775,273 people was by far the largest and most diverse of the 83 counties in the state with a population that was 54.7% White, 39.6% Black/African American, 0.5% American Indian/Alaska Native, 2.9% Asian, 2.3% two or more races, and 5.6% Hispanic/Latino.[3] (See Appendix A. Table 1).

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION IN MICHIGAN AND IN THE US, 2013

	Michigan	United States
Total Population 2013	9,895,622	316,128,839
Male	49.1%	49.2%
Female	50.9%	50.8%
White	79.1%	73.7%
Black/African American	13.9%	12.6%
American Indian/Alaska Native	0.5%	0.8%
Asian/Pacific Islander	2.7%	5.3%
Other	1.0%	4.7%
Two or more races	2.7%	3.0%
Hispanic/Latino	4.7%	17.1%

Source: ACS, 2014

1 Michigan. Wikipedia. http://en.wikipedia.org/wiki/Michigan
2 State of Michigan. Michigan's State Facts. http://www.michigan.gov/som/0,1607,7-192-29938_30245-67959--,00.html
3 American Fact Finder, US Census Bureau, Population Division. Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2013_PEPANNRES

Detroit is among the top 5 metropolitan areas in the country where Americans of Arab ancestry reside,[4] with a significant cluster of people of Arab ancestry in Dearborn, Michigan. Approximately one-third of the population in the metropolitan area claims Arab heritage, estimated to be between 190,000 and 500,000 people. This represents the second largest concentration of Arab Americans in the US.[4]

In 2013, there were 3,818,931 households in Michigan located in a land area of over 56,500 square miles.[3] Population density was, on average, 174.8 persons per square mile ranging from fewer than 10 persons per square mile in Keweenaw County (4.0), Ontonagon County (5.2), Schoolcraft County (7.2), Luce County (7.4), and Baraga County (9.9) to 2,974.4 persons per square mile in Wayne County.[3] Eighty-nine percent of Michigan residents age 25 and older graduated from high school or obtained an equivalency diploma.[3] The percentage of the population age 25 and older with at least a high school education ranged from 80.8% in Lake County to 94.3% in Leelanau County and 93.9% in Washtenaw County.[3] More than one-quarter of the state's residents age 25 and older earned a bachelor's degree or higher. The percentage of the population age 25 and older with at least a bachelor's degree ranged from 8.2% in Lake County to 50.9% in Washtenaw [3] (see Appendix A, Table 1).

Median annual household income in Michigan between 2008-2012 was $48,471.[3] Median household income was highest in Livingston County ($72,396) and lowest in Lake County ($30,390), which also had the lowest number of college graduates.[3] The percent of the population living at or below the poverty level was highest in Isabella County (32.1%) and lowest in Livingston County (6.3%)[3] (see Appendix A, Table 1).

Between 2005-2011, the child poverty rate in Michigan increased by one-third from 18% to 25% of children in the state living in families with incomes below the FPL.[5] Children from minority backgrounds were more likely than non-Hispanic White or Asian children to live in poverty.[5] Three of every 5 children living in Roscommon (60%) and Lake (60%) counties were in families using Supplemental Nutrition Assistance Program (SNAP) benefits, while only 14% of children in Livingston County were in families enrolled in the program.[5] In addition, nearly half of all school children in Michigan (48%) qualified for the federal free or reduced price school lunch program based on family income with 94% of students in Lake County qualifying for the program. [5]

Industry and Labor Markets in Michigan

Michigan's auto industry, which is a large employer in the state, was greatly affected during the recent economic recession, which began in December 2007 and ended in June 2009. One indicator of the recession's impact was the reduction in the number of automobile/truck units manufactured. In 2000, 3.1 million units were produced. Production fell to 1.8 million units in 2008.[6] However, in 2013 the industry was in an upward trend producing approximately 2.5 million units. Automotive production for the month of July 2014 was the highest since 1986.[6] Still, the unemployment rate in the state remains high.

In January 2015, the unemployment rate in Michigan was 6.3% compared to 5.6% nationally. Michigan's unemployment rate ranked 37th in the nation. This was an improvement from an unemployment rate of 7.7% in July 2014, which, at that time, ranked among the top in the nation along with Nevada (7.7%) and

[4] Arab American Institute. Michigan. http://b.3cdn.net/aai/dfab1c90e9a819c9c1_tkm6iyilb.pdf
[5] Zehnder-Merrell, J. Child and Family Well-Being in Michigan and Its Counties, Overview 2013. Lansing, MI: Michigan League for Public Policy. Kids Count in Michigan; 2013. http://www.mlpp.org/misc/KCMIDB2013rev.pdf
[6] Michigan Bureau of Labor Market Information and Strategic Initiatives and the Michigan Treasury's Office of Revenue and Tax Analysis. Key Labor Market and Economic Metrics. August Update. 2014. http://milmi.org/admin/uploadedPublications/1985_Labor_Mkt_Metrics.pdff.

Rhode Island (7.7%).[6] While there is still a larger percentage of unemployed people in Michigan compared to many other states, this unemployment rate represents a significant improvement over the 14.1% unemployment rate in 2009. Employment in December 2013 was up 8% over its lowest level in December 2009. In December 2014, Michigan's labor force participation rate was 39th in the US at 60.2%.[6]

Industry growth in Michigan is greatest in the manufacturing, construction, and professional and business service sectors. Manufacturing job growth is primarily concentrated in durable goods with transport equipment manufacturing adding 8,700 jobs since July 2013.[7] Michigan's share of scientific and engineering employment at 142,000 jobs ranked the state at seventh in the nation in 2011. The rebound in the state's automotive manufacturing sector was the main driver of growth in scientific and engineering employment overall.[7]

The manufacturing sector employs over 500,000 workers statewide, which is nearly 1 of every 6 private sector jobs. While domestic automakers (27%) including General Motors, Chrysler, and Ford and metals manufacturers (18%) are the most common employers in this industrial sector, machinery manufacturing (12%), food manufacturing (7%) including Kellogg and Morton Salt, plastics rubber products manufacturing (6%), bioscience manufacturing (5%), and furniture manufacturing (4%) such as Steelcase are also large employers in the sector.[8] Half of all manufacturing workers are employed in production occupations and 1 of every 5 manufacturing workers is employed in management or professional occupations. The workforce in this cluster is largely male (74%) and almost one-third (32%) is between the ages of 45 and 54. Twenty percent of the workforce in the manufacturing sector is older than age 55, driving concerns about future workforce supply and also raising concerns about near future demand for health services.[8]

The proximity of much of the state to both the Great Lakes and numerous inland lakes makes tourism an important industry especially in the Upper Peninsula. Metropolitan Detroit is also a popular tourist destination. Tourism is Michigan's second largest industry. Tourism depends heavily on seasonal employment, which affects unemployment rates and insurance benefits for those working in the industry.

Michigan is a major net exporter of agricultural products, including blueberries, cherries, apples, and Christmas trees. The agricultural cluster is among the few sectors in Michigan recording employment expansion since before the recent recession.[9] Almost half of all jobs in this sector (47%) are in food processing, with 31% in farming and the remainder (22%) in wholesale and retail services related to the sale and distribution of food and animal products.[9]

Health care employment accounts for nearly 18% of total employment in Michigan, providing 585,000 of the 3,270,400 jobs in the state. Michigan contains both small and large health care facilities distributed throughout the state. The aging of the population and the increase in the incidence and prevalence of

[7] State of Michigan. Department of Technology, Management and Budget. Bureau of Labor Market Information and Strategic Initiatives. Michigan Economic and Workforce Indicators and Insights-Winter 2013. http://milmi.org/admin/uploadedPublications/1986_Winter_2013_Michigan_Economic_Workforce_Indicators_Insights.pdf

[8] Pure Michigan, Workforce Development Agency. Manufacturing Cluster Workforce Analysis. January 2013. http://milmi.org/admin/uploadedPublications/1995_WDA_ManufacturingFINAL.pdf

[9] Pure Michigan, Workforce Development Agency. Agriculture Cluster Workforce Analysis. January 2013. http://milmi.org/admin/uploadedPublications/1991_WDA_AgricultureFINAL.pdf

chronic disease is continuing to drive demand for health care services in the state and the nation, generally.[10]

Michigan's 2013 per capita gross domestic product at $41,252 was below the national average of $49,115, ranking the state at 38th in per capita real GDP.[5] Per capita income was $39,005, which was well below the national average of $44,765, placing Michigan at 35th among states in per capita income.[5] Per capita income in Michigan is growing slower than that of the US, rising 1.2% in 2013 versus 1.3% in the US. In 1982, Michigan had the fourth highest median wage in the US, but the loss of manufacturing jobs in the state placed Michigan at 24th among states in median wages for workers in 2012.[11]

Chapter 2. History of Advocacy to Improve Oral Health in Michigan

There is a long history of stakeholder involvement in initiatives to improve the oral health of Michigan's population. Continuing efforts to identify barriers to access and utilization of services have resulted in the design and implementation of innovative programs to improve the availability of oral health services and ultimately, to enhance oral health outcomes. The following provides a summary of recent efforts to improve oral health for Michigan's people.

History of the Michigan Oral Health Plan

Michigan Department of Community Health (MDCH)
2006
Burden of Oral Disease in Michigan

This report compiled both state and national surveillance data to describe the burden of oral disease in Michigan in 2006.[12] The report provided baseline measures of oral health status and benchmarked the oral health of Michigan's people with national data about the US population. In addition, the report discussed both risk and protective factors for oral disease and the provision and utilization of oral health services in the state, including a discussion of professional workforce capacity and provider organizations, access to services for underserved and special populations, and dental insurance status.[12] The report also provided background information on the prevalence of oral disease under many topical areas, including:

- The epidemiology of oral disease in Michigan;
- Prevention of oral disease through initiatives such as community water fluoridation and dental sealant programs;
- The oral health workforce to provide oral health services;
- Access to oral health care for the population with attention to special populations;
- The burden of untreated dental disease including rates of dental caries in children;
- Immediate unmet dental care needs especially for children;
- Dental disease in adolescents and adults including behaviors that affect oral health outcomes like consumption of carbonated beverages;
- Tooth loss in the population;

[10] Pure Michigan, Workforce Development Agency. Health Care Cluster Workforce Analysis. January 2013. http://milmi.org/admin/uploadedPublications/1993_WDA_HealthFINAL.pdf
[11] Ruark P; for Michigan League for Public Policy. Labor Day Report: Michigan's Paycheck Blues. August 2013. http://www.mlpp.org/wp-content/uploads/2010/07/Labor-Day-Report-Michigans-Paycheck-Blues.pdf
[12] MDCH. Burden of Oral Disease in Michigan, 2006. http://www.michigan.gov/documents/OHBurdenDraft_135603_7.pdf

- The prevalence of periodontal disease among certain racial/ethnic groups or disease categories;
- Oral cancer incidence rates in Michigan with discussion of high-risk populations and risk factors;
- A discussion of the social impacts of poor oral health such as declining nutritional status, impaired social interactions, depression, and sleep difficulties and deprivation;
- The economic impacts of poor oral health including expenditures for dental treatment and loss of school and work productivity; and
- The linkages of oral disease with systemic conditions including diabetes, heart conditions, and stroke.[12]

The report also discussed specific goals for improvements in oral health related to these topics.

Michigan Department of Community Health
2006
Oral Health Plan

The 2006 Michigan Oral Health Plan included much of the material published separately in the aforementioned report but it also elaborated on issues with access to dental care in Michigan, including lack of dental insurance and the importance of an adequate supply of oral health workforce to provide needed services.[13] The report discussed a plan of action to improve the oral health status of the state's population, which was developed by stakeholders focusing separately on each of 4 areas:

1. Data
2. Prevention, Education, and Awareness
3. Funding
4. Workforce[1]

The recommendations of stakeholder workgroups were consolidated in the 2006 State Oral Health Plan using 10 goals organized under the 4 topical areas, including[13]:

Data Goals:

1. Develop a statewide oral health surveillance system to provide a routine source of actionable data.
2. Increase the sustainability of the statewide oral health surveillance system.
3. Provide assistance in the collection and analysis of oral health data related to major policy changes and prevention and intervention initiatives.

Prevention, Education, and Awareness Goals:

1. Increase access to evidence-based preventive practices that maintain optimal oral health.
2. Develop a statewide education program aimed at increasing knowledge about the relationship between oral health and systemic health.
3. Assure the availability of comprehensive, culturally competent, oral health education resources for all ages as well as those designed to enhance patient involvement through self-management.
4. Increase the education of non-dental health care providers on the importance of oral health.
5. Encourage health care providers to discuss with patients the oral effects of tobacco use (cigarettes, cigars, pipes, and chewing tobacco).
6. Increase the education of dental professionals about the signs and symptoms of abuse and neglect.

[13] MDCH. Michigan Oral Health Plan. 2006. http://www.mohc.org/files/oral%20health%20plan-9-29-06.pdf

Funding Goals:

1. Create a Medicaid adult oral health benefit that ensures access to and is consistent with high-quality care standards.
2. Support efforts to roll out HKD as the preferred model for optimal oral health in children with the gradual expansion to additional counties based on those counties with greatest need and funding availability.
3. Develop a system of care that ensures access to oral health services for low-income uninsured populations.
4. Support efforts of all Michigan Oral Health Coalition workgroups to assess resources needed to implement their initiatives.
5. Ensure the successful implementation of the State Oral Health Plan through the acquisition of needed resources.

Workforce Goals:

1. Increase access to oral health services in medically underserved communities and for underserved populations by allowing the provision of high-quality dental care through qualified health care providers.
2. Develop and support incentive programs to attract oral health care professionals to underserved areas and to serve the medically underserved populations.
3. Create and maintain a process for assessing and responding to the supply of and demand for oral health professionals.
4. Develop a dental director leadership position in state government or at the MDCH to serve as the focal point of oral health activity for the state.
5. Facilitate provider education and medical care facility access to improve oral health care for persons with special needs.
6. Periodically evaluate progress and modifications of strategies and/or implementation plan as appropriate.[13]

Each goal is followed by proposed steps to enable the desired outcome, including suggested actions, required resources, responsibility for goal achievement, monitoring mechanisms, and expected completion dates. The report ends with an inventory of oral health programs in Michigan that were developed to achieve the goals of reducing oral disease and oral health disparities for certain populations.

Michigan Department of Community Health
March 2010
Michigan Oral Health Plan

Consistent with a mandate in the Michigan Oral Health Plan of 2006, the goals and objectives defined in that plan were re-evaluated by a committee of diverse oral health stakeholders at the 3-year point in 2009.[14] The plan was updated as a result of the progress review and in consideration of more recent data about prevalence of oral disease in Michigan. New goals were established in a 5-year plan of action framework and the revised plan was published in March 2010.[14]

[14] MDCH. Oral Health Plan. March 2010.
http://www.michigan.gov/documents/mdch/Michigan_State_Oral_Health_Plan_FINAL_2_326169_7.pdf.

The revised plan benchmarked oral health in Michigan to the Healthy People 2010 goals, as did its predecessor. The Healthy People goals included objectives for reduction in dental caries experience and untreated caries among children, reduction in tooth loss and edentulism among adults, reduction in oral cancer mortality, earlier oral cancer detection, increased availability of fluoridated water, increased utilization of oral health prevention and treatment services, and improvement in the availability of providers of oral health services including school-based health centers, community-based clinics, and public health programs.[14]

The updated prevalence data and more current information about risk factors of oral disease in Michigan in the plan described:

- Utilization of dental visits among both the general population and at-risk groups including people eligible for Medicaid;
- Rates of dental caries in the very young, children and adolescents, adults, and the elderly;
- Rates of tooth loss, periodontal disease, and oral cancers;
- The oral health of pregnant women in the state;
- Oral health disparities among diverse populations, people with special health care needs or disabilities, people from lower socioeconomic groups, women and the elderly, especially the confined elderly;
- The implications of poor oral health for overall health and the systemic linkages to chronic disease; and
- The importance of having a sufficient and appropriately distributed supply of trained, culturally competent dental professionals to provide services not only in dental offices but also in settings where typically underserved populations are often treated, including community clinics.[14]

The revised goals within the 2010 oral health plan included the following:

1. Maintain a statewide oral health surveillance system to provide a routine source of actionable data.
2. Implement evidence-based preventive practices that maintain optimal oral health for Michigan communities.
3. Increase knowledge of the relationship between oral health and systemic health.
4. Provide information about the availability of comprehensive and culturally sensitive oral health education resources.
5. Develop strategies for Michigan to increase access to oral health services by establishing a dental home no later than age 1.
6. Support a public and private system of care that ensures access to comprehensive oral health services for all Michigan residents.
7. Increase access to oral health services in underserved populations and communities.
8. Increase oral health access for persons with special needs.
9. Increase oral health access for the elderly.
10. Develop and sustain the necessary infrastructure to successfully implement the state oral health plan.[14]

As with the previous iteration, each goal statement in the plan was followed by the rationale for the goal along with suggested steps to further progress towards full achievement, a description of resources and collaborations that would be useful, designation of a responsible organization, a description of monitoring mechanisms and outcomes evaluation measures, and desirable completion dates.[14]

Michigan Department of Community Health
March 2010
Michigan Oral Health Plan Mid-Term Progress Report

Midway through the 5-year plan of action described in the 2010 Michigan Oral Health Plan, the department published a progress report that provided a detailed accounting of the steps taken to achieve each of the 10 overarching goals in the state's plan.[15] The activities described documented progress towards the stated goals and described constructive programs to improve the oral health status of the population. Some of the outcomes described in this report included:

- By 2012, the number of SEAL! Michigan grantees providing dental sealants in schools and education to teachers, students, and parents about the importance of oral health had increased from 6 to 9 programs. Since 2010, more than 3,000 children in 160 schools in grades 1, 2, 6, and 7 had benefitted from dental sealant placement and dental referrals provided through the program.
- The Babies TOO! Fluoride Varnish Program had resulted in more than 2,000 children from birth to age 3 having oral health screenings, fluoride varnish applications, and referrals to dental homes during well-baby or well-child visits in medical offices since 2010.
- In 2011, the Public Dental Prevention Program enabled in PA 161 had resulted in about 23,000 underserved or unassigned people receiving preventive oral health services.
- The expansion of the HKD Program had reached children in 75 counties in Michigan.
- In 2010, several survey reports describing screening surveys were published, including the Count Your Smiles Report of the statewide examination of a sample of third-graders and the Senior Smiles Survey Report describing a statewide sample survey of the oral health of elderly people living in care facilities.[15]

Michigan Department of Community Health
2013
Burden of Oral Disease in Michigan in 2013

This report updated the prevalence data contained in the original and subsequent reports on the burden of oral disease in the state and benchmarked recent surveillance data with the Healthy People 2020 goals.[16] The report contained an executive summary of facts related to oral disease epidemiology, prevention activities in the state, the supply and distribution of oral health workforce, and a description of access to oral health services in Michigan followed by a detailed discussion of the oral disease status of the population using a range of indicators to describe oral health.[16] The report also discussed the supply and distribution of oral health workforce, oral health professional education programs in Michigan, oral health safety net providers, and dental insurance status of Michigan's residents.[16] It also contained a summary of oral health promotion and prevention programs in Michigan, including a listing of reports related to oral health promotion and research activities. The document provided statistics about community water fluoridation programs in Michigan.

[15] MDCH. Michigan Oral Health Plan Mid-Term Progress Report. August 2012.
http://www.michigan.gov/documents/mdch/Mid-term_report_FINAL_397405_7.pdf
[16] MDCH. Burden of Oral Disease in Michigan, 2013.
http://www.michigan.gov/documents/mdch/Burden_of_Oral_Health_Annual_Report_416501_7.pdf.

In 2013, Michigan had met or exceeded Healthy People 2020 goals in a number of areas[16]:

- The Healthy People 2020 target to reduce the rates of edentulism in adults age 65-74 was 21.6%. In 2010, just 13.1% of adults in that age cohort in Michigan were edentulist.
- The Healthy People 2020 target to increase the percentage of low-income children and adolescents who received any preventive dental service during the previous year was 29.4%. In 2008, 32.5% of low-income children and adolescents received a preventive dental service.
- Michigan exceeded the Healthy People target of 28.4% of local health departments with oral health prevention or care programs with 40% of local health departments having oral health programs in 2011.
- The state was also very close to meeting the Healthy People target of 83% for FQHCs with an oral health component. In 2011, 82.8% of FQHCs in Michigan had an oral health component. Nationally just 75% of FQHCs had an oral health component.
- Michigan exceeded the Healthy People 2020 goal for population served by optimally fluoridated water (79.6%) with 91% of the state's population on community water supplies served with fluoridated water in 2011.
- Michigan met the Healthy People 2020 goal for oral and craniofacial health surveillance system (100%) in 2012.[16]

The report provided further detailed statistics from surveillance data about the oral health of patients with chronic disease, special populations with increased risk for poor oral health outcomes, socioeconomic disparities and other barriers to oral health services, dental caries and gum disease, social and economic impacts of poor oral health, risk factors for poor oral health outcomes, protective factors for achieving improved population oral health, and current oral health initiatives and programs in the state.[16]

Other Reports Related to Oral Health in Michigan

University of Michigan School of Social Work
2011
Conference: Increasing Access to Oral Health Care in Michigan: A Discussion of Three Possible Solutions

In August of 2011, The University of Michigan School of Social Work hosted more than 130 oral health stakeholders at a one day conference to discuss possible solutions to the problem of limited access to oral health care for the underserved in Michigan. The assemblage included dental and dental hygiene professionals, safety net provider organizations, advocates for children and families, academic professionals, and others. The three solutions put forth for discussion included the following:

- Introduction of a mid-level dental provider
- Increasing utilization of existing modes of practice
- Collaborations linking oral health providers with other care providers

Conference participants discussed the utility of a mid-level dental therapy model and agreed that strong international evidence exists that dental therapists provide safe, competent, high quality care and generate commendable patient satisfaction scores. The group also cited emerging evidence from dental therapy practice in Alaska and Minnesota to support these conclusions. However, there was also agreement that more research is needed to understand the relative contributions of the dental therapy workforce model to increased access to oral health services.

Attendees also discussed the utility of using existing service delivery structures and workforce to expand access. This strategy included a focus on education about prevention and promotion of preventive care, efforts to increase efficiencies in oral health service delivery in private practices and safety net organizations using dental assistants trained in expanded functions, and initiatives to expand the functions of registered dental hygienists to increase their reach in community and public health settings.

Participants also acknowledged the importance of building collaborations between oral health providers and primary care clinicians and other professionals (e.g. social workers) to improve oral health assessment and referral rates, to better navigate patients in need of oral health services to available providers, and to promote adherence to oral health treatment plans.

Michigan Dental Association
2010-2013
A United Voice for Oral Health

In 2009, the Michigan Dental Association (MDA) convened a group of 30 oral health stakeholders to identify barriers to oral health access for Michigan residents.[17] In 2010, the group, called the Michigan Access to Oral Health Care Work Group published a report of findings that made a set of 17 recommendations to improve oral health outcomes for the state's population, including the following (organized by topical area):

- Funding and payment
  - Find new sources of revenue to expand HKD
  - Advocate for dental benefits in the Medicaid program
  - Create an oral health division in the MDCH
- Prevention and early diagnosis and treatment
  - Encourage oral screening by physicians and other providers
  - Provide education and training for physicians, nurses, and others to do oral health screenings and educate parents
  - Support and facilitate the Head Start Dental Home Initiative
  - Support efforts to educate and advocate for community water fluoridation
- Partnerships between the medical and oral health communities
  - Develop an oral health curriculum for health care professionals
  - Issue guidelines for physicians about oral health screenings
  - Review state law to identify opportunities for interdisciplinary management of oral health care
  - Support clinical training for nurses and physicians to apply fluoride varnish
- New models of care and workforce scope of practice
  - Authorize dental assistants to assist dental hygienists with dental sealant application in school-based and community health center programs
  - Establish model volunteer dental programs
  - Study the effects of "alternative" dental providers on provision of oral health care
- Public education on the value of oral health care
  - Educate pregnant and parenting adults about oral health
  - Educate the public about the serious consequences of poor or neglected oral health

[17] Public Sector Consultants, Inc. A United Voice for Oral Health. 2013 Update. Final Report and Recommendations from the Michigan Access to Oral Health Care Work Group. http://www.smilemichigan.com/Portals/pro/ProDocuments/DonatedCare/united_voice_for_oral_health.pdf.

- Implement a social marketing campaign to increase awareness of the importance of oral health[17]

Barriers to patient access to oral health care identified in the deliberations of the collaborative included the following:

- Financial barriers
- Structural barriers
- Cultural barriers

The report also discussed the economic, medical, and social consequences of untreated oral disease.

In 2013, the consultant to the Michigan Access to Oral Health Care Work Group issued an update to the initial report. The update detailed progress towards the original goals describing the following outcomes:

- Since the original report, there was an increase in the number of Michigan counties in which children had access to the HKD program. In October 2012, HKD had expanded to 75 counties with a goal of statewide expansion by 2016.
- A law was passed in 2012, which permitted dental assistants to assist dental hygienists in applying dental sealants in qualified settings. The expected impact of the legislation was expanded access to sealant services for more children.
- Oral screening procedure guidelines for physicians were incorporated into the guidelines on preventive care of the American Academy of Pediatrics and those of the Michigan Quality Improvement Consortium.
- The University of Detroit Mercy School of Dentistry was conducting a study to evaluate care provided by expanded function dental hygienists.
- Communities in Michigan seeking to expand access to dental care for county residents were matched with similar communities who already had successful local programs to encourage program replication.
- The MDA and the MDCH developed oral health care guidelines for educators and school administrators and the MDA hosted a symposium about the guidelines.
- The Interprofessional Education Consortium and medical and dental professional organizations were actively working with the universities in the state to provide guidance on interprofessional curricula and training in oral health.

University of Michigan
Child Health Evaluation and Research Unit
2007-2012
Healthy Kids Dental: Trends FY2007-2012

The Child Health Evaluation and Research Unit of the University of Michigan issued a report for the MDCH evaluating the HKD program in the state. The report described changes since 2000 in the number of dental providers treating low-income children and the impact of increased utilization of oral health services on children's oral health outcomes after implementation of the HKD program.[18]

[18] Clark S, Cohn L. *Healthy Kids Dental: Trends FY2007-FY2012*. Project report for the Michigan Department of Community Health. October 2013. http://brighterfuturesmi.com/cms/assets/uploads/2014/02/HKD-Final-Report-for-Delta.pdf.

In May 2000, the state of Michigan contracted with Delta Dental to manage oral health services for Medicaid-eligible children in 22 counties in the state calling the innovative program, Healthy Kids Dental (HKD).[18] Once partnered with the state, Delta Dental was able to leverage existing provider networks and its efficient administrative processes to increase access to oral health services for Medicaid-eligible children in participating counties. Delta Dental was also able to offer higher reimbursement for services to its network providers than that previously provided by the Medicaid FFS program. The HKD program was subsequently expanded to include an additional 15 counties in October 2000, with ongoing expansions in 2006, 2008, 2012, and 2013. By October 2013, Medicaid-eligible children in all but 5 counties in Michigan were eligible for HKD, with children in 4 of the 5 remaining counties becoming eligible for HKD in 2014.[18]

This study examined utilization of oral health services by children in the 65 counties with HKD programs from May 2000 through September 2012. Thirteen additional counties had transitioned to the HKD program after September 2102 but were not considered in the study. The study examined claims data to describe:

- The percent of children in HKD receiving any dental service;
- The percent receiving any preventive dental care;
- The percent of children with a dental home;
- The number of participating dental providers; and
- The average cost of dental services per enrolled child and per visit.[18]

The findings included the following:

- A larger proportion of children in counties with the HKD program received dental services than children living in counties where only Medicaid FFS benefits were available.
- Substantial increases in access to oral health services occurred immediately following counties implementing the HKD program and those increases were sustained over time.
- Children in counties with only Medicaid FFS reimbursement for oral health services were disadvantaged by the absence of the HKD program.
- Children in the HKD program were more likely than their FFS counterparts to receive preventive dental care and were also more likely to receive preventive oral health care than children nationally. Children in the Michigan Medicaid FFS program were less likely than children nationally to receive preventive dental services.
- Researchers found a substantial increase in the number of dental providers seeing Medicaid-eligible children in counties where the HKD program was active. One outcome of higher provider participation rates was a lower average number of Medicaid-eligible children per provider in HKD counties than in Medicaid FFS counties. In FFS counties where provider participation was much lower, per provider caseloads were much higher.
- Over the 2-year period from 2010-2012, 40% of children enrolled in HKD showed evidence of having an established dental home (defined as 2 preventive visits within a 2-year period to the same provider). Just 28% of children in Medicaid FFS counties showed evidence of having a dental home in 2010.
- Costs for per enrolled child and per visit were higher in 2011 and 2012 for children in the HKD program than for children in Medicaid FFS. Costs in each program appeared to be relatively stable over time. [18]

University of Michigan
Child Health Evaluation and Research Unit
December 2014
Healthy Kids Dental Evaluation: Update of Trends Through 2013

This recent report further reviews the impact of the HKD program on services to children in Michigan in the 75 counties in which the HKD program was operating as of October 2013, including 61 counties with ongoing HKD coverage and 14 counties with new HKD coverage in fiscal year 2013. The report compares utilization of oral health services for children covered by HKD with that of children covered by Medicaid FFS in the 8 counties in Michigan in which HKD was not available.[19] The report also compares utilization rates of children with HKD coverage and Medicaid FFS coverage with those of children in the same age cohorts with commercial insurance.

The findings of the analysis indicated that HKD counties showed consistently higher utilization of dental services among insured children than did counties with Medicaid FFS.[19] In the 14 counties which joined HKD in 2013, there was an appreciable increase in dental services utilization among covered children with differences of over 10% for both preventive and diagnostic services from utilization under FFS coverage.[19] On average more than half and as high as 58% of eligible children in HKD counties received dental services in 2013 compared to 44% of children in FFS counties. The data show that increases in dental services utilization in HKD counties are sustained over time but those increases have plateaued in recent years. The immediate impact of HKD in counties that began the program in 2013 was apparent with those counties achieving utilization rates in that year comparable to counties with longer-term enrollment in the program.

The researchers were able to compare utilization rates in HKD, FFS, and commercial insurance programs. While HKD counties demonstrated higher utilization rates than FFS counties among children in those programs, commercially insured children were much more likely to be using dental services than publicly insured children in all counties with differences of 20 percentage points or more.[19]

This report also remarked once again on the increased participation of dentists in HKD counties finding that more dentists were seeing some publicly insured children in HKD counties than in FFS counties and that fewer dentists in HKD counties had very large caseloads of publicly insured children than in FFS counties.[19]

An analysis of utilization by age group showed that utilization of oral health services was lowest for very young children and highest for the age 7-10 group with decreasing utilization in older children. The findings also revealed that children in FFS counties were more likely than children in HKD counties to receive all of their services through school-based oral health programs and clinics or through mobile dental services. Many school-based oral health programs focus on preventive oral health services only with referrals to community dentists for needed restorative services. Since establishing a dental home in which dental services are provided on an ongoing basis is a desirable oral health goal, these data were concerning.

Michigan Oral Health Coalition
2014
Check-Up on Oral Health: A Call to Action

[19] Clark S, Cohn L. University of Michigan, Child Health Evaluation and Research Unit. Healthy Kids Dental Evaluation: Update of Trends through FY 2013. December 2014. Project Report for the MDCH Oral Health Program.

The Michigan Oral Health Coalition published a brief entitled "Check-Up on Oral Health: A Call to Action," which discussed the importance of expanding the HKD program to all counties statewide.[20] In early 2014, the HKD program provided dental benefits for approximately 500,000 children in 78 of the 83 counties in Michigan.[20] The coalition reported that children in the HKD program were 60.6% more likely to receive a preventive dental service by age 3 and 25% less likely to use emergency dental care by age 3 than children in the Medicaid FFS program.[20] The brief presented data showing that children in the HKD program traveled, on average, 7.6 miles to receive dental care as opposed to children receiving care under Medicaid FFS who traveled on average 24.5 miles for dental services.[20] Children attending schools in the city of Detroit, which is in a FFS county, were more likely than other children to have a toothache when biting or chewing. [20] The report remarked on geographic, demographic, socioeconomic, and workforce factors influencing oral health outcomes in the state.

- Sixty of the 83 counties in Michigan contained either a designated partial or whole county geographic or population group DHPSA. [20]
- Six counties in the state had no dentist enrolled in Michigan Medicaid.[20]
- The Medicaid reimbursement rate for dental services in Michigan had not increased since the 1990s. As a result, only 10% of Medicaid enrolled dentists[20] were considered critical access providers with claims for services to Medicaid-eligible people totaling more than $10,000 in 2008.
- Statewide, 7 million people benefited from fluoridation in public water systems.[20]
- Only 23.3% of third-grade children had sealants present on their first molar teeth. Children from racial/ethnic minority groups had 2 times as much untreated dental decay as other children, and only half as many dental sealants. [20]
- In 2011, more than 1,000 people were hospitalized for emergency conditions related to the teeth and jaw. [20] Many of these hospitalizations were considered avoidable if there had been early treatment of dental disease or regular preventive dental care.
- The Medicaid program insures 900,000 low-income adults and is the primary insurer for dental care for these enrollees.[20]

[20] Michigan Oral Health Coalition. Check-Up on Oral Health: A Call to Action. 2014. http://mohc.org/files/Policy%20Statements/2014%20Call%20to%20Action.pdf.

Chapter 3. Oral Health of Michigan's Population

The following bullets summarize the major findings of this report on the oral health of Michigan's people. The findings are discussed in more detail in the narratives that follow these summary bullets.

Community Water Fluoridation

- Michigan currently ranks 15th in the country in the percentage of people served by community water systems who are receiving fluoridated water (90.9%). In 2013, there were 1,452 community water systems in Michigan serving approximately 8 million people.[21]

Oral Health Status of Adults and Utilization of Oral Health Services in Michigan

There were positive indicators that Michigan's population had better than average oral health utilization and clinical outcomes.

- In 2012, the percentage of the population of adults in Michigan that visited a dentist, a dental hygienist, or a dental clinic (67.3%) was somewhat higher than the percentage of adults in the US (64.9%) with a dental visit.[22]
- Michigan ranked 18th highest in the US for the percentage of the state's population having a dental visit.[22]
- Adults in Michigan (42.5%) were less likely than adults in the US (44.9%) to have had 1 or more permanent teeth extracted, ranking Michigan at 19th lowest in the nation on this negative measure of oral health.[22]
- Nationally, 15.0% of people had lost all of their teeth in 2012, but just 12.9% of adults in Michigan reported edentulism in the 2012 Behavioral Risk Factor Surveillance System (BRFSS). This placed Michigan as the state with the 12th lowest rate of edentulism in the nation, another indicator that Michigan adults were above the US average in oral health status.[22]

While measures of oral health access and health status were suggestive of positive oral health status, there were findings that suggested that certain population groups in Michigan were at high risk for poor oral health outcomes.

- Between 2002-2012, the percentage of adults in Michigan that reported no dental visit in the prior year on the BRFSS surveys increased, especially among adults age 25-34 (17.3% increase over the 10-year period).[22]
- Only 58.2% of respondents age 25-34 visited a dental provider in the prior year. At the same time 73.4% of respondents age 55-64 visited a dental provider.[22]
- Males and Hispanics were less likely than females and non-Hispanics to have seen a dentist in 2012.[22]
- White adults (70.9% of white respondents) in Michigan were more likely than adults from other racial/ethnic groups to have visited a dentist in the previous year.[22]
- Having teeth removed for decay or gum disease was less prevalent among those with higher levels of education than among those who had less than a high school education. Fifty-nine percent of Michigan's residents without a high school education had at least 1 permanent tooth removed.[22]

[21] MDCH. MDCH Water Fluoridation Program. Fluoridation Equipment Grants. September 12, 2013.
[22] MDCH. Michigan Annual BRFSS Annual Reports: 2002, 2004, 2006, 2008, 2010, and 2012. http://www.michigan.gov/mdch/0,4612,7-132-2945_5104_5279_39424_39425-134600--,00.html.

- Having a permanent tooth removed was less prevalent among adults in Michigan with annual incomes of $50,000 or more (31.0% of higher income adults) than among adults at lower income levels (56.9% of lower-income adults).[22]
- Among the group of people age 65 and older with annual incomes less than $15,000, 25.6% indicated they had lost all their teeth.[22]

Oral Health Status of Children in Michigan

Children are a population of special concern because early and routine access to oral health services is predictive of better health outcomes over the long term. Currently, lack of access to oral health care contributes to significant disparities in oral health status.[23]

- Higher percentages of Medicaid-eligible children were receiving oral health services in Michigan in 2013 than in 1999. In 1999, just 8.2% of Medicaid-eligible children had a preventive oral health service, while in 2013, 36.3% of eligible children received a preventive service.[24]
- Medicaid-eligible children age 3-14 were more likely to have a dental service, preventive service, or dental treatment service than children in all other age cohorts. The group exhibiting the highest utilization rates of oral health services were children age 6-9.[24]
- In Michigan, the percentage of Medicaid-eligible children age 0-20 receiving any dental or oral health services gradually increased over the most recent 4 years, from 36.7% to 39.7%.[24]
- Over the 15 years from 1999-2013, Michigan has lagged behind the national average in the percentage of Medicaid-eligible children who received any dental service in every year except 2002 and 2004.[24]
- The percentage of Michigan's Medicaid-eligible children receiving preventive oral health services from 2002-2007 tracked closely or exceeded the percentage of Medicaid-eligible children nationally receiving preventive services. However, the share of eligible children receiving services in Michigan fell below the national rate in 2008 and has not exceeded the national rate in any subsequent year.[24]
- In the 2011-2012 National Survey of Children's Health (NSCH), parents were asked to appraise the overall condition of their children's oral health if their children had natural teeth. A higher percentage of parents of children in Michigan (76.4%) indicated that their children had excellent or very good oral health than parents nationally (71.3%).[25]

Oral Health of Third-Grade Children in Michigan

- The percentage of third-grade children with primary caries experience decreased in the 4 years between the 2005-2006 and 2009-2010 third-grade surveys of oral health status in all regions of Michigan except suburban Detroit. In that region, there was a 7.6% increase in third-graders with caries experience in their primary teeth over the time period. Still, children in suburban

[23] IOM (Institute of Medicine) and NRC (National Research Council). *Improving access to oral health care for vulnerable and underserved populations*. Washington, D.C.: The National Academies Press; 2011.
[24] Centers for Medicaid & Medicare Services (CMS). Early Periodic Screening Diagnosis and Treatment Form CMS-416, Michigan 1999-2011. http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-and-Periodic-Screening-Diagnostic-and-Treatment.html
[25] National Survey of Children's Health. Data Resource Center for Child & Adolescent Health. http://www.childhealthdata.org/learn/NSCH

Detroit had lower rates of caries in primary teeth than their peers in the Upper Peninsula and the Northern Lower Peninsula in both survey years.[26]

- Less than one-fifth of third-graders in Michigan had caries in their permanent teeth when examined for either of the third-grade oral health surveys. However, the percentage of children with caries in their permanent teeth increased by almost 6% in suburban Detroit and by over 2% in the city of Detroit in the 2005-2006 and 2009-2010 school year.[26]
- A percentage of third-grade children in Michigan were observed to need routine or early dental care during the examination for the surveys conducted in 2005-2006 and again in 2009-2010. The statewide percentage of children in need of routine care increased only slightly (+.6%) between survey periods. However, there was a considerable change in percentage of children in suburban Detroit who were in need of routine or early dental care (+16.8%) over the period between surveys.[26]
- Most concerning of the results from the third-grade surveys of children's oral health was the percentage of children in the city of Detroit in 2009-2010 who were in need of immediate dental care (16.8%).[26]
- While all children participating in the third-grade survey received a clinical examination, a parent of each child was also asked to complete a survey asking questions about the child's oral health and access to services. The 2 most frequently selected reasons for not accessing oral health services in both the 2005-2006 survey and the 2009-2010 survey were lack of dental insurance and the inability to afford the services.[26]

Oral Health Status of Pregnant Women in Michigan

The risk of transmitting oral disease to children or of pre-term birth makes the oral health of pregnant and parenting women of special concern.

- Nationwide from 2007-2009, 56% of pregnant women did not visit a dentist during their most recent pregnancy. [27] Socioeconomic and racial/ethnic disparities among pregnant women impacted utilization of oral health services during pregnancy. Non-Hispanic Black and Hispanic women were less likely to have their teeth cleaned during pregnancy than were non-Hispanic White women, and pregnant poor women were less likely than those with higher incomes to receive dental care.[27]
- In Michigan in 2008, just 25.3% of new mothers indicated they received any dental care during their most recent pregnancy and only 46.4% received oral health counseling from their medical provider during the pregnancy.[27]

Oral Health Status of Elders in Michigan

Older people, particularly those who are not community dwelling, are at high risk for poor oral health outcomes due to a number of factors, including dementia, limited mobility, and lack of dental insurance to pay for services.

- The screenings of 747 Michigan senior citizens found that at the time of screening 5.5% of participants were in need of urgent dental treatment and 14.9% were in need of periodontal

[26] MDCH Michigan Third-Grade Surveys, Count your Smiles 2005 to 2006 and Count your Smiles 2010-2011 (conducted in 2009 to 2010) (May 2011). http://www.michigan.gov/documents/Basic_Screening_Survey_updated_3-16-06_164625_7.pdf and https://www.mipha.org/pdf/oral_health/MPCA%20Final%2012142011%20.pdf

[27] MDCH. A Summary of the 2013 Michigan Perinatal Oral Health Conference. August 2013. http://www.michigan.gov/documents/infantmortality/PerinatalOralHealthConfReport_FINAL_450021_7.pdf.

care. The screenings revealed that 17.3% of the population had severe dry mouth, 15.7% had sever gingival inflammation, 16.5% had untreated decay, 12.7% had root fragments, 7.2% had obvious tooth mobility, and 20.5% had substantial oral debris.[28]

- Fifty-nine percent of all seniors screened were either fully or partially edentulous with 42.9% exhibiting edentulism in both arches.[28]

Oral Cancer in Michigan

While the incidence of many cancers declined among Michigan's population from 2007-2011, the incidence of oral cancers and thyroid cancer rose and Michigan's population had 1 of the highest and most statistically significant rates of oral cancer increases among all cancers.

- The incidence of cancer of the oral cavity and the pharynx rose in Michigan from a rate of 12.03 per 100,000 population in 2002 to 12.17 cases per 100,000 population in 2011. The incidence of oral cancers continued to rise with Michigan showing an age-adjusted incidence rate statewide of 12.76 per 100,000 population in 2013.[29]
- In Michigan's population age 65 and older, the incidence of oral cancer decreased 0.2% from 2007-2011. However, the rate of oral cancers increased in Michigan's population younger than age 65. The increase in the oral cancer rate in the younger than age 65 group was the highest for all cancers.[29]
- Tobacco use was linked to the incidence of oral cancers. In 2014, a greater percentage of adults were smokers in Michigan than the US percentage of adult smokers. In addition, the percentage of adults who had ever smoked more than 100 cigarettes was greater in Michigan than in the US.[29]

The Youth Risk Behavior Surveillance System (YRBSS) monitors risky behaviors among young people in the US in 6 topical areas, including tobacco, alcohol, and drug use.

- Young people in Michigan used cigarettes and other tobacco products at a lower rate than young people nationally. In 2013, 11.8% of youth in Michigan and 15.7% of youth in the US had smoked an entire cigarette on at least 1 day during the 30 days prior to the survey. This represented a significant decrease over the 27.5% of youth in 1991 who indicated this smoking behavior.[30]
- The use of smokeless tobacco products is especially concerning because of the heightened risk of developing oral cancers. In 2005, 2.3% of adults age 18 and older were users of snuff or other chewing tobacco products according to data collected in the National Health Interview Survey.[31]
- In 2009, 8.8% of adolescents in grades 9-12 in the US and 6.9% in Michigan used smokeless tobacco products in the 30 days prior to participating in the YRBSS.[30] The prevalence of using smokeless tobacco products increased nationally from 7.8% in 1999 to 8.8% in 2013, but the change was not statistically significant.[30]

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[28] MDCH. Michigan Senior Smiles Basic Screening Survey Report. Results from a 2010 Oral Health Screening and Needs Assessment of Michigan Residents and Managers of Alternative Long-Term Care Facilities. https://www.michigan.gov/documents/mdch/Senior_Smiles_Report_Final_050311_355657_7.pdf

[29] National Cancer Institute. CDC. State Cancer Profiles. Incident Rate Report for Michigan by County. http://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=26&cancer=003&race=00&sex=0&age=001&type=incd

[30] Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance-United States 2013. Morbidity and Mortality Weekly Report. Surveillance Summaries. 2014;63(4). http://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf.

[31] Centers for Disease Control and Prevention. National Health Interview Survey. http://www.cdc.gov/nchs/nhis.htm.

Community Water Fluoridation

Fluoride is a naturally occurring element commonly found in water sources that is effective in preventing or controlling dental caries, especially in children. Studies show that water fluoridation reduces the rate of dental caries by about 25% over a person's lifetime. [32] The Centers for Disease Control and Prevention (CDC) recognizes water fluoridation as 1 of the most important public health interventions of the last century for its contribution to improved population oral health. [32]

The amount of natural fluoride in water may not always be at the optimal level to provide the desired protective effect. As a result, many municipal water systems and other water suppliers across the US supplement water with additional fluoride to achieve an appropriate concentration. Generally, the natural level of fluoride in public water systems is assessed prior to supplementation to determine the additional amount needed to meet baseline concentration. In the past, recommended fluoride levels for drinking water varied from 0.7 parts per million (ppm) for people living in warmer climates to 1.2 ppm for people living in cooler climates. The different concentrations accommodated the tendency of people in warmer locations to drink more water.[33] In January 2011, federal guidelines for baseline fluoride levels were revised to a single baseline, 0.7 ppm, regardless of climate conditions. Effectiveness research found that the lower fluoride concentration offered sufficient protection while also reducing the risk of fluorosis, which causes discoloration and surface irregularities on teeth, particularly among children.[33]

In 1945, the city of Grand Rapids, Michigan was the first city in the world to add fluoride to its municipal water system. [34] A 15-year research study ensued during which the rate of tooth decay among schoolchildren in the Grand Rapids district was monitored.[34] The study was originally sponsored by the US Surgeon General but was eventually assumed by the National Institute of Dental Research (which became the National Institute of Dental and Craniofacial Research, part of the National Institutes of Health) at its creation in 1948 when the National Dental Research Act was signed into law by President Harry Truman.[34] The study found a 60% drop in the caries rate among schoolchildren in Grand Rapids over the period of the research.[34]

Michigan currently ranks 15th in the country in the percentage of people served by community water systems with fluoridated water (90.9%).[35] In 2013, there were 1,452 community water systems in Michigan serving approximately 8 million people.[21] Some of the community water systems, private wells, and springs used for potable water supplies in the state provided water with naturally occurring fluoride at the recommended level.

The MDCH reports that community water systems serve both small and large communities in the state, ranging from mobile home parks with as few as 25 residents to large cities, such as Detroit that serve many hundreds of thousands.[36] In 2013, there were 136 community water systems in Michigan that adjusted fluoride levels with 233 consecutive systems accessing these public systems.[21] Therefore, 469 community water systems provided water with supplemental fluoride to their public.[21] In addition, 238

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[32] Centers for Disease Control and Prevention. Community Water Fluoridation. Fluoridation Basics. http://www.cdc.gov/fluoridation/basics/index.htm.

[33] Centers for Disease Control and Prevention. HHS and EPA announce new scientific assessments and actions on fluoride. January 7, 2011. http://wayback.archive-it.org/3926/20140108162323/http:/www.hhs.gov/news/press/2011pres/01/20110107a.html

[34] National Institute of Dental and Craniofacial Research. The Story of Fluoridation. http://www.nidcr.nih.gov/oralhealth/topics/fluoride/thestoryoffluoridation.htm.

[35] National Center for Chronic Disease Prevention and Health Promotion. Oral Health Resources. My Water's Fluoride. http://apps.nccd.cdc.gov/MWF/SearchResultsV.asp?State=MI&StateName=Michigan&County=ALL&StartPG=1&EndPG=20

[36] MDCH. Oral Health Plan. March 2010. http://www.michigan.gov/documents/mdch/Michigan_State_Oral_Health_Plan_FINAL_2_326169_7.pdf.

community water systems provided water with naturally occurring fluoride at levels sufficient to protect the public.[21] In total, 607 community water systems in Michigan provided fluoridated water at the recommended level.[21] The remaining 845 unsupplemented community water systems, which served approximately 781,000 people, had insufficient naturally occurring fluoride to provide protection at recommended levels.[21]

Almost three-quarters of the state's total population (73.8%) received fluoridated water through their drinking water system.[37] In 16 of the 83 counties in Michigan, more than 75% of the total population received fluoridated water[38] and in 38 of the state's counties, more than 75% of the population on a public water supply received fluoridated water.[39]

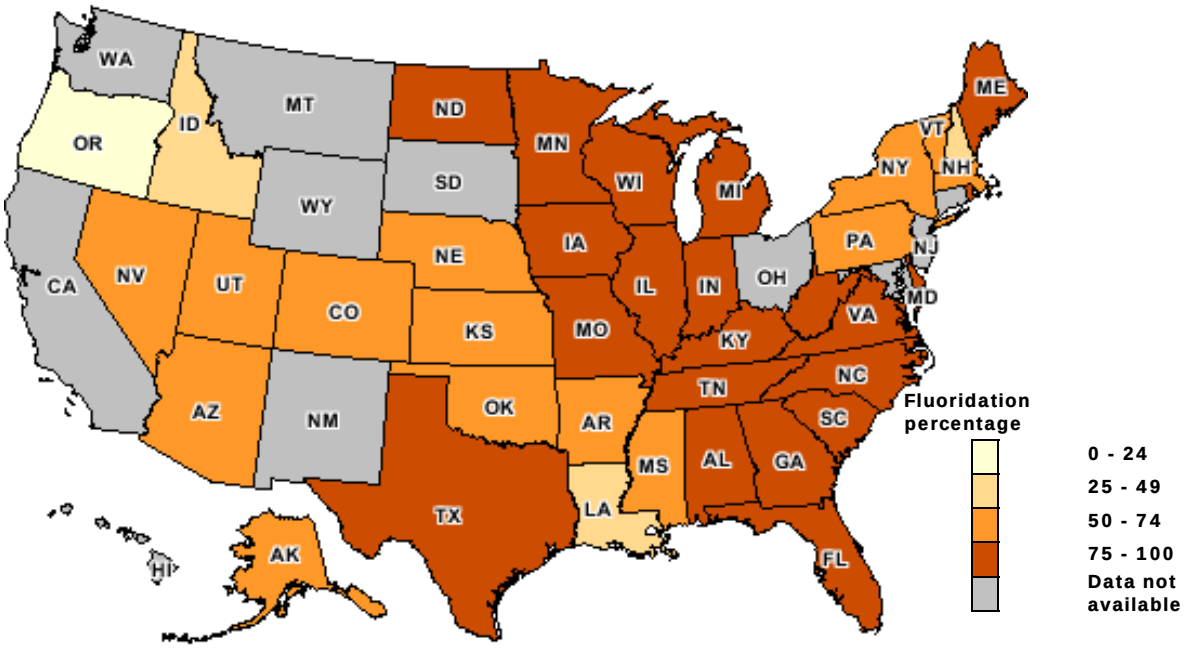
[37] MDCH. Burden of Oral Disease in Michigan, 2006. http://www.michigan.gov/documents/OHBurdenDraft_135603_7.pdf.
[38] Centers for Disease Control and Prevention. Water Fluoridation: National Fluoridation Report. 2006. http://apps.nccd.cdc.gov/gisdoh/waterfluor.aspx
[39] MDCH. Percentage of Persons Served by Michigan Community Fluoridated Water Systems by County. 2011. http://www.michigan.gov/documents/mdch/2011_county_map_395208_7.pdf.

TABLE 2. PEOPLE RECEIVING FLUORIDATED WATER THROUGH COMMUNITY WATER SYSTEMS BY STATE, 2012

State	People receiving fluoridated water	People served by community water system	%	Rank
United States	**210,655,401**	**282,534,910**	**74.6%**	
Alabama	3,781,607	4,822,023	78.4%	23
Alaska	361,240	682,528	52.9%	41
Arizona	3,199,068	5,536,324	57.8%	38
Arkansas	1,785,679	2,669,485	66.9%	33
California	24,215,234	38,041,430	63.7%	34
Colorado	3,757,694	5,187,582	72.4%	28
Connecticut	2,350,532	2,603,377	90.3%	14
Delaware	705,824	818,110	86.3%	19
District of Columbia	595,000	595,000	10.0%	
Florida	13,371,262	17,149,724	78.0%	24
Georgia	9,551,793	9,919,945	96.3%	6
Hawaii	139,598	1,290,549	10.8%	50
Idaho	395,863	1,097,332	36.1%	46
Illinois	12,682,543	12,875,255	98.5%	3
Indiana	4,342,273	4,582,496	94.8%	8
Iowa	2,555,593	2,778,894	92.0%	12
Kansas	1,719,503	2,702,452	63.6%	Tied for 35
Kentucky	4,375,026	4,380,415	99.9%	1
Louisiana	1,996,568	4,601,893	43.4%	45
Maine	527,163	664,063	79.4%	22
Maryland	5,060,379	5,204,155	97.2%	4
Massachusetts	4,681,038	6,646,144	70.4%	31
Michigan	**7,218,670**	**7,999,859**	**90.2%**	**15**
Minnesota	4,134,663	4,184,753	98.8%	2
Mississippi	1,738,478	2,984,926	58.2%	37
Missouri	3,994,342	5,226,360	76.4%	26
Montana	252,299	788,805	32.0%	47
Nebraska	1,015,094	1,425,664	71.2%	30
Nevada	1,870,698	2,544,079	73.5%	27
New Hampshire	383,333	832,631	46.0%	43
New Jersey	1,206,270	8,288,715	14.6%	49
New Mexico	1,210,877	1,571,600	77.0%	25
New York	12,989,488	18,094,452	71.8%	29
North Carolina	6,164,847	7,042,655	87.5%	18
North Dakota	612,560	633,645	96.7%	5
Ohio	9,716,289	10,537,957	92.2%	11
Oklahoma	2,486,718	3,548,057	70.1%	32
Oregon	833,557	3,688,540	22.6%	48
Pennsylvania	5,885,390	10,780,146	54.6%	40
Rhode Island	837,549	997,824	83.9%	20
South Carolina	3,602,956	3,839,526	93.8%	9
South Dakota	646,671	690,759	93.6%	10
Tennessee	5,229,461	5,826,866	89.7%	16
Texas	20,002,506	25,113,656	79.6%	21
Utah	1,384,638	2,676,448	51.7%	42
Vermont	252,920	450,483	56.1%	39
Virginia	6,159,737	6,416,760	96.0%	7
Washington	3,515,797	5,525,840	63.6%	Tied for 35
West Virginia	1,365,697	1,499,749	91.1%	13
Wisconsin	3,597,525	4,025,756	89.4%	17
Wyoming	195,891	449,223	43.6%	44

Source: CDC, 2012

FIGURE 1. PERCENTAGE OF EACH STATE'S POPULATION ON COMMUNITY WATER SYSTEMS RECEIVING FLUORIDATED WATER, 2012



0-24%	25%-49%	50%-74%	75%-100%	Data Not Available
Oregon	Idaho	Alaska	Alabama	California
	Louisiana	Arizona	Delaware	Connecticut
	New Hampshire	Arkansas	Florida	DC
		Colorado	Georgia	Hawaii
		Kansas	Illinois	Maryland
		Massachusetts	Indiana	Montana
		Mississippi	Iowa	New Jersey
		Nebraska	Kentucky	New Mexico
		Nevada	Maine	Ohio
		New York	Michigan	South Dakota
		Oklahoma	Minnesota	Washington
		Pennsylvania	Missouri	Wyoming
		Utah	North Carolina	
		Vermont	North Dakota	
			Rhode Island	
			South Carolina	
			Tennessee	
			Texas	
			Virginia	
			West Virginia	
			Wisconsin	

Source: CDC, 2012

Oral Health Status of Michigan's Population

The oral health status of a population is influenced by numerous endogenous and exogenous factors. Geography, socioeconomic conditions, oral health literacy, oral health preventive behaviors, and cultural preferences all impact a patient's interest in or ability to seek oral health services. Health behaviors including diet, smoking, and daily hygiene impact the condition of the oral cavity. In addition, use of medications and genetic factors influence the likelihood of dental disease. Data on the oral health status of the US population are sparse although there are some resources that provide limited insight into population oral health at both the national and state level.

The Behavioral Health Risk Factor Surveillance System

The BRFSS is managed by CDC with cooperation from states. The BRFSS is a nationwide surveillance system that uses telephone survey research to collect data on prevalence and incidence of chronic disease, utilization of health services, and personal health behaviors, such as smoking, alcohol consumption, seat belt use, and nutritional practices that increase risk of impaired health status in the population. The BRFSS was first implemented nationwide in 1993 and consisted of a fixed core of questions (including standard questions on demographics and health behaviors), a rotating core (2 sets of questions asked in alternating years), and an emerging core (questions focused on current issues) as well as optional modules and state-added questions about specific health conditions.[40] An oral health module was introduced as 1 of the rotating core modules in 1995. The most recent year for which population oral health data is available is 2012.

According to BRFSS data, in 2012, the percentage of the population of adults in Michigan that visited a dentist, dental hygienist, or dental clinic (67.3%) was somewhat higher than the percentage of adults in the US (64.9%) with a dental visit. Michigan ranked 18th highest in the US for the percentage of the state's population having had a dental visit within the prior year.[41]

Adults in Michigan (42.5%) were less likely than adults in the US (44.9%) to have had 1 or more permanent teeth extracted, ranking Michigan at 19th lowest in the nation on this negative measure of oral health.[41] Nationally, 15.0% of the population had lost all teeth in 2012 but just 12.9% of adults in Michigan reported edentulism in the 2012 BRFSS. This placed Michigan as the state with the 12th lowest rate of edentulism in the nation, another indicator that Michigan adults were above the US average in oral health status.[41]

However, the oral health of Michigan adults varied among population groups with adults in certain racial or ethnic groups and those with lower incomes and lower levels of education exhibiting poorer outcomes on measures of oral health status. The following table and charts provide information about adults in Michigan and other states according to BRFSS 2012 data.

[40] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. http://www.cdc.gov/brfss/questionnaires.htm.

[41] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Prevalence and Trends Data, All States-2012. http://apps.nccd.cdc.gov/brfss/page.asp?cat=OH&yr=2012&state=All#OH.

TABLE 3. ORAL HEALTH INDICATORS FROM THE BRFSS BY POPULATION IN THE US AND IN STATES, 2012

The prevalence of adults age 18+ who have had permanent teeth extracted		The prevalence of adults age 65+ who have had all their natural teeth extracted		The prevalence of adults who have visited a dentist, dental hygienist, or dental clinic within the past year	
United States	**44.9%**	**United States**	**15.0%**	**United States**	**64.9%**
West Virginia	61.6%	West Virginia	32.6%	Massachusetts	75.5%
Mississippi	57.7%	Louisiana	27.0%	Connecticut	75.4%
Alabama	54.3%	Mississippi	23.5%	Minnesota	74.2%
Louisiana	54.1%	Missouri	23.3%	Rhode Island	73.1%
Tennessee	52.7%	Tennessee	22.9%	New Hampshire	72.4%
Arkansas	50.7%	Kentucky	22.2%	Maryland	72.0%
Maine	50.6%	Alabama	22.1%	Wisconsin	71.6%
Kentucky	50.3%	Arkansas	21.2%	Iowa	70.7%
South Carolina	49.5%	Maine	20.9%	District of Columbia	70.5%
Pennsylvania	49.2%	Oklahoma	20.5%	South Dakota	70.5%
Oklahoma	48.9%	North Carolina	19.3%	New Jersey	70.4%
New York	48.8%	Ohio	18.7%	Vermont	70.2%
Florida	48.7%	Indiana	18.3%	Hawaii	70.2%
Indiana	48.1%	South Dakota	18.3%	Delaware	69.8%
North Carolina	47.4%	Kansas	17.8%	Virginia	69.5%
Nevada	47.3%	South Carolina	17.8%	Pennsylvania	68.1%
Missouri	47.1%	Montana	16.9%	Utah	67.6%
New Jersey	45.0%	Georgia	16.7%	Michigan	67.3%
Delaware	44.7%	Pennsylvania	16.7%	Washington	67.2%
Ohio	44.6%	Vermont	16.3%	New York	67.2%
Georgia	44.6%	Iowa	16.1%	Nebraska	67.2%
New Mexico	44.6%	North Dakota	16.0%	Idaho	67.0%
Illinois	44.5%	Wyoming	15.9%	Ohio	66.9%
Arizona	44.0%	Delaware	15.8%	California	66.9%
South Dakota	43.8%	Illinois	15.7%	Illinois	66.7%
New Hampshire	43.3%	Idaho	15.0%	Alaska	66.7%
Massachusetts	42.7%	New Mexico	14.9%	Kansas	66.5%
North Dakota	42.7%	Florida	14.6%	North Dakota	66.5%
Maryland	42.7%	Virginia	14.4%	Wyoming	65.4%
Michigan	42.5%	Massachusetts	13.8%	Maine	65.0%
Kansas	42.3%	New York	13.6%	Colorado	64.8%
Vermont	42.2%	Alaska	13.5%	Oregon	64.4%
Montana	42.1%	Oregon	13.3%	North Carolina	64.1%
Texas	42.1%	Nevada	13.3%	Georgia	63.4%
Rhode Island	41.8%	Maryland	13.1%	Indiana	62.2%
Idaho	41.7%	Wisconsin	12.8%	Missouri	61.3%
Wyoming	41.5%	Nebraska	12.6%	Arizona	61.2%
Iowa	41.1%	Texas	12.4%	Montana	60.5%
Virginia	41.1%	Michigan	12.4%	New Mexico	60.5%
California	40.7%	New Jersey	12.3%	Tennessee	60.4%
Hawaii	40.6%	Connecticut	12.2%	Nevada	60.1%
Connecticut	40.6%	Arizona	11.8%	Kentucky	59.4%
Oregon	40.0%	Utah	11.6%	South Carolina	59.3%
Alaska	39.7%	New Hampshire	11.6%	Florida	59.3%
Nebraska	39.3%	District of Columbia	11.3%	Oklahoma	58.6%
Wisconsin	38.2%	Colorado	11.1%	Alabama	58.0%
District of Columbia	37.8%	Rhode Island	11.0%	Texas	57.9%
Washington	37.8%	Minnesota	11.0%	West Virginia	55.9%
Colorado	37.1%	Washington	10.0%	Louisiana	55.1%
Minnesota	34.8%	California	8.5%	Mississippi	54.8%
Utah	33.3%	Hawaii	6.5%	Arkansas	54.0%

Over time, the percentage of adults in Michigan who reported no dental visit in the prior year on BRFSS surveys has increased, especially among adults age 25-34.[22] This is an indication that utilization of oral health services may be declining among the state's adults.

TABLE 4. CHARACTERISTICS OF ADULTS WHO REPORTED NO DENTAL VISIT IN THE PRIOR YEAR, MICHIGAN BRFSS, 2002, 2004, 2006, 2008, 2010, 2012*

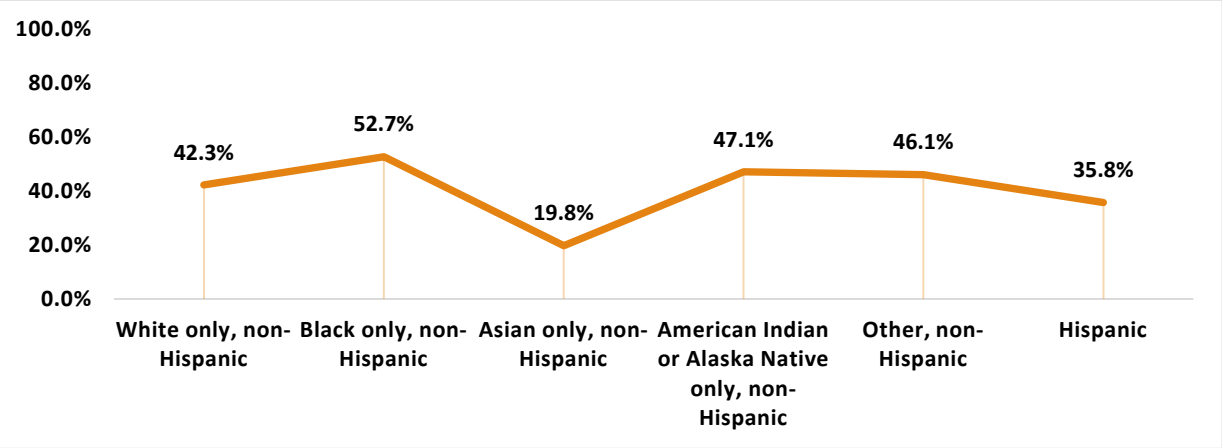
No Dental Visit in the Past Year							
Year	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**Net Change 2002-2012**
Total in Michigan	**23.9%**	**24.0%**	**25.4%**	**25.2%**	**27.5%**	**32.0%**	**8.1%**
Age							
Age 18-24	25.2%	25.7%	26.0%	25.9%	28.6%	31.3%	**6.1%**
Age 25-34	24.5%	29.6%	28.8%	30.1%	37.2%	41.8%	**17.3%**
Age 35-44	23.1%	20.8%	25.2%	25.0%	27.2%	33.7%	**10.6%**
Age 45-54	21.6%	22.9%	21.5%	23.8%	27.3%	31.6%	**10.0%**
Age 55-64	20.5%	20.2%	23.2%	20.3%	23.8%	26.6%	**6.1%**
Age 65-74	26.4%	24.0%	27.3%	24.9%	22.0%	27.5%	**1.1%**
Age ≥ 75 years	29.8%	25.9%	30.6%	27.7%	27.3%	29.4%	**-0.4%**
Gender							
Male	24.7%	26.3%	27.7%	27.4%	29.5%	36.2%	**11.5%**
Female	23.1%	21.9%	23.4%	23.2%	25.7%	28.0%	**4.9%**
Race							
White (non-Hispanic)	21.4%	22.4%	23.1%	22.6%	24.9%	29.1%	**7.7%**
Black (non-Hispanic)	35.1%	29.6%	36.7%	36.7%	37.7%	44.8%	**9.7%**
Other (non-Hispanic)			35.0%	34.9%	34.3%	41.9%	**6.9%**
Hispanic			23.6%	26.0%	36.5%	36.9%	**13.3%**
Education							
< High school	48.8%	44.3%	47.1%	48.0%	50.1%		**1.3%**
High school graduate	28.2%	30.1%	31.8%	32.1%	34.9%		**6.7%**
Some college	21.1%	23.7%	25.7%	24.7%	28.7%		**7.6%**
College graduate	13.6%	11.8%	12.6%	14.4%	15.8%		**2.2%**
Annual Household Income							
<$20,000	47.6%	48.6%	51.5%	46.9%	55.5%	55.7%	**8.1%**
$20,000-$34,999	31.0%	32.5%	37.9%	347.0%	39.0%	42.4%	**11.4%**
$35,000-$49,999	20.9%	19.9%	24.9%	24.9%	24.6%	28.3%	**7.4%**
$50,000-$74,999	15.9%	17.8%	17.2%	19.4%	18.5%	21.5%	**5.6%**
≥$75,000	11.0%	10.4%	10.1%	12.3%	12.0%	13.7%	**2.7%**
Health Insurance							
Insured						27.6%	
Uninsured						60.2%	
Disability							
Disabled						42.2%	
Not disabled						28.7%	

Source: MDCH. Michigan Annual BRFSS Annual Reports: 2002, 2004, 2006, 2008, 2010, and 2012.
*Note: Red indicates a negative change.

Adults in Michigan who had permanent teeth removed (including wisdom teeth) because of tooth decay or gum disease (not due to injury or for orthodontic reasons) varied in demographic characteristics.[41]

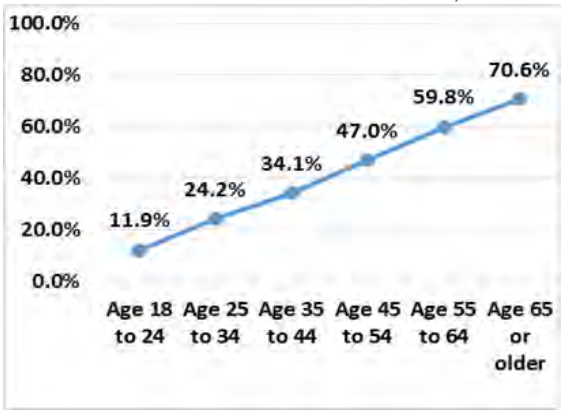
- People in Michigan of Asian origins were less likely than those from other racial or ethnic groups to have had teeth extracted because of decay or other disease processes. Just 19.8% of all Asians who responded to the BRFSS survey indicated any tooth removal.
- As expected, the likelihood of having teeth removed for decay or gum disease increased with age. Seventy-one percent of adults age 65 and older in Michigan who participated in the survey indicated removal of at least 1 permanent tooth.
- Having teeth removed for decay or gum disease was less prevalent among those with higher levels of education than among those who had less than a high school education. Fifty-nine percent of Michigan's residents without a high school education had at least 1 permanent tooth removed.
- Having a permanent tooth removed was less prevalent among adults in Michigan with annual incomes of $50,000 or more (31.0% of higher-income adults) than among adults at lower income levels (56.9% of lower-income adults).

FIGURE 2. PREVALENCE OF PERMANENT TOOTH/TEETH EXTRACTION IN MICHIGAN ADULTS AGE 18 AND OLDER BY RACE/ETHNICITY, 2012



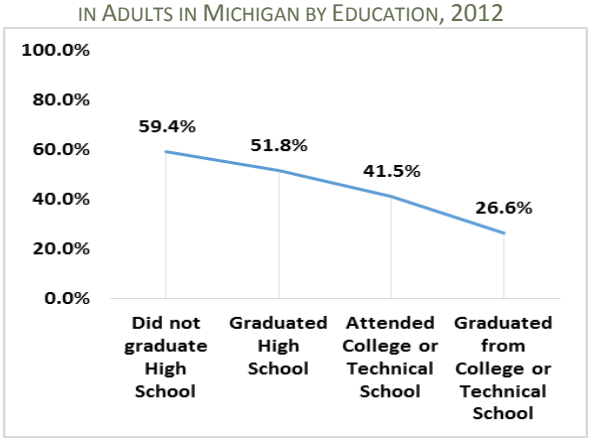
Source: CDC, BRFSS, 2012

FIGURE 3. PREVALENCE OF PERMANENT TOOTH/TEETH EXTRACTION IN ADULTS IN MICHIGAN BY AGE, 2012



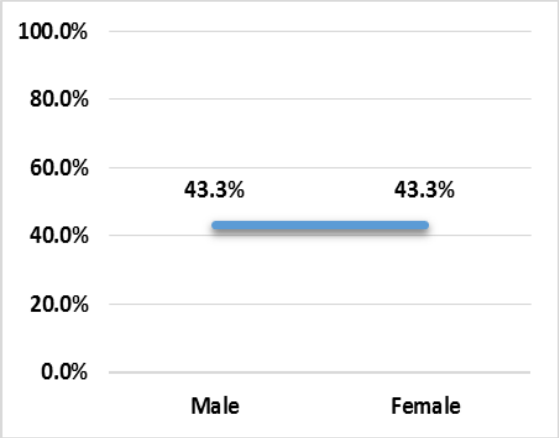
Source: CDC, BRFSS, 2012

FIGURE 4. PREVALENCE OF PERMANENT TOOTH EXTRACTION IN ADULTS IN MICHIGAN BY EDUCATION, 2012



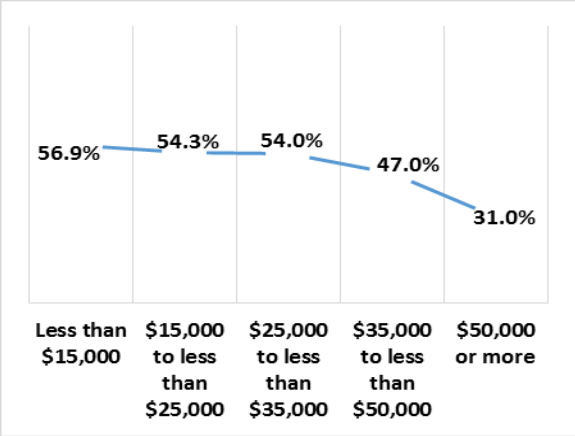
Source: CDC, BRFSS, 2012

FIGURE 5. PREVALENCE OF PERMANENT TOOTH/TEETH EXTRACTION IN ADULTS IN MICHIGAN BY GENDER, 2012



Source: CDC, BRFSS, 2012

FIGURE 6. PREVALENCE OF PERMANENT TOOTH/TEETH EXTRACTION IN ADULTS IN MICHIGAN BY ANNUAL INCOME, 2012

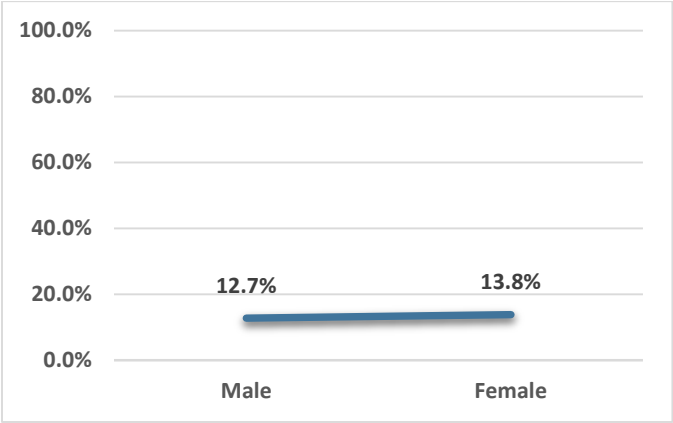


Source: CDC, BRFSS, 2012

Almost 13% of the population age 65 and older in Michigan reported loss of all teeth.[41] The prevalence of edentulism in Michigan in this age group was highest among those with the lowest levels of educational attainment and the lowest annual incomes.

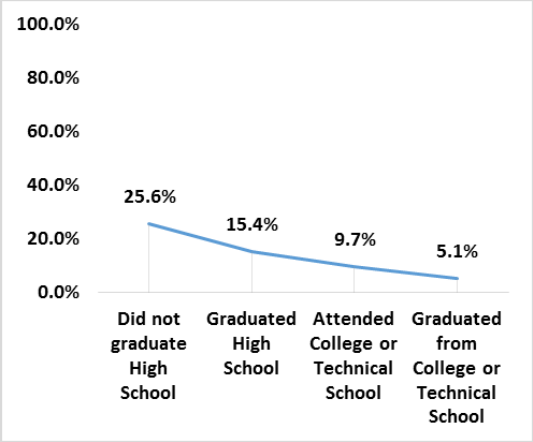
- The prevalence of edentulism by gender was about equal with 13.8% of females and 12.7% of males age 65 and older reporting loss of all teeth.
- More than one-quarter (25.6%) of respondents from Michigan age 65 and older with less than a high school education reported edentulism versus just 5.1% of those who had graduated from college or technical school.
- Among the group of people age 65 and older with annual incomes less than $15,000, 25.6% indicated loss of all teeth.

FIGURE 7. PREVALENCE OF EDENTULISM IN OLDER ADULTS IN MICHIGAN BY GENDER, 2012



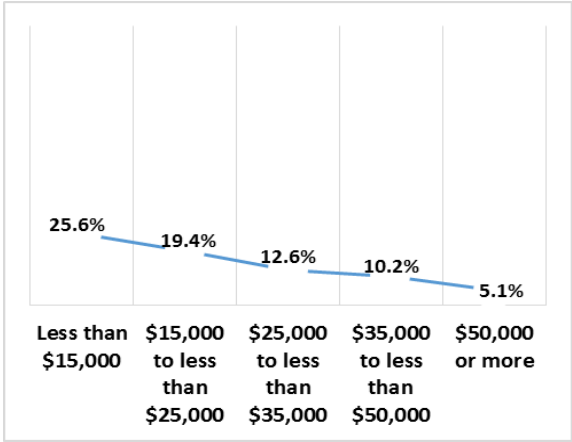
Source: CDC, BRFSS, 2012

FIGURE 8. PREVALENCE OF EDENTULISM IN OLDER ADULTS IN MICHIGAN BY EDUCATIONAL LEVEL, 2012



Source: CDC, BRFSS, 2012

FIGURE 9. PREVALENCE OF EDENTULISM IN OLDER ADULTS IN MICHIGAN BY EDUCATIONAL LEVEL, 2012

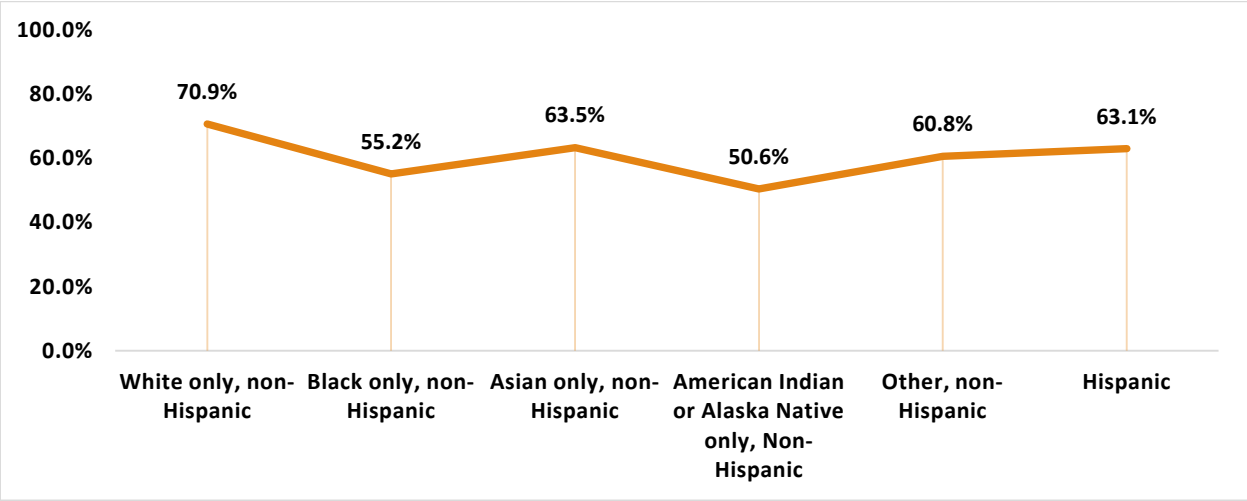


Source: CDC, BRFSS, 2012

Visiting a dentist, dental hygienist, or dental clinic in the previous year is a positive indicator of utilization of oral health services and appropriate servicing of oral health needs. Two-thirds of adults in Michigan age 18 and older (67.3%) visited a dentist in the year prior to the 2012 BRFSS survey. The characteristics of those who had visited a dentist in that year varied by race/ethnicity, gender, educational attainment, and income.

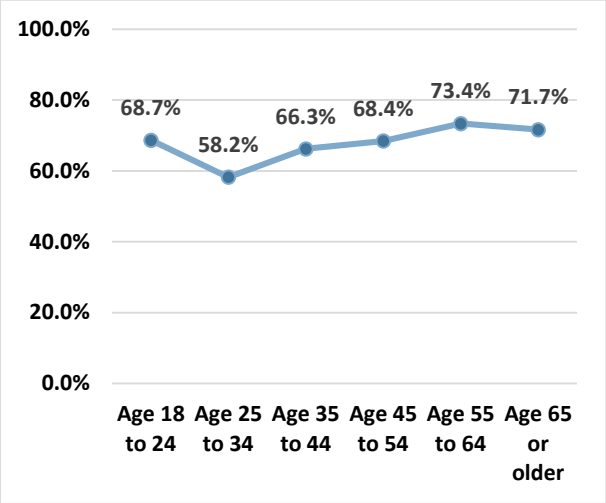
- White adults in Michigan (70.9% of White respondents) were more likely than adults from other racial/ethnic groups to have visited a dentist in the previous year.
- Only 58.2% of respondents age 25-34 visited a dental provider in the prior year. At the same time, 73.4% of respondents age 55-64 visited a dental provider.
- Females were more likely than males to have visited an oral health provider in the previous year with 72.0% of female respondents indicating utilization of dental services versus 63.8% of male respondents.

FIGURE 10. PREVALENCE OF ADULTS IN MICHIGAN WHO HAD VISITED A DENTIST, DENTAL HYGIENIST, OR DENTAL CLINIC IN THE PRIOR YEAR BY RACE/ETHNICITY, 2012



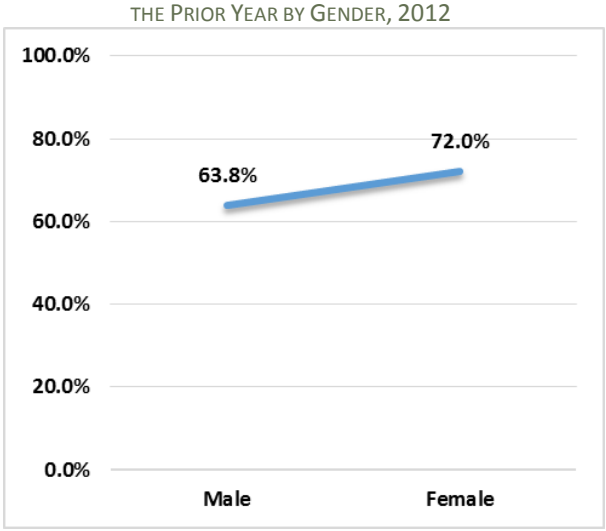
Source: CDC, BRFSS, 2012

FIGURE 11. PREVALENCE OF ADULTS IN MICHIGAN WHO HAD VISITED A DENTIST, DENTAL HYGIENIST, OR DENTAL CLINIC IN THE PRIOR YEAR BY AGE, 2012



Source: CDC, BRFSS, 2012

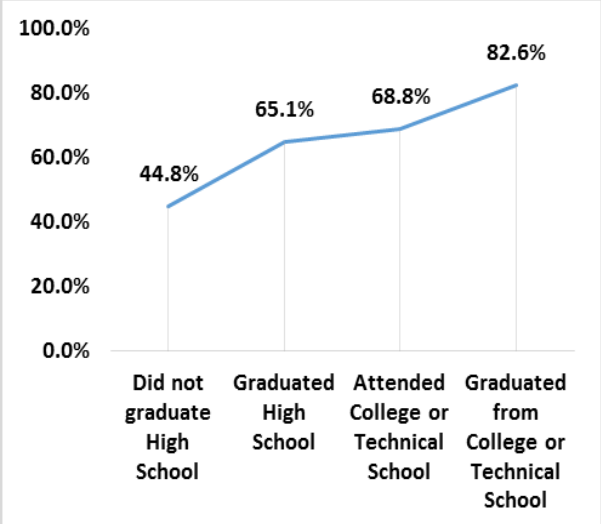
FIGURE 12. PREVALENCE OF ADULTS IN MICHIGAN WHO HAD VISITED A DENTIST, DENTAL HYGIENIST, OR DENTAL CLINIC IN THE PRIOR YEAR BY GENDER, 2012



Source: CDC, BRFSS, 2012

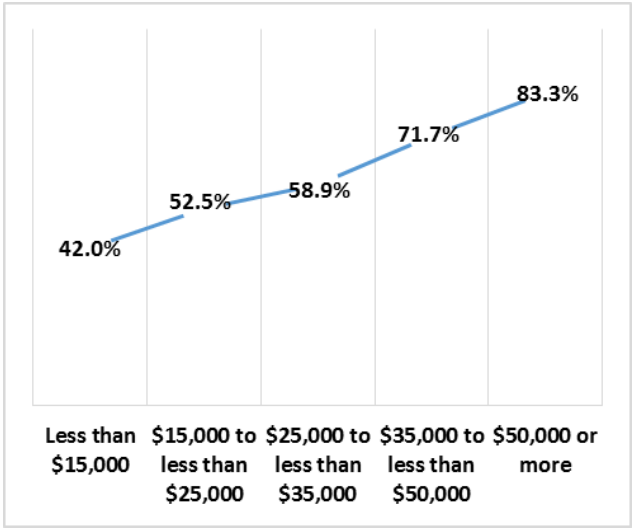
- Adults in Michigan with higher levels of educational attainment were more likely to have visited a dentist than those who had not graduated from high school. Eighty-three percent of adults who had graduated from college or technical school had visited a dentist in the prior year versus 44.8% of adults who had not graduated from high school.
- Adults with incomes of $50,000 or more were more likely to have visited a dental provider in the year prior to the survey (83.3%) than adults in Michigan with annual incomes of less than $15,000 (42.0%).

FIGURE 13. PREVALENCE OF ADULTS IN MICHIGAN WHO HAD VISITED A DENTIST, DENTAL HYGIENIST OR DENTAL CLINIC IN THE PRIOR YEAR BY EDUCATIONAL ATTAINMENT, 2012



Source: CDC, BRFSS, 2012

FIGURE 14. PREVALENCE OF ADULTS IN MICHIGAN WHO HAD VISITED A DENTIST, DENTAL HYGIENIST OR DENTAL CLINIC IN THE PRIOR YEAR BY ANNUAL INCOME, 2012



Source: CDC, BRFSS, 2012

Limited regional analysis of BRFSS data was possible for several metropolitan statistical areas (MSAs) in Michigan. The sample size in those areas was adequate to analyze based on most demographic variables, except race/ethnicity. Analyses of oral health status and utilization of oral health services for the Detroit-Livonia-Dearborn MSA, the Grand Rapids-Wyoming MSA, and the Warren-Troy-Farmington Hills MSAs for 2012 are available in Appendix C of this report.

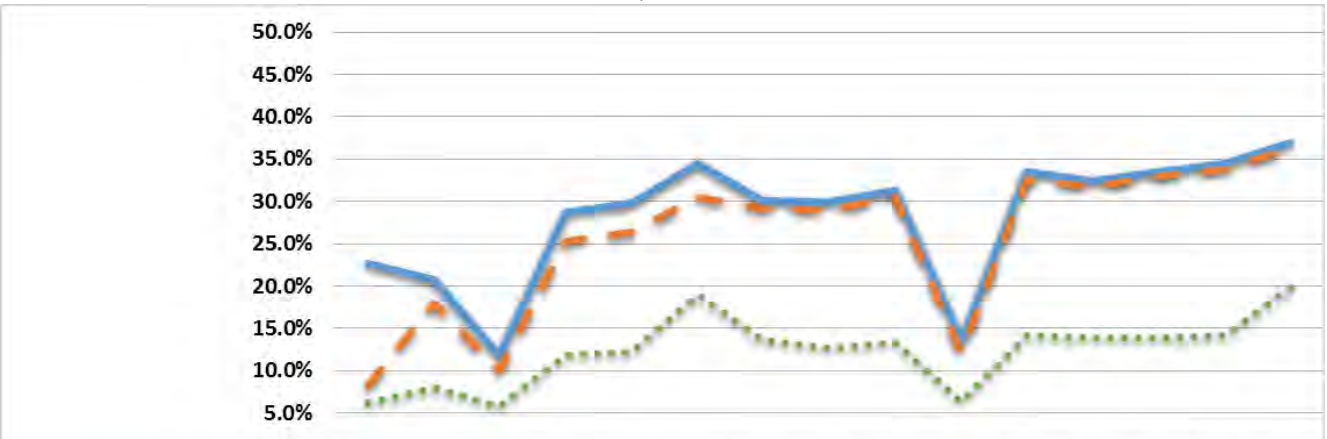
Oral Health of Children in Michigan

Early Periodic Screening, Diagnostic and Treatment Services Report CMS Form 416

State Medicaid programs are required to complete and submit an annual survey in a standard reporting format to describe rates of utilization and receipt of health care services, including oral health care among children eligible for mandated EPSDT services. These reports provide important information about trends in utilization of medical and dental services among children age less than 1 to age 20.[24]

Over the 15 years for which data are currently available, annual variation was evident in the percentage of Medicaid-eligible children in Michigan who received any dental service, preventive dental services, and dental treatment services. There were higher percentages of children receiving oral health services in 2013 than in 1999. However, in 2001 and 2008, utilization rates dipped substantially from the previous and subsequent years. Literature indicates that data anomalies appeared in CMS 416 reports for some states during years when conversion to Medicaid managed care complicated data availability. In fact, there were conversions to Healthy Kids Dental in several counties in Michigan in 2001 and 2008 suggesting that the visible dips are data irregularities not significant decreases in actual service utilization. The most noticeable increase over time was in the percentage of children who received a preventive service each year. In 1999, just 8.2% of eligible children had a preventive oral health service while in 2013, 36.3% of Medicaid-eligible children received a preventive service.

FIGURE 15. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE LESS THAN 1 YEAR TO AGE 20 RECEIVING ANY DENTAL SERVICES, 1999-2013

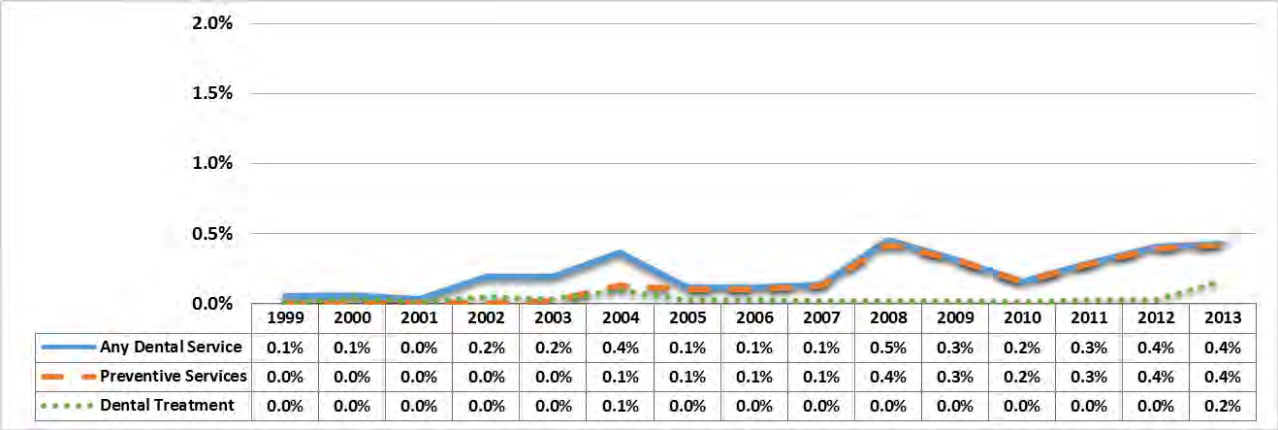


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	22.7%	20.7%	11.9%	28.8%	29.9%	34.5%	30.1%	30.0%	31.4%	13.6%	33.5%	32.4%	33.5%	34.5%	37.0%
Preventive Services	8.2%	17.9%	10.1%	25.3%	26.4%	30.5%	29.1%	29.0%	30.5%	12.1%	32.6%	31.7%	32.9%	33.8%	36.3%
Dental Treatment	6.2%	7.9%	5.8%	11.7%	12.3%	18.9%	13.6%	12.6%	13.3%	6.3%	14.2%	13.9%	13.9%	14.2%	19.8%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

Utilization of oral health services varied by age cohort. While there is growing realization that very young children benefit from early oral health screening and prevention services, the percentages of young children receiving preventive dental services, which is increasing somewhat over time, remains relatively low in Michigan and in the US generally.

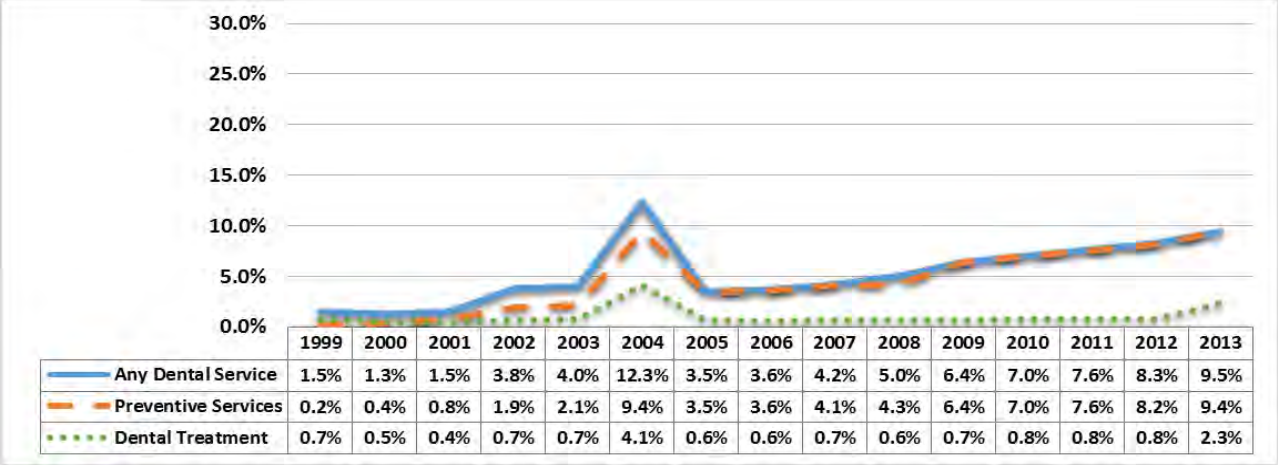
FIGURE 16. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE LESS THAN 1, 1999-2013



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	0.1%	0.1%	0.0%	0.2%	0.2%	0.4%	0.1%	0.1%	0.1%	0.5%	0.3%	0.2%	0.3%	0.4%	0.4%
Preventive Services	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.4%	0.3%	0.2%	0.3%	0.4%	0.4%
Dental Treatment	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

FIGURE 17. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN BETWEEN AGE 1-2, 1999-2013

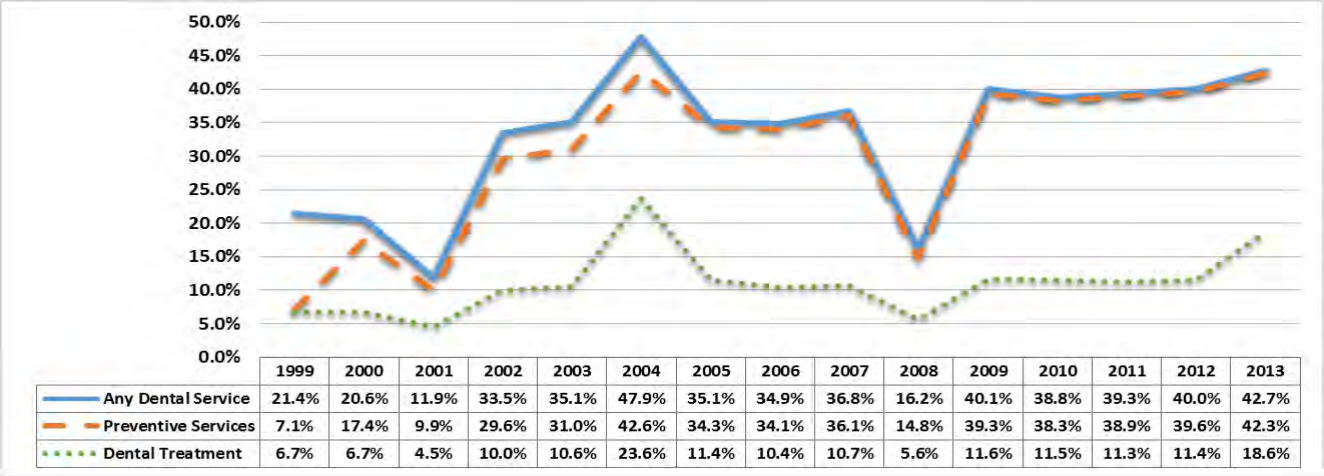


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	1.5%	1.3%	1.5%	3.8%	4.0%	12.3%	3.5%	3.6%	4.2%	5.0%	6.4%	7.0%	7.6%	8.3%	9.5%
Preventive Services	0.2%	0.4%	0.8%	1.9%	2.1%	9.4%	3.5%	3.6%	4.1%	4.3%	6.4%	7.0%	7.6%	8.2%	9.4%
Dental Treatment	0.7%	0.5%	0.4%	0.7%	0.7%	4.1%	0.6%	0.6%	0.7%	0.6%	0.7%	0.8%	0.8%	0.8%	2.3%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

Medicaid-eligible children age 3-14 were more likely to have a dental service, preventive service, or dental treatment service than children in all other age cohorts. The group exhibiting the highest utilization rates of oral health services was children age 6-9. Many school-based oral health programs target children in these age groups, providing fluoride varnish services and or dental sealants as well as prophylaxis. While data do not permit attribution of services to the actual settings in which they are provided, it seems likely that school-based programs across the state are impacting utilization of oral health services for children in these age groups. The high rate of preventive services provided to these children supports this supposition since school-based oral health programs are largely staffed by dental hygienists who provide oral health promotion, screening, and preventive care. Head Start Programs for pre-school children are also engaging more with oral health providers to help young children in these programs (beginning at age 3) establish dental homes.

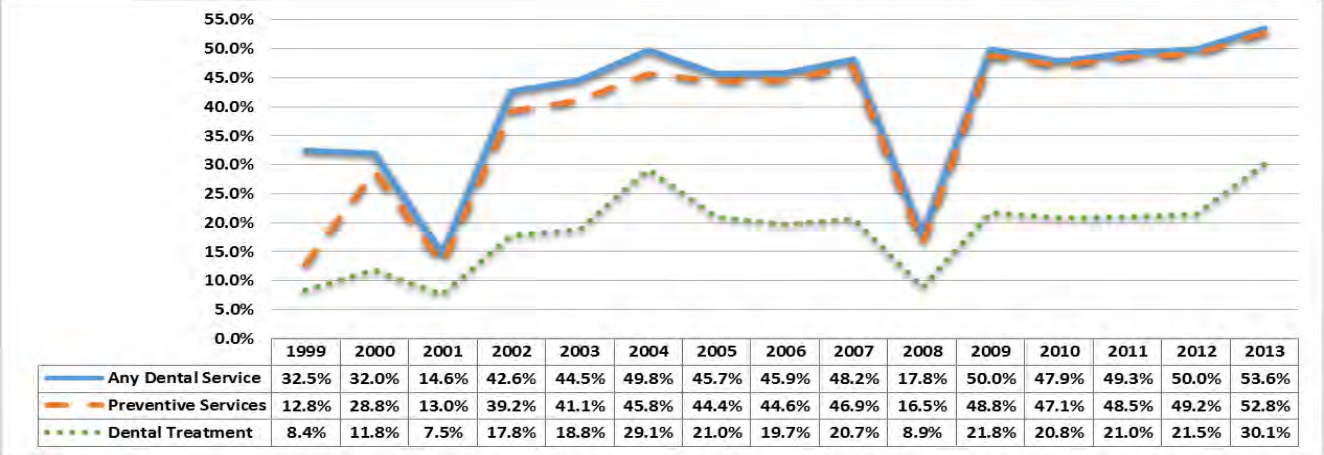
Figure 18. **EPSDT Services for Medicaid-eligible Children in Michigan Age Less than 3 to Age 5, 1999-2013**



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	21.4%	20.6%	11.9%	33.5%	35.1%	47.9%	35.1%	34.9%	36.8%	16.2%	40.1%	38.8%	39.3%	40.0%	42.7%
Preventive Services	7.1%	17.4%	9.9%	29.6%	31.0%	42.6%	34.3%	34.1%	36.1%	14.8%	39.3%	38.3%	38.9%	39.6%	42.3%
Dental Treatment	6.7%	6.7%	4.5%	10.0%	10.6%	23.6%	11.4%	10.4%	10.7%	5.6%	11.6%	11.5%	11.3%	11.4%	18.6%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

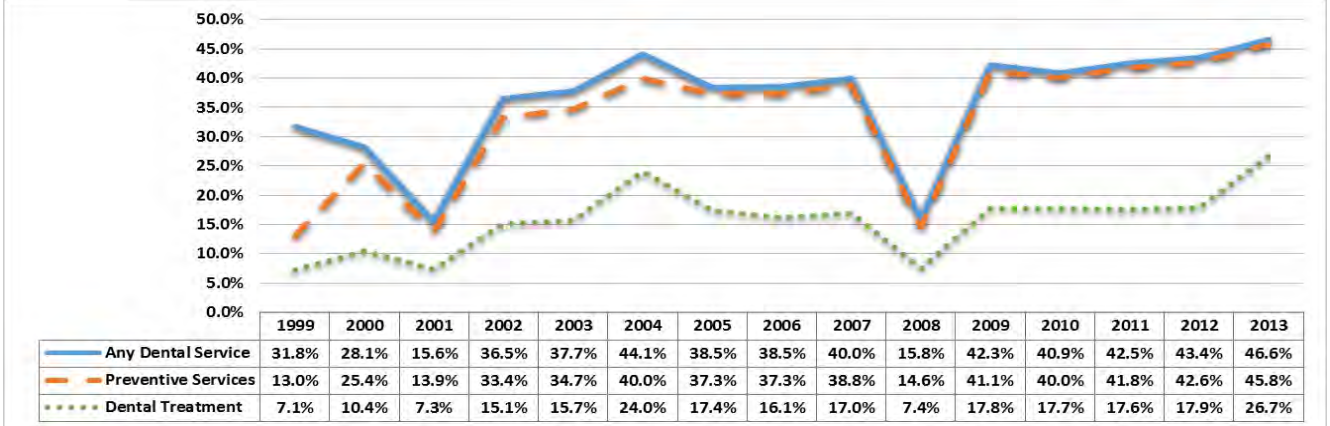
FIGURE 19. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 6-9 1999-2013



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	32.5%	32.0%	14.6%	42.6%	44.5%	49.8%	45.7%	45.9%	48.2%	17.8%	50.0%	47.9%	49.3%	50.0%	53.6%
Preventive Services	12.8%	28.8%	13.0%	39.2%	41.1%	45.8%	44.4%	44.6%	46.9%	16.5%	48.8%	47.1%	48.5%	49.2%	52.8%
Dental Treatment	8.4%	11.8%	7.5%	17.8%	18.8%	29.1%	21.0%	19.7%	20.7%	8.9%	21.8%	20.8%	21.0%	21.5%	30.1%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

FIGURE 20. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 10-14, 1999-2013

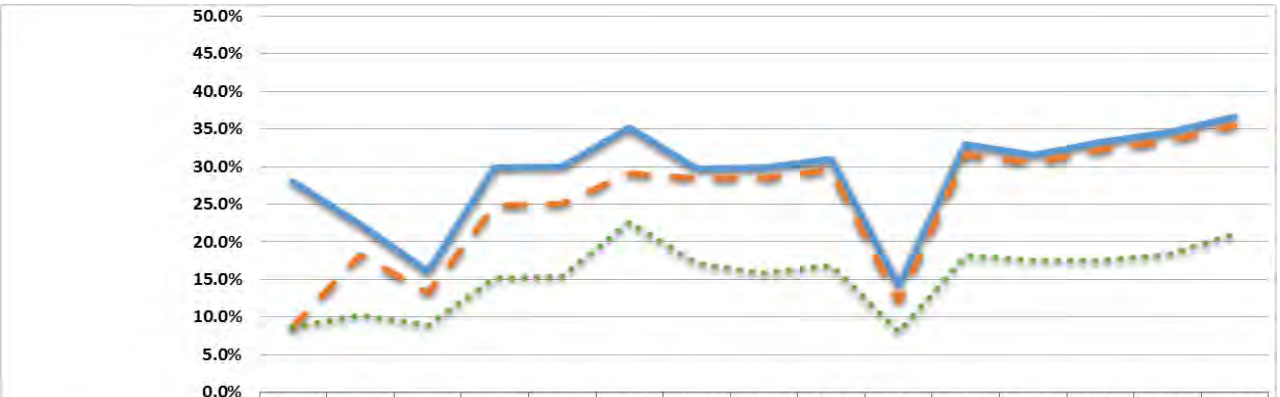


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	31.8%	28.1%	15.6%	36.5%	37.7%	44.1%	38.5%	38.5%	40.0%	15.8%	42.3%	40.9%	42.5%	43.4%	46.6%
Preventive Services	13.0%	25.4%	13.9%	33.4%	34.7%	40.0%	37.3%	37.3%	38.8%	14.6%	41.1%	40.0%	41.8%	42.6%	45.8%
Dental Treatment	7.1%	10.4%	7.3%	15.1%	15.7%	24.0%	17.4%	16.1%	17.0%	7.4%	17.8%	17.7%	17.6%	17.9%	26.7%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

While children in the age 15-18 cohort still received dental services, this age group exhibited lower rates of utilization of preventive and other oral health services than younger school children.

FIGURE 21. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 15-18, 1999-2013

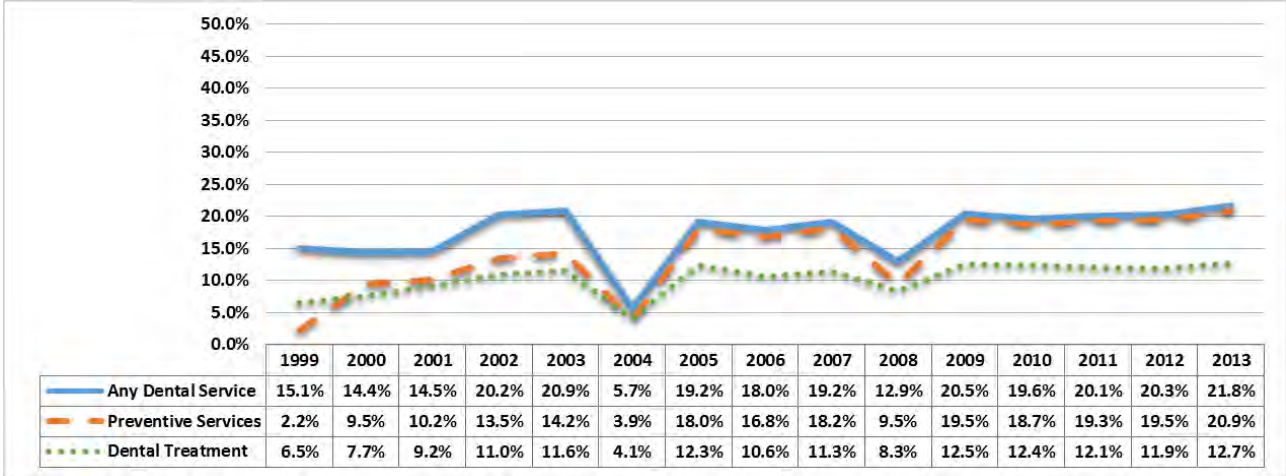


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	28.1%	22.4%	16.1%	29.9%	30.0%	35.2%	29.8%	29.9%	31.0%	14.2%	33.0%	31.6%	33.2%	34.5%	36.6%
Preventive Services	8.6%	18.3%	13.2%	24.9%	25.1%	29.1%	28.4%	28.4%	29.7%	12.0%	31.6%	30.5%	32.3%	33.5%	35.5%
Dental Treatment	8.7%	10.2%	9.0%	15.2%	15.4%	22.7%	17.1%	15.9%	16.9%	8.0%	18.2%	17.6%	17.6%	18.3%	21.1%

Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

There was further erosion in utilization rates of any dental services among young people age 19-20 who were eligible for Medicaid services under the EPSDT program. Young people in this age group have mostly exited formal public education, which may contribute to the decline in utilization of any dental services.

FIGURE 22. EPSDT SERVICES FOR MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 19-20, 1999-2013



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Any Dental Service	15.1%	14.4%	14.5%	20.2%	20.9%	5.7%	19.2%	18.0%	19.2%	12.9%	20.5%	19.6%	20.1%	20.3%	21.8%
Preventive Services	2.2%	9.5%	10.2%	13.5%	14.2%	3.9%	18.0%	16.8%	18.2%	9.5%	19.5%	18.7%	19.3%	19.5%	20.9%
Dental Treatment	6.5%	7.7%	9.2%	11.0%	11.6%	4.1%	12.3%	10.6%	11.3%	8.3%	12.5%	12.4%	12.1%	11.9%	12.7%

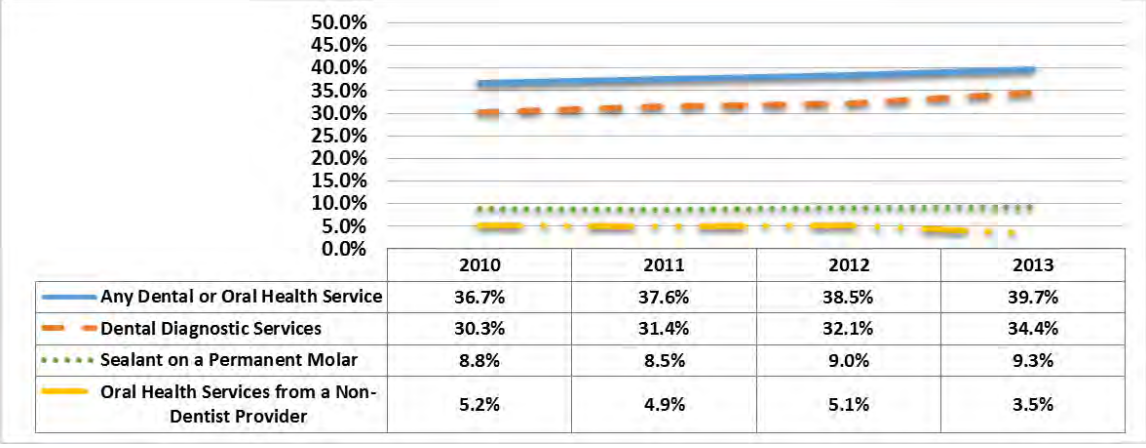
Source: CMS EPSDT, Form CMS-416, Michigan 1999-2013.

Starting in 2010, the EPSDT reporting form (CMS-416) was revised to include more discrete information about oral health services provided to children in state Medicaid programs. Beginning in that year, data were collected to describe the number of eligible children in each state who received a dental diagnostic service, a sealant on a permanent molar, and/or an oral health service from a non-dentist provider. The new form also included a question about receiving any dental or oral health service from a dental provider or another health or oral health professional not working under dental supervision, including

dental hygienists. The contributions of health professionals other than dentists, including dental hygienists working in independent practice or under public health supervision, to oral health care are increasing. Physicians, nurses and nurse practitioners, physician assistants, and others are trained in many states to provide oral health screening, prevention, and promotion services with state Medicaid programs reimbursing for these services.

In Michigan, the percentage of Medicaid-eligible children age less than 1 to age 20 receiving any dental or oral health services gradually increased over the most recent four years from 36.7% to 39.7%.

FIGURE 23. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE LESS THAN 1 TO AGE 20 RECEIVING PARTICULAR DENTAL SERVICES, 2010-2013

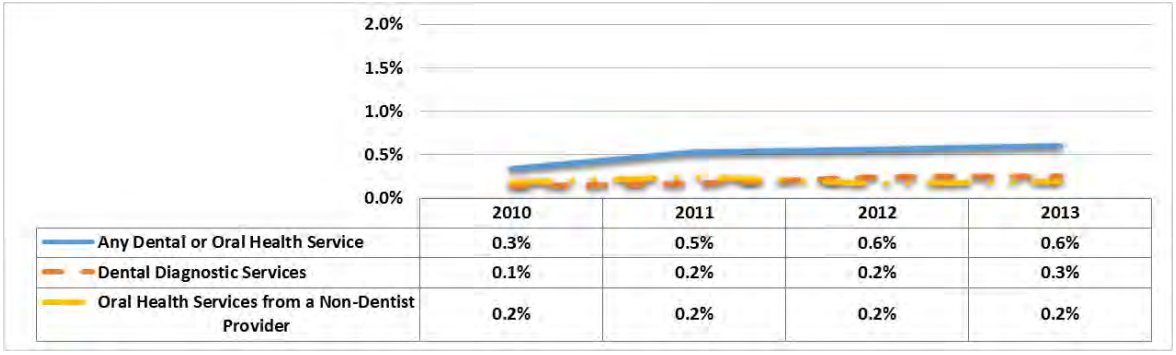


	2010	2011	2012	2013
Any Dental or Oral Health Service	36.7%	37.6%	38.5%	39.7%
Dental Diagnostic Services	30.3%	31.4%	32.1%	34.4%
Sealant on a Permanent Molar	8.8%	8.5%	9.0%	9.3%
Oral Health Services from a Non-Dentist Provider	5.2%	4.9%	5.1%	3.5%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

As previously discussed, there is variation by age cohort in receipt of services. While there is increasing recognition that dental care for children should begin as soon as or before their teeth erupt, very few Medicaid-eligible children younger than age 1 received any oral health service. Recent oral health policy and program initiatives are encouraging pediatric health care professionals to include oral health screening and prevention services in their periodic examinations of infants and young children.

FIGURE 24. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN LESS THAN AGE 1 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013



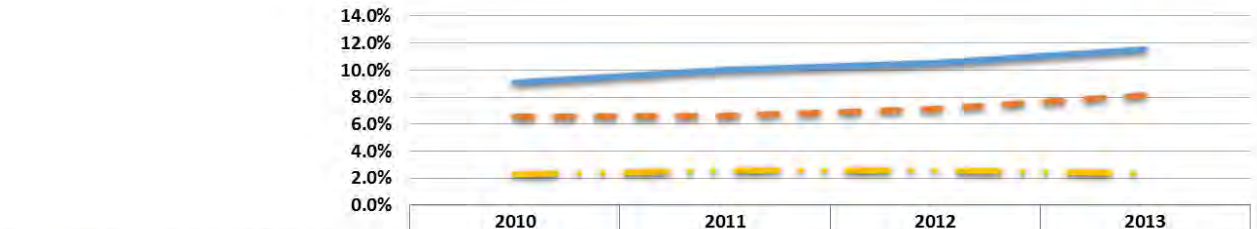
	2010	2011	2012	2013
Any Dental or Oral Health Service	0.3%	0.5%	0.6%	0.6%
Dental Diagnostic Services	0.1%	0.2%	0.2%	0.3%
Oral Health Services from a Non-Dentist Provider	0.2%	0.2%	0.2%	0.2%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

There was an increase in the number of Medicaid-eligible children age 1-2 who received any oral health service in the 4-year period. While there is growing awareness among both dental and health care professionals of the importance of oral health screening and prevention services for this age group, the percentage of children in the age cohort who actually received services remains low. It is interesting to

note that in this age cohort, and in all older cohorts, the percentage of children receiving oral health services from a non-dentist provider remained relatively constant over the 4 years while there were overall increases in the percentage receiving any dental or oral health services. This suggests that more children are seeing dental professionals for services.

FIGURE 25. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 1-2 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013



	2010	2011	2012	2013
Any Dental or Oral Health Service	9.1%	10.0%	10.6%	11.6%
Dental Diagnostic Services	6.5%	6.6%	7.2%	8.1%
Oral Health Services from a Non-Dentist Provider	2.3%	2.6%	2.6%	2.4%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

The percentage of Medicaid-eligible children age less than 3 to age 5 receiving any dental or oral health service was much higher than for younger children over the 4-year period. In many states including Michigan, there has been a concerted effort in Head Start and Early Head Start programs to address the oral health of low-income children qualifying for the program. The percentage of children receiving preventive or treatment services increased slightly over the 4 years with an accompanying increase in the percentage of children who received a dental diagnostic service over the time period. The percentage of children receiving services from a non-dentist provider declined between 2012-2013.

FIGURE 26. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE LESS THAN 3 TO AGE 5 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013

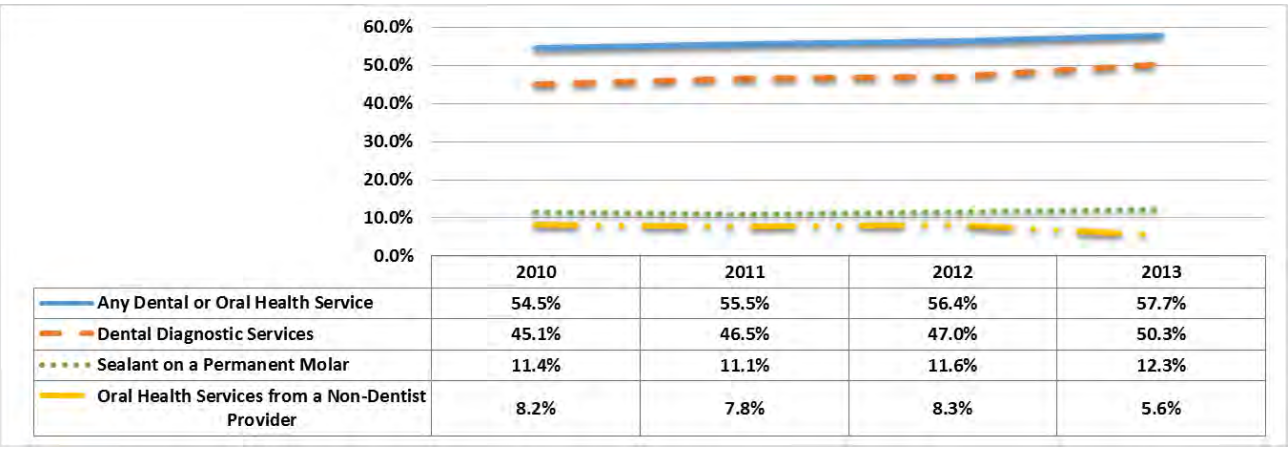
	2010	2011	2012	2013
Any Dental or Oral Health Service	43.9%	43.8%	44.8%	45.7%
Dental Diagnostic Services	36.6%	37.0%	37.3%	39.8%
Oral Health Services from a Non-Dentist Provider	6.4%	5.8%	6.4%	4.2%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

As previously stated, Medicaid-eligible children age 6-9 are more likely to receive dental and oral health services than children in any other age cohort. Again, the percentage of children receiving services from non-dental professionals decreased over the 4-year period while the percentage receiving any services

increased. The low percentage of children who received sealant services in this group is concerning since it is during this period that permanent molars begin to erupt. Sealants provide protective barriers that forestall decay and are therefore, an important preventive service.

FIGURE 27. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 6-9 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013



	2010	2011	2012	2013
Any Dental or Oral Health Service	54.5%	55.5%	56.4%	57.7%
Dental Diagnostic Services	45.1%	46.5%	47.0%	50.3%
Sealant on a Permanent Molar	11.4%	11.1%	11.6%	12.3%
Oral Health Services from a Non-Dentist Provider	8.2%	7.8%	8.3%	5.6%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013
Note: This data do not include children who already have sealants placed, only those who had a sealant placed in the year for which the data were collected.

More than half of Medicaid-eligible children age 10-14 received a dental or oral health service from 2010-2013. Still the percentage of children who had sealants placed on a permanent molar was low considering that permanent molars were present in this age group. It is important to note that the data on sealants only reflect those children who had a new sealant placed during the year. They do not include those children who had existing sealants. It is, therefore, likely that higher percentages of children had sealants than these data indicate.

FIGURE 28. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 10-14 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013

	2010	2011	2012	2013
Any Dental or Oral Health Service	46.4%	47.6%	48.6%	50.1%
Dental Diagnostic Services	38.5%	40.1%	40.7%	43.7%
Sealant on a Permanent Molar	6.5%	6.4%	6.7%	6.7%
Oral Health Services from a Non-Dentist Provider	6.4%	5.9%	6.2%	4.3%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

While there was an increase among Medicaid-eligible children age 15-18 receiving dental or oral health services, when compared to younger cohorts this group was less likely to have received dental services.

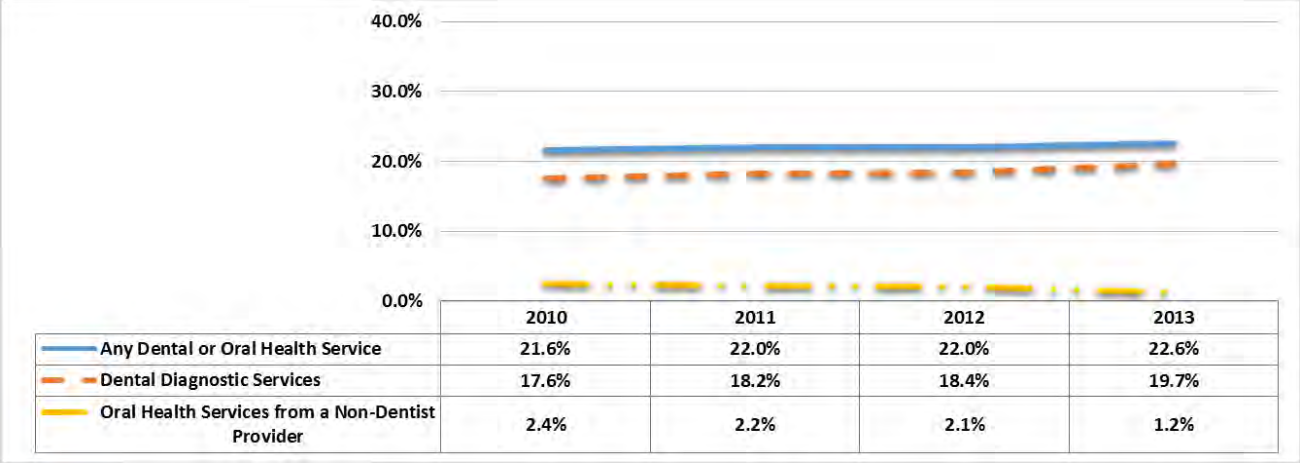
The percentage of children receiving dental or oral health services begins to decline in the age 10-14 group and continues to decline in the age 15-18 group with further noticeable declines among the age 19-20 group.

FIGURE 29. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 15-18 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013

	2010	2011	2012	2013
Any Dental or Oral Health Service	35.1%	36.4%	37.5%	38.5%
Dental Diagnostic Services	29.2%	30.9%	31.8%	34.0%
Oral Health Services from a Non-Dentist Provider	4.2%	3.6%	3.7%	2.4%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

FIGURE 30. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN IN MICHIGAN AGE 19-20 RECEIVING ANY DENTAL OR ORAL HEALTH SERVICES, 2010-2013

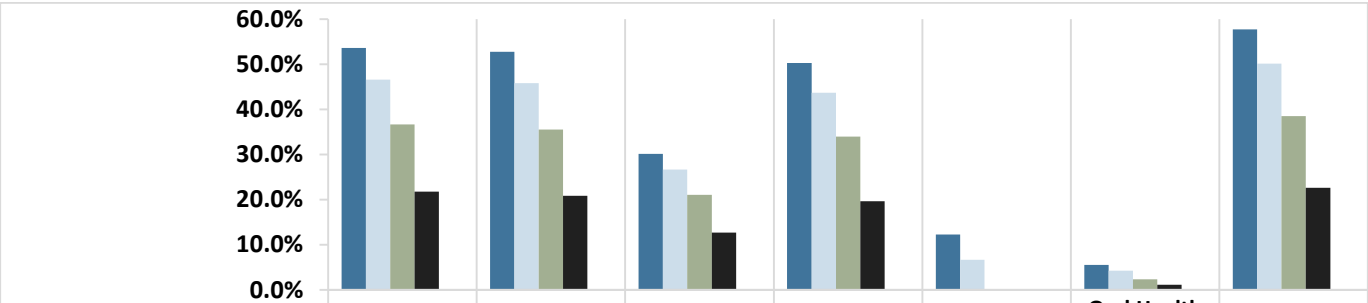


	2010	2011	2012	2013
Any Dental or Oral Health Service	21.6%	22.0%	22.0%	22.6%
Dental Diagnostic Services	17.6%	18.2%	18.4%	19.7%
Oral Health Services from a Non-Dentist Provider	2.4%	2.2%	2.1%	1.2%

Source: CMS EPSDT, Form CMS-416, Michigan 2010-2013

A chi square test was completed using the 2013 data from CMS- Form 416 for children age 6-20 to understand whether variation in receipt of dental or oral health services across age cohorts was meaningful. The p-values were highly significant ($p<0.00001$), indicating an inverse relationship between the percentage of children receiving Medicaid dental services and their age, with older children being significantly less likely to receive any dental service compared to the younger children. Similar trends were also observed in the previous years including 2010, 2011, and 2012.

FIGURE 31. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN RECEIVING DENTAL SERVICES IN 2013 BY AGE COHORT



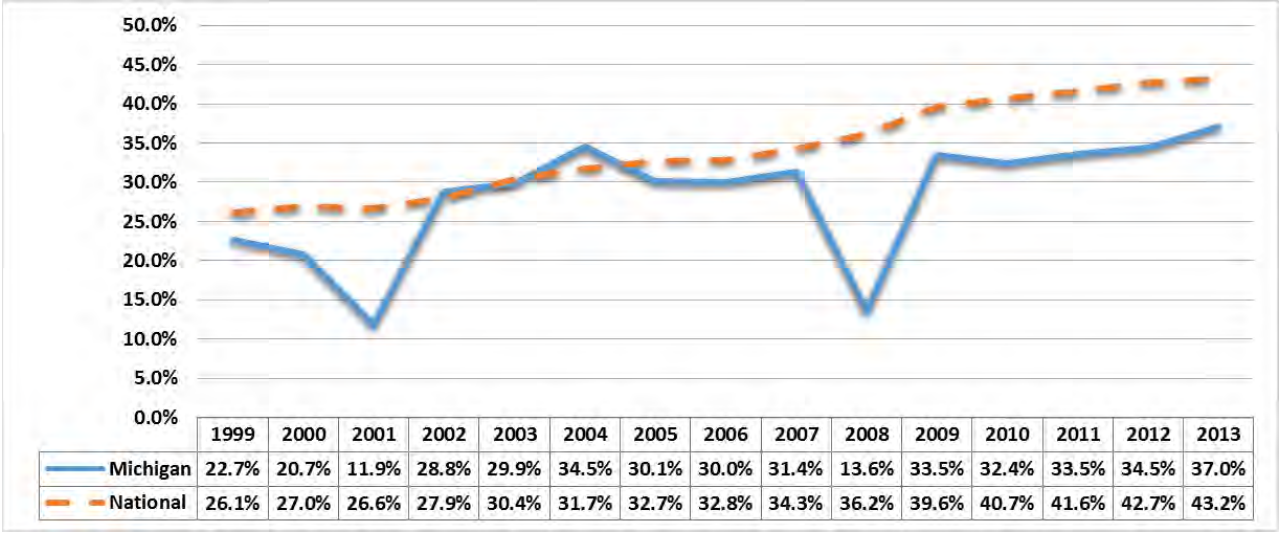
	Any Dental Service	Preventive Services	Dental Treatment	Dental Diagnostic Services	Sealant on a Permanent Molar	Oral Health Services from a Non-Dentist Provider	Any Dental or Oral Health Service
6 years to 9 years	53.6%	52.8%	30.1%	50.3%	12.3%	5.6%	57.7%
10 years to 14 years	46.6%	45.8%	26.7%	43.7%	6.7%	4.3%	50.1%
15 years to 18 years	36.6%	35.5%	21.1%	34.0%		2.4%	38.5%
19 years to 20 years	21.8%	20.9%	12.7%	19.7%		1.2%	22.6%
P-value for chi-square test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: CMS EPSDT, Form CMS-416, Michigan 2013, CHWS 2014

Oral Health of Children in the US and Michigan

Benchmarking the delivery of oral health services to Medicaid-eligible children in Michigan with the national average for oral health services is an instructive exercise. Over the 15 years from 1999-2013, Michigan has lagged behind the national average in the percentage of Medicaid-eligible children who received any dental service in every year except 2002 and 2004.

FIGURE 32. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN LESS THAN AGE 21 RECEIVING ANY DENTAL SERVICE IN MICHIGAN AND IN THE US, 1999-2013

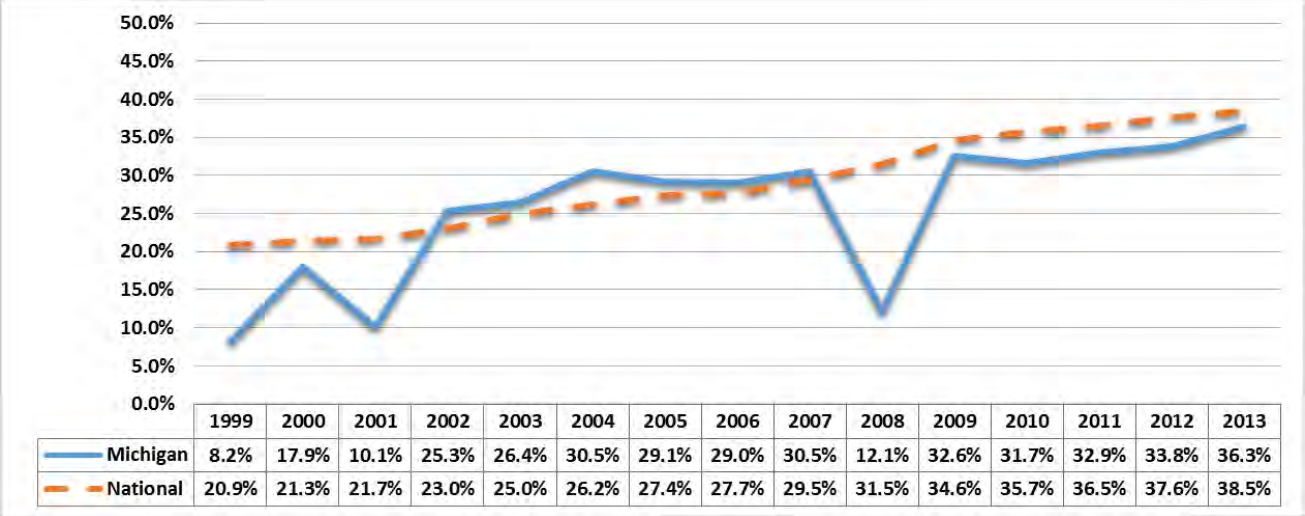


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Michigan	22.7%	20.7%	11.9%	28.8%	29.9%	34.5%	30.1%	30.0%	31.4%	13.6%	33.5%	32.4%	33.5%	34.5%	37.0%
National	26.1%	27.0%	26.6%	27.9%	30.4%	31.7%	32.7%	32.8%	34.3%	36.2%	39.6%	40.7%	41.6%	42.7%	43.2%

Source: CMS EPSDT, Form CMS-416, National and Michigan 1999-2013

The percentage of Michigan's Medicaid-eligible children receiving preventive oral health services from 2002-2007 tracked closely or exceeded the percentage of Medicaid-eligible children nationally receiving preventive services. However, the share of eligible children receiving services in Michigan fell below the national rate in 2008 and has not exceeded the national rate in any subsequent year.

FIGURE 33. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN LESS THAN AGE 21 RECEIVING ANY PREVENTIVE DENTAL SERVICE IN MICHIGAN AND IN THE US, 1999-2013

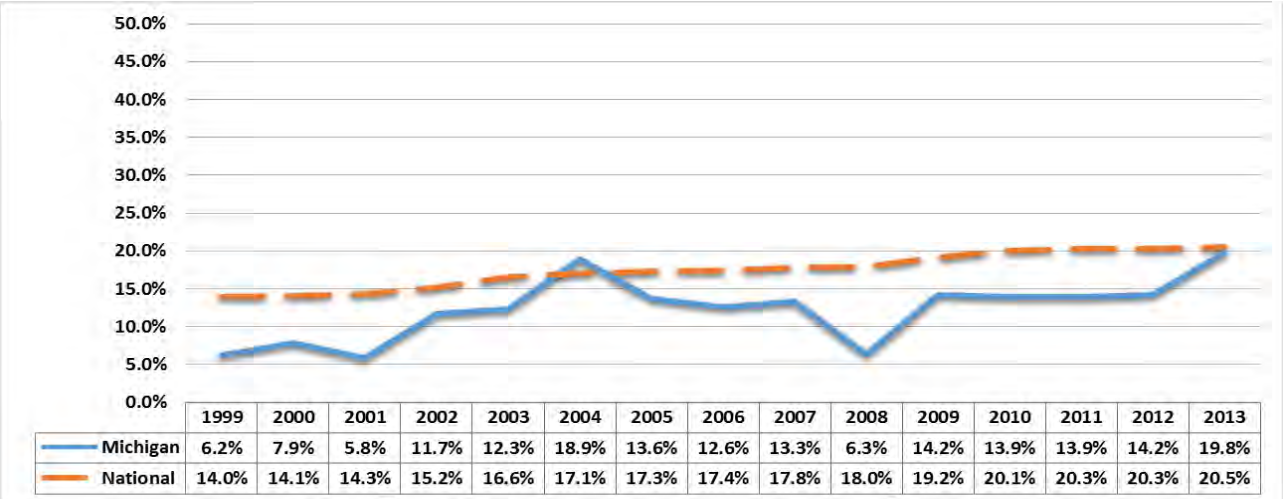


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Michigan	8.2%	17.9%	10.1%	25.3%	26.4%	30.5%	29.1%	29.0%	30.5%	12.1%	32.6%	31.7%	32.9%	33.8%	36.3%
National	20.9%	21.3%	21.7%	23.0%	25.0%	26.2%	27.4%	27.7%	29.5%	31.5%	34.6%	35.7%	36.5%	37.6%	38.5%

Source: CMS EPSDT, Form CMS-416, National and Michigan 1999-2013

While a low rate of dental treatment services can be desirable as an indicator of lack of need for restorative or therapeutic services and an appropriate oral health outcome, it may also be an indicator of lack of access to treatment services and an indicator of unmet need. Medicaid-eligible children nationally and in Michigan were mostly unlikely to have received any dental treatment services annually. Medicaid-eligible children in Michigan were even less likely than children nationally to receive treatment services. The percentage of children receiving treatment services in Michigan rose from 14.2% in 2012 to 19.8% in 2013, a positive upward tick.

FIGURE 34. PERCENTAGE OF MEDICAID-ELIGIBLE CHILDREN LESS THAN AGE 21 RECEIVING ANY DENTAL TREATMENT SERVICE IN MICHIGAN AND IN THE US, 1999-2013



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Michigan	6.2%	7.9%	5.8%	11.7%	12.3%	18.9%	13.6%	12.6%	13.3%	6.3%	14.2%	13.9%	13.9%	14.2%	19.8%
National	14.0%	14.1%	14.3%	15.2%	16.6%	17.1%	17.3%	17.4%	17.8%	18.0%	19.2%	20.1%	20.3%	20.3%	20.5%

Source: CMS EPSDT, Form CMS-416, National and Michigan 1999-2013

Surveys of Third-Grade Children in Michigan

In the 2005-2006 academic year and again in the 2009-2010 academic year, surveys about the oral health of third-grade children were conducted across Michigan by oral health professionals who clinically examined children to assess their oral health status.

The most recent survey (2009-2010) evaluating oral health status and utilization of oral health services used a sample of 2,056 third-graders in 75 Michigan elementary schools across the state.[42] The study included oral health screening examinations of these children as well as surveys of their parents to understand access to oral health providers and utilization of oral health services. The clinical examinations were completed by dental hygienists who evaluated each child on standard measures of oral health status, including:

- Present and past caries experience;
- Untreated cavitated lesions;
- Treated cavitated lesions;
- Presence or absence of sealants;
- Presence of fluorosis; and
- Evaluation by the dental hygienist of the urgency of need for treatment for any existing dental problems.[42]

The screenings conducted for the 2009-2010 survey found that[42]:

- Third-grade children who lived in communities with public water supplies that were fluoridated at optimal levels had fewer teeth with cavities than children who lived in communities with non-fluoridated water.
- Children who participated in the free and reduced lunch program at school or were not covered by dental insurance had higher rates of caries than children who did not qualify for the federal lunch program or had dental insurance, suggesting that socioeconomic factors impact oral health status.
- The greatest oral health disparities linked to socioeconomic characteristics of the children were among third-graders in the Detroit urban area and in the northern Lower Peninsula of the state.
- Over half of all third-graders (55.9%) had caries experience and it was more prevalent in certain geographic areas of the state. For example, 70.3% of third-graders in the Upper Peninsula had a history of dental decay.
- Children with untreated decay averaged 2.5 untreated primary teeth. For those with untreated permanent tooth decay, the average was 1.5 untreated permanent teeth.
- Children with any caries experience (treated or untreated) had on average 3.8 affected teeth.
- On average, 27.1% of third-graders in Michigan had untreated dental disease.
- Children who had not had an annual dental visit and children who were not covered by private dental insurance had the highest rates of untreated dental disease.
- Children in the Detroit metropolitan area had the highest prevalence of untreated disease (41.9% of children).
- Children without private dental insurance were twice as likely to have untreated disease (1 in 3 children) compared to children with private dental insurance (1 in 6 had untreated caries).

[42] MDCH. Count your Smiles 2011-2012. http://www.michigan.gov/documents/mdch/2010_CYS_Final_Report_Booklet_416499_7.pdf.

Each dental hygienist assessor evaluated the urgency of need for treatment when the need for dental care was identified in a child. On average, over one-third of third-grade students needed immediate or early dental care. Seven percent of third-graders were in need of immediate dental care as a result of pain, infection, or swelling and 28.1% needed early dental care. Children living in the Detroit urban area were 4 times more likely to need immediate dental services and those living in the northern Lower Peninsula were twice as likely as children living in suburban Detroit.[42]

There were racial/ethnic differences among children related to need for immediate services. Hispanic, African American, and Arab American children demonstrated 2 times higher prevalence of need for immediate care than did White children. Third-graders who had not had a dental visit within the past year were 3 times more likely to have immediate need than those had experienced at least 1 dental visit in that time.[42]

As part of the study, parents of participating children completed surveys about their children's oral health. While just 11.3% of parents statewide reported that their child had a toothache within the previous 6 months, 1 in 4 parents in the Detroit urban area reported a child with a toothache at in that time period.[42] African American and Hispanic children, females, children in free and reduced lunch programs, and those covered by public insurance were more likely than others to report a toothache within the last 6 months.[42]

Statewide, 84% of parents indicated that their child had visited the dentist within the past year.[42] There was geographic variation with 91% of parents in the Upper Peninsula reporting a dental visit in contrast to 74% in the northern Lower Peninsula.[42] White children (86%) were more likely than Arab American children (68%) or American Indian children (69%) in Michigan to have had a dental visit in the last year, as were privately insured children (92%) versus children on public insurance (77.3%) or those without any insurance (71.2%).[42]

Parents provided an assessment of their level of difficulty with obtaining dental care for their children. Thirty percent of children in families who had difficulty obtaining dental care in the previous year had toothaches within the last 6 months compared to 8.9% of children in families with no difficulty obtaining dental care in the previous year.[42] In some geographic regions, fewer parents reported difficulty obtaining dental care for their children, including in the upper peninsula (5.2%) and the city of Detroit (5.3%), than parents in other areas, such as the southern Lower Peninsula (9.6%) and suburban Detroit (9.6%).[42]

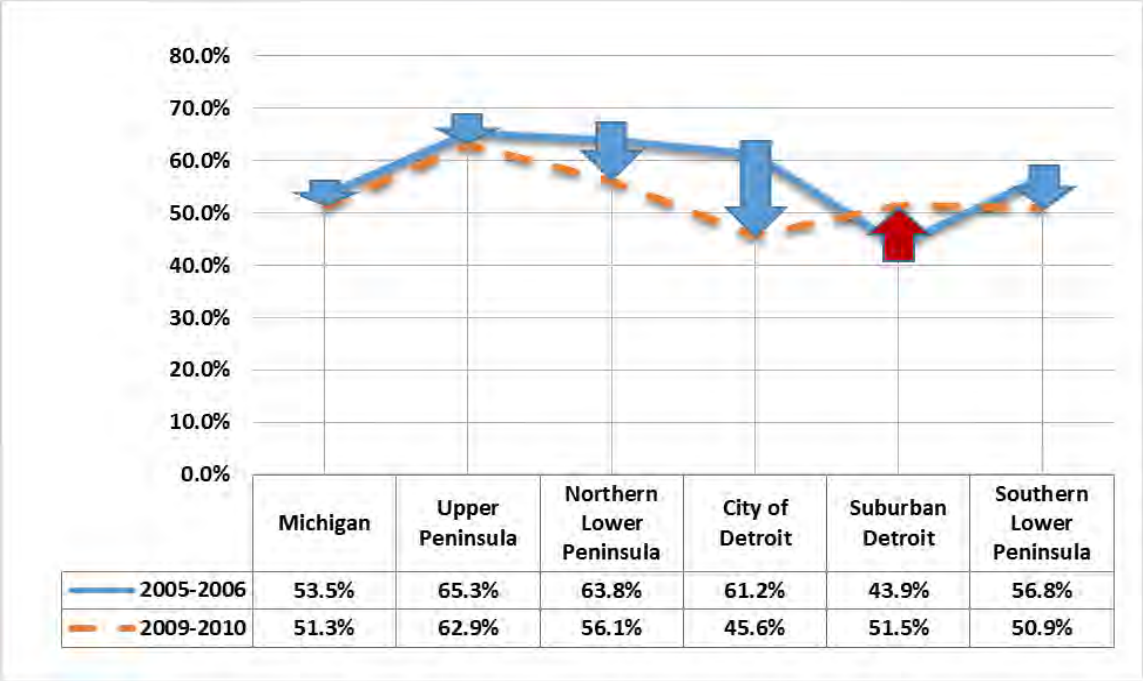
The 2009-2010 study replicated a similar study conducted in the 2005-2006 academic year and used the same methodology. The earlier study examined a sample of 1,586 third-grade children in 74 elementary schools across Michigan and also included a survey of parents. The charts and tables that follow compare results from the 2 surveys by geographic regions in the state.

At least half of all third-grade children had caries in their primary teeth when examined for the surveys. In the 2005-2006 survey, third-graders in suburban Detroit had the lowest rate of caries in their primary teeth.[43] In the 2009-2010 survey, third-graders in the city of Detroit manifested the lowest rates of caries by region in the state.[42] The percentage of third-grade children with primary caries experience decreased in the 4-year interval between the surveys in all regions of Michigan except suburban Detroit where there was a 7.6% increase in third-graders with caries experience in their primary teeth. Still, children in suburban Detroit had lower rates of caries in primary teeth than their peers in the Upper Peninsula and the northern Lower Peninsula in both survey years. The percentage of third-grade

[43] MDCH. Count Your Smiles 2005-2006. http://www.michigan.gov/documents/Basic_Screening_Survey_updated_3-16-06_164625_7.pdf.

children in the city of Detroit with caries experience in their primary teeth substantially decreased over time.

FIGURE 35. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH CARIES EXPERIENCE IN THEIR PRIMARY TEETH, 2005-2006 AND 2009-2010

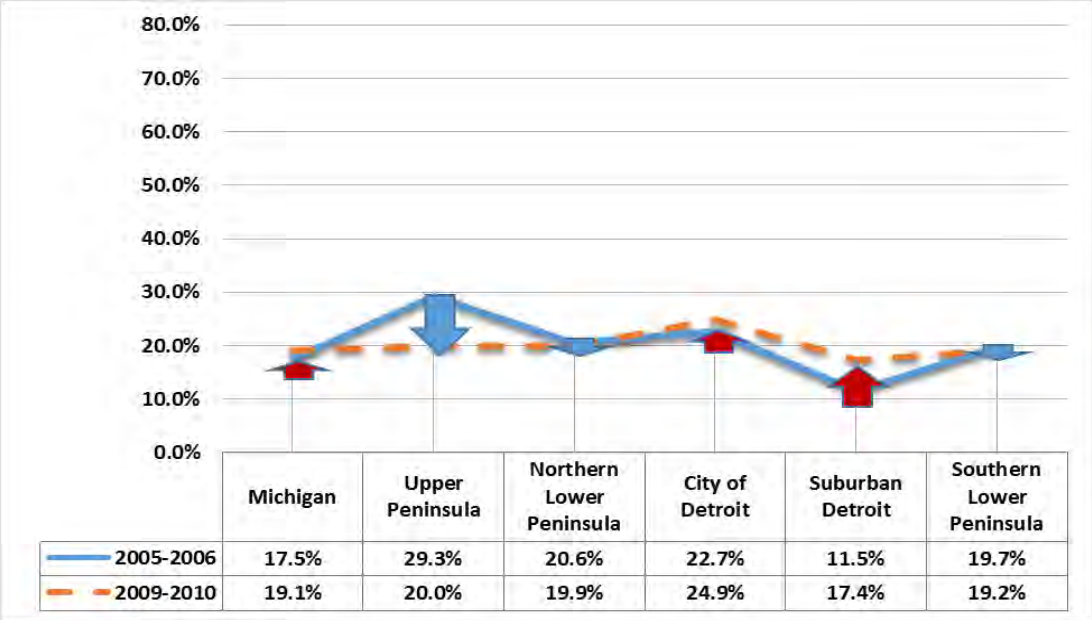


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	53.5%	65.3%	63.8%	61.2%	43.9%	56.8%
2009-2010	51.3%	62.9%	56.1%	45.6%	51.5%	50.9%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

Less than one-fifth of third-graders in Michigan had caries in their permanent teeth when examined for either survey. However, the percentage of children with caries in their permanent teeth increased by almost 6% in suburban Detroit and by over 2% in the city of Detroit between the 2005-2006 school year and the 2009-2010 school year.[42,43] As a result, there was a net increase in the percentage of third-graders statewide with dental caries in their permanent teeth. Despite the substantial increase, children in suburban Detroit still exhibited the lowest regional rate of caries in their permanent teeth.

FIGURE 36. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH CARIES EXPERIENCE IN THEIR PERMANENT TEETH, 2005-2006 AND 2009-2010



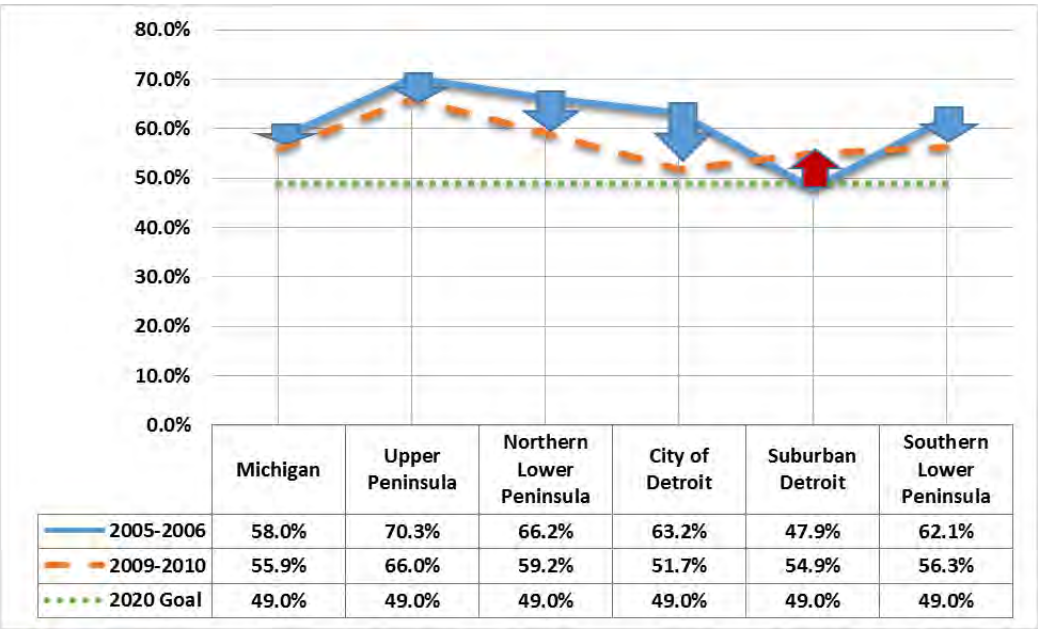
	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	17.5%	29.3%	20.6%	22.7%	11.5%	19.7%
2009-2010	19.1%	20.0%	19.9%	24.9%	17.4%	19.2%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

Healthy People 2020 (HP 2020) is a set of 10-year objectives for improving the health of the US population. [44] HP 2020 sets goals for prevention activities and priorities to reduce chronic disease incidence in the population. These health targets allow states to benchmark progress in improving population health. The HP 2020 goals include several related to oral health. One indicator, which is relevant to this discussion, is to reduce the proportion of children age 6-9 with dental caries experience in their primary and permanent teeth.[44] In the baseline years (1999-2004), the National Health and Nutrition Examination Survey found that 54.4% of children in this age group had caries experience. The goal for 2020 was to reduce that percentage by 10% to 49.0% nationally.[44] From 2009-2010, 55.9% of children participating in the third-grade survey in Michigan had caries experience in their primary or permanent teeth.[42] This was above the target level for HP 2020.

[44] Healthy People 2020. Oral Health. http://www.healthypeople.gov/2020/data-search/Search-the-Data?&f[0]=field_topic_area%3A3511

FIGURE 37. PERCENT OF THIRD-GRADE CHILDREN WITH CARIES EXPERIENCE IN PRIMARY OR PERMANENT TEETH IN MICHIGAN, 2005-2010 AND HP 2020 GOAL

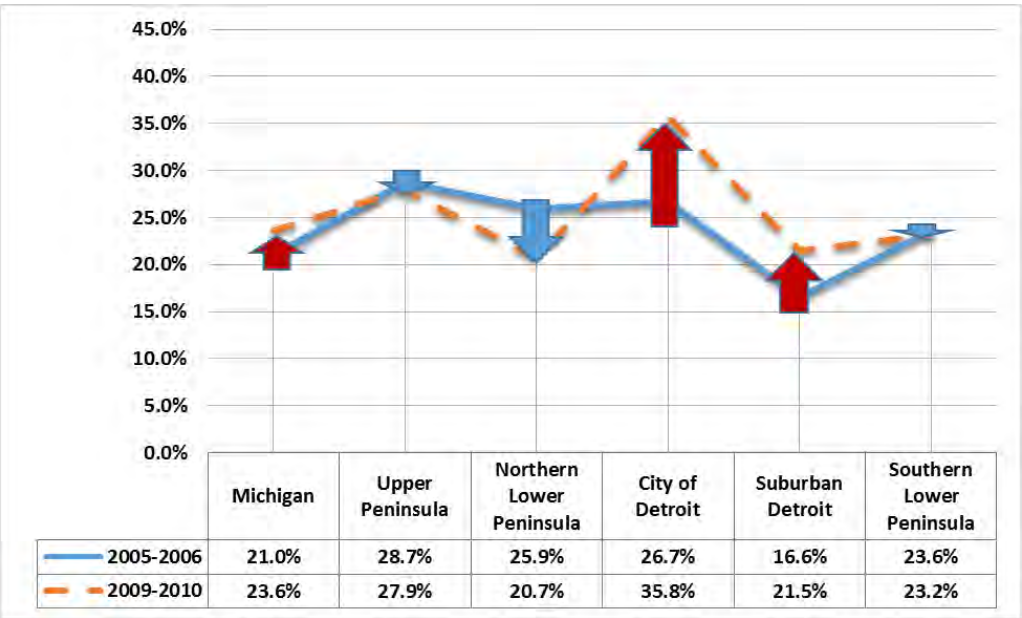


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	58.0%	70.3%	66.2%	63.2%	47.9%	62.1%
2009-2010	55.9%	66.0%	59.2%	51.7%	54.9%	56.3%
2020 Goal	49.0%	49.0%	49.0%	49.0%	49.0%	49.0%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

The third-grade surveys provided data on the percentage of children with untreated caries in their primary and permanent teeth. The percentage of third-grade children in Michigan with untreated decay in primary dentition increased between the 2005-2006 survey (21.0%) and the 2009-2010 survey (23.6%).[42] There was a noticeable increase in children with untreated decay in primary teeth in the city of Detroit (+9.1%) and in suburban Detroit (+4.9%) and a noticeable decrease in children with untreated decay in the northern Lower Peninsula (-5.2%) from 2009-2010.[42,43]

FIGURE 38. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH UNTREATED CARIES IN THEIR PRIMARY TEETH, 2005-2006 AND 2009-2010

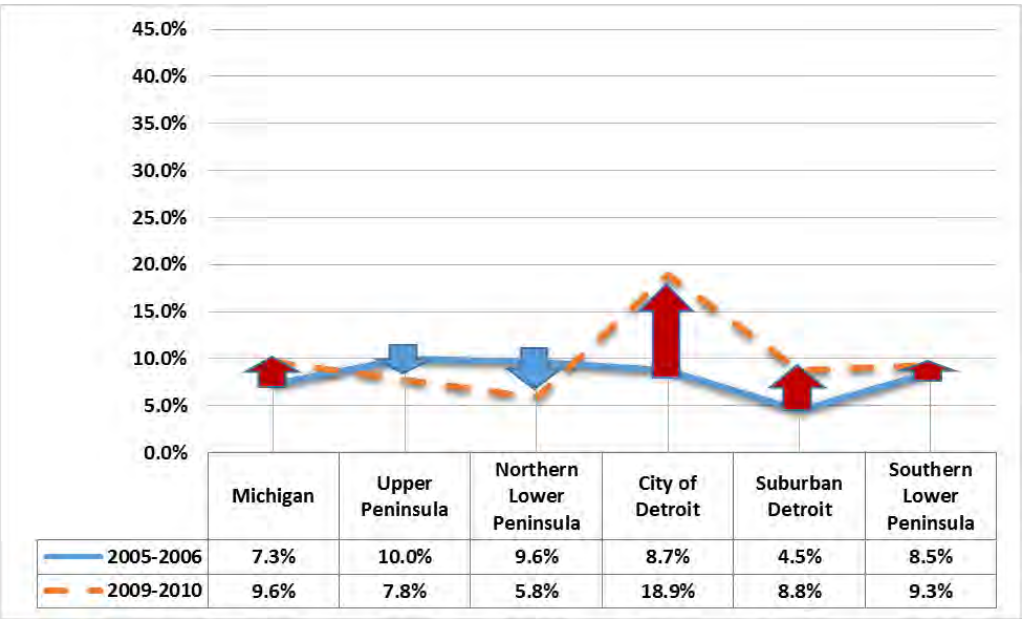


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	21.0%	28.7%	25.9%	26.7%	16.6%	23.6%
2009-2010	23.6%	27.9%	20.7%	35.8%	21.5%	23.2%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

The percent of third-grade children in Michigan with untreated caries in permanent teeth also increased from 7.3% in the 2005-2006 school year to 9.6% in the 2009-2010 school year.[42,43] A noticeably higher percentage of children in the city of Detroit exhibited decay in permanent teeth in 2009-2010 than in the earlier survey. There were improvements in the rate of untreated decay in permanent teeth for children in the Upper Peninsula and the northern Lower Peninsula between the 2 survey years. [42,43]

FIGURE 39. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH UNTREATED CARIES IN THEIR PERMANENT TEETH, 2005-2006 AND 2009-2010

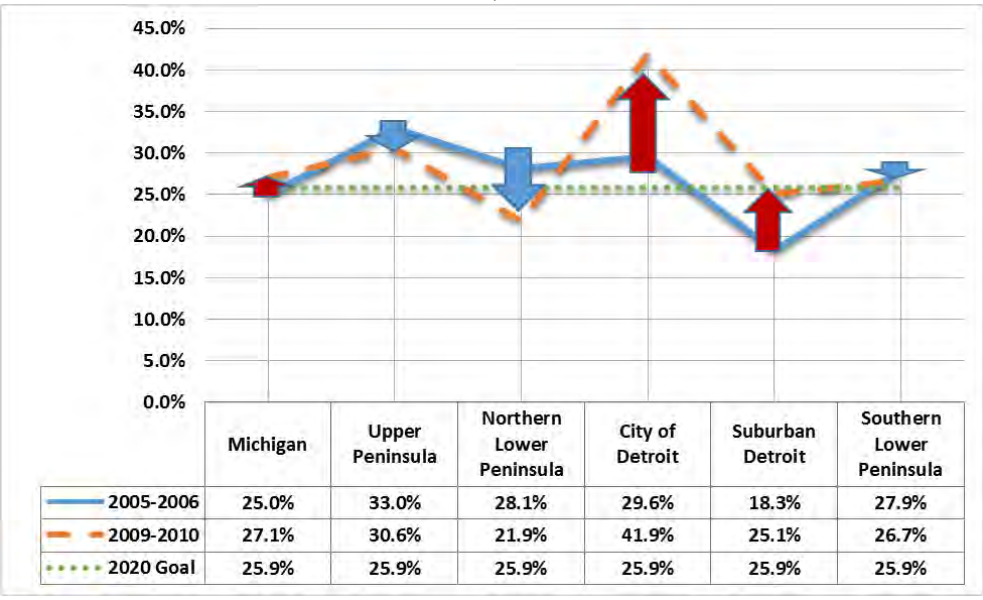


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	7.3%	10.0%	9.6%	8.7%	4.5%	8.5%
2009-2010	9.6%	7.8%	5.8%	18.9%	8.8%	9.3%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

HP 2020 includes a goal to reduce the proportion of children age 6-9 with untreated dental caries experience in their primary and permanent teeth from a baseline in 1999-2004 of 28.8% to 25.9% (a 10% decrease).[44] The percentage of children with untreated decay in the northern Lower Peninsula of Michigan and in suburban Detroit is below this goal. However, the statewide rate of 27.1% of third-grade children with untreated decay in either or both primary and permanent teeth in the most recent survey year is still above the HP 2020 target rate.

FIGURE 40. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH UNTREATED CARIES IN EITHER OR BOTH PRIMARY OR PERMANENT TEETH, 2005-2006 AND 2009-2010



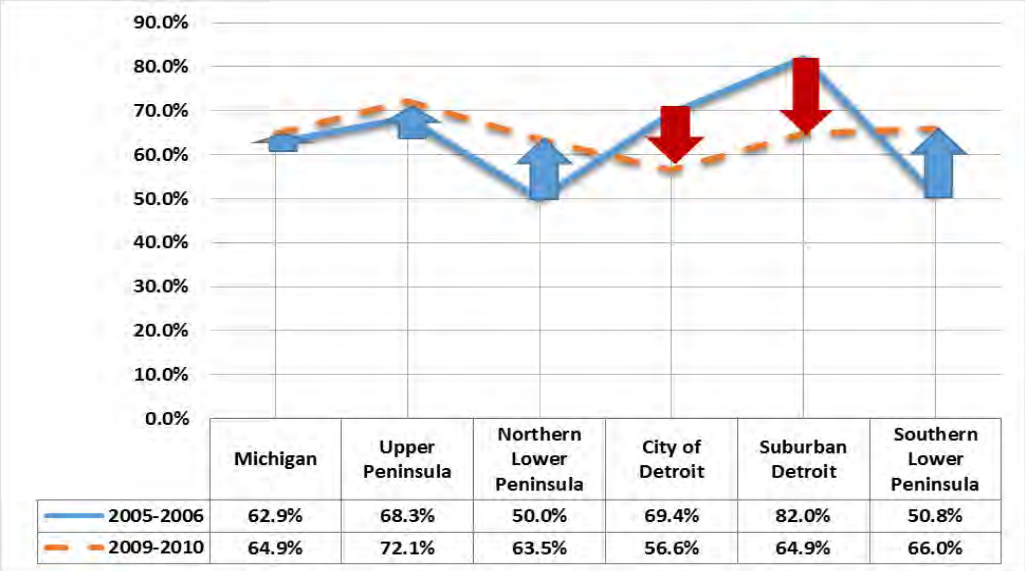
	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	25.0%	33.0%	28.1%	29.6%	18.3%	27.9%
2009-2010	27.1%	30.6%	21.9%	41.9%	25.1%	26.7%
2020 Goal	25.9%	25.9%	25.9%	25.9%	25.9%	25.9%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

The surveys revealed that some third-grade children in Michigan were in need of dental care at the time of the survey examinations. Having unmet dental care needs may be indicator of lack of access to appropriate and timely oral health services. Lack of timely access to care may result in the need for immediate or emergency care when a dental condition progresses without appropriate intervention.

The percentage of third-grade children in Michigan with no obvious dental problem improved between surveys. In 2005-2006, 62.9% of children had no obvious dental problem with an increase to 64.9% in 2009-2010.[42,43] However, a much lower percentage of children in suburban Detroit were assessed as having no obvious dental problem in 2005-2006 (82.0%) than in 2009-2010 (64.9%).[42,43]

FIGURE 41. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH NO OBVIOUS DENTAL PROBLEM, 2005-2006 AND 2009-2010

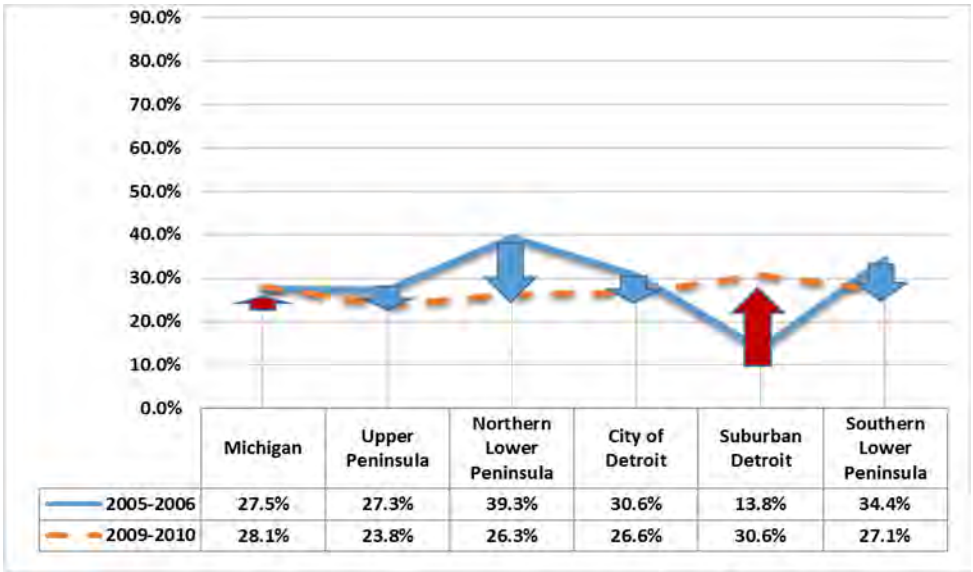


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	62.9%	68.3%	50.0%	69.4%	82.0%	50.8%
2009-2010	64.9%	72.1%	63.5%	56.6%	64.9%	66.0%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

A percentage of children in Michigan were observed to need routine or early dental care during the examinations for both surveys. The statewide percentage of children in need of routine care increased only slightly (.6%) between survey periods. However, there was a considerable change in percentage of children in suburban Detroit who were in need of routine or early dental care (+16.8%) over the period between surveys.[42,43] This regional rate reduced the impact of decreases in other regions of Michigan on the statewide rate.

FIGURE 42. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN IN NEED OF ROUTINE/EARLY DENTAL CARE, 2005-2006 AND 2009-2010

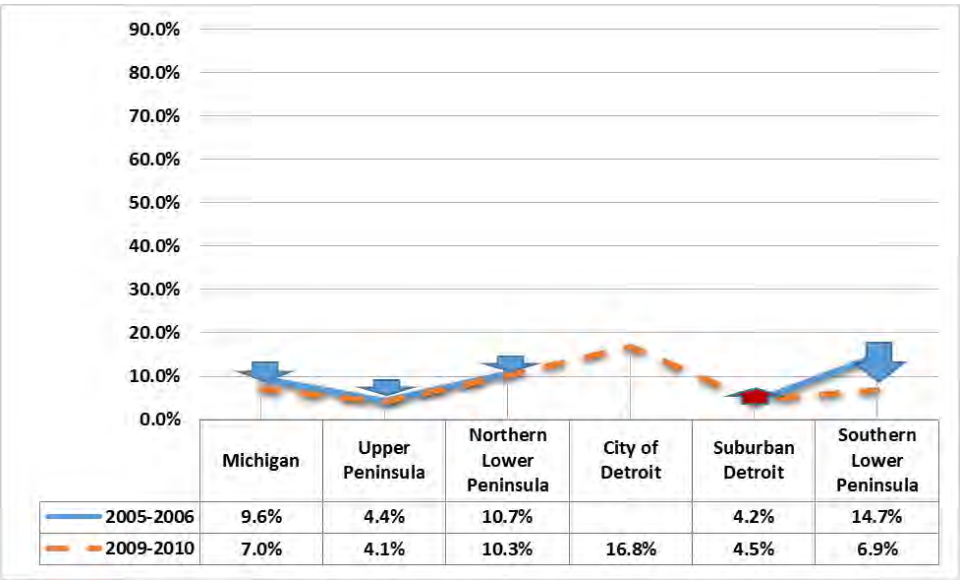


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	27.5%	27.3%	39.3%	30.6%	13.8%	34.4%
2009-2010	28.1%	23.8%	26.3%	26.6%	30.6%	27.1%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

Most concerning of the results from the third-grade surveys of children's oral health was the percentage of children in the city of Detroit in 2009-2010 who were in need of immediate dental care (16.8%).

FIGURE 43. PERCENT OF THIRD-GRADE CHILDREN IN MICHIGAN WITH IMMEDIATE NEED FOR DENTAL CARE, 2005-2006 AND 2009-2010

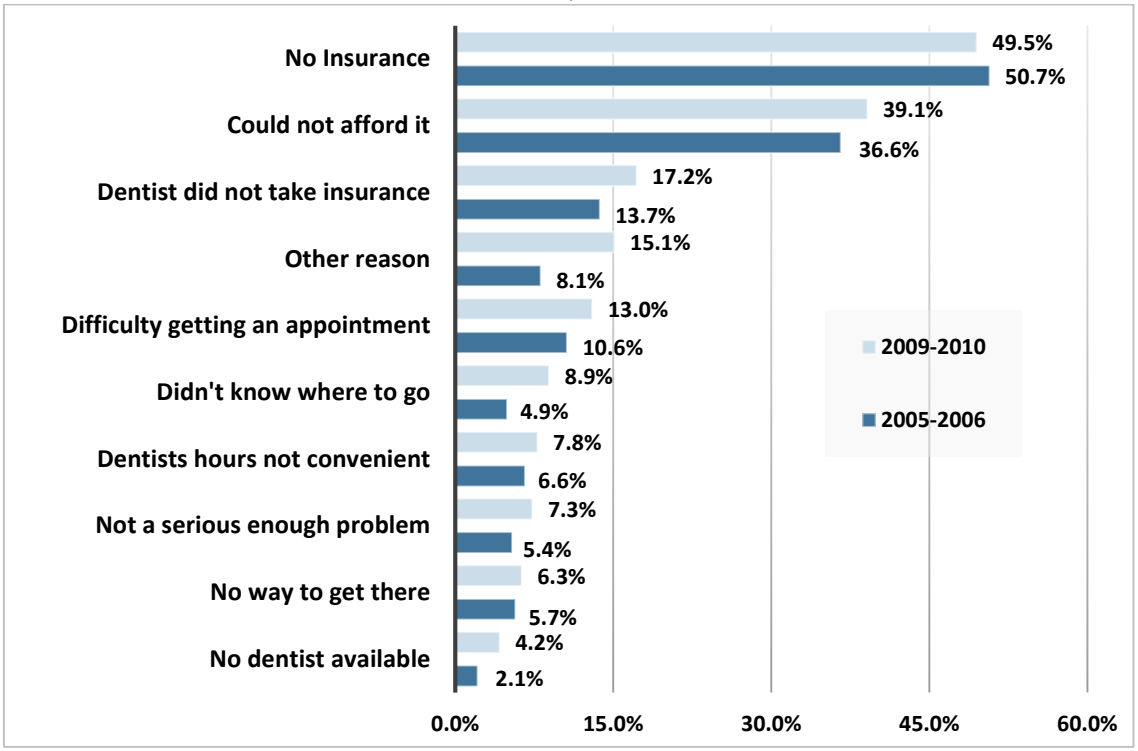


	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
2005-2006	9.6%	4.4%	10.7%		4.2%	14.7%
2009-2010	7.0%	4.1%	10.3%	16.8%	4.5%	6.9%

Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

While all children participating in the third-grade surveys received a clinical examination, a parent of each child was also asked to complete a survey asking questions about the child's oral health and access to services. One question on the survey asked parents of children who were unable to get dental services in the prior year the reasons why. The 2 most frequently selected reasons in both the 2005-2006 survey and 2009-2010 survey were lack of dental insurance and the inability to afford the services.

FIGURE 44. PERCENT OF PARENTS OF THIRD-GRADE SURVEY PARTICIPANTS BY REASONS SELECTED FOR THEIR CHILDREN NOT RECEIVING DENTAL CARE IN THE PAST YEAR, 2005-2006 AND 2009-2010



Source: Michigan Third-Grade Survey, 2005-2006 and 2009-2010

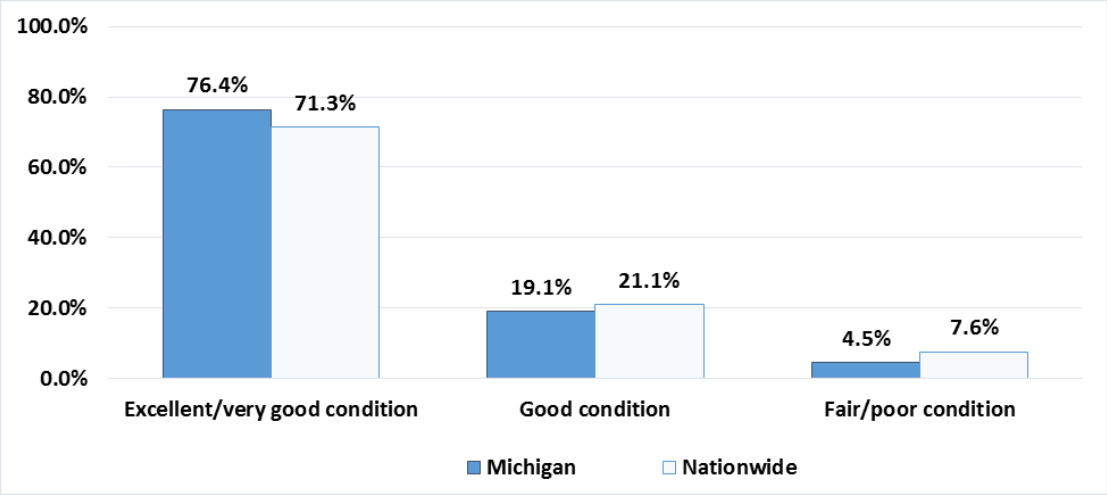
2011-2012 National Survey of Children's Health

The National Survey of Children's Health (NSCH), sponsored by the US. Department of Health and Human Services' Maternal and Child Health Bureau of the Health Resources and Services Administration, is a survey of the health and well-being of non-institutionalized children age 0-17. The NSCH is conducted every 4 years (2003-2004, 2007-2008, and 2011-2012) and provides national- and state-level estimates (50 states and Washington, DC) of children's health, including several oral health indicators.[45]

In the 2011-2012 NSCH, parents were asked to appraise the overall condition of their children's oral health if their children had natural teeth. A higher percentage of parents of children in Michigan (76.4%) indicated that their children had excellent or very good oral health than parents nationally (71.3%).[45]

[45] Child and Adolescent Health Measurement. Data Resource for Child and Adolescent Health. The National Survey of Children's Health. http://www.childhealthdata.org/learn/NSCH

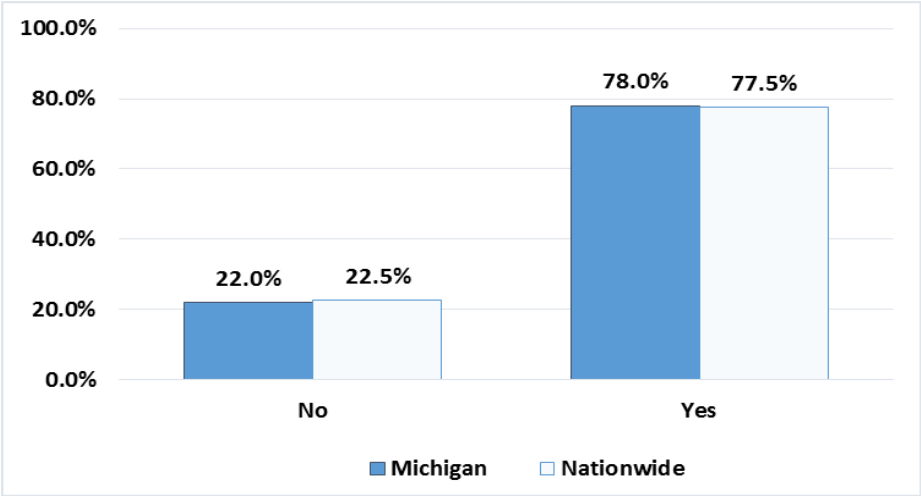
FIGURE 45. PARENTS' APPRAISAL OF OVERALL ORAL HEALTH OF CHILDREN IN THE US AND IN MICHIGAN AGE 1-17 WITH NATURAL TEETH, 2011-2012



Source: NSCH, 2011-2012

Parents of children in Michigan were also slightly more likely than parents nationally to indicate their children had received any oral health services, including screening, diagnostic, preventive, or therapeutic services in the previous year.

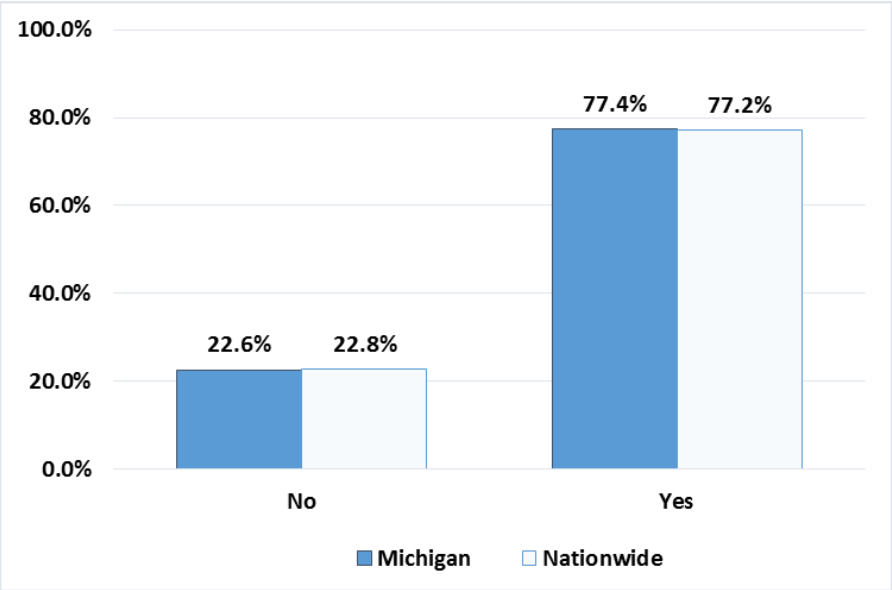
FIGURE 46. PERCENTAGE OF CHILDREN IN THE US AND IN MICHIGAN AGE 1-17 WHO RECEIVED ANY DENTAL SERVICE DURING THE PAST 12 MONTHS



Source: NSCH, 2011-2012

Parents of children in Michigan who responded to the survey were as likely as parents of children nationally to indicate that their child had received a preventive oral health service in the previous year.

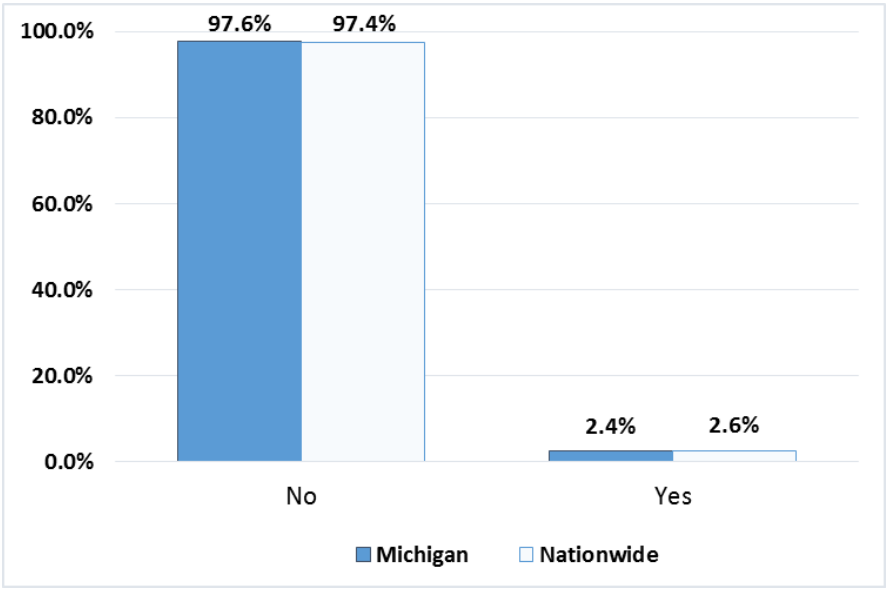
FIGURE 47. PERCENTAGE OF CHILDREN IN THE US AND IN MICHIGAN AGE1-17 WHO RECEIVED ANY PREVENTIVE ORAL HEALTH SERVICE DURING THE PAST 12 MONTHS



Source: NSCH, 2011-2012

Parents were also asked to indicate if during the past year there was any time when needed oral health care was delayed or not received. A very low percentage of parents nationwide or in Michigan observed any delayed care or unmet need for dental care in the past year.

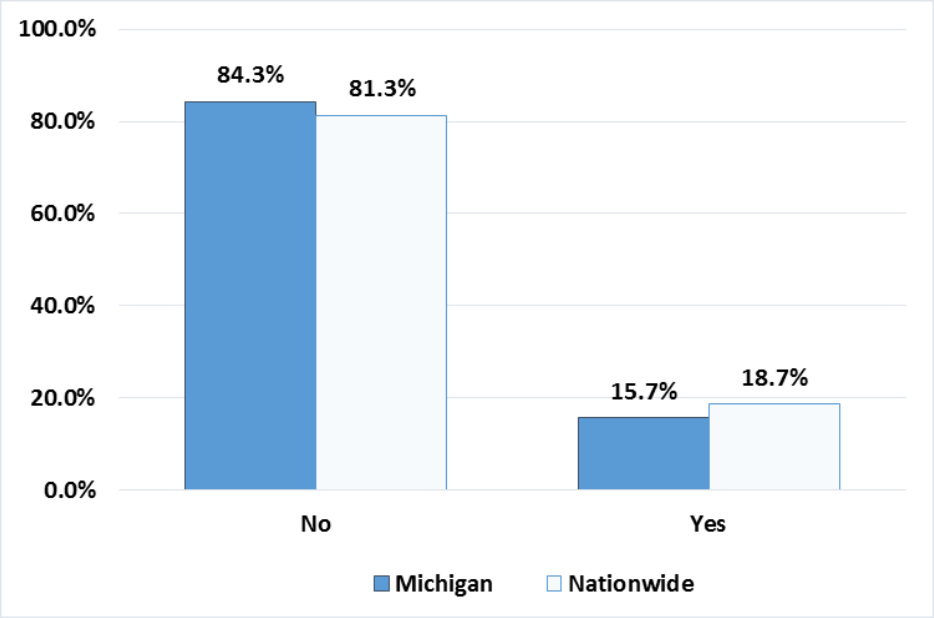
FIGURE 48. PERCENTAGE OF CHILDREN IN THE US AND IN MICHIGAN AGE 1-17 WITH DELAYED CARE OR UNMET NEED FOR DENTAL CARE DURING THE PAST 12 MONTHS



Source: NSCH, 2011-2012

Most parents also indicated the absence of tooth decay or toothache in their children during the previous year. Parents in Michigan were more likely to indicate the lack of oral disease or tooth pain in their children (84.3%) than were parents nationally (81.3%).

FIGURE 49. PERCENTAGE OF CHILDREN AGE 1-17 WITH AN ORAL HEALTH PROBLEM (TOOTHACHE, DECAYED TEETH, UNFILLED CAVITIES) DURING THE PAST 12 MONTHS



Source: NSCH, 2011-2012

Oral Health of Pregnant and Parenting Women in Michigan

The oral health of pregnant women is important both for the mother and the unborn infant. Poor oral health in the mother is linked to a high risk of pre-term birth and low-birth-weight babies. In addition, the bacteria responsible for dental caries can be transmitted from a mother to her infant, placing children of mothers with poor oral health at risk for early onset of caries. Gum disease, gingivitis, and dental caries are relatively common in pregnant women due to a number of factors, including fluctuating hormonal levels, heightened inflammatory responses to oral disease, changes in immune response, and changes in oral flora, such as increased acidity in the mouth, which affects oral health.[46]

Nationwide between 2007-2009, 56% of pregnant women did not visit a dentist during their most recent pregnancy.[46] Socioeconomic and racial/ethnic disparities among pregnant women impact utilization of oral health services during pregnancy. Non-Hispanic Black and Hispanic women were less likely to have their teeth cleaned during pregnancy than were non-Hispanic White women and pregnant poor women were less likely than those with higher incomes to receive dental care.[46] In Michigan in 2008, just 25.3% of new mothers indicated they received any dental care during their most recent pregnancy and only 46.4% received oral health counseling from their medical provider during the pregnancy.[27]

The CDC in collaboration with the MDCH conducts an annual population-based survey of a sample of approximately 2,000 women who had live births in a particular year to obtain data about risk factors for infant mortality.[47] The sample is selected from eligible birth certificates in Michigan.[47] Women who deliver low-birth-weight babies and women who are Black are oversampled to assure adequate

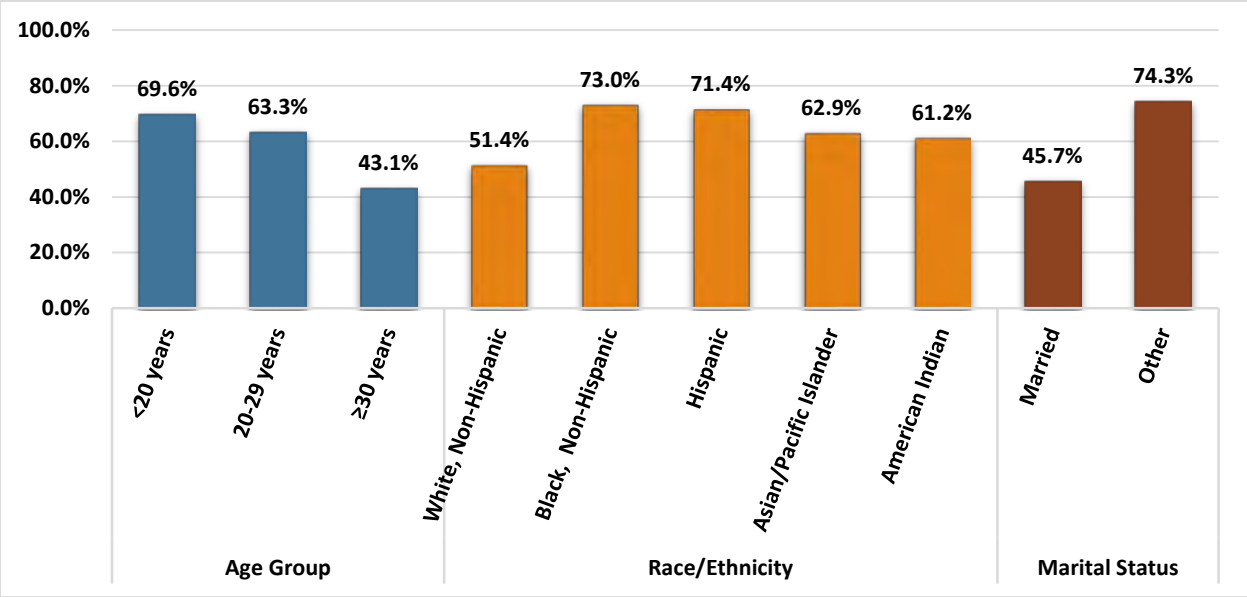
[46] The American College of Obstetricians and Gynecologists. Committee on Health Care for Underserved Women. Committee Opinion. Oral Health Care during Pregnancy and Through the Lifespan. August 2013. http://www.acog.org/-/media/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/co569.pdf?dmc=1&ts=20141211T1305436980.

[47] Zimmerman N, Anderson B, Larder C, Wahl R, Lyon-Callo S. MDCH. Oral health during pregnancy, 2004-2008. MI PRAMS Delivery. 2013;12(1). http://www.michigan.gov/documents/mdch/PRAMS_Newsletter_Oral_Health_Final3_435030_7.pdf.

representation.[47] Survey results are weighted to be representative of all Michigan mothers who delivered a live birth in the year.[47] The survey asks questions about oral health and dental services during pregnancy. The following results describe the data collected from 2004-2008 from Michigan mothers.

The Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire asked new mothers if they needed to see a dentist for an oral health problem during their most recent pregnancy and if so, did they seek care. During the 4-year survey period, 74.0% of women said they did not need dental care while pregnant and 26% of women indicated they experienced a need for dental care while pregnant.[47] Among those who indicated need, 58.4% visited a dentist while the remainder (41.6%) did not.[47] Mothers who were younger, from minority groups, or were unmarried were more likely than other pregnant women to not seek dental care when needed during pregnancy.[47]

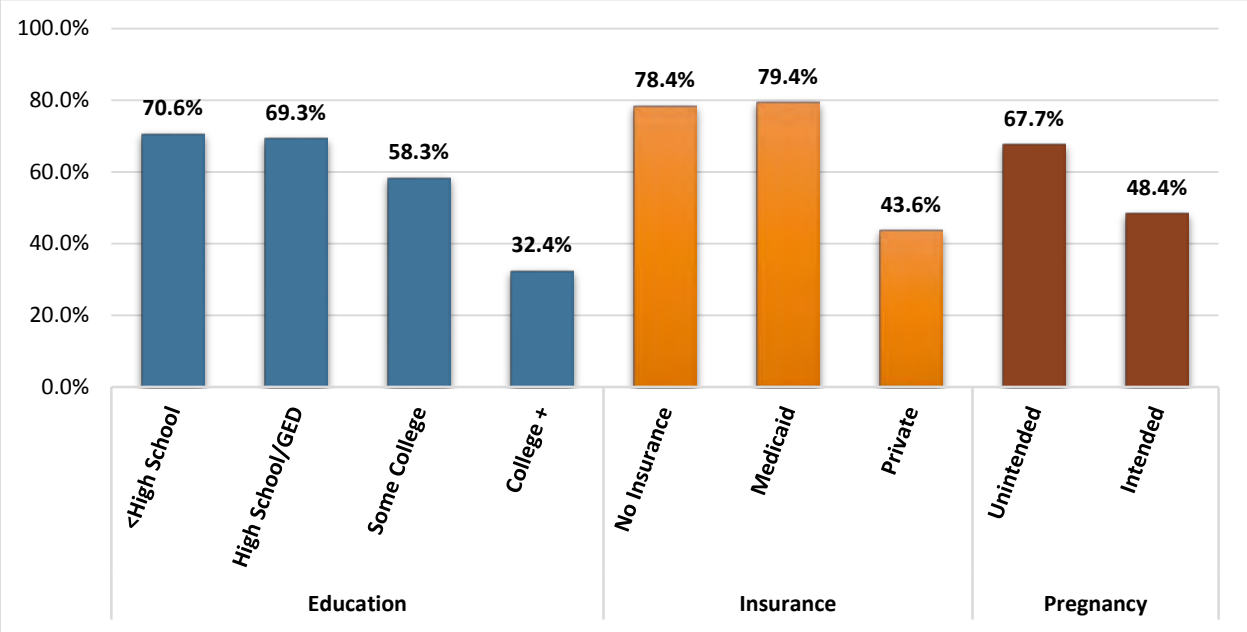
FIGURE 50. PREVALENCE OF NOT RECEIVING DENTAL CARE DURING PREGNANCY BY DEMOGRAPHIC CHARACTERISTICS OF MOTHERS, 2004-2008, MICHIGAN



Source: PRAMS, 2004-2008

New mothers with a high school education or less, those with no health insurance, those using Medicaid prior to pregnancy, or those with unintended pregnancies were more likely than other new mothers to not receive needed dental services during pregnancy.[47] After controlling for all factors, maternal age, race, level of education, and pre-pregnancy insurance status were statistically significant predictors of receiving dental care during pregnancy.[47]

FIGURE 51. PREVALENCE OF NOT RECEIVING DENTAL CARE BY LEVEL OF MATERNAL EDUCATION AND BY PRE-PREGNANCY INSURANCE STATUS, 2004-2008, MICHIGAN



Source: PRAMS, 2004-2008

New mothers were also asked about having their teeth cleaned by a dental hygienist at any time before, during, or after their pregnancy. This question served as an indicator of receipt of any dental services. From 2004-2008, 86.2% of new mothers indicated having their teeth cleaned at some time prior to their most recent pregnancy, 47.3% had their teeth cleaned during their most recent pregnancy, and 38.9% had their teeth cleaned after their most recent pregnancy (includes duplicated counts).[47] Women also provided information about their deliveries and their babies, including information about pre-term births, placement in neonatal intensive care units after birth, and about low birth-weights. Researchers found that after controlling for all other factors including maternal age, education, race, insurance status, and marital status, women who had not had their teeth cleaned during pregnancy were significantly more likely than those who did to have poor birth outcomes.[47] Women who did not have their teeth cleaned during pregnancy had a 15% higher prevalence of pre-term birth, a 27% higher prevalence of having an infant admitted to the NICU, and a 19% higher prevalence of having a low-birth-weight baby.[47]

Oral Health of Older Adults in Michigan

Oral health care for older adults (age 65 and older) is a concern since many do not benefit from employer-sponsored insurance plans that include dental coverage. At age 65, many older Americans become insured by Medicare, which has no dental insurance benefit. The likelihood of utilization of oral health services is linked to having dental insurance,[48] so older adults without coverage are at risk of having unmet oral health needs.

[48] Isman R, Isman B. Oral Health America white paper: Access to oral health services in the United States 1997 and beyond. Oral Health America. 1997.

Community dwelling older adults are more likely than elders living in skilled nursing facilities or other communal residences to receive regular oral health services. While many dentists treat adults age 65 and older in their practices, these patients are typically well older adults. [49] Few dentists provide services in nursing homes. Older adults living in long-term care facilities or those confined to home are at increased risk for poor oral health status due to restricted resources, limited mobility, complex health comorbidities, and cognitive impairments.[50]

The objective of a 2010 study sponsored by the MDCH in collaboration with the Coalition for Oral Health for the Aging, the Michigan Primary Care Association, the MDA, the University of Michigan School of Dentistry, and the Michigan Oral Health Coalition was to understand the oral health status of Michigan residents age 65 and older. The screening survey of older adults who were living in ALTCFs in Michigan was completed to understand access to and utilization of oral health services among the resident population and to describe facility practices regarding the oral health of residents. The survey was called the Michigan Senior Smiles Basic Screening Survey.[28]

The study included a clinical screening examination of 187 older adults living in 1 of 37 participating ALTCFs in Michigan.[28] Seniors also completed a written survey instrument to provide a personal assessment of oral health status. In addition, 35 managers of ALTCFs in Michigan completed a separate survey about dental screening and treatment services for residents of their facilities. The seniors participating in the screening examinations and surveys were not necessarily located in the same facilities managed by respondents to the facility survey. It was therefore not possible to link facility practices to patient outcomes during the analyses of the various surveys.[28]

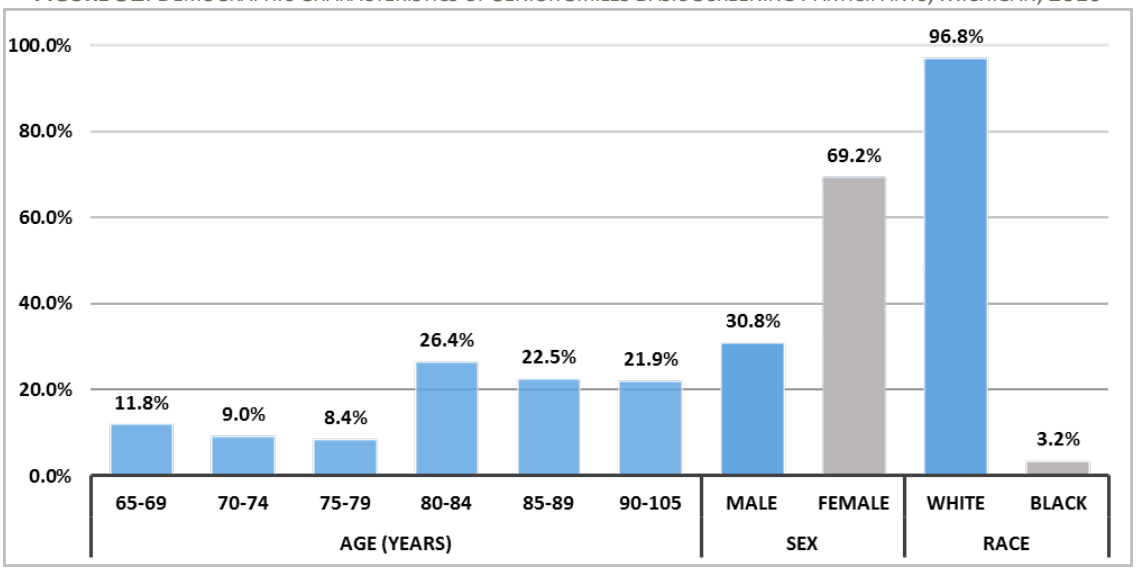
The following charts describe the findings first from the dental hygienist's screening assessments of ALTCF residents and the survey of older adults followed by the findings from the survey of ALTCF managers in Michigan.

The majority of study participants were female (69.2%) and most (96.8%) were White. More than 70% of study participants were age 80 or older, with the oldest participant reporting 105 years.[28]

[49] Smith BJ; for American Dental Association. The ~~Next~~ Crisis: Elder Oral Health Care. The NOW Crisis. (PowerPoint presentation). http://www.nationaloralhealthconference.com/docs/presentations/2010/Barbara%20Smith%20-%20The%20Next%20Crisis%20-%20Elder%20Oral%20Health%20Care.pdf.

[50] Berg R, Berkey DB, Tang JM, Baine C, Altman DS. Oral health status of older adults in Arizona: results from the Arizona Elder Study. *Special Care in Dentistry*. 2000;20(6):226-233.

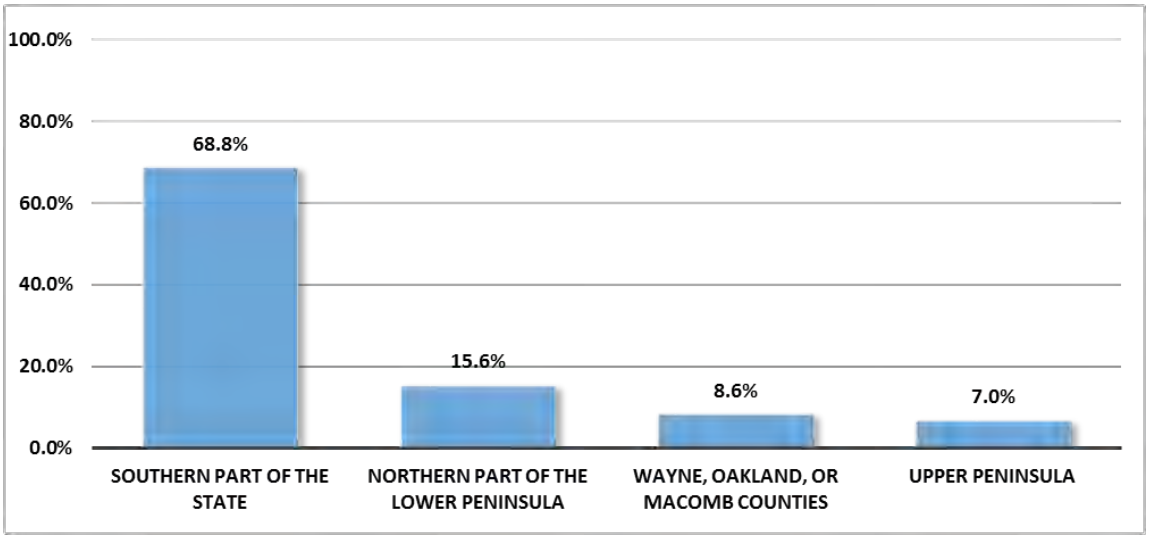
FIGURE 52. DEMOGRAPHIC CHARACTERISTICS OF SENIOR SMILES BASIC SCREENING PARTICIPANTS, MICHIGAN, 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

Most of the screened older adults were living in facilities in southern Michigan (68.8%).[28]

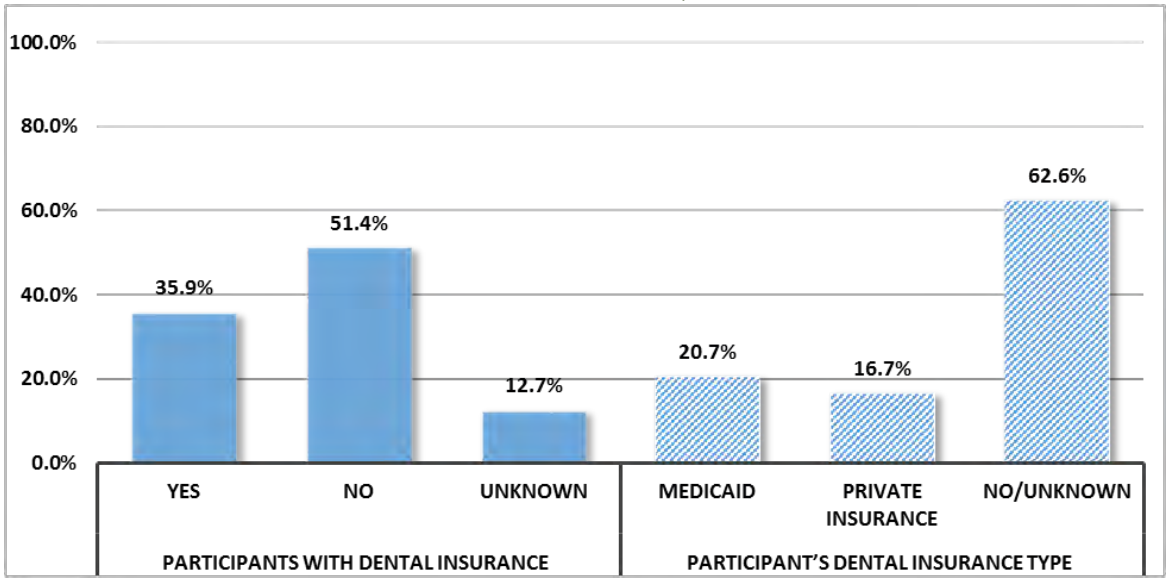
FIGURE 53. GEOGRAPHIC LOCATION OF SCREENED ELDERS IN MICHIGAN, 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

More than half of the participants (51.4%) had no dental insurance coverage at the time of the survey.[28] Other participants (12.7%) expressed uncertainty about whether or not they had dental insurance. A few study participants (16.7%) had private dental insurance and 20.7% were insured by Michigan Medicaid.[28]

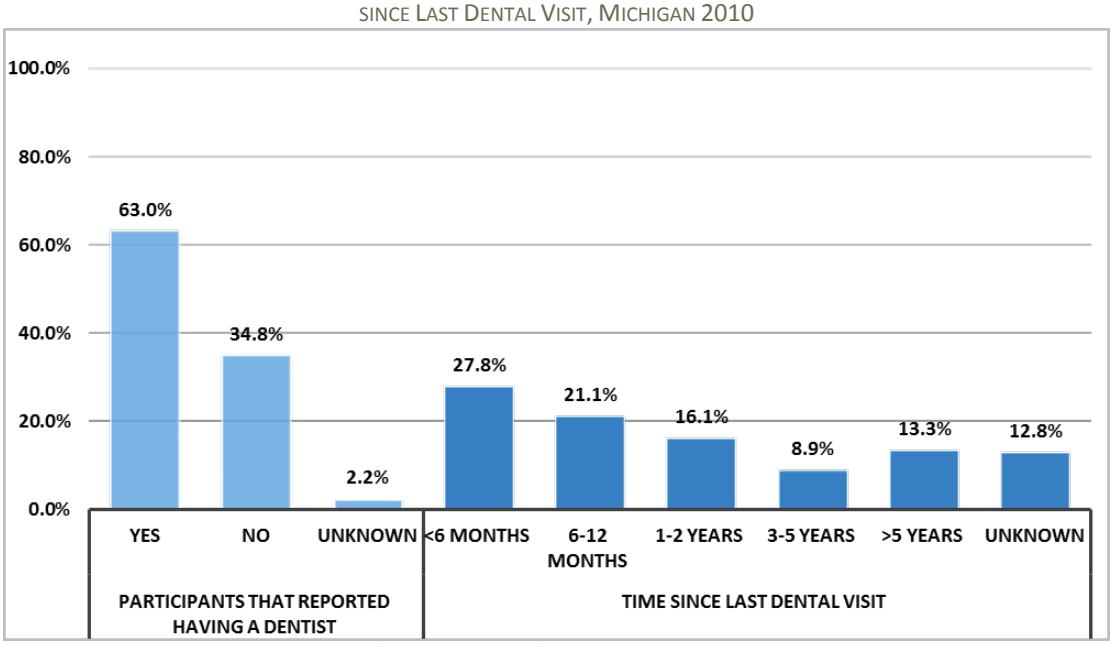
FIGURE 54. PERCENTAGE OF SCREENING SURVEY PARTICIPANTS WITH OR WITHOUT DENTAL INSURANCE AND TYPE OF DENTAL INSURANCE COVERAGE, MICHIGAN 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

More than one-third of the survey participants reported not having a regular dentist (34.8%) and only 48.9% of the participants had seen a dentist in the prior year.[28] More than 20% of participants had not seen a dentist for more than 3 years and 12.8% did not know when they had last seen a dentist.[28]

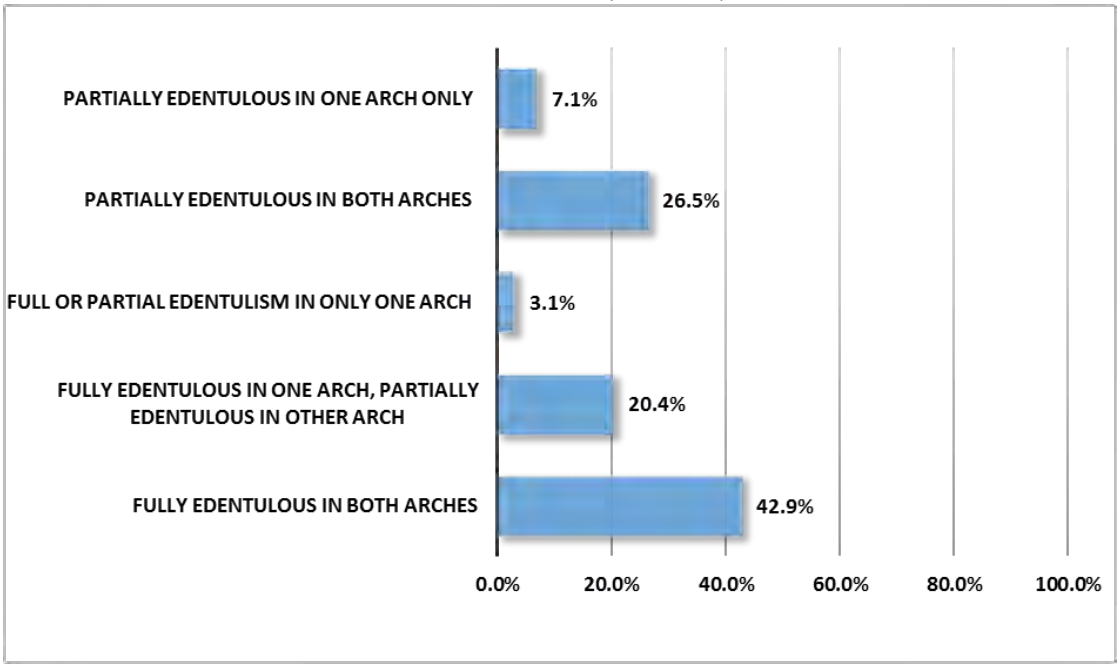
FIGURE 55. PERCENTAGE OF SCREENING SURVEY PARTICIPANTS WITH A REGULAR DENTIST AND LENGTH OF TIME SINCE LAST DENTAL VISIT, MICHIGAN 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

Fifty-nine percent of all the older adults screened were either fully or partially edentulous and 42.9% exhibited edentulism in both arches.[28]

FIGURE 56. PREVALENCE OF TOTAL AND PARTIAL EDENTULISM AMONG SCREENED ELDERS IN ALTCFS WITH FULL OR PARTIAL EDENTULISM, MICHIGAN, 2010

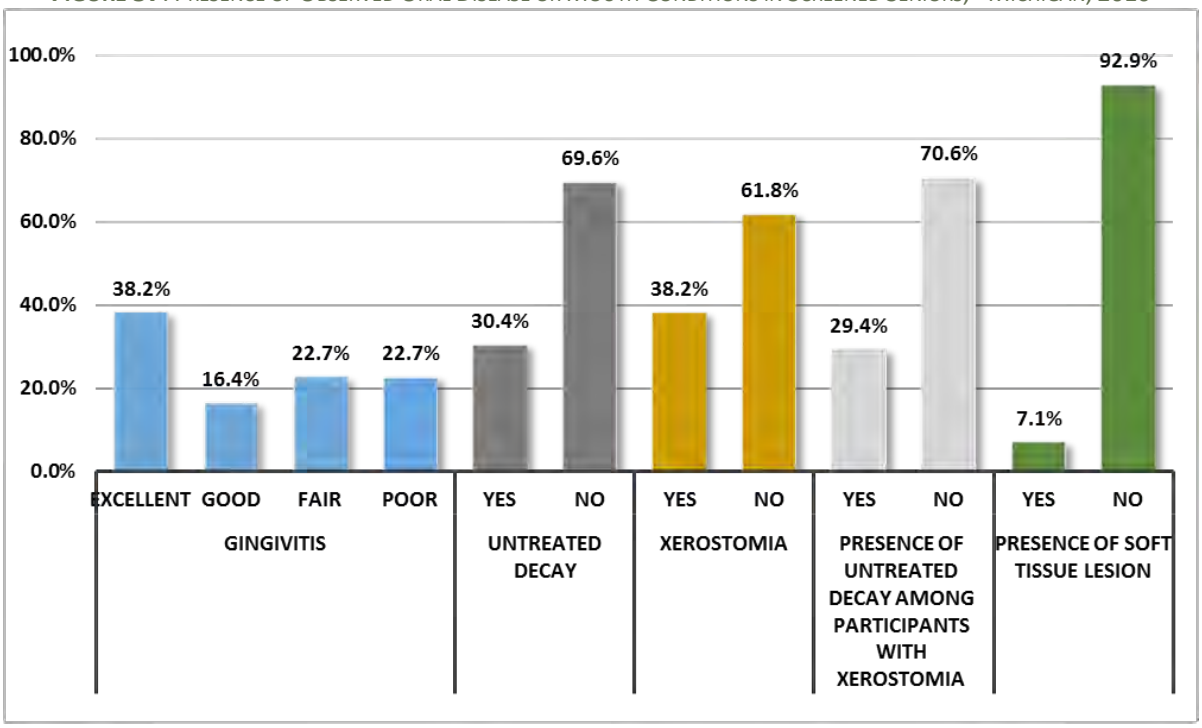


Source: Michigan Senior Smiles Basic Screening Survey, 2010

Seniors with any teeth, including those who were partially edentulous, were screened for the presence of oral disease, including tooth decay and gum disease.

- Over 30% of screened seniors exhibited untreated tooth decay and 45.4% had gums that were only in fair or poor condition due to gingivitis.
- More than one-third of participants had dry mouth (xerostomia), which is a side effect of many medications used by an older population. The condition is especially prevalent among those using multiple medications. Saliva is anticariogenic so its absence could be deleterious to good oral health outcomes.
- Almost all participants (82.2%) had a restorative dental care need at the time of screening and 17.8% had major or urgent need for immediate dental services.
- Among the clinically screened seniors, 30.4% had untreated decay.
- All survey participants with full, partial, or no dentition were screened for soft tissue lesions, which may be a precursor to oral cancer in patients. Only 7.1% of those screened had a lesion.[28]

FIGURE 57. PRESENCE OF OBSERVED ORAL DISEASE OR MOUTH CONDITIONS IN SCREENED SENIORS,* MICHIGAN, 2010



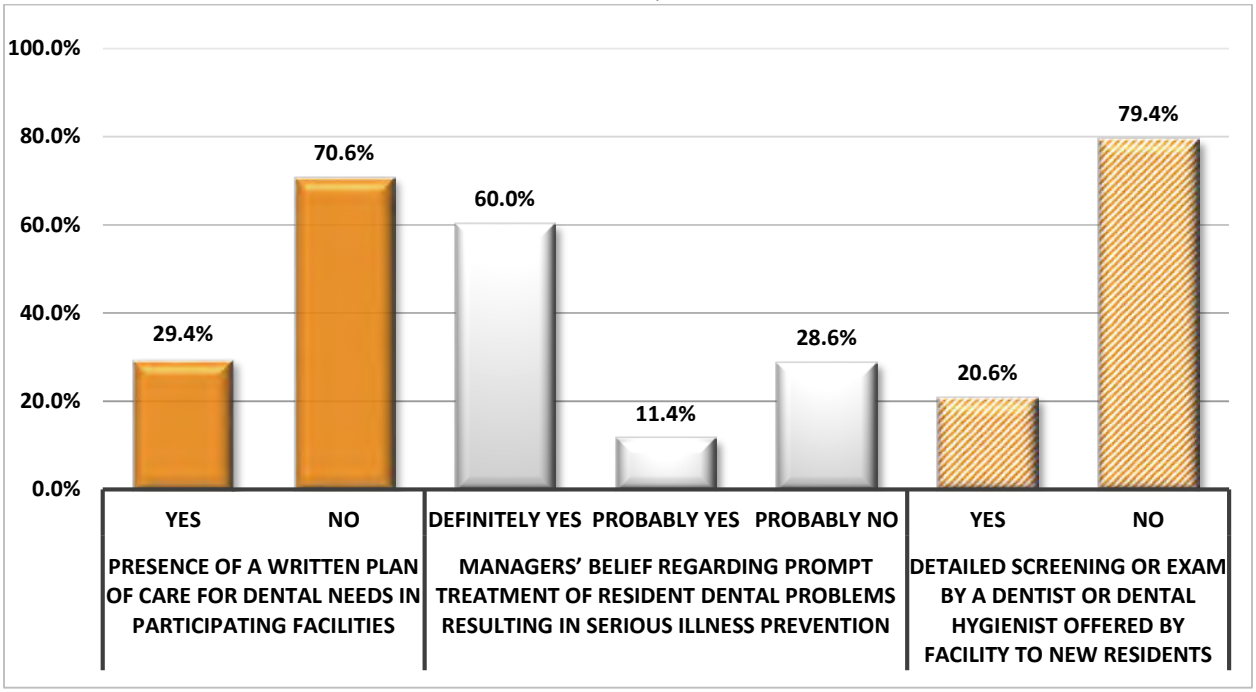
Source: Michigan Senior Smiles Basic Screening Survey, 2010

*Note: Number of observations varied: Screened for Gingivitis = 110, Screened for Untreated Decay = 148, Screened for Xerostomia =123, Presence of Xerostomia =36, Screened for Soft Tissue Lesion = 170.

As previously explained, managers of ALTCFs in Michigan were asked to complete a survey about facility efforts and organizational policies to address the oral health needs of their residents. While there were a limited number of responses to the facility managers' survey, those who did respond provided insights into oral health policies in ALTCFs.

- Very few of the ALTCFs had a written plan of care to meet the dental needs of their residents. While 29.4% of managers indicated a written plan existed, the remainder (70.6%) reported that their facility did not have a plan of care.[28]
- One-fifth of ALTCF managers (20.6%) reported that their facilities offered a dental screening or oral examination by a dentist or dental hygienist to new residents upon admission to the facility.[28]

FIGURE 58. ORAL HEALTH PRACTICES OF FACILITIES, BELIEFS OF FACILITY MANAGERS, AND NEEDS OF RESIDENTS IN ALTCFS IN MICHIGAN, 2010

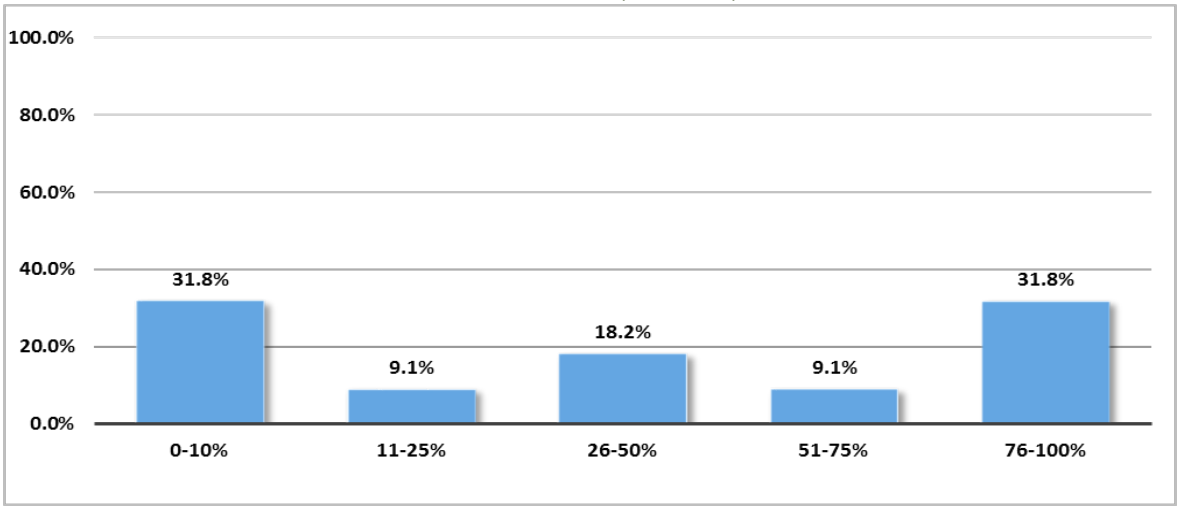


Source: Michigan Senior Smiles Basic Screening Survey, 2010

Despite the general absence of a formal plan of care, 60% of facility manager respondents expressed the opinion that prompt treatment of dental problems would prevent subsequent serious illnesses.[28] This is an indicator that many managers were aware of the potential complications of untreated oral disease.

Less than one-third of manager respondents (31.8%) indicated that most of the residents (76%-100%) in the facility had received dental care in the prior year. A similar percent of managers (31.9%) reported that few facility residents (1%-10%) had received any dental services in the previous year.[28]

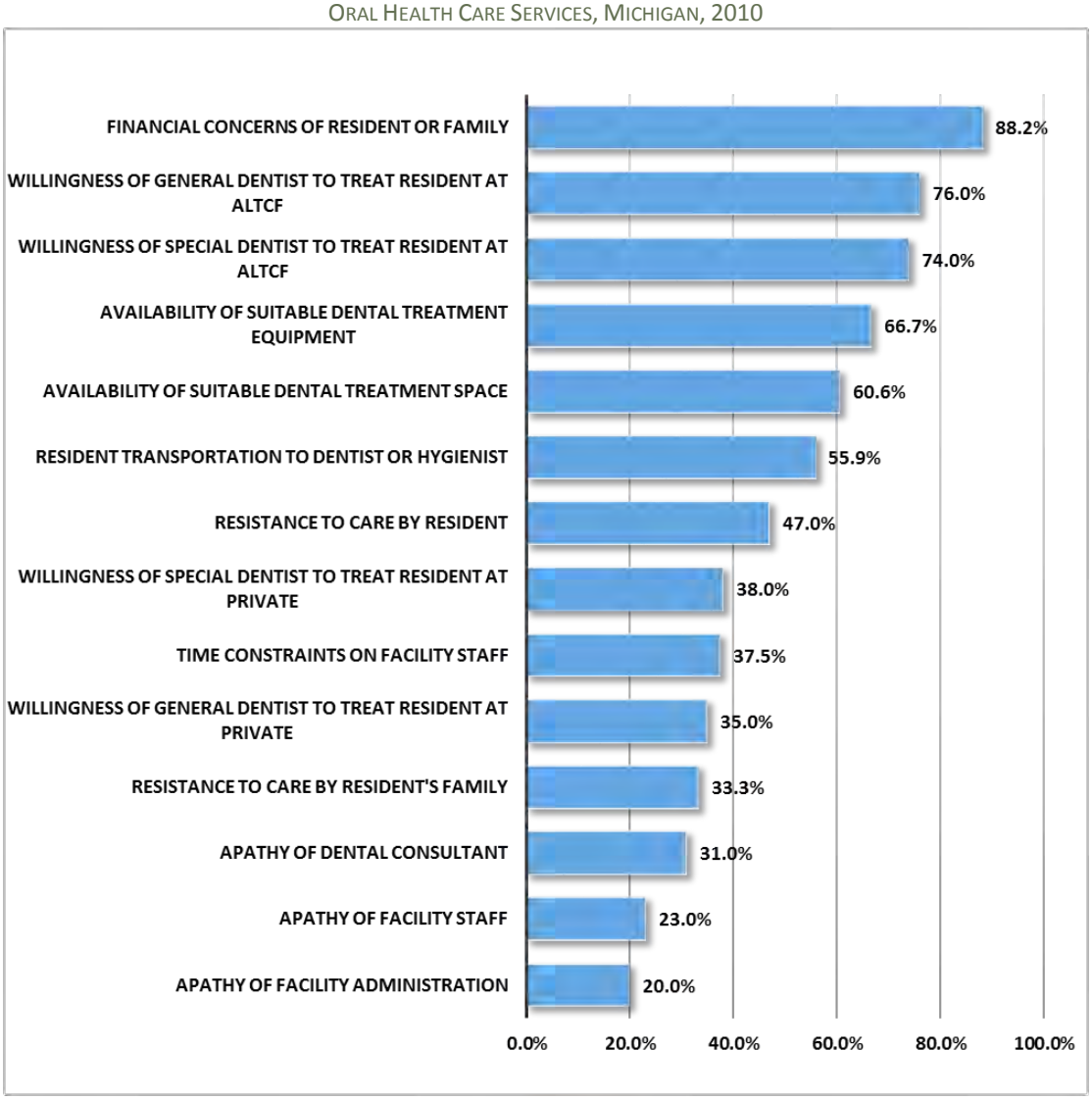
FIGURE 59. PERCENTAGE OF FACILITIES BY PERCENTAGE OF FACILITY RESIDENTS THAT RECEIVED DENTAL TREATMENT SERVICES IN THE PRIOR 12 MONTHS, MICHIGAN, 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

Managers were asked to rank the potential barriers to good oral health for facility residents on a Likert scale of significance. The most significant barriers to obtaining oral health services identified by facility managers were financial concerns for the resident or the family (88.2%) and the lack of willingness of general dentists (76.0%) or specialty dentists (74.0%) to treat residents at ALTCFs.[28] The availability of suitable dental treatment space (60.6%) and suitable dental treatment equipment (66.7%) were also cited as important barriers to receiving oral health services in ALTCFs as was resident transportation to a dental or dental hygienist appointment (55.9%).[28]

FIGURE 60. PERCENTAGE OF FACILITY MANAGERS BY PERCEIVED BARRIERS FOR FACILITY RESIDENTS TO OBTAIN ORAL HEALTH CARE SERVICES, MICHIGAN, 2010



Source: Michigan Senior Smiles Basic Screening Survey, 2010

Michigan Oral Health Project for the Aging

In 2013, an oral health screening project was conducted to determine the oral health status of people age 65 and older in distinct regions of Michigan, including the city of Detroit (called Region 1A) and in

Hillsdale, Lenawee, and Jackson Counties (Region 2).[51] This was a pilot project with a goal of determining the best techniques for eventual use in gathering oral screening data from older adults statewide. The research included both a clinical screening assessment by a dental hygienist and a written survey instrument asking each senior about utilization of oral health services and dental insurance status. It also asked the respondent to provide a self-assessment of personal oral health status.

One difference from the previously discussed project was that this survey included community dwelling seniors as well as residents of ALTCFs. Dental hygiene assessments and screenings occurred at locations and events where seniors commonly congregated, such as meal sites, faith-based organizations, senior living centers, and health fairs. The professional team providing the screening exams was consistent across the settings. At project completion, 350 seniors were screened in Region 1A and 397 seniors were screened in Region 2.[51]

The demographic characteristics of the screening participants varied by region with substantially more older adults who were Black participating in Region 1A and substantially more older adults who were White in Region 2. In both regions, most participants were female. Seniors screened in Region 1a were somewhat younger on average (71 years) than senior participants in Region 2 (75 years). In both regions, the most common age group was seniors age 65-69.[51]

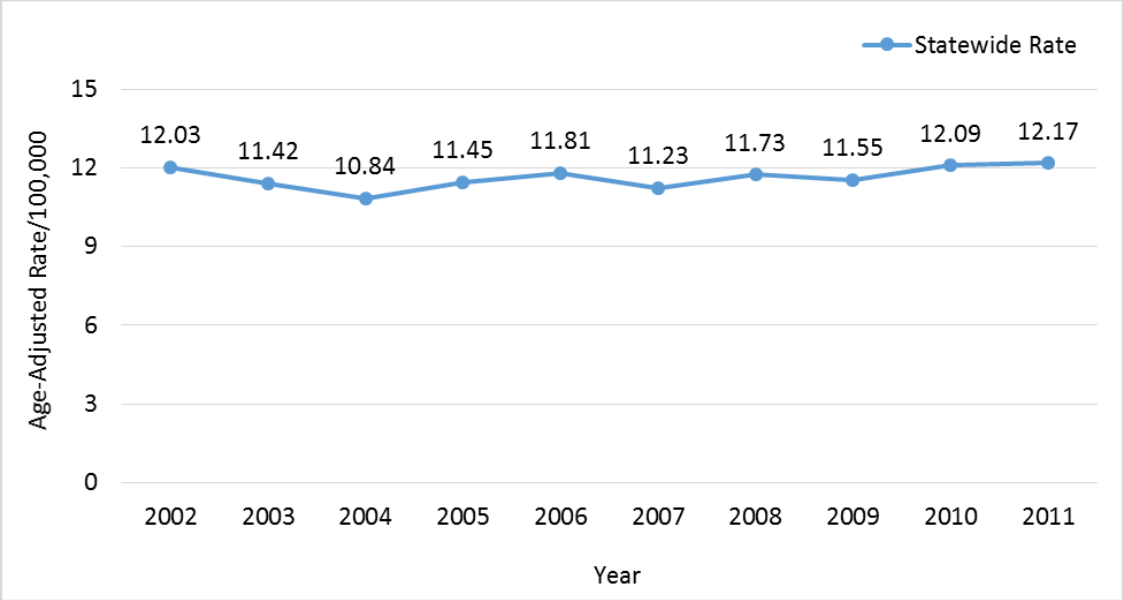
The screenings of 747 Michigan senior citizens found that 5.5% of participants were in need of urgent dental treatment and 14.9% were in need of periodontal care at the time of assessment.[51] The screenings revealed that 17.3% of the screened population had severe dry mouth, 15.7% had severe gingival inflammation, 16.5% had untreated decay, 12.7% had root fragments, 7.2% had obvious tooth mobility, and 20.5% had substantial oral debris.[51]

Oral Cancer in Michigan

The age-adjusted incidence rate for cancer of the oral cavity and the pharynx rose in Michigan from a 12.03 per 100,000 population in 2002 to 12.17 cases per 100,000 population in 2011. The incidence of oral cancers continued to rise; Michigan showed an age-adjusted incidence rate for oral cancers of 12.76 per 100,000 population in 2013.[29]

[51] MDCH. Michigan Oral Health Project for the Aging (Michigan Senior Smile Survey Region 1a/2). Oral Health Project Focused on the Aging. October 2014. http://www.michigan.gov/documents/mdch/NACDD_2013-2014-MSSS-R1A-2-_JMoore-BAnderson_474983_7.pdf.

FIGURE 61. ORAL CAVITY AND PHARYNX CANCER AGE-ADJUSTED INCIDENCE RATES IN MICHIGAN, 2002-2011



Source: National Cancer Institute, State Cancer Profiles
Note: Age-Adjusted to the 2000 US Standard Million Population
Data accessed November 7, 2014 based on data released November 30, 2013

In a trend analysis using 5 years of data about age-adjusted oral cancer incidence rates, the incidence of oral cancer rose faster in Michigan than in the US.[29]

TABLE 5. AGE-ADJUSTED INCIDENCE RATES OF ORAL CANCERS PER 100,000 POPULATION IN MICHIGAN AND THE US, 2007-2011

	Annual Incidence Rate over rate period (95% Confidence Interval)	Average Cases per year/ per 100,000 over rate period	Recent trend	Recent 5-Year Trend in Incidence Rates (95% Confidence Interval)
Michigan	**11.4 (11.1; 11.7)**	**1,300**	**Rising**	**2 (0.3; 3.7)**
US	11.2 (11.1; 11.2)	37,597	Stable	0.2 (-0.6; 1.0)

Source: National Cancer Institute, State Cancer Profiles
Notes: Age adjusted to the 2,000 US standard million population
Data for the US do not include data from Nevada

Cancer incidence rates vary noticeably by county in Michigan with the highest age-adjusted rates per population in Montmorency and Alcona Counties in 2013. The incidence of oral cancer in these counties was almost twice the state rate.[52]

[52] Michigan Cancer Surveillance Program. Oral Cavity and Pharynx 2002-2011. http://www.cancer-rates.info/mi/index.php.

TABLE 6. ORAL CAVITY AND PHARYNX CANCER INCIDENCE RATES IN MICHIGAN BY COUNTY, 2002-2011

County	Population at Risk	Cases	Crude Rate	Age-adjusted Rate
Montmorency	100,519	36	35.81	23.25
Alcona	112,944	39	34.53	22.43
Roscommon	252,076	73	28.96	17.50
Alpena	302,175	69	22.83	16.77
Presque Isle	138,342	36	26.02	15.56
Arenac	166,715	35	20.99	14.74
Kalkaska	173,236	31	17.89	14.38
Jackson	1,615,877	258	15.97	14.34
Tuscola	570,681	92	16.12	13.79
Lapeer	901,249	134	14.87	13.69
Iosco	265,249	63	23.75	13.67
Clare	313,772	61	19.44	13.63
Bay	1,086,110	180	16.57	13.52
Lake	116,165	26	22.38	13.52
Osceola	237,405	38	16.01	13.32
Oscoda	90,256	16	17.73	13.23***
Otsego	244,410	39	15.96	13.17
Wayne	19,128,843	2,612	13.65	13.12
Dickinson	267,302	47	17.58	12.84
Crawford	144,035	27	18.75	12.79
Gladwin	263,559	52	19.73	12.61
Berrien	1,581,812	241	15.24	12.53
Alger	96,352	16	16.61	12.45***
Shiawassee	718,453	98	13.64	12.13
Newaygo	489,736	66	13.48	12.06
Saginaw	2,044,632	283	13.84	11.99
St. Clair	1,660,385	227	13.67	11.97
Calhoun	1,377,022	185	13.43	11.93
Kalamazoo	2,460,086	287	11.67	11.79
Oceana	271,267	39	14.38	11.78
Genesee	4,354,342	549	12.61	11.77
Eaton	1,076,511	142	13.19	11.74
Van Buren	766,996	101	13.17	11.61
Washtenaw	3,419,003	352	10.3	11.61
Mason	287,161	46	16.02	11.58
Ogemaw	218,883	37	16.9	11.56
Emmet	327,161	50	15.28	11.56
Oakland	12,024,656	1,525	12.68	11.48
Macomb	8,307,117	1,074	12.93	11.44
Leelanau	217,387	38	17.48	11.40

Source: Michigan Cancer Surveillance Program

Note: All rates are per 100,000. Rates are age adjusted to the 2000 US Standard Million Population

Data accessed November 7, 2014 based on data released November 30, 2013

~ Counts/rates are suppressed if fewer than 10 cases were reported in the specified category.

***Counts < 20 are too few to calculate a stable age-adjusted rate.

(CONTINUED)

County	Population at Risk	Cases	Crude Rate	Age-adjusted Rate
Grand Traverse	847,937	111	13.09	11.36
Manistee	249,718	41	16.42	11.22
Marquette	661,576	88	13.3	11.15
Missaukee	149,846	22	14.68	11.10
Muskegon	1,726,250	210	12.17	11.04
Sanilac	441,997	60	13.57	10.98
Gratiot	425,211	50	11.76	10.97
Livingston	1,782,328	210	11.78	10.94
Ingham	2,819,471	279	9.9	10.90
Ontonagon	71,650	14	19.54	10.87***
Mackinac	114,127	17	14.9	10.86***
Barry	592,203	76	12.83	10.85
Cass	522,741	70	13.39	10.84
Midland	837,853	101	12.05	10.82
Benzie	175,182	26	14.84	10.74
Hillsdale	470,967	60	12.74	10.70
Huron	341,463	50	14.64	10.43
Wexford	322,525	39	12.09	10.41
Keweenaw	21,400	~	~	~
Antrim	239,714	35	14.6	10.21
Kent	5,959,521	577	9.68	10.06
Montcalm	633,662	72	11.36	10.02
Cheboygan	268,352	35	13.04	10.00
Charlevoix	263,486	34	12.9	9.94
St. Joseph	619,307	66	10.66	9.93
Monroe	1,517,354	170	11.2	9.79
Branch	461,180	51	11.06	9.61
Iron	122,309	21	17.17	9.50
Allegan	1,106,972	111	10.03	9.36
Ionia	643,505	59	9.17	9.31
Lenawee	1,007,357	106	10.52	9.12
Ottawa	2,577,892	220	8.53	9.05
Houghton	361,702	33	9.12	8.89
Chippewa	389,374	39	10.02	8.82
Gogebic	166,863	21	12.59	8.72
Baraga	88,722	10	11.27	8.44***
Mecosta	426,085	40	9.39	8.36
Clinton	725,993	64	8.82	8.26
Isabella	683,677	43	6.29	8.18
Menominee	244,909	26	10.62	8.14
Delta	376,535	41	10.89	7.78
Luce	67,601	~	~	~
Schoolcraft	87,231	~	~	~
STATE	**99,803,630**	**12,738**	**12.76**	**11.64**

Source: Michigan Cancer Surveillance Program

Note: All rates are per 100,000. Rates are age adjusted to the 2000 US Standard Million Population

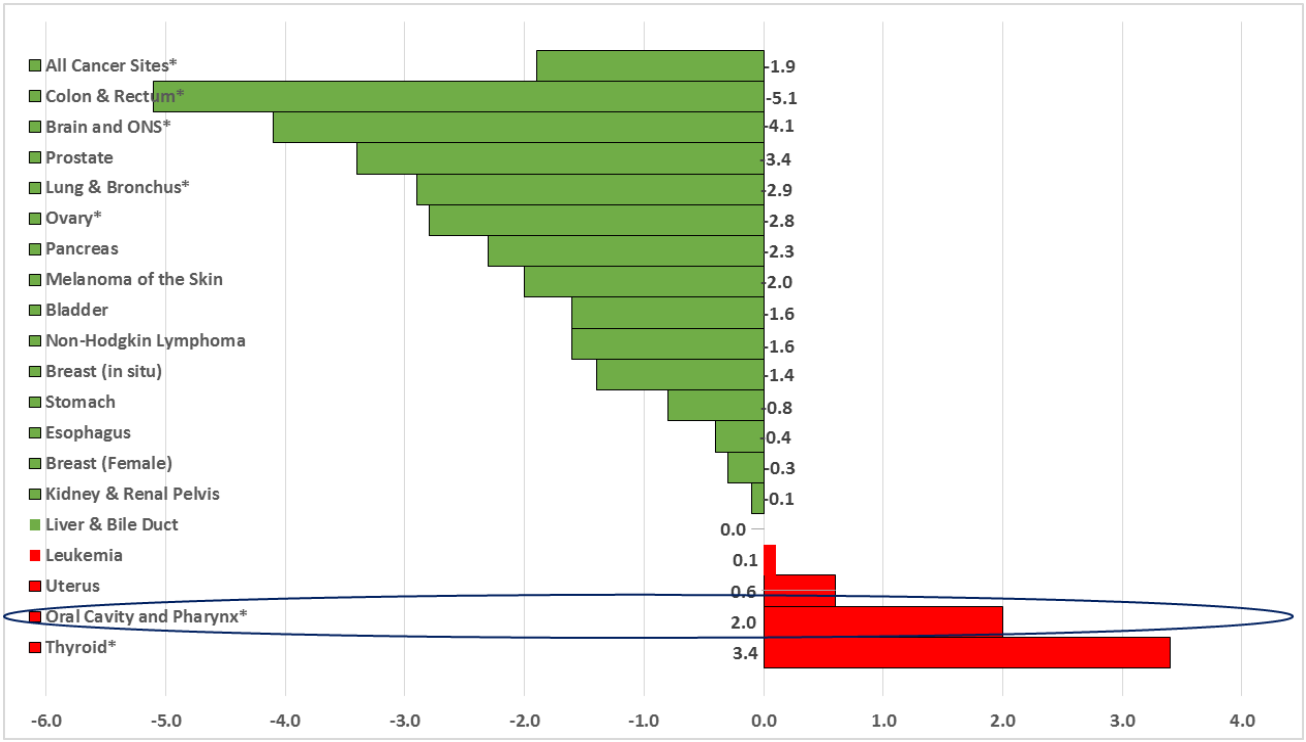
Data accessed November 7, 2014 based on data released November 30, 2013

~ Counts/rates are suppressed if fewer than 10 cases were reported in the specified category.

***Counts < 20 are too few to calculate a stable age-adjusted rate.

While the incidence of many cancers has declined among Michigan's population from 2007-2011, oral cancer is on the rise along with thyroid cancer. Oral cancer has 1 of the highest and most statistically significant rate increases among all cancers.[53]

FIGURE 62. PERCENTAGE INCREASE OR DECREASE OF CANCER INCIDENCE IN MICHIGAN'S POPULATION BY TYPE OF CANCER, 2007-2011

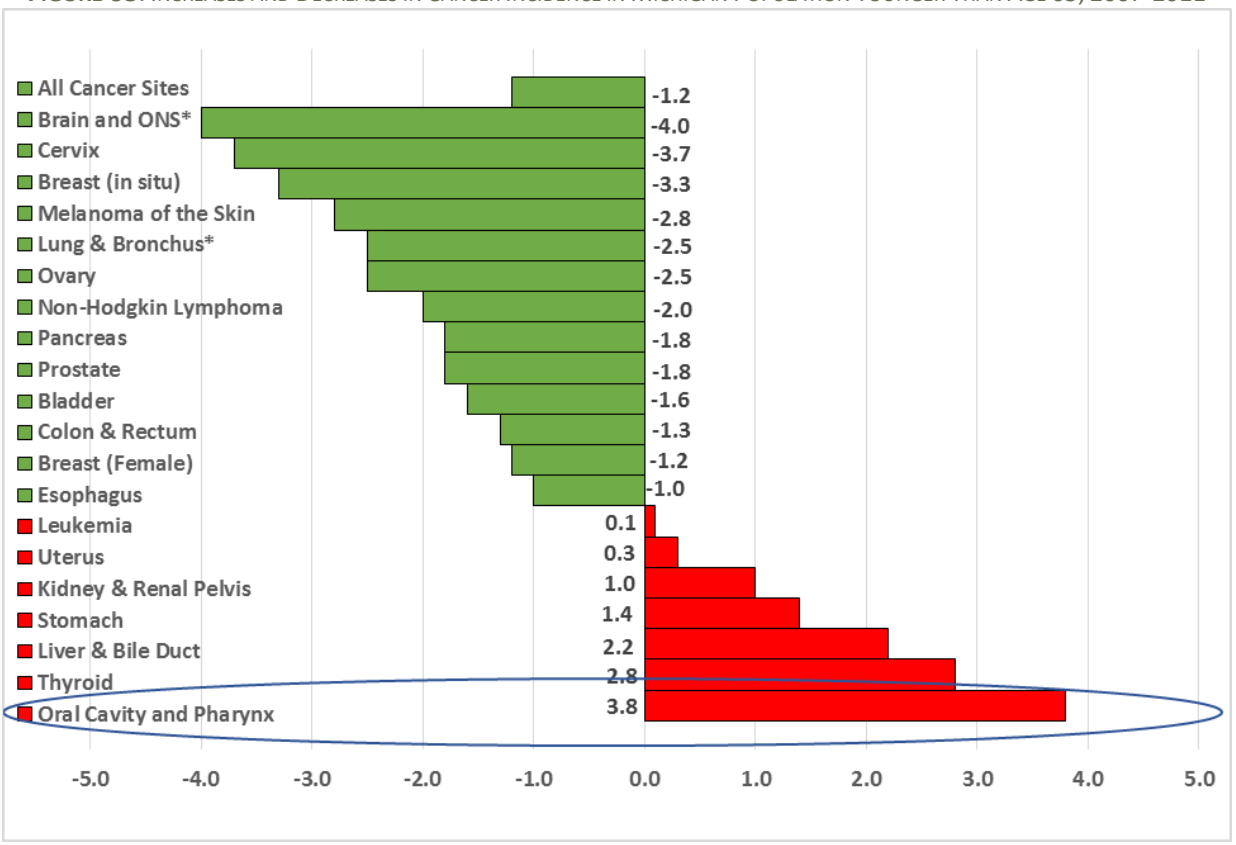


Green indicates decreases in cancer incidence. Red indicates increases in cancer incidence.
Source: National Program of Cancer Registries (NPCR), National Cancer Institute, SEER
*Indicates the annual percentage change is significantly different ($p<0.05$).
Note: Rates are age adjusted to the 2000 US standard population in 19 age groups. Rates are for invasive cancer only (except for bladder cancer which includes both invasive and in situ) or unless otherwise specified (eg, breast cancer).
Population counts are based on census populations as modified by NCI. The 1969-2012 US population data file is used with NPCR data from January 2014.
These data are from different sources due to different years of data availability.

In the population age 65 and older in Michigan, the incidence of oral cancer decreased 0.2% between 2007-2011. However, the rates of oral cancers increased in Michigan for people younger than age 65. The increase in the oral cancer rate in the younger than age 65 group was the highest for all cancers.[52]

[53] Centers for Disease Control and Prevention. National Program of Cancer Registries (NPCR). Cancer Data and Statistics Tools. August 7, 2013. http://www.cdc.gov/cancer/npcr/tools.htm

FIGURE 63. INCREASES AND DECREASES IN CANCER INCIDENCE IN MICHIGAN POPULATION YOUNGER THAN AGE 65, 2007-2011



Green indicates decreases in cancer incidence. Red indicates increases in cancer incidence.
Source: National Program of Cancer Registries (NPCR), National Cancer Institute, SEER
*Indicates the annual percentage change is significantly different ($p<0.05$).
Note: Rates are age adjusted to the 2000 US standard population in 19 age groups. Rates are for invasive cancer only (except for bladder cancer which includes both invasive and in situ) or unless otherwise specified (eg, breast cancer).
Population counts are based on census populations as modified by NCI. The 1969-2012 US population data file is used with NPCR data from January 2014.
These data are from different sources due to different years of data availability.

Tobacco use is linked to the incidence of oral cancers. Smoking cigarettes and other tobacco products including cigars or use of smokeless tobacco puts users at risk for developing oral cancers over their lifetimes. Smokeless tobacco use increases the risk of cancers of the mouth and gums and cigar use is linked to cancers of the larynx, mouth, esophagus, and lungs.[54] The BRFSS asks questions about tobacco use and exposure to secondhand smoke in the household or work environment. In 2014, the percentage of adults in Michigan who smoked was larger than the percentage of adults in the US who smoked. In addition, the percentage of adults who had ever smoked more than 100 cigarettes was greater in Michigan than in the US.[22]

[54] Healthy People.gov. Tobacco Use. Overview. https://www.healthypeople.gov/2020/topics-objectives/topic/tobacco-use.

TABLE 7. PERCENT OF THE ADULT POPULATION IN MICHIGAN AND IN THE US USING CIGARETTES, ATTEMPTING TO STOP SMOKING IN THE PAST YEAR, OR WORKING OR LIVING IN NON-SMOKING ENVIRONMENTS, 2014

Screening & Risk Factors: Smoking (2014)	Michigan	USA	Healthy People 2020 Target
Current Smoker, Age 18+	23.4%	18.9%	12.0%
Ever Smoked 100 Cigarettes, Age 18+	49.3%	43.7%	
Percent of Daily Smokers Who Stopped Smoking for 1 Day or Longer in the Past 12 Months, Age 18+	31.7%	34.0%	
Percent of Workers in Non-Smoking Environments (All People), Age 18+	88.5%	82.2%	
Percent of Workers in Non-Smoking Environments (Current Smokers), Age 18+	87.2%	75.9%	
Percent of Workers in Non-Smoking Environments (Former/Never Smokers), Age 18+	88.8%	83.3%	
Percent of People Who Answered No One is Allowed to Smoke Anywhere Inside Their Home (All People), Age 18+	77.8%	83.9%	
Percent of People Who Answered No One is Allowed to Smoke Anywhere Inside Their Home (Current Smokers), Age 18+	38.0%	48.4%	
Percent of People Who Answered No One is Allowed to Smoke Inside Their Home (Former/Never Smokers), Age 18+	86.5%	90.6%	

Source: National Cancer Institute, State Cancer Profiles, BRFSS.

The YRBSS monitors risky behaviors among young people in the US in 6 topical areas, including tobacco, alcohol, and drug use. The YRBSS collects data on over 100 risk-related behaviors through school-based surveys from a sample of middle and high school students in grades 9-12 in public and private schools in all 50 states and Washington, DC. The sampling strategy uses a 2-stage cluster design to assure representativeness. The 2013 survey asked 86 standard questions as well as other questions that are reported only at the national level.[30] States and large urban school districts had the option to add or delete questions from the standard protocol.[30]

Young people in Michigan used cigarettes and other tobacco products at a lower rate than young people nationally. In 2013, 11.8% of youth in Michigan and 15.7% of youth in the US had smoked an entire cigarette on at least 1 day during the 30 days prior to the survey. This represented a significant decrease over the 27.5% of youth in 1991 who indicated this smoking behavior.[30]

The use of smokeless tobacco products is especially concerning because of the heightened risk of developing oral cancers. In 2005, 2.3% of adults age 18 and older were users of snuff or other chewing tobacco products according to data collected in the National Health Interview Survey.[31] In 2009, 8.8% of adolescents in grades 9-12 in the US and 6.9% in Michigan used smokeless tobacco products in the 30

days prior to participating in the YRBSS.[30] The prevalence of using smokeless tobacco products increased nationally from 7.8% in 1999 to 8.8% in 2013, but the change was not statistically significant.[30]

TABLE 8. USE OF TOBACCO PRODUCTS BY YOUTHS IN MICHIGAN AND THE US, 2013

Tobacco Use	Michigan	USA	Healthy People 2020 Objectives
Ever tried cigarette smoking (even 1 or 2 puffs)	35.8%	41.1%	
Smoked a whole cigarette before age 13 (for the first time)	7.9%	9.3%	
Currently smoked cigarettes (on at least 1 day during the 30 days before the survey)	11.8%	15.7%	16.0%
Currently smoked cigarettes frequently (on 20 or more days during the 30 days before the survey)	4.3%	5.6%	
Smoked more than 10 cigarettes per day (among students who currently smoke cigarettes on the days they smoked during the 30 days before the survey)	8.7%	8.6%	
Did not try to quit smoking cigarettes (among students who currently smoked cigarettes during the 12 months before the survey)	48.1%	52.0%	
Smoked cigarettes on school property (on at least 1 day during the 30 days before the survey)	2.8%	3.8%	
Usually obtained their own cigarettes by buying them in a store or gas station (during the 30 days before the survey among students who currently smoked cigarettes and who were younger than age 18)	15.4%	18.1%	
Ever smoked at least 1 cigarette every day for 30 days	7.1%	8.8%	
Smoked cigarettes on all 30 days (during the 30 days before the survey)	2.8%	4.0%	
Currently used smokeless tobacco (chewing tobacco, snuff, or dip on at least 1 day during the 30 days before the survey)	6.9%	8.8%	6.9%
Currently used cigars (cigars, cigarillos, or little cigars on at least 1 day during the 30 days before the survey)	10.7%	12.6%	8.0%
Currently used tobacco (current cigarette use, current smokeless tobacco use, or current cigar use)	17.9%	22.4%	21.0%

Sources: YRBSS, 2013; HP 2020.

Chapter 4. Financing for Oral Health Services

Improving access to oral health services is a policy goal with many dimensions. One primary issue is defining particular access barriers to oral health services so that they might be removed and thereby improve the population's ability to obtain services. Barriers to access may differ substantially by individual or population group. Sociodemographic, educational, environmental, and structural factors all may influence a person's or a population's ability to access care, and other factors, especially cultural beliefs and oral health literacy may affect individual willingness to do so. While access to oral health services may be available and even unimpeded, appropriate utilization of oral health services may not. Lack of knowledge of the importance of oral health, fear of dental procedures, or cultural preferences may discourage individuals from pursuing even routine care. Enabling conditions such as convenient hours at dental practices and possessing dental insurance promote appropriate utilization. An often-cited barrier to improving oral health is the lack of financial access for some populations, including the uninsured and underinsured who cannot afford personal contributions to the cost of care.

Dental Insurance and Co-Payments and the Cost of Oral Health Services

Utilization of dental services among working age adults steadily declined in the US between 2000-2011 partly because of changes in dental insurance status in the population. During this period, the percentage of the population with private dental insurance declined. At the same time, a number of states reduced or eliminated adult dental coverage in Medicaid programs resulting in an erosion of adult dental benefits nationwide.[55]

While there has been a gradual increase in the share of dental expenditures financed by public sources, especially Medicaid, over recent years, dental care is still mainly financed by private dental insurance and out-of-pocket spending. This differs greatly from financing in health care.[55] Patients are often required to pay a higher portion of the cost for dental services than for health care services and many commercial dental insurance plans have annual payment limits. As a result, patients with limited insurance coverage or high costs of participation may delay or defer care, especially when the economic climate is poor. Studies have shown that cost barriers are higher for dental care then for other health care services and that patients often cite lack of affordability as a primary reason for not seeking needed dental services.[56] There is a widely held misperception that dental care, especially preventive dental care, is electable and therefore deferrable when cost of care is considered prohibitive.

Although the percentage of the population reporting cost as a barrier to receiving needed dental care increased from 2000-2010, the percentage reporting cost barriers has subsequently declined, and fell again in 2013.[56] Young adults age 21-34 were the most likely group to report no cost barriers to seeking dental care.[56] Despite recent improvements, cost still remains a serious barrier to dental services utilization.[56] A study conducted on behalf of the ADA's Health Policy Institute found there were a number of reasons why adults who indicated intent to defer dental care in the coming year were electing to not seek services. Cost was a major factor and 1 of the primary barriers to obtaining oral

[55] Wall T, Nasseh K, Vujicic M. US Dental Spending Remains Flat Through 2012. http://www.ada.org/~/media/ADA/Science%20and%20Research/Files/HPRCBrief_0114_1.ashx

[56] Wall T, Nasseh K, Vujicic M; for ADA. Health Policy Resources Center, Research Brief. US Dental Spending Remains Flat Through 2012. January 2014. http://www.ada.org/~/media/ADA/Science%20and%20Research/Files/HPRCBrief_0114_1.ashx.

health services. A concern is that delaying or foregoing care may result in more expensive dental care needs from progressed dental disease over the long term.

A recent study from the Commonwealth Fund also found that a percentage of the US population still identifies cost as a barrier to seeking needed health services. [57] When health insurance deductibles, co-pays, and coinsurance are high relative to total income people often elect to delay or defer services. In the study, which used a consumer survey, 46% of respondents with health insurance who were earning $23,000 or less annually indicated that they had skipped or delayed care because of the cost of deductibles, co-pays, and coinsurance for health care services.[57] Skipping care included not filling prescriptions, not obtaining a medical test or recommended follow-up care, not seeing a medical specialist as recommended, or not going to the doctor despite having a medical problem.[57] These findings suggest that even having dental insurance may not guarantee that patients with lower incomes can afford their contributions to the cost of care.

Dental insurance status is predictive of utilization of oral health services. Having dental insurance coverage is estimated to increase the probability of utilization of preventive oral health services by 19% and the use of restorative services by between 11% and 16%.[58] The National Association of Dental Plans found that at the end of 2012, about 60% of the US population (187,261,740 people) was covered by a private or public dental insurance plan and about 126,652,000 people had no dental insurance benefits.[59] There were approximately 2.7 times more Americans who were dentally uninsured than medically uninsured in that year.[60] The percentage of the US population with dental benefits through public or private insurance plans varied over the last decade with a significant drop in 2009 during the recent economic recession. There has been a steady increase in the proportion of the population with dental insurance during post-recession economic recovery.

According to the ADA, the percentage of Americans with private dental insurance benefits declined between 2000-2011 resulting in more uninsured adults and more children moving to public dental insurance programs.[61] The decline in private dental benefits affected utilization rates of oral health services especially among adults some of whom qualified for Medicaid coverage in their states. While adult Medicaid enrollment increased over the decade beginning in 2000 due to the number of adults in reduced economic circumstances, adult utilization of dental services declined. Some states offer no adult dental benefit in their Medicaid programs or coverage is limited to emergency dental services only. A national analysis examining the impact of Medicaid benefit expansion in states found that the likelihood of a low-income adult visiting a dentist increased between 16%-22% within a year of obtaining

[57] Collins SR, Rasmussen W, Doty MM, Beurel S. Too High a Price: Out of Pocket Health Care Costs in the United States. New York, NY: The Commonwealth Fund; 2014. http://www.commonwealthfund.org/publications/issue-briefs/2014/nov/out-of-pocket-health-care-costs.

[58] Meyerhoefer CD, Zuvekas SH, Manksi R. The demand for preventive and restorative dental services. *Health Economics*. 2014;23(1):24-32. http://onlinelibrary.wiley.com/doi/10.1002/hec.2899/pdf.

[59] National Association of Dental Plans. 2012 NADP/DDPA Joint Dental Benefits Report: Enrollment. http://nadp.peachnewmedia.com/store/seminar/seminar.php?seminar=17429

[60] National Association of Dental Plans. Who has dental benefits? http://www.nadp.org/Dental_Benefits_Basics/Dental_BB_1.aspx.

[61] Yarborough C, Nasseh K, Vujicic M; for ADA, Health Policy Institute, Research Brief. Key Differences in Dental Care Seeking Behavior between Medicaid and Non-Medicaid Adults and Children. September 2014. http://www.ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0814_4.ashx.

dental benefits through a Medicaid program.[62] In 2011, just 36.1% of working age adults in the US visited a dentist compared to 41% in 2003.[63]

FIGURE 64. PERCENT OF THE US POPULATION WITH PUBLIC OR PRIVATE DENTAL INSURANCE COVERAGE, 2003-2012

Sources: National Association of Dental Plans, 2013; US Census Bureau

Children who qualify for public health insurance programs including Medicaid and CHIP are assured of coverage for dental services. However, some children do not qualify because the family's income exceeds eligibility limits; yet these families may also be unable to afford the high cost of private health and dental insurances. In 2012, the number of children in Michigan who did not have health insurance was estimated at 109,000 children or 4.5% of the population of children.[64] This number includes children who qualify for but are not enrolled in public health insurance programs. In Michigan in 2012, 92.2% of eligible children were enrolled in public programs but the remainder, about 71,000 eligible children, was not enrolled. The insurance mandate contained in the ACA may appreciably reduce that number.

The Affordable Care Act

Dental benefits for children are 1 of several essential health benefits mandated in the ACA. State Medicaid programs are required to cover dental services for children age 0-20 through the EPSDT benefit. The ACA now mandates that pediatric dental insurance be offered in the small group and individual insurance markets across the US on federal and state insurance exchanges.

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[62] Choi MK. The impact of Medicaid insurance coverage on dental service use. *Journal of Health Economics*. 2011;30(5):1020-1031. http://www.sciencedirect.com/science/article/pii/S0167629611001110X#.

[63] Nasseh K, Vujicic M; for Health Policy Institute, ADA. Dental Care Utilization Continues to Decline Among Working-Age Adults, Increases among the Elderly, Stable among Children. October 2013. http://www.ada.org/~/media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_1013_2.ashx.

[64] MACPAC. Report to the Congress on Medicaid and CHIP. June 2014. https://childrenshospitals.org/issues-and-advocacy/childrens-health-insurance-program/issue-briefs-and-reports/2014/macpac-june-2014-report-to-the-congress-on-medicaid-and-chip-summary.

However, while commercial dental insurance for children is offered on these exchanges, the purchase of dental insurance for children is not assured, especially in the complex private market. The IRS rules providing insurance subsidies to low-income purchasers of health insurance do not include a direct subsidy for the purchase of pediatric dental insurance. In many states where medical and dental plans are sold separately, parents of children who do not qualify for public benefits must elect to purchase unsubsidized private dental plans, which increase the percentage of their income that is spent on health coverage. As a result, some parents choose not to buy dental insurance. Many state legislatures are currently debating the advisability of embedding dental benefits in medical plans for children rather than leaving the benefit as a stand-alone purchase.

Another positive impact of the ACA is the opportunity for states to expand eligibility for Medicaid to adults at or below 138% of the FPL. To date, 29 states have embraced the opportunity to use federal subsidies to expand eligibility in their Medicaid programs. The District of Columbia and Connecticut have expanded eligibility to higher income populations (just over 200% FPL). Michigan's expansion program called the Healthy Michigan Plan provided the eligible population with health and dental coverage through managed care offerings with an embedded dental benefit.

In a report that describes enrollment in dental insurance plans since implementation of the ACA and activation of the state and federal marketplaces, the National Association of Dental Plans states that 96% of enrollees selecting dental plans in the Federally Facilitated Marketplace (FFM) are between age 18-64.[65] In those states where patients enroll through the FFM, 21.8% of all enrollees selecting a health plan also elected to purchase a stand-alone dental plan. Just 4% of new enrollees in stand-alone dental plans were age 0-17.[65] Enrollments though the marketplaces increased the percentage of people with individual dental coverage across the US by 14%.[65] In Michigan, more than 55,000 people enrolled in a stand-alone dental plan through the State Partnership Marketplace (SPM) by early 2014.[66]

The National Association of Dental Plans reports that in 2013 approximately 55.8% of Michigan's population was enrolled in a private (45.3%) or public (10.5%) dental insurance plan.[67] Most of the population was enrolled in a dental preferred provider organization plan. More than 44% of the state's population lacked dental insurance in 2013.

[65] National Association of Dental Plans. NADP Encouraged by Early FFM Enrollments but Says, "There's Still Work to be Done." February 2014.
[66] National Association of Dental Plans. Selection of Qualified Dental Plans in 2014 Marketplaces. July 2014. http://www.nadp.org/docs/default-source/HCR-Documents/NADP_Chart_of_QDP_Selection_in_Marketplaces_July_2014.pdf.
[67] National Association of Dental Plans. Michigan Dental Benefits Fact Sheet. 2014. http://nadp.peachnewmedia.com/store/seminar/seminar.php?seminar=252422.

TABLE 9. DENTAL INSURANCE STATUS OF MICHIGAN'S POPULATION, 2013**

Type of Dental Insurance	# of People Enrolled	Totals	Number of Plans Offered	# of Dentists Participating
Dental Health Maintenance Organization	113,185		1	641
Dental Preferred Provider Organization	4,178,567		26	4,146
Dental Indemnity Plan	78,124		15	
Other Private Dental Insurance (Including Discount Plans)	108,164		17	2,921
Total Population with Private Dental Insurance		**4,478,040**		
Medicaid/ CHIP	568,456			
Other Public (eg Healthy Michigan)	471,545			
Total Population with Public Dental Insurance		**1,040,001**		
Total Population with Any Dental Insurance Coverage		**5,518,041**		
Total Population in Michigan 2013		**9,895,622**		
Percent of Michigan's Population with Any Dental Insurance Coverage		**55.8%**		
Percent of Michigan's Population Covered by Private Dental Insurance		**45.3%**		
Percent of Michigan's Population Covered by Public Dental Insurance		**10.5%**		

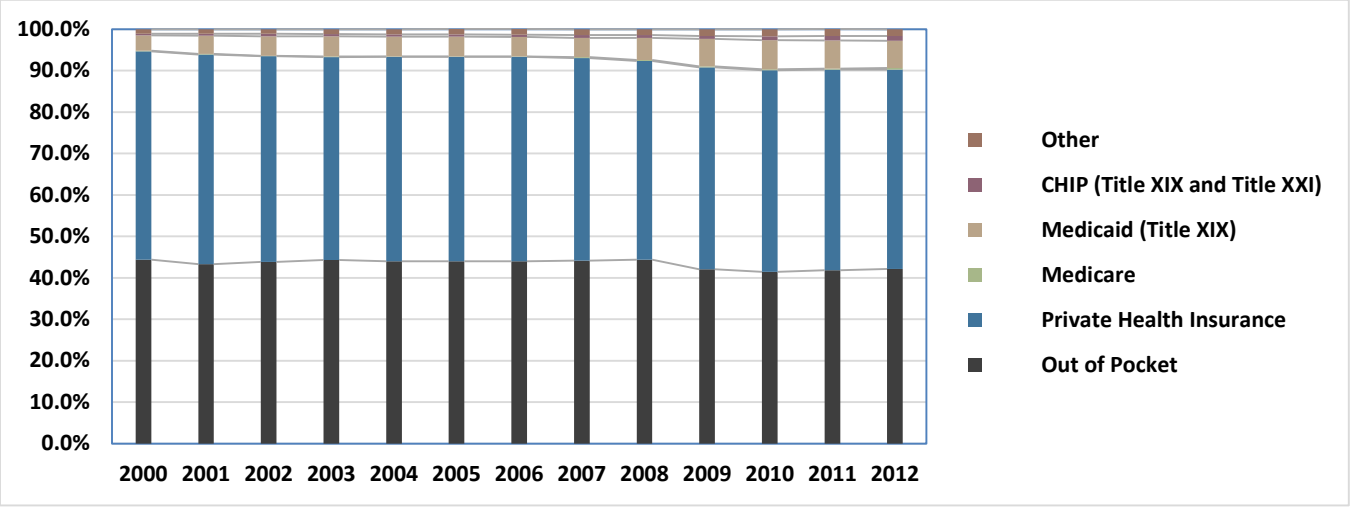
Source: National Association of Dental Plans, 2014; US Census. ** Note: It is assumed that any Medicaid-eligible child or adult with a managed care dental benefit is included in the counts of private insurance coverage not public insurance coverage. NADP used counts from CMS to describe public insurance enrollees.

Out-of-Pocket Expenditures for Dental Services

The cost of dental services is often cited as a barrier to greater utilization of oral health services particularly for the uninsured or for insured populations with dental insurance that provides only minimal coverage or requires high co-pay and co-insurance responsibilities**.** In 2013, dental expenditures in the US totaled $111 billion and total health care expenditures reached $2.9 trillion. Out-of-pocket payments for patients for dental services were estimated to account for 42% of all dental spending in 2013,[68] while out-of-pocket spending for health care services only amounted to 11.4% of expenditures.[69] In 2012, the per capita expenditure for health care was $8,915 including per capita dental expenditures of $354.[70] Growth in out-of-pocket expenditures for dental services in 2013 was 1.7% versus a 3.2% increase for out-of-pocket health spending overall.[68] In 2012, private insurance expenditures represented 48.1% of total dental expenditures followed closely by out-of-pocket payments (42.2%). Public insurance (mainly Medicaid) paid only a small portion of dental expenditures (8.1%).

[68] Centers for Medicare & Medicaid Services. National Health Expenditures 2013 Highlights. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/highlights.pdf.
[69]Centers for Medicare & Medicaid Services. National Health Expenditure Projections 2012-2022. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/proj2012.pdf.
[70] Centers for Medicare & Medicaid Services. Aggregate and per Capita Amounts 1960-2012. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/tables.pdf.

FIGURE 65. PERCENT OF ANNUAL DENTAL EXPENDITURES IN THE US BY SOURCE OF PAYMENT, 2000-2012



Source: CMS, National Health Care Expenditures by type of Expenditure and Program

In 2010, 6.6% of all health care expenditures in the US were for dental services. Private insurance companies paid a higher percentage of dental expenditures (43.1%) than of overall health care expenditures (40.1%).[71] However, the reverse was true for public insurance programs. Medicaid paid 5.8% of dental expenditures and 14.2% of overall health expenditures in the US.[71] A higher percentage of out-of-pocket expenditures in 2010 were for dental services (47.5%) than for health care services (14.2%) with 40.4% of the US population incurring a dental expense of, on average, $666 per person. [71]

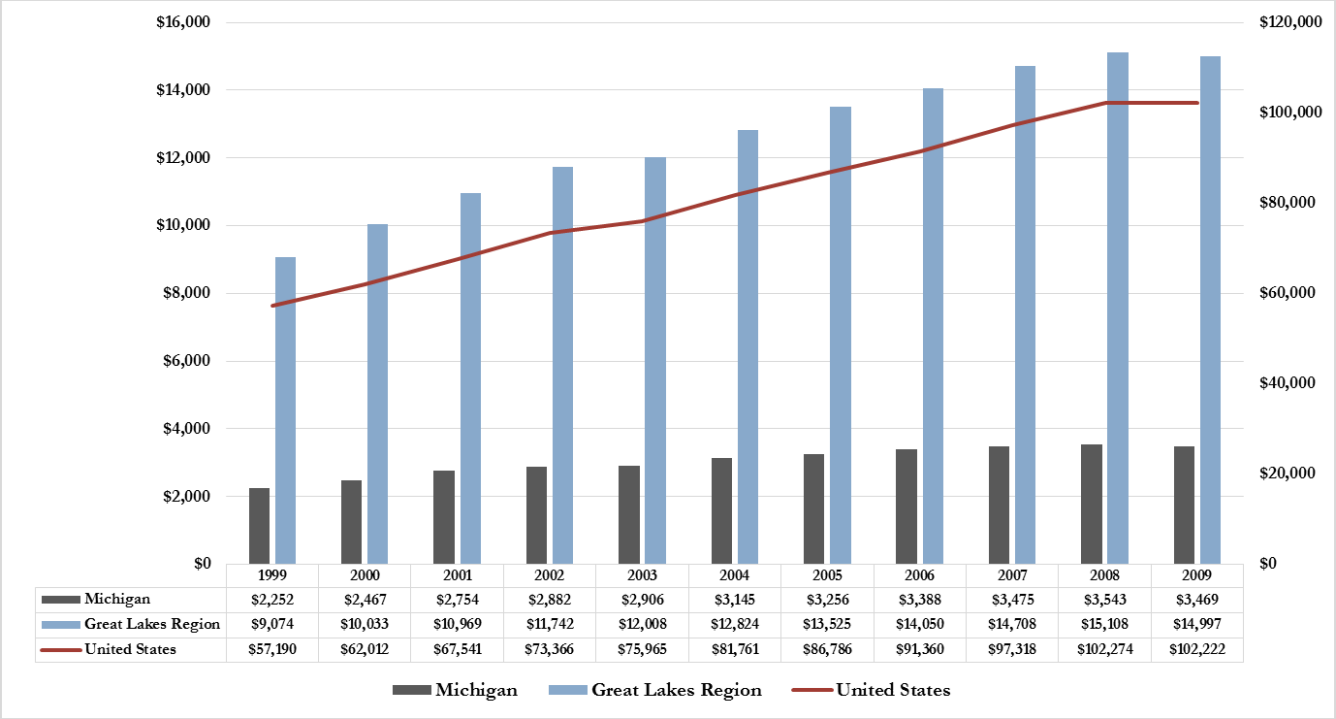
In 2010, 45.9% of Michigan's population (civilian, non-institutionalized people) incurred an expense for dental care compared to 40.4% of the US population.[71] While the average annual per person dental expense in the US was $666, in Michigan the average per person dental expense was substantially higher at $827.[71] Nationally, 43.1% of dental expenditures were paid by private insurance carriers, but in Michigan just 40% of dental expenditures were paid by private insurers.[71] Michigan's people paid a higher percentage of dental expenditures out-of-pocket (49.5%) than were paid out-of-pocket nationally (47.5%).[71]

In a review of historical payments for dental services nationally, regionally, and in Michigan between 1991-2009, the average annual growth rate for dental expenses in the US was 6.4% versus 5.9% in the Great Lakes Region (the states of Illinois, Indiana, Michigan, Ohio, and Wisconsin) and 5.2% in Michigan.[72] Between 1999-2009, total dental expenditures increased by almost 79% in the US (annual growth rate of 6.5%), by 65% in the Great Lakes Region (annual growth rate of 5.9%), but by only 54% in Michigan (annual growth rate of 5.6%).[72]

[71] Agency for Healthcare Research and Quality. Dental expenditures in the 10 largest states, 2010. Medical Expenditure Panel Survey. Statistical Brief #415. June 2013. http://meps.ahrq.gov/mepsweb/data_files/publications/st415/stat415.pdf

[72] Centers for Medicare & Medicaid. Total All Payers State Estimates by State of Residence-Dental Services. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/res-tables.pdf.

FIGURE 66. ESTIMATED TOTAL DENTAL SPENDING BY ALL PAYERS IN MILLIONS OF DOLLARS IN THE US, GREAT LAKES REGION, AND MICHIGAN, 1999-2009



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Michigan	$2,252	$2,467	$2,754	$2,882	$2,906	$3,145	$3,256	$3,388	$3,475	$3,543	$3,469
Great Lakes Region	$9,074	$10,033	$10,969	$11,742	$12,008	$12,824	$13,525	$14,050	$14,708	$15,108	$14,997
United States	$57,190	$62,012	$67,541	$73,366	$75,965	$81,761	$86,786	$91,360	$97,318	$102,274	$102,222

Source: CMS, All Payer State Estimates 1991-2009. Note: Great Lakes Region is Illinois, Indiana, Michigan, Ohio, and Wisconsin.

Chapter 5. Dental Health Professional Shortage Areas and Safety Net Providers in Michigan

Financial barriers to access to dental services may be compounded by the lack of available oral health providers especially in rural areas and in inner cities where the supply of oral health workers may be limited or not well distributed. The uneven distribution of a competent professional workforce impedes access in certain geographies and for certain population groups in Michigan and across the US.

A health professional shortage area (HPSA) is a geographic area, population group, or facility determined by the US Department of Health and Human Services, Health Resources and Services Administration (HRSA), Office of Shortage Designation to have a shortage of health professionals. A HPSA may be designated for a shortage of primary care physicians, dentists, or mental health providers. These designations are defined in the following ways:

- *Geographic* - This designation covers 1 or more counties or a sub-county area with a shortage of providers. In a geographic HPSA, the entire residential civilian population is considered underserved.
- *Special Population* - This designation covers a special population residing in a geographic area with limited access to providers. Special populations include: Medicaid-eligible populations, low-income people, migrant and seasonal farm workers, homeless populations, American Indians, Alaska Natives, and others who may be isolated by linguistic and/or cultural barriers.
- *Facility* - This designation covers a residential facility with 250 or more residents or public and nonprofit dental facilities with insufficient capacity to meet the needs of the area or population group it serves. Facilities include federal and state correctional institutions, youth detention facilities, public or nonprofit outpatient facilities, and state or county mental health hospitals. A number of different types of facilities receive automatic designation, including FQHCs, FQHC

look-alikes, rural health clinics, and outpatient health programs or facilities run by tribal organizations or urban American Indian organizations. [73]

The standard to qualify for designation as a DHPSA is a threshold ratio of full-time equivalent (FTE) dentists-to-population. The ratio varies by type of designation.

- Geographic DHPSA designations require a population-to-FTE dental ratio of at least 5,000 people: 1 dentist.
- A special population DHPSA or geographic high-need designation requires a ratio of at least 4,000:1.
- Public or nonprofit outpatient DHPSA facility designations must document insufficient capacity (5,000 outpatient dental visits per 1 FTE dental or a wait time of at least 6 weeks for routine services) for the population or area designated as a DHPSA.
- Correctional facilities or youth detention facilities must have at least 250 residents and an inmate-to-FTE dental ratio of 1,500:1 in order to qualify for designation. [74]

HRSA has established formulas for counting FTE dental professionals that account for the contributions of dental auxiliaries and for differences in productivity due to differences in the ages of dental professionals. HPSA/DHPSA designation is used by a variety of federal and state health professional recruitment and retention programs, including the National Health Service Corp and programs that grant a waiver of the 2-year home return requirement for physicians with an expiring exchange visitor visa.

In September 2014, there were 4,968 DHPSAs in the US with a total population of 47,595,261 people.[75] HRSA estimates that it would require 7,300 additional oral health professionals to meet the needs of the currently underserved in designated geographic areas, facilities, or special populations.[75] HRSA estimates that only about 41% of the need for dental care is met by current capacity in DHPSAs.[75] While many of these designations are in non-metropolitan areas (55%), a significant percentage (45%) are in metropolitan areas,[75] suggesting that there are numerous special populations in urban settings who are underserved.

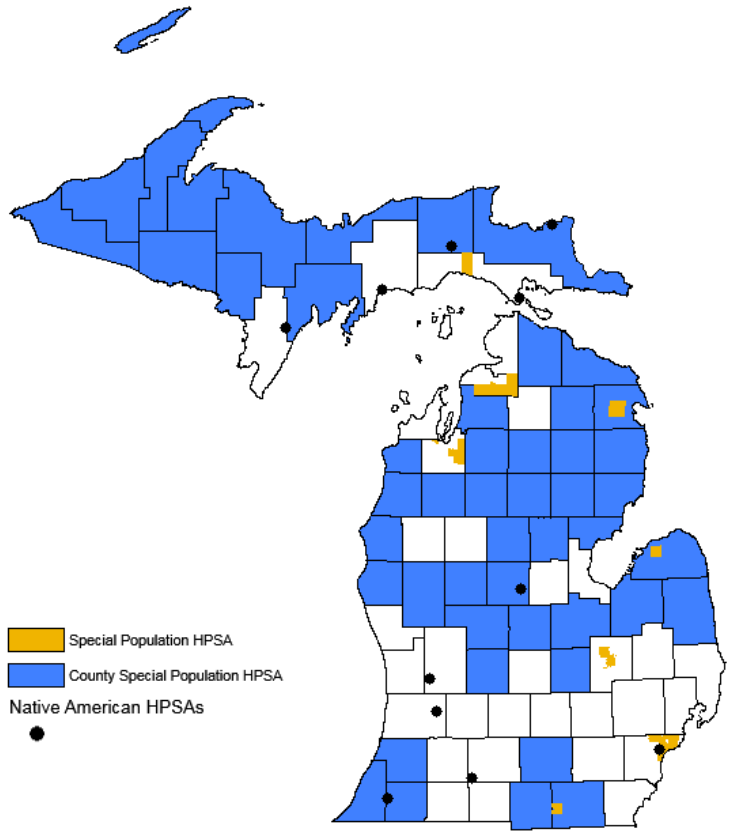
In September 2014, there were 212 DHPSAs in Michigan; 166 facility designations, 58 special populations DHPSAs with a single county designation, and 1 geographic designation.[75] There is at least 1 DHPSA designation in each of 76 counties in the state. The 7 counties with no DHPSA designations are Barry, Clinton, Emmet, Lapeer, Livingston, Midland, and Ottawa counties. HRSA estimates there are 869,500 people living in Michigan's DHPSAs and that currently 41.8% of need for dental services in these DHPSAs is met. HRSA estimates that 128 additional dental professionals would be needed to remove these designations.[75]

[73] HRSA. Shortage Designation: Health Professional Shortage Areas & Medically Underserved Areas/Populations. http://www.hrsa.gov/shortage/

[74] HRSA. Dental HPSA Designation Criteria. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/dentalhpsacriteria.html

[75] HRSA, Data Warehouse. Designated Health Professional Shortage Areas Statistics. Fourth Quarter of Fiscal Year 2014. Designated HPSA Quarterly Summary. November 10, 2014. http://datawarehouse.hrsa.gov/HGDWReports/RT_App.aspx?rpt=HH

FIGURE 67. DHPSA DESIGNATIONS IN MICHIGAN, 2014 (EXCLUDING FACILITY DESIGNATIONS)



Source: HRSA, 2014

DHPSA geographic, special population, or facility designations provide some safety-net organizations with enhanced federal and state funding to serve populations at risk for lack of access to oral health services, including opportunities for dental professionals to avail themselves of state and federal education loan repayment programs.

Safety Net Providers

The Institute of Medicine defines safety-net providers as providers who by mission or mandate organize and deliver substantial health and health-related services to the uninsured, the Medicaid population, or others who are considered vulnerable.[76] In Michigan, there are 127 nonprofit community hospitals; 172 certified rural health clinics; more than 90 school-based or school-linked health centers; 45 city, county, or district health departments; at least 80 free clinics; and 35 FQHCS or FQHC look-alikes operating in 216 delivery sites.[76] These organizations constitute the institutional health care safety net in the state. While all provide health care services, only some provide oral health care as part of their service menu.

[76] Center for Healthcare Research & Transformation. Federally Qualified Health Centers: An Overview. July 2013. http://www.chrt.org/publication/federally-qualified-health-centers-overview/.

The safety net for oral health services encompasses a broad range of both individual oral health professionals and organizational providers. Safety-net providers offer no-cost or reduced-cost services to populations with limited access to dental services or to those without dental homes with limited ability to pay for care. Private practice dentists provide a large portion of the free or low-cost services offered to patients. Their contributions, through their individual practices or organized volunteer opportunities, free dental clinics, or dental services-for-a-day events are included in the safety net even though they are hard to quantify. The Dental Lifeline Network reports that from 2012-2013, 458 people with disabilities or were elderly or medically fragile received donated dental services from oral health providers in Michigan.[77] The value of the care provided by 822 dentists and 251 laboratories was approximately $1.65 million. Since 1995, 5,164 state residents have received more than $15.9 million in donated care from dentists in Michigan.[77]

For profit dental management or dental service organizations, also known as group dental or group practice organizations contribute to oral health service delivery in the safety net in Michigan. Aspen Dental, Great Expressions, and others are providing services to populations that find the convenient locations of these practices (often in local shopping malls), extended office hours including weekends and evenings, and acceptance of public dental insurance especially accommodating. However, it is not possible to evaluate the contributions of these organizations to improved access to care in the state since data describing the patients receiving treatment from these organizations or the services provided are not publicly available.

FQHCs

FQHCs operate as Section 330 grantees receiving federal grant funding to provide comprehensive health, oral health, and mental health services for patients. FQHCs are mandated by the federal government to provide preventive oral health services for patients as part of their organizational responsibilities. Not all FQHCs are able to provide direct dental services or to offer a full complement of dental services. Clinics may contract with dental providers in the community to accept referrals for patients in need of dental services. Some FQHCs provide vouchers to patients to pay for care in the community. In 2010, Michigan ranked 37th in the nation on the number of FQHC service delivery sites per 10,000, with less than 2 delivery sites per 10,000 uninsured patients in the state.[76] In 2010, FQHCs provided health care services for approximately 5.5% of all state residents, 14.5% of the state's uninsured, and 14.5% of the state's Medicaid beneficiaries.[76]

There was a 60% percent increase in the state's Medicaid-eligible population from 1999-2010 due to the declining economy in the state. There was also a 127% increase in the number of uninsured and Medicaid-insured patients served by FQHCs in Michigan between 2001 (180,596 patients) and 2010 (410,145 patients).[76] From 2008-2011, federal funding for FQHCs in Michigan increased 83.4% with Michigan ranking 10th among states in total allotment to FQHCs.[76]

FQHCs file annual reports describing patients served and services provided. The following figures compare the information compiled from the Uniform Data System (UDS) for all FQHCs in the US. Tables and charts describing services provided by individual FQHCs in Michigan are available in Appendix D of this report.

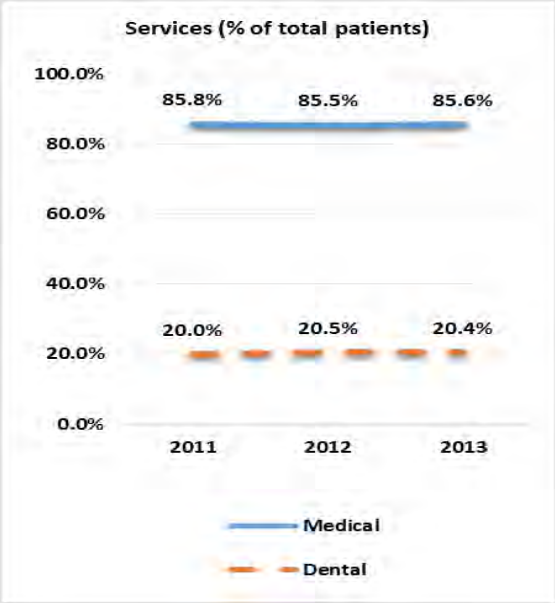
[77] Dental Lifeline Network. Michigan Donated Dental Services (DDS), 2012-2013 Report. http://www.mhc.org/Portals/michiganhealthcouncil/Downloads/donated-dental.pdf.

The number of annual patient visits to FQHCs in the US for dental services tripled between 2000-2010 to 9.2 million stretching the ability of FQHCs to meet demand for oral health care due to limited capacity and limited availability of oral health workforce.[76] In Michigan in 2013, 33 program grantees filed reports with HRSA and reported that a total of more than 175,000 patients received dental services through a Michigan FQHC.[78] An analysis of the UDS data in 2011, 2012, and 2013 for FQHCs in the US and in Michigan found the following:

- A higher percentage of patients in FQHCs in Michigan were provided dental services than patients in FQHCs in the US in all 3 years.
- The population of patients receiving services in FQHCs in Michigan is somewhat younger than those served by FQHCs nationally.

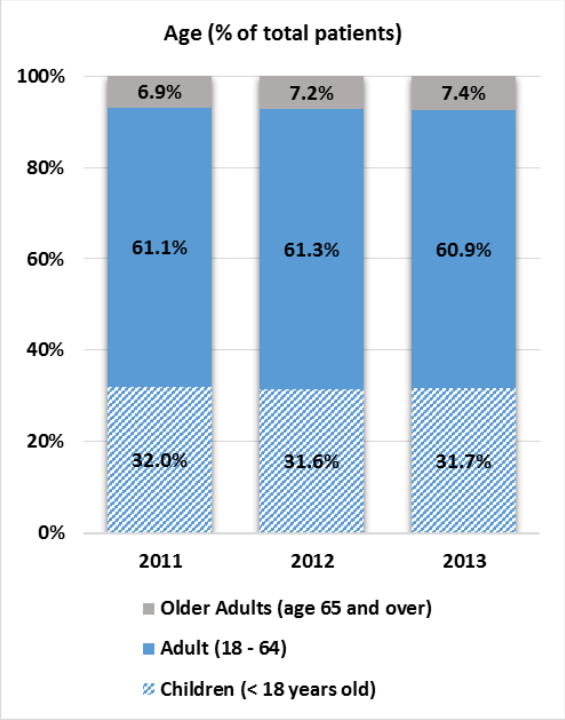
[78] HRSA. Primary Care: The Health Center Program. 2013 Health Center Data. Michigan Program Grantee Data. http://bphc.hrsa.gov/uds/datacenter.aspx?state=MI&year=%=yr%

FIGURE 68. PERCENTAGE OF PATIENTS IN FQHCS IN THE US RECEIVING MEDICAL AND DENTAL SERVICES, 2011-2013



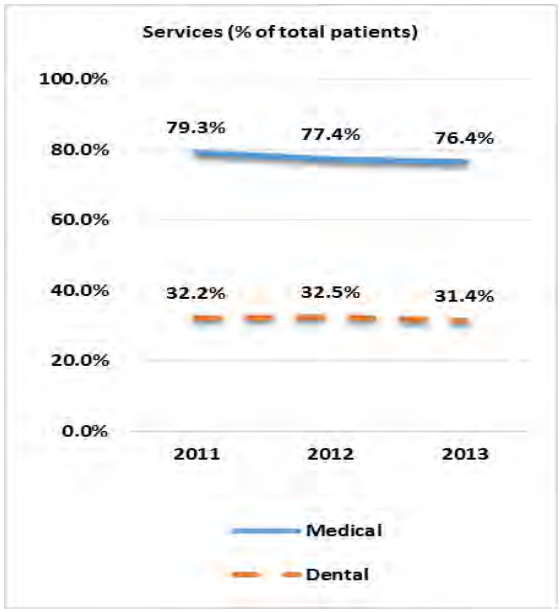
Source: UDS, 2011, 2012, 2013

FIGURE 69. PERCENTAGE OF PATIENTS IN FQHCS IN THE US BY AGE, 2011-2013



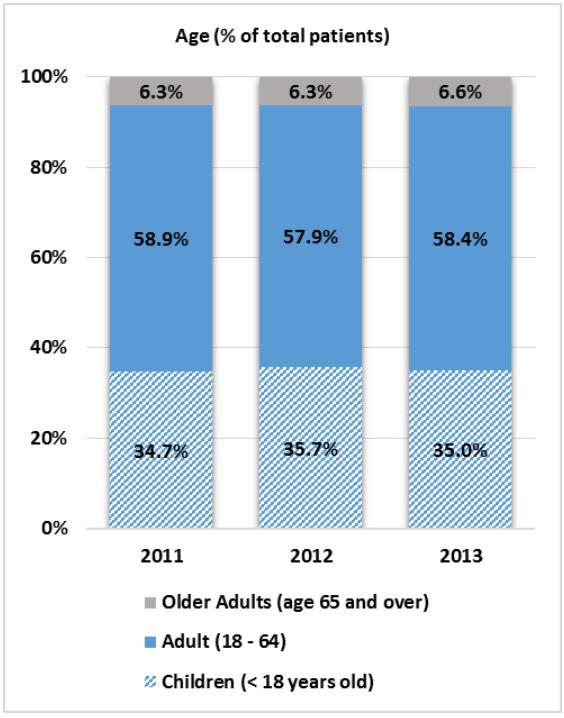
Source: UDS, 2011, 2012, 2013

FIGURE 70. PERCENTAGE OF PATIENTS IN FQHCS IN MICHIGAN RECEIVING MEDICAL AND DENTAL SERVICES, 2011-2013



Source: UDS, 2011, 2012, 2013

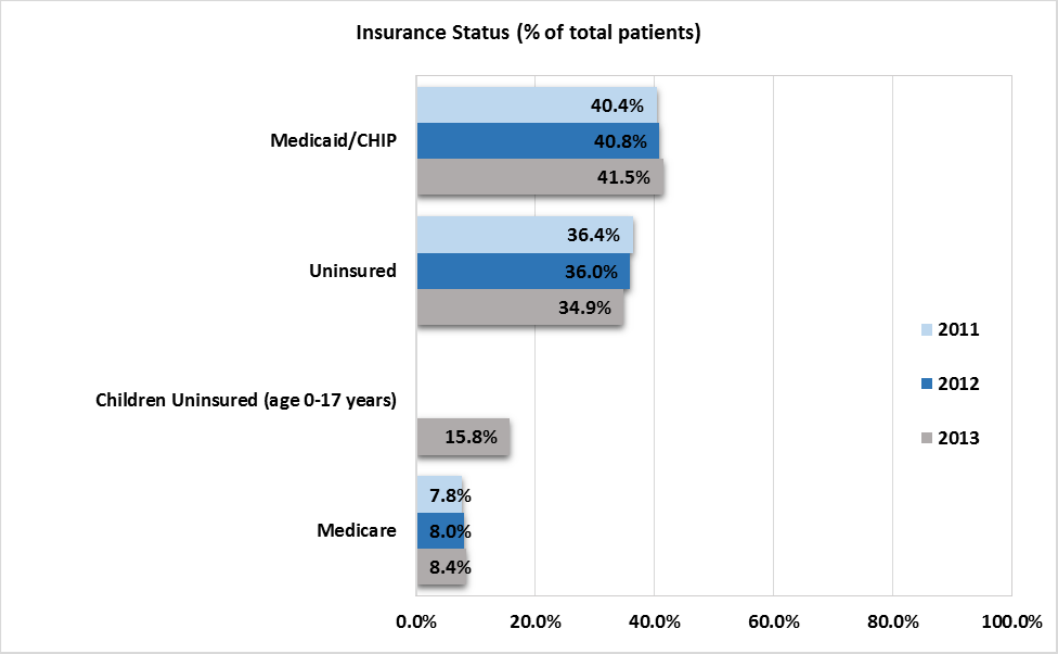
FIGURE 71. PERCENTAGE OF PATIENTS IN FQHCS IN MICHIGAN BY AGE, 2011-2013



Source: UDS, 2011, 2012, 2013

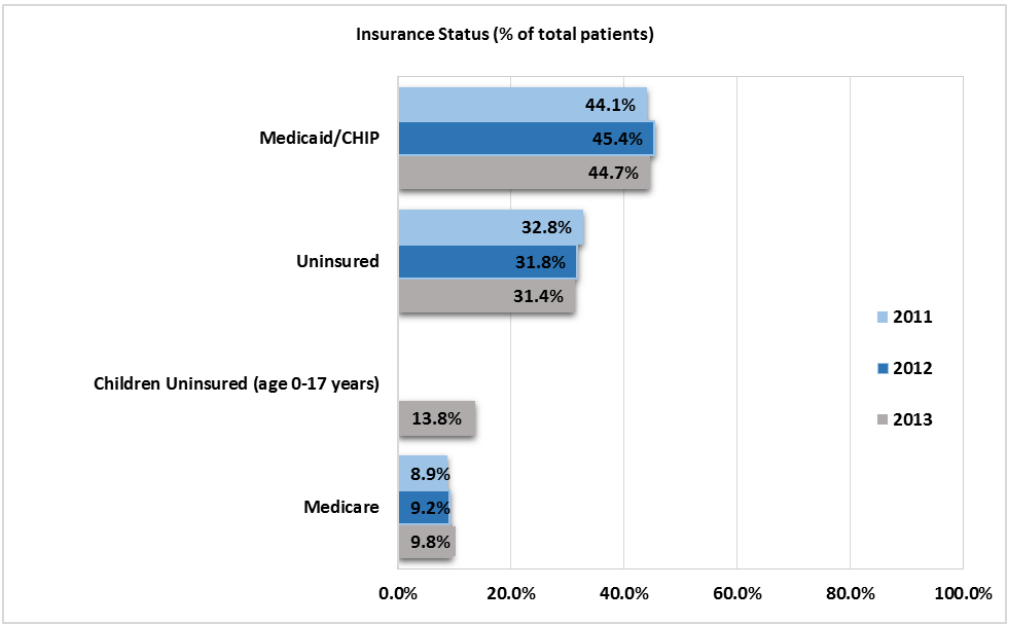
- The caseloads of FQHCs in Michigan were comprised of a higher percentage of Medicaid-insured patients and a lower percentage of uninsured patients than in FQHCs nationally.

FIGURE 72. TYPE OF INSURANCE OF PAYMENT STATUS OF PATIENT CASELOADS IN FQHCS IN THE US, 2011, 2012, 2013



Source: UDS, 2011, 2012, 2013

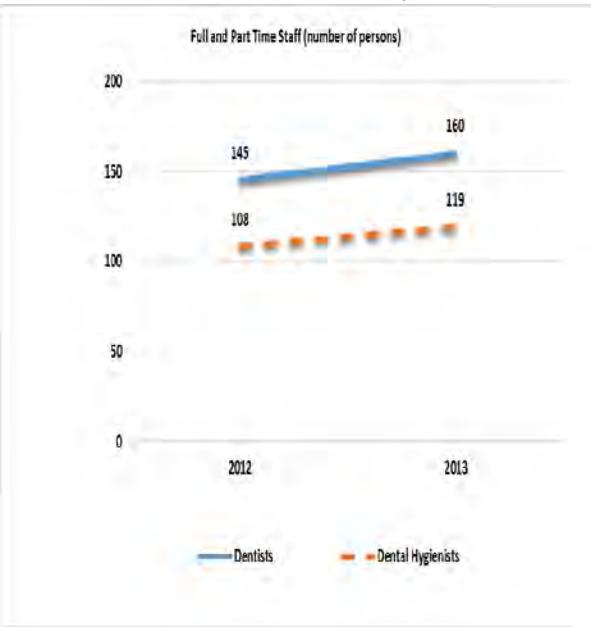
FIGURE 73. TYPE OF INSURANCE OF PAYMENT STATUS OF PATIENT CASELOADS IN FQHCS IN MICHIGAN, 2011, 2012, 2013



Source: UDS, 2011, 2012, 2013

- Between 2012-2013, the number of full- and part-time dental staff in FQHCs in Michigan increased.
- Over the 3 years from 2011-2013, the number of FTE dental professionals employed by FQHCs in Michigan also increased.

FIGURE 74. TOTAL NUMBER OF FULL- AND PART-TIME ORAL HEALTH STAFF IN FQHCS IN MICHIGAN, 2012-2013



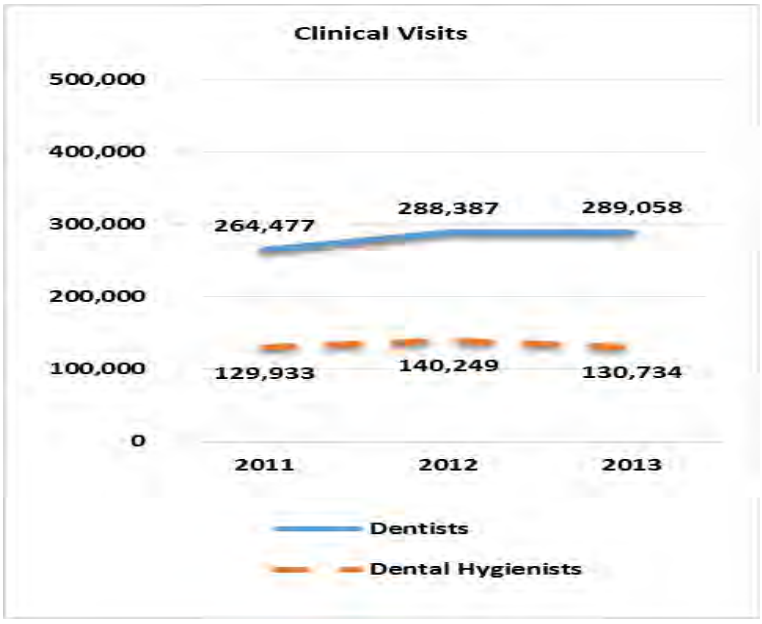
Source: UDS 2012, 2013

FIGURE 75. TOTAL FULL TIME EQUIVALENT ORAL HEALTH STAFF IN FQHCS IN MICHIGAN, 2011, 2012, 2013

Source: UDS 2011, 2012, 2013

- The number of patient visits to dentists in FQHCs in Michigan increased over the 3-year period.

FIGURE 76. NUMBER OF CLINICAL VISITS TO DENTISTS AND DENTAL HYGIENISTS IN FQHCS IN MICHIGAN, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

Michigan Community Dental Clinics

Michigan Community Dental Clinics (MCDC) is a not-for-profit organization that manages dental clinics on behalf of local public health departments across the state. MCDC operates on a social entrepreneur public health model that focuses on effecting social change by incorporating patient education and prevention services along with delivery of quality oral health care by oral health teams that are committed to and engaged with the mission of the organization.[79] MCDC was first established in 2006 to expand the already successful Dental Clinics North model to other parts of Michigan.[80] In recent years, MCDC has continued to form new collaborations across the state and now manages 26 community dental clinics and 10 hospital dentistry sites providing both general and specialty dental services. In March 2015, a new clinic opened in Spalding, MI. The MCDC network serves Medicaid-insured people and those with no dental insurance by providing reduced fee services. Its hospital sites serve the developmentally disabled, both children and adults, as well as young children in need of extensive dental services requiring anesthesia.[79] MCDC clinics also act as clinical training sites for dental residents who are completing advanced education in general dentistry in Michigan.[79] MCDC has an extensive electronic dental record system that facilitates communication across sites and providers and enables quality monitoring system wide.

In 2013, MCDC clinics served 65,269 patients throughout the state with 179,068 office visits.[79] Just over half of the patients (51%) were adults age 21-60, 40% were children age 20 or younger, and 9% were seniors older than age 60.[79] The MCDC model is nationally recognized as a successful network that improves access for underserved populations and does so in a cost-effective manner.

Michigan Dental and Dental Hygiene Education Program Clinics

Dental and dental hygiene professional education programs with student clinics are significant contributors to increased access to oral health services for patients. In stakeholder interviews conducted for this project, multiple informants remarked upon the contributions of these clinics to improved access. It was not possible to find current data to describe numbers of services provided for the patients treated in these clinics.

The University of Michigan: School of Dentistry manages several dental clinics that are available to the public, Medicaid insured, or uninsured with:

- A student dental and dental hygiene clinic provides general dental services;
- Several graduate specialty clinics provide endodontics, orthodontics, pedodontics, periodontics, prosthodontics, restorative dentistry, and oral and maxillofacial surgery;
- A full service dental faculty practice including orthodontic and pediatric practices is available; and
- A patient admissions and emergency services clinic is available to address immediate need.

The University of Detroit Mercy School of Dentistry also provides services to Medicaid-insured patients and others at student clinical fees through:

- Two student dental and dental hygiene clinics that provide general dentistry services;

[79] Michigan Community Dental Clinics. Changing Lives One Smile at a Time: 2013 Annual Report.
[80] Michigan Community Dental Clinics. About Us. http://midental.org/about-us/.

- Graduate specialty clinics offers periodontics, oral and maxillofacial surgery, endodontics, orthodontics, and pedodontics; and
- A faculty practice that offers both general and specialty dental services.

Both dental schools also host dental hygiene education programs whose students offer services in the student clinics affiliated with each university. Other dental hygiene education programs in Michigan offer low-cost preventative services to the public in student clinics for people in the communities in which they are located. While these programs do not generally accept insurance, the cost for services is scaled affordably for people with limited resources. These programs are sponsored by:

- Kalamazoo Valley Community College, Kalamazoo, MI
- Lansing Community College, Lansing, MI
- Grand Rapids Community College, Grand Rapids, MI
- Mott Community College, Flint, MI
- Delta College, University Center, MI
- Baker College, Auburn Hills, MI
- Oakland Community College, Waterford, MI
- Wayne County Community College, Detroit, MI
- Ferris State University, Big Rapids, MI
- Kellogg Community College, Battle Creek, MI

Dentists Treating Publicly Insured Patients

As previously mentioned, most dental services are provided in the offices of private practice dentists who also offer services to underserved populations. The contributions of private practice dentists to care in the safety net are very difficult to quantify because it is generally embedded with other work.

The uneven distribution of dental providers in any state limits access especially for rural populations. Literature suggests that private dental practices are commonly located in metropolitan areas, especially in the suburbs of urban areas.[81] This preference is likely due to favorable economic conditions and sufficient population to provide an adequate number of patients with the ability to pay for dental services. Another contributing factor to restricted access to oral health services, even when there is a sufficient supply of oral health professionals in an area, is the limited number of dentists who participate in state Medicaid programs and are willing to treat patients with public insurance.

In surveys of dentists in Michigan, which were fielded over the triennial period for dental re-licensure in 2009, 2010, and 2011, dentists were asked to estimate the approximate percentage of their monthly patient caseloads that included patients with particular characteristics, including those with public dental insurance (eg, Medicaid).[82]

The following data describing the percentage of patients with particular characteristics in dental caseloads in Michigan was collected from the one-third of dentists licensing in each year of the license renewal cycle. There were differences in cohort responses in each year. While many of the differences in

[81] Wall T, Brown L. The urban and rural distribution of dentists, 2000. *JADA*. 2007;138(7):1003-1011. http://jada.ada.org/article/S0002-8177(14)62428-4/pdf..
[82]MDCH. Public Sector Consultants. Survey of Dentists, Survey Findings, 2011. https://www.michigan.gov/documents/healthcareworkforcecenter/MDCH_2011_Dentist_Survey_Report_Final_377915_7.pdf.

patient caseloads described by dentists in each of the 3 years were not significantly different across years, there was some notable variation. For instance, in 2010, 9.6% of dentists indicated that children insured by a public insurance program constituted at least 20% of their patient caseload. This was a greater percentage than in either the preceding (5.6%) or the subsequent year (7.0%).[82]

There were other annual differences among dentists responding to the surveys relative to the percentage of publicly insured children in their dental caseloads:

- More dentists in 2011 than in 2009 indicated that 1%-5% of their patient caseload included publicly insured children. In 2011, fewer dentists indicated that they *did not* treat any Medicaid- or MIChild-insured children than in 2009. These changes may indicate growing dental participation with the Medicaid, MIChild, or HKD programs.
- In 2011, more dentists indicated that publicly insured children constituted 20% or more of their monthly caseloads than in 2009, although the percentage of dentists in this category remained small.

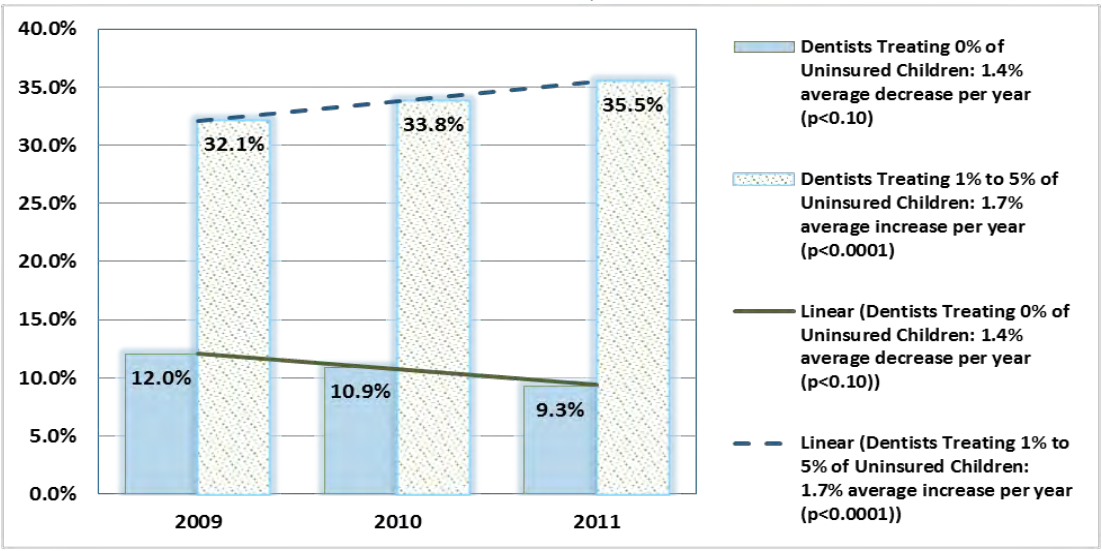
TABLE 10. PERCENTAGES OF DENTISTS' PATIENT CASELOADS BY PATIENT CHARACTERISTICS, MICHIGAN, 2009-2011

Characteristics of Patients	% of Dentists Providing Care to 0% of Patients in Caseload		
	2009	2010	2011
Children insured by Medicaid or MIChild	48.4%	42.8%	45.0%
Adults covered by Medicaid	83.8%	83.8%	85.8%
Children paying on a sliding fee scale	83.7%	83.1%	83.1%
Adults paying on a sliding fee scale	82.3%	80.6%	82.0%
Uninsured children	12.0%	10.9%	9.3%
Uninsured adults	7.0%	6.8%	7.3%
Nursing home residents	48.5%	46.8%	48.3%
Children with developmental disabilities	28.6%	31.0%	30.8%
Adults with developmental disabilities	25.8%	26.8%	25.7%
Characteristics of Patients	**% of Dentists Providing Care to 1% to 5% of Patients in Caseload**		
	2009	**2010**	**2011**
Children insured by Medicaid or MIChild	34.2%	34.2%	36.2%
Adults covered by Medicaid	10.0%	8.5%	8.1%
Children paying on a sliding fee scale	12.2%	10.8%	11.8%
Adults paying on a sliding fee scale	11.3%	11.3%	10.2%
Uninsured children	32.1%	33.8%	35.5%
Uninsured adults	13.3%	15.2%	16.8%
Nursing home residents	45.5%	46.8%	46.9%
Children with developmental disabilities	66.0%	63.4%	63.6%
Adults with developmental disabilities	69.5%	68.0%	70.2%
Characteristics of Patients	**% of Dentists Providing Care to 6% to 10% of Patients in Caseload**		
	2009	**2010**	**2011**
Children insured by Medicaid or MIChild	7.6%	7.9%	6.7%
Adults covered by Medicaid	2.1%	2.6%	1.7%
Children paying on a sliding fee scale	2.2%	2.9%	1.9%
Adults paying on a sliding fee scale	3.9%	3.2%	4.3%
Uninsured children	25.8%	24.5%	27.2%
Uninsured adults	26.4%	20.9%	21.9%
Nursing home residents	4.4%	4.6%	3.7%
Children with developmental disabilities	3.9%	3.7%	3.4%
Adults with developmental disabilities	3.7%	3.6%	2.7%
Characteristics of Patients	**% of Dentists Providing Care to 11% to 20% of Patients in Caseload**		
	2009	**2010**	**2011**
Children insured by Medicaid or MIChild	**4.3%**	**5.4%**	**5.1%**
Adults covered by Medicaid	1.2%	1.0%	0.9%
Children paying on a sliding fee scale	**1.2%**	**2.0%**	1.9%
Adults paying on a sliding fee scale	1.4%	2.6%	2.3%
Uninsured children	16.8%	17.6%	14.5%
Uninsured adults	27.1%	29.5%	25.2%
Nursing home residents	1.1%	0.6%	0.9%
Children with developmental disabilities	1.1%	1.2%	1.2%
Adults with developmental disabilities	0.3%	1.0%	1.0%
Characteristics of Patients	**% of Dentists Providing Care to >20% of Patients in Caseload**		
	2009	**2010**	**2011**
Children insured by Medicaid or MIChild	5.6%	9.6%	7.0%
Adults covered by Medicaid	2.9%	4.1%	3.4%
Children paying on a sliding fee scale	0.7%	1.2%	1.4%
Adults paying on a sliding fee scale	1.1%	2.4%	1.2%
Uninsured children	13.3%	13.3%	13.5%
Uninsured adults	26.2%	27.7%	28.8%
Nursing home residents	0.5%	1.1%	0.3%
Children with developmental disabilities	0.5%	0.6%	1.0%

Source: MDCH, Private Sector Consulting, Surveys of Dentists in Michigan, 2009, 2010, 2011

In 2011, more dentists indicated they treated some percentage of uninsured children than in any of the preceding years with fewer dentists indicating that there were no uninsured children in their typical monthly caseload. There are 2 possible explanations. One is that there were more uninsured children in the population in 2011 or that uninsured children were more likely to be receiving dental services in 2011 than in 2009.

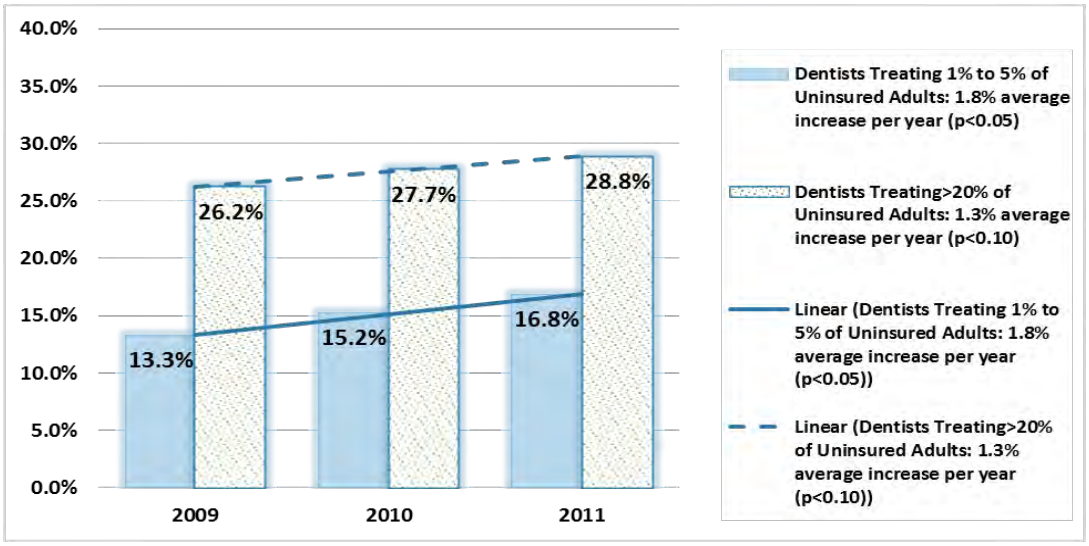
FIGURE 77. PERCENTAGE OF DENTISTS IN MICHIGAN WHO DID NOT TREAT OR ONLY TREATED A SMALL PERCENTAGE OF UNINSURED CHILDREN, 2009-2011



Source: Private Sector Consultants, Surveys of Dentists in Michigan, 2009-2011

There was also a significant increase from 2009-2011 in the percentage of dentists who indicated that either 1%-5% or greater than 20% of their caseload was uninsured adults. There were decreases in the percentage of dentists who indicated their caseloads included either 0% or 6%-20% uninsured adults. This may reflect the impact of the economic recession in 2008 leaving more adults without dental insurance due to job or benefit loss. Michigan's unemployment rates were among the highest in the nation during the recession.

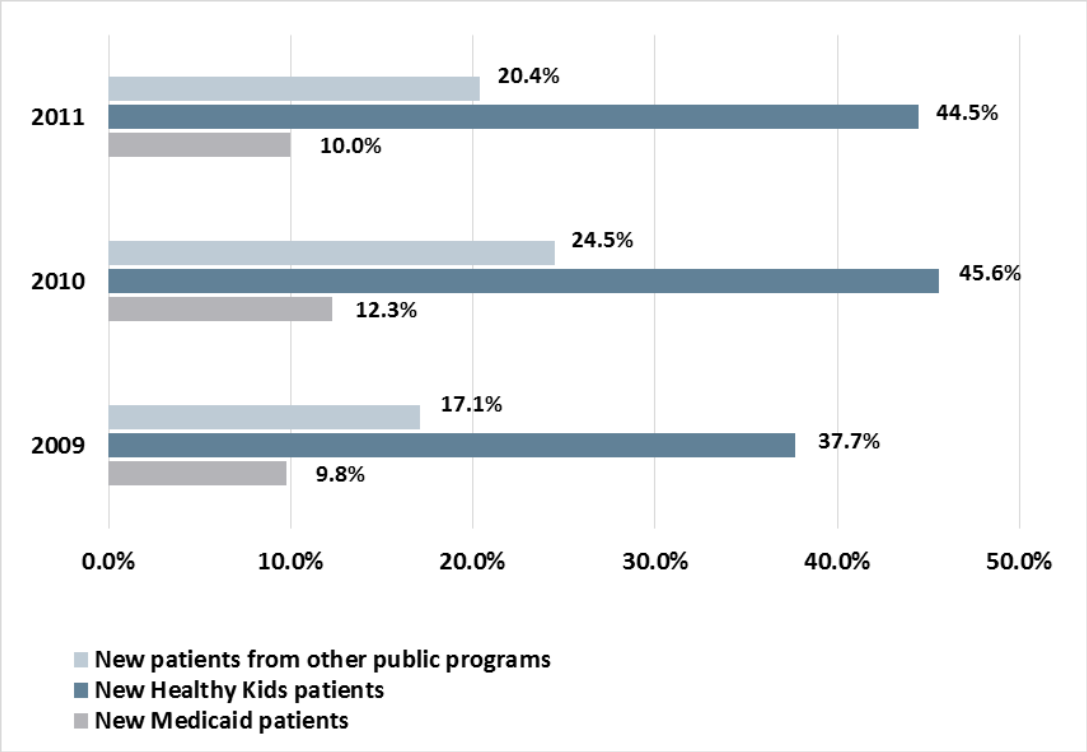
FIGURE 78. PERCENTAGE OF DENTISTS IN MICHIGAN WITH PATIENT CASELOADS OF 1%-5% OR GREATER THAN 20% UNINSURED ADULTS



Source: MDCH, Private Sector Consultants, Surveys of Dentists in Michigan, 2009-2011

The annual surveys asked dentists whether they were accepting patients insured by public insurance programs. The percentages of dentists accepting any new patients with Medicaid, HKD, or other public insurance increased between 2009-2011.[82] There was a noticeable change in the percentage of dentists accepting new patients with public dental coverage among the dentists surveyed in 2010. The percentage of dentists accepting new patients with public insurance in 2011 was lower than in 2010 but still exceeded the percentages in 2009. The expansion of the HKD program to include more counties in Michigan appears to have significantly impacted the number of dentists treating Medicaid-eligible children.

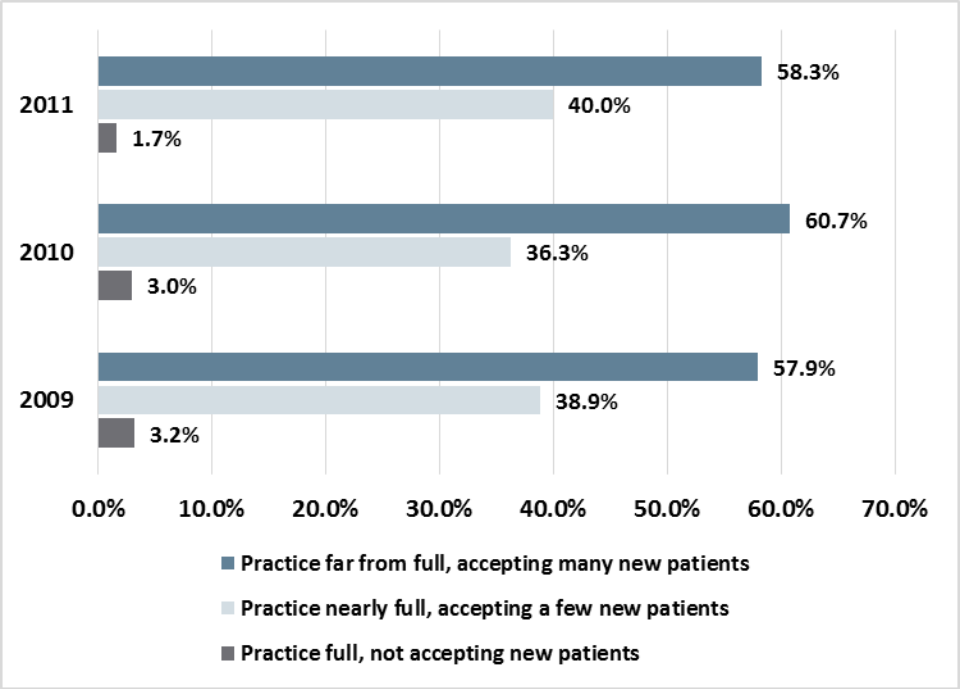
FIGURE 79. PERCENTAGE OF DENTISTS IN MICHIGAN ACCEPTING NEW PATIENTS BY TYPE OF INSURANCE, 2009-2011



Source: MDCH, Private Sector Consultants, Surveys of Dentists in Michigan, 2009-2011

Dentists' willingness to accept new patients may be influenced by a variety of factors, including increased or decreased demand from their established patient caseload affecting the dentist's ability to accept or not accept new patients. Almost 60% of Michigan dentists re-licensing in the 2009, 2010, and 2011 survey years indicated that their practices were far from full and many expressed a willingness to accept new patients.[82] This may represent a favorable circumstance for Medicaid insured patients.

FIGURE 80. PERCENT OF DENTISTS IN MICHIGAN BY WILLINGNESS TO ACCEPT NEW PATIENTS, 2009-2011



Source: MDCH, Private Sector Consultants, Surveys of Dentists in Michigan, 2009-2011

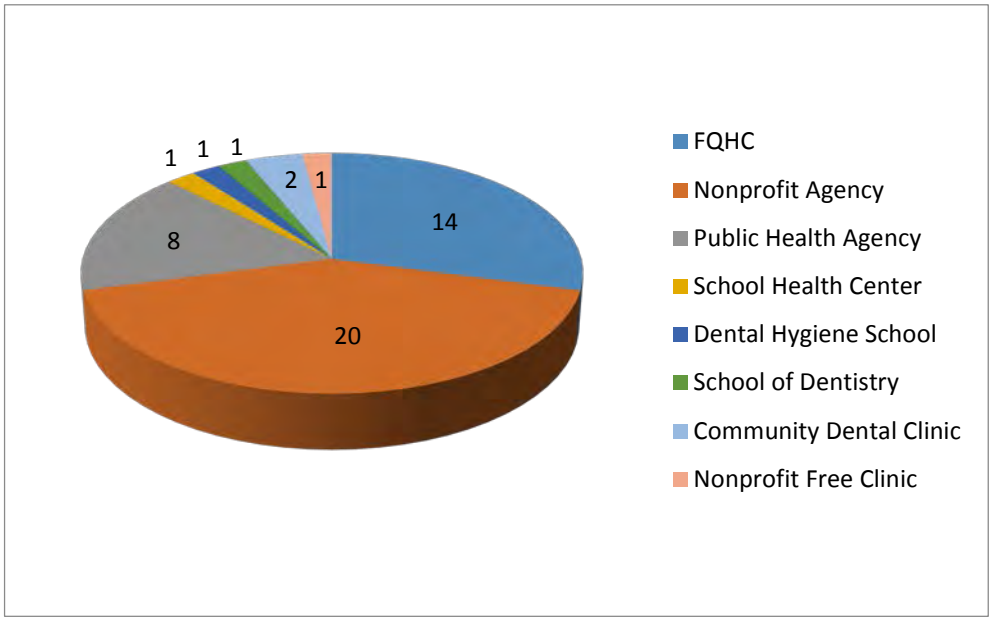
Michigan Public Act 161 Programs

In 2005, the Michigan legislature passed Public Act 161 (PA 161) to allow dental hygienists to provide preventive services to underserved patients in settings other than dental practices under the supervision of a dentist in public or non-profit programs.[83] Program participants must apply and be approved to offer preventive oral health services to unassigned and underserved populations in Michigan. Program services are provided by dental hygienists working collaboratively under the supervision of participating dentists. Once approved, programs are required to file quarterly reports describing the services provided and patients served. Each PA 161 program must complete a renewal application process every 2 years. Program participants are encouraged to refer patients for dental services if a need is identified in the screening process.

In September 2014, there were 48 programs approved as providers under PA 161. Most were under the auspices of nonprofit agencies, FQHCs, or public health agencies in Michigan.[83]

[83] MDCH. Oral Health Program. Public Health Administration Quality Improvement Project. PA 161: Public Dental Prevention Program Customer Satisfaction Process Survey, 2012. https://www.michigan.gov/documents/mdch/PA_161_Program_Report_Final_435621_7.pdf.

FIGURE 81. NUMBER OF APPROVED PA 161 PROGRAMS IN MICHIGAN, SEPTEMBER 2014, BY TYPE OF ORGANIZATION



Source: MDCH, 2014

The MDCH compiles a yearly report summing the quarterly data submitted by program participants. Between 2010-2013, there were successive increases in the number of services provided to both adults and children in Michigan despite variation both in the number of PA 161 programs and the number of providers offering services.

TABLE 11. PA 161 SERVICES TO ADULTS AND CHILDREN IN MICHIGAN BY NUMBERS OF PROGRAMS, PROVIDERS, AND PATIENTS, 2010-2013

Public Dental Prevention Program PA 161 Services and Providers	10/2010 to 09/2011	10/2011 to 09/2012	10/2012 to 09/2013
Number of PA 161 Programs	53	55	51
Number of Dental Hygienist Providers	181	204	192
Number of Dentists	93	96	92
Number of Adults Screened	2,995	4,235	5,225
Number of Adults Receiving Prophylactic Services	3,819	3,968	4,815
Number of Children Screened	19,668	28,599	29,626
Number of Children Receiving Prophylactic Services	18,852	19,855	20,784
Number of Children Receiving Dental Sealants	4,597	5,800	6,209
Number of Sealants Placed	14,160	18,365	19,807
First Molar			15,552
Second Molar			2,586
Number of Fluoride Varnish Applications	25,884	27,615	25,382
Number of Other Fluoride Applications	11,112	2,278	566
Persons with Developmental Disabilities Screened			74
Migrant Farm Workers			
Adults		369	286
Children			1,430
Number of Referrals for Dental Treatment	8,448	17,558	16,792
Of Those Referred, Number Reporting Receipt of Treatment	1,745	3,937	3,101
Number of People Referred to a Dental Home	11,000		

Source: MDCH 2010-2011, 2011-2012, 2012-2013

Services provided under PA 161 are offered in a wide variety of settings, including community clinics, school-based programs, Head Start and Early Head Start programs, WIC programs, mobile dental vans, migrant farm worker programs, and even churches and health fairs (included in "Other" below). A substantial number of services under PA 161 are being provided to children in school-based or school-affiliated oral health programs.

TABLE 12. SETTINGS WHERE SERVICES WERE PROVIDED THROUGH PA 161 PROGRAMS IN MICHIGAN, 2010-2013

Public Dental Prevention Program PA 161 - Settings	10/2010 to 09/2011	10/2011 to 09/2012	10/2012 to 09/2013
Public Health Agency, FQHC, or Community Clinic			
Adults	1,536	2,018	2,558
Children	3,640	2,628	1,783
Long-term Care or Nursing Facility			
Adults	28	63	52
School-based/School-linked Program			
Children	7,203	15,638	17,928
Fluoride Varnish Applications	14,395		
School Outreach Program			214
Children			1,315
Head Start Settings			
Children	3,570	6,160	6,285
Fluoride Varnish Applications	3,200		
Juvenile Home Settings			
Adults			10
Children			193
Other Settings - Screened			
Adults			473
Children			193
Other Settings - Prophylaxis			
Adults			1,367
Setting Unknown		1,265	984

Source: MDCH 2010-2011, 2011-2012, 2012-2013

There was a progressive increase in the average number of services provided to unassigned and underserved patients by dental hygienists in the PA 161 program during the most recent 3 years of the program.

TABLE 13. AVERAGE NUMBER OF SERVICES PROVIDED AND PATIENTS TREATED PER DENTAL HYGIENIST WORKING IN PA 161 PROGRAMS, MICHIGAN, 2010-2013

Services and Patients per PA 161 Dental Hygienist	2010 - 2011	2011-2012	2012-2013
Number of Dental Hygienist (DH) Providers	**181**	**204**	**192**
Number of Adults Screened per DH	16.5	20.8	27.2
Number of Adults Receiving Prophylactic Services per DH	21.1	19.5	25.1
Number of Children Screened per DH	108.7	140.2	154.3
Number of Children Receiving Prophylactic Services per DH	104.2	97.3	108.3
Number of Children Receiving Dental Sealants per DH	25.4	28.4	32.3
Number of Sealants Placed per DH	78.2	90.0	103.2

Source: MDCH 2010-2011, 2011-2012, 2012-2013

Indian Health Services

The American Indian population in Michigan is served by the Bemidji Area Indian Health Services in several dental clinics, including the Ellen Marshal Memorial Health Center of Bay Mills Indian Community, The Medicine Lodge of The Grand Traverse Band of Ottawa and Chippewa Indians, the Dental clinic of the Hannahville Indian Community, the Northern Health Center and the Southern Health Center on the Pine Creek Reservation of the Nottawaseppi Huron Bank of the Potawatomi, the Nimkee Memorial Wellness Center of the Saginaw Chippewa Indian Tribe, and the Sault Ste. Marie of the Sault Tribe of Chippewa Indians of Michigan, and The Pokagon Band of Potawatomi.

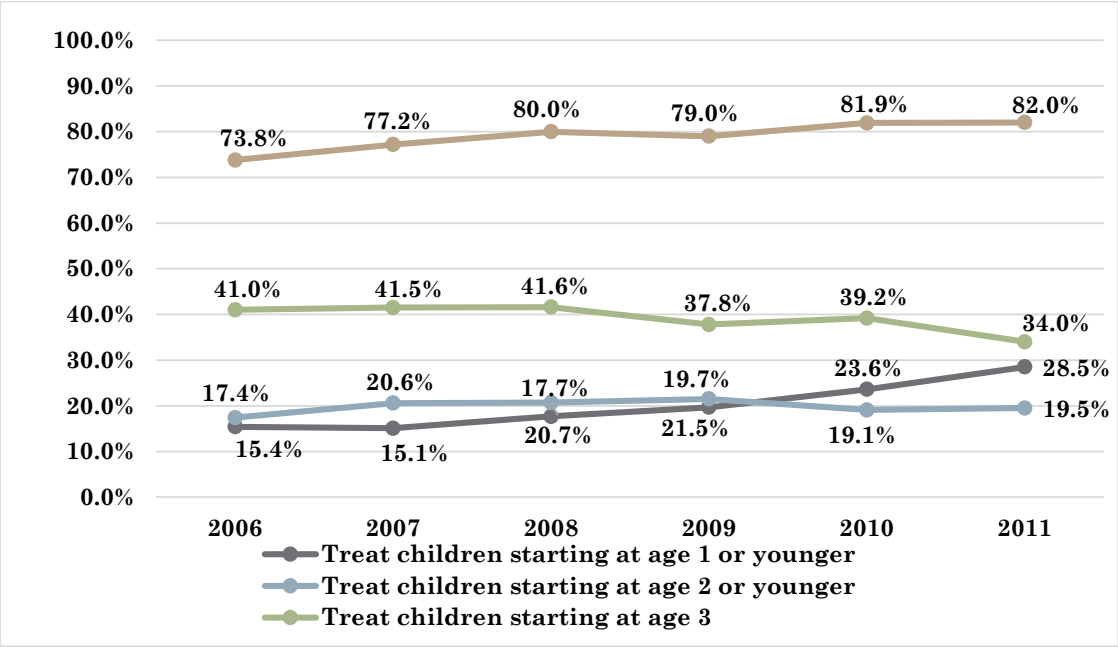
Points of Light

Points of Light is a grassroots project initiated by a pediatric dentist in Livingston County with a mission of improving the oral health of infants and young children through early prevention initiatives and by helping children both in the county and throughout Michigan to establish a dental home. The initiative engages pediatric and general dentists to participate in the care of very young children, children in Head Start and Early Head Start programs, and children with special health care needs. The program also enlists pediatricians to perform oral health screening and assessment activities and refer children for oral health services. The initiative began in 2004 in Livingston County and has extended to many locations within in Michigan and throughout the US.

The project uses a website as a tool for both professionals participating in the program and for parents of children in need of dental care. The website contains training resources for dentists and pediatricians about caring for very young children and also permits providers to enlist with the program. Parents access the website to identify providers who are willing to treat young children. The project relies on peer-to-peer recruitment.

The annual surveys of dentists conducted in Michigan as part of re-licensure revealed that there was an increase in the percentage of dentists who were treating children age 3 or younger, from 73.8% in 2006 to 82.0% in 2011, an increase of 8.2% over the 6-year period. There is increasing recognition that young children should have an initial dental visit as early as age 1 or younger. The survey data found that among dentists who were treating any young children in 2011, a higher percentage were seeing children at age 1 or younger than in the past. In 2006, 15.4% of dentists reported treating patients age 1 or younger and in 2011, 28.5% of dentists reported patients in this age group. This was an increase of 13.1% over the 6-year period.

FIGURE 82. PERCENTAGE OF DENTISTS TREATING ANY CHILDREN AGE 3 OR YOUNGER AND PERCENTAGE OF DENTISTS BEGINNING TO TREAT PATIENTS AT AGE 1, 2, OR 3



Source: MDCH, Private Sector Consultants, Surveys of Dentists in Michigan, 2006-2011

Calhoun County's Dentists' Partnership and its Pay-It-Forward Dental Access Initiative

In 2007, stakeholders in Calhoun County, Michigan convened to discuss the dental health care needs of the underserved population and develop a plan to improve access to services and improve the oral health of the 4,700 people who were living at or below the poverty level in that county.[84] At the time, approximately 110 uninsured residents of the county were seen monthly in the Bronson Battle Creek Hospital ED for acute unresolved dental pain.[85] Many in the population lacked dental insurance or the personal financial means to cover the cost of dental care. Stakeholders involved in the conversation included dentists, hospitals, free clinics, the Kellogg Community College dental hygienist program, the Calhoun Health Plan (an adult benefits waiver program through the state), and the FQHCs in the county.[84] The group was convened by Community HealthCare Connections in Battle Creek, who continue to oversee operations for the program conceived by the coalition.

The access initiative, called the Dentists' Partnership, settled on 2 pathways to improving access to oral health services, including serving the uninsured through paid and donated dental services. A key aspect of the program is shared caseload among dentists so that 1 or a few dentists are not assuming an "inequitable burden" for donated or reduced fee services.[85] To qualify for participation in the program, the person/patient must have income lower than 200% of the poverty level, but must also be ineligible for the state Medicaid program.[85] People who receive help through the partnership program must themselves provide community volunteer services at a local nonprofit agency, the duration of which is determined by the extent of needed dental services.[85] The value of the volunteer time is calculated to

[84] Pearl S; for Community HealthCare Connections. The Community Dental Access Initiative. The Dentists' Partnership. A Pay-It-Forward Dental Access Initiative, 6 year Summary Report. June 2013.
[85] Higbea RJ, Palumbo CH, Pearl SA, Byrne MJ, Wise J. Dentists' partnership of Michigan's Calhoun County: a care model for uninsured populations. *Health Affairs*. 2013;32(9):1646-1651.

coincide with the value of the dental services needed. The volunteer requirements must be completed prior to receiving a dental service, although exceptions are made for emergent care needs. [85]

Each participant is also required to complete an oral health education class with one-on-one instruction from a dental hygienist who provides a toothbrush, toothpaste, and floss to each participant.[84] A dental hygienist also provides a dental screening, prophylaxis, and x-rays, and prepares the clinical notes preliminary to the initial dental visit.[85]

Dentists agree to participate in the program at 1 of 3 levels:

- Access (providing 2 to 3 visits to eligible patients in a month);
- Partner (4 to 7 visits monthly); or
- Advocate (8 or more visits per month).

Dentists who commit to the program receive a minimum of a $1,000 commitment bonus with additional $1,000 payments as the commitment level increases. These bonuses are for equipment and supply purchases or to pay for staff training. In addition, the dentist is assured of a $35.00 no-show fee for any patient who does not arrive for a scheduled appointment.[84] Dentists are able to indicate the services they are willing to provide, including treatment planning, restorations, and extractions and may limit treatment to a particular service. As a result, a patient needing both a restoration and an extraction may see more than 1 dentist or a single dentist may provide all services.

In a 2013 report, describing the initiative, the 5-year cost of the program was $782,832 ($130,472 average annual investment). The value of donated dental services, supplies, and materials and the value of the 57,000 volunteer service hours was calculated at $2,533,959, a significant return on investment for the program.[84, 85] One indicator of improved access to dental services was a 70% decrease in the number of ED visits to the Battle Creek hospital for dental pain. Costs for the program were mainly administrative and were provided by grants from various organizations, such as the hospital, the local community foundation, and the United Way.

Use of Emergency Departments and Dental-related Hospitalizations for Treatment of Preventable Dental Conditions.

Hospital EDs are a de facto safety-net provider for people with pain and infection due to oral disease and lack a dental home. Care in the ED is estimated to cost as much as 500% more than appropriate care in a dental office. The high cost of ED use for ambulatory care sensitive dental conditions (those conditions that could be more effectively treated with appropriate outpatient services) is a major concern of policymakers and providers across the US. For the uninsured and those with insurance but without an established relationship with a dental provider, access to appropriate, timely oral health services in an acute situation is problematic.

In 2011, Delta Dental commissioned a study to describe the costs of treating dental conditions in hospitals in Michigan.[86] The study excluded outpatient services for dental conditions and used only data that described ED and inpatient treatment. The research found that in 2011 there were over 7,000 visits to EDs in Michigan for treatment of preventable dental conditions, 1,007 of which resulted in hospitalizations.[86] More than two-thirds (68.1%) of inpatient treatment for preventable dental

[86] Rosaen A, Horwitz J; for Anderson Economic Group, LLC. The Cost of Dental Related Emergency Room Visits in Michigan. April 3, 2014. http://www.midental.org/hub_sites/michigan-dental/www/assets/uploads/files/AEG-Delta-Dental_Report.pdf.

conditions in Michigan in 2011 was provided to adults age 18-65, with older adults age 65 and older (15.8%) and children age 17 and younger (16.2%) representing smaller proportions of those treated. [86]

The cost of providing care in hospitals in Michigan for these conditions was estimated to be at least $15 million.[86] The average cost of an avoidable hospitalization for dental conditions was estimated at $12,448.[86] Forty-two percent of all patient visits to EDs for dental care in the state in 2009 were for treatment of dental caries, which are difficult to effectively treat without access to an appropriately equipped dental operatory. [86] Medical personnel in EDs are not generally trained to provide oral health services so visits to EDs often result in only palliative care, such as antibiotics for infection or medications to reduce pain. Almost two-thirds of the hospitalizations for dental conditions in Michigan were for dental abscesses, which are infections of the root that may potentially have systemic implications.[86] Earlier treatment by a dentist would likely prevent the need for hospitalization for complications of progressive infection.

The report described barriers to care in the community that forced some people to EDs for treatment of dental conditions, including lack of dental insurance and not having a dental home. Structural barriers such as needing time off from work to receive care, lack of appointment availability during the evenings and on weekends, and lack of transportation to obtain care also impeded access. Oral health literacy was also important to a patient's understanding of the need for routine hygiene behaviors that support oral health and the interplay of oral health with systemic health.

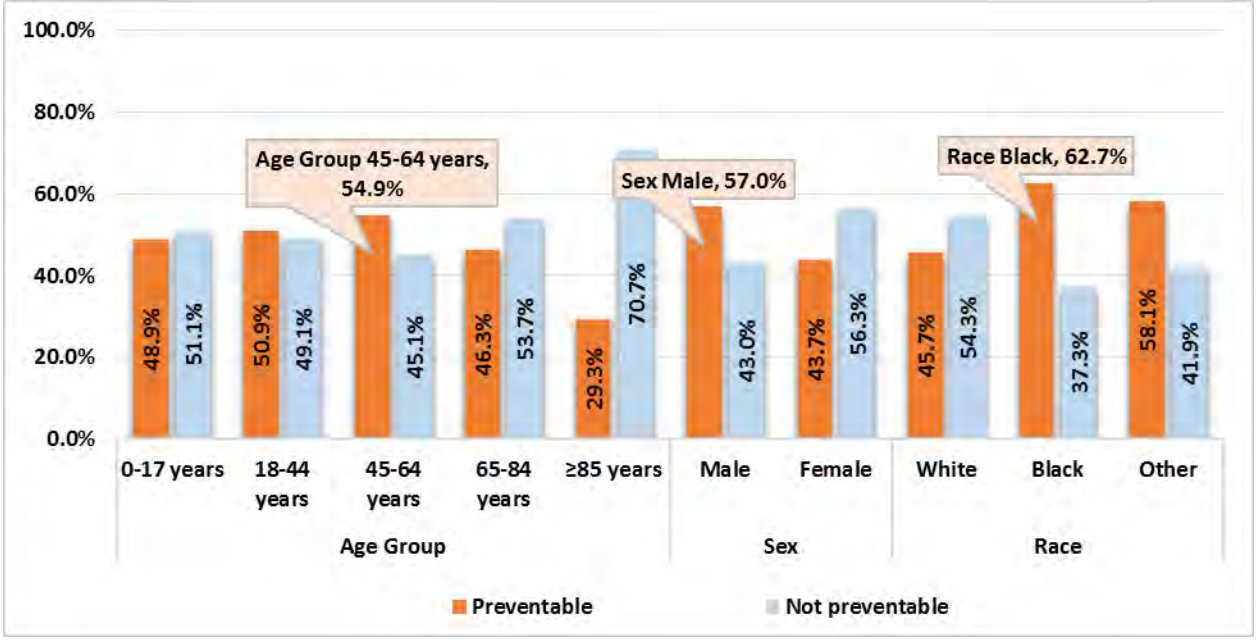
In another study, Michigan State University and the MDCH collaborated on research using hospital discharge data from the Michigan inpatient database to describe dental-related hospital admissions in Michigan in 2009-2010.[87] The goal of the research was to describe the prevalence of nontraumatic dental-related hospitalizations in the state during the 2-year period. In 2009-2010, there were 1,978 identified hospitalizations for dental conditions unrelated to dental trauma.[87] Of these conditions, 49.9% were determined to be preventable if appropriate earlier treatment had been received.[87] Preventable dental conditions included diseases of the hard tissues of the tooth, diseases of the pulp and the periapical tissue, and gingival and periodontic diseases.[87] Non-preventable conditions included diseases of the jaw, the salivary glands, and the tongue. [87]

The cost of all dental-related hospitalizations in Michigan was over $25 million in the 2-year period, $9 million of which was avoidable if the underlying dental problem had been addressed in a timely manner in an appropriate outpatient setting. [87] Forty-five percent of the hospitalizations for avoidable dental conditions were for patients with public insurance and 8.8% were for self-pay patients (assumed to be uninsured).[87]

Patients who were hospitalized in Michigan in 2009-2010 for both preventable and non-preventable dental conditions were more likely to be White (73.8%), female, (53.3%), and age 45 and younger (56.4%).[87] However, patients who were Black, male, and age 45-64 were more likely to be hospitalized for a preventable dental condition than were other groups.[87] Self-pay patients were also more likely than others to be hospitalized for a preventable dental condition. [87]

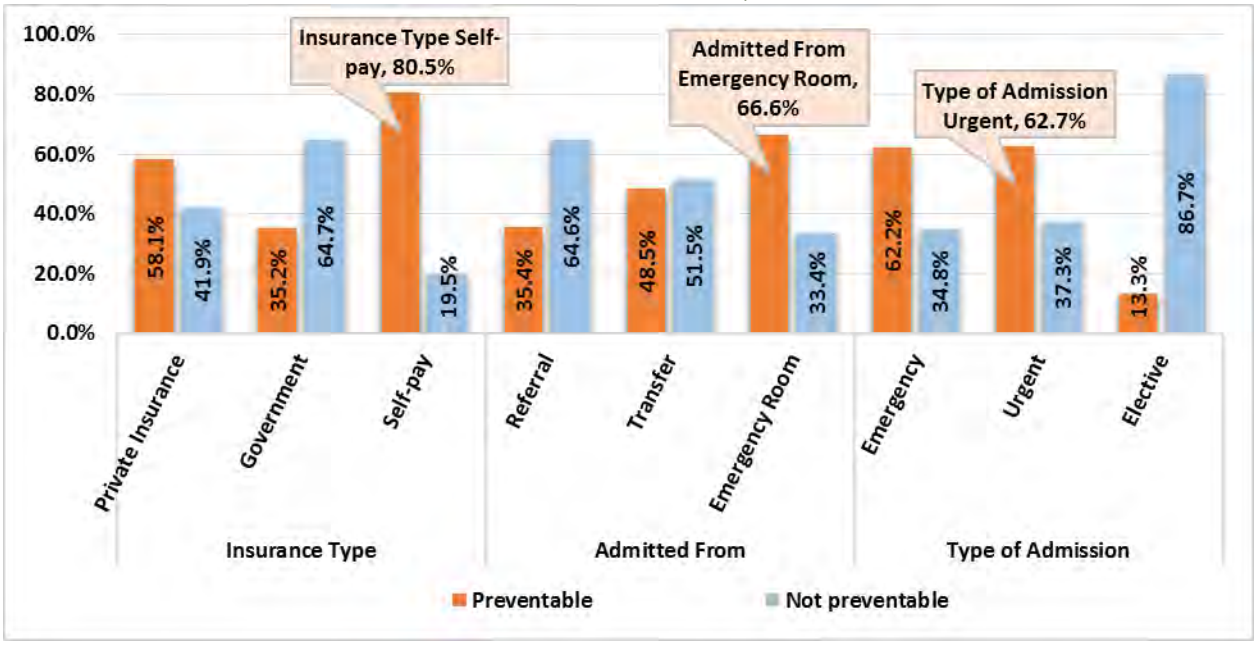
[87] Nickles A, Reeves MJ, Lyon-Callo S, Farrell C. Characteristics of Dental-Related Hospital Admissions in Michigan, 2009-2010. (PowerPoint presentation).
https://www.michigan.gov/documents/mdch/Dental_Hospital_Admissions_in_Michigan_APHA_416502_7.pdf.

FIGURE 83. DEMOGRAPHIC CHARACTERISTICS OF PATIENTS ADMITTED TO HOSPITALS IN MICHIGAN FOR PREVENTABLE AND NON-PREVENTABLE DENTAL CONDITIONS, 2009-2010*



Source: University of Michigan, MDCH, 2009-2010
*Note: all group comparisons were statistically significant at p-value<0.0001

FIGURE 84. INSURANCE AND ADMISSION TYPE OF PATIENTS ADMITTED TO HOSPITALS IN MICHIGAN FOR PREVENTABLE OR NON-PREVENTABLE DENTAL CONDITIONS, 2009-2010*



Source: University of Michigan, MDCH, 2009-2010
*Note: all group comparisons were statistically significant at p-value<0.0001
Referral - Includes physician, clinic/outpatient, and HMO referral
Transfer - Transfer from hospital, skilled nursing facility, or other health care facility

Chapter 6. The Oral Health Workforce in Michigan

According to the Department of Licensing and Regulatory Affairs in Michigan, in 2014, there were 7,664 licensed dentists, 10,536 licensed dental hygienists, and 1,726 licensed dental assistants in the state. These numbers included professionals who were licensed in Michigan but whose primary practice was out of state or professionals and others who maintained a license but were not professionally active.

When licensure lists were used to locate currently licensed oral professionals in Michigan (excluding those with out of state addresses) by the counties listed in the licensure files, there were 6,661 general dentists, 997 specialty dentists, 9,557 dental hygienists, and 1,653 dental assistants with addresses in Michigan in July 2014.

TABLE 14. NUMBER OF LICENSED ORAL HEALTH PROFESSIONALS WITH ADDRESSES IN MICHIGAN BY TYPE AND COUNTY, 2014

County	Dental Assistant	Dental Hygienist	Dentist	Endo-dontist	Oral Surgeon	Ortho-dontist	Pedo-dontist	Perio-dontist	Prostho-dontist	Total
Alcona	5	5	4	0	0	0	0	0	0	14
Alger	0	7	5	0	1	0	0	0	0	13
Allegan	24	97	31	0	1	0	0	1	0	154
Alpena	2	32	20	1	0	2	0	0	0	57
Antrim	9	20	13	0	0	0	0	0	0	42
Arenac	6	29	5	0	0	0	0	0	0	40
Baraga	0	5	6	0	0	0	1	0	0	12
Barry	13	53	17	0	0	0	0	0	0	83
Bay	86	135	55	2	1	2	1	1	0	283
Benzie	15	16	6	0	0	0	0	0	0	37
Berrien	66	114	83	2	3	3	1	1	0	273
Branch	2	49	20	0	1	1	0	0	0	73
Calhoun	11	141	78	1	3	2	0	2	0	238
Cass	8	31	11	0	0	0	0	0	0	50
Charlevoix	8	28	22	1	1	0	0	0	0	60
Cheboygan	2	24	10	0	0	0	0	0	0	36
Chippewa	2	21	22	0	0	2	0	0	0	47
Clare	5	19	7	0	0	0	0	0	0	31
Clinton	16	81	26	0	0	1	1	0	0	125
Crawford	2	4	6	0	0	0	0	0	0	12
Delta	1	31	25	1	0	1	0	1	0	60
Dickinson	1	21	28	0	0	3	0	0	0	53
Eaton	32	138	64	0	3	4	2	1	0	244
Emmet	5	41	37	2	3	2	0	2	1	93
Genesee	134	567	211	6	4	8	9	7	1	950
Gladwin	4	17	9	0	0	0	0	0	0	30
Gogebic	0	9	8	0	0	0	0	0	0	17
Grand Traverse	82	106	93	4	6	6	3	3	0	303
Gratiot	9	31	15	0	0	1	0	0	0	56
Hillsdale	3	38	15	0	0	1	0	0	0	57
Houghton	1	15	20	0	0	1	0	0	0	37
Huron	11	34	15	0	0	0	0	0	0	60
Ingham	45	241	191	8	7	5	5	6	2	511
Ionia	24	74	29	0	0	1	0	0	0	128
Iosco	2	21	14	0	0	0	0	0	0	37
Iron	2	5	4	0	0	0	0	0	0	11
Isabella	7	36	26	0	1	1	0	0	0	71
Jackson	25	135	80	2	4	4	4	3	0	257
Kalamazoo	15	299	180	7	9	6	5	4	1	526
Kalkaska	12	18	5	0	0	0	0	0	0	35

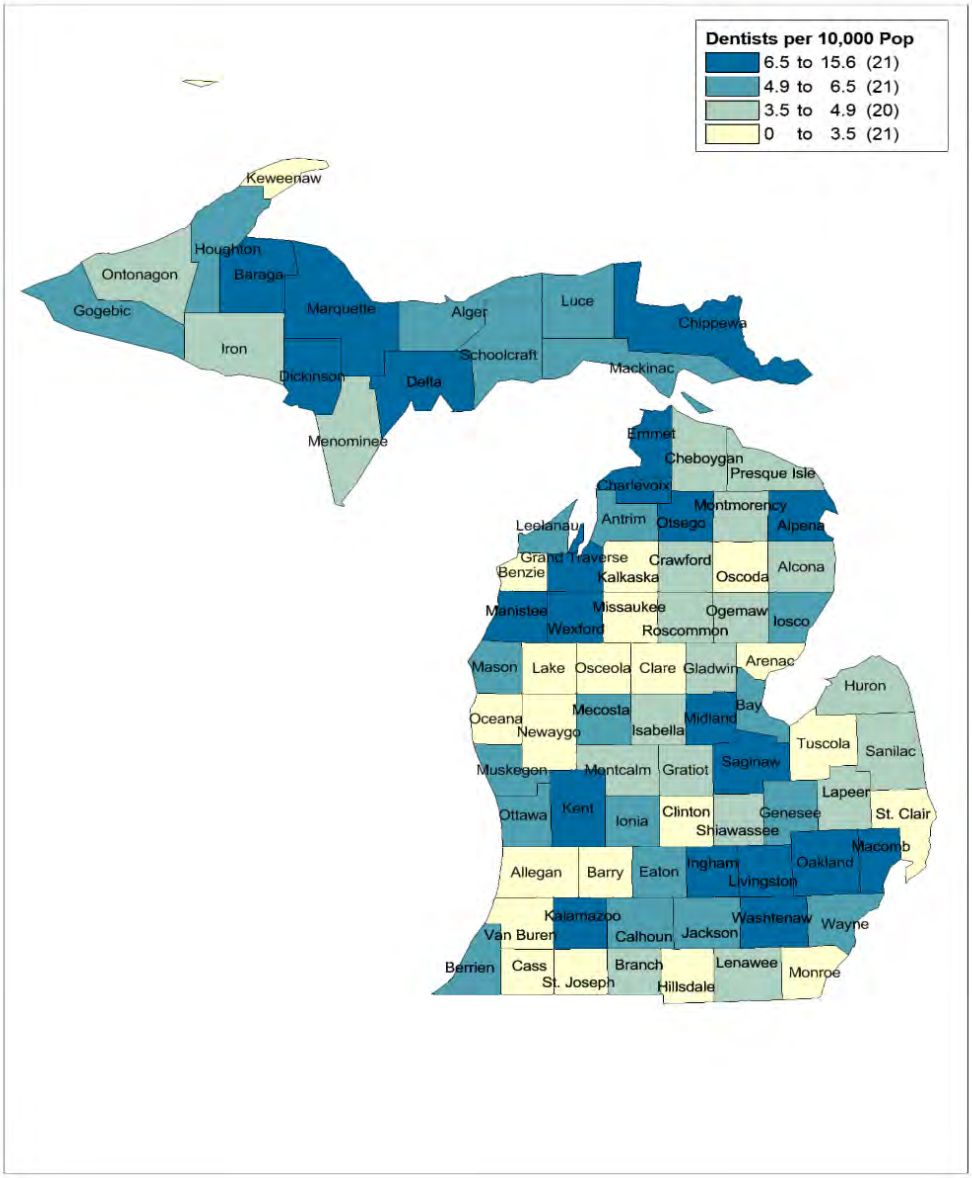
(CONTINUED)

County	Dental Assistant	Dental Hygienist	Dentist	Endo-dontist	Oral Surgeon	Ortho-dontist	Pedo-dontist	Perio-dontist	Prostho-dontist	Total
Kent	185	704	427	11	16	27	11	8	2	1,392
Keweenaw	2	2	0	0	0	0	0	0	0	4
Lake	0	3	2	0	0	0	0	0	0	5
Lapeer	25	127	35	1	1	1	0	0	0	190
Leelanau	5	12	13	0	1	0	0	0	0	31
Lenawee	19	101	37	0	1	1	0	0	0	159
Livingston	40	220	119	4	4	8	3	3	3	404
Luce	2	3	3	0	0	0	0	0	0	8
Mackinac	1	7	7	0	0	0	0	0	0	15
Macomb	51	922	596	9	20	28	9	9	2	1,646
Manistee	10	24	15	0	0	1	0	0	0	50
Marquette	11	62	54	1	2	4	1	1	0	136
Mason	3	23	17	0	0	1	0	0	0	44
Mecosta	6	59	23	0	0	1	0	0	0	89
Menominee	0	8	11	0	0	1	0	0	0	20
Midland	23	69	64	1	3	3	0	1	0	164
Missaukee	1	14	4	0	0	0	0	0	0	19
Monroe	6	139	52	1	2	4	0	0	0	204
Montcalm	23	58	26	0	0	0	0	0	0	107
Montmorency	0	5	4	0	0	0	0	0	0	9
Muskegon	23	129	83	2	5	2	1	0	0	245
Newaygo	1	18	16	0	0	0	0	0	0	35
Oakland	78	1,466	1,462	37	44	73	27	39	17	3,250
Oceana	0	19	7	0	0	0	1	0	0	27
Ogemaw	5	15	9	0	0	0	0	0	0	29
Ontonagon	0	4	3	0	0	0	0	0	0	7
Osceola	0	17	4	0	0	0	0	0	0	21
Oscoda	0	4	2	0	0	0	0	0	0	6
Otsego	7	32	16	1	2	1	0	0	0	59
Ottawa	77	312	156	5	5	11	4	1	0	571
Presque Isle	6	17	5	0	0	0	0	0	0	28
Roscommon	2	14	10	0	0	0	0	0	0	26
Saginaw	73	204	131	5	6	6	2	3	3	433
Saint Clair	28	233	88	2	3	8	4	3	0	369
Saint Joseph	5	37	16	0	0	1	0	0	0	59
Sanilac	14	43	16	0	0	0	0	0	0	73
Schoolcraft	1	2	4	0	0	0	0	0	0	7
Shiawassee	24	88	32	0	1	2	0	0	0	147
Tuscola	24	67	13	0	0	2	0	0	0	106
Van Buren	10	72	23	0	0	1	1	0	0	107
Washtenaw	77	271	522	16	13	28	16	21	12	978
Wayne	69	1,100	995	21	21	36	12	23	8	2,286
Wexford	19	43	23	0	0	2	0	1	0	88
Total All Counties	**1,653**	**9,557**	**6,661**	**154**	**198**	**310**	**124**	**145**	**52**	**18,854**

Source: Michigan Licensure Lists, 2014. Note: The numbers may vary from other sources due to some missing data.

The distribution of oral health professionals is a concern in many states with dentists often locating in more populated areas where the potential to build a successful practice is supported by a sufficient population with adequate resources to pay for care. The general preference of dentists for practice sites in metropolitan areas compromises access for populations living in rural areas and densely populated inner cities. The following maps are visual representations of the distribution of oral health professionals in Michigan by county based on the ratio of dental professionals to the county population. In 20 counties, there were fewer than 3.5 dentists per 10,000 population. Nationally, there are approximately 6.2 dentists working in dentistry per 10,000 population (62.04 per 100,000 population).[88] However, the ratio of dentists actually providing clinical care is smaller than this number (see Figure 90).

FIGURE 85. RATIO OF DENTISTS IN MICHIGAN PER 10,000 POPULATION BY COUNTY

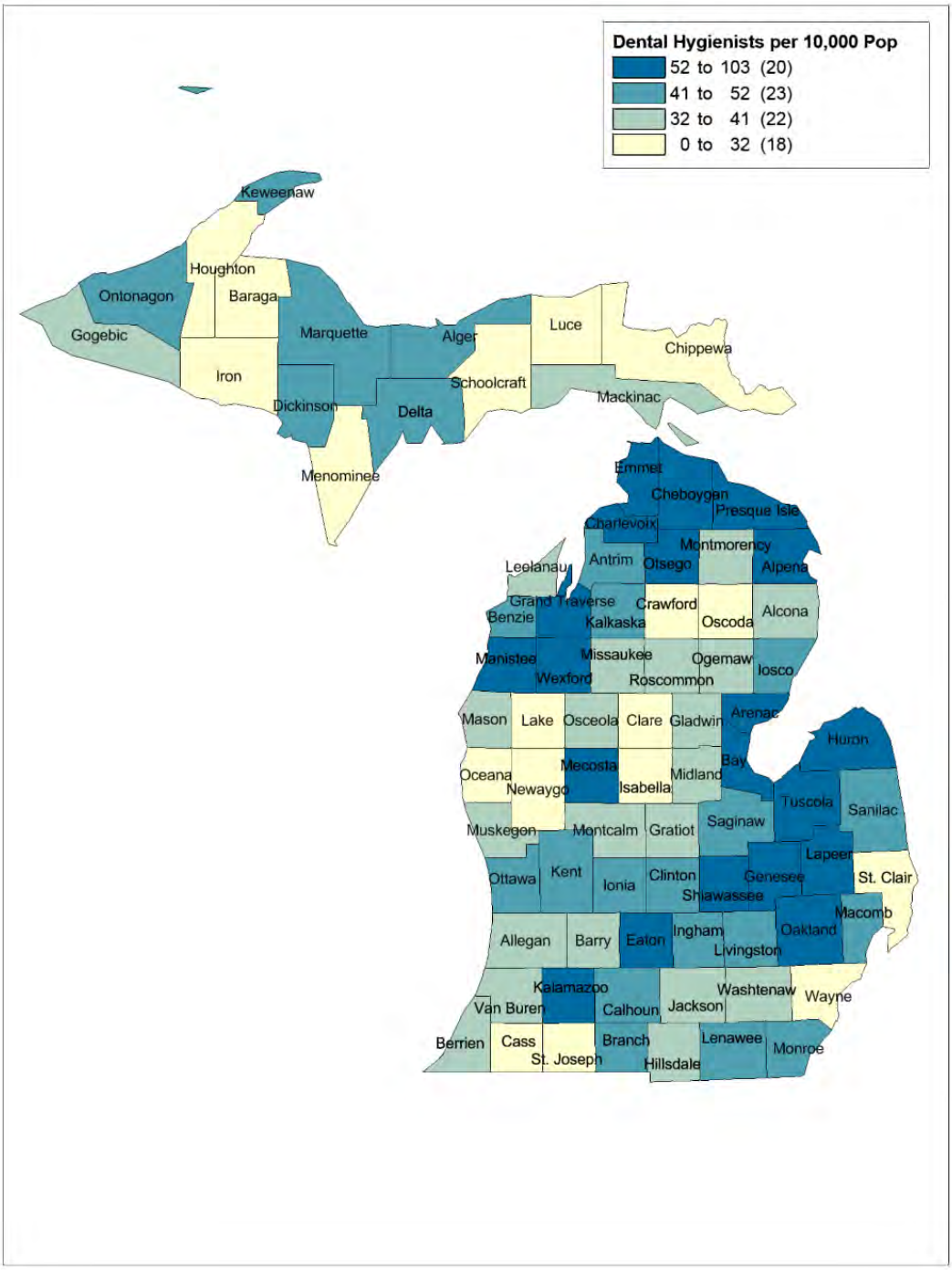


Source: Michigan Licensure Lists, 2014

[88] American Dental Association. Dentist Supply in the US: 1993-2011. Table 5: Dentists per 100,000 Population (by State) - Dentists Working in Dentistry. 2011.

The distribution of dental hygienists across Michigan is also variable with the ratio of professionals to population varying by county.

FIGURE 86. RATIO OF DENTAL HYGIENISTS IN MICHIGAN PER 10,000 POPULATION BY COUNTY, 2014



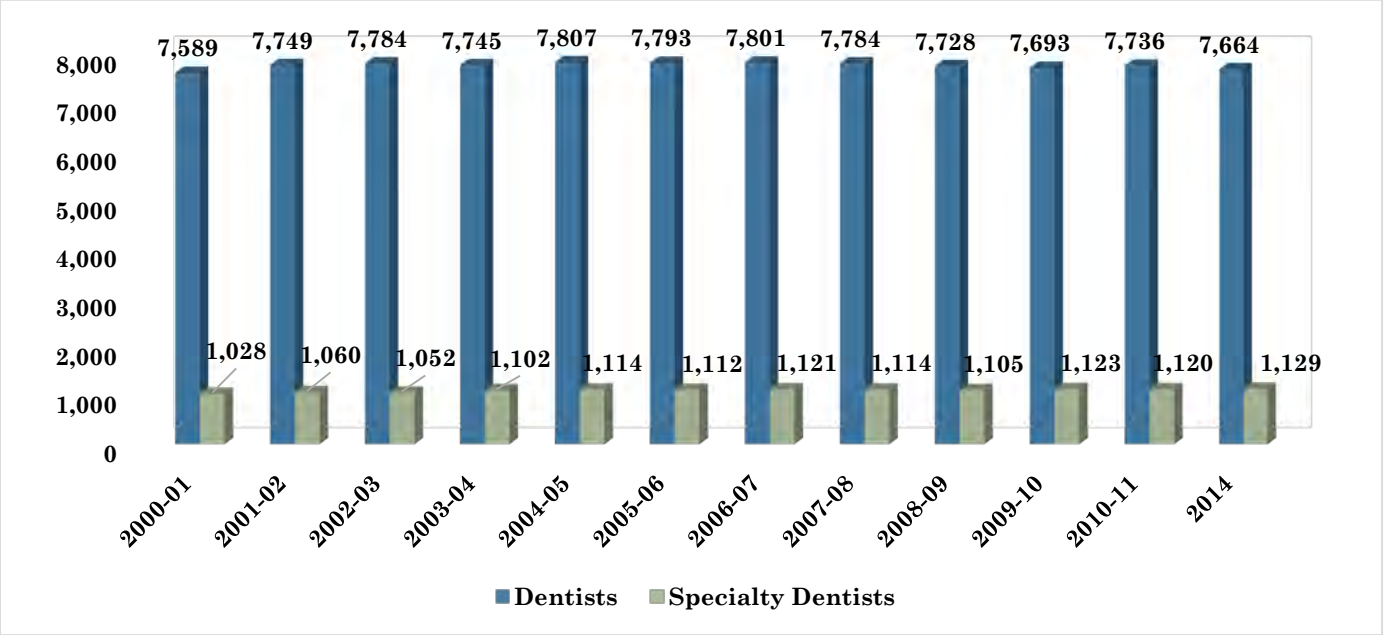
Source: Michigan Licensure Lists, 2014

The Michigan Department of Consumer and Industry Services Bureau of Health Services publishes an annual report that compiles data from each of the health professions regulatory boards in the state.

These reports describe board structures and membership, the number of disciplinary reviews and sanctions issued in the year, and the number of applications received and licenses issued annually, including a summary of total professional licenses in effect in each professional discipline. The following figure and table were compiled from those data.

The annual reports from the Bureau of Health Services contain yearly summaries of professional counts from the Michigan Board of Dentistry.[89] Past data from these summaries indicated there were more dentists licensed in Michigan in 2010-2011 than in 2001-2002 and that the number of dental specialists licensed to practice in the state had also increased over time. The number of licensed dentists in the state peaked in 2004-2005 with a decreasing number of licensed dentists over subsequent years. These decreases may reflect the impact of the economic recession in Michigan at a time when dentists across the US reported decreased utilization of dental services due to economic constraints on patients, such as joblessness and loss of insurance. In addition, the dental profession nationally is aging with the population so departures and retirements from dentistry by older dentists may also have contributed to the decreasing numbers of dentists since the peak year in 2004-2005.

FIGURE 87. THE NUMBER OF DENTAL LICENSES AND SPECIALTY DENTAL LICENSES IN MICHIGAN, 2000-2014



Source: Michigan Department of Consumer and Industry Services, Bureau of Health Professions.
(Note: The number of licenses reported for 2014 was taken from a published report of the Michigan Department of Licensing and Regulatory Affairs rather than from the Michigan Board of Dentistry. Data between 2011-2014 were unavailable.)

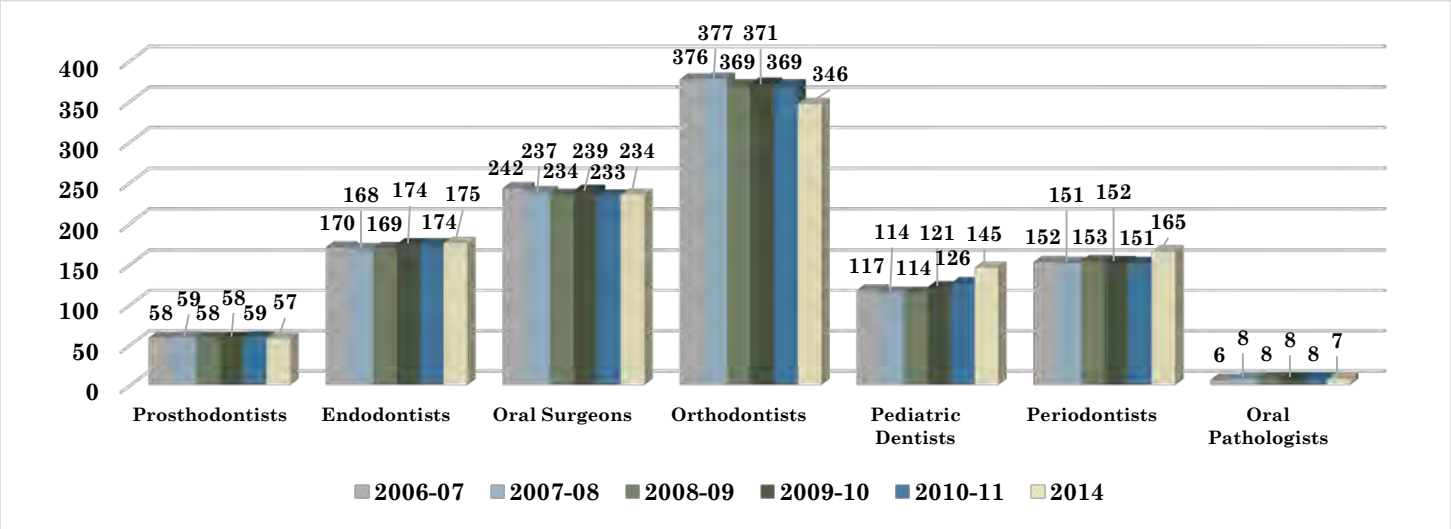
The data on dental specialists in Michigan showed increases in the number of pediatric dentists, endodontists, and periodontists between 2006-2014 with a decrease in the number of oral surgeons and orthodontists in Michigan. Overall, decreases in specialty licenses were mostly small, except for orthodontics. Orthodonture is generally provided to adolescents, an age group that has decreased in number nationally in recent years. In addition, new technology has shortened the average time needed for orthodontic adjustments and alignments for some patients increasing available capacity and

[89] Michigan Department of Consumer and Industry Services, Department of Licensing and Regulatory Affairs. Health Professions Licensing Division Michigan Department Bureau of Health Professions. http://www.michigan.gov/lara/0,4601,7-154-35299_63294_63303---,00.html.

efficiency in orthodontic practices. The Medicaid program in Michigan covers orthodonture only for very high-need patients.

Other demographic trends have increased demand for dental specialists who treat older patients, including periodontists. Some factors contributing to increased demand for periodontists are the aging of the baby boom population and the high rates of diabetes and heart disease in the population, both of which have impacts on oral health and demand for dental specialty services.

FIGURE 88. THE NUMBER OF SPECIALTY DENTAL LICENSES BY YEAR AND SPECIALTY, 2006-2014



Source: Michigan Department of Consumer and Industry Services, Bureau of Health Professions.
(Note: The number of licenses reported for 2014 was taken from a published report of the Michigan Department of Licensing and Regulatory Affairs rather than from the Michigan Board of Dentistry. Data between 2011-2014 were unavailable.)

Trends over Time in Supply of Dentists in Michigan

A review of the number of new applications for licensure and current licenses to practice dentistry as reported by the Board of Dentistry in Michigan to the Department of Licensing and Regulatory Affairs revealed that the supply of dentists remained relatively flat for a decade (2000-2011), with only a slight increase in supply (1.9%) after 2000. Contributing factors may have included the depressed economy in Michigan, the rate of outbound migration from the state in recent years, and the current slow population growth, any of which might have depressed demand for dental services and limited the supply of new dentists locating practices in Michigan.

TABLE 15. NUMBER OF NEW APPLICANTS FOR LICENSURE AND TOTAL NUMBER OF DENTAL LICENSES IN MICHIGAN, 2000-2011

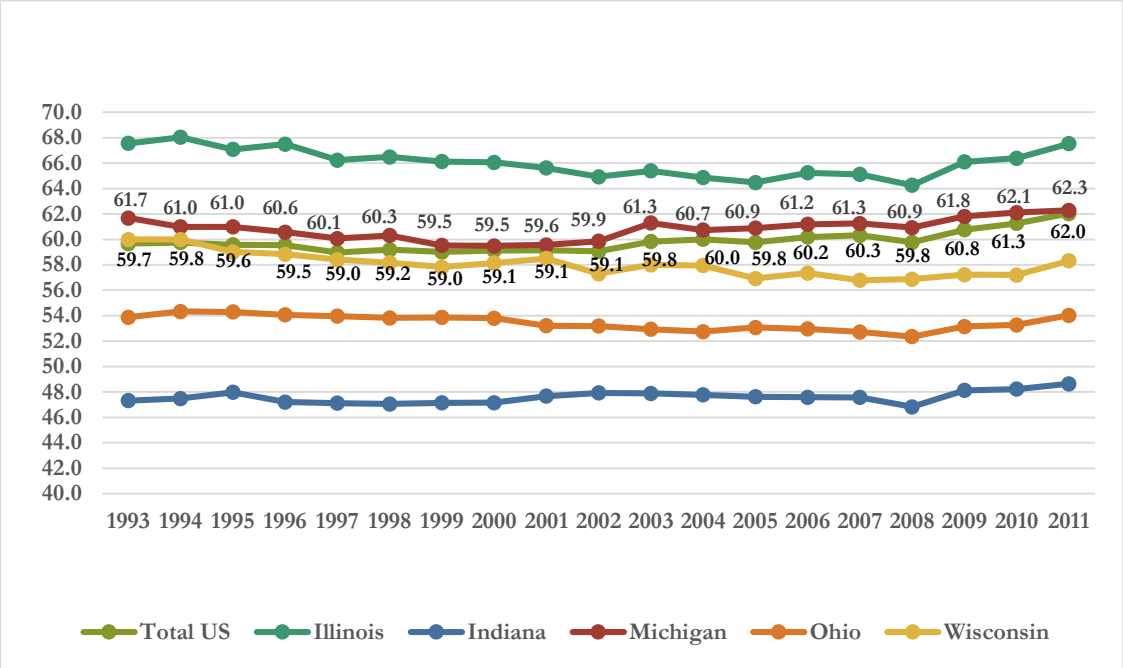
Dentists	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Net Change 2000-2011
Applications Received	345	270	258	260	250	255	203	213	189	184	232	
Number of Licensees	7,589	7,749	7,784	7,745	7,807	7,793	7,801	7,784	7,728	7,693	7,736	
New applicants as % of supply in previous year		3.6%	3.3%	3.3%	3.2%	3.3%	2.6%	2.7%	2.4%	2.4%	3.0%	
Net gain or loss in # over previous year		160	35	-39	62	-14	8	-17	-56	-35	43	147
Supply as a % of supply in previous year		102.1%	100.5%	99.5%	100.8%	99.8%	100.1%	99.8%	99.3%	99.5%	100.6%	101.9%

Source: Michigan Department of Consumer and Industry Services, Department of Licensing and Regulatory Affairs

Supply of Dentists in Michigan, the Surrounding States, and the US, 1993-2011

The ratio of dentists working in dentistry (including all settings such as education, research, military, government, hospitals, clinical care, etc.) to 100,000 population has remained relatively stable over time in the US. In 2011, there were 62.0 dentists working in dentistry per 100,000 population, up from 59.8 per 100,000 population in 1993. The ratio of dentists working in dentistry to 100,000 rose in Michigan from 1993 (61.7) to 2011 (62.3). The Michigan ratio experienced decline from 1994-2005 with a rebound in subsequent years. Several neighboring states also experienced similar declines after 1995. Wisconsin is the only neighboring state that experienced a net decline in the ratio of professionally active dentists to population from 1993 (60.0) to 2011 (58.3).[88]

FIGURE 89. RATIOS OF DENTISTS WORKING IN DENTISTRY TO 100,000 POPULATION IN MICHIGAN, SURROUNDING STATES, AND THE US, 1993-2011

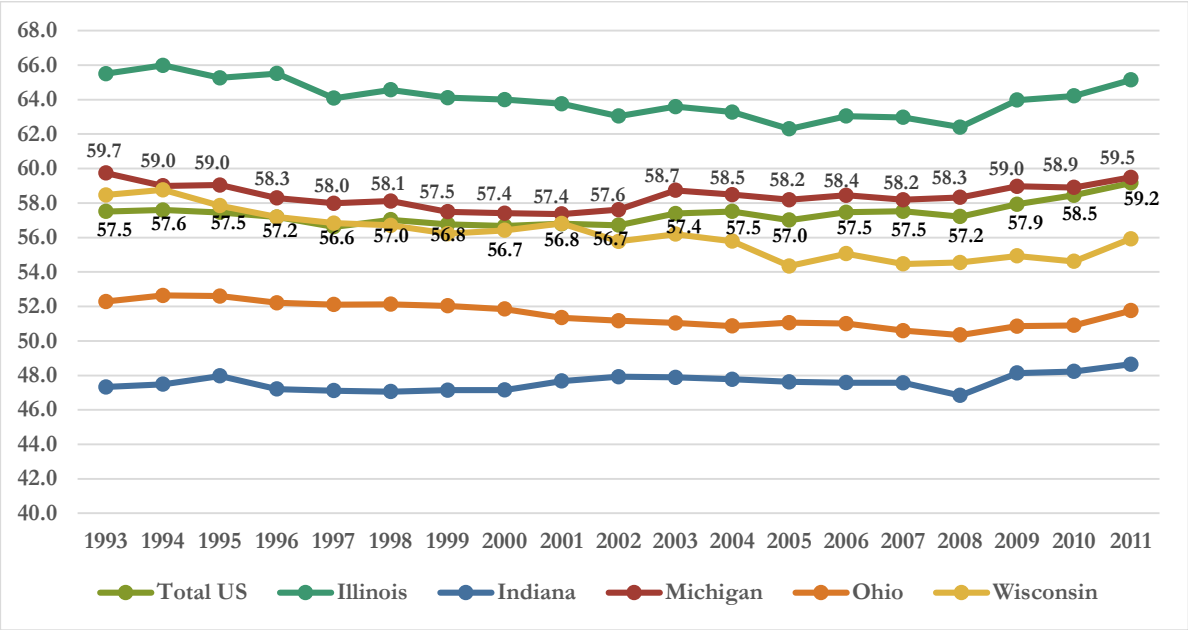


Source: ADA, Dentist Supply in the US: 1993-2011. Table 5: Dentists per 100,000 – Dentists Working in Dentistry.

The ratio of dentists in clinical practice to population increased in the US from 57.5 in 1993 to 59.2 in 2011. [90] These ratios included dentists providing clinical services in private practices, government agencies, hospitals, and Veterans Affairs settings, among others. The ratio of clinically practicing dentists to population in Michigan in 2011 (59.5) was similar to that in 1993 (59.7), reflecting limited growth in supply of dentists in clinical practice relative to the population in the state. There was a general decline in the ratio in Michigan until 2011 when the ratio rebounded. In 2011, Michigan's ratio of clinically practicing dentists to population (59.5) was marginally higher than in the US (59.2). Illinois was the only neighboring state to appreciably exceed the national ratio with a clinical dentist to population ratio in 2011 of 65.1. Once again, Wisconsin experienced a noticeable decline in this ratio between 1993 (58.5) and 2011 (55.9).

[90] American Dental Association. Dentist Supply in the US: 1993-2011. Table 6 Dentists per 100,000 Population (by State) – Dentists Providing Clinical Care. 2011.

FIGURE 90. RATIOS OF DENTISTS PROVIDING CLINICAL CARE TO 100,000 POPULATION IN MICHIGAN, SURROUNDING STATES, AND THE US, 1993-2011



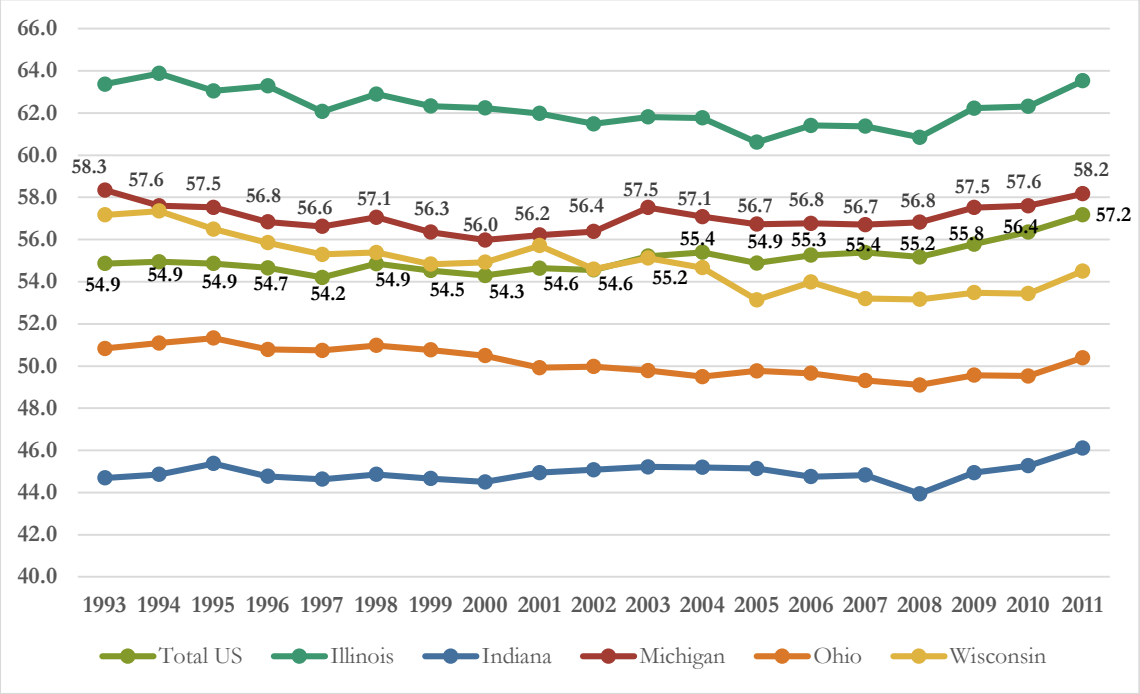
Source: ADA, Dentist Supply in the US: 1993-2011. Table 6: Dentists per 100,000 Population - Dentists Providing Clinical Care.

Most dental care in the US is provided in the offices of private practice dentists with about 92% of professionally active dentists working in this practice model.[23] Maintaining an adequate supply of private practice dentists per population is therefore, important to supporting access to care. The ratio of private practice dentists to 100,000 population in Michigan declined beginning in 1993, experiencing both rebound and retrenchment until 2010.[91] Still, during the 15-year period, the ratio of dentists in private practice to 100,000 population in Michigan exceeded the comparable ratio for the US in every year. By 2011, the ratio of private practice dentists to population in Michigan (58.2) had increased to a level similar to that in 1993 (58.3).

The trend in private practice dentists per 100,000 population across the US from 1993-2011 included small declines in the annual ratios in the late 1990s with increases beginning in 1998. Subsequent changes in the supply of dentists resulted in an upward trend in the ratios of dentists per population until 2011. In that year, the national ratio was 57.2 private practice dentists to 100,000 population in the US.[91] States neighboring Michigan experienced varying supply/population trends over the 15 years, with Illinois and Ohio having similar ratios of private practice dentists to population in 2011 compared to 1993. Indiana gained dentists over the time period moving from a ratio of 44.7 dentists in private practice to 100,000 population in 1993 to 46.1 in 2011.[91] Conversely, Wisconsin experienced a loss moving from 57.2 in 1993 to 54.4 in 2011.[91] Illinois and Michigan were the only states among the 5 states in the region to retain a private practice dentist ratio to population that was higher than the national ratio.

[91] American Dental Association. Dentist Supply in the US: 1993-2011. Table 7: Dentists per 100,000 Population – Dentists in Private Practice. 2011.

FIGURE 91. RATIOS OF DENTISTS IN PRIVATE PRACTICE TO 100,000 POPULATION IN MICHIGAN, SURROUNDING STATES, AND THE US, 1993-2011



Source: ADA, Dentist Supply in the US: 1993-2011. Table 7: Dentists per 100,000 Population – Dentists in Private Practice.

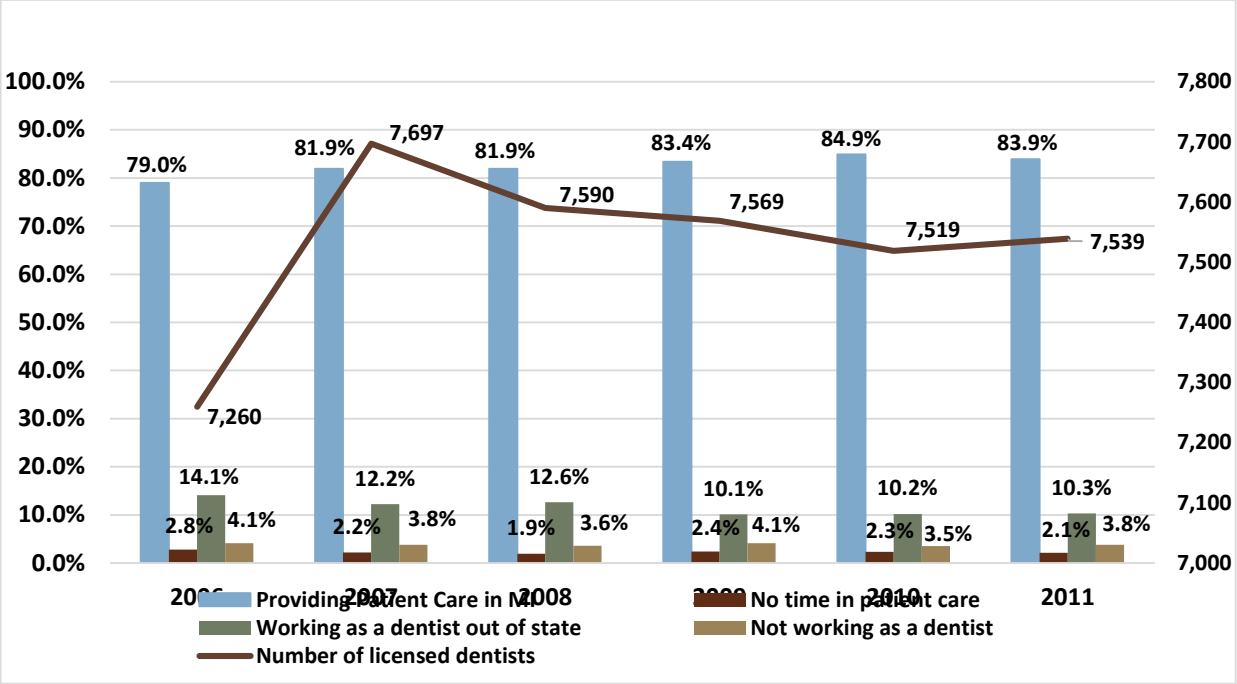
Surveys of Oral Health Professionals in Michigan

For several years, Public Sector Consultants conducted surveys of dentists and dental hygienists in Michigan on behalf of the MDCH to understand the demographics, geography, and practice of dental professionals in the state. These surveys were conducted as part of the re-licensure process that occurs over a 3-year period. As a result, in each year the survey was fielded to about one-third of the licensed oral health professionals in the state. Response rates varied by year. The following describes the findings from these surveys over time.

Dentists

While the percentage of licensed dentists who were actively practicing dentistry in Michigan increased over the 6 years of the survey (2006-2011), the actual number of licensed dentists peaked in 2007 and declined until 2010. There was a slight increase in the number of licensed dentists in the state in 2011. Over the 6-year period, a higher percentage of licensed dentists indicated they were actively practicing in Michigan with a decreasing percentage of licensed dentists indicating they were primarily practicing out of the state.

FIGURE 92. NUMBER OF LICENSED DENTISTS AND PERCENTAGE ACTIVELY PRACTICING IN MICHIGAN, 2006-2011



Source: MDCH, Public Sector Consultants, Surveys of Dentists 2006-2011

The percentage of dentists practicing general dentistry increased from 2006-2010, with decreases in the percentage of dentists practicing specialty dentistry in the 5-year period. However, in 2011 the percentage of dentists practicing general dentistry decreased and the percentage of dentists practicing in a dental specialty increased.

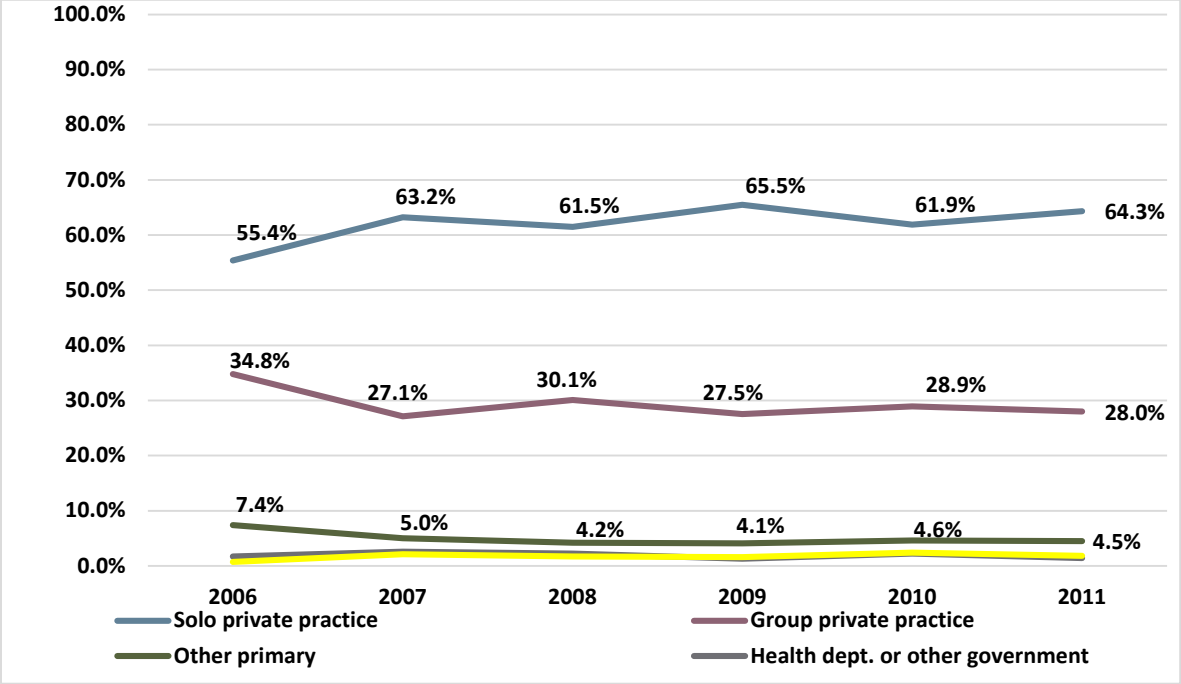
TABLE 16. PERCENTAGE OF DENTISTS PRACTICING GENERAL OR SPECIALTY DENTISTRY AND TYPE OF SPECIALTY, 2006-2011

Type of Practice	2006	2007	2008	2009	2010	2011
General Dentistry	**78.1%**	**82.5%**	**83.1%**	**85.3%**	**86.8%**	**82.8%**
Specialty Dentistry	**21.8%**	**17.4%**	**16.9%**	**14.6%**	**13.3%**	**17.1%**
Orthodontics	6.1%	5.5%	5.5%	5.8%	4.4%	4.3%
Oral and maxillofacial surgery	4.3%	2.8%	2.2%	2.5%	1.6%	1.9%
Endodontics	3.2%	2.5%	2.0%	1.8%	1.9%	2.6%
Prosthodontics	3.0%	1.5%	2.5%	1.1%	0.8%	2.2%
Pediatric dentistry	2.2%	1.6%	2.2%	1.8%	1.8%	2.6%
Periodontics	2.3%	2.2%	1.9%	1.4%	1.7%	2.4%
Public Health	0.7%	1.3%	0.6%	0.2%	1.1%	1.1%

Source: MDCH, Public Sector Consultants, Surveys of Dentists in Michigan 2006-2011

According to the annual re-licensure surveys, a higher percentage of licensed dentists were primarily practicing in solo private dental practices in 2011 than in 2006, with a corresponding decrease in the percentage of dentists practicing in group private practice or other settings during that time. In 2011, the percentage of dentists practicing in a community-based organization (1.8%) or a health department or other government agency (1.4%) was a small proportion of licensed dentists in Michigan.

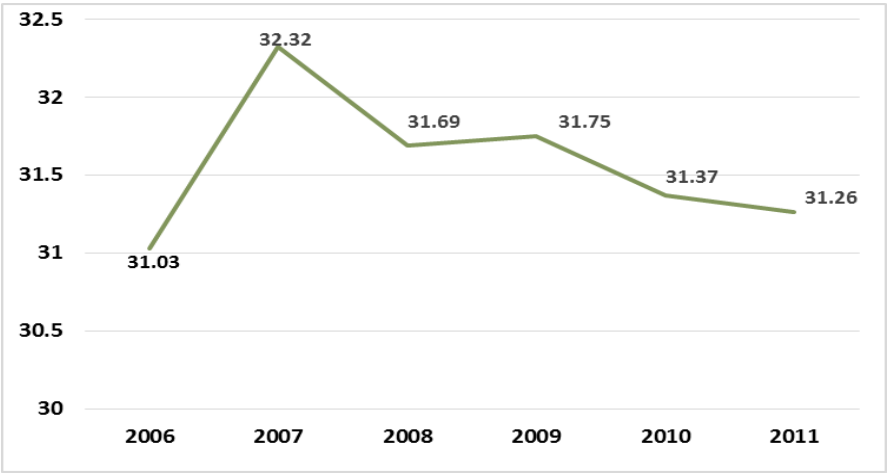
FIGURE 93. PERCENTAGES OF LICENSED DENTISTS IN MICHIGAN BY PRIMARY PRACTICE SETTING, 2006-2011



Source: MDCH, Public Sector Consultants, Surveys of Dentists in Michigan 2006-2011

While there was little variation from 2006-2011 in average hours worked per week reported by dentists responding to the annual survey, there was a peak in average hours worked in 2007 with subsequent annual declines. Again, demand for dental services weakened after the economic recession, which likely affected average hours worked.

FIGURE 94. AVERAGE WEEKLY HOURS WORKED BY DENTISTS IN MICHIGAN, 2006-2011



Source: MDCH, Private Sector Consultants, Surveys of Dentists in Michigan 2006-2011

Demographics

According to the data collected in the annual surveys, the dental workforce in Michigan is less racially and ethnically diverse than dentists in the US generally. The Michigan dental workforce is also less gender diverse than dentists nationally. Dentists in the state are also not as diverse as the state's

population. Health workforce diversity is a desirable attribute since research shows that utilization of services, compliance with treatment or health promotion recommendations, and ultimately health outcomes improve when care is provided by professionals with gender, racial, or ethnic concordance or in a culturally competent context.[23]

More women are becoming dentists. In the 2012-2013 academic year, the first-year class in dental schools was 47.1% female and the graduating class was 46.7% female.[92] According to the ADA, in 2011, 23.4% of dentists working in dentistry were female. [93] Gender diversification was mainly evident in the younger cohorts of dentists in the US, with female dentists representing 57.1% of dentists age 45 and younger. The age of Michigan's dentists impacts gender mix since the state's dentist population is primarily older. In 2011, 51% of dentists in Michigan indicated they were age 55 or older. In that year, only 19% of dentists in Michigan were age 44 or younger compared to 35% of dentists nationwide.

TABLE 17. DEMOGRAPHIC CHARACTERISTICS OF DENTISTS IN MICHIGAN, 2006-2011 AND IN THE US, 2006-2011

Dentists in Michigan Gender	2006	2007	2008	2009	2010	2011	In US 2008	In US 2011	Pop. MI 2013
Male	80.5%	80.7%	79.8%	82.6%	80.4%	80.8%	N/A	75.6%	49.1%
Female	19.5%	19.3%	19.8%	17.4%	19.6%	19.2%	N/A	23.4%	50.9%
Race/Ethnicity									
White, non-Hispanic	85.3%	85.2%	88.2%	89.5%	87.2%	91.1%	86.2%	N/A	80.1%
Asian/Pacific Islander	6.1%	4.1%	5.1%	3.3%	3.2%	2.8%	6.9%	N/A	2.7%
Black/African American, non-Hispanic	1.7%	5.4%	2.9%	2.5%	3.3%	2.3%	3.4%	N/A	14.3%
American Indian/Alaska Native	1.3%	0.6%	0.4%	0.5%	0.5%	0.2%	0.1%	N/A	0.7%
Hispanic/Latino	1.5%	1.3%	0.7%	1.0%	1.4%	1.0%	3.4%	N/A	4.7%
Multiracial	1.1%	1.0%	0.7%	0.9%	1.4%	0.7%	N/A	N/A	2.2%
Other	2.0%	2.5%	1.7%	2.3%	3.0%	2.0%	N/A	N/A	
Age									
25-34	13.4%	6.9%	9.7%	8.6%	7.3%	7.2%	12.3%	13.6%	
35-44	17.0%	17.2%	15.7%	12.6%	12.7%	11.7%	23.3%	21.4%	
45-54	32.6%	29.2%	30.1%	29.7%	31.1%	29.7%	30.5%	23.4%	
55-64	23.6%	32.2%	29.1%	33.5%	31.2%	36.8%	23.4%	26.0%	
65 and older	13.0%	14.5%	14.1%	15.5%	17.7%	14.6%	10.5%	15.7%	

Sources: MDCH, Private Sector Consultants, ADA, ACS

The American Community Survey (ACS) 2008-2013 of the US Census Bureau describes the dentist population in Michigan as being somewhat more diverse currently than the Michigan survey data that were compiled between 2006-2011.[94] In the ACS data, Black/African American dentists were overrepresented in Michigan compared to dentists in the US, but were still underrepresented compared to Michigan's population (see Table 16 above). The ACS also indicated a higher percentage of younger dentists in Michigan (29% younger than age 45) compared to the Michigan survey data and a lower percentage of dentists age 55 and older (45%). However, the general trends discussed above are also reflected in the ACS data.

[92]American Dental Association. Survey of Dental Education Programs 2011-12 and 2012-13. http://www.ada.org/en/science-research/health-policy-institute/data-center/dental-education.

[93] American Dental Association. Dentists Working in Dentistry 1993-2011. US Dentists by Age and Gender, Table 9. Supply of Dentists in the US by Age and Gender.

[94] US Census Bureau. American Community Survey. Five-Year Estimates 2009-2013. http://www.census.gov/acs/www/ and Public Use Microdata Sample (PUMS). http://www.census.gov/acs/www/data_documentation/public_use_microdata_sample/.

TABLE 18. DEMOGRAPHICS OF DENTISTS IN THE US AND MICHIGAN, 2008-2012

Dentists	US 2008-2012		Michigan 2008-2012	
Gender	**N**	**%**	**N**	**%**
Male	137,477	75.5%	5,098	85.0%
Female	44,497	24.5%	897	15.0%
Total	181,974	100.0%	5,995	100.0%
Race/Ethnicity				
White, alone	147,439	81.0%	5,183	86.5%
Black/African American, alone	5,703	3.1%	380	6.3%
Asian/Pacific Islander, alone	24,548	13.6%	412	6.9%
American Indian/Alaska Native, alone	275	0.1%		
Some other race, alone	1,902	1.1%		
Two or more races,	2,107	1.2%	20	0.3%
Total	181,974	100.1%	5,995	100.0%
Hispanic/Latino		5.8%		1.1%
Age				
<35	27,361	15.5%	505	8.8%
35-44	39,514	22.5%	1,159	20.1%
45-54	43,195	24.5%	1,525	26.4%
55-59	24,883	14.1%	975	16.9%
60-64	21,385	12.2%	876	15.2%
65-74	19,683	11.2%	729	12.6%
Total	176,021	100.0%	5,769	100.0%

Source: US Census Bureau, ACS, 2008-2013. Note: Numbers differ from previously referenced sources due to differences in survey design and weighting methodologies.

The age of the dentist population in Michigan is concerning because an adequate supply of workforce to provide needed services is key to achieving goals for increased utilization of oral health services and improvements in population oral health status. Nationally, the average retirement age for dentists increased to age 69.3 in 2011, up from age 64.8 in 2001,[95] so the impact of departures from dentistry in the older age group may occur later or more gradually than previously anticipated.

Dentists who responded to the annual re-licensure surveys in Michigan were asked to provide information about their future plans and how much longer they expected to practice dentistry. In 2011, 22.8% of dentists indicated plans to practice dentistry for only 1-5 more years and another 26.7% indicated plans to practice for only 5-10 more years. Almost half of Michigan's current dentists are therefore planning to leave dentistry within the coming 10 years. The percentage of dentists planning to practice for the next 21-30 or more years decreased over the 6 years of the survey while at the same time the percentage of dentists expecting to practice 10 years or less increased.

[95] Valachovic R; for American Dental Education Association. A Dentist Shortage? Maybe, Maybe Not. May 15, 2014. https://adeachartingprogress.wordpress.com/2014/05/15/a-dentist-shortage-maybe-maybe-not/.

TABLE 19. NUMBER OF MORE YEARS MICHIGAN DENTISTS PLAN TO PRACTICE DENTISTRY, 2006-2011

Number of years planning to practice dentistry	2006	2007	2008	2009	2010	2011
1 to 5 years	19.0%	22.2%	21.2%	21.7%	21.9%	22.8%
6 to 10 years	24.1%	24.3%	26.9%	26.4%	27.1%	26.7%
11 to 15 years	19.6%	19.4%	18.4%	17.9%	19.3%	22.9%
16 to 20 years	15.3%	17.5%	15.0%	17.1%	13.5%	14.5%
21 to 30 years	15.5%	12.6%	14.0%	11.6%	13.9%	9.9%
More than 30 years	6.5%	4.0%	4.1%	5.4%	4.3%	3.1%

Source: MDCH, Prime Care Consultants, Surveys of Dentists in Michigan 2006-2011

Dentists who responded to the annual re-licensure survey were also asked to indicate their professional plans in the coming 3 years. In any year, a large majority of active dentists in Michigan planned to maintain their current practice or increase their hours. However, between 15%-20% of dentists in any 1 year expected to reduce patient care hours, move their practice out of state, or retire. Changes in practice patterns and departures also affect the availability of dentists in the state.

TABLE 20. PERCENTAGE OF MICHIGAN DENTISTS BY PLANS FOR DENTAL PRACTICE IN THE COMING 3 YEARS, 2006-2011

Plans for the Coming 3 Years	2006	2007	2008	2009	2010	2011
Plan to maintain current practice as is in the next 3 years	67.4%	71.5%	72.4%	71.6%	68.8%	70.7%
Plain to increase hours in the next 3 years	15.7%	13.5%	10.1%	16.8%	18.9%	16.2%
Plan to reduce patient care hours in the next 3 years	6.8%	9.3%	8.9%	5.3%	6.6%	6.7%
Plan to move practice to another Michigan location in the next 3 years	6.6%	4.5%	3.3%	3.1%	2.6%	3.3%
Plan to move practice out of state in the next 3 years	2.3%	1.3%	2.1%	1.7%	1.2%	1.9%
Plan to retire in the next 3 years	7.1%	8.2%	8.4%	8.1%	7.3%	8.9%

Source: MDCH, Prime Care Consultants, Surveys of Dentists in Michigan, 2006-2011

Education of Dentists

Research in medicine and dentistry finds that physicians and dentists select clinical practice locations based not only on professional opportunity and salary level but with consideration to personal preferences and origins.[96,97,98] Some states are able to leverage these preferences by offering lower in-

[96] New England Journal of Medicine Career Center. 2011 Survey of Final-Year Medical Residents. Recruiting Physicians Today. November/December 2011;19(6).

[97] Center for Workforce Studies of the Association of American Medical Colleges (AAMC). Young Physicians and Their Initial Preferences: A Summary of Findings from Focus Groups Conducted at US Residency Programs. 2009. http://c.ymcdn.com/sites/www.aspr.org/resource/resmgr/imported/young-physicians-and-their-initial-practice-preferences.pdf.

[98] Graham JW. Factors influencing the choice of practice location for recent dental graduates. *JADA.* 1977;94(5):821-5.

state tuition to dental students from the state who qualify for admission, thus increasing the likelihood of selection of an in-state practice upon graduation. Michigan is fortunate to have 2 of the 65 dental schools in the US accredited by the Commission on Dental Accreditation (CODA). Dental education is available at the University of Michigan School of Dentistry (UM Dentistry) and the University of Detroit Mercy School of Dentistry (UDM Dental). UM Dentistry is able to offer lower tuition to in-state students than to students from out of state.

In the 2012-2013 academic year, CODA reported that there were 208 first-year dental students entering dental schools in the US who indicated that Michigan was their state of residence.[92] Of that number, 155 (74.5%) were attending either UM Dentistry (66) or UDM Dental (89).[92] Other states in which first-year students from Michigan had enrolled in a dental education program were Arizona (3), California (5), Connecticut (1), District of Columbia (1), Florida (4), Illinois (6), Indiana (2), Kentucky (3), Maryland (4), Massachusetts (10), Minnesota (1), New York (3), Ohio (3), Pennsylvania (4), Tennessee (1), Texas (1), and Wisconsin (1).[92] Similar data from the prior year showed that, in 2011, the total number of first-year dental students from Michigan in US dental schools was 193. Of those, 147 (76.2%) were enrolled in 1 of the 2 Michigan dental education programs.[92]

The 2 Michigan dental schools appear to be the major source of dentists in the state. Each year, a high percentage of licensed dentists responding to the re-licensure surveys in Michigan indicated graduation from a dental school in Michigan. In 2011, 80.7% of survey respondents indicated they had received their dental education in Michigan, 17.5% attended a dental school in a state other than Michigan, and 1.8% were educated in another country. As a comparison, a 2010 study in Wisconsin found that just 61% of actively practicing dentists in the state had graduated from Marquette University, the only dental school in Wisconsin.[99] The annual surveys also suggested that selection of practice in Michigan by dentists graduating from Michigan dental schools is a relatively stable trend.

TABLE 21. PERCENTAGE OF SURVEY RESPONDENTS BY LOCATION OF DENTAL SCHOOL ATTENDED, 2006-2011

Location of Dental School	2006	2007	2008	2009	2010	2011
Attended dental school in Michigan	82.2%	79.9%	81.0%	80.4%	82.3%	80.7%
University of Michigan	55.0%	58.4%	57.9%	59.2%	58.8%	60.9%
University of Detroit Mercy	45.0%	41.6%	40.0%	40.8%	41.2%	39.1%
Attended dental school in another state	15.2%	18.4%	17.5%	18.6%	17.0%	17.5%
Attended dental school in another country	2.6%	1.7%	1.3%	1.0%	0.7%	1.8%

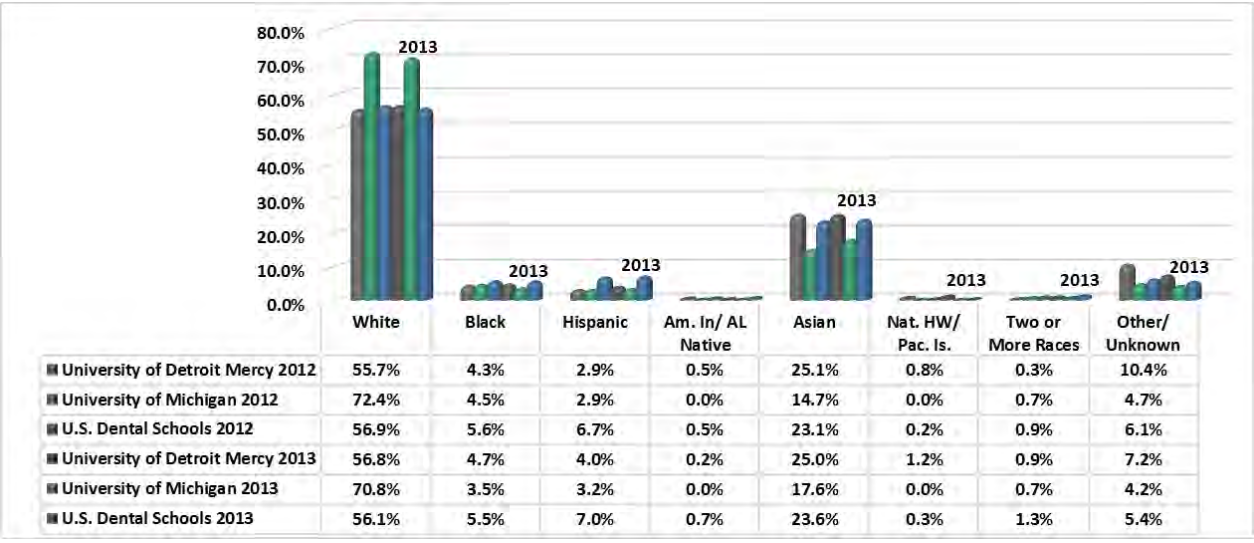
Source: MDCH, Public Sector Consultants, Surveys of Dentists in Michigan, 2006-2011

Diversification of the Dental Profession in Michigan

The gender and race/ethnicity of students in Michigan dental schools and in the US currently indicates increasing professional diversity. Students at UM Dentistry are not as racially/ethnically diverse as dental students at UDM Dental nor are students in Michigan as diverse as dental students in the US overall. Students are more diverse than in the past. However, the relatively small number of dental students who were non-White and the lack of available information about their states of origin make it difficult to predict the specific impacts of increasing student diversity in the Michigan dental workforce, especially for underrepresented minorities.

[99] Beazoglou T, Bailit H, Myne V, Roth K. Supply and Demand for Dental Services: Wisconsin 2010-2020. January 2010. http://www.wda.org/wp-content/uploads/2012/04/Supply-and-Demand_Final-Report.pdf.

FIGURE 95. RACE/ETHNICITY OF DENTAL STUDENTS IN MICHIGAN AND THE US, 2012-2013



	White	Black	Hispanic	Am. In/ AL Native	Asian	Nat. HW/ Pac. Is.	Two or More Races	Other/ Unknown
University of Detroit Mercy 2012	55.7%	4.3%	2.9%	0.5%	25.1%	0.8%	0.3%	10.4%
University of Michigan 2012	72.4%	4.5%	2.9%	0.0%	14.7%	0.0%	0.7%	4.7%
U.S. Dental Schools 2012	56.9%	5.6%	6.7%	0.5%	23.1%	0.2%	0.9%	6.1%
University of Detroit Mercy 2013	56.8%	4.7%	4.0%	0.2%	25.0%	1.2%	0.9%	7.2%
University of Michigan 2013	70.8%	3.5%	3.2%	0.0%	17.6%	0.0%	0.7%	4.2%
U.S. Dental Schools 2013	56.1%	5.5%	7.0%	0.7%	23.6%	0.3%	1.3%	5.4%

Source: ADA, Surveys of Dental Education Programs, 2011-2012 and 2012-2013

The high percentage of female dental students in Michigan and across the US suggests ongoing gender diversification within the active dental workforce. Gender diversification is likely to occur more rapidly than racial diversification because of the high percentage of female students currently, a trend which began about 40 years ago and has accelerated in recent years.[100] The implications of the feminization of dentistry on patterns of practice that might impact service delivery are not yet well understood,[101] although there is some literature that suggests that geographic distribution may be affected. Women dentists show preferences for practice in more populated areas, which may impact the availability of dental services in less populated areas over the long term.[102,103]

Trends in dental school enrollment in the US over a decade (2002-2012) show a gradual decrease in male student enrollment from 58.0% of students in 2002 to 53.1% in 2012. The gender of dental students in Michigan's dental schools has remained essentially unchanged, although there were particular years in which there was a higher percentage of female students than in other years. It is difficult to explain this year-to-year variation without extensive research into student applications and admissions into particular dental schools over time. In any case, the percentage of female dental students in any year in either Michigan school ranged from 41.8%-50.4%. If, as earlier suggested, many of these graduates choose to practice in Michigan the gender composition of the workforce in the state will change.

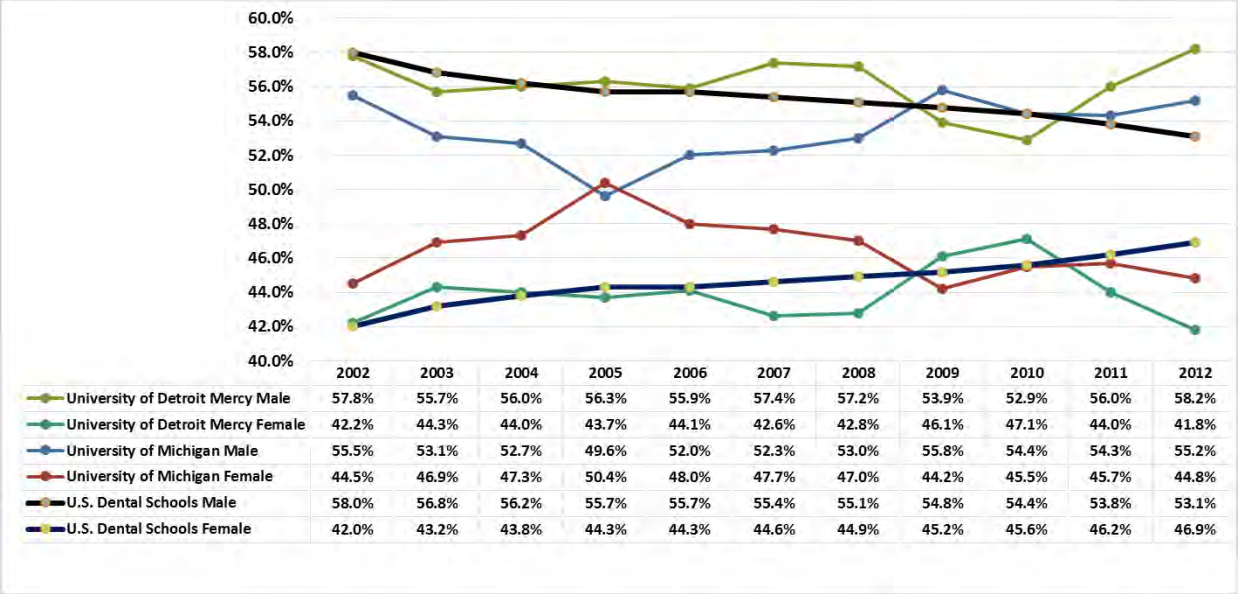
[100] McKay JC, Quinonez CR. The feminization of dentistry: implications for the profession. *J Can Dent Assoc*. 2012;78:c1. http://www.jcda.ca/article/c1.

[101] Riley JL, Gordan VV, Rouisse KM, McClelland J, Gilbert GH. Differences in male and female dentists' practice patterns regarding diagnosis and treatment of dental caries. *JADA*. 2011 Apr;142(4):429-40.

[102] Wanchek TN, Rephann TJ. Filling the Gaps: Dentist Disparities along the Rural Urban Continuum. March 24, 2011. http://www.coopercenter.org/sites/default/files/publications/dentist_final.pdf

[103] Wall T, Brown L. The urban and rural distribution of dentists, 2000. *JADA*. 2007;138(7):1003-1011.

FIGURE 96. GENDER DISTRIBUTION OF DENTAL STUDENTS AT MICHIGAN DENTAL SCHOOLS AND IN THE US, 2002-2012



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
University of Detroit Mercy Male	57.8%	55.7%	56.0%	56.3%	55.9%	57.4%	57.2%	53.9%	52.9%	56.0%	58.2%
University of Detroit Mercy Female	42.2%	44.3%	44.0%	43.7%	44.1%	42.6%	42.8%	46.1%	47.1%	44.0%	41.8%
University of Michigan Male	55.5%	53.1%	52.7%	49.6%	52.0%	52.3%	53.0%	55.8%	54.4%	54.3%	55.2%
University of Michigan Female	44.5%	46.9%	47.3%	50.4%	48.0%	47.7%	47.0%	44.2%	45.5%	45.7%	44.8%
U.S. Dental Schools Male	58.0%	56.8%	56.2%	55.7%	55.7%	55.4%	55.1%	54.8%	54.4%	53.8%	53.1%
U.S. Dental Schools Female	42.0%	43.2%	43.8%	44.3%	44.3%	44.6%	44.9%	45.2%	45.6%	46.2%	46.9%

Source: ADA, Surveys of Dental Education Programs 2011-2012 and 2012-2013

Dental Hygienists

In 2014, there were 10,536 licensed dental hygienists in Michigan. The number of dental hygienists in Michigan has increased steadily over time with a net increase of 19.3% in the number of licensed dental hygienists in the state between 2000-2011.

TABLE 22. NUMBER OF ANNUAL APPLICATIONS FOR LICENSURE AND NUMBER OF DENTAL HYGIENE LICENSES IN MICHIGAN, 2000-2001 TO 2010-2011.

Registered Dental Hygienists	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Net Change 2000-2011
Applications Received	435	382	359	381	353	395	352	329	344	368	315	
Number of Licensees	8,720	9,014	9,201	9,403	9,613	9,762	9,927	10,052	10,173	10,297	10,400	
New applicants as % of supply in previous year		4.4%	4.0%	4.1%	3.8%	4.1%	3.6%	3.3%	3.4%	3.6%	3.1%	
Net gain or loss in # over previous year		294	187	202	210	149	165	125	121	124	103	**1,680**
Percent net gain over previous year		3.4%	2.1%	2.2%	2.2%	1.5%	1.7%	1.3%	1.2%	1.2%	1.0%	**19.3%**

Source: Michigan Department of Consumer and Industry Services, Department of Licensing and Regulatory Affairs

Demographics

Dental hygienists in Michigan are generally White females and more than 58% indicate an age between 35-54.

TABLE 23. DEMOGRAPHIC CHARACTERISTICS OF DENTAL HYGIENISTS IN MICHIGAN, 2006-2010

Gender	2006	2007	2008	2009	2010
Male	0.4%	0.5%	0.7%	0.4%	0.7%
Female	99.6%	99.5%	99.3%	99.6%	99.3%
Race/Ethnicity					
White, non-Hispanic	95.0%	94.1%	95.3%	94.1%	93.9%
Black/African American, non-Hispanic	1.6%	2.2%	1.0%	1.3%	1.5%
Asian/Pacific Islander	0.5%	0.9%	0.7%	0.7%	1.0%
American Indian/Alaska Native	1.1%	0.7%	0.8%	0.9%	0.7%
Hispanic/Latino	0.6%	0.8%	1.0%	0.8%	1.0%
Multiracial	0.4%	0.6%	0.5%	0.5%	0.7%
Other	0.7%	0.7%	0.7%	1.7%	1.2%
Total Number of Licensed DHs	**9,436**	**9,587**	**9,734**	**9,856**	**9,964**
Age					
< 25	3.0%	3.6%	3.5%	2.5%	2.4%
25-34	20.8%	20.1%	20.2%	18.9%	19.2%
35-44	28.1%	29.7%	28.7%	25.8%	27.6%
45-54	34.5%	32.7%	31.3%	32.8%	30.5%
55-64	12.4%	12.6%	14.8%	18.1%	19.0%
65 and older	1.1%	1.4%	1.4%	2.1%	1.3%

Source: Public Sector Consultants, Surveys of Dental Hygienists in Michigan, 2006-2010

The ACS of the US Census Bureau provides current estimates of supply of workers based on self-described employment in census data. The following table describes summary compiled data from the ACS using estimates from 2008-2012.[94] The data revealed that the dental hygiene profession in the US was not representative of the US population based on gender or race/ethnicity. Dental hygienists in Michigan were also not representative of the population in the state, however, a higher percentage of dental hygienists in Michigan were Black/African American than dental hygienists in the US overall.

TABLE 24. DEMOGRAPHIC CHARACTERISTICS OF DENTAL HYGIENISTS IN THE US AND MICHIGAN AND OF THE POPULATION IN MICHIGAN, 2008-2012

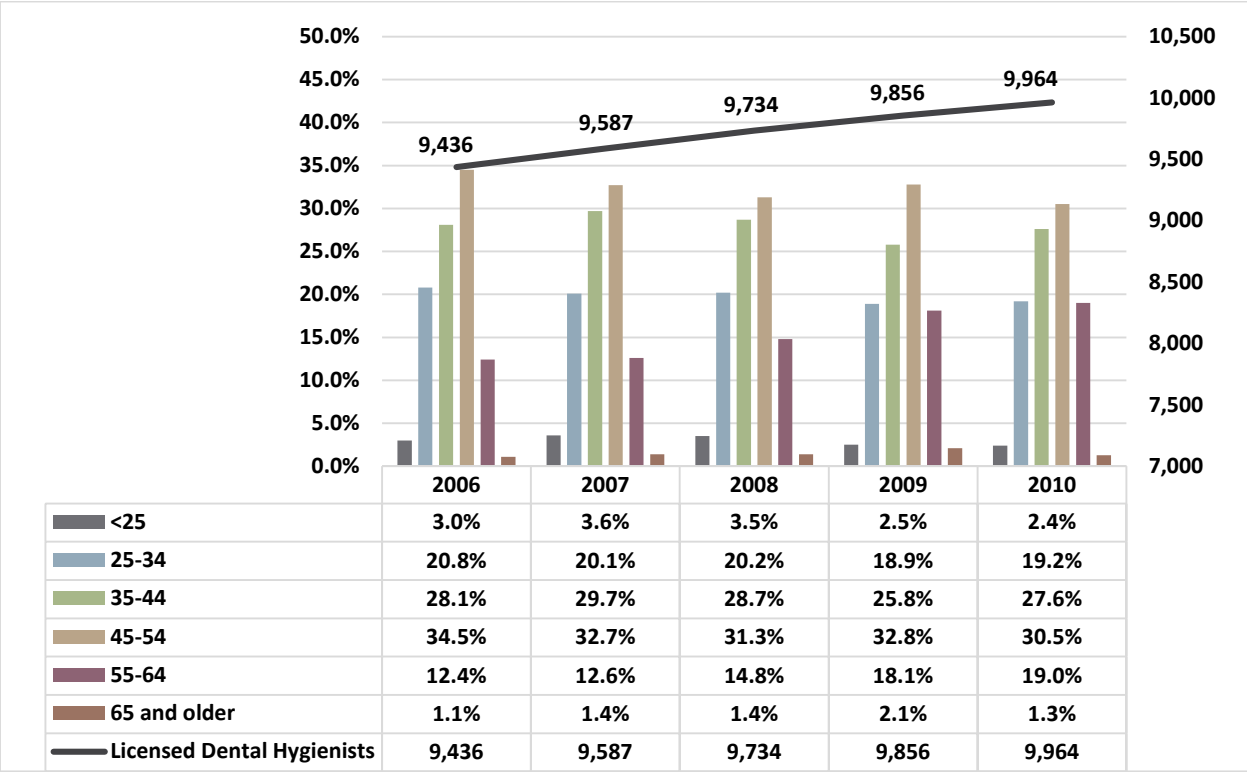
Gender	DHs in the U.S. 2008-2012	U.S. Population 2013	DHs in MI 2008-2012	MI Population 2013
Male	2.8%	49.2%	1.6%	49.1%
Female	97.2%	50.8%	98.4%	50.9%
Race/Ethnicity				
White, alone	90.1%	73.7%	92.0%	79.1%
Black African American, alone	2.7%	12.6%	4.8%	13.9%
Asian/Pacific Islander, alone	4.0%	5.3%	0.8%	2.7%
American Indian/Alaska Native, alone	0.2%	0.8%	0.5%	0.5%
Hispanic/Latino	5.8%	17.1%	2.9%	4.7%
Multiracial	1.5%	3.0%	0.7%	2.7%
Other	1.4%	4.7%	1.2%	1.0%
Total Number	**161,911**	**316,128,839**	**8,795**	**9,895,622**
Age				
< 25	31.0%	46.9%	26.3%	
25-34				
35-44	26.7%	12.8%	29.2%	12.3%
45-54	26.3%	13.8%	31.3%	14.4%
55-64	13.4%	12.5%	11.9%	13.4%
65 and over	2.6%	14.2%	1.3%	13.5%

Sources: ACS. American Fact Finder. ACS 2013 1-year estimates. Demographics. For dental hygienist data: ACS, Public Use Microdata Sample (PUMS), 5-year ACS PUMS files (2008-2012).

Surveys of dental hygienists in Michigan conducted during re-licensure from 2006-2010[104] showed that the age composition of the dental hygiene workforce in the state was shifting. While dental hygienists remained younger on average than dentists in the state, the distribution within specific age cohorts was changing. In 2006, 23.8% of the workforce was age 34 or younger and 13.5% was age 55 and older. By 2010, 21.6% of the workforce was age 34 or younger and 20.3% was age 55 and older. The increased percentage of dental hygienists in the older age groups suggested that net gains in the workforce might decrease over time with fewer younger workers ready to replace those departing and retiring from dental hygiene practice.

[104] MDCH. Public Sector Consultants. Surveys of Dental Hygienists in Michigan, Survey Findings 2010. https://www.michigan.gov/documents/healthcareworkforcecenter/2010DentalHygieneLicensureSurvey_349780_7.pdf.

FIGURE 97. AGE DISTRIBUTION OF THE DENTAL HYGIENE WORKFORCE IN MICHIGAN, 2006-2010 AND NUMBER OF LICENSED DENTAL HYGIENISTS, 2006-2010

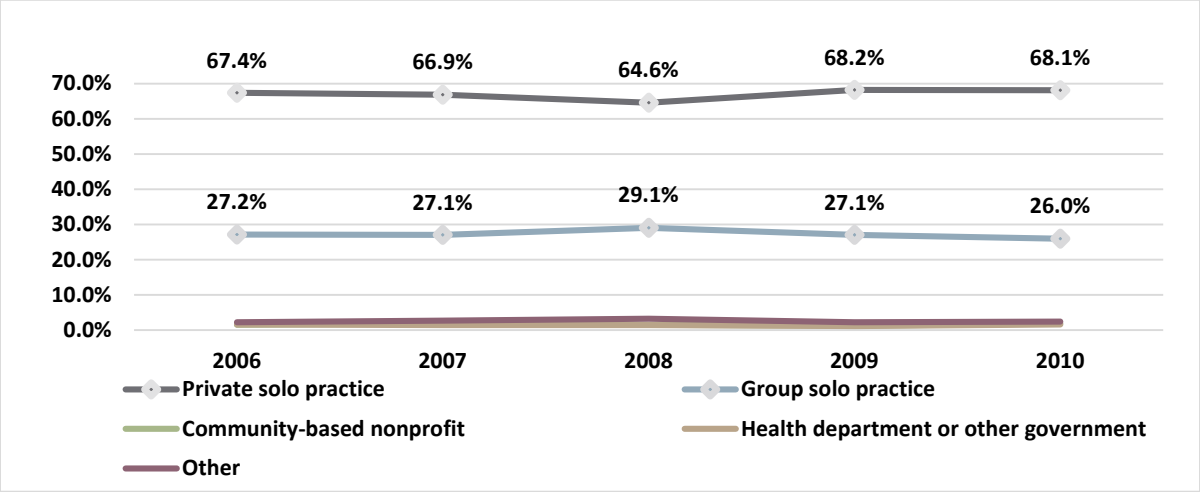


	2006	2007	2008	2009	2010
<25	3.0%	3.6%	3.5%	2.5%	2.4%
25-34	20.8%	20.1%	20.2%	18.9%	19.2%
35-44	28.1%	29.7%	28.7%	25.8%	27.6%
45-54	34.5%	32.7%	31.3%	32.8%	30.5%
55-64	12.4%	12.6%	14.8%	18.1%	19.0%
65 and older	1.1%	1.4%	1.4%	2.1%	1.3%
Licensed Dental Hygienists	9,436	9,587	9,734	9,856	9,964

Source: MDCH, Public Sector Consultants, Surveys of Dental Hygienists in Michigan, 2006-2010

Dental hygienists in Michigan primarily work in either solo or group practice settings. These settings closely track with those for dentists in Michigan, although, in every year, a higher percentage of dental hygienists indicated employment in a private solo dental practice than did dentists. Dental hygienists were less likely than dentists to indicate practice in community, government, or other settings in every year.

FIGURE 98. PRIMARY PRACTICE SETTING FOR DENTAL HYGIENISTS IN MICHIGAN, 2006-2010



Source: MDCH, Public Sector Consultants, Surveys of Dental Hygienists, 2006-2010

In each survey year, more than one-quarter and as much as 30% of dental hygienists indicated employment in a secondary setting. While secondary employment is available to many health professions, dental hygienists have comparatively high rates of secondary employment. Approximately half of dental hygienists nationally work part time.[105] A dental hygienist may choose secondary employment to supplement income or to constitute full-time employment from several jobs. Once again, most dental hygienists who indicated a secondary practice setting in the Michigan surveys were in private practice settings.

TABLE 25. SECONDARY PRACTICE SETTINGS, DENTAL HYGIENISTS IN MICHIGAN, 2006-2011

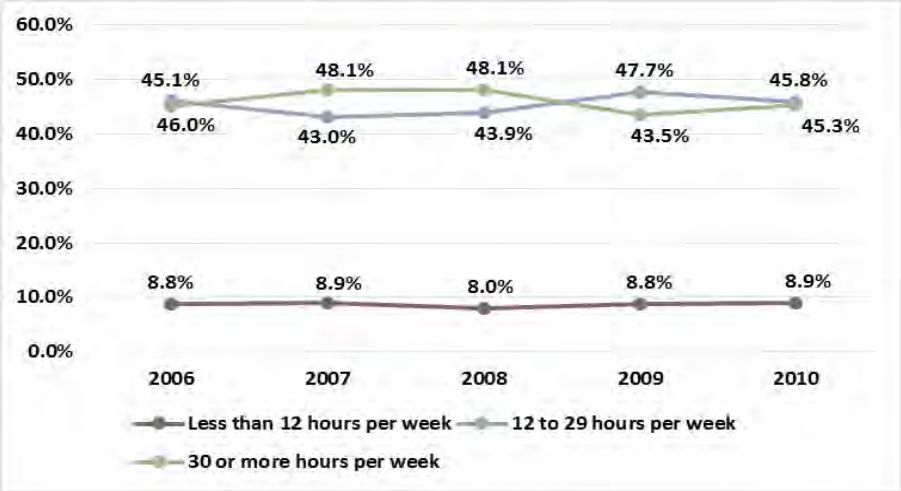
Secondary Practice Setting	2006	2007	2008	2009	2010
Private solo practice	19.1%	20.4%	19.4%	18.8%	17.6%
Group solo practice	6.1%	6.4%	7.1%	4.4%	6.1%
Community based nonprofit	0.7%	0.8%	0.4%	0.8%	0.8%
Health department or other government	0.5%	0.4%	0.3%	0.6%	0.4%
Other	1.3%	2.0%	1.7%	0.9%	2.1%
No secondary setting	72.3%	70.0%	71.1%	74.5%	73.0%

Source: Public Sector Consultants, Surveys of Dental Hygienists in Michigan, 2006-2010

Practice patterns in dentistry, especially in private dental practice, commonly reflect preferences for 4-day workweeks so FTE in dentistry is often measured as 32 hours or more per week. As indicated above, the dental hygiene profession is commonly regarded as highly part time (defined variously as less than 30, 31, or 32 hours per week). The surveys of Michigan dental hygienists included questions about hours worked per week in dental hygiene practice. The following figure shows that less than half of dental hygienists in Michigan in any year indicated working 30 hours or more per week. There was a noticeable dip in percentage of dental hygienists working full time in 2009, suggesting that the economic recession that affected demand for dental services, may have affected dental hygienists' hours of employment.

[105] US Bureau of Labor Statistics. Occupational Outlook Handbook. Dental Hygienists. http://www.bls.gov/ooh/healthcare/dental-hygienists.htm.

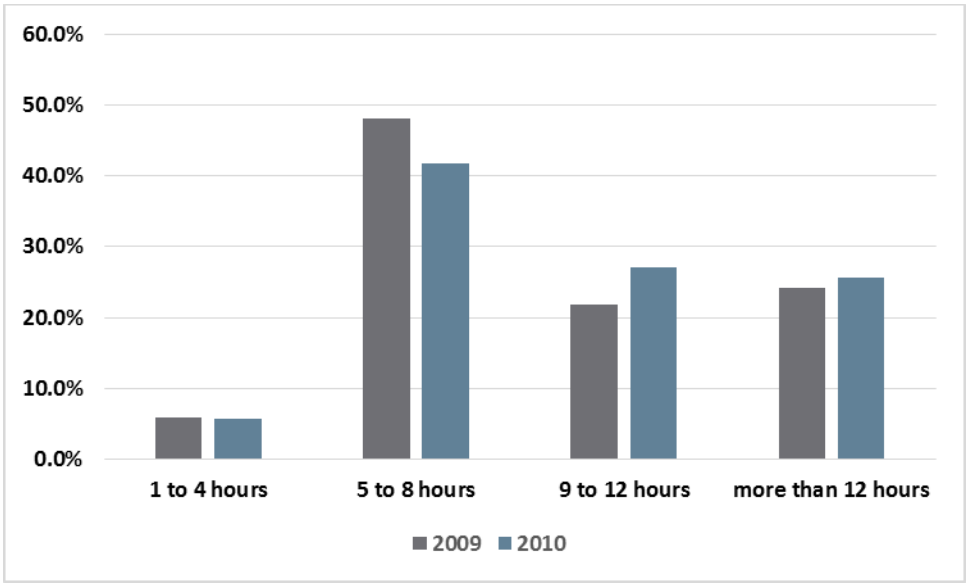
FIGURE 99. PERCENT OF ACTIVELY PRACTICING DENTAL HYGIENISTS IN MICHIGAN BY HOURS WORKED PER WEEK IN DENTAL HYGIENE, 2006-2010



Source: MDCH, Public Sector Consultants, Survey of Dental Hygienists in Michigan, 2006-2010

In 2009-2010, dental hygienists were asked if they were working in dental hygiene as many hours as they would like. In 2009 (24.7%) and 2010 (30.0%), some survey respondents indicated that they would like to work more hours than they were working at the time of survey completion. These dental hygienists represent additional capacity that might be engaged to increase availability of professional oral health services in the state, particularly enhancing the availability of oral health prevention and promotion services. Those who wished to work more hours were asked to indicate the number of extra hours per week they wished to work. Almost half of those responding to the question in both years wished to work between 5-8 extra hours per week.

FIGURE 100. PERCENTAGE OF DENTAL HYGIENISTS WISHING TO WORK MORE HOURS BY NUMBER OF EXTRA HOURS DESIRED, 2006-2010



Source: MDCH, Private Sector Consultants, Survey of Dental Hygienists in Michigan, 2009-2010

Dental hygienists who were re-licensing but not currently working in dental hygiene were asked if they were seeking employment in the field. Both those who were and were not seeking employment were then asked to provide the reasons for not currently working as a dental hygienist. The most common reason for not working in dental hygiene or for not currently seeking work in dental hygiene was that there were no jobs available in the field. This suggests saturation in the current employment market.

TABLE 26. REASONS FOR NOT WORKING IN DENTAL HYGIENE CURRENTLY AMONG DENTAL HYGIENISTS IN MICHIGAN WHO WERE NOT CURRENTLY WORKING IN DENTAL HYGIENE, 2006-2010

Reason for not working as a hygienist or reaon for being unemployed and seeking work	Hygienists seeking employment in hygiene				
	2006	2007	2008	2009	2010
Difficult to find hygiene position	83.0%	86.9%	83.8%	86.1%	90.8%
Better salary in other type of work	4.6%	3.3%	4.4%	2.8%	1.0%
Work environment prevents me from practicing effectively	6.2%	6.6%	11.8%	5.6%	5.1%
Other position more rewarding professionally	3.1%	3.3%	4.4%	0.0%	1.0%
Disability/physical demands of the job	4.6%	1.6%	7.4%	1.4%	3.1%
Taking care of family	33.8%	26.2%	26.5%	18.1%	22.4%
	Hygienists already employed in or seeking employment in another field				
	2006	2007	2008	2009	2010
Difficult to find hygiene position	11.9%	26.5%	27.1%	37.3%	45.2%
Better salary in other type of work	25.4%	28.6%	27.1%	24.5%	16.1%
Work environment prevents me from practicing effectively	14.9%	12.2%	0.0%	9.4%	8.1%
Other position more rewarding professionally	68.7%	42.9%	29.2%	37.7%	38.7%
Disability/physical demands of the job	22.4%	20.4%	20.8%	17.0%	12.9%
Taking care of family	11.9%	14.3%	14.6%	9.4%	16.1%

Source: MDCH, Private Sector Consultants, Surveys of DHs in Michigan, 2006-2010

Education of Dental Hygienists

In each year of the Michigan re-licensure surveys, dental hygienists were asked to identify their completed degrees. The data from 2010 indicated that 2.7% of dental hygiene professionals in Michigan had completed a master's degree or higher, 21.7% had a bachelor's degree as their highest educational degree, and the remainder (75.6%) had an associate degree.

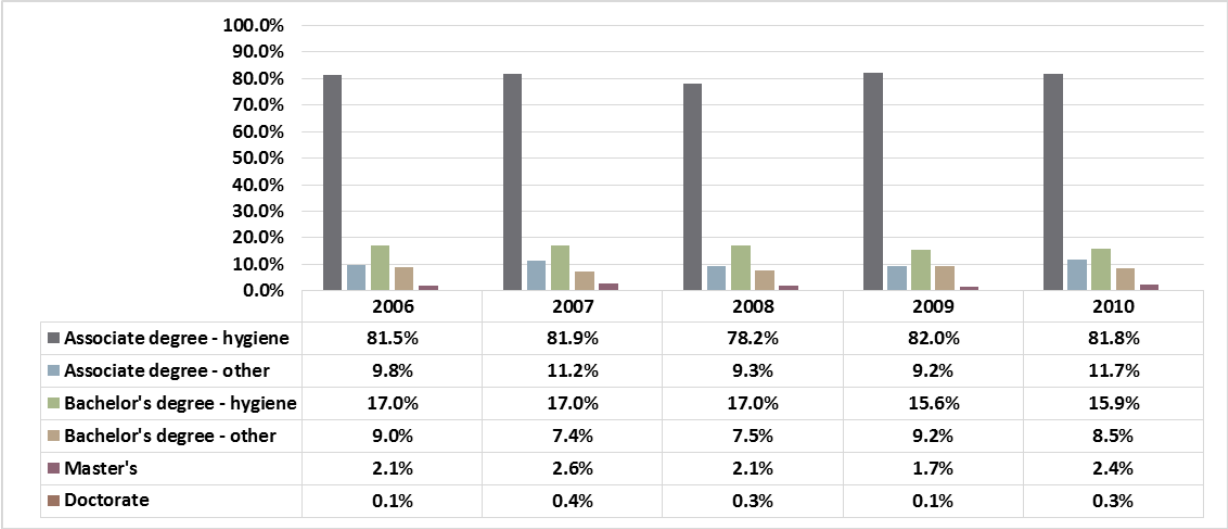
This educational profile differs somewhat from the educational profile of dental hygienists nationally. A national sample survey of dental hygienists was conducted in 2007. [106] It showed that 60.6% of dental hygienists listed an associate degree as their highest educational attainment and 3.2% indicated a certificate as their highest education. The remainder of dental hygienists had a bachelor's degree (30.7%) or a master's degree or higher (5%).[106] Entry-level education for the profession is an associate degree. However, the average number of academic credits to obtain an associate degree in dental hygiene (approximately 90 credit hours)[107] far exceeds that required for most associate degrees (60 hours). Dental hygienists who graduate from associate degree programs are educated in a standardized curriculum in programs accredited by the Commission on Dental Education, which prepares them in all

[106] Center for Health Workforce Studies, American Dental Hygienist Association. *Executive Summary. The 2007 Dental Hygiene Practitioner Survey*. Rensselaer, NY: CHWS; 2008.
[107] Center for Health Workforce Studies, American Dental Hygienist Association. *Technical Report. Dental Hygiene Education Program Director Survey, 2006*. Rensselaer, NY: CHWS; 2007.

clinical competencies attributed to dental hygiene. Dental hygienists must pass regional boards and state licensure examinations, all of which further assure competency to practice.

Most health professions must produce some highly educated professionals to serve as educators and researchers. In addition, many of the innovative oral health workforce models (eg, the advanced dental therapist in Minnesota) require higher levels of educational attainment beyond that requisite for initial entry to the profession.

FIGURE 101. EDUCATIONAL DEGREES OF DENTAL HYGIENISTS IN MICHIGAN, 2006-2010* **



	2006	2007	2008	2009	2010
Associate degree - hygiene	81.5%	81.9%	78.2%	82.0%	81.8%
Associate degree - other	9.8%	11.2%	9.3%	9.2%	11.7%
Bachelor's degree - hygiene	17.0%	17.0%	17.0%	15.6%	15.9%
Bachelor's degree - other	9.0%	7.4%	7.5%	9.2%	8.5%
Master's	2.1%	2.6%	2.1%	1.7%	2.4%
Doctorate	0.1%	0.4%	0.3%	0.1%	0.3%

Source: MDCH, Private Sector Consultants, Surveys of Dental Hygienists in Michigan, 2006-2010.
*Note: Dental hygienists listed all degrees obtained so totals in each year exceed 100%. **Note: Highest degree in 2010 was calculated by subtracting all those with master's degrees or higher from 100%, (100%-**2.7% with graduate degree**=97.3% without graduate degrees), then subtracting total percent with advanced degrees from percent with bachelor's degrees to determine those with bachelor's degrees as highest attainment (24.4%-2.7%=**21.7% with bachelor's degrees without graduate degree**), and then subtracting the percent of those with bachelor's degrees or master's degrees from 100% (100%-2.7%-21.7% = **75.6% with associate degree alone.)**

In 2013, there were 335 entry-level dental hygiene programs in the US, 5 of which awarded certificates; 281 of which awarded associate degrees; 41 of which awarded bachelor's degrees; and 8 of which awarded other degrees, including graduate degrees.[108] Eighty-two of these programs are housed in universities or 4-year colleges, including 22 in dental schools. The remaining 253 programs are hosted in community colleges, vocational and technical schools and colleges, and other settings.[109] The number of dental hygiene education programs across the US has increased rapidly. In 2002-2003 academic year there were 265 accredited programs with first-year student capacity totaling 7,261 students. In 2012-2013, there were 335 programs with first-year student capacity of 9,613.[110] There are currently 13 dental hygiene education programs available in Michigan offered by 12 different institutions (Baker

[108] American Dental Association. Health Policy Resources Center. Surveys of Allied Dental Education 2011-2012 and 2012-2013. Number of Institutions Awarding Degrees in Allied Dental Education Programs, 2012-2013. http://www.ada.org/en/science-research/health-policy-institute/data-center/dental-education

[109] American Dental Association. Health Policy Resources Center. Surveys of Allied Dental Education 2011-2012 and 2012-2013; Comparison of First-Year Student Capacity Versus Enrollment by Educational Setting, 2012-2013. http://www.ada.org/en/science-research/health-policy-institute/data-center/dental-education

[110] American Dental Association. Health Policy Resources Center. Surveys of Allied Dental Education 2011-2012 and 2012-2013. First-Year Student Capacity Versus Enrollment by Number of Dental Hygiene Programs, 2002-03 to 2012-13. http://www.ada.org/en/science-research/health-policy-institute/data-center/dental-education.

College offers the program at 2 different campuses). Eleven of the programs offer an associate degree upon completion with 2 offering a bachelor's degree or a baccalaureate completion program. The program at the University of Michigan also offers a master's degree. In 2011, there were 298 dental hygiene graduates from these programs and in 2012 the number of graduates was 289.

TABLE 27. DENTAL HYGIENE EDUCATION PROGRAMS IN MICHIGAN, DEGREES GRANTED, ENTRY REQUIREMENTS, ENROLLMENTS, AND GRADUATES, 2011-2012

2011	Degree Granted	Minimum Educational Requirement for Entry	1st yr capacity	lst yr enrolled	2nd yr enrolled	3rd/4th yr enrolled	Total enrollment	Diploma/ certificate	Associate degree	Bachelor's degree	Certificate & associate detree	Other	Total graduates
Baker College Of Auburn Hills	Associate Degree	One Year Of College	48	24	21	0	45	0	21	0	0	0	21
Baker College Of Port Huron	Associate Degree	One Year Of College	24	24	19	0	43	0	22	0	0	0	22
Delta College	Associate Degree	One Year Of College	18	18	16	0	34	0	14	0	0	0	14
Ferris State University	Associate Degree	One Year Of College	44	44	42	0	86	0	37	0	0	0	37
Grand Rapids Community College	Associate Degree	One Year Of College	32	32	31	0	63	0	31	0	0	0	31
Kalamazoo Valley Community College	Associate Degree	One Year Of College	24	24	17	0	41	0	19	0	0	0	19
Kellogg Community College	Associate Degree	GED/HS Diploma	20	20	17	0	37	0	19	0	0	0	19
Lansing Community College	Associate Degree	One Year Of College	24	24	21	0	45	0	24	0	0	0	24
Mott Community College	Associate Degree	Other	30	24	19	0	43	0	17	0	0	0	17
Oakland Community College	Associate Degree	One Year Of College	30	27	20	0	47	0	0	0	20	0	20
University Of Detroit Mercy	Bacc. Degree/Degree Completion	Two Years Of College	27	28	27	0	55	0	0	26	0	1	27
University Of Michigan	Bacc. Degree/Degree Completion/Master's	One Year Of College	30	30	25	27	82	0	0	28	0	0	28
Wayne County Community College	Associate Degree	Two Years Of College	24	24	21	0	45	0	19	0	0	0	19
		Totals	**375**	**343**	**296**	**27**	**666**	**0**	**223**	**54**	**20**	**1**	**298**
2012													
Baker College Of Auburn Hills	Associate Degree	One Year Of College	48	24	24	0	48	0	21	0	0	0	21
Baker College Of Port Huron	Associate Degree	One Year Of College	24	24	23	0	47	0	18	0	0	0	18
Delta College	Associate Degree	One Year Of College	18	18	14	0	32	0	14	0	0	0	14
Ferris State University	Associate Degree	One Year Of College	44	40	38	0	78	0	42	0	0	0	42
Grand Rapids Community College	Associate Degree	One Year Of College	32	32	32	0	64	0	30	0	0	0	30
Kalamazoo Valley Community College	Associate Degree	One Year Of College	24	24	23	0	47	0	17	0	0	0	17
Kellogg Community College	Associate Degree	GED/HSDiploma	20	20	19	0	39	0	18	0	0	0	18
Lansing Community College	Associate Degree	One Year Of College	24	23	23	0	46	0	21	0	0	0	21
Mott Community College	Associate Degree	Other	30	23	22	0	45	0	19	0	0	0	19
Oakland Community College	Associate Degree	One Year Of College	30	29	22	0	51	0	0	0	20	0	20
University Of Detroit Mercy	Bacc. Degree/Degree Completion	Two Years Of College	26	24	27	1	52	0	0	25	0	0	25
University Of Michigan	Bacc. Degree/Degree Completion/Master's	One Year Of College	30	23	29	25	77	0	0	27	0	0	27
Wayne County Community College	Associate Degree	Two Years Of College	24	23	23	0	46	0	17	0	0	0	17
		Totals	**374**	**327**	**319**	**26**	**672**	**0**	**217**	**52**	**20**	**0**	**289**

Source: ADA, Surveys of Allied Dental Education Programs, 2011-2012

A Discussion about the Sufficiency of Supply of Oral Health Professionals in the US

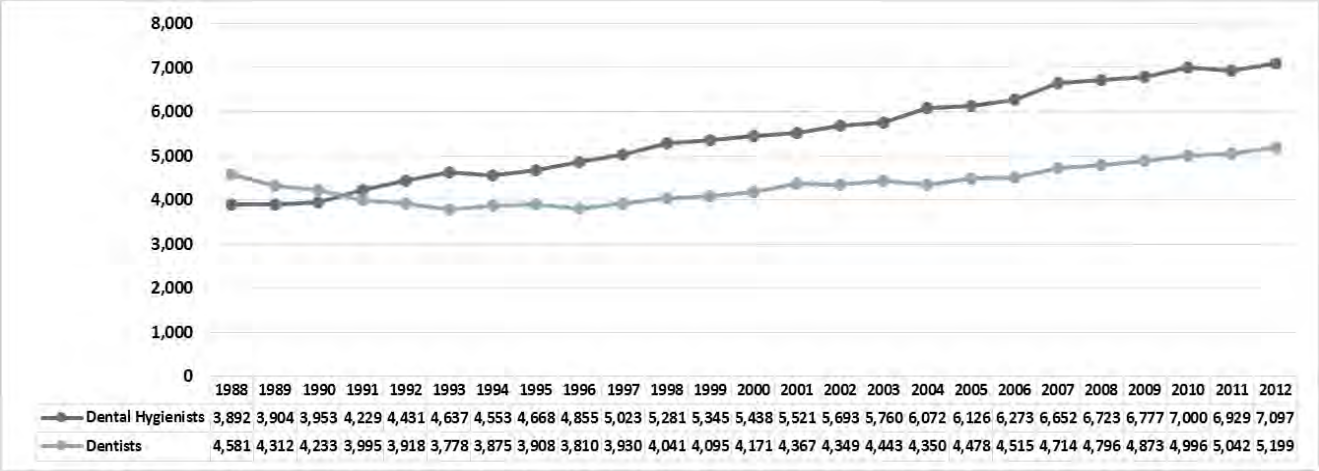
There is some concern nationally that education programs may be producing an oversupply of dental hygienists relative to demand for these professionals. Since dental hygienists generally work under the supervision of dentists and most work in private practice settings, job opportunities for dental hygienists are directly linked to the supply of practicing dentists. The national supply of dentists while increasing in recent years has grown at a much slower rate relative to the supply of dental hygienists. The production of new dental hygienists in 2012 represented an 82% increase over production in 1988 while the number of new dentists in 2012 represented only a 13.5% increase over the number produced in 1988. Concerns about the current rate of departures from the dental profession affecting employment opportunities for dental hygienists are based on the numbers of older dentists leaving the workforce. These departures are impacting the supply of dentists nationwide and may be further eroding employment opportunities for dental hygienists.

In the past decade, about 6,000 dentists were leaving the profession annually with just over 5,000 new dental school graduates entering the active workforce, but not all choose private practice. This equation would suggest that production levels of new dentists might not be adequate to maintain supply to serve the expected increased demand for dental services from a growing and aging population. However, recent data suggests that this trend may be reversing. The ADA reported that in 2013 only 3,600 dentists retired from practice while more than 5,000 new dentists entered the workforce.[95] As previously mentioned, over a 10-year period the average retirement age for dentists changed from age 64.8 in 2001 to age 69.3 in 2011.[95]

Literature also suggests that the supply or number of dentists is not the only metric that should be used in calculating the adequacy of capacity to provide services. Differences in individual dentist's contributions and efficiency in practice, improved technology, innovations in oral health service delivery, improvements in the oral health status of the population, and the efficient use of other dental personnel all effect the capacity within the current delivery system to meet demand for services.[111] While the mean number of total patient treatment hours in dentistry has declined since 1990, the number of patient visits per treatment hour has increased steadily from 2.14 visits per hour in 1981-1985 to 2.41 in 2004 to 2006.[106] During these years there were also increases in the average number of FTE dental hygienists and chairside assistants in dental practices,[106] suggesting that supportive dental personnel are contributing to increased efficiency and productivity in oral health service delivery. The following figures provide graphical information showing trends in the number of graduates from dental and allied dental education programs and trends in supply of dentists and dental hygienists nationally.

[111] Wendling WR. Private sector approaches to workforce enhancement. *J Public Health Dent*. June 2010;70 Suppl 1:S24-31.

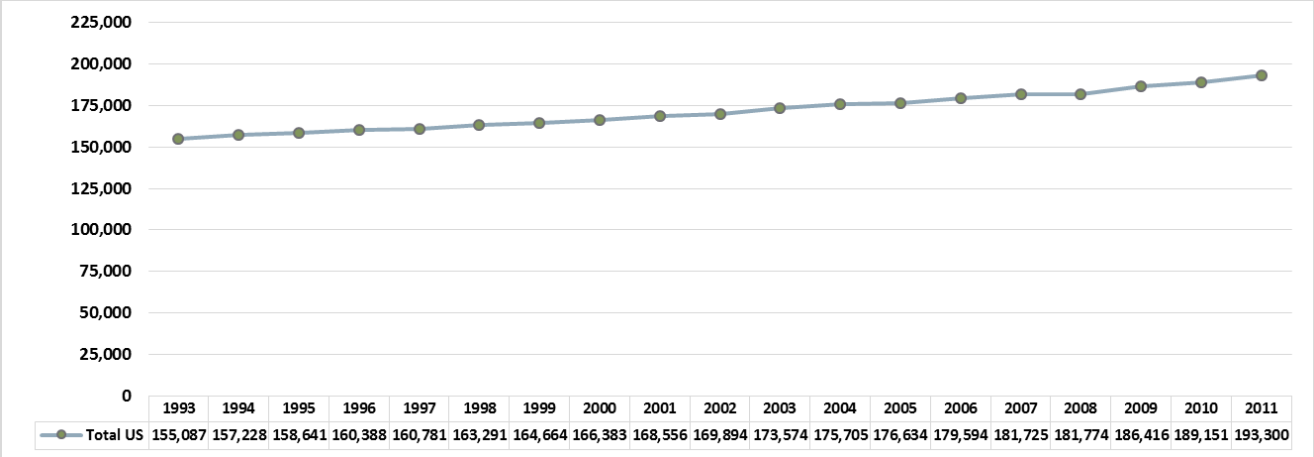
FIGURE 102. NUMBER OF GRADUATES FROM DENTAL AND DENTAL HYGIENE EDUCATION PROGRAMS, US, 1988-2012



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Dental Hygienists	3,892	3,904	3,953	4,229	4,431	4,637	4,553	4,668	4,855	5,023	5,281	5,345	5,438	5,521	5,693	5,760	6,072	6,126	6,273	6,652	6,723	6,777	7,000	6,929	7,097
Dentists	4,581	4,312	4,233	3,995	3,918	3,778	3,875	3,908	3,810	3,930	4,041	4,095	4,171	4,367	4,349	4,443	4,350	4,478	4,515	4,714	4,796	4,873	4,996	5,042	5,199

Source: ADA, Surveys of Dental Education Programs and Allied Dental Education Programs, 1988-2012

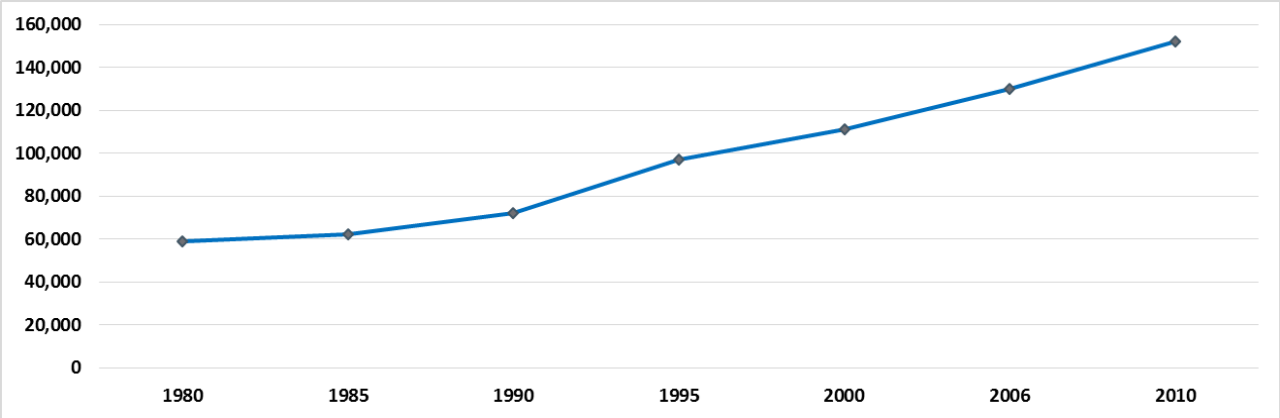
FIGURE 103. ESTIMATED SUPPLY OF DENTISTS IN THE US, 1993-2011



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total US	155,087	157,228	158,641	160,388	160,781	163,291	164,664	166,383	168,556	169,894	173,574	175,705	176,634	179,594	181,725	181,774	186,416	189,151	193,300

Source: ADA

FIGURE 104. ESTIMATED SUPPLY OF DENTAL HYGIENISTS IN THE US, 1980-2010



Sources: Area Resource File, 1980, 1990; ADA, 1995; American Dental Hygienists Association, 2000; CHWS, 2006; ACS, 2010.

Any discussion of the adequacy of supply of oral health professions must also consider how the workforce is distributed across the various geographies in the nation or in a state. While a state may have an apparently adequate supply of oral health professions based on per capita metrics, the location of oral health providers may significantly influence the availability of dental providers, especially in rural areas and inner cities. In addition, low-income populations and others may be at risk for lack of access to dental services even when there appears to be a sufficient number of providers because, nationally, a small percentage of dentists actively participate in the care for publicly insured populations or the uninsured. Therefore, simply producing and maintaining a supply of oral health professionals does not improve access to care when structural and environmental factors impose further barriers.

While it appears that Michigan has an adequate supply of oral health professionals based on current licensure and census data, it is clear that there are areas of the state where the number of oral health professionals is relatively small. A limited supply of professionals may not be the only impediment to care, but it is a fundamental requirement for improved access.

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Appendix A.

Oral Health Workforce Regulation in Michigan

The following information is excerpted from Michigan Public Health Code Act 379 of 1978, Part 166 Dentistry 333.16601 to 333.16648 and the Michigan Regulations of the Department of Licensing and Regulatory Affairs, Dentistry, General Rules R338.1101 to R338.11821.

The Board of Dentistry

The Board of Dentistry consists of 19 voting members, 8 of whom are dentists. At least 1 (or more) must have a specialty certification and 1 must be a dental school faculty member. Four of the members are dental hygienists; 3 are dental assistants; and 3 are public members. A 9-member task force including 1 general dentist, 1 prosthodontist, 1 endodontist, 1 oral and maxillofacial surgeon, 1 orthodontist, 1 pediatric dentist, 1 periodontist, 1 oral pathologist, and 1 public member advises the board on matters related to specialty dentistry.

Dentists

An applicant for licensure as a dentist in Michigan must have graduated from an approved dental educational program, passed all parts of the national board examination, passed a dental simulated clinical examination and written examination from a regional board of dental examiners or a state clinical, and written examination that is substantially equivalent to the regional board. The dentist must complete and submit an application for licensure along with a fee.

Dental specialists must apply for a separate license, which requires submission of proof of completion of specialty training and passage of the written and clinical examinations of the relevant specialty board. The regulations address the training and competencies required to be licensed in each specific specialty.

Licensure by endorsement is also available if the corresponding state had substantially equivalent licensure requirements, if the applicant has been practicing for a minimum of 5 years immediately preceding the application for licensure in Michigan, and in the absence of a board action or violation in another state. Licensure of specialty by endorsement is also available.

A dentist may only administer general anesthesia, intravenous conscious sedation, and/or enteral sedation if the dentist is qualified to do so. The dentist must have completed at least 1 year of advanced training in general anesthesia and pain control and be certified in basic and advanced CPR. The facility in which the anesthesia service is provided must meet equipment standards and the dentist must be physically present with the patient from administration to the point when the patient regains consciousness. To administer intravenous sedation, the dentist must, at a minimum, have 60 hours of training in intravenous conscious sedation and related subjects including a minimum of 40 hours of clinical training during which the dentist has sedated at least 20 cases. The dentist must also be certified in basic and advanced CPR and the facility must be properly equipped.

There are provisions to allow a foreign-trained dentist to qualify for licensure to practice dentistry in the state if the dentist successfully completes a minimum of 2 years in a dentistry program in an accredited dental school or completes a 2-year master's degree or certificate program including a dental specialty program that complies with regulatory standards. The dentist must pass all parts of the national board examination in dentistry and the dental simulated clinical written and clinical examination.

Licenses must be renewed every 3 years and the applicant for re-licensure must have completed at least 60 hours of continuing education during the 3 years preceding application.

The dentist may delegate or assign procedures to dental assistants, registered dental assistants, or to dental hygienists with exceptions. The dentist may not assign or delegate any of the following to a dental assistant, registered dental assistant, or dental hygienist unless so authorized in code:

- Diagnosing or prescribing
- Cutting of hard and soft tissue
- Any intra-oral restorative procedures
- Administration of local anesthesia, nitrous oxide analgesia, or acupuncture.
- Irrigation and medication of root canals, try-in of cones or points, filings or filling of root canals
- Taking impressions for any purpose other than study or opposing models
- Permanent cementation of any restoration

Dental Assistants and Registered Dental Assistants

A dental assistant is a non-licensed person who performs basic supportive procedures under the supervision of a dentist.

A registered dental assistant is a person licensed by the board who has:

- Graduated or received a certificate from a school meeting standards approved by the board; and
- Passed the appropriate board written comprehensive and clinical examination.

Under general supervision, a registered dental assistant who has completed a CODA-accredited education course consisting of at least 10 hours of didactic and clinical instruction may perform the following tasks:

- Pulp vitality testing;
- Placing and removing matrices and wedges;
- Applying cavity liners and bases;
- Placing and packing non-epinephrine retraction cords;
- Applying desensitizing agents;
- Taking an impression for orthodontic appliances, mouth guards, bite splints, and bleaching trays; and
- Drying endodontic canals with absorbent points.

Under the delegation and direct supervision of a dentist, a registered dental assistant may place, condense, and carve amalgam restorations and take final impressions for indirect restorations if the dental assistant has completed a CODA-approved course with at least 20 hours of didactic instruction and a comprehensive clinical experience.

A registered dental assistant may assist and monitor the administration of nitrous oxide analgesia under the direct supervision of a dentist provided the dental assistant has completed an approved course related to administration. The nitrous oxide levels must be preset by a dentist or dental hygienist before administration. In an emergency, the dental assistant can turn off the N_2O and administer oxygen. Assisting means setting up equipment and placing the facemask, not titrating and turning on equipment.

A dental assistant may work as a second pair of hands for either a dentist or a dental hygienist when either is actively performing services in the mouth of a patient. When acting as a second pair of hands for a dental hygienist, the dental assistant must be so assigned by a dentist. The acts performed by the dental assistant, registered dental assistant, or dental hygienist must be ancillary to the procedures performed by the dentist. This provision is not intended to expand the duties of the dental assistant, the registered dental assistant, or the dental hygienist.

The registered dental assistant must apply for licensure renewal every 3 years and is required to complete at least 36 hours of continuing education in the 3-year period preceding application.

The dentist may only delegate the following to a dental assistant if the assistant is working under a minimum of general supervision:

- Trial sizing of orthodontic bands;
- Holding the matrix for anterior resin restorations;
- Making impressions for study and opposing models;
- Applying of topical, non-aerosol anesthetic solutions;
- Instructing in the use and care of dental appliances; and
- Operating dental radiographic equipment (only allowed if the assistant has competed an approved course in dental radiography).

The dentist may delegate the following to a dental assistant only under direct supervision:

- Placing and removing orthodontic separators;
- Placing and removing orthodontic elastics, ligatures, and arch wires; and
- Dispensing aligners.

The dentist may not assign or delegate a dental assistant or registered dental assistant to perform the following:

- Removal of accretions, stains, or calculus deposits;
- Deep scaling; and
- Root planing.

The dentist may assign the following to a registered dental assistant. Assignment is defined in the rules as meaning that a dentist has designated a patient of record upon whom services are to be performed and has described the procedure to be performed. The dentist need not be in the office or in the treatment room when the procedures are performed.

- Operating dental radiographic equipment
- Making impressions for study and opposing models
- Placing and removing a rubber dam
- Removing excess cement from supragingival surfaces of a tooth with a non-rotary instrument
- Polishing specific teeth with a slow-speed rotary hand piece before a procedure that requires acid etching such as before placement of sealants, resin bonded orthodontic appliances, and direct restorations.
- Applying anticariogenic agents including sealants, fluoride varnish, fluoride applications, etc.
- Polishing and contouring sealants with a slow-speed rotary hand piece
- Inspecting and charting the oral cavity using a mouth mirror and radiographs

- Replacing existing temporary restorations, temporary crowns, and temporary bridges
- Removing orthodontic elastics, ligatures, and elastic or wire separators
- Replacing elastic or wire separators

The following may be assigned to a registered dental assistant only under general supervision of the dentist:

- Placing and removing a nonmetallic temporary restoration nonrotary instruments
- Sizing of temporary crowns and bands

The following may only be assigned to a registered dental assistant who has completed an approved course in the skill and then only under general supervision:

- Performing pulp vitality testing
- Placing and removing matrices and wedges
- Applying cavity liners and bases
- Placing and removing non-epinephrine retraction cords
- Applying desensitizing agents
- Making an impression for orthodontic appliances, mouth guards, bite splints, and bleaching trays
- Drying endodontic canals with absorbent points
- Etching and placing adhesives before placement of orthodontic brackets

The following may only be assigned to a registered dental assistant under direct supervision

- Placing and removing periodontal dressings
- Temporarily cementing and removing temporary crowns and bands
- Removing sutures
- Applying in-office bleaching
- Cementing orthodontic bands or initial placement of orthodontic brackets

The following may only be assigned to a registered dental assistant who has completed an approved course comprehensive clinical experience in the skill that is of sufficient duration and then only under direct supervision:

- Placing, condensing, and carving amalgam restorations
- Making final impressions for indirect restorations
- Assisting and monitoring administration of nitrous oxide analgesia

Other intra-oral procedures not described in the rules may not be assigned to a registered dental assistant. A dentist may not assign a dental hygienist to size temporary crowns and bands or make an impression for orthodontic appliances, mouth guards, etc. unless the dental hygienist is also a registered dental assistant.

Dental Hygienist

The qualifications for licensure as a registered dental hygienist in Michigan include the following:

- Graduation from an accredited dental hygiene education program

- Successful passage of the national board examination in dental hygiene state
- Successful passage of the clinical written examination administered by the regional board or its equivalent

The registered dental hygienist must apply for licensure renewal every 3 years and is required to complete at least 36 hours of continuing education in the 3-year period preceding application.

Registered dental hygienists in Michigan may provide the following services:

- Deep scaling, root planing, and the removal of calcareous deposits may only be performed by a licensed dental hygienist or dentist
- Upon assignment by a dentist, the dental hygienist may take an impression for an orthodontic appliance, a mouth guard, bite splints or bleaching trays

Under the delegation and direct supervision of a dentist, a dental hygienist may administer intraoral block and infiltration anesthesia or nitrous oxide analgesia (not greater than 50% N_2O) to a person age 18 and older. The dental hygienist must have completed an approved course(s) in the administration of local anesthesia, and/or nitrous oxide analgesia and have passed a written examination to prove competency. The dental hygienist must have a current certification in basic or advanced cardiac life support. The dental hygienist is provided with a certificate indicating qualification for this task.

A registered dental hygienist may perform the following only under assignment of a dentist:

- Removing accretions and stains from the surfaces of teeth and applying topical agents essential to prophylaxis
- Root planing or debridement
- Polishing and contouring restorations
- Applying anticariogenic and desensitizing agents
- Charting of the oral cavity
- Preliminary examination
- Applying non-aerosol and non-caustic topical anesthetic agents
- Placing and removing intracoronal temporary sedative dressings
- Taking intra-oral measurements for orthodontic procedures
- Placing and removing post-extraction and periodontal dressings
- Removing excess cement from tooth surfaces
- Providing nutritional counseling for oral health and maintenance
- Applying commonly accepted emergency procedures
- Removing sutures
- Placing and removing a rubber dam
- Making impressions for study or opposing models, orthodontic appliances, mouth guards, bite splints, and bleaching trays
- Operating dental radiographic equipment
- Placing subgingival medicaments
- Temporarily dispensing in office bleaching products

A registered dental hygienist may perform the following only under assignment and direct supervision of a dentist:

- Performing soft tissue curettage

- Administering intra-oral block or infiltration anesthesia or N_2O analgesia or both to a patient age 18 and older and only if properly trained and certified to do so

The Program for Dentally Underserved PA-161

A dental hygienist may perform dental hygiene services under dental supervision as part of a program for the dentally underserved that is conducted by a local, state, or federal grantee health agency for patients who are not assigned to a dentist. An entity may be designated as a grantee health agency for a 2-year period upon application and approval by the department of community health including a public or nonprofit entity, a school, or a nursing home if the entity administers a dental program for a dentally underserved population and employs or contracts with a dentist or dental hygienist. Supervision by a dentist under the program means continuous availability by direct communication in person, by radio, telephone or telecommunication between the supervised individual and the licensed health professional, regularly scheduled review of practice records to provide consultation and education, and provision of predetermined procedures and drug protocols.

Appendix B.

Characteristics of Michigan's Population by County

The following tables describe the population of Michigan by county including race/ethnicity, educational attainment, and sociodemographic characteristics obtained from data compiled by the US Census Bureau, the American Community Survey. There are 83 counties in Michigan with populations that vary noticeably in composition and density. These variations affect oral health status and access to and utilization of oral health services.

Geography	Population	Race Ethnicity						Education		Income		Density
County	Population 2013	White Alone 2013	Asian 2013	Black/ African American 2013	American Indian/ Alaska Native 2013	Other Race/Two or More Races 2013	Hispanic or Latino	High School Graduation or Higher 2008-2012	Bachelor's Degree or Higher	Median Household Income 2008-2012	Persons below Poverty Level 2008-2012	Persons per Square Mile 2010
State of Michigan	**9,895,622**	**79.1%**	**2.7%**	**13.9%**	**0.5%**	**3.7%**	**4.7%**	**88.7%**	**25.5%**	**$48,471**	**16.3%**	**174.8**
Alcona	10,578	97.7%	0.3%	0.3%	0.8%	1.0%	1.4%	86.2%	13.2%	$36,931	15.1%	16.2
Alger	9,522	85.8%	0.5%	6.7%	4.0%	3.0%	1.3%	87.1%	17.0%	$38,348	14.9%	10.5
Allegan	112,531	95.3%	0.8%	1.4%	0.7%	1.7%	7.0%	90.1%	19.9%	$51,030	13.1%	135.0
Alpena	29,091	97.3%	0.6%	0.4%	0.5%	1.2%	1.3%	88.6%	16.0%	$38,900	16.8%	51.8
Antrim	23,370	96.9%	0.3%	0.3%	1.1%	1.4%	1.9%	89.9%	23.9%	$43,171	16.0%	49.6
Arenac	15,487	96.6%	0.3%	0.4%	1.3%	1.4%	1.9%	83.0%	11.0%	$36,937	18.0%	43.8
Baraga	8,695	74.1%	0.3%	7.5%	13.6%	4.5%	1.3%	81.7%	11.6%	$39,594	14.7%	9.9
Barry	59,097	97.2%	0.5%	0.5%	0.5%	1.3%	2.5%	90.9%	17.3%	$53,541	10.8%	107.0
Bay	106,832	95.0%	0.6%	1.7%	0.6%	2.0%	4.9%	88.6%	18.6%	$46,068	13.5%	243.7
Benzie	17,428	96.1%	0.3%	0.6%	1.6%	1.4%	2.2%	90.3%	24.1%	$47,491	13.0%	54.8
Berrien	155,252	79.8%	1.8%	15.4%	0.6%	2.3%	5.0%	87.3%	24.2%	$43,471	17.4%	276.2
Branch	43,649	95.3%	0.6%	2.1%	0.5%	1.5%	4.3%	87.0%	13.8%	$42,995	17.3%	89.4
Calhoun	135,012	83.2%	1.9%	11.1%	0.7%	3.2%	4.7%	88.6%	18.9%	$42,164	17.0%	192.8
Cass	51,910	89.8%	0.8%	5.4%	1.1%	2.9%	3.2%	87.2%	16.9%	$45,462	13.7%	106.7
Charlevoix	26,129	95.7%	0.4%	0.4%	1.7%	1.8%	1.6%	91.6%	25.4%	$47,177	12.4%	62.3
Cheboygan	25,726	93.2%	0.4%	0.6%	3.1%	2.7%	1.2%	87.8%	16.6%	$38,166	18.0%	36.6
Chippewa	38,696	72.0%	0.8%	6.8%	15.4%	4.9%	1.6%	89.2%	17.7%	$41,114	18.5%	24.7
Clare	30,569	96.8%	0.3%	0.6%	0.7%	1.5%	1.8%	84.1%	11.1%	$33,334	24.8%	54.8
Clinton	76,739	94.2%	1.5%	1.9%	0.5%	1.9%	4.4%	92.7%	27.8%	$58,231	11.2%	133.1
Crawford	13,904	97.0%	0.4%	0.7%	0.7%	1.2%	1.6%	84.8%	15.2%	$39,982	18.7%	25.3
Delta	36,905	94.5%	0.5%	0.3%	2.5%	2.2%	1.0%	91.7%	17.9%	$42,504	15.3%	31.7
Dickinson	26,098	96.9%	0.6%	0.5%	0.7%	1.4%	1.4%	93.9%	18.9%	$44,272	11.0%	34.4
Eaton	108,348	88.3%	1.9%	7.0%	0.5%	2.3%	5.2%	93.5%	24.9%	$55,301	9.9%	187.3
Emmet	33,140	92.7%	0.6%	0.6%	3.8%	2.3%	1.5%	93.3%	31.1%	$50,686	10.9%	69.9

Geography	Population	Race Ethnicity						Education		Income		Density
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Genesee	415,376	75.2%	1.0%	20.8%	0.6%	2.5%	3.2%	88.8%	19.0%	$42,730	19.9%	668.5
Gladwin	25,493	97.7%	0.3%	0.4%	0.6%	1.0%	1.3%	85.0%	11.6%	$38,571	20.7%	51.2
Gogebic	15,916	90.9%	0.5%	4.4%	2.6%	1.6%	1.2%	91.8%	18.7%	$34,397	18.9%	14.9
Grand Traverse	89,987	95.0%	0.7%	1.3%	1.2%	1.7%	2.6%	93.3%	29.6%	$51,641	11.2%	187.3
Gratiot	41,968	92.0%	0.5%	5.8%	0.6%	1.1%	5.5%	87.4%	13.4%	$40,224	18.3%	74.7
Hillsdale	46,101	97.2%	0.4%	0.6%	0.5%	1.3%	2.1%	86.4%	14.8%	$42,668	19.6%	78.1
Houghton	36,225	94.2%	2.8%	0.9%	0.6%	1.4%	1.4%	90.7%	27.7%	$34,453	23.7%	36.3
Huron	32,224	97.8%	0.5%	0.5%	0.4%	0.8%	2.1%	86.1%	14.1%	$40,349	14.9%	39.6
Ingham	282,234	77.9%	5.6%	12.2%	0.7%	3.8%	7.6%	91.1%	35.8%	$45,567	21.5%	505.1
Ionia	64,073	92.6%	0.5%	4.9%	0.6%	1.4%	4.7%	86.8%	13.8%	$47,580	16.3%	111.9
Iosco	25,429	96.2%	0.6%	0.6%	0.8%	1.8%	2.0%	86.4%	13.9%	$35,396	19.6%	41.1
Iron	11,516	96.8%	0.3%	0.3%	1.2%	1.4%	1.7%	89.3%	17.7%	$35,551	13.7%	10.1
Isabella	70,436	89.1%	1.8%	2.6%	3.7%	2.6%	3.7%	89.9%	25.2%	$35,927	32.1%	122.8
Jackson	160,369	88.0%	0.8%	8.3%	0.4%	2.5%	3.2%	88.8%	18.5%	$46,572	16.1%	228.4
Kalamazoo	256,725	82.4%	2.6%	11.2%	0.5%	3.3%	4.5%	92.4%	33.7%	$46,011	18.9%	445.7
Kalkaska	17,196	96.5%	0.3%	0.5%	0.9%	1.8%	1.7%	86.5%	11.6%	$39,849	16.2%	30.6
Kent	621,700	83.6%	2.6%	10.3%	0.7%	2.8%	10.0%	89.1%	30.9%	$51,030	15.6%	711.5
Keweenaw	2,191	98.5%	0.0%	0.2%	0.2%	1.1%	1.0%	91.4%	23.6%	$42,406	18.8%	4.0
Lake	11,386	87.0%	0.2%	9.2%	0.9%	2.7%	2.5%	80.8%	8.2%	$30,390	24.1%	20.3
Lapeer	88,389	96.5%	0.4%	1.2%	0.5%	1.3%	4.4%	89.8%	16.8%	$52,369	11.5%	137.4
Leelanau	21,747	93.6%	0.5%	0.4%	3.6%	1.7%	3.9%	94.3%	39.0%	$53,982	11.1%	62.5
Lenawee	99,188	94.2%	0.6%	2.8%	0.6%	1.9%	7.7%	88.9%	19.4%	$48,528	14.1%	133.3
Livingston	184,443	96.8%	0.9%	0.6%	0.4%	1.3%	2.2%	93.9%	31.8%	$72,396	6.3%	320.2

Geography	Population	Race Ethnicity						Education		Income		Density
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Luce	6,502	80.3%	0.3%	11.1%	5.1%	3.2%	1.4%	85.1%	13.8%	$42,414	16.9%	7.4
Mackinac	11,061	75.6%	0.4%	1.2%	17.5%	5.3%	1.4%	88.4%	18.7%	$38,507	15.3%	10.9
Macomb	854,769	83.6%	3.4%	10.5%	0.3%	2.1%	2.4%	88.0%	22.2%	$53,628	11.8%	1754.9
Manistee	24,450	92.1%	0.4%	3.3%	2.2%	2.0%	2.8%	87.9%	17.7%	$41,228	15.3%	45.6
Marquette	67,700	93.8%	0.6%	1.8%	1.8%	2.0%	1.4%	93.1%	28.4%	$45,349	15.4%	37.1
Mason	28,605	95.8%	0.5%	0.8%	1.1%	1.7%	4.2%	88.6%	19.4%	$40,957	16.9%	58.0
Mecosta	43,108	93.3%	0.9%	3.0%	0.7%	2.2%	2.0%	89.4%	21.5%	$38,332	22.9%	77.1
Menominee	23,791	94.9%	0.4%	0.5%	2.9%	1.3%	1.5%	89.6%	13.8%	$40,865	14.7%	23.0
Midland	83,919	94.4%	2.3%	1.3%	0.5%	1.5%	2.4%	92.4%	32.0%	$52,947	12.2%	162.0
Missaukee	15,051	97.0%	0.4%	0.4%	0.7%	1.5%	2.4%	86.9%	13.5%	$40,406	15.5%	26.3
Monroe	150,376	95.0%	0.6%	2.3%	0.4%	1.6%	3.3%	89.1%	17.6%	$54,588	11.8%	276.7
Montcalm	63,105	95.0%	0.5%	2.5%	0.6%	1.5%	3.2%	86.4%	12.8%	$40,707	18.6%	89.8
Montmorency	9,350	97.5%	0.2%	0.3%	0.5%	1.4%	1.2%	84.1%	10.5%	$34,955	18.7%	17.9
Muskegon	171,008	81.4%	0.7%	14.2%	1.0%	2.7%	5.2%	87.6%	16.8%	$40,843	19.5%	344.9
Newaygo	48,001	96.0%	0.4%	1.2%	0.9%	1.4%	5.8%	85.3%	13.2%	$43,180	18.3%	59.6
Oakland	1,231,640	76.9%	6.3%	0.3%	14.4%	2.1%	3.7%	92.6%	42.7%	$65,637	9.9%	1385.7
Oceana	26,245	95.9%	0.3%	0.7%	1.5%	1.7%	14.1%	83.0%	14.7%	$39,667	20.6%	51.9
Ogemaw	21,234	97.0%	0.4%	0.3%	0.9%	1.4%	1.8%	84.6%	10.8%	$35,320	20.5%	38.5
Ontonagon	6,322	96.7%	0.3%	0.2%	1.2%	1.6%	1.1%	89.6%	16.7%	$33,769	15.5%	5.2
Osceola	23,259	96.4%	0.3%	0.9%	0.6%	1.8%	1.5%	86.7%	13.1%	$37,825	20.0%	41.5
Oscoda	8,379	97.3%	0.1%	0.2%	0.8%	1.6%	1.1%	81.9%	9.6%	$33,942	20.1%	15.3
Otsego	24,129	96.4%	0.5%	0.5%	0.8%	1.7%	1.5%	90.4%	18.9%	$47,140	12.3%	46.9
Ottawa	272,701	93.1%	2.8%	1.8%	0.6%	1.7%	9.3%	90.7%	29.3%	$55,760	10.5%	468.2
Presque Isle	13,062	97.0%	0.4%	0.6%	0.9%	1.1%	1.0%	86.1%	15.9%	$39,109	12.6%	20.3

Geography	Population	Race Ethnicity						Education		Income		Density
County	Population 2013	White Alone 2013	Asian 2013	Black/ African American 2013	American Indian/ Alaska Native 2013	Other Race/Two or More Races 2013	Hispanic or Latino	High School Graduation or Higher 2008-2012	Bachelor's Degree or Higher	Median Household Income 2008-2012	Persons below Poverty Level 2008-2012	Persons per Square Mile 2010
Roscommon	24,014	96.9%	0.5%	0.6%	0.7%	1.3%	1.5%	85.4%	14.5%	$34,765	21.6%	47.1
Saginaw	196,542	76.8%	1.2%	19.3%	0.5%	2.1%	8.0%	86.8%	18.8%	$42,828	18.7%	250.2
Sanilac	41,823	97.5%	0.4%	0.5%	0.6%	1.1%	3.7%	85.8%	11.7%	$40,019	16.7%	44.8
Schoolcraft	8,247	86.8%	0.2%	0.3%	9.2%	3.5%	0.8%	89.0%	12.3%	$37,468	18.3%	7.2
Shiawassee	68,900	97.0%	0.5%	0.6%	0.5%	1.4%	2.7%	89.9%	14.5%	$47,106	14.4%	133.1
St. Clair	160,469	94.4%	0.6%	2.5%	0.5%	1.9%	3.1%	88.5%	15.5%	$47,877	14.3%	226.1
St. Joseph	60,964	93.9%	0.7%	2.7%	0.6%	2.0%	7.0%	84.5%	14.3%	$44,214	17.3%	122.4
Tuscola	54,263	96.7%	0.3%	1.2%	0.6%	1.2%	3.2%	85.4%	12.8%	$43,463	15.7%	69.4
Van Buren	75,455	91.4%	0.6%	4.2%	1.3%	2.4%	10.8%	84.8%	18.4%	$44,425	18.9%	125.5
Washtenaw	354,240	75.0%	8.4%	12.9%	0.4%	3.4%	4.4%	93.9%	50.8%	$59,063	14.6%	488.4
Wayne	1,775,273	54.7%	2.9%	39.6%	0.5%	2.3%	5.6%	83.8%	20.8%	$41,504	23.8%	2974.4
Wexford	32,645	96.5%	0.7%	0.5%	0.5%	1.7%	1.7%	88.0%	15.9%	$40,660	17.7%	57.9

Source: US Census Bureau, ACS, 2013

Appendix C.

Oral Health Status of the Population by Region

The following tables and figures describe the oral health status of the population in Michigan by regions in the state. The data for these charts were obtained variously from sources cited elsewhere in this report and as cited under each figure.

Oral Health Status of Children in Michigan by Region, 2005-2006 and 2009-2010

Third Grade Children		Healthy People 2020 Goal		Status by Region						Change Between 2005 and 2010					
				Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula	Michigan	Upper Peninsula	Northern Lower Peninsula	City of Detroit	Suburban Detroit	Southern Lower Peninsula
Primary Caries Experience	2005-2006	Reduce proportion of children age 6 to 9 with dental caries experience in primary or permanent teeth	Baseline 1999-2004	53.5%	65.3%	63.8%	61.2%	43.9%	56.8%	-2.2%	-2.4%	-7.7%	-15.6%	7.6%	-5.9%
	2009-2010			51.3%	62.9%	56.1%	45.6%	51.5%	50.9%						
Permanent Caries Experience	2005-2006		54.4%	17.5%	29.3%	20.6%	22.7%	11.5%	19.7%	1.6%	-9.3%	-0.7%	2.2%	5.9%	-0.5%
	2009-2010		Target	19.1%	20.0%	19.9%	24.9%	17.4%	19.2%						
Primary or Permanent Caries Experience	2005-2006		58.0%	70.3%	66.2%	63.2%	47.9%	62.1%	-2.1%	-4.3%	-7.0%	-11.5%	7.0%	-5.8%	
	2009-2010		49.0%	55.9%	66.0%	59.2%	51.7%	54.9%	56.3%						
Untreated Primary Decay	2005-2006	Reduce the proportion of children age 6 to 9 withuntreated dental decay in at least one primary or permanent tooth	Baseline 1999-2004	21.0%	28.7%	25.9%	26.7%	16.6%	23.6%	2.6%	-0.8%	-5.2%	9.1%	4.9%	-0.4%
	2009-2010			23.6%	27.9%	20.7%	35.8%	21.5%	23.2%						
Untreated Permanent Decay	2005-2006		28.8%	7.3%	10.0%	9.6%	8.7%	4.5%	8.5%	2.3%	-2.2%	-3.8%	10.2%	4.3%	0.8%
	2009-2010		Target	9.6%	7.8%	5.8%	18.9%	8.8%	9.3%						
Untreated Primary or Permanent Decay	2005-2006		25.0%	33.0%	28.1%	29.6%	18.3%	27.9%	2.1%	-2.4%	-6.2%	12.3%	6.8%	-1.2%	
	2009-2010		25.9%	27.1%	30.6%	21.9%	41.9%	25.1%	26.7%						
Routine/Early Dental Care Needed	2005-2006	No Goal		27.5%	27.3%	39.3%	30.6%	13.8%	34.4%	0.6%	-3.5%	-13.0%	-4.0%	16.8%	-7.3%
	2009-2010			28.1%	23.8%	26.3%	26.6%	30.6%	27.1%						
Immediate Dental Care Needed	2005-2006			9.6%	4.4%	10.7%	N/A	4.2%	14.7%	-2.6%	-0.3%	-0.4%		0.3%	-7.8%
	2009-2010			7.0%	4.1%	10.3%	16.8%	4.5%	6.9%						
No Obvious Dental Problem	2005-2006			62.9%	68.3%	50.0%	69.4%	82.0%	50.8%	2.0%	3.8%	13.5%	-12.8%	-17.1%	15.2%
	2009-2010			64.9%	72.1%	63.5%	56.6%	64.9%	66.0%						

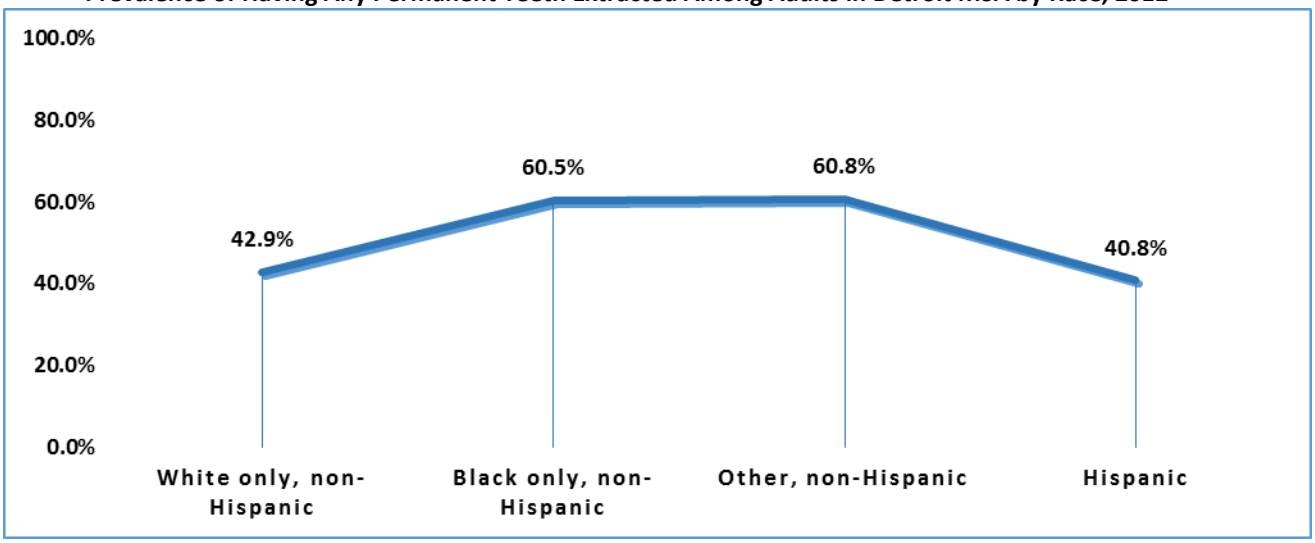
Sources: MDOCH, Healthy People 2020.

The following figures describe prevalence data from the BRFSS about the oral health status and utilization of oral health services of people living in the 3 largest MSAs in Michigan. The data for each MSA were analyzed by a number of demographic variables.

Percentage of Adults Age 18 and Older in Each MSA Who Have Had Any Permanent Teeth Extracted

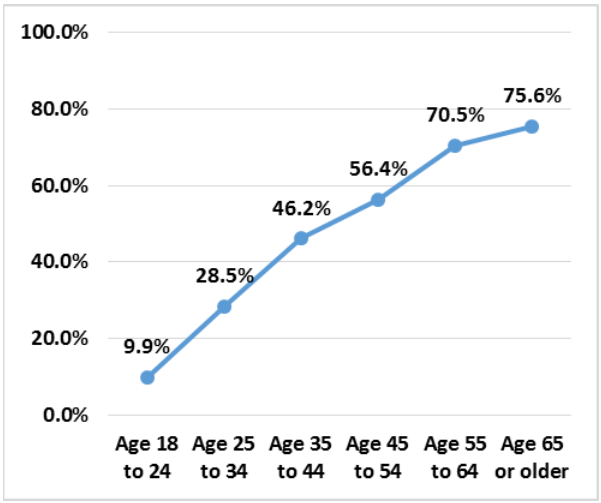
Detroit-Livonia-Dearborn, MI Metropolitan Division (Wayne County)

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Detroit MSA by Race, 2012



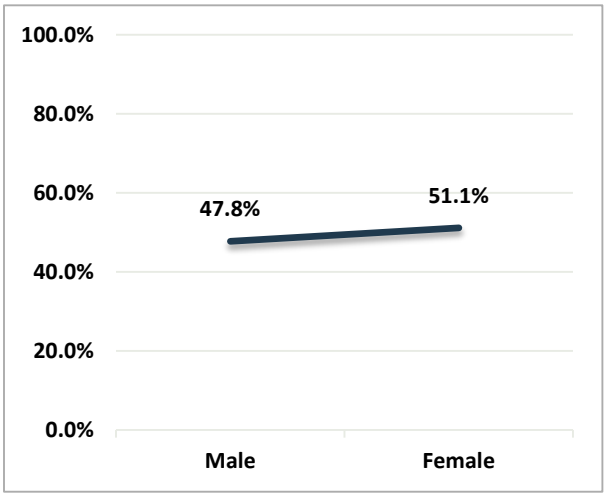
Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Detroit MSA by Age, 2012



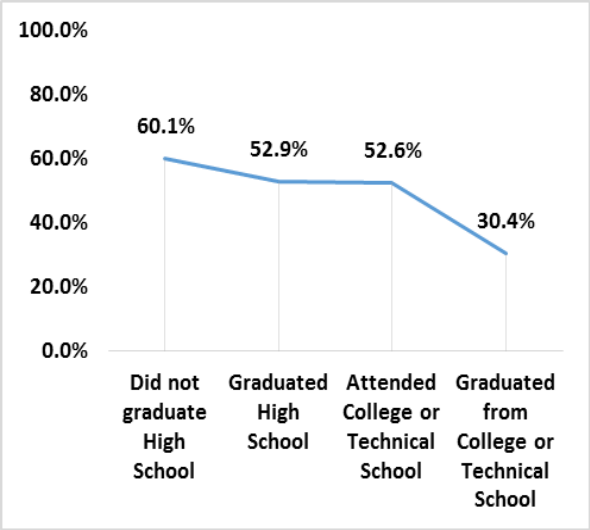
Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Detroit MSA by Gender, 2012



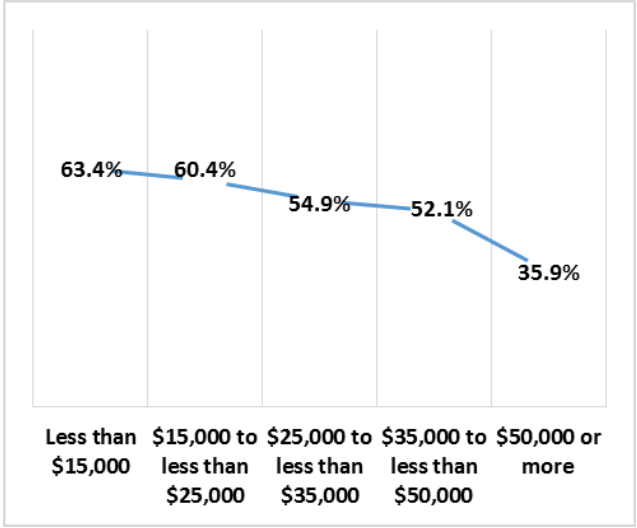
Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Detroit MSA by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Detroit MSA by Annual Income, 2012



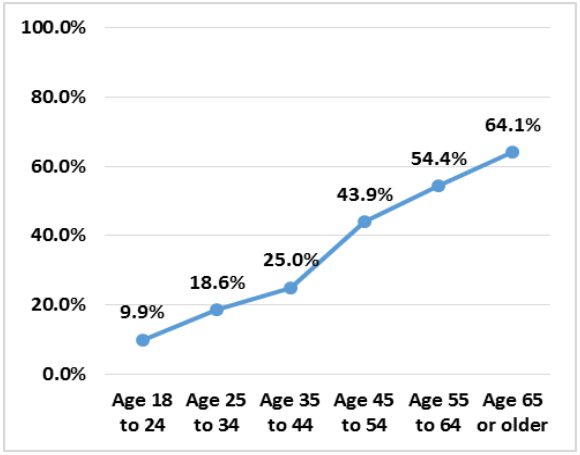
Source: CDC, BRFSS, 2012

Grand Rapids-Wyoming, MI, Metropolitan Statistical Area

(Including Barry County, Ionia County, Kent County, Montcalm County, Newaygo County, and Ottawa County)

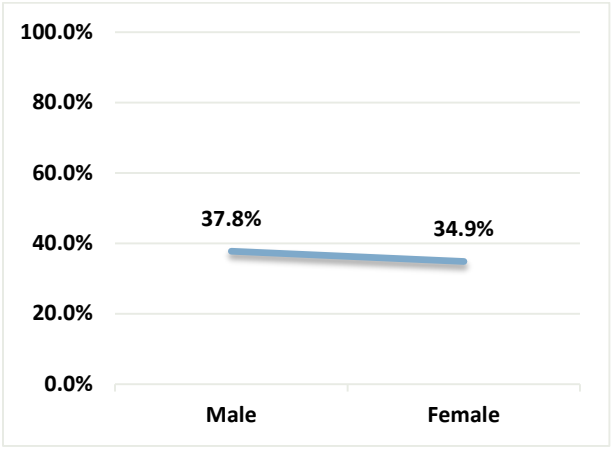
The results are not reported by race/ethnicity due to the BRFSS caution rule of not reporting or interpreting percentages based upon a denominator of fewer than 50 respondents from an unweighted sample.[112]

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Grand Rapids MSA by Age, 2012



Source: CDC, BRFSS, 2012

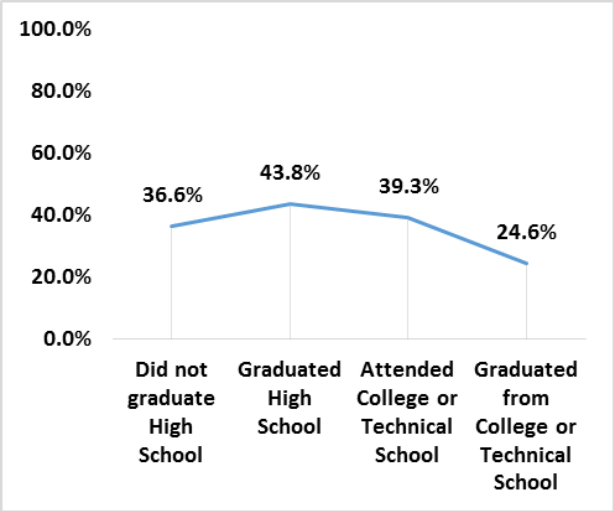
Prevalence of Having Any Permanent Teeth Extracted Among Adults in Grand Rapids MSA by Gender, 2012



Source: CDC, BRFSS, 2012

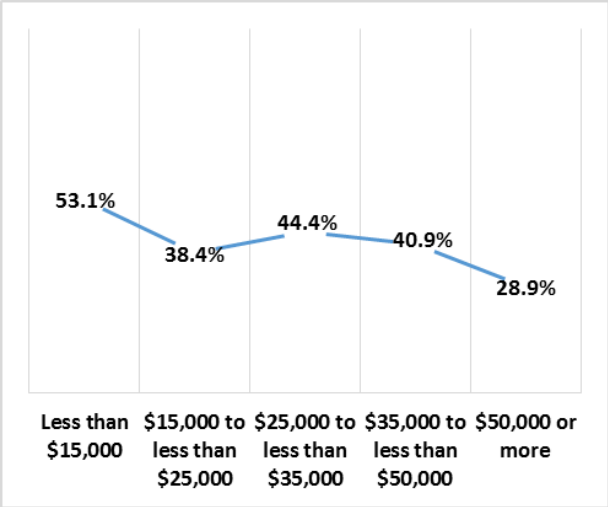
[112] CDC. Behavioral Risk Factor Surveillance System. Comparability of Data BRFSS 2012. http://www.cdc.gov/brfss/annual_data/2012/pdf/Compare_2012.pdf. (Subgroup analyses, particularly using a single data year and specific geographic areas/demographic groups, are limited by small sample sizes that can lead to unreliable findings.)

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Grand Rapids MSA by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Grand Rapids MSA by Annual Income, 2012

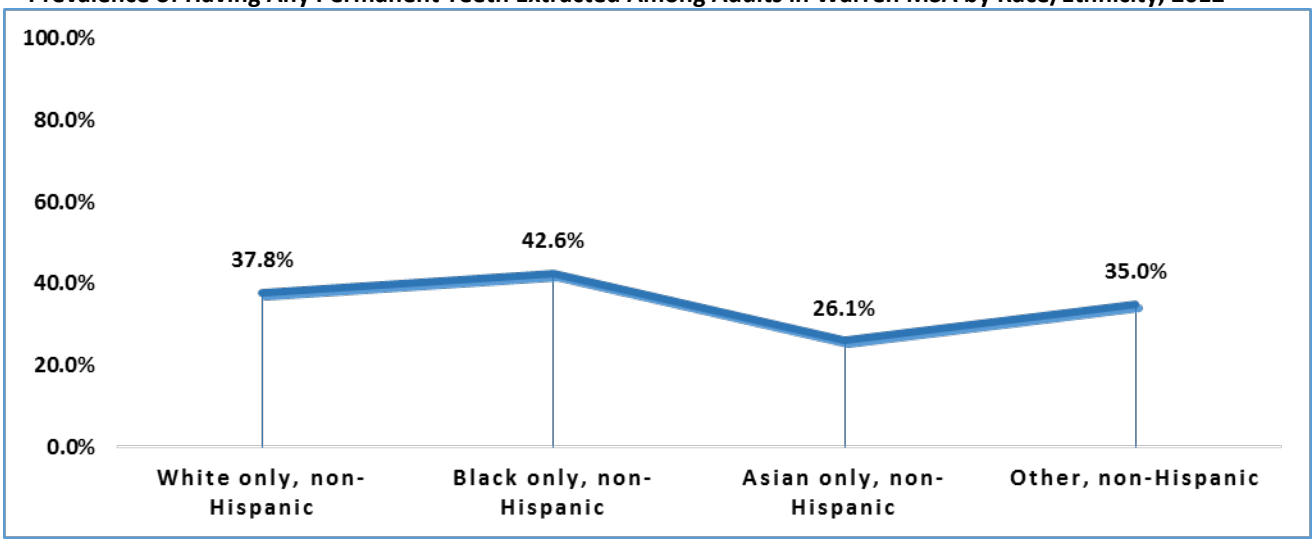


Source: CDC, BRFSS, 2012

Warren-Troy-Farmington Hills, MI, Metropolitan Statistical Area

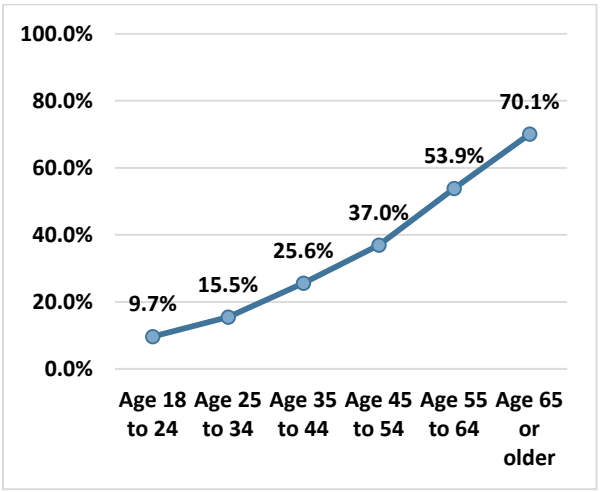
(Including Lapeer County, Livingston County, Macomb County, Oakland County, St. Clair County)

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Warren MSA by Race/Ethnicity, 2012



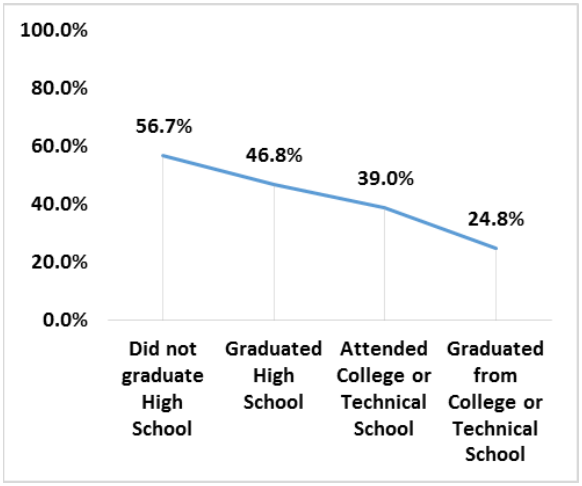
Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Warren MSA by Age, 2012



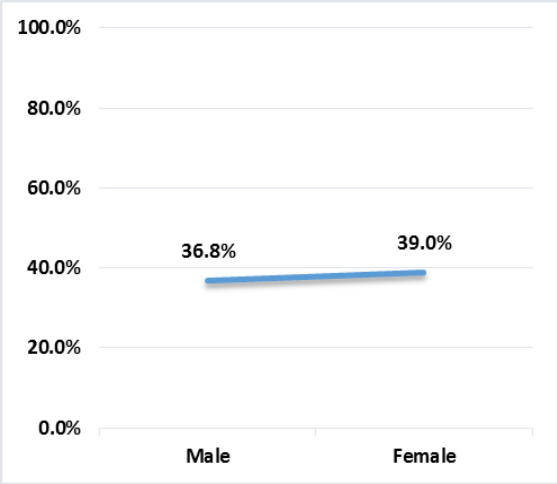
Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Warren MSA by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Warren MSA by Gender, 2012



Source: CDC, BRFSS, 2012

Prevalence of Having Any Permanent Teeth Extracted Among Adults in Warren MSA by Annual Income, 2012

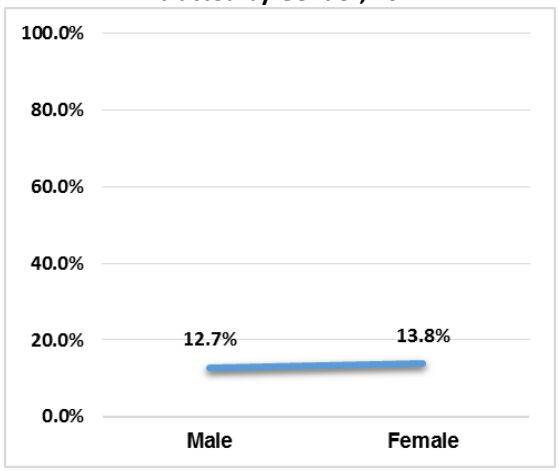
Source: CDC, BRFSS, 2012

The following results are not reported by race/ethnicity in any MSA due to the BRFSS caution rule of not reporting/ interpreting percentages based upon a denominator of fewer than 50 respondents from an unweighted sample.[53]

Percentage of Adults Age 65 or Older in Each MSA Who Have Had All Their Natural Teeth Extracted

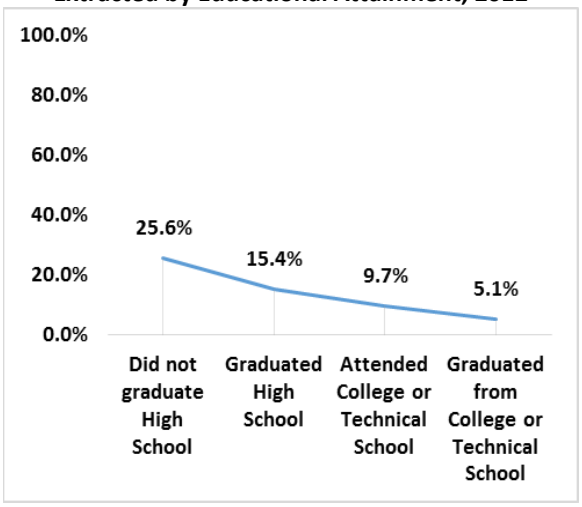
Detroit-Livonia-Dearborn, MI Metropolitan Division (Wayne County)

Percentage of Adults Age 65 or Older in Detroit MSA Who Have Had All Their Natural Teeth Extracted by Gender, 2012



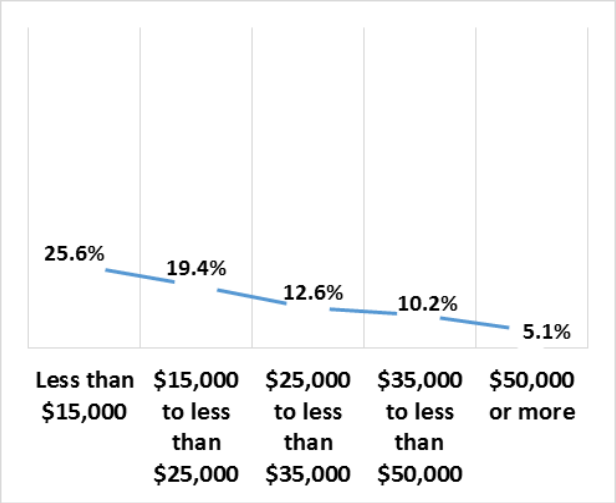
Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Detroit MSA Who Have Had All Their Natural Teeth Extracted by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Detroit MSA Who Have Had All Their Natural Teeth Extracted in by Annual Income, 2012

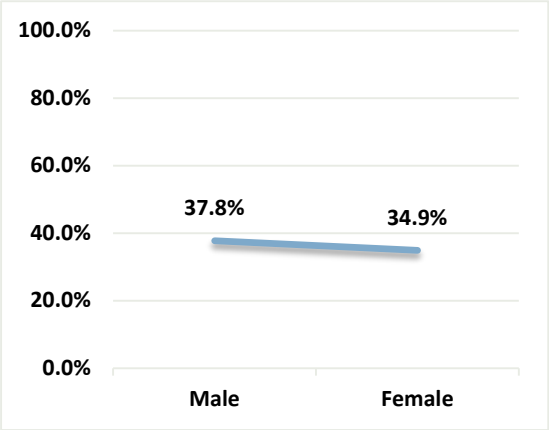


Source: CDC, BRFSS, 2012

Grand Rapids-Wyoming, MI, Metropolitan Statistical Area

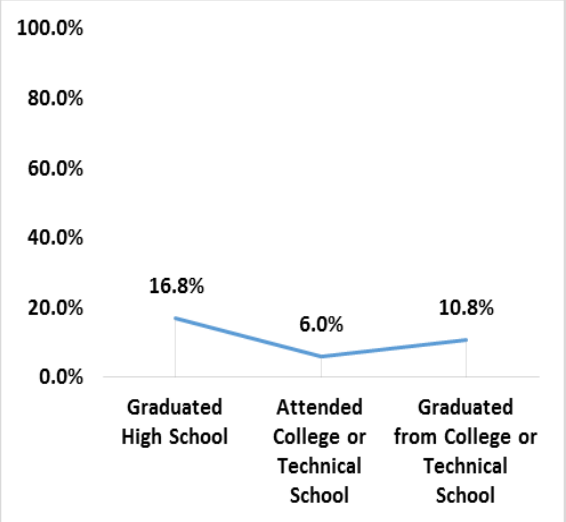
(Including Barry County, Ionia County, Kent County, Montcalm County, Newaygo County, Ottawa County)

Percentage of Adults Age 65 or Older in Grand Rapids MSA Who Have Had All Their Natural Teeth Extracted by Gender, 2012



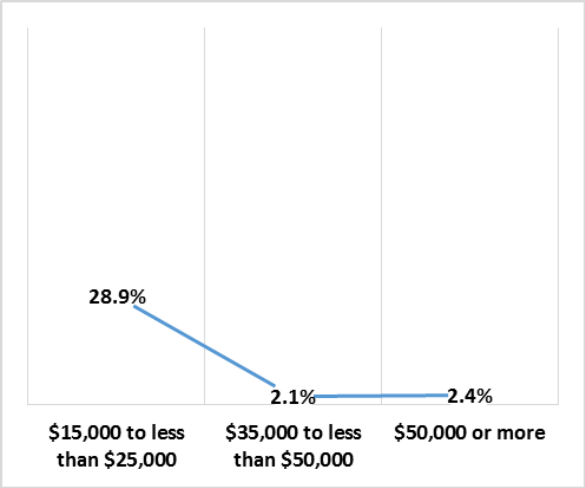
Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Grand Rapids MSA Who Have Had All Their Natural Teeth Extracted by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Detroit MSA Who Have Had All Their Natural Teeth Extracted in by Annual Income, 2012

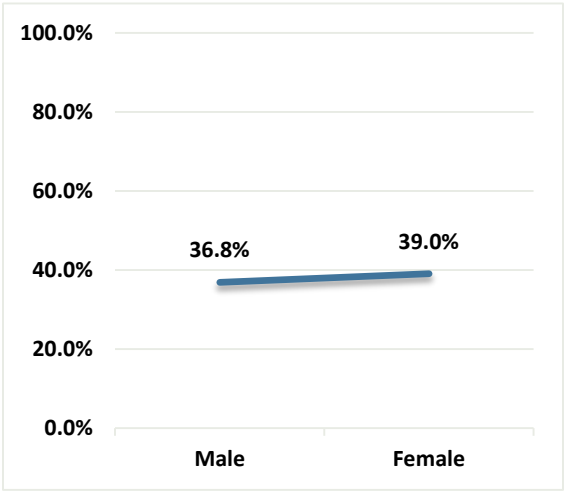


Source: CDC, BRFSS, 2012

Warren-Troy-Farmington Hills, MI, Metropolitan Statistical Area

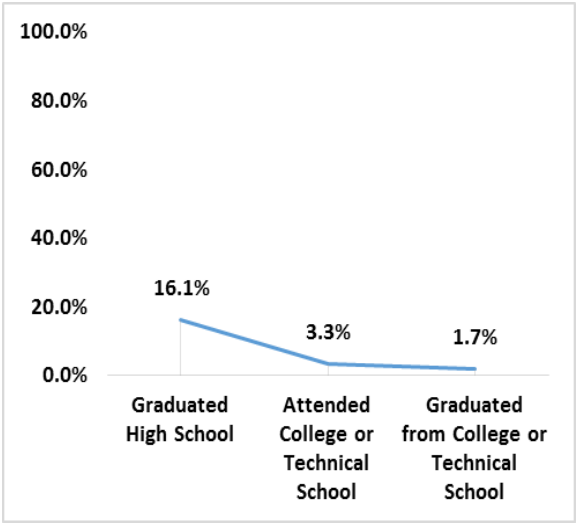
(Including Lapeer County, Livingston County, Macomb County, Oakland County, St. Clair County

Percentage of Adults Age 65 or Older in Wayne MSA Who Have Had All Their Natural Teeth Extracted by Gender, 2012



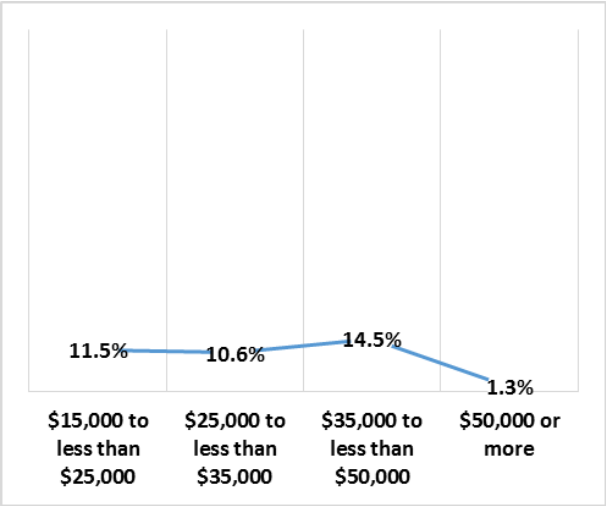
Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Wayne MSA Who Have Had All Their Natural Teeth Extracted by Educational Attainment, 2012



Source: CDC, BRFSS, 2012

Percentage of Adults Age 65 or Older in Detroit MSA Who Have Had All Their Natural Teeth Extracted in by Annual Income, 2012

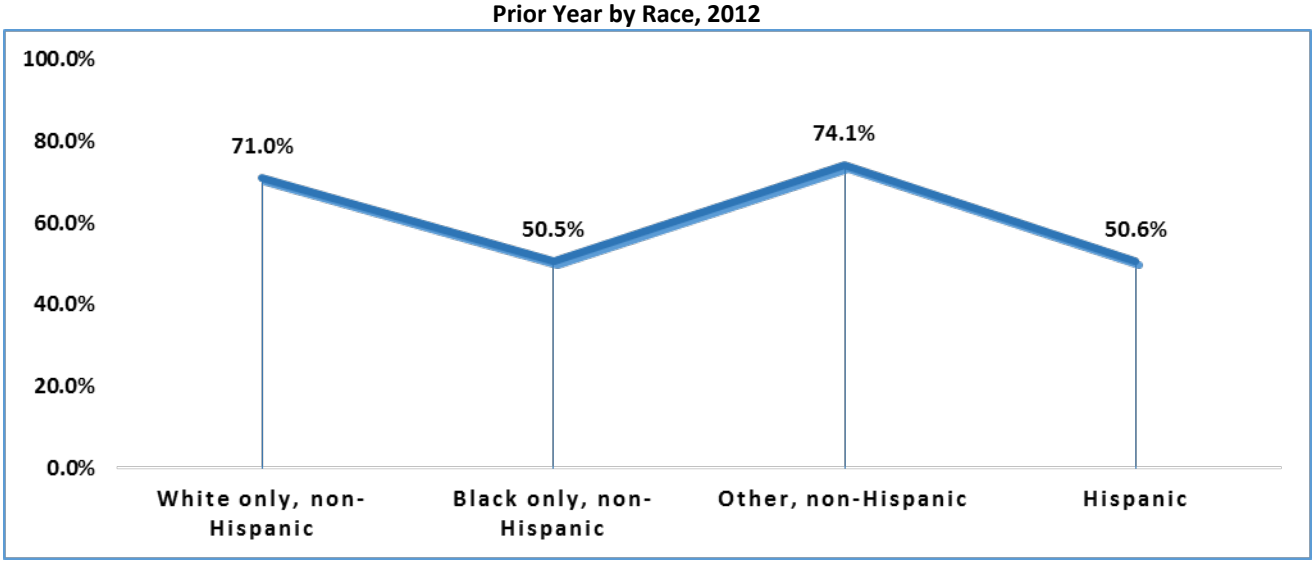


Source: CDC, BRFSS, 2012

The Prevalence of Adults Visiting a Dentist, Dental Hygienist, or a Dental Clinic within the Past Year

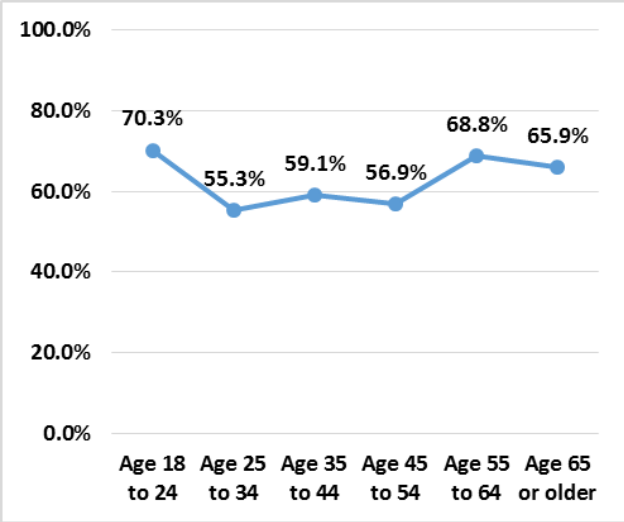
Detroit-Livonia-Dearborn, MI Metropolitan Division (Wayne County)

Prevalence of Adults in Detroit MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Race, 2012



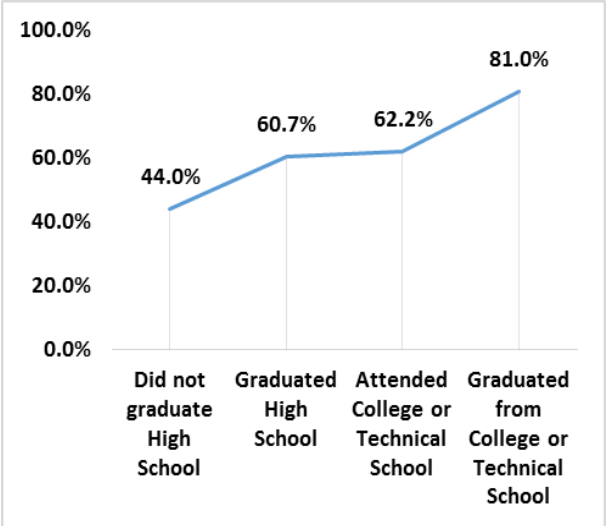
Source: CDC, BRFSS, 2012

Prevalence of Adults in Detroit MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Age, 2012



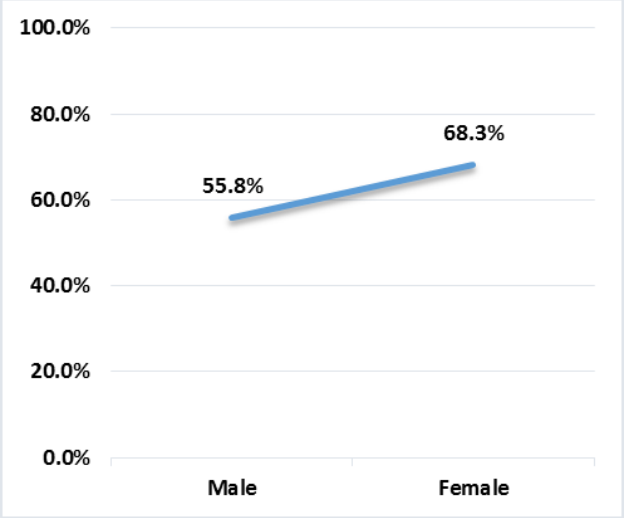
Source: CDC, BRFSS, 2012

Prevalence of Adults in Detroit MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Educational Attainment, 2012



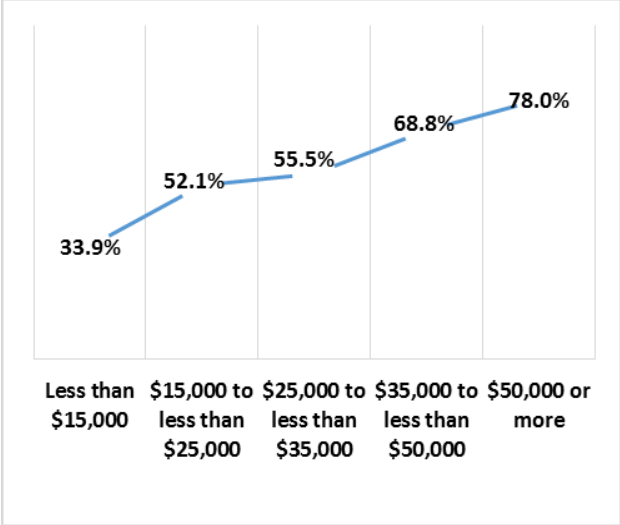
Source: CDC, BRFSS 2012

Prevalence of Adults in Detroit MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Gender, 2012



Source: CDC, BRFSS, 2012

Prevalence of Adults in Detroit MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Annual Income, 2012



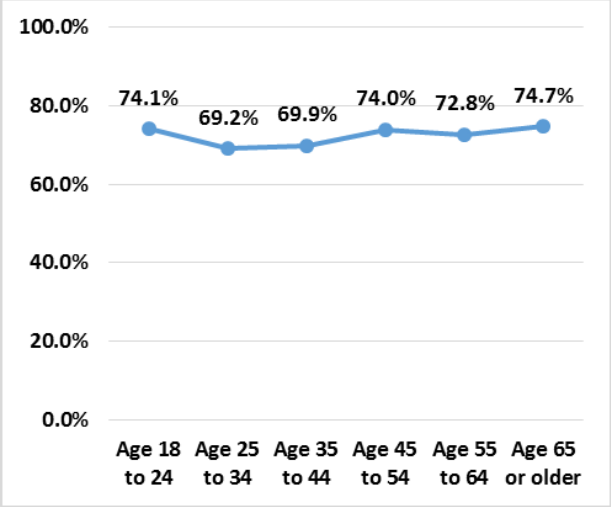
Source: CDC, BRFSS, 2012

The following results are not reported by race/ethnicity due to the BRFSS caution rule of not reporting/ interpreting percentages based upon a denominator of fewer than 50 respondents from an unweighted sample.[53]

Grand Rapids-Wyoming, MI, Metropolitan Statistical Area

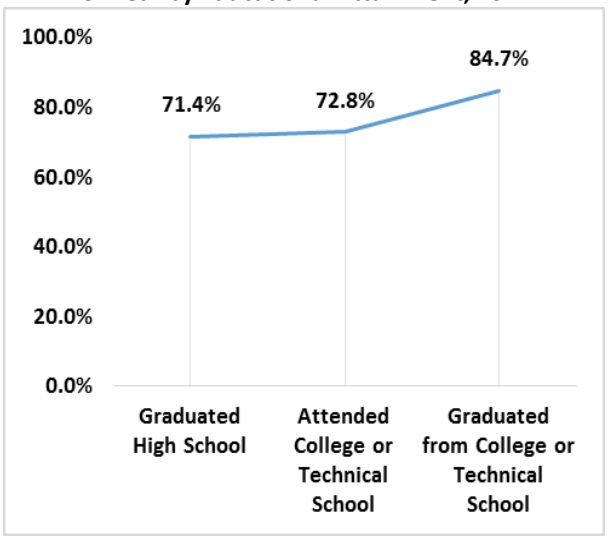
(Including Barry County, Ionia County, Kent County, Montcalm County, Newaygo County, Ottawa County)

Prevalence of Adults in Grand Rapids MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Age, 2012



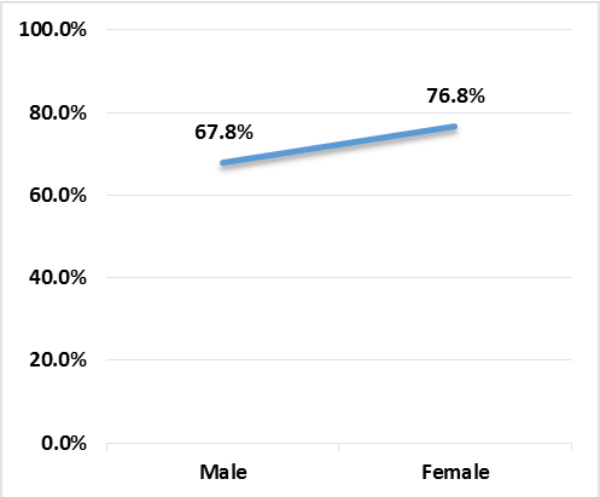
Source: CDC, BRFSS 2012

Prevalence of Adults in Grand Rapids MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Educational Attainment, 2012



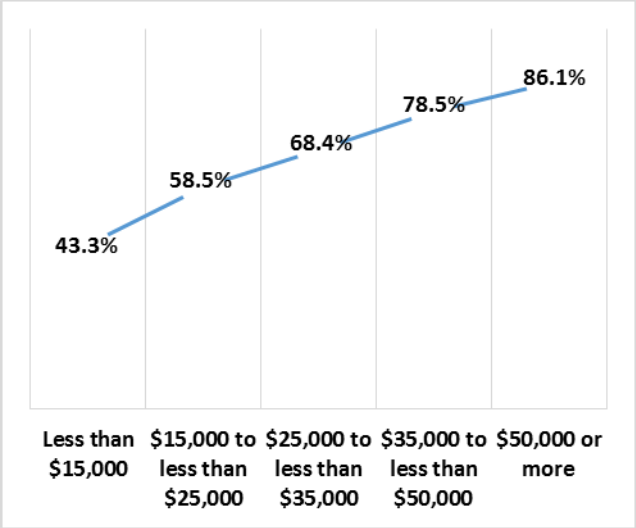
Source: CDC, BRFSS 2012

Prevalence of Adults in Grand Rapids MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Gender, 2012



Source: CDC, BRFSS 2012

Prevalence of Adults in Grand Rapids MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Annual Income, 2012

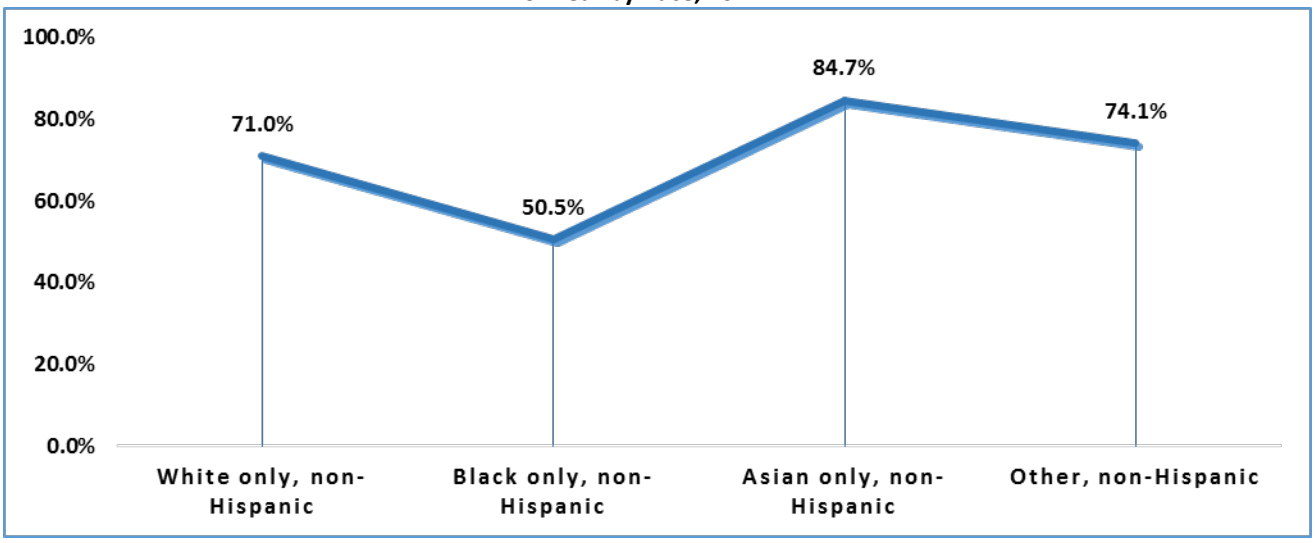


Source: CDC, BRFSS 2012

Warren-Troy-Farmington Hills, MI, Metropolitan Statistical Area

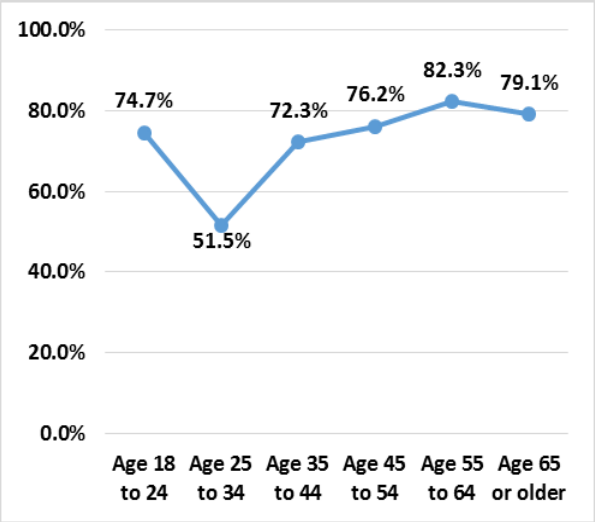
(Including Lapeer County, Livingston County, Macomb County, Oakland County, St. Clair County

Prevalence of Adults in Warren MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Race, 2012



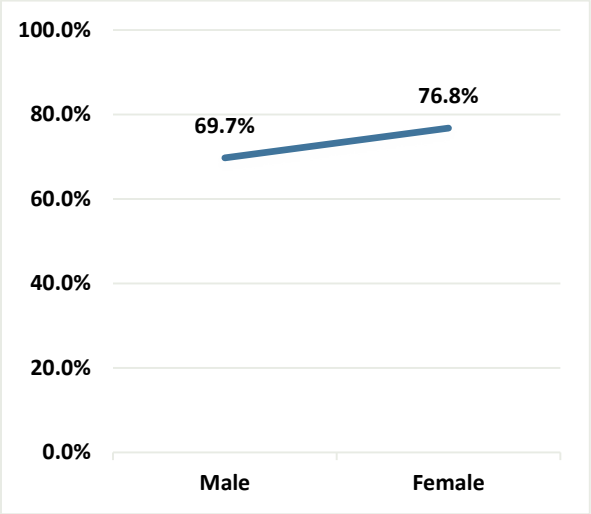
Source: CDC, BRFSS 2012

Prevalence of Adults in Warren MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Age, 2012



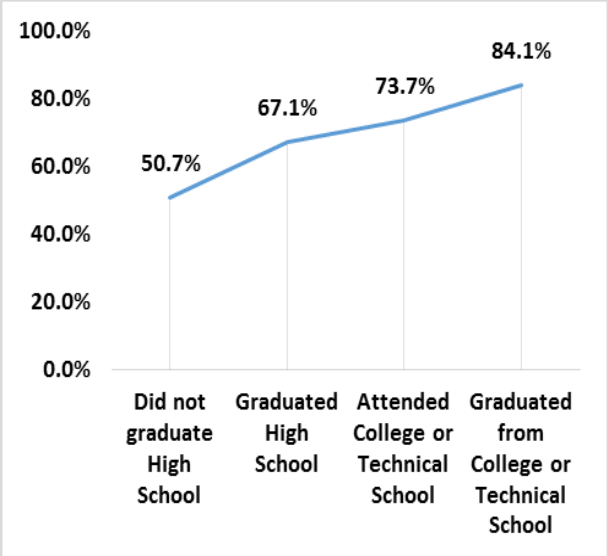
Source: CDC, BRFSS 2012

Prevalence of Adults in Warren MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Gender, 2012



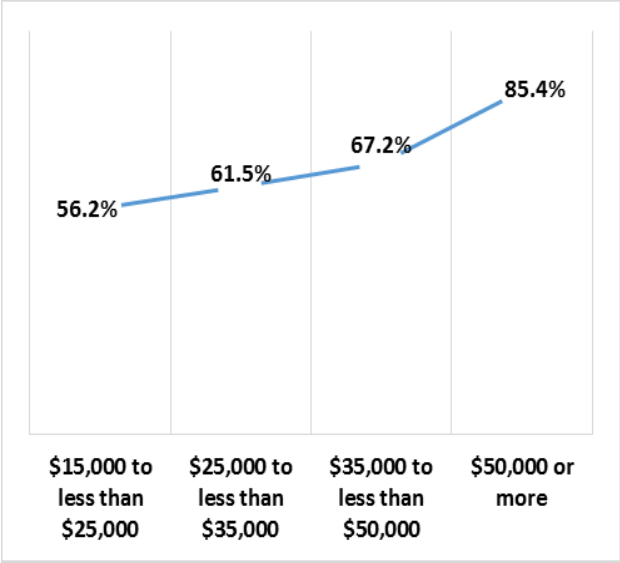
Source: CDC, BRFSS 2012

Prevalence of Adults in Warren MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Educational Attainment, 2012



Source: CDC, BRFSS 2012

Prevalence of Adults in Warren MSA Visiting a Dentist, Dental Hygienist, or Dental Clinic in the Prior Year by Annual Income, 2012



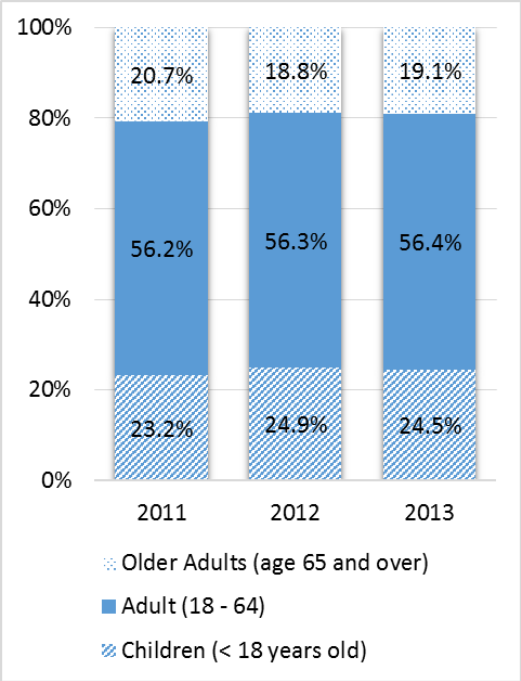
Source CDC, BRFSS 2012

Appendix D.

The following figures describe data from the UDS to which all FQHCs report annually to describe services to patients. Each FQHC in Michigan that reported data is presented.

Alcona Citizens for Health, Inc., FQHC in Lincoln, Michigan

Age of Patient Caseload, 2011, 2012, 2013

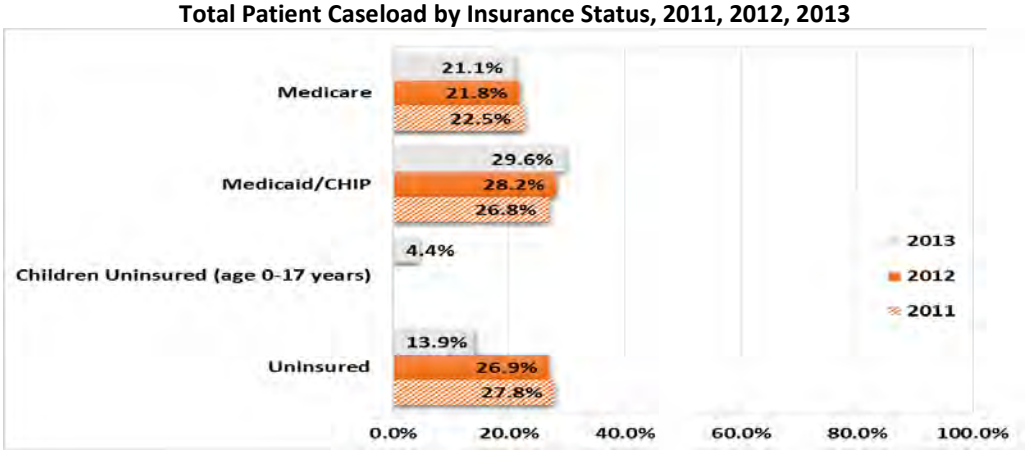


Source: UDS, 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013

Source: UDS, 2011, 2012, 2013

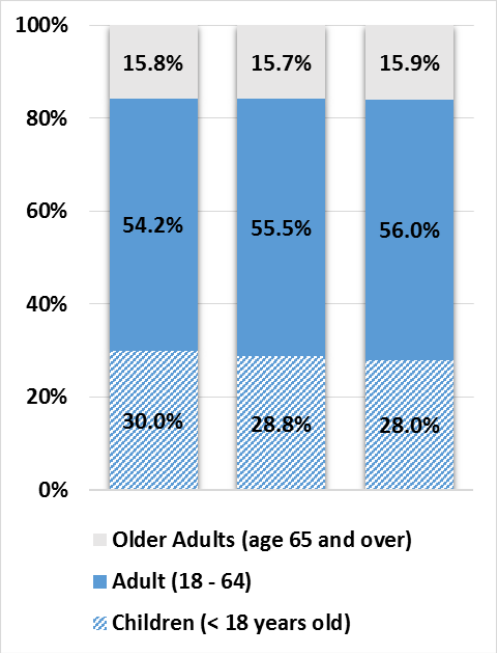
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS, 2011, 2012, 2013

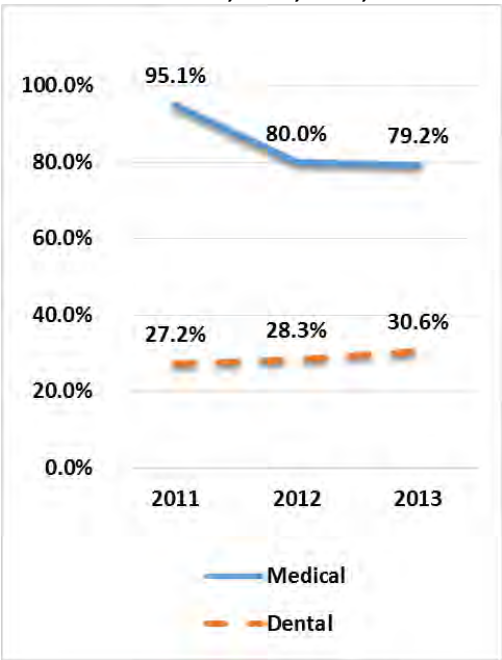
Baldwin Family Health Care, Inc., FQHC in Baldwin, Michigan

Age of Patient Caseload, 2011, 2012, 2013



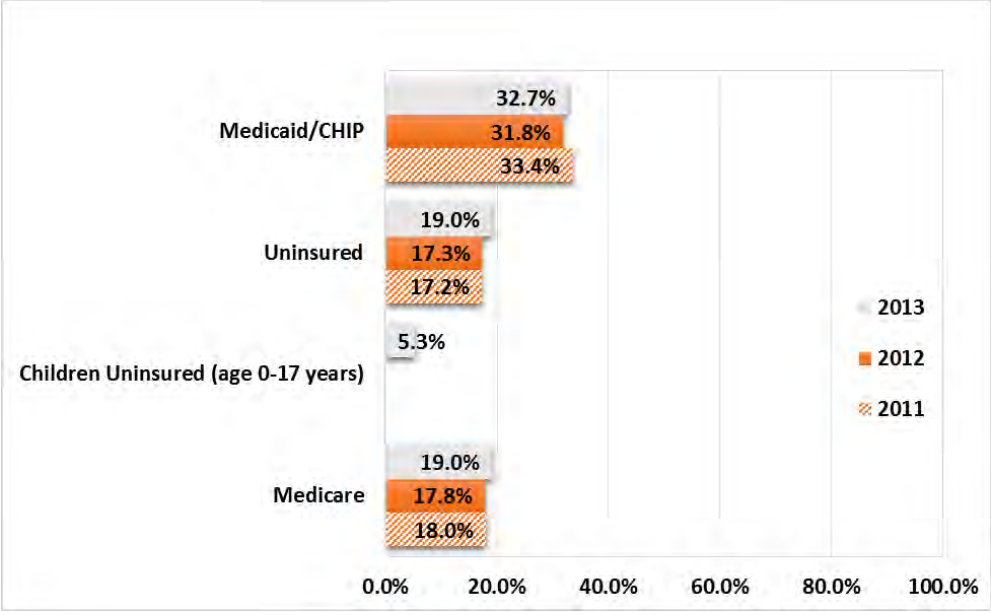
Source: UDS, 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS, 2011, 2012, 2013

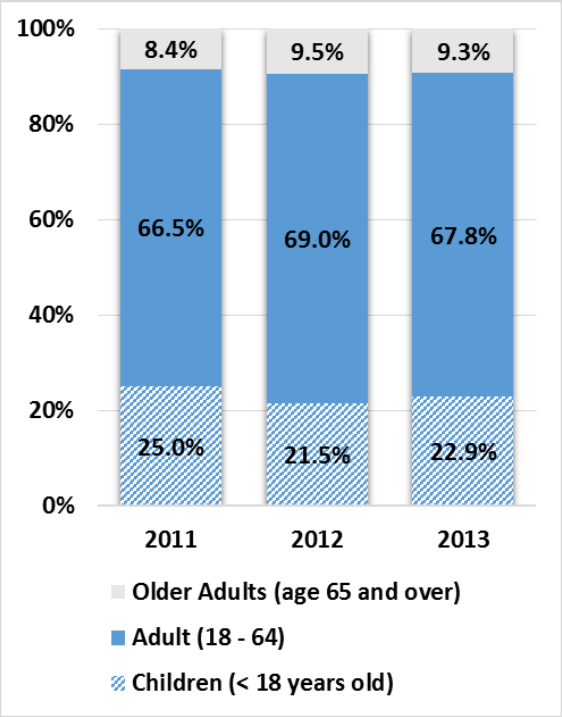
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS, 2011, 2012, 2013

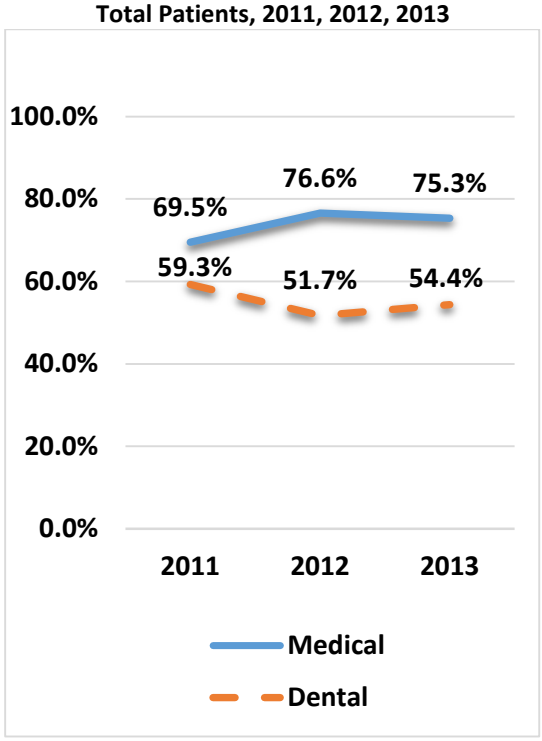
Bay Mills Indian Community, FQHC in Brimley, Michigan

Age of Patient Caseload, 2011, 2012, 2013



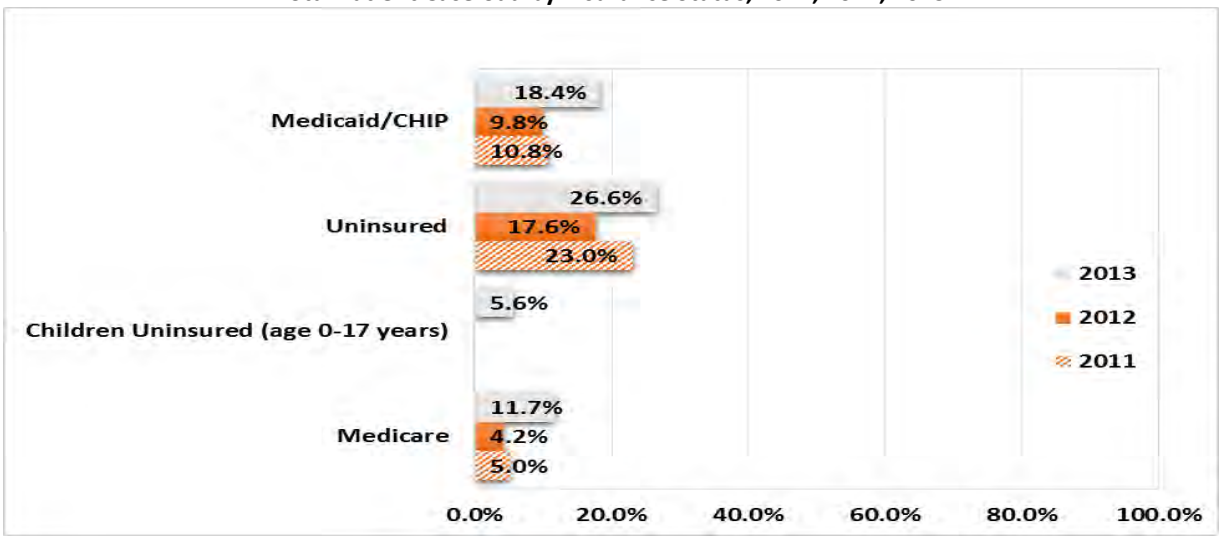
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

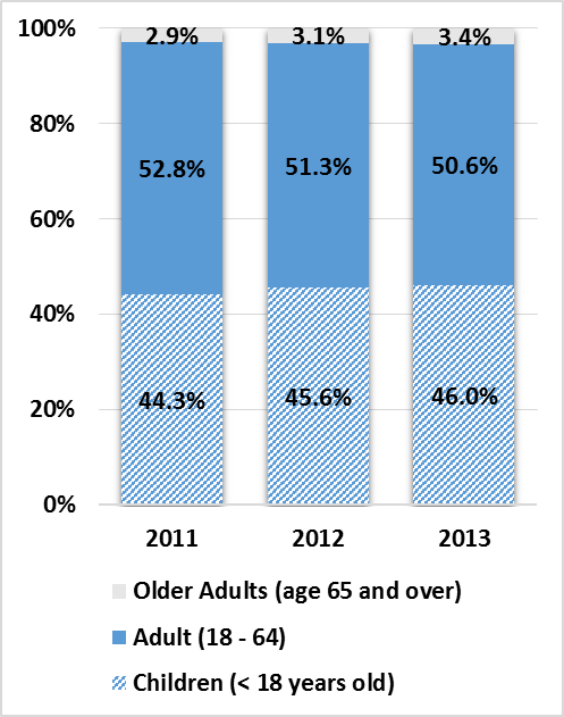
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

Center for Family Health, FQHC in Jackson, Michigan

Age of Patient Caseload, 2011, 2012, 2013

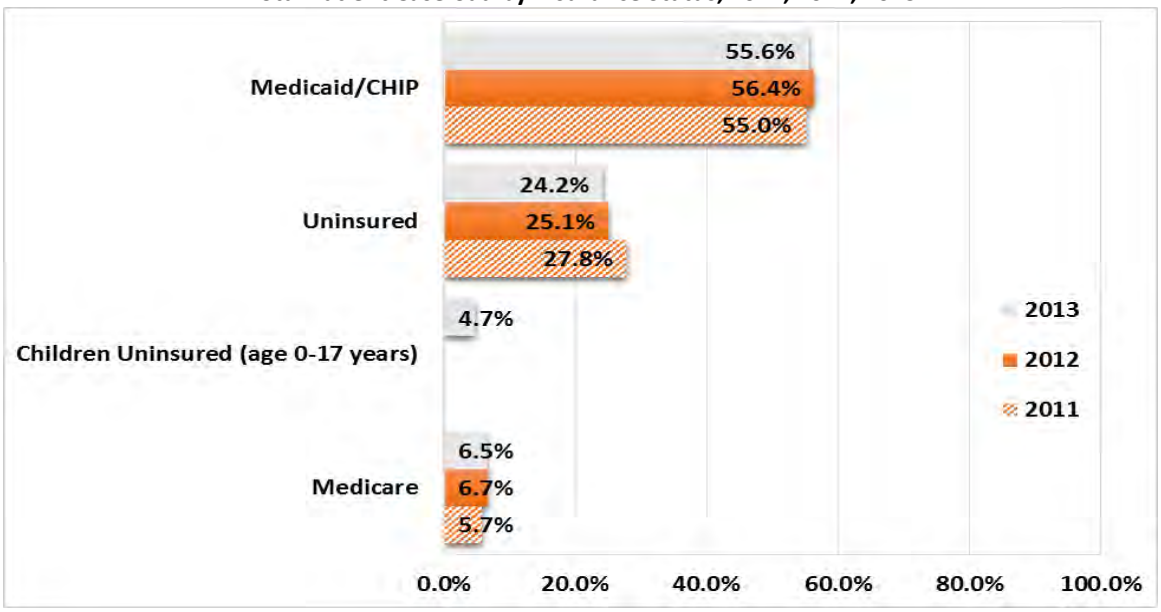


Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013

Source: UDS 2011, 2012, 2013

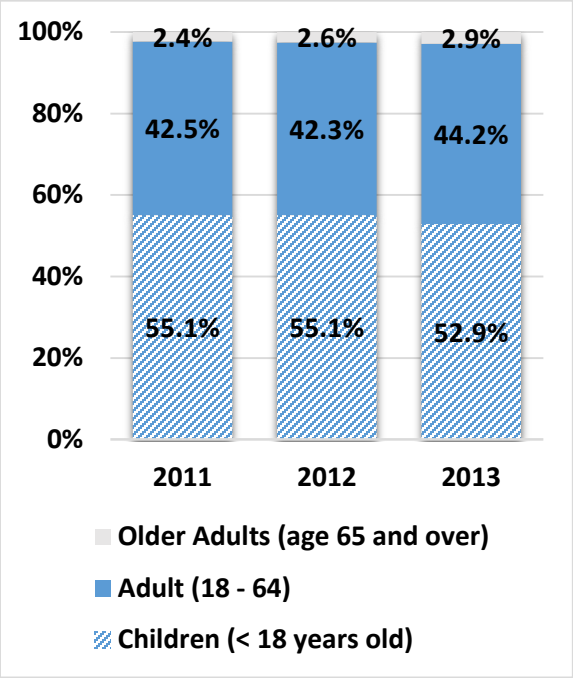
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

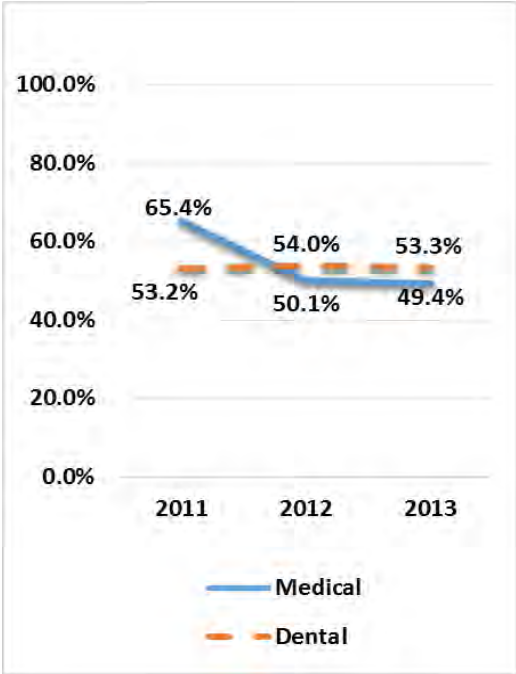
Cherry Street Services, FQHC in Grand Rapids, Michigan

Age of Patient Caseload, 2011, 2012, 2013



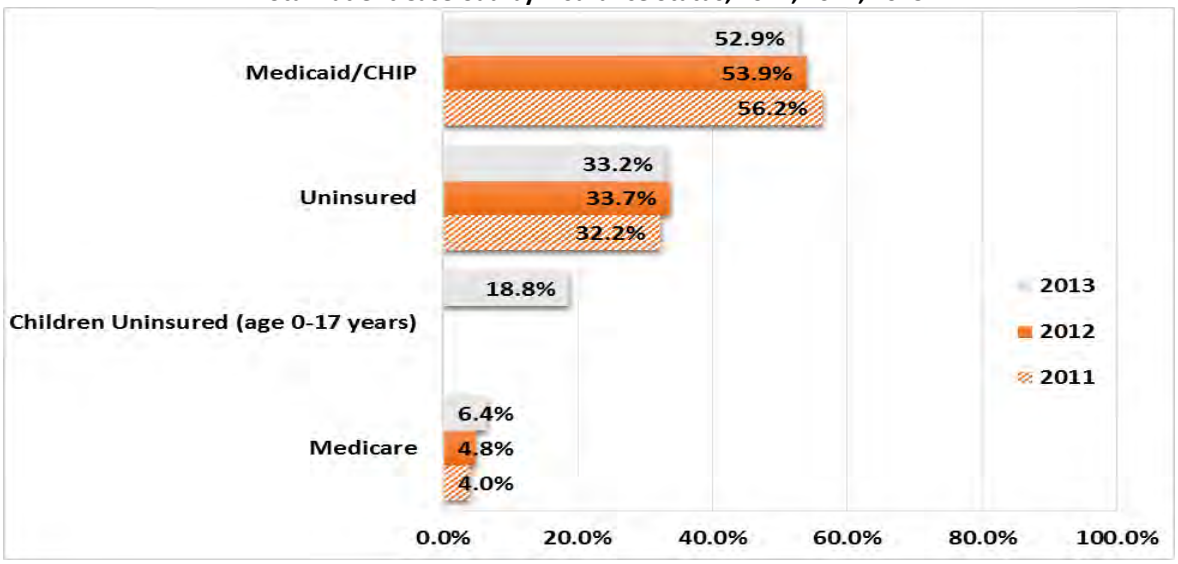
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

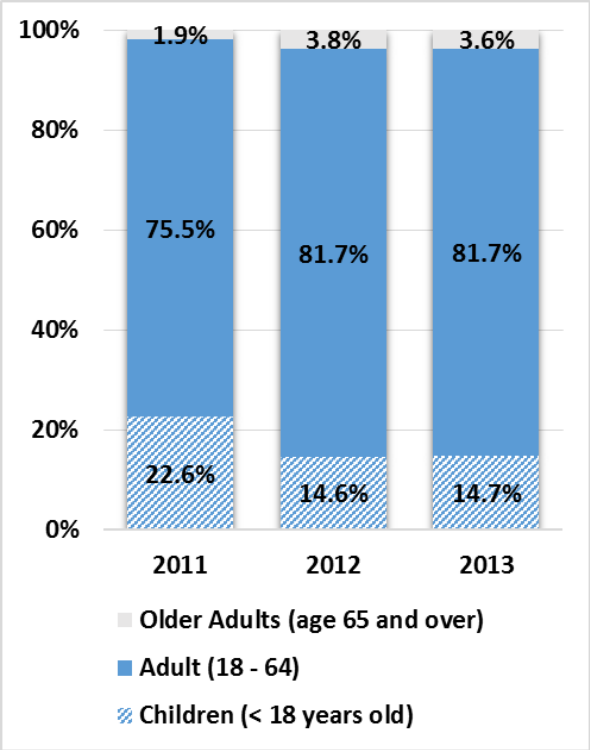
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

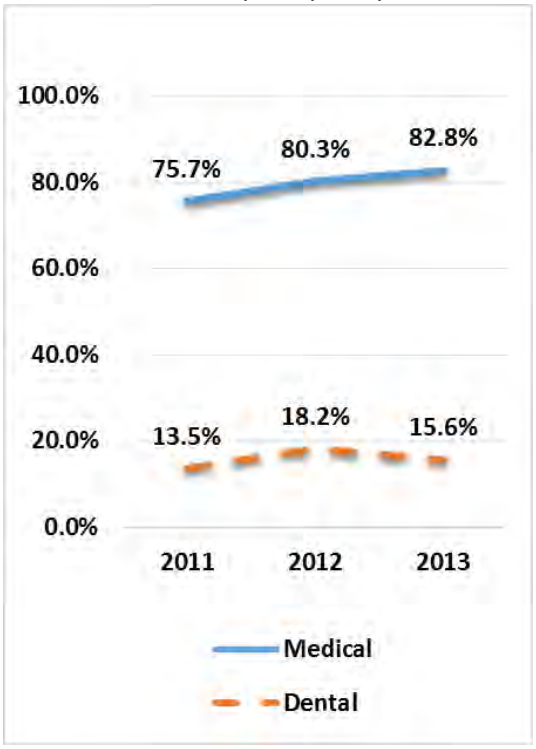
Community Health & Social Services Center, Inc., FQHC in Detroit, Michigan

Age of Patient Caseload, 2011, 2012, 2013



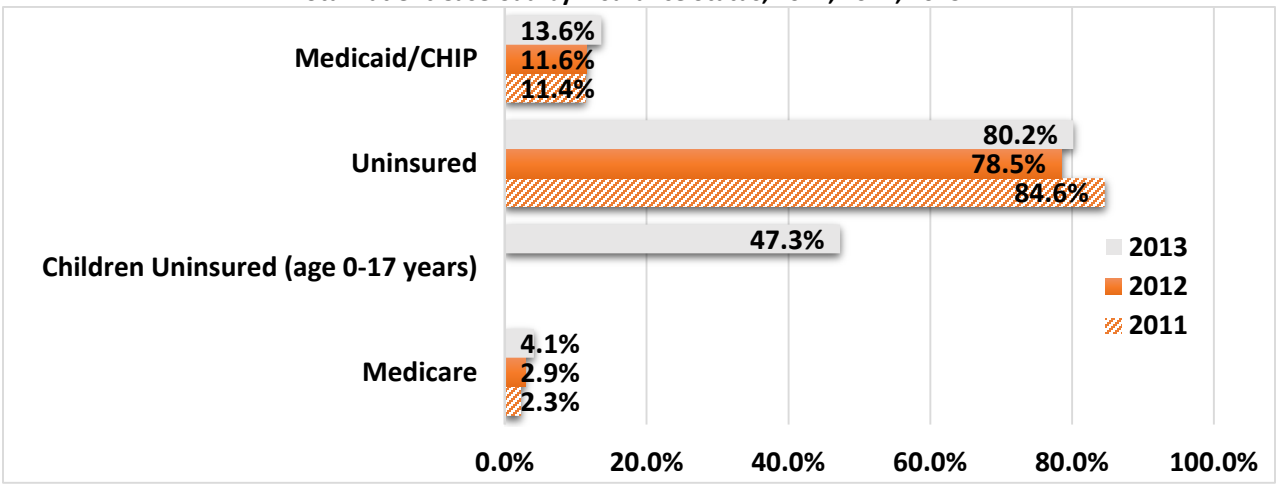
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

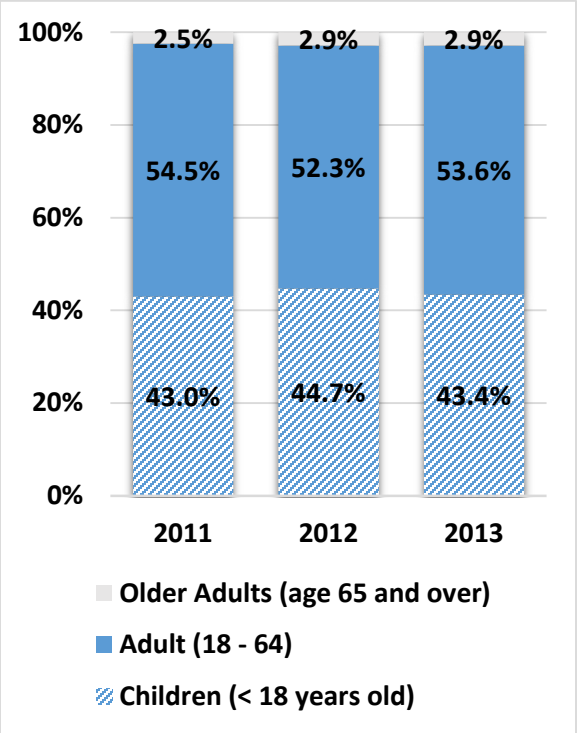
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

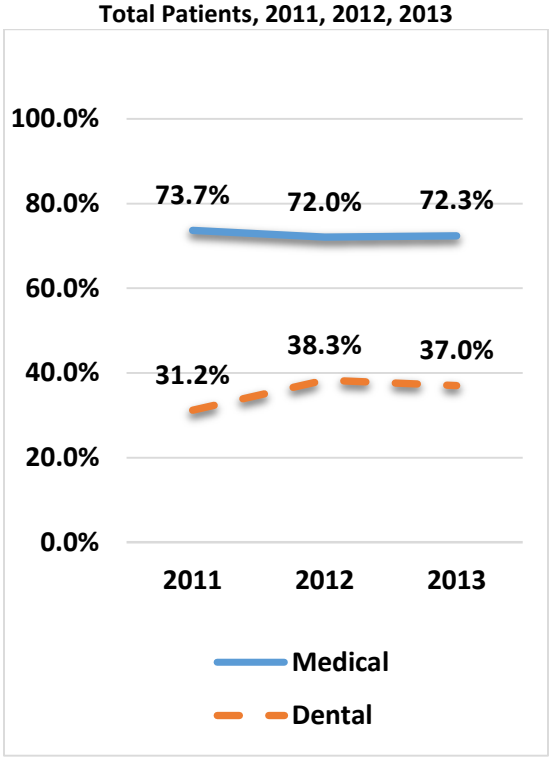
County of Ingham Health Department Ingham Community Health Centers, FQHC in Lansing, Michigan

Age of Patient Caseload, 2011, 2012, 2013



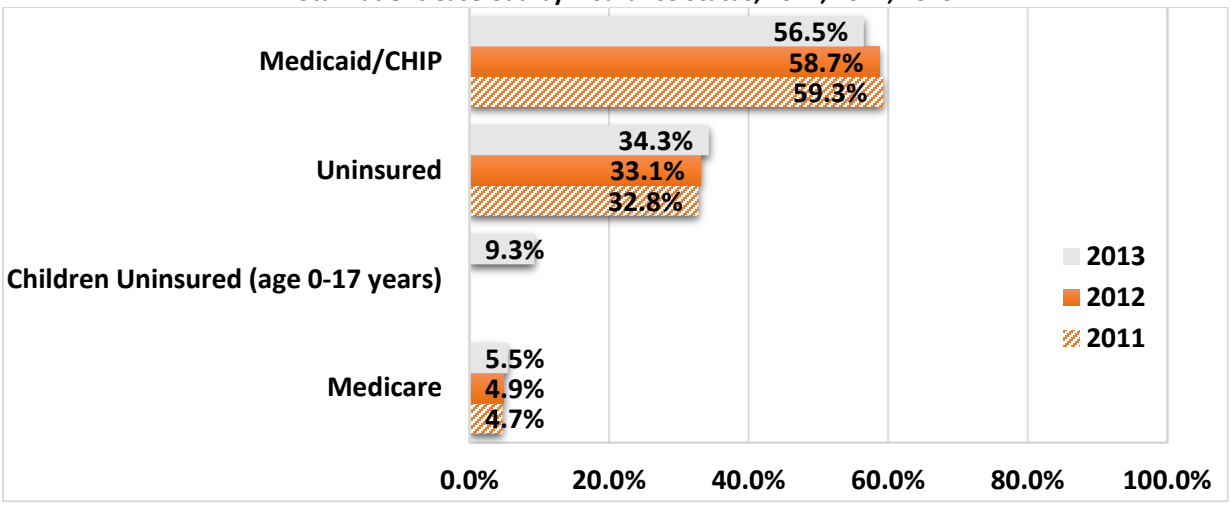
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

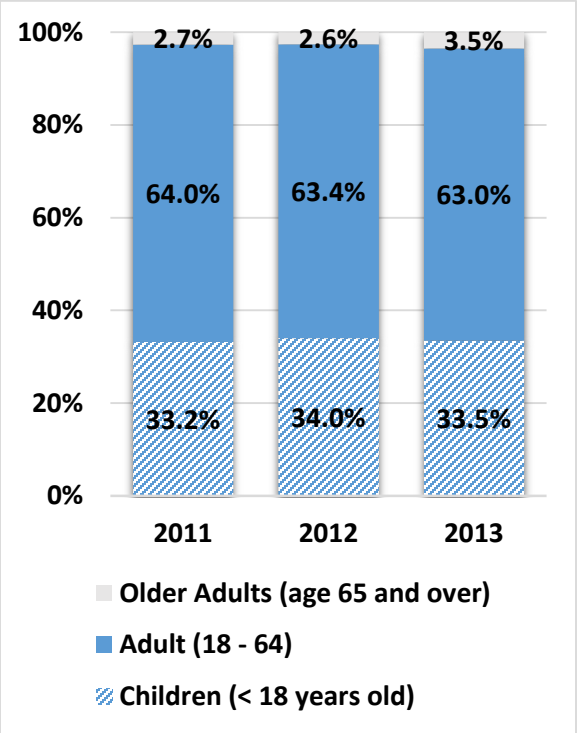
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

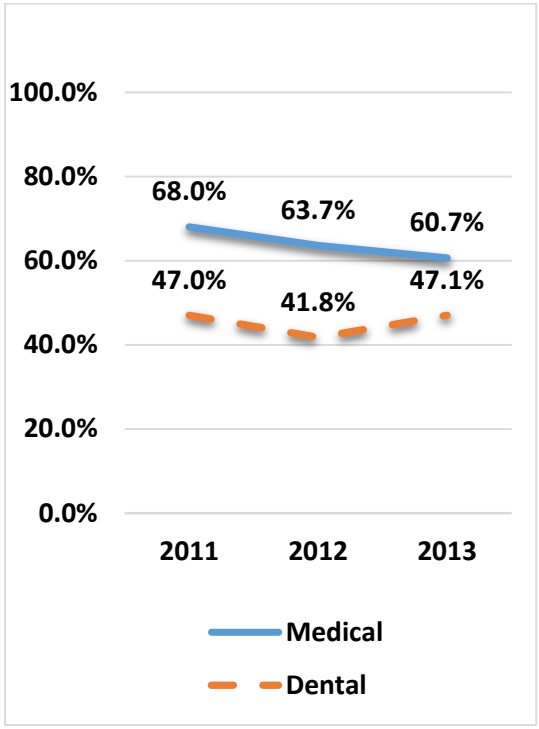
Covenant Community Care Inc., FQHC in Detroit, Michigan

Age of Patient Caseload, 2011, 2012, 2013



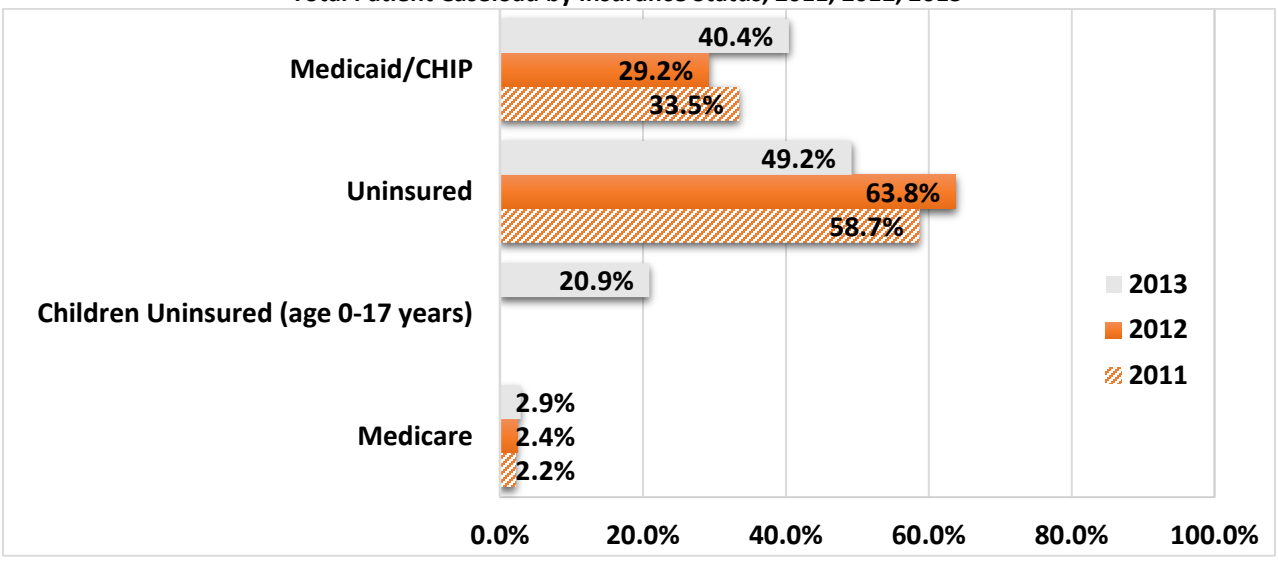
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

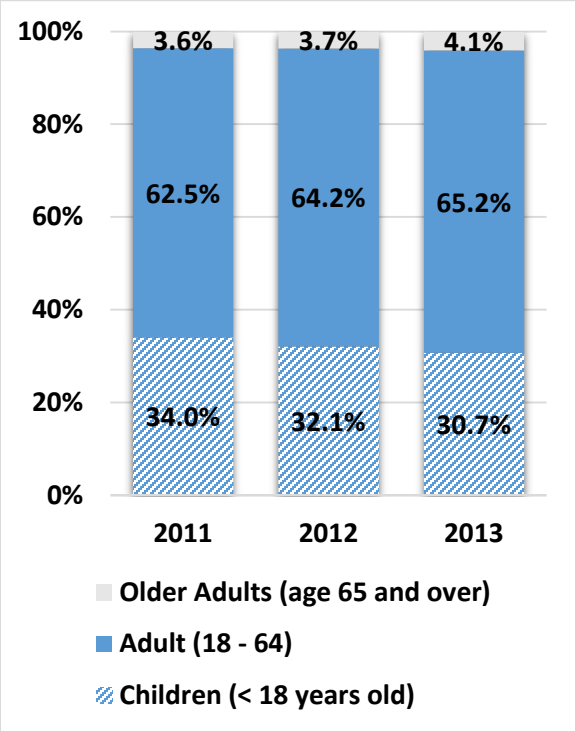
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

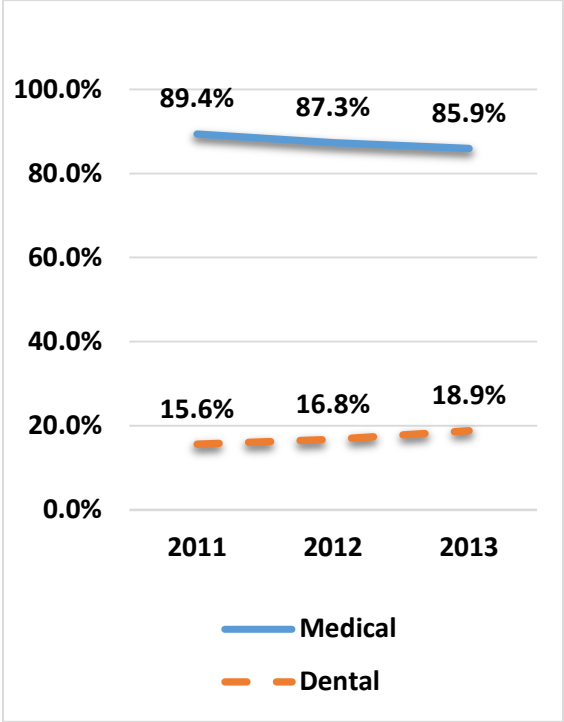
Detroit Community Health Connection Inc., Detroit, Michigan, Detroit, Michigan

Age of Patient Caseload, 2011, 2012, 2013



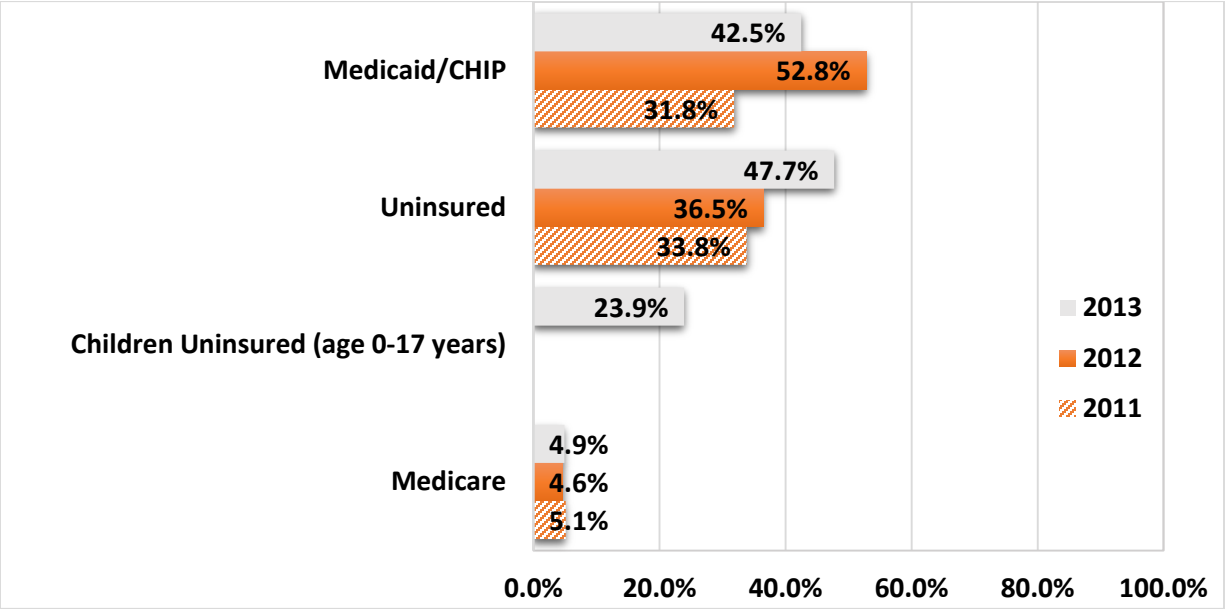
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

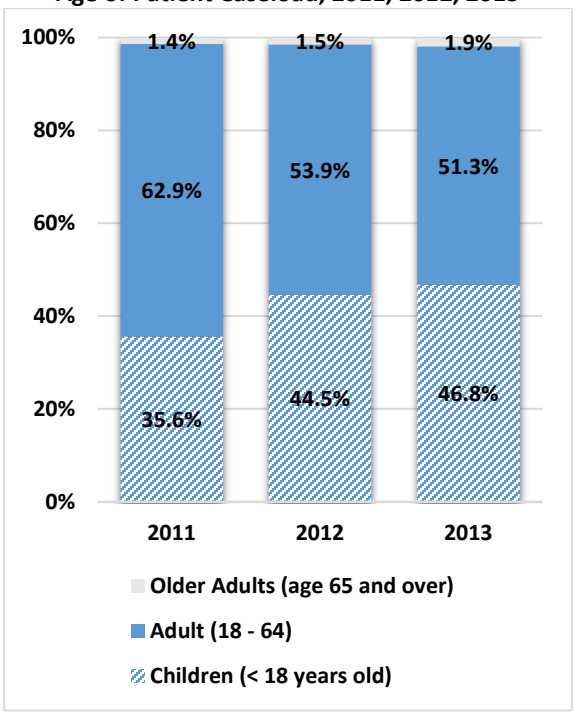
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

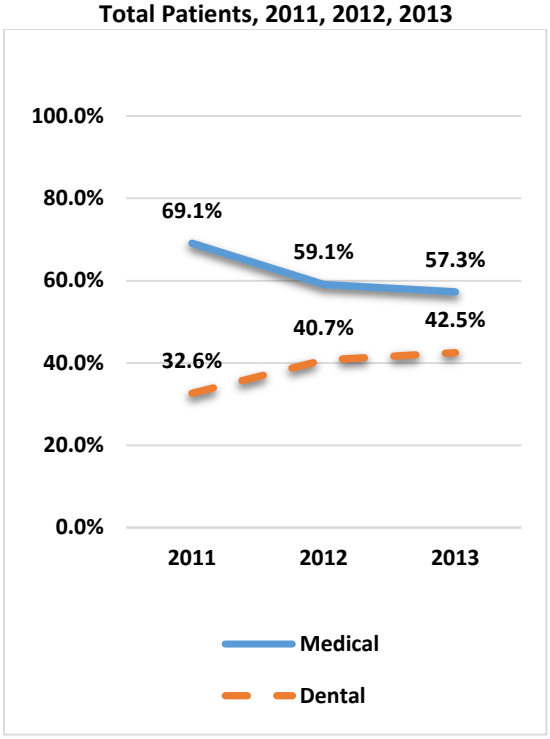
Detroit Health Care for the Homeless, Advantage Health Centers, FQHC in Detroit, Michigan

Age of Patient Caseload, 2011, 2012, 2013



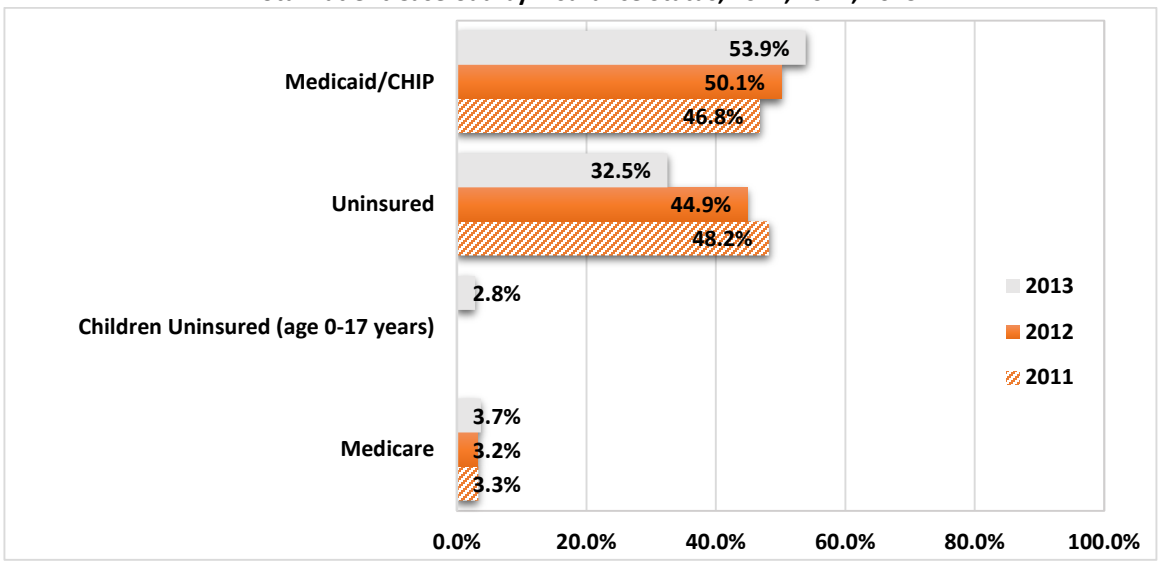
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

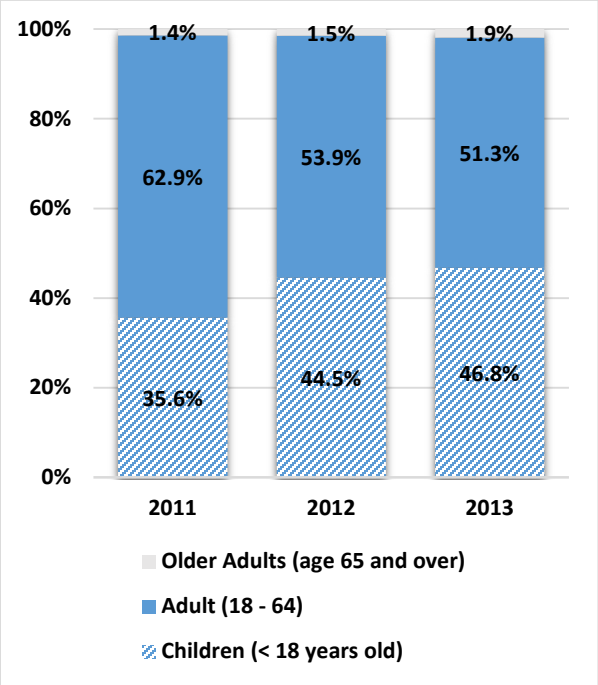
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

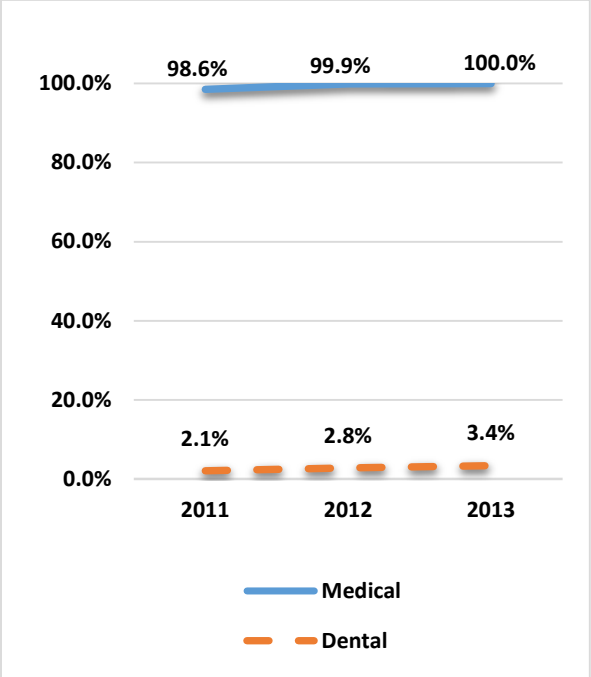
Downriver Community Services Inc., FQHC in Algonac, Michigan

Age of Patient Caseload, 2011, 2012, 2013



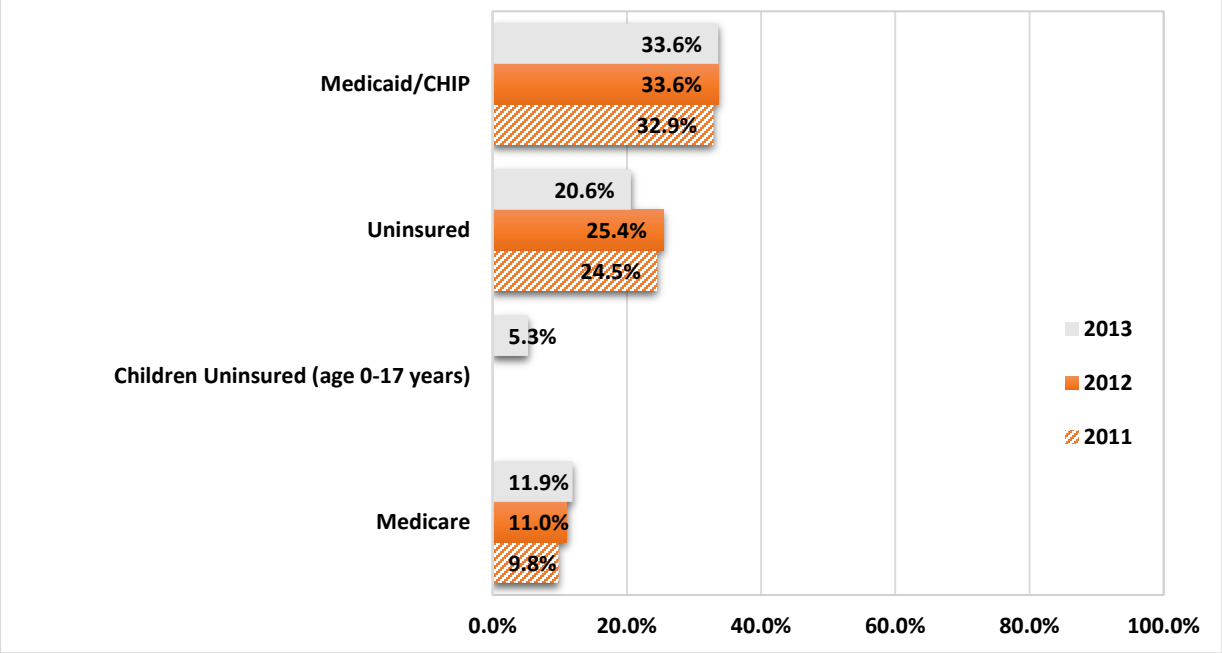
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

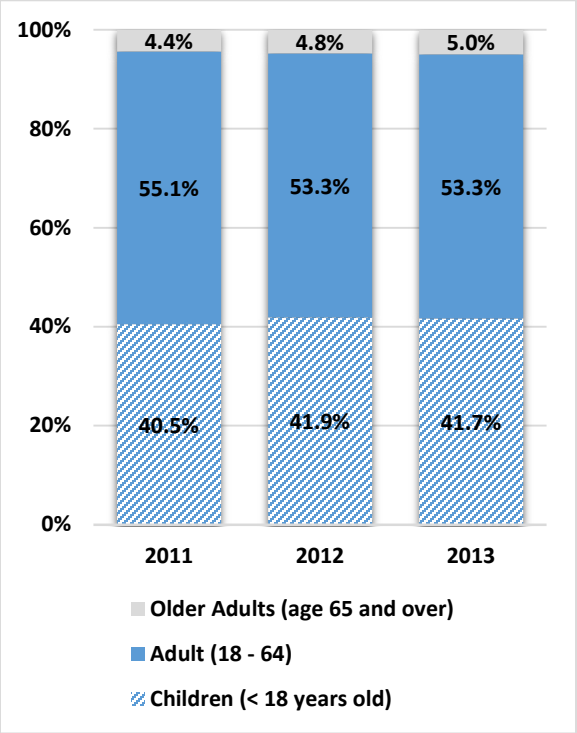
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

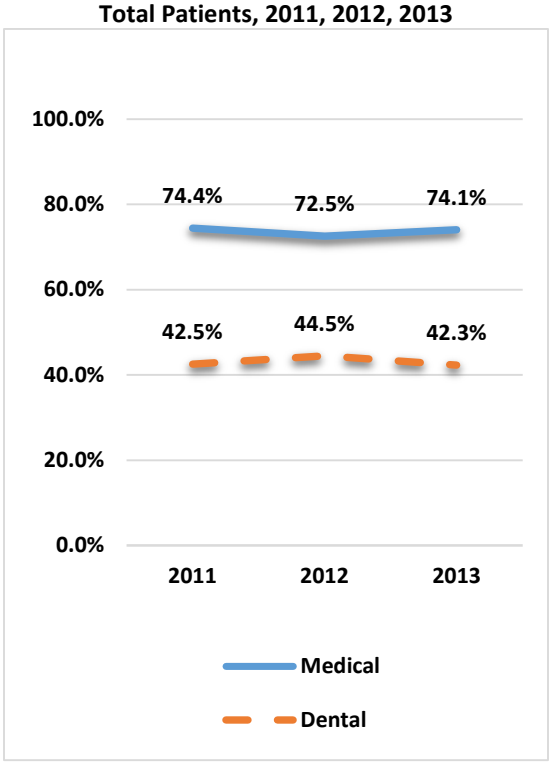
Family Health Center of Battle Creek, Battle Creek, Michigan

Age of Patient Caseload, 2011, 2012, 2013



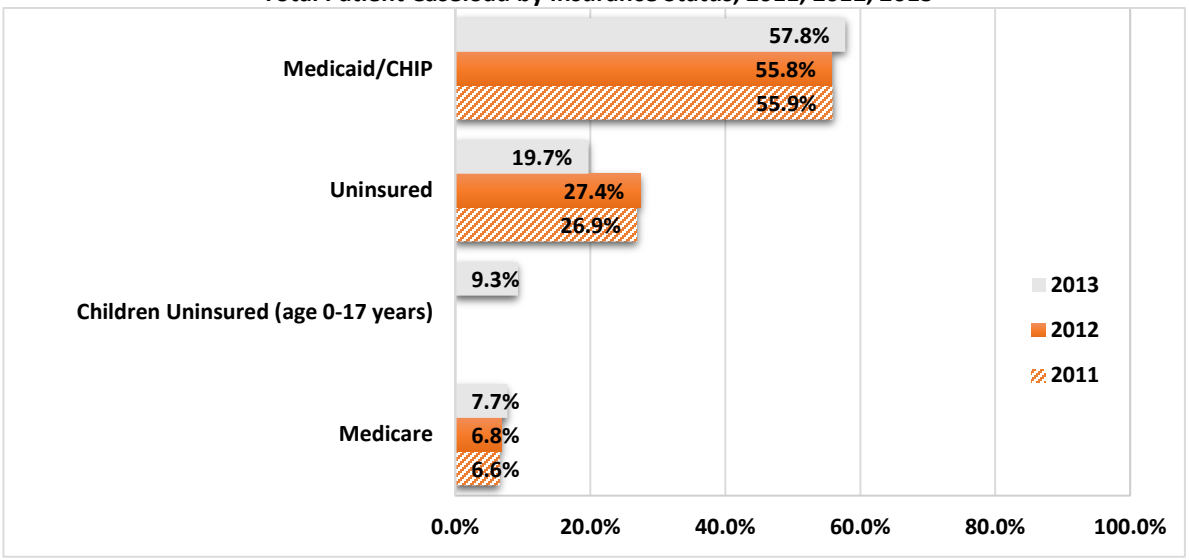
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

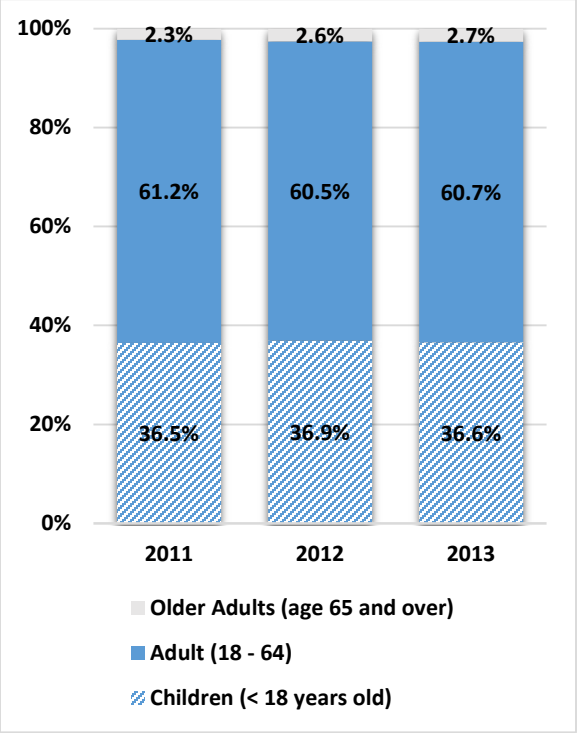
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012 2013

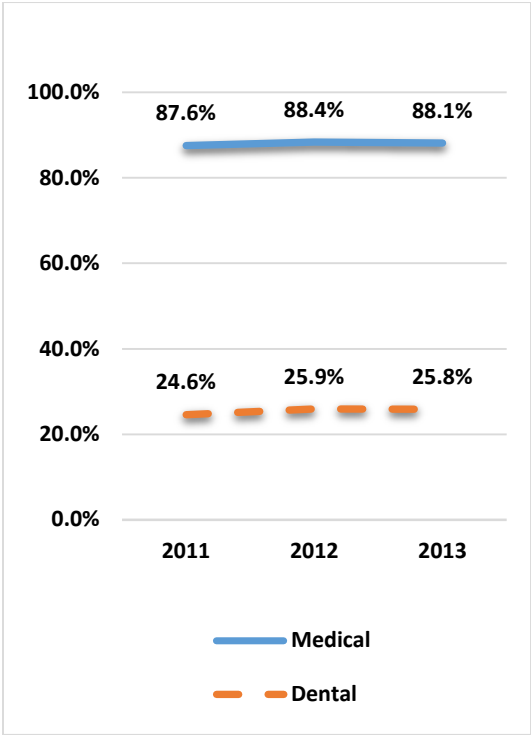
Family Health Center, Inc., Kalamazoo, Michigan

Age of Patient Caseload, 2011, 2012, 2013



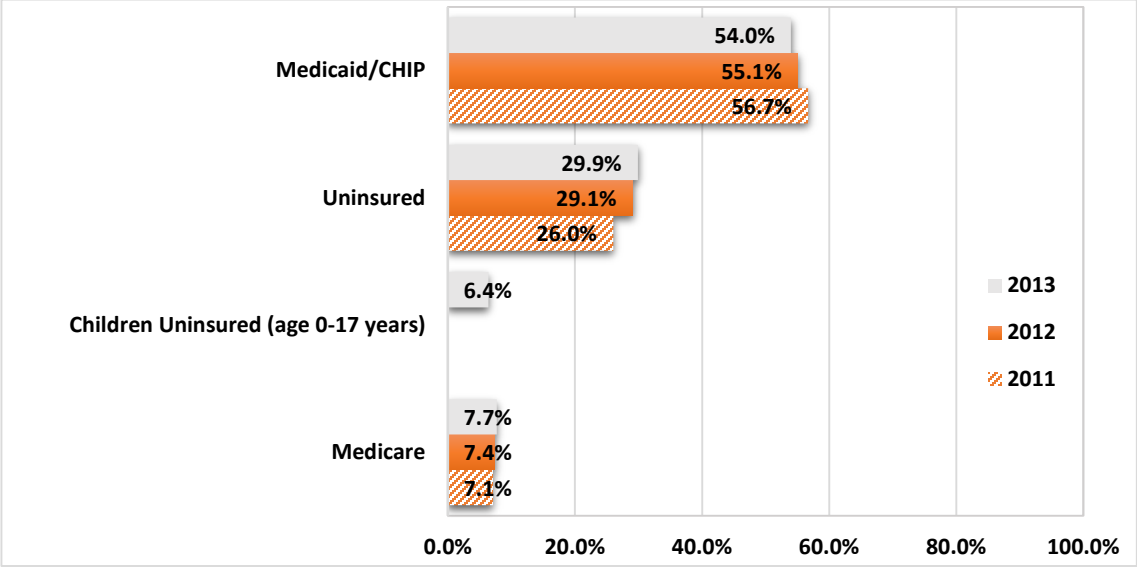
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



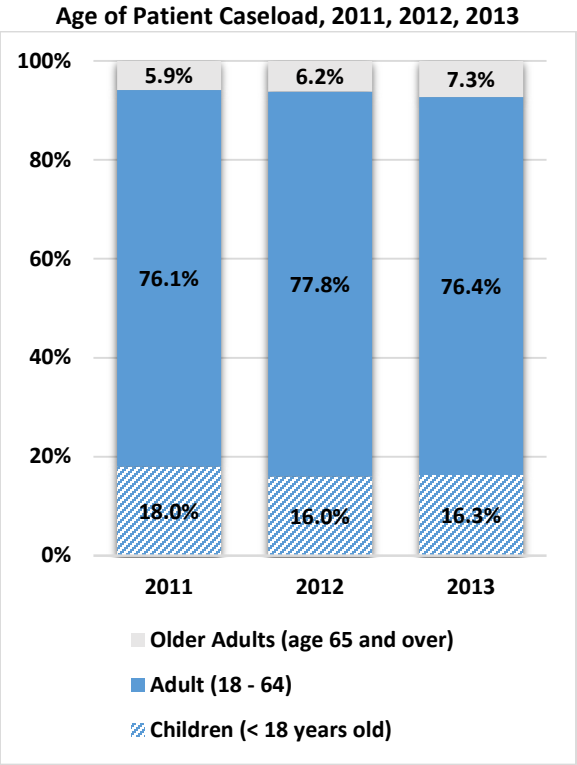
Source: UDS 2011, 2012, 2013

Total Patient Caseload by Insurance Status, 2011, 2012, 2013

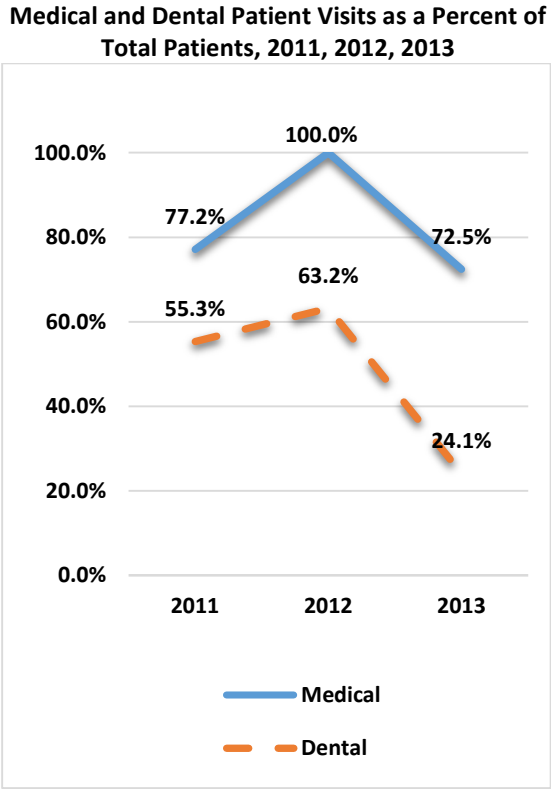


Source: UDS 2011, 2012, 2013

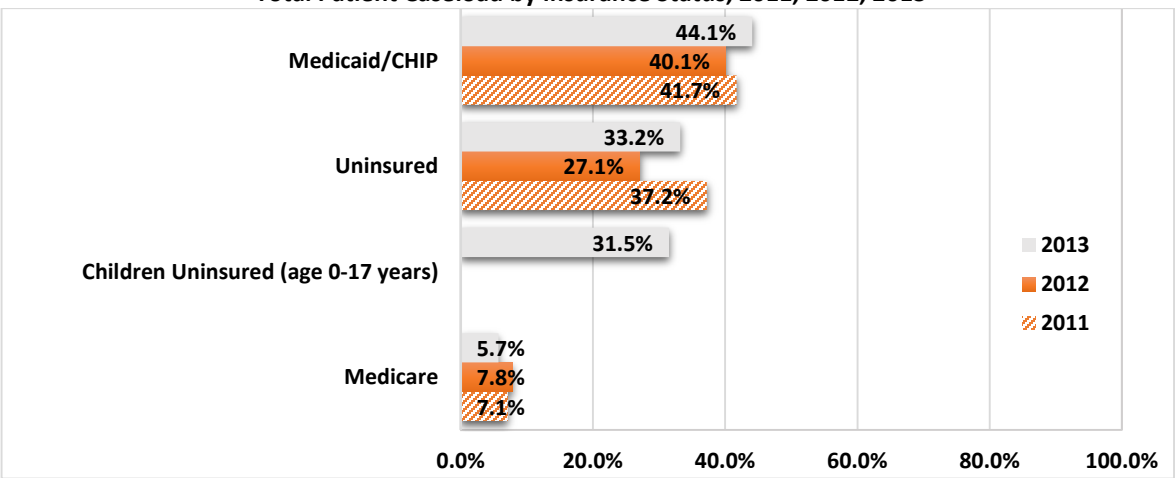
Family Medical Center of Michigan, Inc., FQHC in Carleton, Michigan



Source: UDS 2011, 2012, 2013

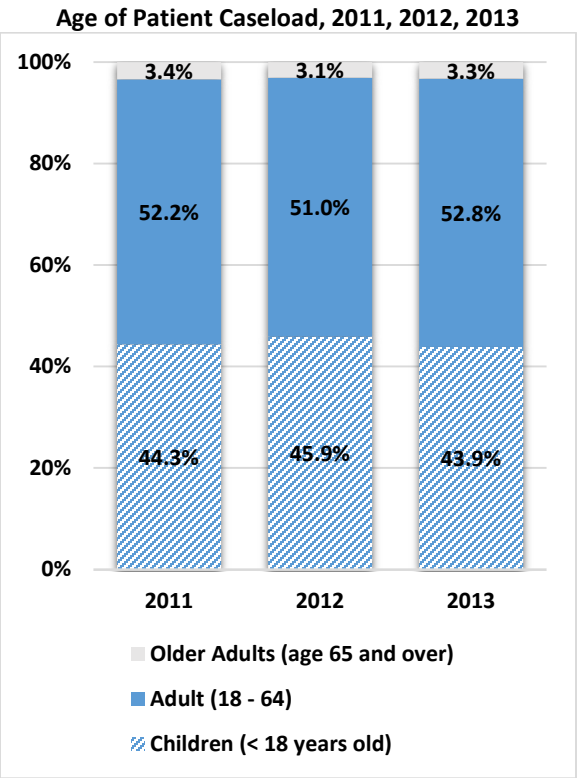


Source: UDS 2011, 2012, 2013

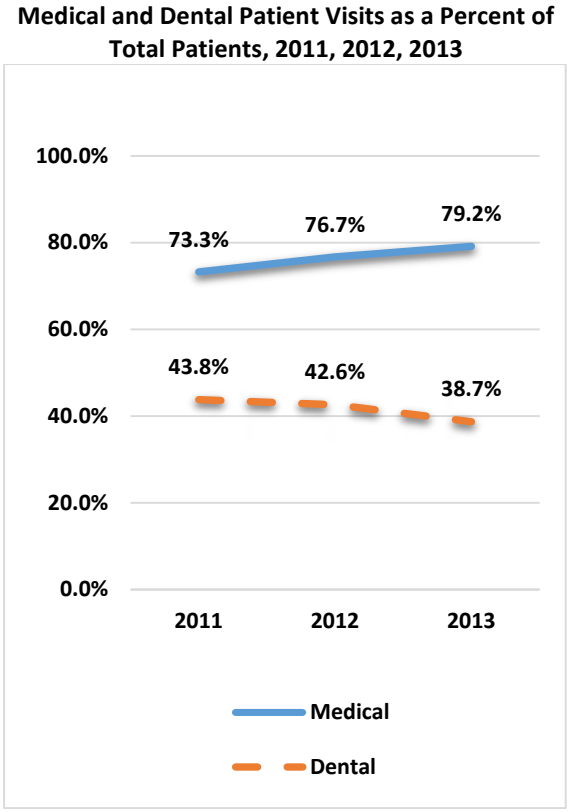


Source: UDS 2011, 2012, 2013

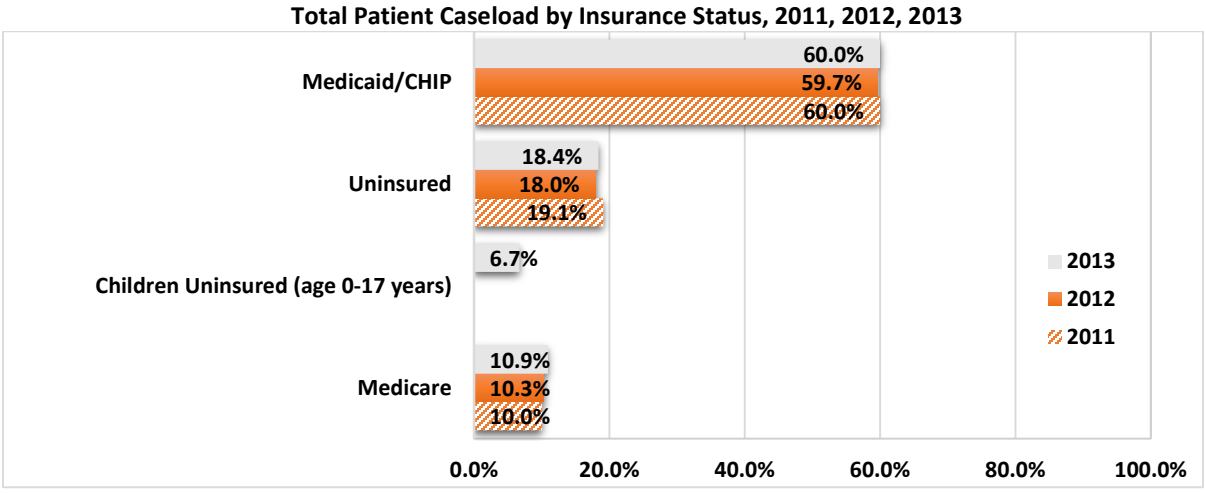
Hackley Community Care Center, Inc., FQHC in Muskegon, Michigan



Source: UDS 2011, 2012, 2013



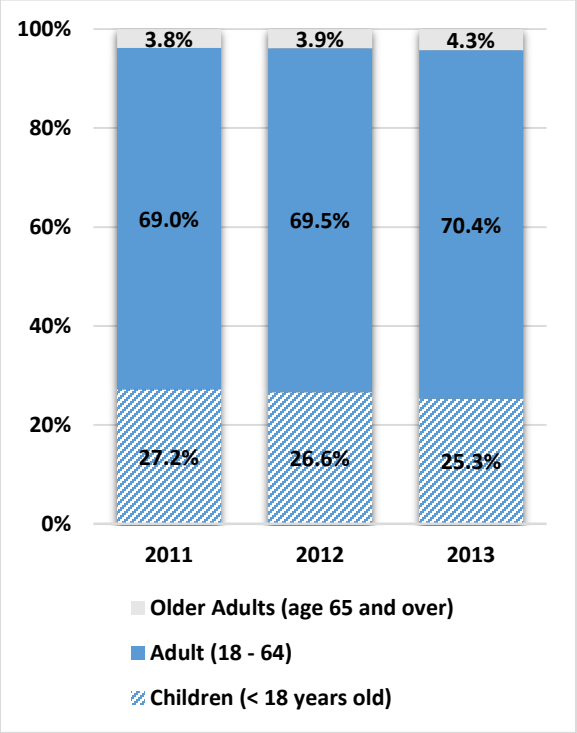
Source: UDS 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

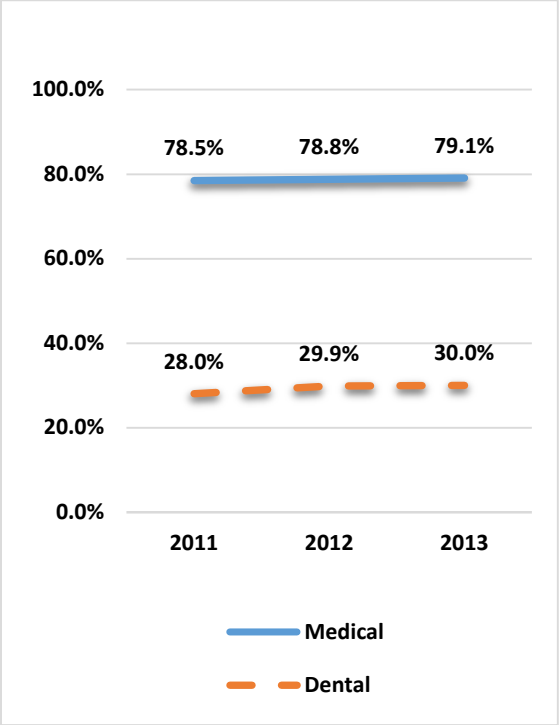
Hamilton Community Health Network, Inc., FQHC in Flint, Michigan

Age of Patient Caseload, 2011, 2012, 2013



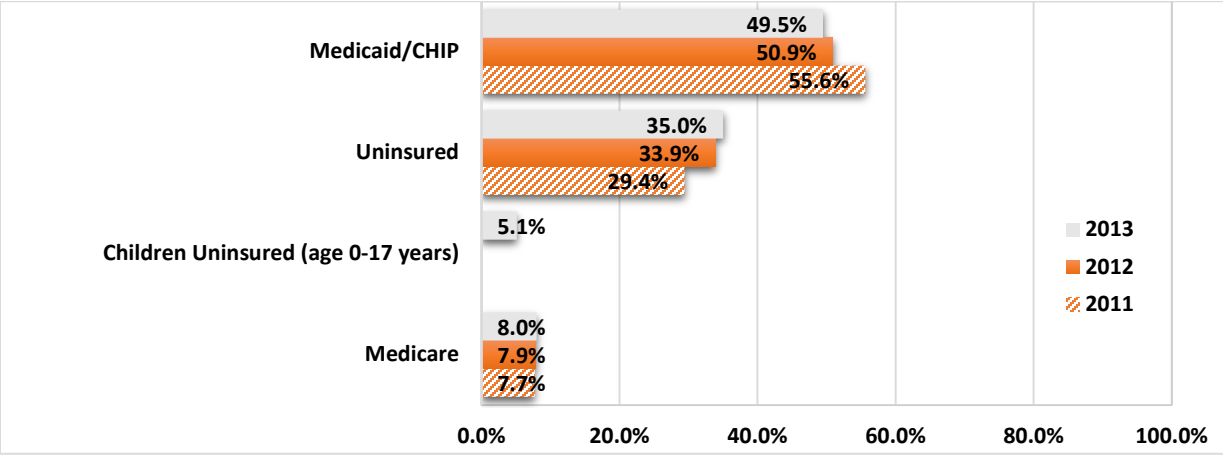
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

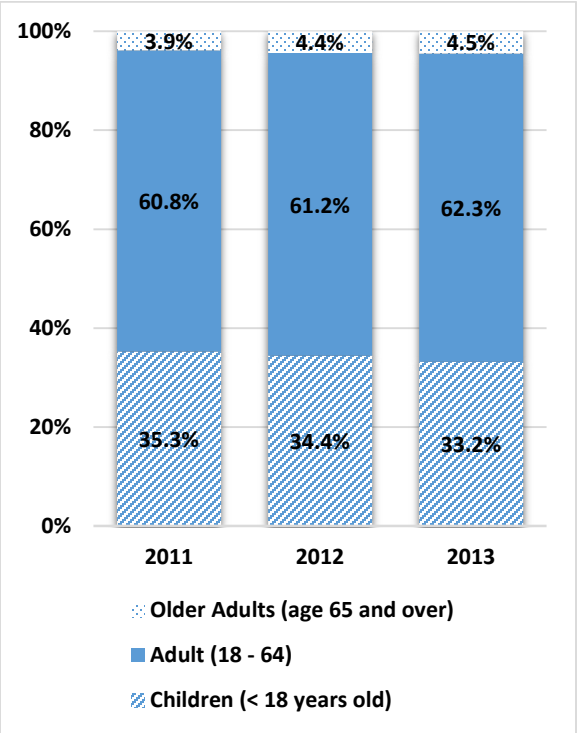
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

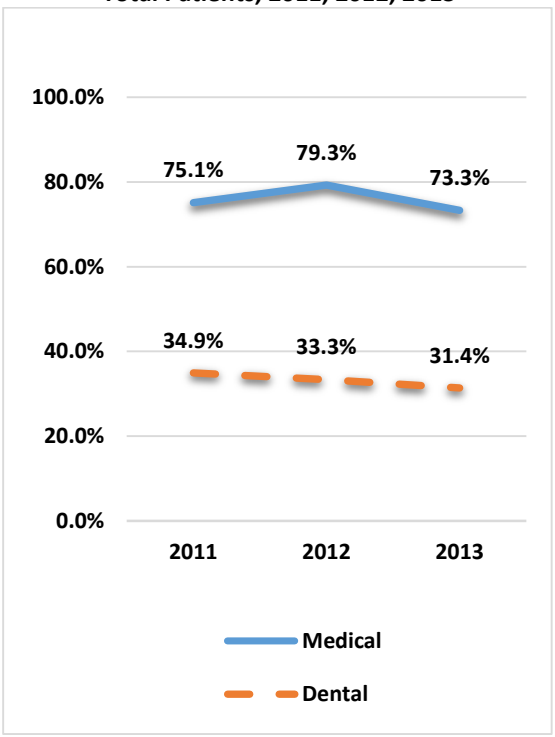
Health Delivery, Inc., FQHC in Saginaw, Michigan

Age of Patient Caseload, 2011, 2012, 2013



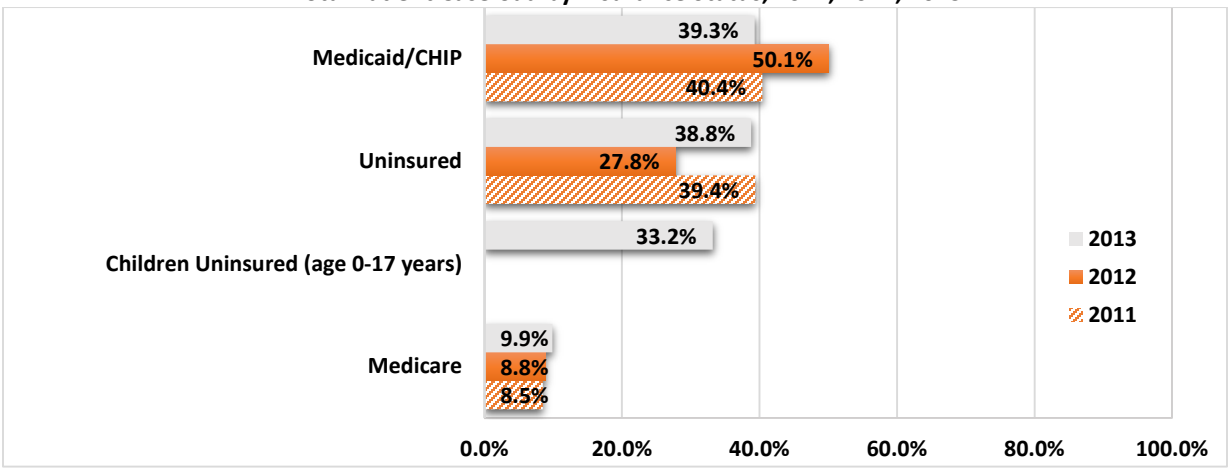
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

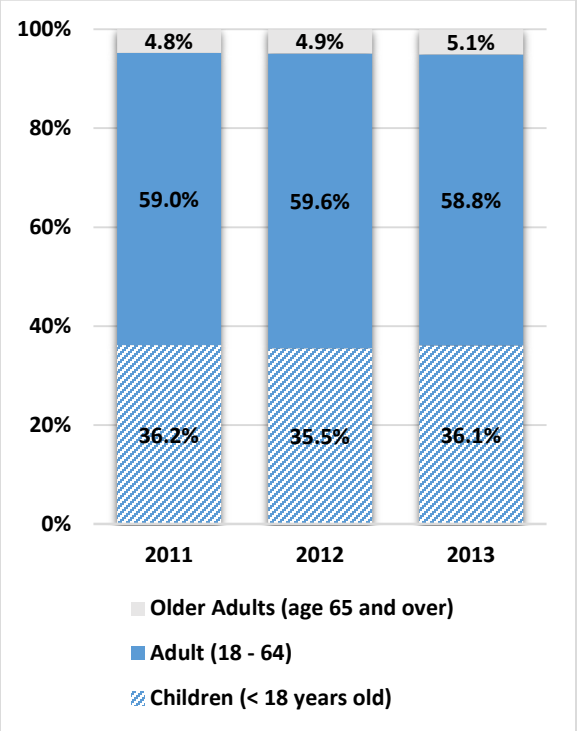
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

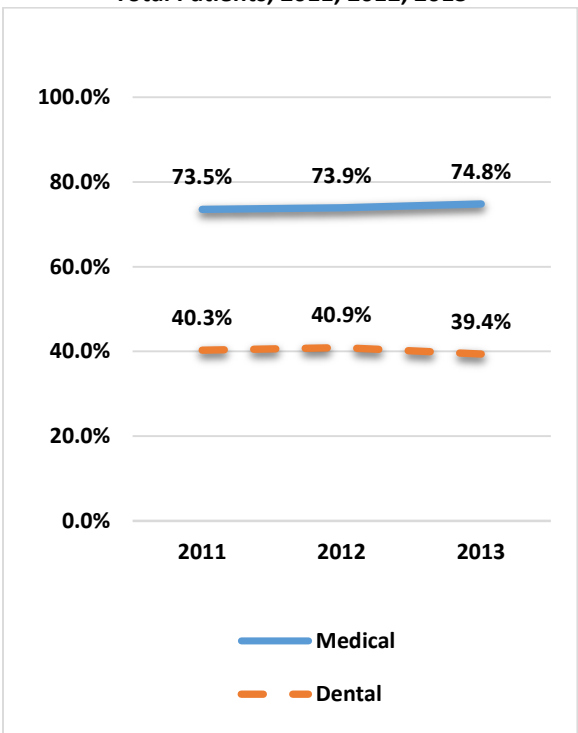
InterCare Community Health Network, FQHC in Bangor, Michigan

Age of Patient Caseload, 2011, 2012, 2013



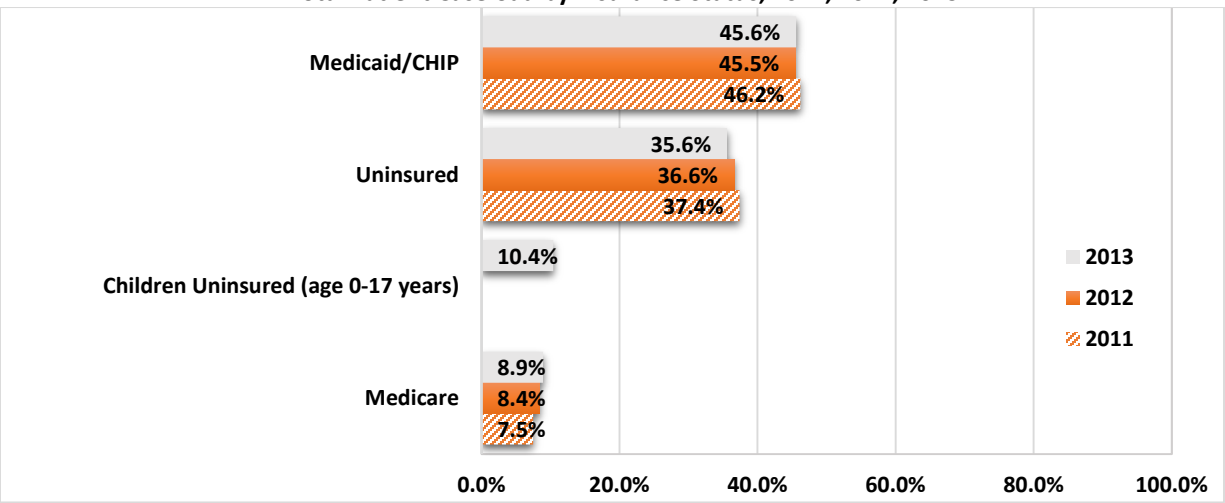
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

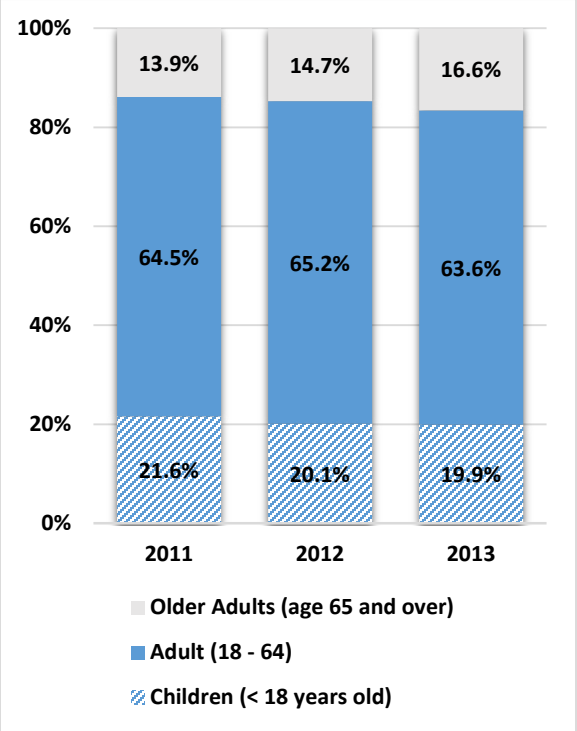
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

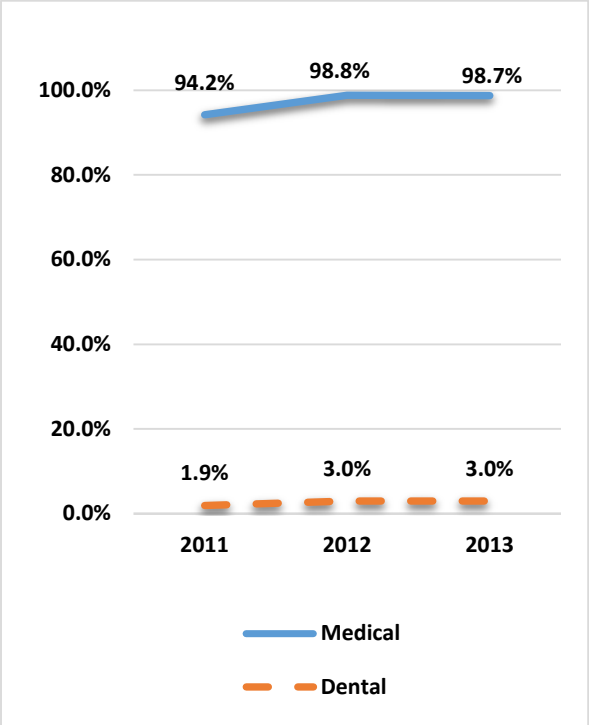
Lakeland Immediate Care Center (Cassopolis Family Clinic), FQHC in Cassopolis, Michigan

Age of Patient Caseload, 2011, 2012, 2013



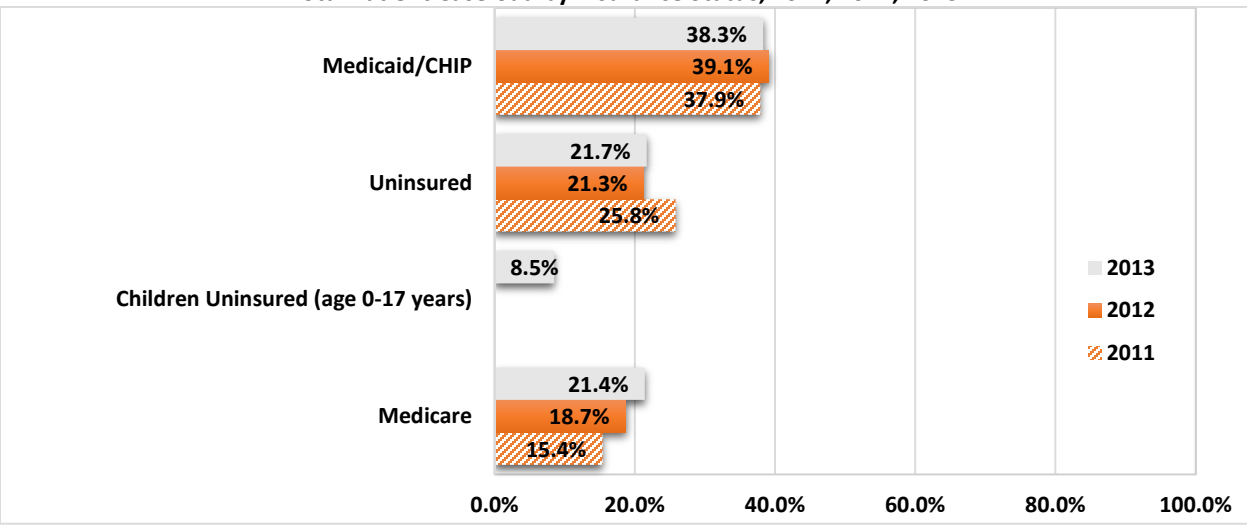
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

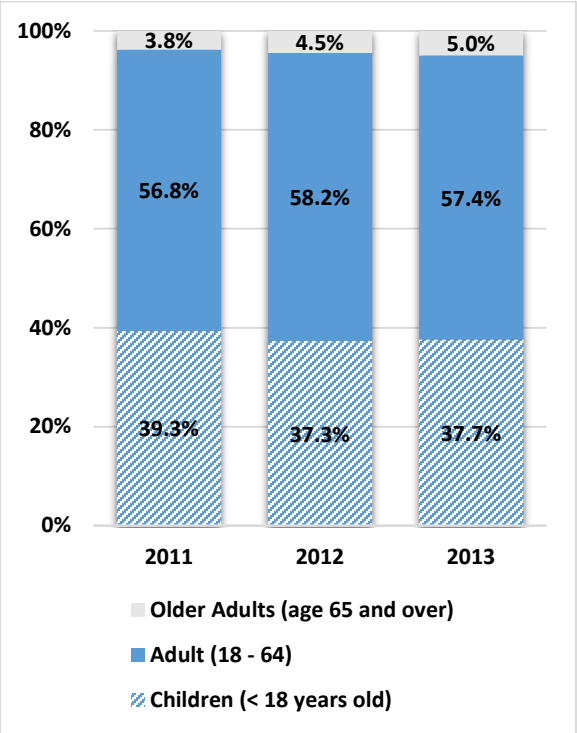
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

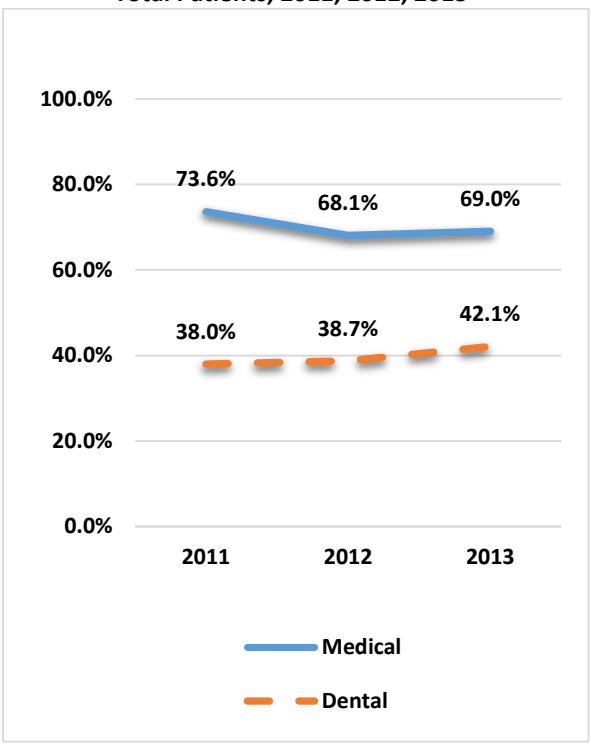
MGH Family HC DBA Muskegon Family Care (Muskegon Family Care), FQHC in Muskegon, Michigan

Age of Patient Caseload, 2011, 2012, 2013



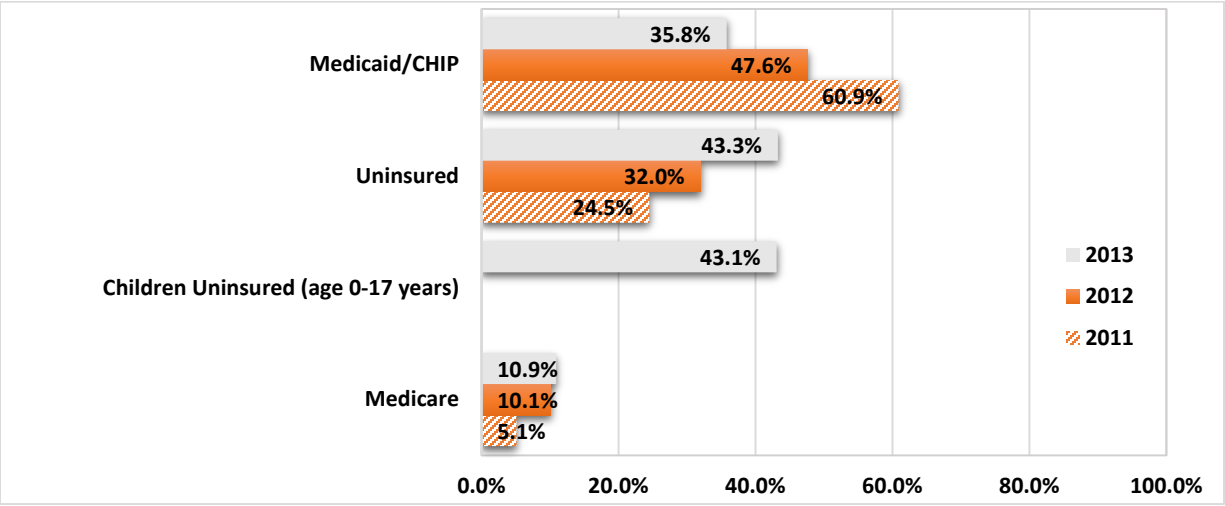
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

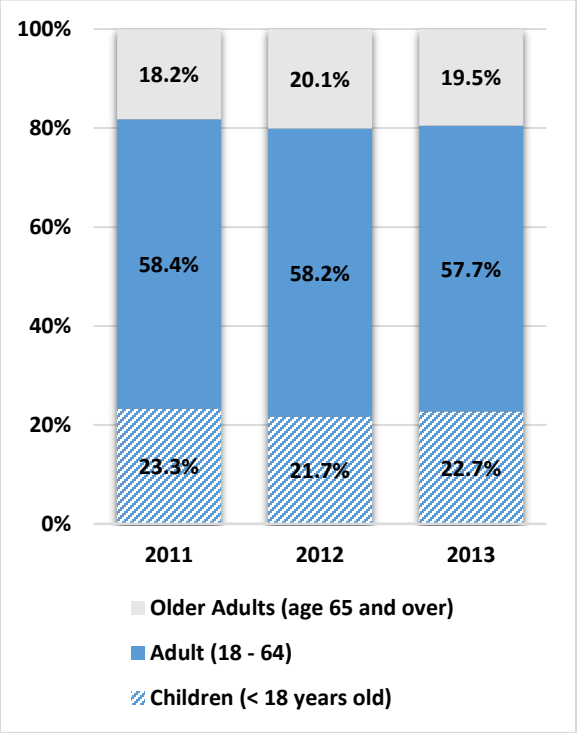
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

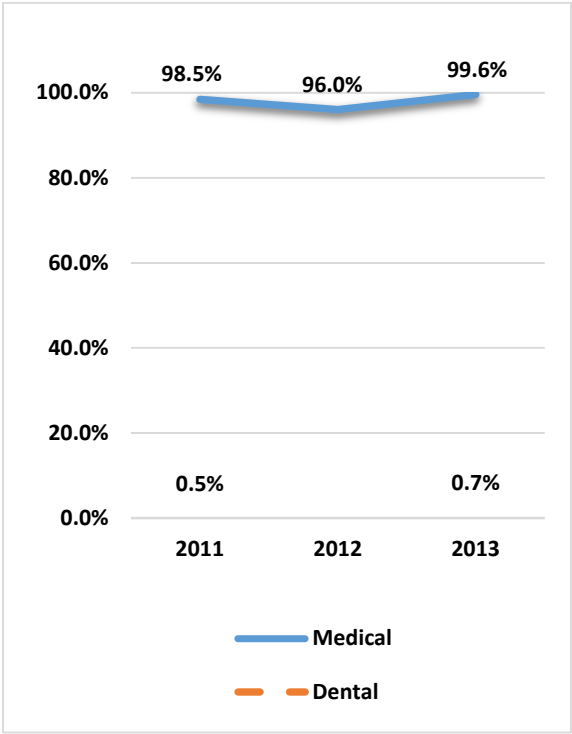
Mid-Michigan Health Services, FQHC in Houghton Lake, Michigan

Age of Patient Caseload, 2011, 2012, 2013



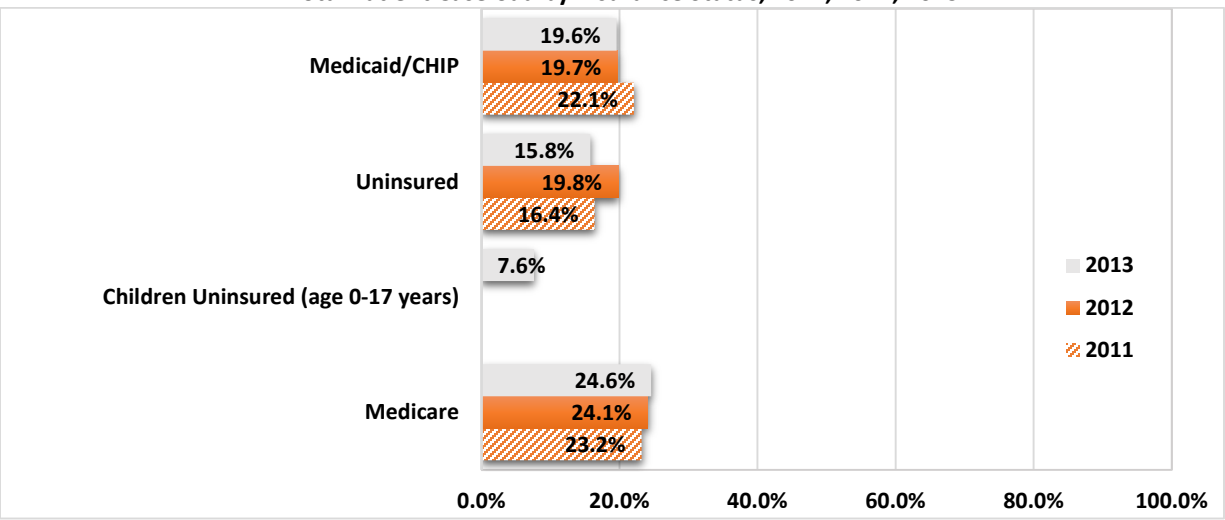
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

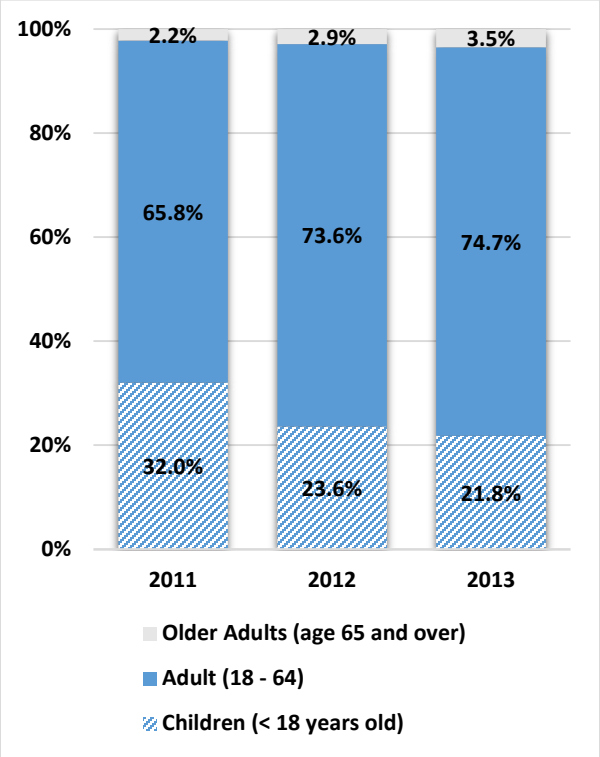
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

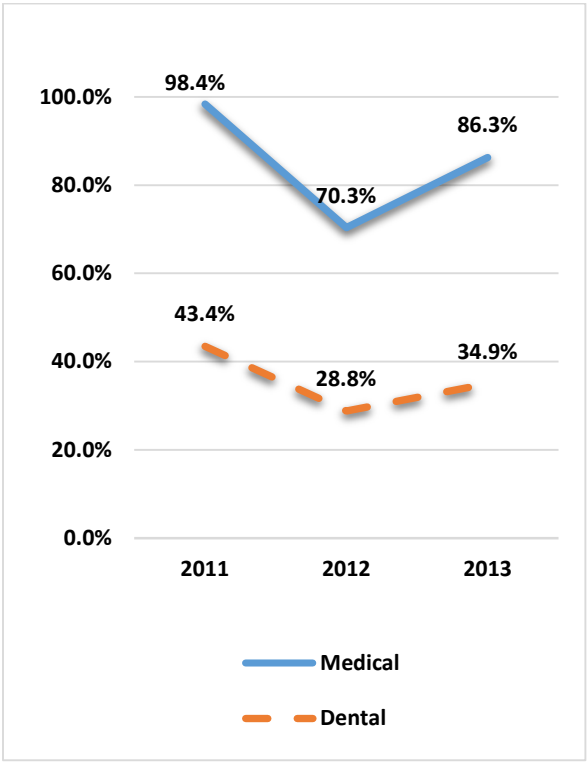
Northwest Michigan Health Services, Inc., FQHC in Traverse City, Michigan

Age of Patient Caseload, 2011, 2012, 2013



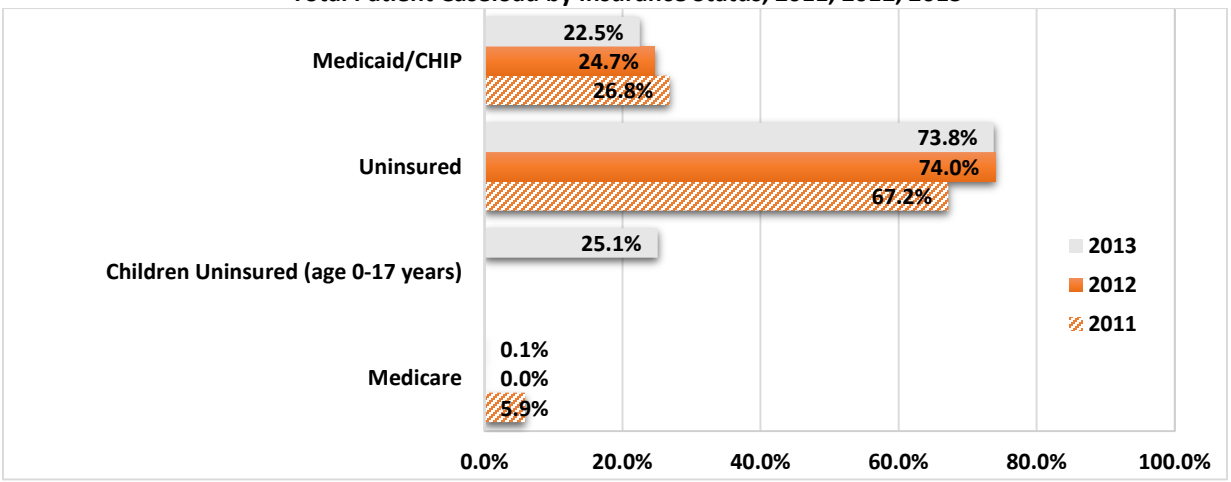
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

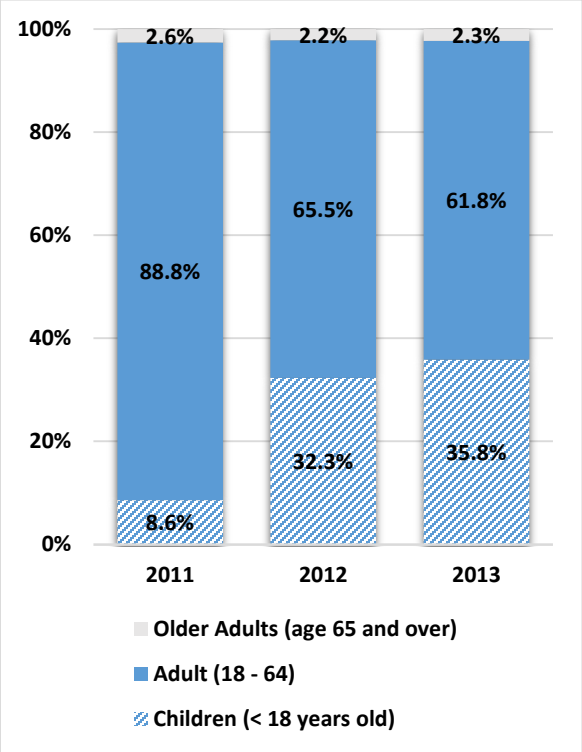
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

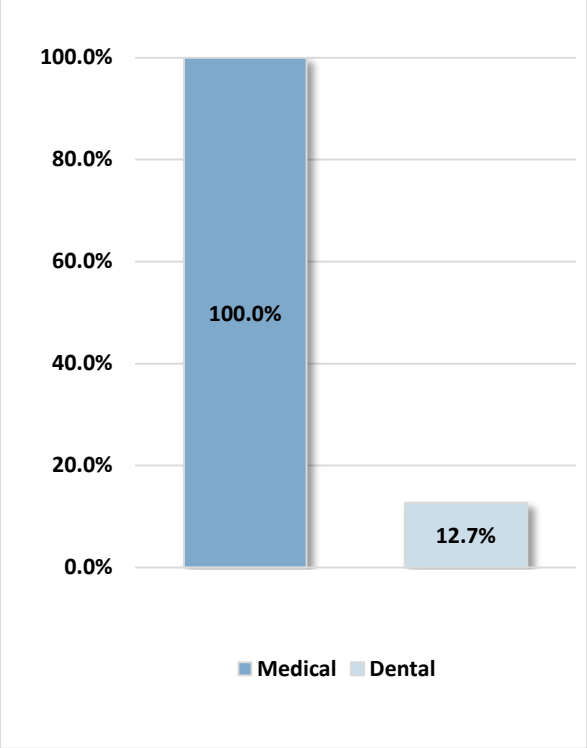
Oakland Primary Health Services, Inc., Pontiac, Michigan

Age of Patient Caseload, 2011, 2012, 2013



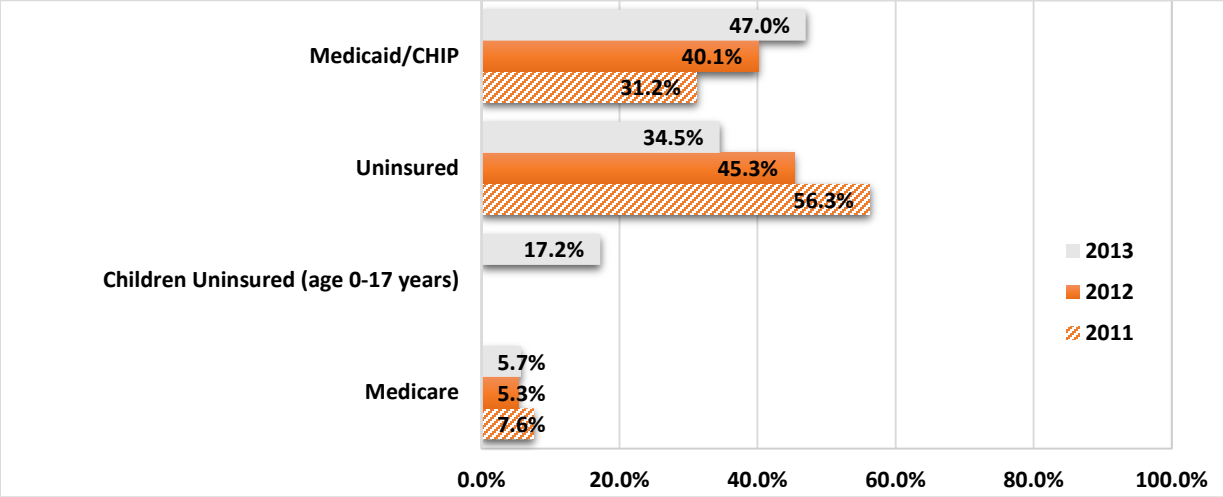
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

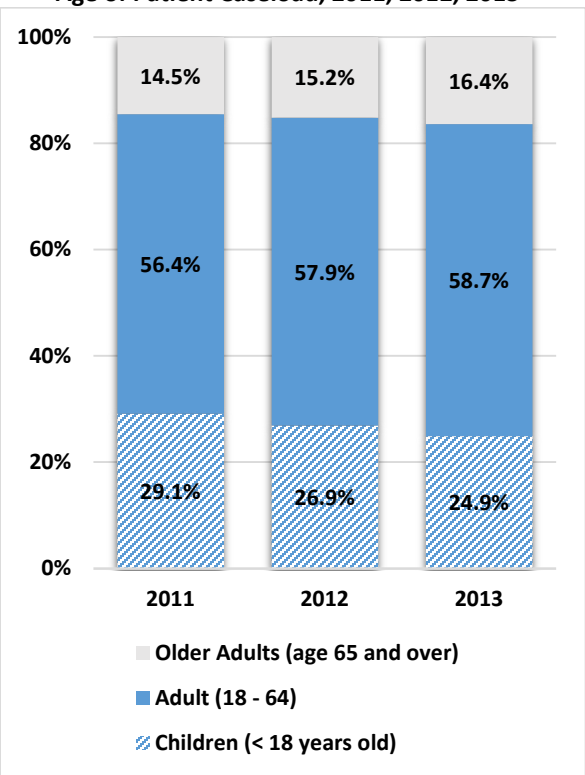
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

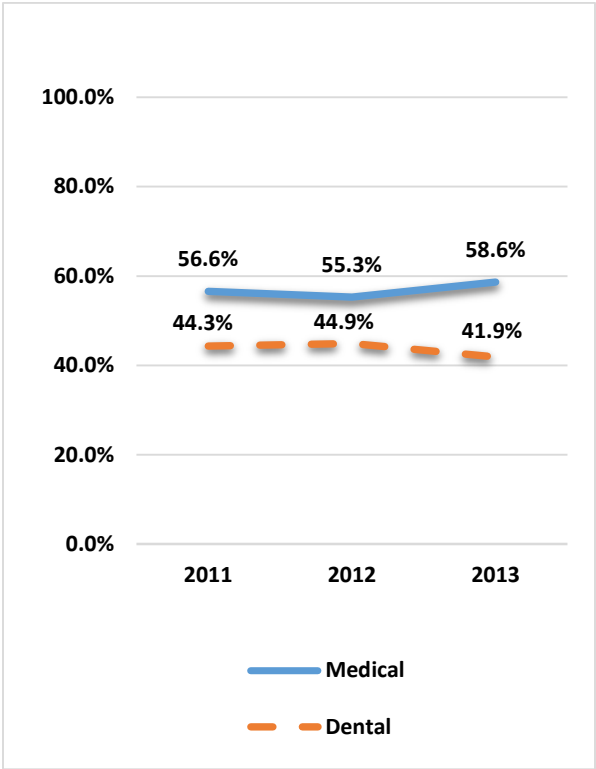
Sterling Area Health Center, FQHC in Sterling, Michigan

Age of Patient Caseload, 2011, 2012, 2013



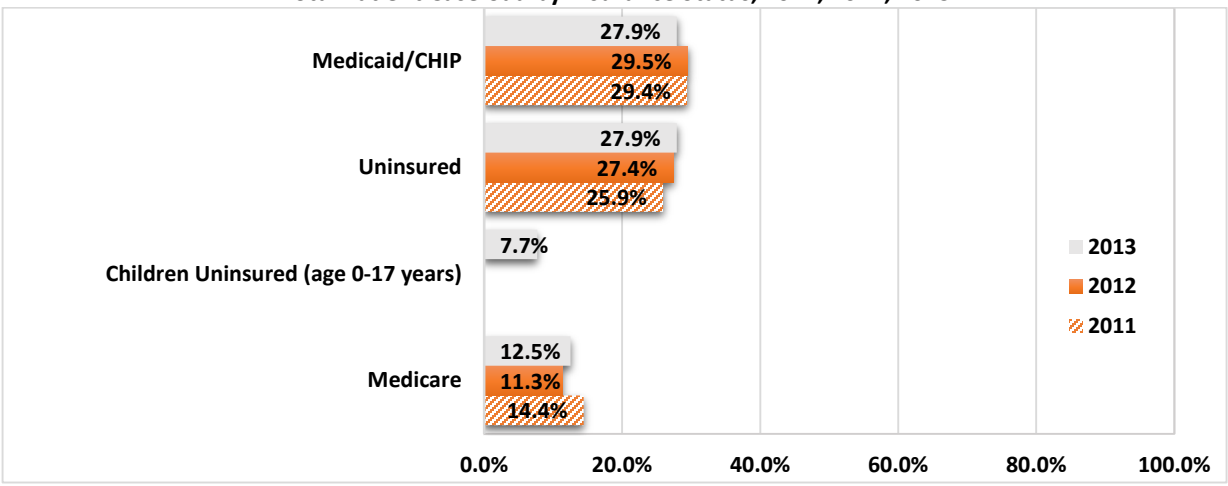
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



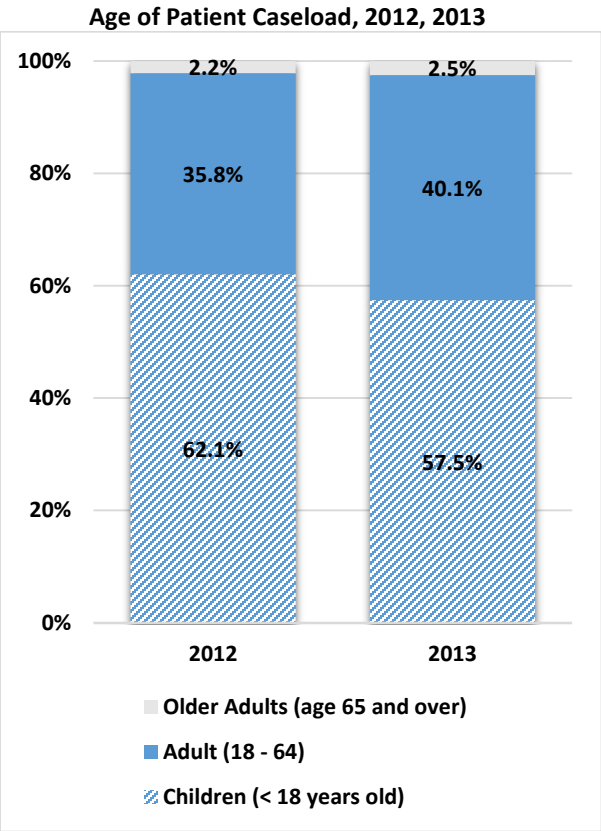
Source: UDS 2011, 2012, 2013

Total Patient Caseload by Insurance Status, 2011, 2012, 2013

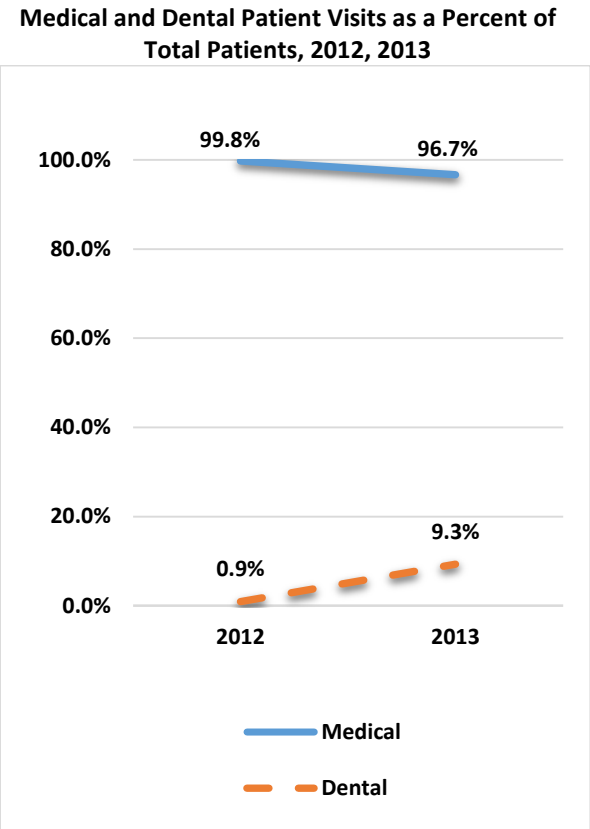


Source: UDS 2011, 2012, 2013

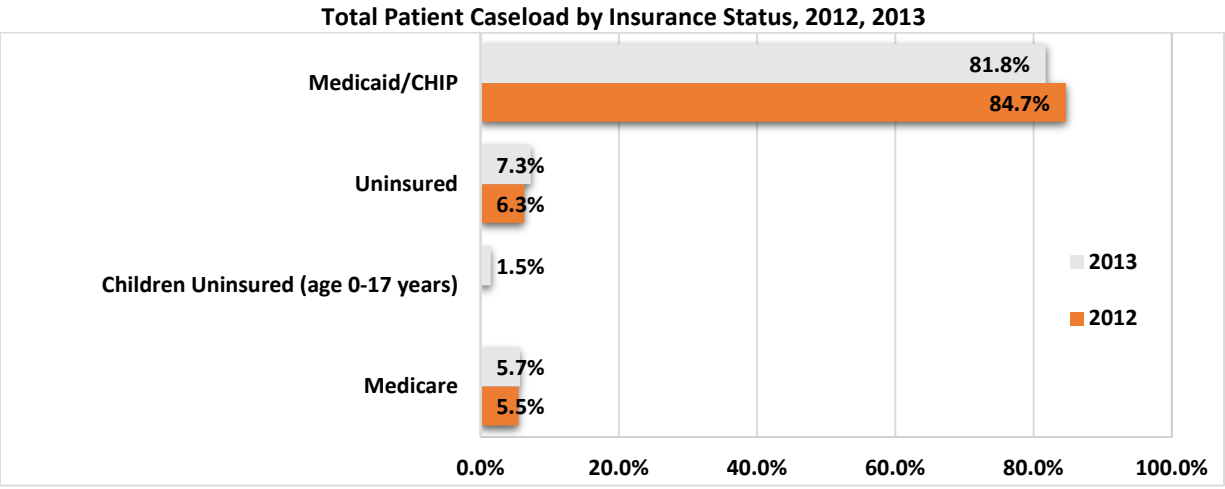
The Wellness Plan Medical Centers, FQHC in Detroit, Michigan



Source: UDS, 2012, 2013



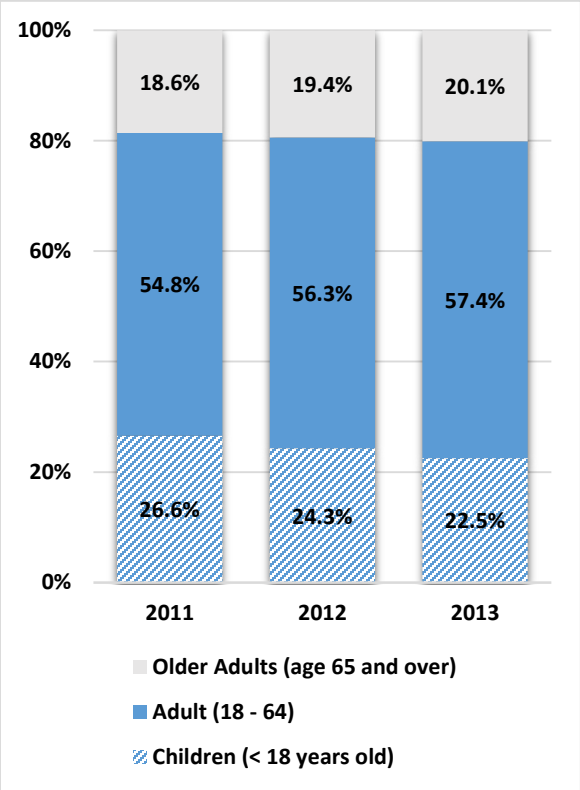
Source: UDS 2012, 2013



Source: UDS 2012, 2013

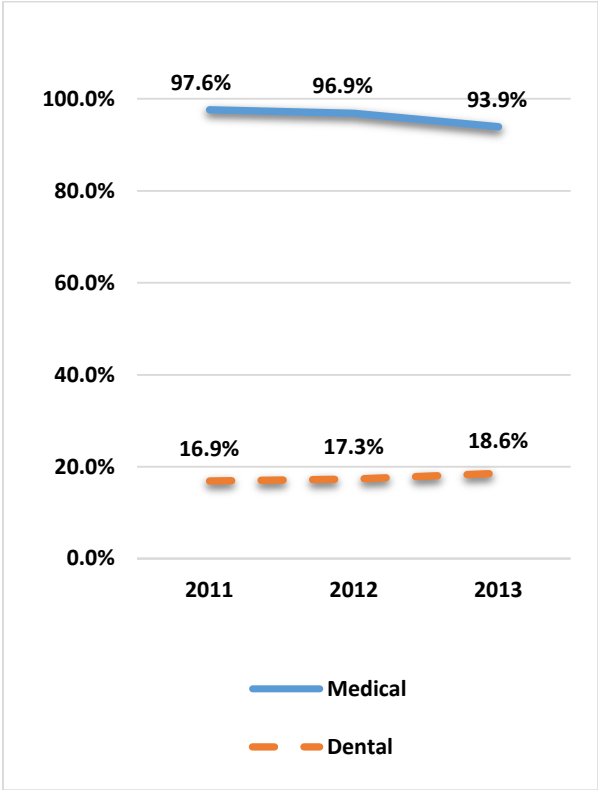
Thunder Bay Community Health Service, Inc., FQHC in Hillman, Michigan

Age of Patient Caseload, 2011, 2012, 2013



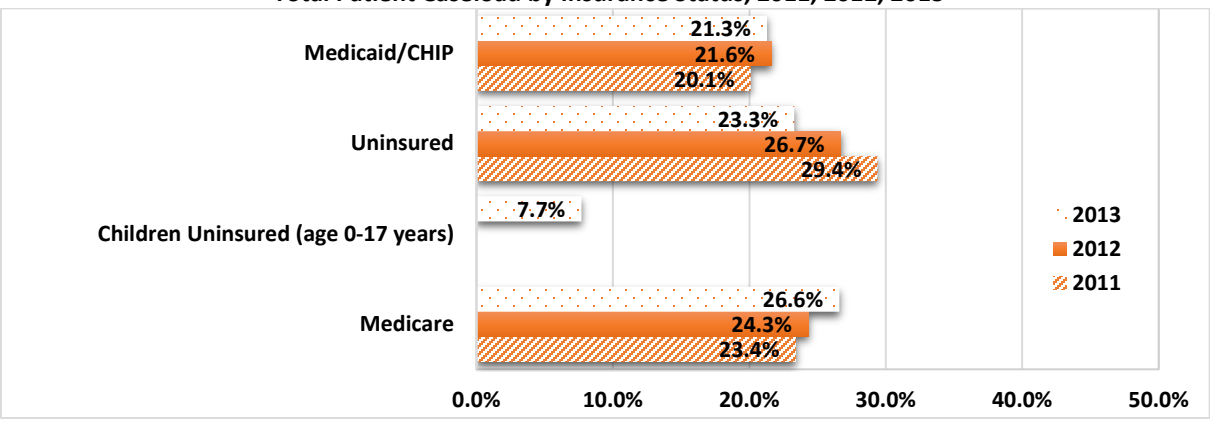
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

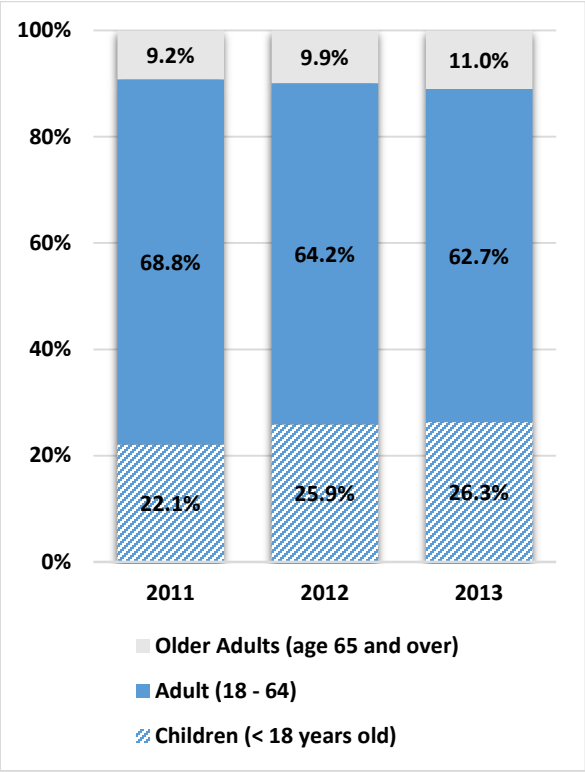
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

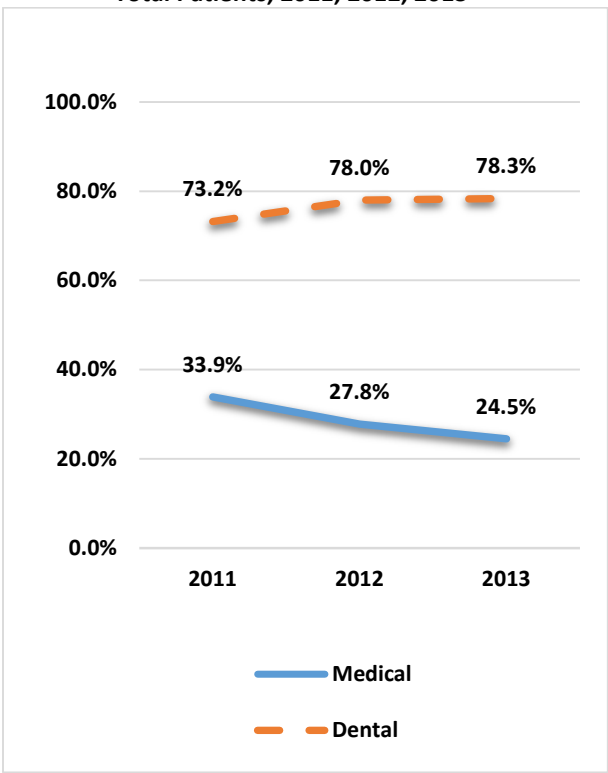
Upper Peninsula Association of Rural Health Services, Inc., FQHC in Marquette, Michigan

Age of Patient Caseload, 2011, 2012, 2013



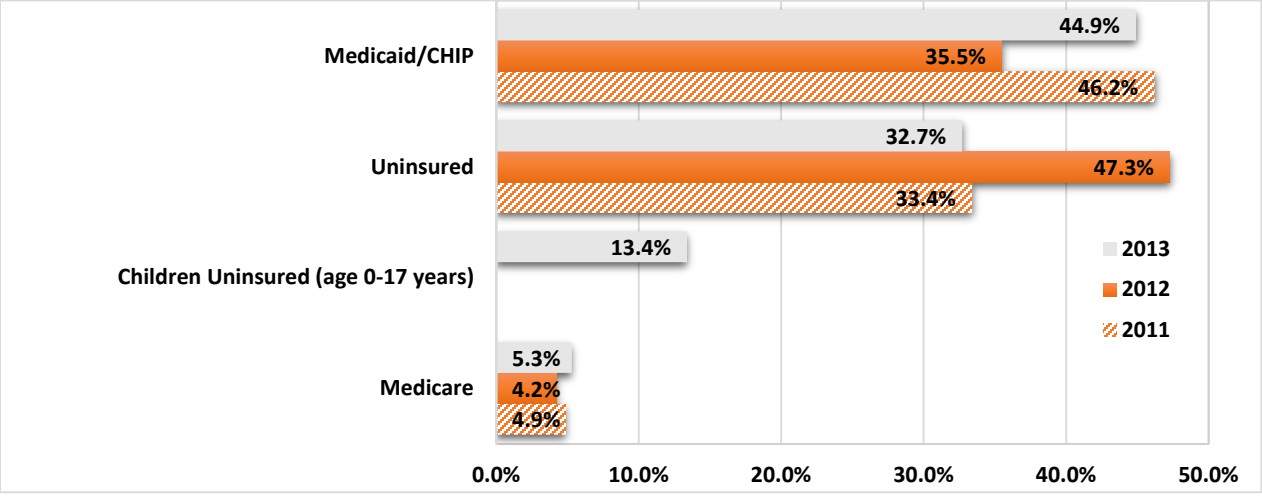
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

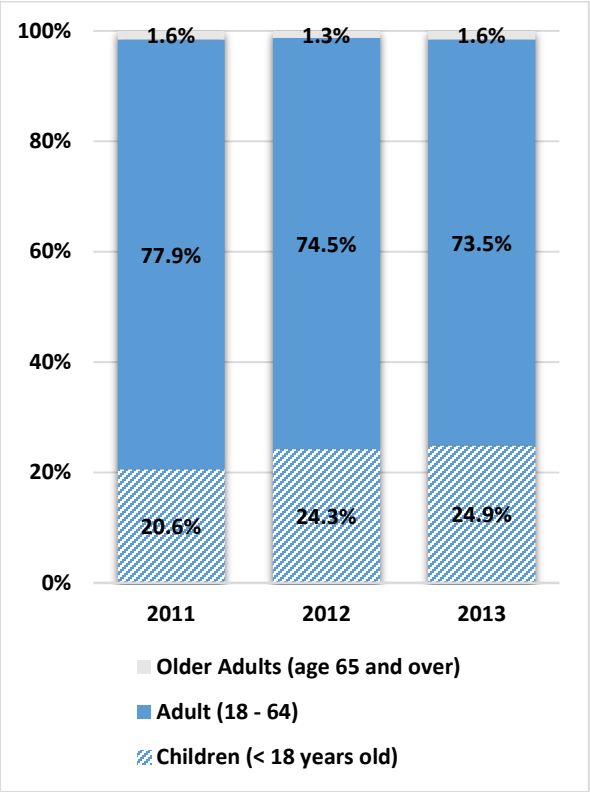
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

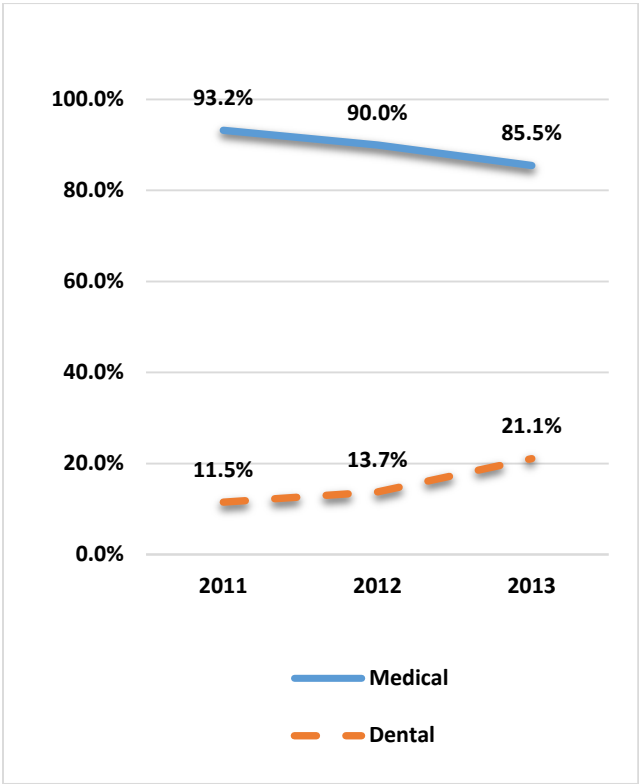
Western Wayne Family Health Centers, FQHC in Inkster, Michigan

Age of Patient Caseload, 2011, 2012, 2013



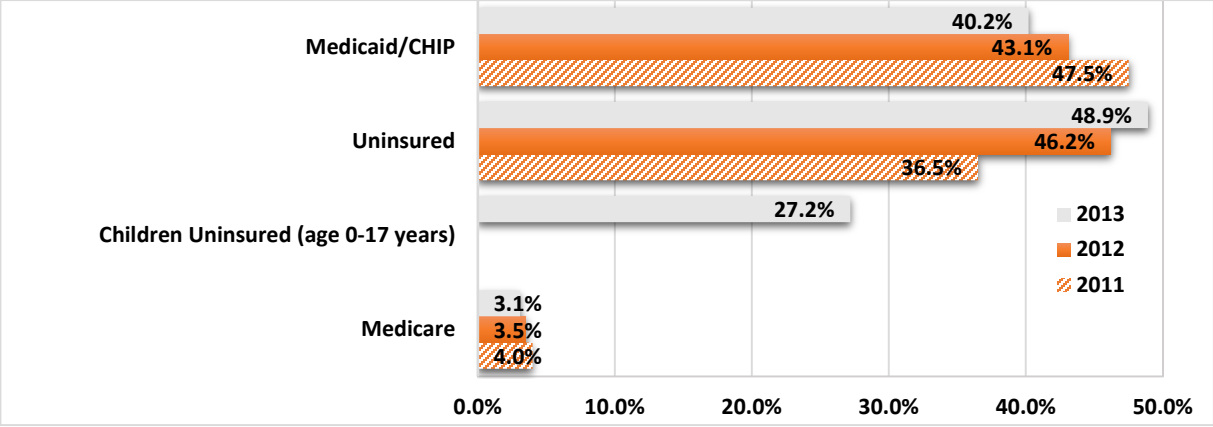
Source: UDS 2011, 2012, 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

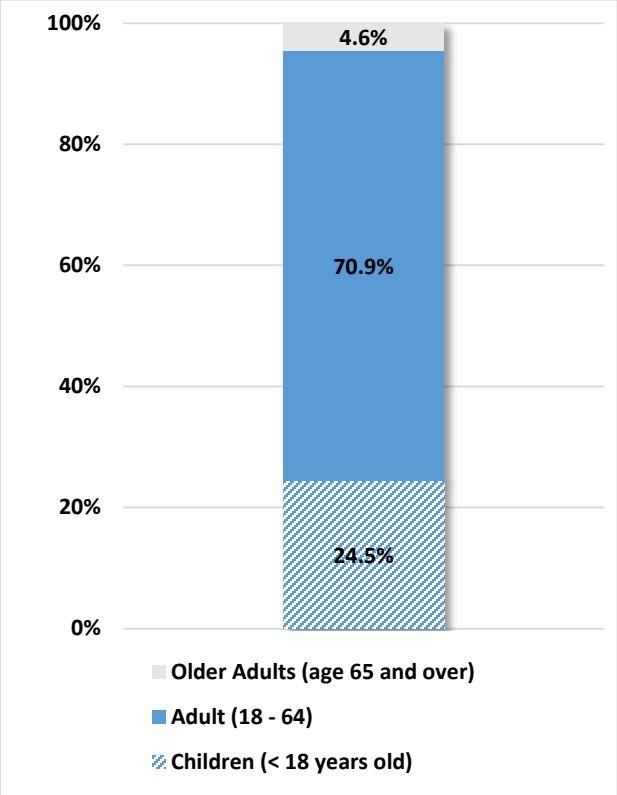
Total Patient Caseload by Insurance Status, 2011, 2012, 2013



Source: UDS 2011, 2012, 2013

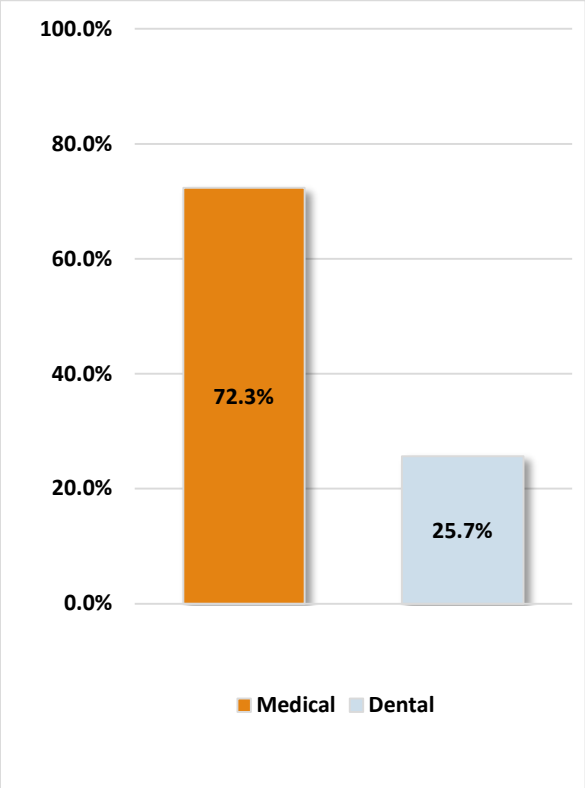
Oakland Integrated Healthcare Network, Inc. FQHC Look-Alike in Pontiac, Michigan

Age of Patient Caseload, 2013



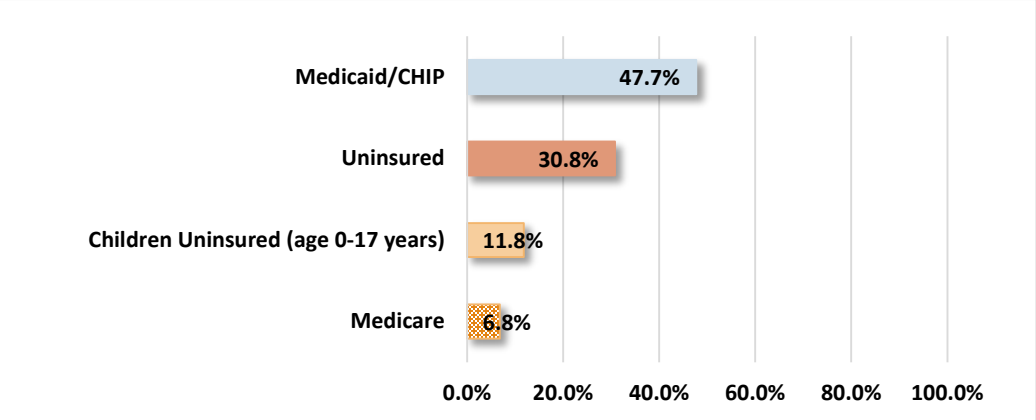
Source: UDS 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2013



Source: UDS 2013

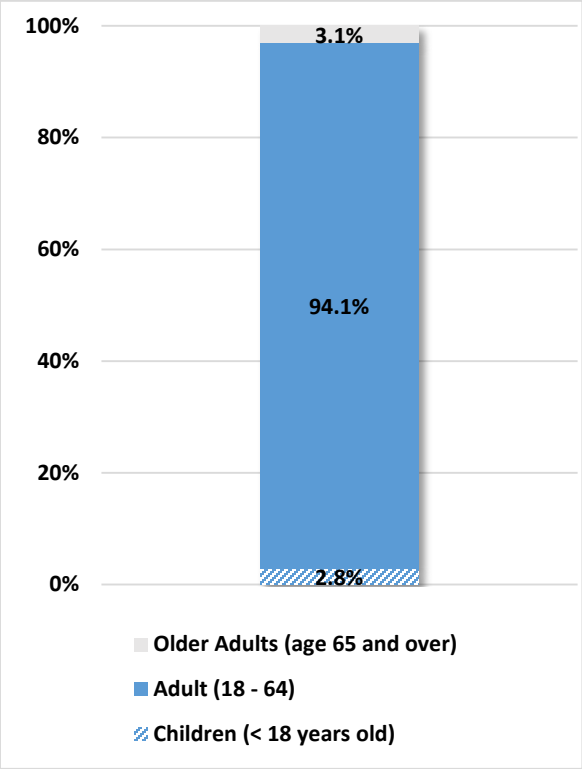
Total Patient Caseload by Insurance Status, 2013



Source: UDS 2013

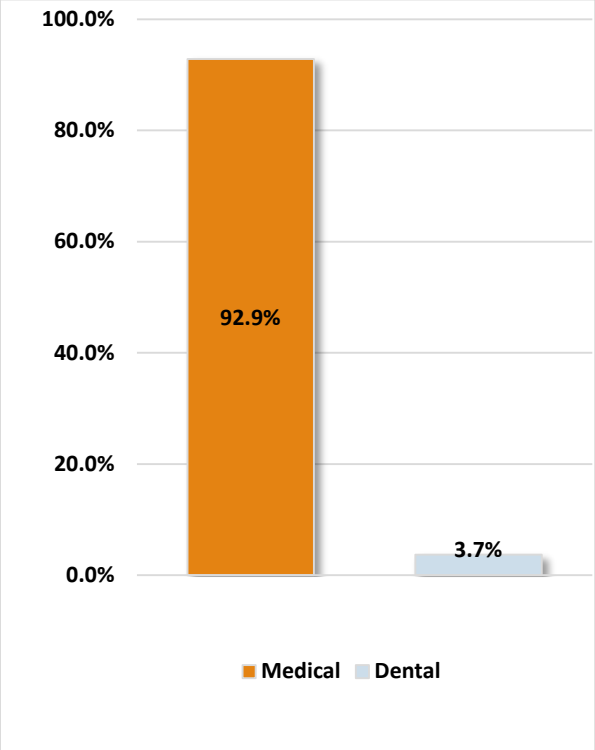
Traverse Health Clinic and Coalition (Traverse Health Clinic), FQHC Look-Alike in Traverse City, Michigan

Age of Patient Caseload, 2013



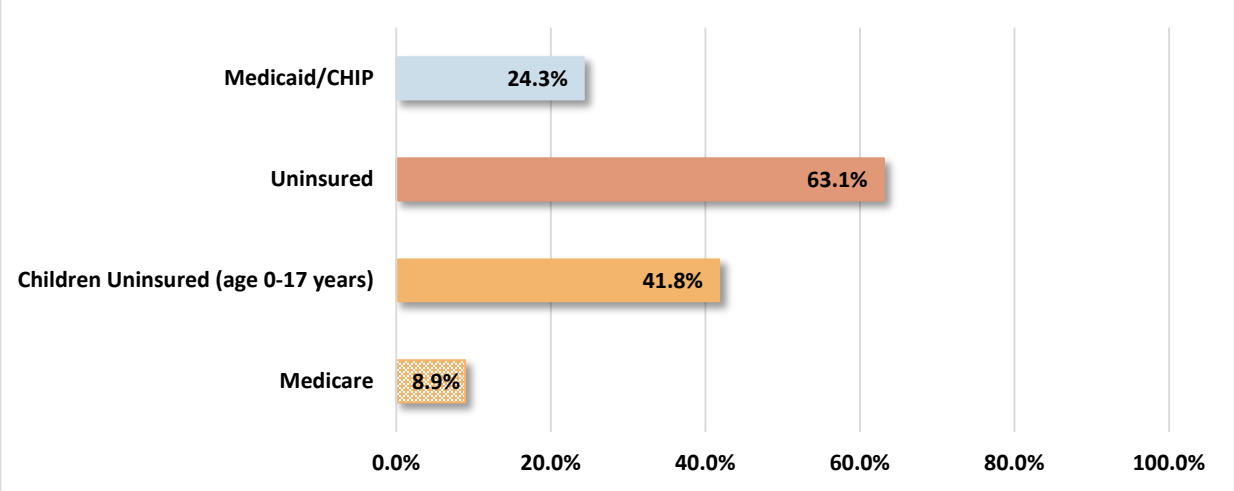
Source: UDS 2013

Medical and Dental Patient Visits as a Percent of Total Patients, 2013



Source: UDS 2013

Total Patient Caseload by Insurance Status, 2013



Source: UDS 2013

Michigan Health Center Grantees without Direct Dental Services in 2011-2013:

1. East Jordan Family Health Center, East Jordan
2. Genesee Health System Flint
3. Saint Mary's Health Care (Mercy Health-Saint Mary's Community Health Centers), Grand Rapids
4. Upper Great Lakes Family Health Center, Gwinn (also FQHC Look-Alike)
5. Wayne, Charter County Of, Detroit

Michigan FQHC Look-Alikes without Direct Dental Services in 2011-2013:

1. Health Centers Detroit Foundation (Health Centers Detroit Medical Group), Detroit