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The Cost of Dental-Related Emergency Room Visits in Michigan

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I. Executive Summary 1

Purpose of Report 1
Overview of Approach 1
Overview of Findings 2
About Anderson Economic Group 3

II. Hospital Care for Preventable Dental Conditions ... 4

Preventable Hospital Visits for Dental Care 4
Cost of Care in a Hospital 6
Comparison to Cost of Dental Care in Traditional
Dental Setting 8

III. Programs to Improve Dental Health in Michigan..11

State-Wide Dental Health Programs 13
Community Dental Health Programs 18
Barriers to Care for At-Risk Populations 20

Appendix A. Resources..A-1

Appendix B: About the Authors............................B-1

Anderson Economic Group B-1
Study's Authors B-1
Contributor B-2

I.Executive Summary

Over the past decade, nationwide spending on health care increased at an average rate of 6.1% annually, about four percentage points faster than inflation.[1] This alarming increase in the cost of care has motivated policymakers, hospital administrators, doctors, nurses, insurers, patients, and others to rethink how they administer, pay for, and seek care. While there is no consensus on the reason for this rapid growth in the cost of care, most agree that we can combat it by administering care more efficiently.

One area where efficiency gains might be most forthcoming is the utilization of hospitals. Trips to the emergency room and inpatient hospital stays are expensive and, often, preventable. Among the many preventable conditions that end up being treated in emergency rooms, dental conditions may be the most striking. Almost half of all visits to the emergency room for dental conditions are for cavities. Other common conditions include abscesses, tooth removal, and gingivitis (gum disease). There were over 1,000 hospitalizations in the year 2011 in Michigan for preventable dental conditions alone.[2]

These costly visits could have been prevented with proper checkups and dental care. However, particularly among low-income and rural populations, many patients cannot access care for a variety of reasons. In this report, we estimate the annual cost of treating patients in hospitals for preventable dental conditions. We also review a set of current programs that provide dental care to low-income individuals in Michigan.

PURPOSE OF REPORT

Delta Dental of Michigan, Ohio, and Indiana commissioned Anderson Economic Group to prepare this report to:

- Analyze the cost of treating dental conditions in hospitals in Michigan; and
- Identify and discuss existing programs available in the state to help provide preventive oral health care and oral health education.

OVERVIEW OF APPROACH

To estimate the cost of providing hospital services to those with preventable dental conditions, we relied primarily on two sources: the Medical Expenditure Panel Survey, which is a national survey of doctors and patients that tracks conditions, treatment, and costs of health care; and the Michigan Department of

1. Growth in health care expenditures is from the Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group. The average annual change shown here is the compound average growth rate from 2001 to 2011.
2. Michigan Department of Community Health, Division for Vital Records and Health Statistics, <http://www.mdch.state.mi.us/pha/osr/index.asp?Id=14>, accessed in August 2013.

Community Health, which keeps statistics on hospital admissions in the state and corresponding patient demographics.

Our approach likely results in an underestimate of the cost of hospital services for dental-related conditions because we analyzed emergency room and inpatient treatment only, leaving outpatient care for dental-related conditions beyond the scope of our study.

OVERVIEW OF FINDINGS

Our research and analysis resulted in the following findings:

1. *Treatment for preventable dental conditions in hospitals in the State of Michigan cost at least $15 million in 2011. It is likely that these costs greatly exceed the cost of providing routine dental care for these patients.*

In the year 2011, we estimate that there were over 7,000 visits to the emergency room to receive treatment for preventable dental conditions.[3] In addition, there were over 1,000 hospitalizations for preventable dental conditions. The total payments made by patients and insurers for these services exceeded $15 million. This figure does not include additional costs from cases where hospitals lost money on treating these patients, such as when patients were not able to make payments. As a result, this represents a conservative estimate for the total cost of care.

Other reports investigating a similar question in different states sometimes show the total amount of *charges* for this care, resulting in a considerably higher estimate.[4] Hospital charges usually exceed the total payments made by insurers and patients, mainly because public and private insurers have negotiated steep discounts with hospitals. To provide the ability to compare apples to apples in comparison with these other reports, we estimate that total *charges* for these preventable dental conditions at hospitals in Michigan totaled $58 million in the year 2011.

Some patients treated for preventable dental conditions may have access to dental care, but under-used it or were not aware of their access. However, it is likely that most such patients simply did not have access to basic dental care that could

3. See “Statewide Costs of Hospital Treatments for Dental Conditions” on page 7.
4. The following two studies estimated the total *charges* due to dental care in hospitals or emergency departments, not total *costs*:
   Florida Public Health Institute, “315 Patients a Day Seek Dental Treatment in Florida’s Hospital Emergency Rooms,” December 15, 2011.
   S. Nagarkar, J. Kumar and M. Moss, “Early Childhood Caries-related Visits to Emergency Departments and Ambulatory Surgery Facilities and Associated Charges in New York State,” *Journal of the American Dental Association*, January 2012, pp. 59-65.

have prevented their condition. A single avoided hospitalization, which costs $12,448 on average, would pay for decades of preventative and diagnostic care at average costs for patients using private dental insurance in Michigan. For more information, see "Hospital Care for Preventable Dental Conditions" on page 4.

2. The Michigan Department of Community Health and nonprofits throughout the state administer several programs expanding access to dental care. Nevertheless, a significant need remains.

Through a variety of avenues, hundreds of thousands of adults and children in the state receive some subsidized dental services and education on oral health. Most of these programs are subsidized by federal, state, or local governments. In addition, there are several large nonprofits, such as Smiles on Wheels, Free Clinics of Michigan, and Michigan Community Dental Clinics that provide free or subsidized dental care to a range of state residents. See "Programs to Improve Dental Health in Michigan" on page 11 for more information.

While such programs have provided access to quality and affordable dental care to thousands of Michigan residents, there are still many who continue to use the emergency room as their primary dental care center. The continued use of hospitals for preventative dental conditions can partially be attributed to the remaining barriers to oral health care. These barriers are particularly prevalent among adults, as the income level requirements for free or reduced cost dental care for adults is generally less generous than for children. Additionally, there are likely many Michigan residents who fail to meet the income level requirements for dental care insurance and programs, but are nevertheless unable to afford oral health care. Obstacles to access for the uninsured are discussed further in "Barriers to Care for At-Risk Populations" on page 20.

ABOUT ANDERSON ECONOMIC GROUP

Anderson Economic Group, LLC offers research and consulting in economics, finance, market analysis, and public policy. Since AEG's founding in 1996, the company has helped clients including universities, state and local governments, non-profit organizations, and private and public companies. AEG has completed studies on the costs of health care for universities, hospitals, insurers, and trade organizations located throughout the United States. For more information on the report's authors, please see "Appendix B: About the Authors" on page B-1.

II.Hospital Care for Preventable Dental Conditions

Patients in Michigan, often because they have no alternative, visit an emergency room to receive care for preventable dental conditions approximately 7,000 times a year. In this section, we present our estimates for the amount of visits to the emergency room for dental care, how many resulted in hospitalization, and the cost of these visits.

PREVENTABLE HOSPITAL VISITS FOR DENTAL CARE

For a variety of reasons, including lack of insurance, limited access to providers, and convenience, many patients go to the emergency room to receive their dental care. Most of these visits to the emergency room are not actually "emergencies." For example, 42% of the emergency room visits for dental care in 2009 were for dental caries (cavities). In addition, 63% of hospital admissions following oral-health-related emergency room visits in that year were for abscesses.[5] Each of these conditions could be treated in an outpatient setting by a dentist. At the least, more frequent visits to the dentist could have prevented these conditions from resulting in a hospital stay.

The Michigan Department of Community Health estimates that there were 1,071 hospitalizations for preventable dental conditions in the year 2011. Of these, 173 of those hospitalized were children under the age of 18.[6] Hospitalizations represent inpatient hospital stays, meaning that not only did most of these patients spend time in the emergency room, but they were admitted to the hospital for further care and recovery.[7] These preventable dental conditions could either be treated in a dentist's office or outpatient setting or could have been prevented by regular dental care. The conditions include cavities, gingivitis and periodontal disease, cracked or lost teeth, abscesses, and cysts.[8]

Using data from the Medical Expenditure Panel Survey, we found that, on average, for every inpatient hospital stay due to a preventable dental condition, there were just under seven emergency room visits for those same conditions. This implies that, in addition to the 1,071 inpatient stays for preventable dental con-

5. Krystle Seu, Kendall Hall, and Ernest Moy, "Emergency Department Visits for Dental-Related Conditions, 2009," Statistical Brief #143, Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, November 2012.
6. Michigan Department of Community Health, "Ambulatory Care Sensitive Hospitalizations by Selected Age Groups: Michigan Residents, 2011,"<http://www.mdch.state.mi.us/pha/osr/CHI/HOSP/PH11TT17.ASP>, accessed August 3, 2013.
7. According to the Medical Expenditure Panel Surveys from 2008 to 2010, 68% of inpatient hospitalizations for preventable dental conditions began in an emergency room.
8. The ICD-9-CM codes for classification of diseases and injuries that apply to preventable dental conditions used here are 521, 522, 523, 525, and 528.

ditions in Michigan in the year 2011, there were approximately 7,300 visits to the emergency room for the same conditions.

Looking at the inpatient hospitalizations by age of the patient reveals that, while most patients are between ages 18 and 64, there are substantial numbers of both children and seniors who are included.

TABLE 1. Proportion of Inpatient Treatment for Preventable Dental Conditions by Age in Michigan, 2011

	Proportion of Total
Ages 17 and under	16.2%
Ages 18-64	68.1%
Ages 65 and up	15.8%

Source: Michigan Department of Community Health
Analysis: Anderson Economic Group, LLC
Notes: Preventable dental conditions include those corresponding to ICD-9-CM codes 521, 522, 523, 525, and 528.

At the time of this report's publication there are no data available on the dental insurance status of hospital patients treated for preventable dental conditions in Michigan. However, data are available on the health insurance status of the national population admitted to emergency rooms for preventable dental conditions. This is useful as an indicator of the burden these costs place on the health system, as uninsured patients may not be able to pay for their care. Table 2 below shows the health insurance status of emergency room patients treated for preventable dental conditions.

TABLE 2. Insurance Status of Patients Visiting an Emergency Room for Preventable Dental Conditions in the United States, 2008-2010

Insurance Status	Proportion of Total
Private Health Insurance	28.4%
Public Health Insurance	40.5%
Uninsured	31.2%

Source: Medical Expenditure Panel Survey
Analysis: Anderson Economic Group, LLC
Notes: Preventable dental conditions include those corresponding to ICD-9-CM codes 521, 522, 523, 525, and 528.

Nationally, a plurality of patients visiting the emergency room for preventable dental conditions (41%) in the years 2008 to 2010 had public health insurance (Medicaid or Medicare, for the most part).[9] Another 31% were uninsured, and 28% had private health insurance.

COST OF CARE IN A HOSPITAL

Emergency rooms and hospital beds are particularly expensive places to treat preventable dental conditions.

The average hospital charge for an emergency room visit for a preventable dental condition was over $1,000 in the U.S. from 2008 to 2010. Hospitals are practically never paid the full amount that they charge for care. Rather, they have arrangements with private insurers or with government programs to receive a certain payment level for different procedures. Only the uninsured end up paying amounts close to the actual charge. Actual payments for a trip to the emergency room for a preventable dental condition were $290, on average.

If a patient is admitted to the hospital after a procedure in the emergency room—after removal of an oral abscess, for example—the costs escalate dramatically. It is likely that much of these patients' hospital care includes treatment of knock-on effects of dental problems that would not have occurred otherwise, including pain relief, treatment of infections, and surgery. The average total charge for an inpatient stay due to a preventable dental condition was $46,000 during the years from 2008 to 2010. Of this charge, hospitals received an average payment of over $12,000 from the patient and the patient's insurer, combined. This data is summarized in Table 3 below.

TABLE 3. Average Charge and Average Payment for an Emergency Room Visit or Inpatient Stay for a Preventable Dental Condition, 2008-2010

	Hospital Charge	Total Payment
Emergency Room Visit	$1,103	$290
Inpatient Hospital Stay	$46,174	$12,448

Source: Medical Expenditures Panel Survey
Analysis: Anderson Economic Group, LLC
Notes: Preventable dental conditions include those corresponding to ICD-9-CM codes 521, 522, 523, 525, and 528.
Total payments include payments by insurer and patient.

A Note on Cost Compared to Charge and Payment

Neither of the values presented above, payments or charges, are exactly equal to the cost of care. It may be the case that the hospital is losing a bit of money on these patients, so the payments are below the cost of care. On the other hand, hospitals need to remain solvent, so in the long run, payments received from all services provided, along with donations and other revenues, must be at least equal to their cost of care.

9. Coverage for dental care is included in Medicaid coverage in less than half of US states. Several states, including Michigan, dropped dental coverage from Medicaid during the recent economic recession. Michigan restored dental coverage for adults to Medicaid in October 2010.

The average "cost-to-charge ratio" in the State of Michigan, the total cost of providing care at hospitals in the state divided by total hospital charges, is 0.384.[10] In other words, every dollar in hospital charges represents about 38 cents in costs to the hospital. If this ratio applies to the procedures shown above (and it may not, as it is an average across all procedures for the hospital), then hospitals are losing money on these procedures because the payments are considerably below a third of the charge.

In this report, to be conservative, we assume that the payment received by the hospital is approximately equal to the cost to the hospital of providing care. Note that, by doing so, we are capturing only costs to the patients and insurers, and not capturing any additional costs that the hospital might incur which result in a loss for the hospital. Other reports investigating a similar question in different states sometimes show the total amount of *charges* for this care, resulting in a considerably higher estimate.[11] To provide the ability to compare apples to apples in comparison with these reports, we show our estimate of total charges below, in addition to the total cost.

Statewide Costs of Hospital Treatments for Dental Conditions

Using the above cost data and data on inpatient hospital admissions from the Michigan Department of Community Health, we can estimate the total cost of treating patients with preventable dental conditions in hospitals. Given an average cost of $290 per emergency room visit for a preventable dental condition, the 7,286 emergency room visits in Michigan in the year 2011 cost a total of $2.1 million. Given an average cost of $12,448 per inpatient stay for a preventable dental condition, the 1,071 such hospitalizations in Michigan cost a total of $13.3 million. The total cost for treating preventable dental conditions in hospitals in Michigan, then, was $15.4 million in the year 2011. (The hospital *charges* for this care totaled $57.5 million.)

Assuming, as the evidence suggests, that hospitals actually lost money on treating these patients, this $15 million estimate represents a lower bound on the true cost of providing this care. In addition, these total costs do not include costs for patients at outpatient clinics or for patients where dental conditions were a sec-

10. This cost-to-charge ratio is derived by adding together the urban operating and capital cost-to-charge ratios for the State of Michigan, according to the Center for Medicaid and Medicaid Services FY 2013 Final Rule Tables, Tables 8A and 8B.

11. The following two studies estimated the total *charges* due to dental care in hospitals or emergency departments, not total *costs*:
Florida Public Health Institute, "315 Patients a Day Seek Dental Treatment in Florida's Hospital Emergency Rooms," December 15, 2011.
S. Nagarkar, J. Kumar and M. Moss, "Early Childhood Caries-related Visits to Emergency Departments and Ambulatory Surgery Facilities and Associated Charges in New York State," *Journal of the American Dental Association*, January 2012, pp. 59-65.

ondary reason for the hospitalization or emergency room visit. See Table 4 below for a summary of these estimates.

TABLE 4. Cost of Treating Preventable Dental Conditions in Hospitals in Michigan, 2011

	Amount	Average Cost of Care	Total Cost of Care	Total Charges for Care
Emergency Room Visits	7,286	$290	$2.1 million	$8.0 million
Inpatient Hospital Stays	1,071	$12,448	$13.3 million	$49.5 million
TOTAL			*$15.4 million*	*$57.5 million*

Source: Medical Expenditures Panel Survey
Analysis: Anderson Economic Group, LLC
Notes: Preventable dental conditions include those corresponding to ICD-9-CM codes 521, 522, 523, 525, and 528.
"Total Cost of Care" includes payments by insurer and patient. Total payments are considerably less than hospital charges.

COMPARISON TO COST OF DENTAL CARE IN TRADITIONAL DENTAL SETTING

The cost of providing this care could likely be avoided in many cases if these patients had better access to regular dental care. And it is important to note that the costs we have identified (totaling $57.5 million in hospital charges, and $15.4 million in payments annually) are incurred *even with* the many existing private, state, and local programs to provide dental care to the uninsured identified in the next section of this report.

In principle, the avoidable costs identified in this section (ranging from $290 for emergency room care to over $12,000 for an inpatient hospital stay) can be compared to the cost of expanding access to regular care, though cost savings and the cost of expanding efforts to improve access may not accrue to the same entities. Making such a quantitative comparison directly, in aggregate, is outside the scope of this report, for several reasons.[12] Nevertheless, we do have access to the average annual cost of providing routine care to children and adults whose care is paid for by a Delta Dental plan. Table 5 on page 9 provides the average cost per patient covered by a Delta Dental plan in Michigan in 2012.

12. There is no data available on the dental care history of patients hospitalized for dental-related conditions, nor do we have access to what specific malady caused each visit. Furthermore, we do not know how many people without dental insurance coverage would have to be covered to prevent each instance of unnecessary hospitalization.

TABLE 5. Average Approved Payment for Preventative and Diagnostic Care Per Delta Dental Patient in Michigan, 2012

	Patients Age 18 and Under	Patients Age 19 and Up
Exams	$62.51	$67.28
Cleanings	$84.17	$91.15
Fluorides	$35.31	$1.38
X-rays (all types)	$47.56	$55.12
Brush Biopsies	$0.00	$0.02
Sealants	$8.12	$0.06
Emergency Treatment	$0.71	$2.25
Total	$238.37	$217.26

Source: Delta Dental Plan of Michigan
Analysis: Anderson Economic Group, LLC

To the extent that an instance of hospital care could have been prevented by receiving preventative and diagnostic care at this cost level, the potential savings for that individual are large. Avoiding a single inpatient stay at the average cost of $12,448 would pay for over a decade of preventative and diagnostic care, which costs $217 per year in insurer payments and typically requires little to no out-of-pocket costs.

Some hospital care for preventable dental conditions could be avoided by receiving procedures such as fillings or tooth extractions in a dentist's office. An examination of actual cost data provided by Delta Dental Plan of Michigan shows that many such procedures are less costly than the average emergency room payment for a preventable dental condition, as shown below in Table 6.

TABLE 6. Average Claim, Cost for Insurer, and Out-of-pocket Costs for Delta Dental Patients in Michigan for Selected Dental Procedures, 2013[a]

Service	Average Claim Submitted	Average Cost for Insurer	Average Out-of-pocket Costs for Delta Dental Patients	Average Total Cost (to Insurer and Out-of-pocket)
Fillings	$166.12	$142.06	$24.06	$166.12
Simple Extractions	$134.80	$112.82	$21.98	$134.80
Complex Extractions	$325.61	$274.91	$50.70	$325.61

Source: Delta Dental Plan of Michigan
Analysis: Anderson Economic Group, LLC

a. Data is from a 6- month period in 2013.

As with preventative and diagnostic care, we do not know how many dental procedures provided in a traditional dental setting would be required to prevent each episode of preventable hospital care.

III.Programs to Improve Dental Health in Michigan

For uninsured, underinsured, rural, and inner-city populations, limited access to preventative oral health care and oral health treatments puts individuals' health at risk. To promote access to oral health services, nonprofits, local governments, and the State of Michigan provide education and programs that specifically target these at-risk populations. In this section, we discuss many of the most prominent statewide and local initiatives that provide oral health care services and education; a list of programs can be found in Table 7 on page 12. We also discuss the barriers to care for at-risk populations on page 20.

Initiatives to improve oral health come in many forms. The Michigan Dental Association, for example, provides free oral health handouts on their website, and also is associated with community dental programs that offer reduced fees, sliding fee scales, or payment plans.[13] Other initiatives require the involvement of community health centers, and are administered by the U.S., the state, or local governments and non-profits; many of these efforts lower the costs of oral health care for low-income populations.

Furthermore, organizations are taking steps to increase access to underserved populations by implementing mobile oral health stations, bringing services to non-traditional locations, and lowering the cost of services. Many of the initiatives are administered and/or funded by the Michigan Department of Community Health, as well as private and non-profit firms, including the Delta Dental Foundation and the Michigan Dental Association. Table 7 on page 12 details some key aspects of these programs. We provide more details on these programs beginning with "State-Wide Dental Health Programs" on page 13. It is clear that the programs listed provide a great service; without these programs, thousands of additional Michigan residents could be at risk of losing their access to dental care.

13.A list of participating community dental programs in Michigan can be found on the Michigan Dental Association website at www.smilemichigan.com.

TABLE 7. Examples of Michigan Dental Programs for Underserved Populations

Program	Organization	Population	Description of services
Healthy Kids Dental	MDCH and Delta Dental	Medicaid patients under age 21 in 78 counties	Exams, x-rays, dentures, emergency treatments, sealants, fillings
MIChild	MDCH, Delta Dental, Golden Dental Plans, and DENCAP	Children (< 19) with no comprehensive health insurance who meet family income limits	Dental services
SEAL! Michigan	MDCH	Schools with at least 50% of students on Free/Reduced Lunch Programs	Sealants and fluoride treatments; oral health education
Varnish! Michigan	MDCH	Early Head Start and Head Start children	Screenings and fluoride varnish; offers education to parents, children, and staff
Varnish! Michigan-Babies Too!	MDCH	Medicaid-eligible children (< 3)	Medicaid reimburses fluoride varnish to children under age 3 at EPSDT visits[a]
Free Clinics	Free Clinics of Michigan, 501(c)(3)	Uninsured, underinsured, and those with limited/no access to health care	Dental services, varies by clinic
Michigan Community Dental Clinics	MCDC, Inc.	Low-income, uninsured, Medicaid	Applies private business model to public clinics; re-invests dollars to Dental Assistance Fund to lower patient costs
Health Centers	FQHCs and FQHC Look-Alikes	Targets traditionally underserved areas; accepts all insurances, Medicare, and Medicaid and offers sliding fee programs	Dental services, varies by center
Donated Dental Services	MDCH	Low-income patients who are also disabled, medically at-risk, or elderly	Volunteers provide comprehensive dental treatment; no emergency services
School-Based Fluoride Mouthrinse Programs	MDCH	Elementary schools where over 50% of students do not have access to fluoridate water	Fluoride mouthrinse treatments
Mobile Dental Programs	The School Dentist Program	K-8; accepts Medicaid, MIChild, and Healthy Kids Dental; financial aid for children without dental insurance	Portable, preventative oral health services brought to schools
Dental and Dental Hygiene School Clinics	Individual Dental and Dental Hygiene Schools	Open to the public; fee for services, but at a lower cost than private practices	Varies by center: hygiene clinics offer cleanings, fluoride treatments, and x-rays; dental school clinics offer additional services such as crowns and bridges

Source: Information publicly available at each group's website
Analysis: Anderson Economic Group, LLC

TABLE 7. Examples of Michigan Dental Programs for Underserved Populations (Continued)

Program	Organization	Population	Description of services
Mobile Dental Programs	Smiles on Wheels, 501(c)(3)	Those without a regular dental office in the counties of Jackson, Hillsdale, Branch, Lenawee, and Ingham; accepts Medicaid	Mobile dental hygiene program; part of free fluoride and head start dental screening in several counties
Miles of Smiles	Ottawa County; volunteer network	Low-income, uninsured, and MIChild children	Mobile dental unit capable of preventative and restorative dental services
Kalamazoo County's Portable Offsite Dental Service	Kalamazoo Communities in Schools	Students enrolled in MIChild or Healthy Child Dental in Kalamazoo County	Mobile dental clinic offering x-rays, exams, sealants, and cleaning
Community Dental Access Initiative	Calhoun County Partnership	Low-income and uninsured residents of Calhoun County	Preventative dental services in exchange for volunteering at a community non-profit
Adopt A Child's Smile Program	Midland County volunteer dentists	Children (<18) in Midland County who are ineligible for dental insurance or Medicaid	Preventative dental services including examinations, cleanings, and fillings; orthodontic care in severe cases
Mission of Mercy	Michigan Dental Association and Michigan Dental Association Foundation	Low-income Michigan residents	Annual dental access program that provides a wide range of services over a two or three day period

Source: Information publicly available at each group's website
Analysis: Anderson Economic Group, LLC

a. The Early Periodic Screening, Diagnosis, and Treatment Program is the child health component of Medicaid, required in every state.

STATE-WIDE DENTAL HEALTH PROGRAMS

The Michigan Public Dental Prevention Program. The Michigan Department of Community Health Oral Health Program (MDCH-OHP) administers the Public Dental Prevention Program (PA 161). This program aims to expand access to preventative oral health services to unassigned and underserved populations in Michigan.[14] Through this program, approved non-profit agencies and Community Health Centers can use dental hygienist service providers to administer preventative services to Michigan residents in need of oral health care.

As of September 30, 2012, there were 55 programs under PA 161. For the twelve-month period preceding that date, over 4,000 adults and nearly 30,000 children were screened through programs made possible by PA 161. Some of these programs are school-based programs, and all target children and adults

14. Unassigned individuals include those who are part of a dentist program for underserved populations conducted by a local, state, or federal grantee health agency, but not assigned to it by a dentist.

who do not have access to traditional dental care.[15] Several of the programs, clinics, and centers listed in this chapter are facilitated by PA 161.

Healthy Kids Dental. Healthy Kids Dental is a public private partnership between Delta Dental and the Michigan Department of Community Health. In this program, participating dentists accept payment from Delta Dental for services such as x-rays, exams, sealants, fillings, dentures, and emergency treatments. This program is currently available to Medicaid-eligible children (under the age of 21) in 78 counties in Michigan, and has approximately 500,000 enrollees. Although Michigan's Medicaid program includes dental benefits for children, most dentists do no accept Medicaid-enrolled patients. In contrast, nearly 80% of dentists in those counties participate in Healthy Kids Dental. This difference can partially be attributed to reimbursement rates in the Healthy Kids Dental program. These rates are lower than the median rate charged by Michigan dentists, but higher than the rate reimbursed by Medicaid.[16]

MIChild. MIChild is a health care insurance program for low-income, uninsured individuals under the age of 19 who do not qualify for Medicaid. Funding for this program is provided by the State of Michigan and by federal funds authorized under Title XXI of the Federal Social Security Act. MIChild is administered by the MDCH. The program provides basic preventative health and dental services.

Children in the MIChild program must receive care from a Michigan dentist who participates in the child's selected dental plan and the MIChild program. Families pay a monthly premium of $10, regardless of the number of children in the family. The income levels for eligibility in MIChild are higher than those for Healthy Kids Dental. Families participating in MIChild must reapply each year.[17]

SEAL! Michigan. This school-based program provides eligible students with dental sealants. The MDCH administers this program, awarding grants to non-profit organizations operating with PA 161 dental hygienists, who can work with or without the direct supervision of a dentist. These grantees are funded for

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15. For more information on the details and data for the PA 161 program, see "PA 161: Public Dental Prevention Program 2011-2012 Annual Report October 2011-September 2012" found at: <http://www.michigan.gov/documents/mdch/2011-12_Annual_PA161_Report_407639_7.pdf>.

16. Further information about Healthy Kids Dental can be found at http://www.deltadentalmi.com/Individuals/Healthy-Kids-Dental-and-MIChild/Healthy-Kids-Dental.aspx and in "2011 Check-Up on Oral Health: A Michigan County Profile," Michigan Oral Health Coalition, <http://www. mohc.org/files/Policy%20Statements/2011%20Check-Up%20on%20Oral%20Health.pdf>.

17. Further information about MIChild can be found at http://www.deltadentalmi.com/Individuals/Healthy-Kids-Dental-and-MIChild/MIChild.aspx.

three years, and bring the program to select schools. Eligible schools must have 50% or more of students on Free and Reduced Lunch programs, and grantees focus on schools in counties that do not have Healthy Kids Dental accessibility. Grantees bill any applicable insurance for sealants, but *must* provide sealants to students regardless of coverage. In the 2011-2012 school year:

- 134 schools were served;
- The program had 3,700 grantees;
- 15,086 sealants were placed; and
- Approximately 3,300 students received fluoride treatment.[18]

Varnish! Michigan. This program provides free dental screenings and fluoride varnish to children in Early Head Start and Head Start programs, ages 0-4. Varnish! Michigan was established in 2007 and is administered by the MDCH. The program also provides caries-risk assessment (cavities); oral health education for parents, children, and staff; and helps to identify a local dentist. Dental health information collected through the screenings is used to study the decay prevalence of Early Head Start and Head Start children. This information is then utilized by the MDCH for the promotion of additional dental health programs.[19]

Varnish! Michigan-Babies Too! This program was designed to increase the number of Medicaid medical providers who include oral screenings and fluoride varnish treatments during EPSDT examinations. Registered nurses who have completed certification training administer the screening and fluoride varnish application. This past year, the MDCH provided free fluoride varnish to Medicaid medical providers for patients eligible for this program (October 1, 2012 – September 30, 2013). A maximum of four fluoride varnish applications are allowed for each child during a 12 month period. Medical providers who receive free fluoride varnish from the MDCH are required to collect oral screening data on the children who receive fluoride varnish treatments. This data is utilized for future oral health programs in Michigan by the MDCH. Children younger than three years who are enrolled in the Women, Infant and Children nutrition program (WIC) are also eligible for this program.[20]

Free Clinics of Michigan. These clinics provide a range of medical services to low-income individuals. Free clinics of Michigan are 501(c)(3) tax-exempt organizations. Access to these clinics is restricted to residents who are unin-

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18. Further information about the SEAL! Michigan Program can be found in the "Dental Public Health Activity Descriptive Summary," MDCH, <http://www.michigan.gov/documents/mdch/SEAL_Best_Practice_JM_Short_369419_7.pdf>.
19. For more information about the Varnish! Michigan Program, see http://www.mohc.org/communityprograms.htm.
20. Further information about the Varnish! Michigan-Babies Too! Program can be found at http://www.mohc.org/communityprograms.htm.

sured, underinsured, or have limited access to health care. Although the services provided vary by clinic, there are a number of free clinics across Michigan that offer free dental services.[21]

Michigan Community Dental Clinics. MCDC, Inc. is a not-for-profit management system, working to increase access to dental health care for low-income and uninsured populations. It uses private practice methods such as electronic patient records and compensation that encourages efficiency and productivity in public health dental clinics. The MCDC is modeled after Dental Clinics North, a successful partnership of six local health departments that provided access to dental services to underserved residents in Northern Michigan. The MCDC administers a network of clinics that serves over 90,000 people statewide. Payment is set on a sliding scale based on patient income. When clinics generate revenues that exceed costs, they are placed in a Dental Assistance Fund, which is used to offset the cost of care for patients.[22]

Health Centers. "Health Centers" are non-profit, local clinics located in traditionally underserved areas that provide comprehensive and affordable care. The term "Health Center" is used to describe both Health Center Program grantees and Federally Qualified Health Center Look-Alikes. Health Center Program grantees are organizations that receive grants under Health Center Programs. Health Center Program grantees are also commonly referred to as Federally Qualified Health Centers (FQHCs). A Federally Qualified Health Center Look-Alike is a community-based Health Center that has been certified by the Centers for Medicare and Medicaid Services and meets all Health Center Program requirements. An FQHC Look-Alike distinction makes an organization eligible for fair reimbursement through Medicaid and Medicare, participation in the 340B federal drug pricing program, and assistance in recruiting and retaining health care providers.

There are 39 Health Centers with approximately 170 delivery sites in Michigan, many of which provide dental services. Of these 39 organizations, 35 are Health Center Program grantees, two are FQHC Look-Alikes, and two are both a Health Center Program grantee and an FQHC Look-Alike. While the services provided are not free, the centers are open to all members of the public, regardless of one's ability to pay. Health Centers accept private insurances, Medicare, and Medicaid and offer sliding fee programs based on an individual's ability to pay. Examples of Health Centers in Michigan that provide dental services include:

- Alcona Health Center

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21. Further information about Free Clinics of Michigan can be found at http://www.fcomi.org/clinics-by-services.html.

22. For more information, see midental.org.

- Upper Peninsula Association of Rural Health Services, Inc.
- InterCare Community Health Network
- Cherry Street Health Services
- Family Health Center of Battle Creek
- Oakland Integrated Health Network (FQHC Look-Alike)
- Northwest Michigan Health Services, Inc.[23]

Donated Dental Services. The Michigan Donated Dental Services provides dental care for low-income individuals who require extensive dental work and have no dental insurance. In addition, an individual must be 62 years of age or older, permanently disabled, or mentally ill. Those determined eligible for this program receive free dental treatment. This program is made possible by dentists and dental hygienists who volunteer their time and services. Since the establishment of the program in 1995, the Michigan Donated Dental Services has provided over $13 million worth of services to 5,191 disabled or elderly individuals who had no access to dental health treatment. The Michigan Donated Dental Services' side program, Dental House Calls, provides treatment for disabled individuals who are unable to leave their homes.[24]

School-based Fluoride Mouthrinse Programs. This program is designated for elementary schools where over 50% of the enrolled children live in areas inaccessible to a fluoridated water supply. Students in grades K-6 use the fluoride mouth rinse once weekly. A successful program requires coordination and support from the district superintendent, school board, principals, teachers, and parents.[25]

The School Dentist. This program brings access to affordable oral health care into schools throughout Michigan. Each student who visits the School Dentist receives a dental examination, cleaning, fluoride treatment, sealants, x-rays, and oral health education. The School Dentist accepts private dental insurance plans, Medicaid, MIChild, and Healthy Kids Dental. The School Dentist Smile Foundation helps to provide funding for children unable to pay for services. There is no cost to the school for participating in this program.[26]

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23. Further information about Health Centers in Michigan can be found at http://www.nachc.com/state-healthcare-data.cfm?State=MI and at http://mpca.net/displaycommon.cfm?an=1&subarticlenbr=10.
24. For more information, see http://mihealthinsider.com/content/michigan-donated-dental-services.
25. Further information on School-Based Fluoride Mouthrinse Programs can be found in "Fluoride Mouthrinse Program Manual," MDCH, <http://www.michigan.gov/documents/mdch/Fluoride_Mouthrinse_Manual_172346_7.pdf>.
26. For more information, see http://www.schooldentist.com/default.html.

COMMUNITY DENTAL HEALTH PROGRAMS

Dental School Clinics. Many Michigan dental and dental hygiene schools operate clinics that offer oral health services at a lower cost than private practices. Services at such clinics are provided by dental and dental hygiene students under the supervision of registered dental hygienists and dentists. Costs, payment options, and services provided range by clinic. Due to the teaching nature of the clinics, appointments are longer than in a private practice (2-3 hours). Examples of university and dental school clinics in Michigan include:

- Delta College Dental Hygiene Clinic
- Dental Hygiene Clinic at Ferris State University
- Lansing Community College Dental Hygienist Clinic
- Mott Community College Dental Hygiene Clinic
- University of Detroit Mercy School of Dentistry Student Clinic
- University of Michigan School of Dentistry Student Clinic.

Smiles on Wheels. This non-profit organization provides mobile preventative dental care for adults and children without a dental home. Registered Dental Hygienists travel to 39 schools within Michigan and provide services such as free dental sealants, fluoride varnish treatments, and general oral health education. Additionally, mobile services are available for Head Start programs, WIC, immunization clinics, and health departments. Smiles on Wheels is based in Jackson County and has grown to include schools in the counties of Hillsdale, Branch, Lenawee, and Ingham. During the 2009-2010 fiscal year, this organization provided 3,981 dental sealants to 508 children in 30 different schools. They also administered 538 fluoride varnish treatments and taught 612 children about the importance of proper dental hygiene.

Funding for Smiles on Wheels became available through the MDCH SEAL! Program in 2007. Smiles on Wheels works in conjunction with SEAL! Michigan and the Head Start Fluoride Varnish Program. Smiles on Wheels accepts Medicaid and other types of insurances. The organization also offers reduced fees based on income.[27]

Miles of Smiles. Miles of Smiles is a mobile dental unit, providing dental services to low-income, uninsured, and underinsured individuals in Ottawa County. They provide services at Department of Public Health Clinics, migrant camps, and Head Start Centers. The mobile unit operates with the help of a volunteer network of over 100 dentists, hygienists, and students, and receives support from state grants, local foundations, and donations. The unit is equipped for preventative and restorative oral health services for children as well as adults.[28]

27. For more information, see http://smilesonwheels.org/.
28. Further information on Miles of Smiles can be found at http://www.miottawa.org/Health/OCHD/dental.htm.

Kalamazoo County's Portable Offsite Dental Service. This school-based program brings dental services to children in Kalamazoo County. The program, which was made possible by a partnership between Kalamazoo County's Portable Offsite Dental Service and Kalamazoo Communities In Schools, focuses on outreach to students who have MIChild or Healthy Child insurance. The portable dental clinic offers x-rays, exams, sealants, and cleaning. In the event of cavities or abscesses, students are sent home with a scheduled follow-up appointment at the county dental clinic. This program provided 876 students with a dental examination during the 2008-09 school year.[29]

Calhoun County Community Dental Access Initiative. The Community Dental Access Initiative (CDAI) targets low-income and uninsured residents of Calhoun County. In this unique "pay it forward" program, patients receive oral health care and education in exchange for volunteering at a community non-profit organization. Services provided by the CDAI include oral health education; the provision of toothpaste, toothbrushes, disclosing tablets, and floss; tooth cleaning and screening; dental examination and treatment plan; and care from a dentist to complete individual treatment plans.

Since its establishment in 2007, the CDAI has provided nearly $1,000,000 worth in treatment to county residents. Patient participants in this program have provided over 58,000 volunteer community service hours. The program claims to have already been successful in achieving an 80% reduction of dental pain-related visits to local hospital emergency rooms. The CDAI is made possible by a community partnership of dentist and hygienist volunteers, dental education programs, and health care facilities. Funding is provided by a grant from Bronson Battle Creek, the United Way, and the Battle Creek Community Foundation. The program's success has encouraged the implementation of a similar "pay it forward" dental program in Muskegon County.[30]

Adopt A Child's Smile Program. This non-profit program provides low-income children in Midland County with oral health care. Children must be under the age of 18; ineligible for dental care through insurance or Medicaid; and have been a resident of the county for at least one year prior to treatment. The Adopt A Child's Smile Program (ACSP) is made possible by 51 dentists, orthodontists, and specialists in Midland County who volunteer their time and resources. Since the foundation of the program in October 1988, ACSP has pro-

29. For more information on the Kalamazoo County's Portable Offsite Dental Service, see http://www.mohc.org/communityprograms.htm and in "Dentist in School Keeps Kids Smiling," *Kalamazoo Communities In Schools Newsletter*, February 2009, 2, <http://kcis.us/Portals/0/Feb%2009.pdf>.

30. Further information on the Calhoun County Community Dental Access Initiative can be found at http://www.raconline.org/success/project-examples/730/.

vided $358,000 in basic dental services and has helped 1,081 children in Midland gain access to basic dental care.[31]

Mission of Mercy. This annual event provides low-income individuals with access to a wide range of dental services at no cost to the patient. Mission of Mercy is organized by the Michigan Dental Association and the Michigan Dental Association Foundation. Michigan's first Mission of Mercy was held on June 7-8, 2013 at Saginaw Valley State University's Ryder Center. Over a thousand volunteers, including 350 dentists, 100 hygienists, and 185 dental assistants, contributed to the event's success. Over the two-day period, volunteers treated 1,136 patients, performed 5,493 procedures, and provided over $900,000 in care, an average of $800 per patient seen. Approximately 50% of the procedures performed were extensive treatments, such as oral surgery and restorative care. The Michigan Dental Association and the Michigan Dental Association Foundation are currently organizing the second annual Michigan Mission of Mercy event. The event is scheduled to take place May 29-June 1, 2014 at Ferris State University's Wink Arena. The organizers anticipate treating approximately 1,200 patients at this event.[32]

BARRIERS TO CARE FOR AT-RISK POPULATIONS

In spite of the range and number of programs designed to bring dental care to at-risk populations, there are limitations to this type of uncoordinated oral health care. These limitations can partially attribute to the continued use of hospitals for preventable dental conditions discussed in the previous section. Some communities and counties have many different centers and programs to meet the needs of their at-risk residents; other counties, particularly those in Northern Michigan, lack these types of resources.

Children are better covered by these programs than adults. The Healthy Kids Dental and MIChild programs described on page 14 provide dental insurance for all children whose family income is at or below 200% of the Federal Poverty Level. The percentage of Michigan dentists who accept Healthy Kids insurance is also significantly higher than those who accept Medicaid. With the Medicaid expansion in Michigan, adults at or below 133% of the Federal Poverty Level (about $30,000 annually for a family of four) will qualify for health benefits.[33] The Michigan Legislature voted to restore adult dental benefits to Medicaid in 2010. Still, only one in five dentists in Michigan accepts patients enrolled in

31. For more information, see http://www.safeandsoundcac.org/what-we-do/adopt-a-childs-smile-program/.

32. Additional information on the Mission of Mercy can be found at http://www.smilemichigan.com/foundation/MissionofMercy.aspx.

33. For more information on income requirements for Medicaid in Michigan, see "Facts about Medicaid Expansion," State of Michigan, <http://www.michigan.gov/documents/reinvent/medicaid-factsheet-final-2_410672_7.pdf>.

Medicaid.[34] Furthermore, there are likely many Michigan residents who do not meet the income level requirements for insurance through Medicaid or care through income-based community initiatives, but are still unable to afford purchasing dental care.

There are also barriers to access to oral health care beyond the financial obstacles typically considered. The opportunity cost of obtaining preventative dental care—even at little or no cost—may make "free" care too expensive for some Michigan residents. This cost can be especially high if "free" care is only offered on certain days, as taking time off work may present an additional barrier for potential beneficiaries who have inflexible work schedules. Transportation costs to clinics may be high, particularly for those without an affordable clinic, health center, or community dental initiative in their county. Some non-users who have not yet had dental health problems may simply under-value dental care. Some people who are eligible for these programs may not take advantage of them because they have not yet had dental problems and do not place a high value on dental care.[35]

34. For more information on Dentists that accept Medicaid patients, see *2011 Check-Up on Oral Health: A Michigan County Profile*, Michigan Oral Health Coalition, p. 5, <http://www.mohc.org/files/Policy%20Statements/2011%20Check-Up%20on%20Oral%20Health.pdf>, accessed November 1, 2013.

35. For more information on traditional and nontraditional barriers to dental care, see Albert H. Guay, D.M.D., "Access to dental care: Solving the problem for underserved populations," *Journal of the American Dental Association* Vol. 135, November 2004, <http://www.mohc.org/files/accesstodentalcare.pdf>, accessed November 1, 2013.

Appendix A. Resources

To arrive at our estimate for the treatment cost of preventable dental conditions at hospitals in Michigan, we relied on the following sources. This section contains a brief description of each source, as well as how it was used in our analysis and the corresponding limitations.

Ambulatory Care Sensitive Hospitalizations, Michigan Department of Community Health (MDCH). Each year, the Michigan Department of Community Health, which performs a diverse set of functions including administration of Medicare and regulation of hospitals, publishes a rich set of data on hospitalizations in the State of Michigan. Using Michigan resident inpatient files, collected by the MDCH Division for Vital Records and Health Statistics, the MDCH determines the number of hospitalizations by age, gender, and location for a range of conditions.

For this report, we use their data on hospitalizations for avoidable dental conditions, which correspond to ICD-9-CM codes 521 (diseases of hard tissues of teeth), 522 (diseases of pulp and periapical tissues), 523 (gingival and periodontal disease), 525 (other diseases and conditions of the teeth and supporting structures), and 528 (diseases of the oral soft tissues). MDCH refers to these conditions as avoidable dental conditions.

We included all hospitalizations for these conditions in the year 2011 (the most recent year available) in our estimates for this report. MDCH does not publish the share of these hospitalizations that originated in the emergency room, nor do they publish the number of people attending the emergency room without being admitted to the hospital. Note that it is possible that at least some hospitalizations that fall into this category were not, in fact, avoidable. However, for the purposes of this report, we have assumed that the number of these hospitalizations which were not avoidable is negligible.

Medical Expenditure Panel Survey (MEPS). The Medical Expenditure Panel Survey is an ongoing large-scale survey of families, their medical providers, and their employers in the United States. It is the most complete source of data on the cost and use of health care and health insurance coverage in the U.S. It is administered by the Agency for Healthcare Research and Quality (AHRQ), an agency based in the U.S. Department of Health and Human Services. The output of this survey is a series of data files on medical conditions, employment benefits, long term care, prescribed medicines, dental visits, emergency room visits, and hospital inpatient stays, among others.

For the purposes of this report, we have used information on hospital inpatient stays and emergency room visits. Using the same ICD-9-CM diagnosis codes listed in the above section on the MDCH, we estimated the average payment and charge for an inpatient stay and for an emergency room visit, respectively,

in the years 2008 through 2010 (the most recent year of data available). We also used this data to estimate, for every admission for an avoidable dental condition, how many emergency room visits there were for that same condition.

Note that this is a national survey. It does not provide state-by-state data on hospital charges and payments. Because of this limitation, we assumed that the national average was equivalent to the Michigan average for payments and charges for avoidable dental conditions. Given the variation in hospital charges and payments, this is an imperfect assumption. However, we did find that the treated population in Michigan had similar demographic characteristics and insured status as the national population.

National Hospital Ambulatory Medical Care Survey (NHAMCS). The NHAMCS is a survey administered by the Centers for Disease Control and Prevention on an annual basis. They collect data on the utilization and provision of ambulatory care services in hospital emergency and outpatient departments. Since the scope of data collected by this survey is limited, it did not provide information that directly informed our analysis. We did, however, find that the utilization rates and demographics of the group admitted for avoidable dental conditions in this survey were similar to those from the MEPS and that the variation among large regions (four in the U.S.) was not significant.

Appendix B: About the Authors

ANDERSON ECONOMIC GROUP

Anderson Economic Group, LLC was founded in 1996 and today has offices in East Lansing, Michigan and Chicago, Illinois. AEG is a research and consulting firm that specializes in economics, public policy, financial valuation, and market research. AEG's past clients include:

- *Governments* such as the states of Michigan, North Carolina, and Wisconsin; the cities of Detroit, Cincinnati, Norfolk, and Fort Wayne; counties such as Oakland County, Michigan, and Collier County, Florida; and authorities such as the Detroit-Wayne County Port Authority.
- *Corporations* such as GM, Ford, Delphi, Honda, Taubman Centers, The Detroit Lions, PG&E Generating; SBC, Gambrinus, Labatt USA, and InBev USA; Spartan Stores, Nestle, automobile dealers and dealership groups representing Toyota, Honda, Chrysler, Mercedes-Benz, and other brands.
- *Nonprofit organizations* such as Michigan State University, Wayne State University, University of Michigan, Van Andel Institute, the Michigan Manufacturers Association, United Ways of Michigan, Service Employees International Union, Automation Alley, the Michigan Chamber of Commerce, and Business Leaders for Michigan.

Please visit www.AndersonEconomicGroup.com for more information.

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Mr. Rosaen's recent work includes several economic and fiscal impact analyses, including of proposed real estate developments, power plants, and infrastructure projects; analysis of tax incentives; an analysis of the impact of federal tax incentives on the freight rail industry; and an analysis of the economic contribution that research universities make in the State of Michigan.

Prior to joining Anderson Economic Group, Mr. Rosaen worked for the Office of Retirement Services (part of the Michigan Department of Management and Budget) for the Benefit Plan Design group. He has also worked as a mechanical engineer for Williams International in Walled Lake, Michigan.

Mr. Rosaen holds a Masters in Public Policy from the Gerald R. Ford School of Public Policy at the University of Michigan. He also has a Masters of Science and a Bachelors of Science in mechanical engineering from the University of Michigan.

Jason Horwitz. Mr. Horwitz is a Consultant at Anderson Economic Group, working in the Public Policy and Economic Analysis practice area. Mr. Horwitz'

work includes research and analyses for a range of AEG clients representing both the public and private sectors.

Mr. Horwitz's recent work includes an assessment of the effects of personal property tax reform in Michigan, an assessment of the effects of proposed reforms to state pension and retiree health care systems, analyses of the fiscal condition and tax policies of Michigan's state and local governments, and a review of tax incentive programs administered by the states of Michigan and Kentucky, respectively.

Prior to joining AEG, Mr. Horwitz was the Coordinator of Distribution for the Community Center of St. Bernard near New Orleans, where he oversaw the distribution of donated food, clothes, and household supplies to low-income residents of St. Bernard Parish and New Orleans' Lower Ninth Ward.

Mr. Horwitz holds a Master of Public Policy from the Harris School of Public Policy at the University of Chicago and a Bachelor of Arts in Physics and Philosophy from Swarthmore College.

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Prior to joining Anderson Economic Group, Ms. Perry conducted research in Freiburg, Germany on a Fulbright scholarship. Her project examined the successes and shortcomings of the post-World War II trials that extended attempts of achieving justice beyond what was accomplished at Nuremberg. Ms. Perry also served as an intern for U.S. Senator Carl Levin.

Ms. Perry is a graduate of Michigan State University, James Madison College. She holds a Bachelor of Arts in international relations and German.