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## Acknowledgments

CDC Division of Oral Health  
Violanda Grigorescu, MD, MPH  
Orlene Christie, B.A.  
Sheila Vandenbush, RDH, Ph.D  
Lynda Horsley, B.A.
RATIONALE

Why does Michigan need an Oral Health Surveillance System?

Oral health plays a significant role in all health and well-being throughout the lifespan. Oral disease can result in significant physical and social damage. Dental caries is the most common chronic disease in children, 5 times more common than asthma\(^1\). Nationally, 51 million school hours\(^2\) and 164 million work hours are lost due to oral disease\(^1\). Dental disease has been associated with such chronic diseases as diabetes, stroke and heart disease and recent reports correlate increased risk for poor birth and pregnancy outcomes such as preterm, low birth weight and gestational diabetes. Further, many adults lose their dental coverage following retirement, increasing their vulnerability to oral disease and these associated conditions. As with other body systems, malignancies of the oral cavity are highly fatal when detected late.

While there are clinic-based measurements of some oral diseases in Michigan as well as population-based surveys of adults and children, there are deficiencies in oral health information on special populations (e.g. special needs children, pregnant women, and the elderly). The Michigan Department of Community Health (MDCH), in concert with oral health professionals around the state, has taken the lead in developing the needed oral health surveillance system. Because oral disease arises throughout the entire lifespan, the surveillance will address age-specific oral health concerns. Further, surveillance will establish statewide baseline oral health information.

What information can the oral health surveillance system provide?

The creation of the Michigan oral health surveillance system fulfilled the Healthy People 2010 objectives 21-16 which calls for every state to have an oral and craniofacial health surveillance system. The oral health surveillance has enabled measurements of several health outcomes described in Michigan’s Oral Health Surveillance Logic Model (See Appendix B), the National Oral Health Surveillance System (NOHSS), and Health People 2010 (HP2010) oral health objectives. These include:

1. Reduction in dental caries prevalence among children,
2. Reduction in untreated dental decay prevalence among children,
3. Increased access to fluoridated water,
4. Increased use of dental sealants,
5. Adult and child dental visits for both treatment and preventive care, and
6. Increased early detection of oral cancer.

Data, compiled and maintained by the state, will be shared with stakeholders to enable evidence-based practice and implementation of Michigan’s State Oral Health Plan. This statewide data system will monitor oral health indicators and evaluate the impact of prevention initiatives. Ultimately, the system may provide opportunities to link with other data systems and yield additional oral health outcomes.

STAKEHOLDERS

The information from surveillance will aid the development and implementation of new programs as well as the evaluation and improvement of existing oral health programs. Establishing baseline information is vital to the implementation and evaluation of oral health programs. All individuals are stakeholders in the need for their dental needs to be met while providers benefit in identifying better methods to meet the needs of the population. Benefits from the individuals extend to the businesses that employ them. Healthy workers will
spend more time at work and less time treating illnesses and in turn be more productive. Healthy children will be able to perform their potential in schools, thus improving the functionality of the education system in Michigan. Specifically, MDCH, the Medicaid program, and their service populations will benefit through improved identification and targeting of vulnerable populations. Targeted programs and improved dental care for children, through improved learning, can benefit the Department of Education and Head Start program. Additionally, residents who maintain good oral health behaviors may reduce the burden on dental insurance companies thus enabling expansion of affordable dental insurance. Overall, there are many stakeholders that can benefit from a quality oral health infrastructure that includes surveillance.

PURPOSE AND GOALS

The purpose of the oral health surveillance system is to provide a consistent source of updated reliable and valid information for use in developing, implementing, and evaluating programs to improve the oral health of Michigan citizens. The goals of the oral health surveillance system will be to:

1. Estimate the magnitude of oral disease in Michigan,
2. Monitor trends in oral health indicators,
3. Evaluate the effectiveness of implemented programs and policy changes,
4. Identify vulnerable population groups, and
5. Provide information for decision-making when allocating resources.

SURVEILLANCE TIMELINE

Year 1 (2009-2010)

Process objectives
1. Establish questions for the Michigan BRFSS on oral health objectives for 2010
2. Plan implementation of a BSS for 3rd grade students for September 2009
4. Update the State Oral Health Plan (SOHP)

Outcomes objectives
1. Disseminate the updated SOHP
2. Disseminate results from the vulnerable elderly patients survey

Years 2-5 (2010-2013)

Process objectives
1. Analyze oral health objectives from Michigan BRFSS
2. Enlist the assistance of dental insurers to provide service-utilization information
3. Develop and implement a dental licensing survey based on other primary care licensing surveys conducted by the state.
4. Coordinate with Michigan cancer registries to regularly update oral cancer data.
5. Design an evaluation system and evaluation implementation plan for the surveillance system
6. Identify gaps in the new Healthy People 2020 objectives for the existing data resources, and determine methods to overcome those gaps

Outcomes objectives
1. Disseminate results from the BSS for 3rd grade students
2. Disseminate results from BSS for elderly patients
3. Report all NOHSS indicators to CDC
4. Obtain child utilization of dental services
5. Assess oral cancer incidence and prevalence.

Long term

Process objectives
1. Assist Department of Environmental Quality (DEQ) in developing and maintaining monthly WFRS reporting.
2. Analyze the results of the Sealant Efficiency Assessment for Locals and States (SEALS) data system provided by Centers for Disease Control (CDC).
3. BSS Implementation among 3rd grade students repeated every 5 years.
4. BSS Implementation among elderly patients repeated every 5 years.
5. Dental licensing survey for dentists and hygienists.
6. Regular reporting from cancer registry.
7. Regular reporting from dental insurers on utilization.
8. Routine evaluation of the surveillance system.

Outcomes objectives
1. Report fluoridation levels monthly to WFRS.
2. Report sealant cost effectiveness to CDC and disseminate annual results to key stakeholders throughout the state.
3. Report BRFSS, BSS, WFRS results annually to NOHSS.
4. Presentations on oral health surveillance data at state and local conferences.
5. Annually published reports on oral health surveillance.

Table 1: Years in which oral health data sources are expected to provide data

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<th>Data Source/Year</th>
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ANALYSIS AND DISSEMINATION

How will the oral health surveillance system integrate with pre-existing oral health information sources?

The oral health information provided by this system will be incorporated into the NOHSS, a system devised in partnership between the Centers for Disease Control and Prevention (CDC) and the Association of State and Territorial Dental Directors (ASTDD). Michigan data will be annually updated and reported to the NOHSS for national and state comparison. Community water fluoridation is presently integrated with the CDC-managed Water Fluoridation Reporting System (WFRS) and coordinated with the NOHSS. The Behavioral Risk Factor Surveillance System (BRFSS), a population-based survey that provides information on adult dental visits and missing teeth, is also managed by the CDC and coordinated with the NOHSS. Michigan information from WFRS and BRFSS is currently available through the NOHSS. Existing provider and oral health...
infrastructure information is communicated to the ASTDD for inclusion into state profiles described within the NOHSS.

**How will the data be collected and analyzed?**

In the effort to measure the HP2010 oral health objectives, and not simply the NOHSS indicators, the following coordinator of data systems will be used:

1. The Basic Screening Survey (BSS) of 3rd grade students will establish information on caries experience, untreated decay, and the presence of sealants.
2. The BSS of elderly patients will establish information on tooth loss, edentulous, periodontal disease, and the presence of dentures.
3. Medicaid and private carriers will provide child dental visit information.
4. The BRFSS will monitor adult dental visits and missing teeth, and it will also address associations between oral health and chronic conditions.
5. The WFRS will provide community water supply fluoridation information
6. The SEALS data will provide the cost effectiveness of sealants
8. The Bureau of Health Professions and Medicaid will contribute workforce information

The state oral health epidemiologist will organize the data collection, coordination, and analysis of these different systems. Surveillance data will be kept with and maintained by the state oral health epidemiologist at MDCH. Case definitions for these indicators are located in Appendix A.

**How will data be disseminated?**

Surveillance results will be disseminated to interested programs and policy-makers through presentations and annually published reports. Theses reports will contain current oral health data and any mobile trends. Results will also aid in updating Michigan’s oral health disease burden document. Venues for oral dissemination of surveillance results include the State Oral Health Conference and State Information Integration Conference.

**RESOURCE REQUIREMENTS**

Michigan’s oral health surveillance system will require multiple resources, both direct and indirect. Available financial resources provide by the CDC will fund population-based infrastructure strategies needed to fill identified gaps in oral health knowledge. These strategies include the addition of oral health questions to existing population-based surveys such as the Pregnancy Risk-Assessment Monitoring System (PRAMS) and the Youth Tobacco Survey (YTS). The majority of direct financial resources required by surveillance will result from the statewide Basic Screening Surveys which require extensive material costs in the form of letters, data forms, and dental supplies. The development and implementation of a dental licensing survey will also require financial and material resources. Personnel resources, preferably volunteer dentists and dental hygienists, are also required for the Basic Screening Surveys. The state oral health epidemiologist will require resources to coordinate the oral health data resources and for their dissemination. Any additional funds required by this system will be sought through supplemental grants and request for reallocation of state funds.

**EVALUATION**

**Public Health Importance**

Nearly every individual will need oral health services at some point in their lifetime. Most oral disease is preventable, and virtually every instance of severe oral disease is preventable. Sealants can prevent caries in at-
risk individuals. Preventive behaviors such as brushing and flossing, coupled with regular dental visits can reduce caries and untreated decay. Routine preventive behaviors slow the progression toward gingivitis and periodontal disease. Tobacco and alcohol prevention would help reduce incidence of oral cancer. But despite the preventability of oral disease, there still exists a substantial portion of the population who remain vulnerable. The system must not only address monitoring of disease and identifying populations in need, but also should have the capability to monitor preventive behavior.

Evaluation is important in that it promotes the best use of limited public health resources. Evaluation helps identify indicators that may no longer be of public health importance but may also identify much needed new indicators. Evaluation improves efficiency, helps eliminate duplication of data collection, and identify whether surveillance is meeting its objectives and the needs of public health programs. Continued evaluation will enhance surveillance activities not just for the data itself but for all the stakeholders who benefit from the surveillance system.

**System operation**

*Process:* Assess the coordination process of information resources. Assess Health Insurance Portability and Accountability Act (HIPAA) compliance of the system. Examine institutional review board (IRB) concerns about the system.

*Outcome:* Assess the quality of information provided by the system. Assess the quality of information provided through dissemination. Examine how accurately the system addresses the NOHSS indicators and HP2010 and HP2020 oral health objectives.

**Simplicity/Feasibility**

*Process:* Examine the coordination of information sources contributing to the surveillance system, and the ease in operating, analyzing, and interpreting those sources. Assess technology and skill requirements in acquiring, entering, and transmitting data.

*Outcome:* Analyze resource costs in management of the surveillance system.

**Flexibility**

*Process:* Examine the impact of system adaptation and modification on resources, ease of use, stakeholder buy-in, etc. Assess flexibility by anticipating how the system can be adapted to achieve its objectives.

*Outcome:* Identify oral health indicators that can be added to surveillance. Assess the ability to measure and interpret differing case definitions.

**Acceptability**

*Process:* Survey schools about the time and resource effectiveness of in-school screenings. Assess screener perceptions about school screenings.

*Outcome:* Identify the use of surveillance data in programming. Assess stakeholder perception of data value. Identify survey questions used for policy and programming.

**Sensitivity**

*Process:* Assess screening response rates and characteristics of non-respondents and screening refusals.
Outcome: Examine how accurately case definitions identify disease. Examine how effectively and accurately the system identifies vulnerable populations. Validate system results to external measures.

Timeliness

Process: Examine regularity and consistency of surveillance information dissemination.

Outcome: Evaluate the impact time lag differences of data systems have on the value of the information

Cost

Process: Assess resource efficiency in acquiring surveillance data. Examine staff time to run the surveillance system

Outcome: Determine cost-effectiveness of information output by the system.
References


4 CDC Water Fluoridation Reporting System. July 1st, 2009


6 Synopses of State and Territorial Dental Public Health Programs. ASTDD State Synopsis Questionnaire, 2009. The Synopsis is a product of a cooperative agreement between the Centers for Disease Control and Prevention (CDC) and the Association of State and Territorial Dental Directors (ASTDD).
Appendix A: Case Definitions

For consistency and comparison, we have adopted these case definitions established in the BRFSS, WFRS, HP2010, and other sources where appropriate:

**Caries Experience** (Source: HP2010, Objective 21-1)
A clinical diagnosis of dental caries, presence of fillings in at least one primary or permanent tooth, or evidence of a missing tooth due to caries.

**Untreated Decay** (Source: HP2010, Objective 21-2)
A clinical diagnosis of dental decay in at least one tooth that has not been restored.

**Presence of Dental Sealants** (Source: HP2010, Objective 21-8)
A clinical confirmation of dental sealants applied to one or more permanent molars.

**Missing Teeth** (Source: BRFSS, 2004 Questionnaire 11-2)
Permanent teeth that have been removed or lost because of tooth decay or gum disease, but not due to other reasons, such as injury or orthodontics.

**Preventive Visit** (Source: BRFSS, 2004 Questionnaire 11-3)
Adult preventive visits will be determined by whether the person’s teeth were cleaned by a dentist or dental hygienist. Child preventive visits will be determined by whether the services received were classified as preventive by the type of procedure performed.

**Dental Visit** (Source: BRFSS, 2004 Questionnaire 11-1)
Visited a dentist or a dental clinic for any reason.

**Water Fluoridation** (Source: WFRS)
An adequately fluoridated community water supply is defined as having a level of fluoridation of 0.7 to 1.0 ppm. This can be naturally or artificially supplied.

**Oropharyngeal Cancer** (Source: Silverman 1998)
Cancers of the oral cavity and pharynx include cancers of the lip, tongue, floor of mouth, gingival, soft and hard palate, salivary gland, tonsil, nasopharynx, hypopharynx, oropharynx, and pharynx.

**Periodontal Disease** (Source: HP2010, Objective 21-5)
The presence of one or more sites with 4mm or greater loss of tooth attachment to surrounding periodontal tissues.

**Critical Access Provider** (Source: ASTDD 2004 State Synopsis Questionnaire)
A dental provider who has received Medicaid paid claims for dental services equaling or in excess of $10,000 over the course of one year.
Appendix B: Survey Questions

PRAMS:

1. This question is about the care of your teeth during your most recent pregnancy. For each item, circle Y (Yes) if it is true or circle N (No) if it is not true.
   a. I needed to see a dentist for a problem. N Y
   b. I went to a dentist or dental clinic. N Y
   c. A dental or other health care worker talked with me about how to care for my teeth and gums. N Y

2. Have you ever had your teeth cleaned by a dentist or dental hygienist?
   No (Go to question ##) Yes

3. When did you have your teeth cleaned by a dentist or dental hygienist? For each of the three time periods, circle Y (Yes) if you had your teeth cleaned or circle N (No) if you did not have your teeth cleaned then.
   a. Before my most recent pregnancy. N Y
   b. During my most recent pregnancy. N Y
   c. After my most recent pregnancy. N Y

YOUTH TOBACCO SURVEY:

1. How long has it been since you last visited a dentist or dental clinic (including an orthodontist)?
   a. Within the last year (12 months ago or less)
   b. Within the past two years (more than 1 year but less than 2 years ago)
   c. Within the past five years (more than 2 years ago but less than 5 years ago)
   d. 5 or more years ago
   e. Never
   f. Don’t know/not sure

2. Do you believe that you have dental cavities or “holes” in any of your teeth now?
   a. Yes
   b. No
   c. Don’t know/not sure

3. Do you have any sealants (plastic coatings to prevent cavities) on your back teeth (molars)?
   a. Yes
   b. No
   c. Don’t know/not sure

4. Did you have a toothache during the past 6 months that was bad enough to do any of the following things? (You can choose one answer or more than one)
   a. I did not have a bad toothache during the past 6 months
   b. Bad enough to change what you ate or drank
   c. Bad enough to keep you from sleeping
   d. Bad enough to make you go to the dentist
   e. Bad enough to make you miss school
Appendix C: Michigan Oral Health Surveillance Logic Model

**Personnel Involved**

**Staff:**
- 0.5FTE Oral Health Epidemiologist
- Data management & collection staff
- Information Technology support
- Oral health program & policy leaders

**Partners:**
- Local Health Depts & FQHCs
- DEQ Water Engineers
- Medicaid, Delta Dental, BCBS Staff
- School Based Health Centers
- Michigan Primary Care Association
- Community and Home-based Waiver Staff
- Oral Health Coalition

**Data Sources**

**National:** BRFSS, EPA, YRBS, PRAMS

**State:** Medicaid, HKD, LTC, DEQ, Validation Survey, Delta Dental, Cancer Registry, Bureau of Health Professions

**Local:** MOD, Needs Assessments

**Activities**

**Assess:**
- Update surveillance plan
- Update a flow chart of data systems
- Update oral health surveillance objectives
- Collect data from existing sources
- Identify data gaps
- Coordinate information from all available data resources
- Standardize data sources to collect information that allows comparison
- Obtain IRB approval
- Write surveillance reports on a regular basis

**Develop Policy:**
- Develop methods to assess data accuracy
- Develop measurement methods to fill in data gaps
- Develop methods to simplify data collection
- Develop strategies to sustain the surveillance system
- Develop methods of evaluating surveillance

**Assure:**
- Disseminate surveillance findings
- Ensure confidentiality and security of data
- Evaluate the surveillance system
- Ensure accuracy of data and its interpretation
- Incorporate user feedback into future surveillance strategies

**Intermediate Outcomes**

- Ongoing monitoring of trends in oral health indicators
- Increase evidence-based prevention interventions
- Increase programs available for those most in need
- Increase awareness of oral health resources by providers, policy makers, and clients
- Increase both community-based and population-based oral health programs
- Increase planning and evaluation of new prevention strategies

**Distal Outcomes**

- Reduced prevalence of caries and untreated decay
- Improved early detection of oral cancer
- Improved oral health prevention & education awareness
- Reduced prevalence of periodontal disease
- Improved quality of life

**Other**

- Computer Hardware & Software
- Funding-Budgets, Contracts, CDC
### Appendix D: Oral Health Surveillance Data System Flowchart

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<thead>
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<th>Data Resources</th>
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<th>NOHSS Indicators</th>
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