

A Best Practice Approach Report describes a public health strategy, assesses the strength of evidence on the effectiveness of the strategy, and uses practice examples to illustrate successful/innovative implementation.

Report last updated: May 17, 2011

Best Practice Approach State-based Oral Health Surveillance System

- I. Description (page 1)
- II. Guidelines and Recommendations (page 12)
- III. Research Evidence (page 12)
- IV. Best Practice Criteria (page 13)
- V. State Practice Examples (page 14)
- VI. Acknowledgements (page 18)
- VII. Attachments (page 19)
- VIII. References (page 26)

Summary of Evidence Supporting a State-based Oral Health Surveillance System

Research	+
Expert Opinion	+++
Field Lessons	++
Theoretical Rationale	+++

See **Attachment A** for details.

I. Description

A. Definition of a Surveillance System

For public health, **surveillance** is the ongoing systematic collection, analysis and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practice. A **surveillance system** provides the functional capacity for data collection and analysis as well as the timely dissemination of information derived from these data to persons who can undertake effective prevention and control activities (1).

In performing the public health core function of assessment, state oral health programs often engage in **surveys**, **needs assessment** and **surveillance** efforts. Although they may be related, these data-related activities are distinct. Surveys assess samples of a defined population (e.g., children, adults and special needs individuals) through clinical measures or the use of a questionnaire (2). A survey can provide a snapshot estimate of a defined population at a point in time. Needs assessment is a process that seeks to identify: a) the extent and types of existing and potential problems in a community, b) the current system of services available, and c) the extent of unmet needs, underutilized resources or shortcomings of the service delivery system (3). The three practices come together when point-in-time surveys are repeated and aggregated with other data sources into a surveillance system and when that surveillance system and/or individual surveys are used in a needs assessment.

B. Public Health Surveillance Systems

Surveillance systems provide information necessary for public health decision making (4). A comprehensive **public health surveillance system** routinely collects data on health outcomes, risk factors and intervention strategies for the whole population or representative samples of the population (5). Such a system can be based on linkage of existing databases and collection of additional information to address data gaps. Surveillance systems are not just data collection systems, but involve at least a timely communication of findings to responsible parties and to the public and the use of data to initiate and evaluate public health measures to prevent and control diseases and conditions (4-8).

Data from a public health surveillance system can be used to (9):

- Guide immediate action of public health importance.
- Measure the burden of a disease (or other health-related event), including changes in related factors, populations at high risk, and new or emerging health concerns.
- Monitor trends in the burden of disease (or other health-related event).
- Guide the planning, implementation and evaluation of programs.
- Develop and evaluate public policy.
- Detect changes in health practices and evaluate the effects of these changes.
- Prioritize the allocation of health resources.
- Describe the clinical course of disease.
- Provide a basis for epidemiological research.

A public health surveillance system should effectively disseminate health data so that decision makers at all levels can readily understand the implications of the information. The audiences for these data can include public health practitioners, health care providers, members of affected communities, professional and voluntary organizations, policymakers, the press, and the general public (9). Options for disseminating data and/or information from the system include electronic data interchange; public-use data files; the Internet; press releases; newsletters; bulletins; annual and other types of reports; publication in scientific, peer-reviewed journals; and poster and oral presentations at community and professional meetings (9).

Desirable attributes of public health surveillance systems are (9):

- **Simplicity:** The system is as simple as possible (for structure and ease of operation) while still meeting its objectives.
- **Flexibility:** The system has the ability to adapt to changing information needs or operating conditions with little additional time, personnel or funding. Use of standard data formats that are readily integrated with other systems make a surveillance system flexible.
- **Data Quality:** Data used by the system are complete and valid.
- **Acceptability:** Persons and organizations are willing to participate in the system.
- **Representativeness:** The system accurately describes the occurrence of a health-related event over time and its distribution in the population by place and person.
- **Timeliness:** Information is available quickly.
- **Stability:** The system operates without failure and is available when needed.
- **Sensitivity:** The system identifies a very high proportion of cases (persons with a disease or other health-related event) and has the ability to detect outbreaks and monitor changes in the number of cases over time.
- **Predictive Value Positive (PVP):** The system has a high PVP, the proportion of reported cases that actually have the disease or health-related event under surveillance.

Public health surveillance systems vary in methods, scope, purpose, and objectives; therefore, some attributes that are important to one system might be less important to another. An oral health surveillance system should emphasize those attributes that are most important for the objectives of the system (9).

C. National Oral Health Surveillance System

The **National Oral Health Surveillance System** (NOHSS), developed through a joint effort between the Association of State and Territorial Dental Directors (ASTDD) and the Centers for Disease Control and Prevention (CDC), is designed to help public health programs monitor the burden of oral disease, the use of the oral health care delivery system, and the status of community water fluoridation on a state and national level (10). NOHSS includes eight basic oral health surveillance indicators reported at the state level: dental visits, teeth cleaning, complete tooth loss, fluoridation status, caries (tooth decay) experience, untreated caries, dental sealants and oral/pharyngeal cancer. This minimal set of indicators will be expanded in the future, depending on data sources and surveillance capacity available to most states. Communication of NOHSS information is accomplished through the Internet and the preparation of fact sheets and other materials. Access the NOHSS website at <http://www.cdc.gov/nohss/>.

Data sources for NOHSS include the following state and national surveys and surveillance systems:

Behavioral Risk Factor Surveillance System (BRFSS)

<http://www.cdc.gov/brfss/>

The BRFSS is a state-based, ongoing data collection program designed to measure behavioral risk factors in the adult, non-institutionalized population 18 years of age or older. Oral health questions were fielded in all states in 1999, 2002 and 2004.

Pregnancy Risk Assessment Monitoring System (PRAMS)

<http://www.cdc.gov/prams/>

The PRAMS collects state-specific, population-based data on maternal attitudes and experiences prior to, during, and immediately following pregnancy. The PRAMS sample of women who have had a recent live birth is drawn from the state's birth certificate file.

Youth Risk Behavior Surveillance System (YRBSS)

<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>

The YRBSS is a school-based survey conducted biennially to assess the prevalence of health risk behaviors among high school students. YRBSS includes national, state, territorial and local school-based surveys of high school students.

Basic Screening Survey (BSS)

<http://www.astdd.org/basic-screening-survey-tool/>

The BSS is a standardized set of surveys designed to collect: a) information on the observed oral health of participants, b) self-reported or observed information on age, gender, race and Hispanic ethnicity, and c) self-reported information on access to care for preschool, school-age and adult populations. The surveys are cross-sectional and descriptive. Observations of oral health status are made by dentists, dental hygienists or other appropriate health care workers in accordance with state law.

Water Fluoridation Reporting System (WFRS)

<https://apps.nccd.cdc.gov/WFRS/default.asp>

WFRS is a management and tracking tool that helps states to manage the quality of their water fluoridation programs. WFRS information is the basis for national reports that describe the percentage of the U.S. population on public water systems who receive optimally fluoridated drinking water. The system was developed by CDC in partnership with ASTDD.

Synopses of State and Territorial Dental Public Health Programs (State Synopses)

<http://apps.nccd.cdc.gov/synopses/>

The State Synopses collect oral health program information provided to ASTDD annually by each state's dental director or oral health program manager. ASTDD, in conjunction with CDC's Division of Oral Health, presents that information with data from standard sources (U.S. Census, Department of Education, Bureau of Labor Statistics, etc.) on the State Synopses website. Each state has its own synopsis information on demographics, as well as oral health infrastructure, program administration, and oral health program activities.

State Cancer Registries

<http://www.cdc.gov/cancer/npcr/>

State cancer registries collect data about the occurrence of cancer (incidence), the types of cancer that occur, the cancer's location in the body, the extent of disease at the time of diagnosis (Stage), and the kinds of treatment patients receive. Data collected by state cancer registries enable public health professionals to understand and address the cancer burden more effectively. CDC provides support for states to maintain registries that provide high-quality data through the National Program of Cancer Registries (NPCR).

National Surveys

National surveys collecting oral health data include the National Health and Nutrition Examination Survey [NHANES] (<http://www.cdc.gov/nchs/nhanes.htm>) and National Health Interview Survey [NHIS] (<http://www.cdc.gov/nchs/nhis.htm>). NHANES I (1971-1975), NHANES II (1976-1980), NHANES III (1988-1994), and NHANES IV (ongoing since 1999) provide snapshots of health and nutritional status of the U.S. population with data collected through physical examinations, clinical and laboratory tests, and personal interviews. NHIS (ongoing since 1957) is a cross-sectional household interview survey on the health of the civilian non-institutionalized population of the U.S.

Additional information on each NOHC data source is available at <http://www.cdc.gov/nohss/DSMain.htm>.

D. Building a State Oral Health Surveillance System

In 1999, an ASTDD survey found that only eight (19%) of 43 responding states reported having “a state-based oral health surveillance system” (11). That number might have been even lower if the survey had further defined the required attributes of a surveillance system. In 2010, ASTDD Members Surveys and State Synopses showed that 40 states have a state oral health surveillance system.

Currently, all state programs can initiate oral health surveillance activities using existing data. For example, the BRFSS has oral health data available for all states in 1999, 2002, 2004, 2006 and 2008. Leadership, analytic capacity, infrastructure, and partnerships are needed to enhance program efforts to fully utilize data collected and to develop a comprehensive surveillance system.

The NOHSS can serve as a model for building state-based oral health surveillance systems. A state system would build upon the NOHSS indicators and with increased capacity, the system could collect additional state- or community-level data on an ongoing basis. Time intervals for collection of specific oral health indicators are based on several factors, including cost in dollars and other programmatic resources. Data collection intervals can range from annually to every 5 years.

Since “open mouth” screening surveys are resource intensive, states can seek less expensive data sources by acquiring data relevant to oral health from existing systems where data are already being collected and analyzed by the health department and partnering organizations. These would include data from the BRFSS, state cancer registries (oral and pharyngeal cancer deaths), state Medicaid agencies (percent of Medicaid enrolled populations with past year dental visit) and state water programs (fluoridation). Oral health questions can be added to other ongoing community or statewide surveys, such as the YRBS and PRAMS. When there is no other way to collect needed estimates (e.g., caries prevalence), the program can collect primary data through more expensive “open mouth” surveys among defined samples of populations (e.g., school age children, Head Start children and senior adults).

An oral health surveillance system for a state should:

- Have a clear purpose and set of objectives. The purpose of the system indicates why the system exists, whereas its objectives relate to how the data are used for public health action.
- Contain a core set of measures/indicators that describe the status of important oral conditions or behaviors to serve as benchmarks for assessing progress in achieving good oral health (5).
- Analyze trends when several years of data are available.
- Communicate to decision makers and to the public the surveillance data and information in a timely manner and the communication should enable decision makers at all levels to readily understand the implications of the information.
- Strive to put the surveillance data to action to improve oral health of residents in the state.

A state’s capacity to build and maintain a state-level oral health surveillance system can be enhanced if the state program has secured an epidemiologist or other data analyst (.25 FTE or more). Such support can be contracted or hired by pooling resources with other programs or secured through partnership with academic institutions and other entities. An epidemiologist’s duties would include:

- Routinely analyze state and other available data for program decision making.
- Use BSS data collected according to the standard protocol and disseminate findings to key state audiences.
- Collaborate with other epidemiologists in the health department to answer key questions of mutual interest (e.g., diabetes, tobacco, cancer, and maternal child health).

CDC, Division of Oral Health has developed a logic model for oral health surveillance as a resource tool. The model is provided on the CDC website at http://www.cdc.gov/ORALHEALTH/state_programs/infrastructure/activity2.htm. (See **Attachment B.**)

Developing an **oral health surveillance plan** will provide a written road map for establishing and maintaining a surveillance system (12). In developing the plan, think how best to effectively

and efficiently build a simple, effective, flexible, and sustainable surveillance system. An oral health surveillance plan may have these components:

1. Introduction/background (include a summary of previous data-collection experience in the state).
2. The goals and objectives of the surveillance system (address data collection/analysis, dissemination of surveillance information, and use of surveillance data for programmatic decision-making and public health actions).
3. Identification of the conditions (oral health indicators) to be included in the surveillance system (consider the primary/secondary data sources and data for age-groups and prioritize the list of indicators).
4. Identification of stakeholders who can contribute surveillance data, support the surveillance system, and benefit from surveillance information.
5. Resources needed to design, develop, implement and evaluate the surveillance system (e.g., human resources for planning/data collection/analysis/interpretation and infrastructure in collecting/managing/reporting the surveillance data).
6. Other surveillance system information:
 - Case definitions of indicators
 - Target populations for the surveillance (representation of populations and age-groups)
 - Key data sources
 - Data collection timeline
 - Data collection protocol
 - Data management
 - Data analysis
 - Data gaps and additional data collection efforts needed
 - Data dissemination (timing and reporting of surveillance findings)
 - Privacy, data confidentiality and data release policy
 - Personnel
 - Budget
 - Evaluation plan for the surveillance system

E. Collecting Surveillance Data

The following action steps will help guide the data collection needs in developing a surveillance system:

- Conduct an inventory of existing oral health data sources.
- Review oral health indicators used to report the oral health status and risk factors for the U.S. population (e.g., NOHSS, NHANES, BRFSS, YRBSS, Cancer Registry, etc.).
- Integrate the nine databases listed for the HP 2020 oral health objective OH-15 to increase the number of States and District of Columbia that have an oral and craniofacial health surveillance system. (The HP 2010 tracking document stated that at least six of the nine databases should be used to develop an oral health surveillance system.)
- Select a set of oral health measures or indicators (use an advisory committee or a coalition to provide broad-based input).

- Identify data gaps where data is not available or have not been analyzed for the selected indicators.
- Prioritize indicators that need data collection and analysis.
- Establish the relationship and agreement with data partners to share secondary data and/or collaborate on collecting primary data to fill data gaps.
- Develop a data management system to organize the surveillance data. (In general, a central database will be difficult and expensive to develop when data sources are provided by several partners and their data systems varied.)

Partners are critical for data collection. Collaborations observed among the states include combining efforts to collect data for oral health and data for childhood obesity, asthma and nutrition. For example, oral health screening is conducted with height and weight measurements and oral health questionnaires include questions on soda and milk consumption. Other partnerships observed include working with Head Start, Indian Health Service (IHS), dental schools, and dental and dental hygienists associations to collect oral health data.

National databases can provide information on oral health measures. Selecting some of these national measures for the state oral health surveillance system has the advantage of providing some level of comparison of the state data to national data. The **NDICR/CDC Dental, Oral and Craniofacial Data Resource Center** (<http://drc.hhs.gov/>), co-sponsored by the National Institute of Dental and Craniofacial Research (NIDCR) and CDC, Division of Oral Health, has made the data from NHANES and the NHIS accessible on the web (displaying summary tables and allowing data queries). Another example of a national database is the **National Survey of Children with Special Health Care Needs** (<http://www.cdc.gov/nchs/slait/cshcn.htm>). This database provides national and state data (“Health Care Needs and Access to Care” available at <http://mchb.hrsa.gov/chscn/pages/needs.htm> and “State Data Pages” available at <http://mchb.hrsa.gov/chscn/pages/state.htm>). The survey assesses the prevalence and impact of special health care needs among children in all 50 States and the District of Columbia including the extent to which children with special health care needs (CSHCN) have medical homes, adequate health insurance, and access to needed services.

Collecting surveillance data needs to address the issue of privacy. The Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule provides the first national standards for protecting the privacy of health information and identifies who has access to what health care data, clarifies patients’ rights of control over their health care data, offers definitions of inappropriate access and use, and determines accountability for protecting patient privacy. The Privacy Rule permits covered entities (e.g., health care provider) to disclose protected health information (certain individually identifiable health data such as name and date of birth), without authorization, to public health authorities who are legally authorized to receive such reports for the purpose of preventing or controlling disease, injury, or disability. This would include, for example, the reporting of a disease or injury; reporting vital events, such as births or deaths; and conducting public health surveillance, investigations, or interventions. The Office of Civil Rights Guidance Explaining Significant Aspect of the Privacy Rule, published December 4, 2002, is available at <http://www.hhs.gov/ocr/privacy/hipaa/understanding/summary/index.html> and has a section addressing disclosure for public health activities. In addition, HIPAA Privacy Rule and Public Health – Guidance from CDC and the U.S. Department of Health and Human Services, released in April 2003, is a report to help public health agencies and others understand and interpret their responsibilities under the Privacy Rule (<http://www.cdc.gov/mmwr/preview/mmwrhtml/m2e411a1.htm>). If HIPAA applies, an oral health survey can still be conducted by (13):

- Collecting only non-identifiable data (e.g., do not include a name on the form collecting data and ask for age instead of date of birth).

- Protecting confidentiality such as using privacy envelopes.

Another issue related to collecting surveillance data is to address whether an Institutional Review Board (IRB) is required. Federal and state laws require IRB approval for research. One definition of research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to the general knowledge. Requiring IRB approval for research is for the protection of human subjects (referred to as the “Common Rule”). IRB review is not required for a public health practice, which is not research. A public health practice includes proven methods to monitor health status, investigates occurrence of disease, and is used to implement prevention. The report, *Public Health Practice vs. Research – A Report for Public Health Practitioners Including Cases and Guidance for Making Distinctions* (<http://www.cste.org/pdffiles/newpdffiles/CSTEPHResRptHodgeFinal.5.24.04.pdf>), prepared by the Council of State and Territorial Epidemiologists (www.cste.org) and released in May 2004, provides clarification. For oral health surveys collecting data such as data collected through “open mouth” screenings, verbal interviews or written questionnaires, the Common Rule and HIPAA does not apply if the survey (a) does not collect identifiable health data, (b) has general legal authority to acquire health data needed to monitor health conditions in the population, (c) has specific intent that does not test a hypothesis, (d) provide participant benefits such as contribute to improving health, and (e) selects subjects without including a control group or randomly selects participants (an oral health survey that randomly selects schools and not participants is still a public health practice). It is advisable to submit a letter to IRB describing the oral health survey, asking the IRB to determine if the survey is a public health practice, and asking for a waiver (13).

F. Disseminating Surveillance Information

Disseminating surveillance information to key audiences includes print and electronic forms. Communications of surveillance information include published reports, website access to surveillance information and reports, policy briefs, fact sheets, newsletters, etc. Communications should consider the health literacy levels of different audiences. The target audience may include dentists, legislators, physicians, nurses, health policy makers, coalition members, other state and local partners, potential funding partners, the media, and the general public.

Burden Document

The burden of disease reflects the total significance of a disease for the society, beyond the immediate cost of treatment. An oral health burden document describes oral diseases, disparities, and unmet needs using the most recent data, preferably no more than 5 years old. The indicators of oral health status, monitored by the state-based oral health surveillance, provide needed data for preparing a burden document. A complete state burden document will provide a broad range of measures relating to national and state health objectives.

CDC, Division of Oral Health developed a tool to assist states with creating a comprehensive document that describes the state's burden of oral disease (14). This tool, available on the CDC website at <http://www.cdc.gov/oralhealth/publications/library/burdenbook/index.htm>, provides users with data on a broad range of indicators related to national and state health objectives about oral health. It focuses on the indicators contained in the National Oral Health Surveillance System (<http://www.cdc.gov/nohss/>) and other recommended elements using Healthy People 2010 indicators. The tool includes an outline, example text, national data, and references that

can be used to document the prevalence of oral disease, unmet dental needs, and disparities in oral health. Chapters include background information on oral disease and conditions, as well as basic tables and examples of data displayed as bar charts. The Burden of Oral Disease tool organizes information as follows:

- I. Introduction
- II. Executive Summary
- III. National and State Objectives on Oral Health
- IV. The Burden of Oral Diseases (includes disease prevalence, unmet needs, disparities, and societal impact)
- V. Risk and Protective Factors Affecting Oral Diseases
- VI. Provision of Dental Services
- VII. Conclusions
- VIII. References
- IX. Appendices (includes indicators of oral health status, calendar of expected data release dates, sample fact sheets, and sample policy briefs)

This tool is not meant to be prescriptive. The text can be freely edited or supplemented and the methods of data presentation may be altered.

Submitting Data for the National Oral Health Surveillance System (NOHSS)

The state oral health surveillance system should enable the state to submit data for inclusion in the NOHSS (<http://www.cdc.gov/nohss/>). Currently, NOHSS include the following indicators (10):

1. Dental Visit
Adults aged 18+ who have visited a dentist or dental clinic in the past year
2. Teeth Cleaning
Adults aged 18+ who have had their teeth cleaned in the past year (among adults with natural teeth who have ever visited a dentist or dental clinic)
3. Complete Tooth Loss
Adults aged 65+ who have lost all of their natural teeth due to tooth decay or gum disease
4. Lost 6 or More Teeth
Adults aged 65+ who have lost six or more teeth due to tooth decay or gum disease
5. Fluoridation Status
Percentage of people served by public water systems who receive fluoridated water
6. Dental Sealants
Percentage of 3rd grade students with dental sealants on at least one permanent molar tooth
7. Caries Experience
Percentage of 3rd grade students with caries experience, including treated and untreated tooth decay
8. Untreated Tooth Decay
Percentage of 3rd grade students with untreated tooth decay
9. Cancer of the Oral Cavity and Pharynx
Incidence and mortality of oral and pharyngeal cancer

G. Evaluating a Public Health Surveillance System

The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively (9). Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives. Public health surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency and usefulness.

The Centers for Disease Control and Prevention (CDC) published **Updated Guidelines for Evaluating Public Health Surveillance Systems** (<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm>) in 2001. The evaluation of public health surveillance systems should involve an assessment of system attributes (simplicity, flexibility, data quality, acceptability, representativeness, timeliness, stability, sensitivity, and predictive value positive). Inherent in these attributes are public health informatics concerns that include comparable hardware and software, standard user interface, standard data format and coding, appropriate quality checks, and adherence to confidentiality and security standards. Evaluation of a public health surveillance system should focus on attributes that are most important for the objectives of the system. The Updated Guidelines describe tasks that can be applied in the evaluation of public health surveillance systems with the understanding that not all activities listed under the tasks may be appropriate for all surveillance systems (9):

Task A: Engage the stakeholders in the evaluation

Task B: Describe the surveillance system to be evaluated

- Describe the public health importance of the health-related event under surveillance
- Describe the purpose and operation of the surveillance system
- Describe the resources used to operate the surveillance system

Task C: Focus the evaluation design

Task D: Gather credible evidence regarding the performance of the surveillance system

- Indicate the level of usefulness
- Describe each system attribute

Task E: Justify and state conclusions, and make recommendations

Task F: Ensure use of evaluation findings and share lessons learned

Another resource document, **Framework and Tools for Evaluating Health Surveillance Systems** (http://www.phac-aspc.gc.ca/php-ppsp/pdf/i_Surveillance_Evaluation_Framework_v1.pdf), was developed in 2004 by Health Canada's Population and Public Health Branch Health Surveillance Coordinating Committee. The document was designed to help managers of health surveillance systems identify and document issues relating to the rationale, implementation and effectiveness of their health surveillance systems. The framework and tools were intended to provide standard approaches for enhancing the ability of surveillance to provide relevant information. The document noted that an evaluation of a health surveillance system helps to answer the following questions:

- What are the successes and deficiencies of the surveillance system?
- Is the surveillance system meeting its public health objective?
- How does surveillance both support and benefit stakeholders?
- What measures could improve performance and productivity of the surveillance system and the program(s) that it supports?

H. Initiatives and Coordinated Efforts

CDC Cooperative Agreements

The CDC, Division of Oral Health is providing funding through cooperative agreements to 19 states to strengthen their oral health programs and improve the oral health of their residents (15). The cooperative agreements are renewable through fiscal year 2013. The grantees include: Alaska, Arkansas, Colorado, Connecticut, Georgia, Kansas, Louisiana, Maine, Maryland, Michigan, Minnesota, Nevada, New York, North Dakota, Rhode Island, South Carolina, Texas, Vermont, and Wisconsin. The CDC funding is designed to improve basic state oral health services including monitoring oral diseases and implementing and evaluating prevention programs such as community water fluoridation and school-based sealant programs. The funding supports the planning of a state oral health surveillance system. These grantee states are hiring or contracting an epidemiologist to develop a state-based oral health surveillance system, establish the indicators for surveillance, collect primary and secondary data, and disseminate surveillance findings including preparing a burden document.

SOHCS Grant Program

During 2003-2005, the Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau (MCHB), through its State Oral Health Collaborative Systems (SOHCS) grant program, awarded funds to state oral health programs (16). The purpose of these grants was three-fold:

- Support states in developing, implementing or enhancing efforts to integrate oral health into state Maternal and Child Health programs;
- Address Maternal and Child Health Bureau performance measures in oral health; and
- Stimulate action toward implementation of the Surgeon General's "National Call to Act to Promote Oral Health" as it affects women and children.

States used the SOHCS funding to support the development of a state-based oral health surveillance system. For example, with the SOHCS grant, New Mexico established a set of oral health indicators for their surveillance system, conducted an inventory of available oral health databases in the state, and identified data gaps that required additional investment in primary data collection. Alaska, California and Missouri used the funding to conduct a Basic Screening Survey of children to provide surveillance data.

ASTDD

ASTDD, funded by a cooperative agreement with CDC, administers the National Oral Health Surveillance System (NOHSS). The ASTDD Data Committee oversees this effort and annually collects state data for the NOHSS. The ASTDD Data Committee plans to develop a template to help the state report their state oral health surveillance measures or indicators (17).

I. Future Considerations

Beltrán-Aguilar, *et al.* (18) reviewed and summarized U.S. efforts to collect data on oral diseases, conditions and behaviors implemented at the national and state level. The authors showed that there is an impending need to develop new techniques to build up oral health surveillance systems. Challenges in the immediate future should enhance the monitoring of oral diseases, conditions and risk factors. For examples, testing the validity of self-reporting and visual assessment in senior adults, developing a screening protocol for periodontal diseases, and implementing standardized codes for treatment claims data. Surveillance activities for oral diseases will require developing a permanent process to share information and having the support of the research community for validation of new surveillance tools.

Future considerations should also address the challenge faced by the states in obtaining resources (staffing and funding) to develop a surveillance system and to maintain a system that will continue to mature. Data collection for surveillance requires funding. States have reported cost-effectiveness approaches such as linking to existing surveillance systems for oral health data (e.g., BRFSS and YRBSS) and adding new oral health questions to an existing survey or surveillance system. However, substantial resources are needed to collect primary oral health data through “open mouth” screenings. Although the unit cost of a survey screening using the Basic Screening Survey (BSS) tool is more cost-efficient compared to an epidemiological survey using the Decayed Missing Filled (DMF) Index for teeth, states require ongoing resources to regularly and periodically collect oral health status data through screening surveys. These screening surveys will have to be repeated to monitor trends over time and to collect data for different population groups (e.g., preschool children, school-age children, senior adults, and special needs individuals). Future considerations will need to seek cost-effective alternatives to assess the level of oral diseases, such as techniques to estimate the level of disease among populations, counties or communities without having to expand the survey sample for primary data collection.

II. Guidelines & Recommendations from Authoritative Sources

The Surgeon General’s Report on Oral Health in America stated that having state-specific and local data that augment national data is critical in identifying high-risk populations and in addressing oral health disparities (19).

National Call to Action to Promote Oral Health, a report released by the Office of the Surgeon General, proposed that implementation strategies to overcome barriers in oral health disparities should include building and supporting epidemiologic and surveillance databases at national, state and local levels to identify patterns of disease and populations at risk (20).

Healthy People 2020 Objective OH-15 seeks to increase the number of states that have an oral and craniofacial health surveillance system (21).

The Centers for Disease Control and Prevention published guidelines for evaluating surveillance systems in 1998 (22) and updated those guidelines in 2001 (9).

III. Research Evidence

Generally, there is a lack of reporting on the impact and effectiveness of oral health surveillance in the scientific literature. Although the National Oral Health Surveillance System (NOHSS) has been developed, more time is needed to evaluate the impact of this system.

Effectiveness of public health surveillance (such as early warnings on emerging health problems and program development/evaluation of intervention strategies) has been reported in other fields including infectious diseases and occupational health:

1. AIDS surveillance data provided an understanding of transmission risks and characterized communities affected by the epidemic. Later, these data provided the basis for allocating resources for prevention and treatment programs. New treatments have dramatically improved survival with declines in AIDS incidence and deaths (23).
 2. In some European countries, health surveillance is part of the national health system. Such health and hazard surveillance have been aimed at improving the health, ability to work, and well-being of workers. Reported benefits of health surveillance include improvement in worker satisfaction, improvement in relationships among stakeholders, early detection of health changes, and sickness absence reduction (24-26).
 3. Hospital-based surveillance programs of wound infection resulted in significant reduction in the infection rate of clean wounds and facilitated the adoption of evidence-based practice. Other surveillance programs for surgical-site infections resulted in reduction in infection rates of 35% to 50% (27-28).
-

IV. Best Practice Criteria

For the best practice approach of a **State-based Oral Health Surveillance System**, the ASTDD Best Practices Committee has proposed the following *initial review standards* for five best practice criteria:

1. Impact/Effectiveness:

- A state-based oral health surveillance system contains a core set of measures that describes the status of important oral health conditions and behaviors. These measures serve as benchmarks for assessing progress in achieving good oral health.
- An oral health surveillance system communicates data and information to responsible parties and to the public in a timely manner.
- Data and findings from the surveillance system are used for public health actions.

2. Efficiency:

- Data collection is managed on a periodic but regular schedule.
- Cost-effective strategies are used in collecting, analyzing and communicating surveillance data.

3. Demonstrated Sustainability:

- A mature surveillance system shows several years of data and analyzes trends.

4. Collaboration/Integration:

- Partnerships are established to leverage resources in data collection for the surveillance system.

- Data and findings from the surveillance system are used to integrate oral health into other health programs.

5. Objectives/Rationale:

- A state-based oral health surveillance system has a clear purpose (i.e., why the system exists) and objectives that specify how the data will be used for public health action.
-

V. State Practice Examples

States have submitted descriptions of their successful practices to share their experiences and implementation strategies. The following practice examples illustrate various elements of the best practice approach for a **State-based Oral Health Surveillance System**. These reported success stories should be viewed in the context of the state's and program's environment, infrastructure and resources. End-users are encouraged to review the practice descriptions (click on the links of the practice names) and adapt ideas for a better fit to their states and programs.

A. Summary Listing of Practice Examples

Table 1 offers several practices as examples of state efforts in the development of a state-based surveillance system, as well as examples of surveillance strategies for data collection, dissemination of surveillance findings, and use of surveillance data for public health actions. These practice examples share lessons and ideas in designing a surveillance system and conducting surveillance.

TABLE 1.**Practice Examples of the Development of a State-based Oral Health Surveillance System and of Oral Health Surveillance Strategies**

Item	Practice Name	State	Practice #
Development of a State-based Oral Health Surveillance System:			
1	Illinois Oral Health Surveillance System	IL	16011
2	The Michigan Oral Health Surveillance System Plan	MI	25004
3	New Hampshire's Oral Health Surveillance System	NH	32005
4	North Dakota's Oral Health Surveillance System	ND	37001
Oral Health Surveillance Strategies (Data Collection, Dissemination and Use):			
1	Iowa Oral Health Survey – Surveillance of the Prevalence of Dental Sealants	IA	18005
2	Nevada Third Grade Oral Health Screening Survey	NV	31003
3	Nevada Head Start Oral Health Screening Survey	NV	31004
4	New Hampshire Water Fluoridation Reporting System	NH	32002
5	Arizona Community Oral Health Profiles – Disseminating Surveillance and Other Oral Health Data	AZ	04003
6	Use of Epidemiological Studies and Surveillance to Direct State and Local Oral Health Programs	NC	36001

B. Highlights of the Practice Examples**1. Development of an Oral Health Surveillance System:****[Illinois Oral Health Surveillance System](#)** (Practice #16011)

In 2000, the Illinois Department of Public Health, Division of Oral Health began developing the Illinois Oral Health Surveillance System (IOHSS) with the support of an advisory committee of stakeholders and experts in oral health and epidemiology. The goal of the IOHSS is to monitor the state's oral disease burden and trends, measure changes in oral health program capacity, and monitor and report community water fluoridation. Funding from the Illinois' cooperative agreement with the Centers for Disease Control and Prevention allowed hiring a full time oral health epidemiologist. The IOHSS indicators are listed in **Attachment C**. The IOHSS has developed a network to share the data, provided a burden document, helped communities report oral health needs and prioritize their programs, expanded services to the high-risk populations, and contributed data at the national level to the NOHSS and the ASTDD Synopses.

[The Michigan Oral Health Surveillance System Plan](#) (Practice #2004)

The Michigan Oral Health Surveillance Plan was prepared to guide the development of the state oral health surveillance system. The planning process of the Michigan oral health surveillance system was a collaborative effort between the Michigan Department of Community Health and the Michigan Oral Health Coalition. The implementation of the surveillance plan has built an oral health surveillance system for Michigan. Michigan's surveillance system integrates oral health into several population-based surveillance activities. Coordination with these data sources is made by a part-time oral health epidemiologist. **Attachment D** provides a list of indicators reported by the Michigan Oral Health Surveillance System. The surveillance system provided oral health data for the development of Michigan's Oral Health Plan and for prioritizing state activities to improve oral health.

[New Hampshire's Oral Health Surveillance System](#) (Practice #32005)

New Hampshire's oral health surveillance system began in 2000. With a focus on developing a system that is simple and manageable, New Hampshire modeled their state-based oral health surveillance system on the National Oral Health Surveillance System and used the same eight oral health indicators relying on four data sources. **Attachment E** lists the indicators and data sources. The surveillance system enables the state to monitor progress towards Healthy People 2010 objectives and contributes data to the National Oral Health Surveillance System. New Hampshire's state and local stakeholders have used the surveillance data for developing the state oral health action plan, for setting performance measures for organizations receiving oral health funding from the state, for establishing Healthy New Hampshire 2010 objectives, and for prioritizing oral health program activities.

[North Dakota's Oral Health Surveillance System](#) (Practice #37001)

As a result of the state oral health program's commitment to data collection and use, an oral health surveillance system has been incrementally developed in North Dakota since 1993. The system has grown to include 44 indicators from primary and secondary data sources. Data is collected on a rotating basis. **Attachment F** provides a listing of the surveillance system's oral health indicators and data sources. Surveillance data is used for program planning and implementation, assessing program effectiveness, guiding policy planning and advocacy and improving program accountability. This resulted in the implementation of oral health components in local maternal and child health programs; targeted fluoride mouthrinse, fluoride varnish and dental sealant programs to high risk children; establishment of a dental loan repayment program to expand the dental workforce; and expanding the scope of practice to allow medical professionals to apply fluoride varnish to high-risk children. A Surveillance Plan has been written, which includes a timetable for data collection, a question matrix, a data indicator grid to track trends, and a data communication plan.

2. Oral Health Surveillance Strategies (Data Collection, Dissemination and Use):

[Iowa Oral Health Survey – Surveillance of the Prevalence of Dental Sealants](#) (Practice #18005)

In FY 2004-05, the Iowa Department of Public Health (IDPH), Oral Health Bureau conducted its annual survey to measure the prevalence of dental sealants on permanent molars of third-grade children in Iowa. This is the seventh year of collecting sealant prevalence data. The survey expanded data collection and for the first time included recording the presence of gross tooth decay and filled teeth. The survey involved a new process to train dental hygienists in the field as survey examiners via high quality/full-motion video, high-speed Internet connections, and telephones. In FY 2005-06, the survey was again repeated. The FY 2005-06 overall sealant rate (45.5 percent) was higher than FY 2004-05 (43.4 percent) and FY 2003-04 (39.9 percent). Compared to the previous year, fewer children in FY 2005-06 have tooth decay (13.2 percent vs. 17.5 percent) and more children have a filled tooth (42.8 percent vs. 40.4 percent).

[Nevada Third Grade Oral Health Screening Survey](#) (Practice #31003)

The Oral Health Program at the Nevada State Health Division utilized the ASTDD Basic Screening Survey to conduct a statewide screening of third graders in 2003. The Healthy Smile - Happy Child Screening Survey sampled a cohort of 51 elementary schools throughout the state as a

representative sample of the state as a whole. Utilizing volunteer dentists, the Nevada State Health Division screened 2,472 children. Materials costs of the screenings totaled \$12,968 (\$5.25 per child). The survey contributes data to the state oral health surveillance system. In 2006, the survey of third graders was repeated. The survey of third graders will be conducted every three years.

[Nevada Head Start Oral Health Screening Survey](#) (Practice #31004)

The Healthy Smile - Happy Child Screening Survey was first conducted in 2003 to collect oral health data on third graders in Nevada. In the subsequent year 2004, the survey focused on children ages 3 to 5 who were enrolled in the Head Start Program. Survey findings indicated that there are large unmet oral health needs in the Head Start population. A report of the 2004 survey was disseminated to policymakers, funders, educators, and stakeholders throughout the state. The survey findings led to the Nevada Head Start Association and the Oral Health Program/Nevada State Health Division convening three regional Head Start Oral Health Summits to establish goals and strategies to improve the oral health of Head Start children. The survey of Head Start children will be conducted every three years for surveillance (completed the first survey in 2004 and the second survey in 2007).

[New Hampshire Water Fluoridation Reporting System](#) (Practice #32002)

The Centers for Disease Control and Prevention, in collaboration with the ASTDD, developed the Water Fluoridation Reporting System (WFRS), a surveillance system to collect and edit data on-line to monitor fluoridation in the United States. With the introduction of WFRS in 2001, New Hampshire Department of Health and Human Services' Oral Health Program hired an intern to enter updated state fluoridation information in the WFRS. Using WFRS, the updated numbers showed that 67% of New Hampshire residents received water from a public supply. Of the residents on public water supply, only 43% received fluoridated water. This information was used to update publications and to monitor progress towards achieving the Healthy New Hampshire 2010 objective for water fluoridation.

[Arizona Community Oral Health Profiles – Disseminating Surveillance and Other Oral Health Data](#) (Practice # 04003)

The Arizona Community Oral Health Profiles are a series of fact sheet used to provide Arizona communities with information on the oral health status of their residents. The Arizona Department of Health Services, Office of Oral Health developed the profiles in 1997 to organize available surveillance and other oral health data for communities and to provide easier access to the data. The purpose of the Profiles is to provide community-specific data to support communities in raising awareness of oral health needs, planning and developing solutions to meet the needs of their residents, and/or justifying resources. Public access to 173 community profiles is provided online. Communities have used the profiles for grant proposals and to support community water fluoridation.

[Use of Epidemiological Studies and Surveillance to Direct State and Local Oral Health Programs](#) (Practice #36001)

The Oral Health Section, North Carolina Division of Public Health, determines the oral health of a community in three ways: a) dental assessments – measuring specific oral conditions such as the average number of decayed, missing and filled teeth and proportion of children with dental sealants, b) dental screenings – identifying children in need of dental care and referring them for care, and c) statewide epidemiological surveys – scientifically measuring the quantity and types of oral disease in a population. For surveillance, over 280,000 elementary school children participate in either assessments or screenings annually. Epidemiological surveys are conducted approximately every 15 years. The North Carolina oral health program has been enhanced based on epidemiological studies and surveillance. For example, the 1986-87 survey of school children resulted in a major programmatic change in the oral health program shifting emphasis from restorative treatment services to preventive services.

VI. Acknowledgements

This report is the result of efforts by the ASTDD Best Practices Committee to provide information on developing and improving a state-based oral health surveillance system.

This publication was supported by Cooperative Agreement U58DP001695 from CDC, Division of Oral Health and by Cooperative Agreement U44MC00177 from HRSA, Maternal and Child Health Bureau.

Suggested citation: Association of State and Territorial Dental Directors (ASTDD) Best Practices Committee. Best practice approach: state-based oral health surveillance system [monograph on the Internet]. Sparks, NV: Association of State and Territorial Dental Directors; 2011 May 17. 27 p. Available from: <http://www.astdd.org>.

VII. Attachments

ATTACHMENT A

Strength of Evidence Supporting Best Practice Approaches

The ASTDD Best Practices Committee takes a broad view of evidence to support best practice approaches for building effective state and community oral health programs. The Committee evaluated evidence in four categories: research, expert opinion, field lessons and theoretical rationale. Although all best practice approaches reported have a strong theoretical rationale, the strength of evidence from research, expert opinion and field lessons fall within a spectrum. On one end of the spectrum are promising best practice approaches, which may be supported by little research, a beginning of agreement in expert opinion, and very few field lessons evaluating effectiveness. On the other end of the spectrum are proven best practice approaches, ones that are supported by strong research, extensive expert opinion from multiple authoritative sources, and solid field lessons evaluating effectiveness.

<u>Promising</u> <u>Best Practice Approaches</u>					<u>Proven</u> <u>Best Practice Approaches</u>	
Research	+		⇒		Research	+++
Expert Opinion	+		⇒		Expert Opinion	+++
Field Lessons	+				Field Lessons	+++
Theoretical Rationale	+++				Theoretical Rationale	+++

Research

- + A few studies in dental public health or other disciplines reporting effectiveness.
- ++ Descriptive review of scientific literature supporting effectiveness.
- +++ Systematic review of scientific literature supporting effectiveness.

Expert Opinion

- + An expert group or general professional opinion supporting the practice.
- ++ One authoritative source (such as a national organization or agency) supporting the practice.
- +++ Multiple authoritative sources (including national organizations, agencies or initiatives) supporting the practice.

Field Lessons

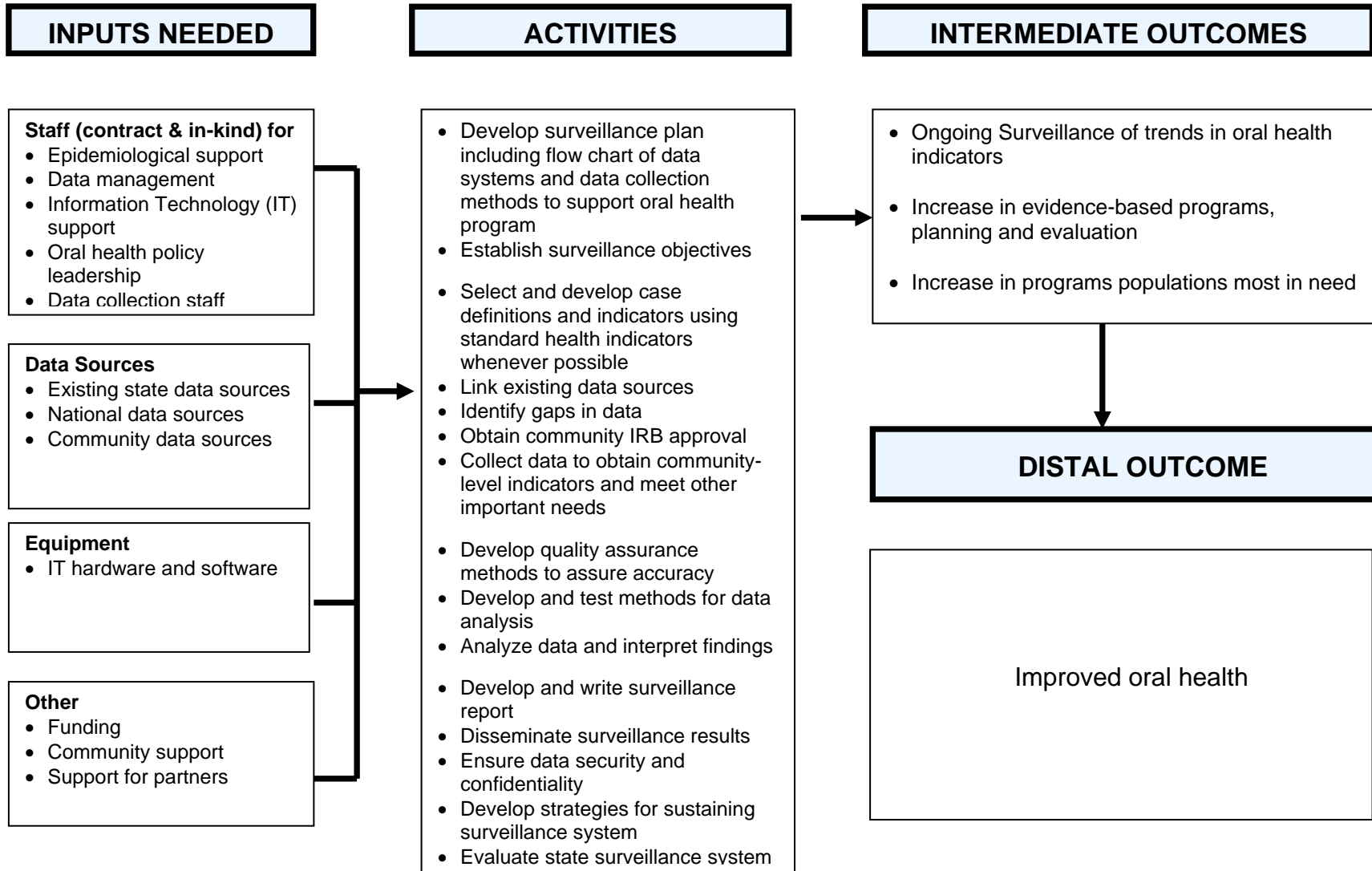
- + Successes in state practices reported without evaluation documenting effectiveness.
- ++ Evaluation by a few states separately documenting effectiveness.
- +++ Cluster evaluation of several states (group evaluation) documenting effectiveness.

Theoretical Rationale

- +++ Only practices which are linked by strong causal reasoning to the desired outcome of improving oral health and total well-being of priority populations will be reported on this website.

ATTACHMENT B

LOGIC MODEL FOR ORAL HEALTH SURVEILLANCE



Source: CDC, Division of Oral Health, http://www.cdc.gov/ORALHEALTH/state_programs/infrastructure/activity2.htm (accessed May 16, 2011)

ATTACHMENT C

Illinois Oral Health Surveillance System Indicators and Data Sources

Behavioral Risk factor Surveillance System (BRFSS) / Interval: 2 years

- Percent of adults with dental visit in the past year
- Percent of adults, aged 65 years and older, who are edentulous
- Percent of adults who have had teeth cleaning within the past year
- Percent of dentate adults with diabetes who had a dental visit within the past year

Statewide 3rd Grade Basic Screening Survey / Interval: 5 years

- Percent of children with caries experience
- Percent of children with untreated decay
- Percent of children in need of urgent treatment
- Percent of children with sealants

Pregnancy Risk Assessment and Monitoring System (PRAMS) / Interval: 1 year

- Percent of pregnant women needed to see a dentist for a problem
- Percent of pregnant women visited dentist or dental clinic
- Percent of pregnant women had a dental/health care worker spoke about care of gums and teeth

Dental Workforce / Interval: 1 year

- Number of licensed dentists by county
- Number of licensed hygienists by county

Illinois Cancer Registry / Interval: 1 year

- Oral and Pharyngeal cancer death rate
- Percent of oral and pharyngeal cancers detected at the earliest stages
- Percent of oral and pharyngeal cancer exam within past 12 months, age 40+

Illinois Department of Health and Family Services (IDHFS) / Interval: 1 year

- Number of dentists enrolled as Medicaid providers
- Number of dentists with at least one paid claim
- Number of dentists with paid claims \geq \$10,000
- Percent of counties in IL without an enrolled Medicaid dentist with paid claims \geq \$10,000
- Percent of Illinois counties without a Medicaid dentist
- Number of children (0-18 years) enrolled in Title XIX Medicaid for at least one month of the year
- Number of children enrolled in Title XXI SCHIP for at least one month of the year
- Percent children enrolled in Title XIX Medicaid for at least one month (0-18 years) with dental visit
- Percent children (0-18 years) enrolled in Title XIX Medicaid for six consecutive months with dental visit
- Percent of adults (18-65 & 65+ years) with dental visits

Division of Oral Health (DOH) / Interval: 1 year

- Number of Safety Net Clinics by county
- Number of newborns referred by Craniofacial Anomaly Program
- Number of children receiving sealants

Illinois Fluoridation Reporting System (IFRS) / Interval: 1 year

- Percentage of people served by public water systems who receive fluoridated water
- Percent of community water systems compliance with community water fluoridation standards

ATTACHMENT D

Michigan Oral Health Surveillance System Indicators and Data Sources

The Michigan Oral Health Surveillance System will initially report the following indicators. The surveillance indicators were established after consideration of data resources available within the state as well as indicators desired at the national level to support the NOHSS and monitor progress towards achieving the HP 2010 oral health objectives.

Children

- Caries experience – 3rd grade children (BSS)
- Untreated decay – 3rd grade children (BSS)
- Sealants present on first molars – 3rd grade children (BSS)
- Low-income preventive dental visit in the past year – Medicaid children (Medicaid)
- Any dental visit in the past year– All children (Medicaid & Private Carriers)

Adults

- No tooth loss - Age 35-44 (BRFS)
- Edentulous - Age 65-74 (BRFS)
- Periodontal Disease - Age 35-44 (BRFS)
- Preventive dental visit - All adults (BRFS)
- Any dental visit - All adults (BRFS)
- Proportion of oral cancers detected at an early stage – All adults (Michigan Cancer Registries)
- Incidence of oral cancer – All adults (Michigan Cancer Registries)
- Mortality due to oral cancer – All adults (Michigan Cancer Registries)

Other

- Population served by adequately fluoridated water (WFRS)
- Density of dental providers (Bureau of Licensing & Health Professions)
- Number of critical access providers (Medicaid)

ATTACHMENT E

New Hampshire's Oral Health Surveillance System Indicators and Data Sources

Oral Health Indicators:

- **Dental Visits** [*percent of adults with dental visit in past year*]
Routine dental visits aid in the prevention, early detection and treatment of tooth decay, oral soft tissue disease, and periodontal diseases.
- **Teeth Cleaning** [*percent of adults who have had their teeth cleaned in past year*]
Having one's teeth cleaned by a dentist or dental hygienist is indicative of preventive behavior.
- **Complete Tooth Loss** [*percent of adults \geq 65 years who are edentulous*]
Loss of all natural permanent teeth (complete tooth loss) substantially reduces quality of life, self-image, and daily functioning.
- **Fluoridation Status** [*percent of population on public water systems receiving fluoridated water*]
Water fluoridation has played an important role in reducing tooth decay and tooth loss.
- **Cancer of the Oral Cavity and Pharynx** [*oral cancer deaths per 100,000 persons*]
Oral and pharyngeal cancer comprises a diversity of malignant tumors that affect the oral cavity and pharynx. Each year, some 30,000 new cases of oral and pharyngeal cancer are diagnosed and 8,000 people die from the disease.
- **Caries Experience** [*percent of children, aged 6-8 years, with history of decay*]
Dental caries is the single most common chronic disease of childhood, occurring five to eight times as frequently as asthma, the second most common chronic disease in children.
- **Untreated Caries** [*percent of children, aged 6-8 years, with untreated decay*]
To avoid pain and discomfort, decayed teeth need to be restored. To keep as much of the natural tooth as possible, decayed teeth should be repaired promptly so that fillings may be kept small.
- **Dental Sealants** [*percent of children, aged 8 years, with sealants*]
Plastic coatings applied to decay-susceptible tooth surfaces (the pits and fissures) have been approved for use for many years and are recommended by professional health associations and public health agencies.

Data Sources:

- **Behavioral Risk Factor Surveillance System (BRFSS)**
The Behavioral Risk Factor Surveillance System is a state-based, ongoing data collection program designed to measure behavioral risk factors in the adult, non-institutionalized population 18 years of age or older. Every month, states select a random sample of adults for a telephone interview.
- **Water Fluoridation Reporting System (WFRS)**
CDC of the Water Fluoridation Reporting System provided New Hampshire with a convenient way to update its numbers on fluoridation. WFRS allows a state to go on-line to update basic information including populations served, fluoridation status, and contact information.
- **State Cancer Registry and Death Certificates**
The Cancer Registry and death certificates provide information on the number of deaths due to oral and pharyngeal care in the state.
- **New Hampshire Third Grade Oral Health Survey – A Basic Screening Survey**
A statewide survey of the oral health status of 3rd grade students was conducted in 2001 and will be repeated every three years. Data collected included dental caries experience, untreated decay, presence of sealants on permanent molars, and urgency of care.

ATTACHMENT F

North Dakota's Oral Health Surveillance System Indicators and Data Sources

Children and Youth:

Head Start Program Information Report (PIR) – 4 indicators

- Percentage of Head Start children who had a dental examination in the past year
- Percentage of Head Start children examined who need dental treatment
- Percentage of Head Start children examined and needing dental treatment who received treatment
- Percentage of Head Start children examined who received preventive care

Basic Screening Survey (BSS) – 5 indicators

- Percentage of third-grade students with dental sealants on at least one permanent molar
- Percentage of third-grade students with caries experience (treated or untreated)
- Percentage of third-grade students with untreated tooth decay
- Percentage of third-grade students in need of urgent care
- Percentage of third-grade students who have had a previous dental visit

Medicaid Claims – 1 indicator

- Percentage of Medicaid-enrolled children who had a dental visit during the year

Vital Records – 2 indicators

- Number of babies born with cleft lip/cleft palate
- Rate of babies born with cleft lip/cleft palate per 1,000 live births

Youth Risk Behavior Survey (YRBS) – 6 indicators

Grades 9-12

- Percentage of youth reporting a dental visit in the last year
- Percentage of youth reporting no cavities
- Percentage of youth reporting one or more cavities
- Percentage of youth reporting use of chewing tobacco, snuff or dip in the past 30 days

Grades 7-8

- Percentage of youth reporting a dental visit in the last year
- Percentage of youth reporting use of chewing tobacco, snuff or dip in the past 30 days

Youth Tobacco Survey (YTS) – 2 indicators

Grades 9-12

- Percentage of youth who have ever used chewing tobacco, snuff or dip
- Percentage of youth who have used chewing tobacco, snuff or dip in the past 30 days

Grades 7-8

- Percentage of youth who have ever used chewing tobacco, snuff or dip
- Percentage of youth who have used chewing tobacco, snuff or dip in the past 30 days

Adults and Elderly:

Medicaid Claims – 1 indicator

- Percentage of Medicaid-enrolled adults who had a dental visit during the year

Behavioral Risk Factor Surveillance System (BRFSS) – 6 indicators

- Percentage of adults 18 and older who have visited a dentist or dental clinic in the past year
- Percentage of adults 18 and older who have had their teeth cleaned in the past year (among adults with natural teeth who have ever visited a dentist or dental clinic)
- Percentage of adults 65 and older who have lost all of their natural teeth due to tooth decay or gum disease
- Percentage of adults 65 and older who have lost six or more teeth due to tooth decay or gum disease
- Percentage of dentate adults 18 and older with diabetes who have visited a dentist or dental clinic in the past year
- Percentage of adults 18 and older who currently use spit tobacco

New Mothers' Survey/Pregnancy Risk Assessment Monitoring System (PRAMS) – 3 indicators

- Percentage of women who had a dental visit during their pregnancy
- Percentage of pregnant women who received information from a health-care provider on importance of dental care during and after pregnancy
- Percentage of pregnant women (new mothers) who had teeth cleaned within the last year

Cancer Registry – 1 indicator

- Age-adjusted incidence rate per 100,000 population of new cases of oral and pharyngeal cancer

Vital Records – 2 indicators

- Number of oral and pharyngeal cancer deaths
- Age-adjusted mortality rate per 100,000 population caused by oral and pharyngeal cancers

Licensure Workforce Survey – 4 indicators

- Number of full-time equivalent (FTE) licensed practicing dentists
- Rate of practicing dentists per 100,000 population
- Number of full-time equivalent (FTE) licensed dental hygienists
- Number of full-time equivalent (FTE) certified dental assistants

Dental Workforce Survey – 3 indicators

- Percentage of practicing dentists who work part-time
- Percentage of practicing dentists who plan to retire in one to five years
- Percentage of practicing dentists who accept any and all Medicaid patients

Water Fluoridation Reporting System (WRFS) – 2 indicators

- Percentage of population served by public water systems who received fluoridated water
- Percentage of public water systems that maintain optimal fluoride levels

VIII. References

1. Thacker SB, Berkelman RL. Public health surveillance in the United States. *Epidemiol Rev* 1988;10:164-90.
2. Burt BA, Eklund SA. *Dentistry, dental practice, and the community*. 5th ed. Philadelphia: W.B. Saunders; 1999.
3. Association of State and Territorial Dental Directors. *Assessing oral health needs: ASTDD seven-step model*. 1995.
4. Teutsch SM and Churchill RE, eds. *Principles and practice of public health surveillance*. New York, NY: Oxford University Press; 1994.
5. Choi BC. Perspectives on epidemiologic surveillance in the 21st century. *Chronic Dis Can* 1998;19(4):145-51.
6. Meriwether RA. Blueprint for a national public health surveillance system for the 21st century. *J Public Health Management Practice* 1996;2(4):16-23.
7. Hinman, AR. Surveillance and the national center for prevention services. *J Health Management Practice* 1996;2(4):50-51.
8. Baker Jr EL, Ross D. Information and surveillance systems and community health: building the public health information infrastructure. *J Health Management Practice* 1996;2(4):58-60.
9. Centers for Disease Control and Prevention. Updated guidelines for evaluating public health surveillance systems: recommendations from the guidelines working group. *MMWR* 2001;50(RR-13):1-35.
10. Centers for Disease Control and Prevention, Division of Oral Health. National Oral Health Surveillance System. Available at: <http://www.cdc.gov/nohss/>
11. Association of State and Territorial Dental Directors. Building infrastructure and capacity in state and territorial oral health programs. April 2000. Available at: <http://www.astdd.org/docs/Infrastructure.pdf>
12. Centers for Disease Control and Prevention, Division of Oral Health. Communication with Gina Thornton-Evans, DDS, MPH, April-May, 2005 and communication with Beth Hines RDH, MPH, December 2006.
13. Centers for Disease Control and Prevention, Division of Oral Health. Webconference: Supporting State Oral Health Programs through Effective Surveillance Systems. Presenter: Kathy Phipps, DrPH, March 22, 2005.
14. Centers for Disease Control and Prevention. *The Burden of Oral Disease: Tool for Creating State Documents*. Atlanta: U.S. Department of Health and Human Services; 2005. Available at: <http://www.cdc.gov/oralhealth/publications/library/burdenbook/index.htm>
15. Centers for Disease Control and Prevention. *CDC Funded States – Cooperative Agreements*. Available at: http://www.cdc.gov/oralhealth/state_programs/cooperative_agreements/index.htm
16. HRSA, Maternal and Child Health Bureau. Communications with Mark Nehring, DDS, MPH, February 2005.
17. Association of State and Territorial Dental Directors, Data Committee. Communications with Stuart Lockwood, DMD, MPH, February 2005.
18. Beltrán-Aguilar, ED, Dolores MM, Lockwood SA, Rozier G, Tomar SL. Oral health surveillance: past, present, and future challenges. *Journal of Public Health Dentistry* 2003 63(3):141-149.
19. U.S. Department of Health and Human Services. *Oral health in America: a report of the Surgeon General*. Rockville, MD: Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000. Available at: <http://www.surgeongeneral.gov/library/oralhealth/>
20. U.S. Department of Health and Human Services. *National call to action to promote oral health*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental and Craniofacial Research. NIH Publication No. 03-5303, Spring 2003. Available at: <http://www.surgeongeneral.gov/topics/oralhealth/nationalcalltoaction.htm>
21. U.S. Department of Health and Human Services. *Healthy People 2020*. Washington, DC. Available at: <http://www.health.gov/healthypeople/Document/default.htm>
22. Centers for Disease Control and Prevention. Guidelines for evaluating surveillance systems. *MMWR* 1998;37(S-5):1-18.

23. Fleming PL, Wortley PM, Karon JM, DeCock KM, Janssen RS. Tracking the HIV epidemic: current issues, future challenges. *Am J of Public Health* Jul 2000;90(7):1037-4.
24. Franco G, Cella MT, Tuccillo E, Ferrari F, Minisci E, Fusetti L. From risk-based health surveillance to health promotion: an evidence-based experience in a health care setting. *International J of Occupational Medicine & Environmental Health* 2002;15(2):117-20.
25. Kauppinen T, Toikkanen J. Health and hazard surveillance – needs and perspectives. *Scandinavian Journal of Work, Environment & Health* 1999;25 Suppl 4:61-7.
26. Fine LJ. Surveillance and occupational health. *International Journal of Occupational & Environmental Health* 1999;5(1):26-9.
27. Reillay JS. The effect of surveillance on surgical wound infection rates. *Journal of Tissue Viability* 1999;9(2):57-60.
28. Roy MC, Perl TM. Basics of surgical-site infection surveillance. *Infection Control & Hospital Epidemiology* 1997;18(9):659-68.