



Enhancing Oral Health Epidemiology Capacity

A Three-Year Training Plan



CSTE

COUNCIL OF STATE AND
TERRITORIAL EPIDEMIOLOGISTS

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Enhancing Oral Health Epidemiologic Capacity:

A Framework for a 3-Year Training Plan

Introduction

Epidemiology is a core function of public health. The 2013 Council of State and Territorial Epidemiologists (CSTE) Epidemiology Capacity Assessment found limited oral health (OH) epidemiology capacity at the state health department level. Improvements in recent years have resulted from competitive Centers for Disease Control and Prevention (CDC) Division of Oral Health funding to state OH programs to enhance their infrastructure and evidence-based practices. However, such support cannot sustain nationwide expansion of the OH epidemiology workforce. Although interest in oral health might exist among states without such capacity, major barriers remain to expansion to all states and territories. Barriers include limited state budget resources, lack of competent applicants because of workforce shortages, hiring freezes, and limitations on contracting.

Two Healthy People 2020 objectives (OH16, PHI13.1) address the goals of improving state-level capacity in OH epidemiology. Organizations leading activities to address these objectives include CDC, the Association of State and Territorial Dental Directors (ASTDD), and CSTE. Experts from these groups have developed a conceptual framework and operational definition for state-based OH systems (SOHSS; www.astdd.org/docs/state-based-oral-health-surveillance-systems-cste-whitepaper-oct-2013.pdf) and consider OH epidemiology training a critical step to enhance state-level OH epidemiology capacity (see Appendix 1 for currently available resources).

A workgroup was established to develop an outline of possible training topic areas for building the framework for a 3-year training plan. This workgroup comprised five state or local health agency OH epidemiologists, a CSTE associate research analyst, and a senior consulting epidemiologist (Appendix 2). Fulfilling this outline will increase capacity and competency, which will result in more states meeting the Healthy People 2020 goal of having state surveillance to monitor oral disease and its affects. The outline consists of five topic areas (Box).

Box. Oral Health Epidemiology Topic Areas

- 1. The public health importance of oral health**
- 2. Factors impacting oral health outcomes**
- 3. How to build an oral health surveillance plan**
- 4. Overview of the National Oral Health Surveillance System indicators and data sources**
- 5. Selected special topics:**
 - Publishing resources for oral health epidemiology (how, where to publish)
 - Developing current policy issues related to oral health
 - Using data to highlight health disparities
 - Developing methods for small areas estimation of illness

Additional details about each of the five topic areas follow. Cost estimates are per year.

Topic #1: The Public Health Importance of Oral Health (i.e., “Oral Health 101”)

Training format recommended: A variety of training approaches might be used: webinar; website posting; face-to-face didactic training courses; didactic training by teleconference. Because this training would be directed toward staff who have no formal dental education, a Web-based format should be considered. Such a format would enable state dental directors, department of health supervisors, and other leaders to provide this training to their personnel without having to send them to off-site courses, which is critical because of frequently limited funding for conference-based training. Providing a Web-based platform also reduces “time away from work”; participants could complete modules at their own pace around other work obligations. In addition, participants could complete the modules within the first few days of employment, increasing their readiness and contributions in OH epidemiology. Furthermore, because many newer personnel in OH epidemiology are anticipated to be young adults with a high degree of technology orientation, a Web-based format might best enhance their learning experience. These employees are likely to prefer an engaging, Web-based platform to traditional didactic formats. Slide sets should be available to download and save for reference.

A Web-based format would be particularly valuable for supporting CSTE Fellows interested in OH—a rapidly developing subdiscipline of epidemiology with many cross-disciplinary connections to chronic disease prevention, perinatal health, and other key areas of population health. Because OH is still considered a niche subdiscipline of epidemiology, a wide array of condensed, ready-to-access training is not available (Appendix 1). Furthermore, no conference or short course currently condenses OH epidemiology material to provide “boot camp” instruction for persons who rapidly need to acquire a knowledge base. Developing a Web-based format would enable Fellows and other trainees to begin contributing relatively quickly to the OH program.

Size or scope of training: Training should include 1) definition of OH; 2) introduction to basic dental terminology, procedures, and key dental personnel; 3) key OH conditions and their effects on populations; and 4) OH as a population health concern.

Definition of OH: Topics should include the following:

- Description of OH care delivery system and key stakeholders involved, e.g., dentists, hygienists, assistants, educators, researchers in basic biomedical and social sciences, public health professionals, advocacy professionals.
- How OH is related to the dimensions of wellness:
 - Oral–systemic connection and current state of research in this area (to be updated every 2 years).
 - Key limitations of current research and knowledge base in oral–systemic health.
 - Diabetes, cardiovascular disease, perinatal outcomes (including material on vertical transmission of oral microorganisms), pulmonary disease, behavioral health.
 - Educational and occupational readiness (e.g., “You can’t concentrate on school or work if your mouth hurts”).

- Development of areas of knowledge: cognitive changes secondary to inflammation; arthritis; gastrointestinal health.

Introduction to Basic Dental Terminology. Topics should include the following:

- Key oral anatomical structures:
 - Four types of teeth: incisors, canines, premolars, molars.
 - Key soft tissues, e.g., lips, tongue, oropharynx, salivary glands (good background knowledge for working with oral cancer data).
 - Key bony structures, e.g., temporomandibular joint dysfunction, mandible, maxilla (good background knowledge for working with oral injury data).
 - Key odontologic (tooth-related) structures, e.g., molar grooves, third molars (“wisdom teeth”).
- Tooth numbering systems for adult and primary (child) dentition:
 - Knowledge essential to certain statistical programming tasks, such as developing matrices to analyze periodontal disease, and useful when analyzing certain datasets, such as Medicaid or private insurance claims data.
- Anatomical descriptions used in dental medicine:
 - Definition and description of terms: mesial, distal, facial/buccal, lingual, occlusal, proximal, distal, and incisal.
- Key dental personnel:
 - Definition/description of dentists, dental hygienists, dental assistants.
 - Description of newly proposed dental personnel, such as dental therapists (“mid-level providers”) and Community Dental Health Coordinators.
 - Description of dental specialties, e.g., prosthodontics, oral and maxillofacial surgery, pediatric dentistry, endodontics, periodontology, oral and maxillofacial pathology, dental public health.
- Dental procedures encountered in routine dental medicine practice:
 - Definition of preventive dentistry and associated procedures, e.g., examinations, dental prophylaxes, sealants, fluoride varnishes, types of dental radiographs, athletic mouth guards.
 - Definition of restorative dentistry and associated procedures, e.g., amalgam and composite restorations, crowns, inlays, onlays.
 - Definition of periodontology and associated procedures, e.g., periodontal examination, scaling and root planing, open-flap debridement.
 - Definition of oral surgery and associated procedures, e.g., types of tooth extractions, biopsies.
 - Definition of orthodontics and associated procedures.
- Description of settings where OH care might be provided:
 - Private practice.
 - Community Health Centers (difference between Federally Qualified Health Centers and “look-a-likes”).

- Dental education facilities, i.e., dental schools, hygiene schools, residency programs.
- Government clinics, e.g., military, Veterans' Administration, correctional facilities, public health clinics.
- Hospitals.
- School-based programs, including mobile and fixed operatory clinics.
- Assisted living facilities/"long-term care facilities"
- Growing role of mobile/portable clinics in providing care to underserved populations.

Key OH Conditions and Their Effects on Populations. Topics should include the following:

- Dental caries:
 - Definition of dental caries.
 - Infectious etiology of condition (include material on "vertical transmission").
 - Role of diet in caries.
 - Statistics on population-level impact, e.g., school absences, prevalence among children.
 - Importance of assessing caries risk in clinical dental medicine and population health practice.
 - Risk factors for dental caries in children and adults (include material on "nursing bottle caries" in infants/young children.
 - Preventive/protective factors (include material on dental visits for infants, as well as parental education on OH).
 - Systemic impacts, e.g., untreated caries can lead to infections of the brain, heart, and other organs.
 - Treatment.
- Periodontal (gum) diseases:
 - What are periodontal diseases?
 - Role of microorganisms and chronic inflammation in disease process.
 - Statistics on population-level impact (percentage of U.S. adults with conditions by severity; the American Academy of Periodontology has a good schematic that describes population level statistics).
 - Types of periodontal disease; severity classifications.
 - Risk factors for periodontal diseases.
 - Protective factors.
 - Systemic impacts, e.g., endocrine/diabetic, cardiovascular, pulmonary, gastrointestinal, perinatal).
 - Treatment of periodontal disease.
 - Long-term implications.
- Oropharyngeal cancers:
 - Definitions.
 - Etiologies (include discussion of human papillomavirus).
 - Where in the oral cavity oropharyngeal cancers exist, i.e., anatomical locations.

- Statistics on population-level occurrence, i.e., increasing prevalence of oropharyngeal cancers among young adults who are nonsmokers and/or nondrinkers.
- Risk factors.
- Protective factors.
- Treatment.
- Long-term effects on patients.
- Oral Injuries:
 - Typical oral injuries.
 - How oral injuries occur, e.g., sports, altercations.
 - Where in the oral and maxillofacial region injuries usually occur.
 - Statistics on population-level effect.
 - Risk factors.
 - Prevention.
 - Typical treatments required.
 - Long-term effects on persons and costs.
- Fluorosis

OH as a Population Health Concern. Topics should include the following:

- Role of in chronic disease outcomes and tertiary health care costs:
 - Suggestion by research that OH conditions influence outcomes in, for example, diabetes and pulmonary disease.
 - Example: Scaling/root planing in reducing hemoglobin A1C among persons with diabetes.
 - Example: Periodontal health and pneumonia after endotracheal intubation.
 - Application of preventive dental care can reduce costly complications related to chronic diseases.
 - OH and behavioral health.
 - Perinatal OH as the “bridge” between pediatric and adult OH.
- General and pediatric dentists are key “force multipliers” in primary care delivery:
 - Dentists as key members of the primary care team, especially in community health centers.
 - Provide care that supports interdisciplinary medical practice.
 - Can identify early systemic conditions that should be addressed by other providers, e.g., blood pressure screening, diabetes symptoms, osteoporosis.
 - Can identify early signs of infectious diseases, e.g., Koplik’s spots in measles, parotid swelling in mumps, oropharyngeal pseudomembrane in diphtheria.
 - Dental personnel provide valuable health counseling, e.g., in nutrition, injury prevention, vaccinations, diabetes compliance.
 - In private practice, patients might visit a dentist before they visit a physician (if they even have a primary care provider).

Shelf life of information: Typically, knowledge in dental medicine is relevant for 4 years. However, given that new paradigms in evidence-based dental medicine may appear more frequently, consideration should be offered to revising courses and offering updates every 2 years.

The following resources should be examined when information is revised:

- American Dental Association's (ADA) Center for Evidence-Based Dentistry, <http://ebd.ada.org/en/>
- ADA Health Policy Institute, www.ada.org/en/science-research/health-policy-institute/
- National Maternal and Child Oral Health Resource Center, www.mchoralhealth.org
- American Academy of Pediatric Dentistry Policy Statements and Clinical Guidelines, www.aapd.org/policies/
- American Academy of Periodontology Clinical and Scientific Papers, www.perio.org/resources-products/clinical-scientific-papers.html
- National Institute of Dental and Craniofacial Research, www.nidcr.nih.gov

Target audience: The primary audience for such training is public health personnel without dentistry-related degrees or training. Such personnel might include

- Public health analysts;
- Epidemiologists;
- Policy analysts;
- Managers;
- Non-dental clinicians, such as nurses, physicians, physician assistants, dieticians;
- Local, state, and federal health organization leaders; and
- New state/local OH epidemiologists or recent Master's degree students who are hired in OH programs or new chronic disease, maternal and child health, and OH program staff in state/local health departments

In addition, this training module could be incorporated into the didactic programs for fellowships, such as CSTE Fellows and Epidemic Intelligence Service. Inclusion would help develop an epidemiology workforce that is adequately prepared to engage in OH-related projects.

Organizations that could help implement training: CSTE, ASTDD, ADA, local and state health departments; federal health agencies.

Projected costs: A didactic lecture program would be relatively inexpensive, particularly if volunteers assisted in developing and delivering the program (\$4,000–\$8,000 for travel costs and initial lecture development for one to three lectures/workshops). For the teleconference version, existing facilities could be used to deliver the content. Storage of the curriculum on a server would be required.

Developing a Web-based platform would require hiring a Web developer to design an interactive website. Although the didactic material could be developed with input and guidance from state OH epidemiologists at little or no additional cost, graphic designers or educational technologists would be

needed for some of the interactive modules, e.g., basic dental anatomy exercises. The modules also would need to be hosted on a server. However, posting material on participating organizations' websites should incur minimal costs. Developing a Web-based format would cost approximately \$20,000–\$40,000.

Topic #2: Factors Impacting OH Outcomes

Training format recommended: A webinar might be the most practical way to reach a wide audience that needs to improve its OH skills and knowledge. Archiving the webinar on existing websites, e.g., of CSTE or ASTDD, would be valuable. In addition, face-to-face lectures could be offered at national or regional meetings of epidemiologists or analysts.

Size or scope of training: Training should include basic information about the epidemiology of OH and the public health importance of OH; a limited overview of OH outcomes, e.g., caries, periodontal disease, oral and pharyngeal cancers, and orofacial clefts; descriptive epidemiology, including rates, high-risk groups, disparities, time trends, geographic distribution within the United States, risk factors, prevention and control measures, examples of successful public health interventions, and areas of future research.

- **Background:** Include a brief review of the public health importance of OH training, specifically summarizing that topic from Topic #1. If these two trainings are given together, this Background section could be skipped in lieu of completion of Topic #1.
- **Significance:** Focus on each of the four conditions below. For each, introduce the impact of the condition, describe mechanisms of disease, and briefly address any other known epidemiologic issues, e.g., inconsistencies in definitions or measurement.
 - **Dental caries:** Discuss evolutionary origins (e.g., caries in primate species), archaeological evidence of caries in ancient humans, and changing pattern of caries with advent of agriculture; historical pattern of change in location and frequency of caries attributed largely to diet change; ecologic triad of risk factors in dental caries, including host (age, genetics, saliva), environment (diet, social factors, fluoride), and agent (*Streptococcus mutans*, lactobacilli, *Actinomyces*).
 - **Periodontitis:** Discuss mechanisms of condition, lack of consistency in definitions for and measurement of periodontal disease, and implications on rates and knowledge of the role of various risk factors.
 - **Oral and pharyngeal cancers:** Discuss causes of leukoplakia and erythroplakia, specifically exposures to tobacco, alcohol, strains of human papillomavirus, and *Candida albicans* (in immunosuppressed persons).
 - **Orofacial clefts:** Discuss biological and environmental origins of clefts.
- **Descriptive epidemiology:** Begin with a discussion U.S. rates of oral disease (as a broad category) overall, followed by rates dental caries, periodontitis, oral and pharyngeal cancers, and orofacial clefts.

- High-risk groups: Discuss differences in rates for each of the four conditions by age, sex, and racial/ethnic groups; and nature of risk, i.e., predominately biological or environmental, for high-risk groups.
- Time trends: Focus on U.S. trends, going back to earliest reliable nationwide data, for each of the four conditions.
- Geographic distribution: Discuss spatial variation in rates within the United States; highlight regional variation, as well as rural/urban differences and socioeconomic variations in risk for each of the four conditions.
- Risk factors (magnitude of risk factors, population-attributable risk): Describe risk factors and the greatest predictors for each outcome (dental caries, periodontitis, oral and pharyngeal cancers, orofacial clefts); how state-specific information can be obtained.
- Prevention and control measures (prevention, screening and early detection, treatment): Describe the principal prevention, screening, and treatment methods used for each of the four outcomes; for example, for dental caries, highlight the historical impact of controlled fluoridation and oral screening during childhood.
- Examples of public health interventions: Summarize the major interventions and the interventions deemed most effective. (This section differs from the previous (prevention and control measures) section by providing multiple specific examples from states where public health interventions have been used successfully.)
- Areas of future research: Highlight likely directions of cutting-edge work investigating risk factors, as well as effectiveness of policy and environmental approaches.

Shelf life of information: This material should have a long shelf life. Reviewing the material every 5 years and incorporating major developments will keep the information current.

Target audience: The primary audience is state health departments that do not have a mature OH epidemiology capacity but are interested in building such capacity. This plan would target those states without current funding for OH (as well as newly funded/capacity building states, which include new OH epidemiologist positions). Implementation phase states or any other states with OH epidemiology experience most likely would consider the information refresher material. Training should be delivered at the Master's degree level in general.

Organizations that could help implement training: CDC, Association of State and Territorial Health Officials (ASTHO), CSTE, ASTDD, and the National Association of Chronic Disease Directors (NACDD).

Projected costs: A Web developer could be contracted for Web services, including webinar development, delivery, archiving, and evaluation. The material could be developed with input and guidance from state OH epidemiologists at little additional cost. Storage of the curriculum on a server would enable continuing delivery of material to new staff or to states with evolving interest in building capacity. Total cost: \$20,000–\$40,000.

Topic #3: How to Build an OH Surveillance System

Training format recommended: A Webinar might be the most practical way to reach a wide audience that needs to improve its OH skills and knowledge. Archiving the webinars on existing websites (e.g., CSTE, ASTDD) would be valuable. In addition, face-to-face lectures/workshops could be offered at national or regional meetings of epidemiologists or analysts.

Size or scope of training: Training should include determining objectives of a surveillance system; determining the logic model to use; selecting indicators; selecting sources of data and frequency; methods, e.g., sampling, data collection, processing and analysis, and report; and developing a dissemination plan and evaluation questions. It should also include background information about the current National Oral Health Surveillance System (NOHSS) and the CSTE White Paper on the definition of an OH surveillance system. Some overlap with material to be presented in Topic #4 is acceptable.

The training objectives for this topic are as follows:

- Understand basic principles of epidemiology and how they apply to surveillance in OH.
- Describe surveillance process and outcome measures for oral disease prevention.
- Understand basic surveillance activities for OH: data collection, recording, analysis, interpretation, and communication of surveillance findings.
- Know the process for development of a Surveillance Plan for OH for a state or region.
- Develop a logic model for OH surveillance.
- Be able to implement and evaluate a statewide OH surveillance plan.

Material can be presented in a series of webinars or two long webinars or face-to-face lectures. There are four major domains.

- Surveillance in OH—Concepts and Indicators: Provide an overview and define key dental terms used in OH surveillance. Sketch ways states can use the data for reporting and program evaluation. Present key elements from published reports to show how OH surveillance can be used for policy and to generate support for funding.
- Surveillance Plan Objectives and Resource Needs: Introduce the logic model (which specifies the inputs, activities, and outcomes that form the basis for the surveillance plan) as a tool for planning OH surveillance and identify resources for plan development. Formulate the logic model to guide the surveillance plan objectives and identifies resources.
- Process for Surveillance Plan Development: Emphasize that building the plan is a collaborative process and that partners are critical for surveillance data collection. Outline key components of the surveillance plan. Explain that once the logic model and surveillance plan goals are sketched out, partnerships need to be established to work on the details of planning for data collection. The roadmap for OH surveillance will cover the following domains: goals/objectives; OH indicators to be included; stakeholders/contributors; and infrastructure for collecting, managing, and reporting surveillance information.
- Implementation and Ongoing Evaluation: Address the surveillance plan in terms of program

management and continuous quality improvement. Review key issues, such as case definitions; community Institutional Review Board approval; data security and confidentiality; data analysis; and program sustainability. Provide an overview of quality assurance methods to ensure accuracy in program evaluation.

Shelf life of information: This material should have a moderate shelf life. Surveillance methods are constantly evolving and can impact OH surveillance efforts. Reviewing the material and methods every 3 years and incorporating major developments will keep the information adequately current.

Target audience: The primary audience is state health departments that do not have a mature OH epidemiology capacity but are interested in building such capacity. This plan would target states without current funding for OH (as well as newly funded/capacity building states and new OH epidemiologist positions). Implementation phase states or any other states with OH epidemiology experience most likely would consider the information refresher material.

Organizations that could help implement training: CDC, CSTE, ASTDD, and NACDD.

Projected costs: A Web developer could be contracted for Web services, including webinar development, delivery, archiving, and evaluation. The material could be developed with the input and guidance of state OH epidemiologists at little additional cost. Storage of the curriculum on a server would enable continuing delivery of material to new staff or to states with evolving interests in building capacity. Total cost: \$20,000–\$40,000.

Topic #4: Overview of National Oral Health Surveillance System iIndicators and Data Sources

Training format recommended: A webinar, website posting (CSTE, CDC, ASTDD), workshops at conferences, and peer-to-peer consultation might be the most effective means of reaching the audience.

Size or scope of training: Training should include information about an OH surveillance system as part of a public health surveillance system; definitions, overarching goal, components, and evolution; a brief history/background of the NOHSS and SOHSS and recent revisions and/or expansion; relationships with other indicators, such as chronic disease indicators and Healthy People 2020; different indicators and data sources available at the national, state, and local levels; indicators to measure OH risk factors and outcomes; comparisons of methods across different data sources; core versus recommended indicators in the SOHSS; means by which state and local OH programs can use the NOHSS and SOHSS depending on their needs and resources; and integrating OH measurement into cross-cutting areas (e.g., prenatal care, medical home, chronic disease management). This training could include one or two webinars that introduce and highlight the three primary state-level OH data sources (State Oral Health Survey, Water Fluoridation Reporting System, ASTDD Synopses) and selected indicators

Shelf life of information: This vital and emerging topic would require update and revision every 2 years.

Target audience: The primary audience is public health department epidemiologists and program staff at state and local OH/chronic disease and maternal and child health programs, OH program directors/managers in current OH epidemiology programs or interested in developing such efforts where they do not currently exist.

Organizations that could help implement training: Association of Maternal and Child Health Programs, NACDD, ASTDD, ASTHO, CDC, CDC's National Center for Health Statistics, dental public health residency programs.

Projected costs: A Web developer could be contracted for Web service. The material could be developed with input and guidance from state OH epidemiologists at little additional cost. Storage of the curriculum on a server would be required. Posting material on websites for participating organizations would cost very little (<\$1,000.) Workshop seminars or lectures presented at national meetings would require travel costs of presenters and time to develop the presentation, at least initially (\$4,000–\$8,000). Material and content could be provided at little cost by a state health department OH epidemiologist volunteer (\$20,000–\$40,000).

Topic #5: Selected Special Topics

A variety of special topics might interest members of targeted audiences. The ability to deliver desired special topics would enhance general outreach and maintain elevated interest levels. Furthermore, these special presentations would improve knowledge in specific areas and build lasting capacity in OH epidemiology.

Training format recommended: Special topics could be delivered in a variety of formats, including webinar, face-to-face didactic training courses; workshops at participating organizations' annual meetings (e.g., CSTE, ATSD, NACDD), and didactic training offered by teleconference.

Size and scope of training: What material should be presented would depend on the special topic chosen for presentation. Relevant topics could be determined by using a committee of state OH epidemiologists or by information derived from an informal email survey of the target audience. Initial suggested special topics include publishing resources for OH epidemiology (how, where), current OH-related policy issues, use of data to highlight health disparities, and development of methods for small areas estimation

Shelf life of information: Shelf life would vary by topic. The nature of special topics might preclude long-term shelf life for some; others topics might have a moderate (1–3 years) shelf life.

Target audience: Each special topic might have a different target audience. Outreach to determine topics to be delivered would depend on effective surveys of the needs and desires of all target audiences. Epidemiology units and chronic disease programs should be included in all offerings.

Organizations that could help implement training: CDC, CSTE, ASTDD, NACDD, and ASTHO.

Projected costs: A Web developer could be contracted for Web services, e.g., for webinars. Material could be developed with input and guidance from state OH epidemiologists at little or no cost. Storage of the curriculum on a server would be required. Costs for didactic lectures at meetings would include travel for the presenter and development of the lecture, at least initially (\$4,000–\$8,000 for one to three presentations). Seminars provided by teleconference would incur costs for lecture development and telecom lines. Total cost: \$20,000–\$40,000.

APPENDIX 1

List of Current Training Materials

Introduction

CDC. The public health system and the 10 essential public health services.

www.cdc.gov/nphpsp/essentialServices.html

CSTE Epidemiology Capacity Assessment report: chronic disease, maternal and child health and oral health modules, draft, September 2014. Includes sections on the epidemiology capacity of state health departments in OH.

State-based oral health surveillance systems: conceptual framework and operational definition, www.cste.org/?page=CSTEPublications. A comprehensive report written by ASTDD for CSTE, Draft, October 2013. This comprehensive document includes details regarding OH surveillance and the National Oral Health Surveillance System and a state OH surveillance system.

ASTDD. Best practice approach. State-Based Oral Health Surveillance System 2011.

www.astdd.org/docs/BPASurveillanceSystem.pdf. Provides a comprehensive outline for State-based Oral Health Surveillance activities and includes a draft logic model and examples of successful systems.

U.S. Department of Health and Human Services. Healthy people 2020 topics and objectives—oral health. www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=32. Includes overview and details of individual OH objectives, their national data sources, baseline, and targets.

Topic #1. The Public Health Importance of Oral Health

Casamassimo P, Holt K, eds. Bright futures in practice: oral health pocket guide. 2nd ed. Washington, DC: National Maternal and Child Oral Health Resource Center; 2014. www.mchoralhealth.org

Karst NS, Smith SK. Dental anatomy: a self-instructional program. 10th ed. Stamford: Appleton and Lange; 1998.

Topic #2. Factors Affecting Oral Health Outcomes

Fluoride Recommendations Work Group. Recommendations for using fluoride to prevent and control dental caries in the United States. MMWR Recomm Rep 2001;50(RR-14):1–42.

www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm. Guide dental and other health-care providers, public health officials, policy makers, and the public in the use of fluoride to prevent and control dental caries, while using resources efficiently and reducing the likelihood of enamel fluorosis.

U.S. Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.

<http://profiles.nlm.nih.gov/ps/retrieve/ResourceMetadata/NNBBJT/>. This first Surgeon General's report on OH can be used as a comprehensive report or training material that ranges from basic OH and status and disparities of oral diseases and disorders to relationships between OH and general health and oral disease prevention and control strategies.

Topic #3. How to Build an Oral Health Surveillance Plan

Michigan Department of Community Health, Bureau of Epidemiology. Dental public health activities and practices. Includes Oral Health Surveillance Plan—guiding the development of a state surveillance system 2010. www.astdd.org/bestpractices/DES25004MIsurveillancesystem.pdf. This is an excellent example of a surveillance plan for OH.

Children's Health Alliance of Wisconsin. Wisconsin's roadmap to improving oral health 2013–2018, 2014. www.chawisconsin.org/documents/OH3OralHealthRoadmap.pdf. This document shows the utility of surveillance data for policy makers and OH stakeholders.

Smith PF, Hadler JL, Stanbury M, et al. "Blueprint version 2.0": updating public health surveillance for the 21st century. J Public Health Manag Pract 2013;19:231–9.

<http://journals.lww.com/jphmp/pages/articleviewer.aspx?year=2013&issue=05000&article=00007&type=abstract>. CSTE proposed updated strategies for public health surveillance. OH surveillance is within the conceptual framework of the public health surveillance.

ASTDD. ASTDD basic screening survey. www.astdd.org/basic-screening-survey-tool/. Basic screening survey protocol and related resources and documents to plan, design, implement, and analyze the State Oral Health Survey.

Topic #4. Overview of National Oral Health Surveillance System Indicators and Data Sources

Malvitz DM, Barker LK, Phipps KR. Development and status of the National Oral Health Surveillance System. Prev Chronic Dis 2009;6:A66. www.ncbi.nlm.nih.gov/pmc/articles/PMC2687872/. A historical overview of and rationale for the initial development of NOHSS indicators.

CSTE Position Statement (12-CD-01). (2012). Proposed new and revised indicators for the National Oral Health Surveillance System. Available under CSTE Position Statement Archive:

www.cste.org/?page=PositionStatements. A revision of NOHSS indicators and their state-level data sources to align with expanded Healthy People 2020 objectives.

CSTE Position Statement (99-CD/MCH-01). (1999). Inclusion of oral health indicators in the National Public Health Surveillance System (NPHSS). Available under CSTE Position Statement Archive: www.cste.org/?page=PositionStatements. Proposed inclusion of four OH indicators in the NPHSS, including three indicators among adults from the Behavioral Risk Factor Surveillance System (dental visit, teeth cleaning and edentulism) and one indicator on fluoridation status. These indicators were included in the initial set of NOHSS indicators.

CSTE Position Statement (99-CD/MCH-02). (1999). Inclusion of childhood dental caries and dental sealants Indicators in the National Public Health Surveillance System, NPHSS. Available under CSTE Position Statement Archive: www.cste.org/?page=PositionStatements. Proposed inclusion of three OH indicators among children in the NPHSS, including caries experience, untreated caries, and sealant indicators from the State Oral Health Survey based on the ASTDD Basic Screening Survey protocol. These indicators among third-grade students were included in the initial set of NOHSS indicators.

Topic #5. Selected Special Topics

Institute of Medicine (2011). Advancing oral health in America. www.iom.edu/Reports/2011/Advancing-Oral-Health-in-America.aspx. Assessed the current OH status and OH care system and recommended strategic actions to improve OH and OH care of the nation

Institute of Medicine (2011). Improving access to oral health care for vulnerable and underserved populations. www.iom.edu/Reports/2011/Improving-Access-to-Oral-Health-Care-for-Vulnerable-and-Underserved-Populations.aspx. Assessed the current OH care system and developed a vision for improving OH care for vulnerable and underserved populations, such as children and Medicaid beneficiaries.

Gooch BF, Griffin SO, Gray SK, et al. Preventing dental caries through school-based sealant programs: updated recommendations and reviews of evidence. J Am Dent Assoc 2009;140:1356–65. [http://jada.ada.org/article/S0002-8177\(14\)64584-0/fulltext](http://jada.ada.org/article/S0002-8177(14)64584-0/fulltext). Provides guidance to school-based sealant programs.

APPENDIX 2

Abbreviations and Acronyms

ADA	American Dental Association
ASTDD	Association of State and Territorial Dental Directors
ASTHO	Association of State and Territorial Health Officials
CDC	Centers for Disease Control and Prevention
CSTE	Council of State and Territorial Epidemiologists
NACDD	National Association of Chronic Disease Directors
NOHSS	National Oral Health Surveillance System
NPHSS	National Public Health Surveillance System
OH	oral health
SOHSS	State Oral Health Surveillance System