



# MISSISSIPPI ORAL HEALTH SURVEILLANCE PLAN 2018-2022

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MISSISSIPPI STATE DEPARTMENT OF HEALTH

Office of Oral Health  
Office of Health Data and Research

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## INTRODUCTION

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### The Purpose of Public Health Surveillance

The 1988 Institute of Medicine (IOM) report on the future of public health outlines three core functions for public health: assessment, policy development, and assurance [IOM]. In the report (updated in 2003), the IOM recommended that every public health agency regularly and systematically collect, assemble, analyze, and disseminate information on community health status to carry out the assessment function. Public health agencies accomplish this task through public health surveillance -- the ongoing, systematic collection, analysis, and interpretation of health data [Teutsch]. Surveillance is essential for planning, implementing, and evaluating public health practice and, ideally, is closely integrated with data dissemination to public health decision makers and other stakeholders [Hall]. The overarching purpose of public health surveillance is to provide **actionable health information to guide public health policy and programs** [Smith].

### The Public Health Importance of Oral Health

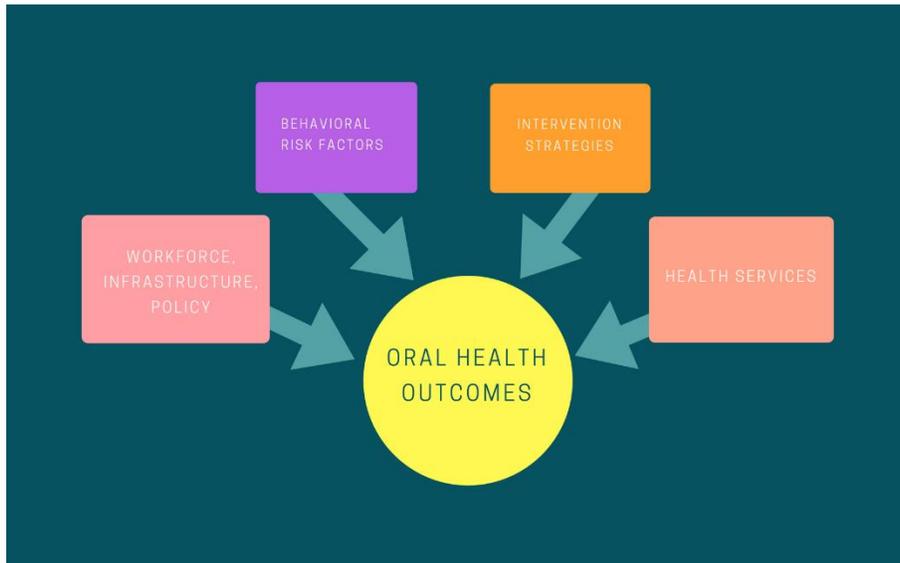
The 2000 report, *Oral Health in America: A Report of the Surgeon General*, states that oral health is more than healthy teeth [DHHS]. That means being free of chronic oral-facial pain, oral and pharyngeal (throat) cancers, oral soft tissue lesions, cleft lip or other birth defects, oral injuries due to sports-related trauma or physical abuse, and scores of other diseases and disorders that affect the oral, dental, and craniofacial tissues. The report notes that oral health is integral to general health and stresses the importance of good oral health at both the individual and population (public health) level.

In the United States, the two most common oral diseases are dental caries (tooth decay) and periodontal (gum) disease. Although less common, cancers of the oral cavity and pharynx, orofacial clefts (cleft lip and cleft palate), malocclusion, oral-facial pain, and other oral health problems can severely affect general health and quality of life. For example, poor oral health impacts the ability to eat, communicate and learn, and affects how we look and interact with others, sometimes creating low self-esteem or making it difficult to find jobs where public interaction is important.

Each oral disease or condition, also referred to as an oral health outcome, is influenced by a variety of factors including access to dental care, individual risk factors and risk determinants, availability of interventions, workforce and financing issues, public health infrastructure, and public policies (See Figure 1). Following is a brief overview of the major oral health outcomes including common risk factors and intervention strategies.

**Dental Caries:** Dental caries has been described as the single most common chronic childhood disease [DHHS]. In 2011-2012, approximately 37% of U.S. children aged 2-8 years experienced dental caries in primary teeth while 21% of children aged 6-11 and 58% of adolescents aged 12-19 experienced dental caries in permanent teeth [Dye, NCHS brief 191]. The impact of dental caries accumulates over time; of those 20-64 years of age, 91% had caries experience (treated or untreated decay) [Dye, NCHS brief 197]. The prevalence of dental caries experience is generally higher in low-income and minority populations, representing a significant health disparity.

Figure 1: Factors Impacting Oral Health Outcomes



There are effective preventive intervention strategies for dental caries. Caries prevalence and severity can be reduced by appropriate use of fluorides through community water fluoridation, personal or professional topical fluoride applications, and use of toothpaste with fluoride. CDC has recognized community water fluoridation as one of ten great public health achievements of the 20<sup>th</sup> century, yet not everyone has access to fluoridated water [CDC, 1999]. Dental sealants are another effective intervention, preventing caries development in the pits and fissures of molar (back) teeth [Ahovuo-Saloranta]. Dental sealants can be applied in dental offices or community settings (e.g., schools), yet far too few children are benefiting from this proven preventive service; in 2011-2012 in the U.S., only 31% of 6-8 year olds, 49% of 9-11 year olds and 43% of 12-19 year olds had dental sealants on at least one permanent molar [Dye, NCHS brief 191].

To reduce the prevalence of untreated dental decay, all individuals, regardless of income or dental insurance coverage, must have access to restorative dental care. Access to dental care, in turn, is influenced by infrastructure, workforce, financing and policy factors, including availability of low-cost clinics, dentist-to-population ratio, percent of dentists accepting government-funded dental insurance, reimbursement rates for government-funded programs, plus dental practice acts involving supervision, scope of practice and reimbursement.

**Periodontal Disease:** Periodontal disease is another common public health problem in the United States. More than 46% of adults 30 years and older have destructive periodontal disease (periodontitis) with 9% having severe periodontitis characterized by loss of the bony structure supporting the teeth and resulting in partial or total tooth loss [Eke]. Among adults aged 65 years and older, nearly two thirds (68%) have periodontitis with 11% classified as severe [Eke]. As with dental caries, substantial oral health disparities exist. The prevalence of periodontitis is higher in men, Hispanics, adults with less than a high school education, adults below 100% of the Federal Poverty Level, and current smokers [Eke]. The most

common risk factor for periodontitis is smoking; tobacco use prevention and cessation could be a potentially effective population level intervention strategy.

**Cancers of the Oral Cavity and Pharynx:** Although substantially less common than dental caries and periodontitis, cancers of the oral cavity and pharynx have a significant impact on the health care system and should be included in public health surveillance. The National Cancer Institute estimates that in 2018 there will be 51,540 new cases of and 10,030 deaths from cancers of the oral cavity and pharynx [SEER]. Cancers of the oral cavity and pharynx are more common in men than women, among those with a history of tobacco or heavy alcohol use, and individuals infected with human papillomavirus (HPV). Based on data from 2009-2013, the number of new cases of oral cavity and pharynx cancer was 11.1 per 100,000 men and women per year [SEER]. Currently, the primary public health and personal prevention strategies are tobacco cessation and no more than moderate alcohol consumption. HPV vaccines might prevent oral cavity and pharynx cancers as the vaccines prevent an initial infection with HPV types that can cause these cancers, but studies have not yet been done to determine if HPV vaccines will prevent them.

**Orofacial Clefts:** For reporting purposes, orofacial clefts are generally classified as either (1) cleft palate without cleft lip or (2) cleft lip with and without cleft palate. Based on the most recent CDC statistics in 2004-2006 data from 14 state birth defects tracking programs, the estimated incidence of cleft palate without cleft lip is 1 in 1,574 live U.S. births (2,651 cases annually), and the incidence of cleft lip with or without cleft palate is 1 in 940 live births (4,437 cases annually) [Parker]. Orofacial clefts in the U.S. are most common among American Indian and Asian children. Risk factors include family history and maternal use of tobacco, alcohol and street drugs during pregnancy. Prevention strategies include folic acid supplementation plus tobacco, alcohol and drug use cessation during the prenatal period.

**Disparities in Access to Dental Care:** As previously mentioned, oral health disparities are profound in the United States. Children in lower-income families have higher dental caries rates than non-poor children; minority populations have worse oral health than the population in general; and rural residents have worse oral health than urban residents [DHHS]. These disparities start in childhood and persist throughout the lifecycle.

Limited or infrequent access to dental care contributes to poor oral health. Unfortunately, in the U.S. about 46% of children aged 2-17 years did not visit a dentist in 2013, with black (53%) and Hispanic children (51%) more likely to not have visited a dentist compared with white children (41%) [AHRQ]. For adults 18 years and older, 35% report having no dental visit within the past year, with substantial disparities by education, income and race/ethnicity. For those with an annual income less than \$15,000, 57% had no dental visit compared with 20% of those with an income of \$50,000 or more [CDC, 2012 BRFSS].

**Financial Implications:** The cost of treating dental disease is significant. According to the Centers for Medicare & Medicaid Services (CMS), spending for dental services in 2014 was \$113.5 billion, with out-of-pocket personal spending accounting for approximately 40% of all dental spending [CMS].

**Summary:** In summary, the public health implications of poor oral health status are vast. Poor oral health impacts a person’s ability to eat, speak, work, communicate, and learn. Although most oral diseases and conditions are preventable, virtually all adults—and many children—have experienced some oral disease. Serious oral health disparities exist by race, age, geography, and income. The cost of oral disease treatment is significant, and the majority of those costs are paid by individuals or through private insurance. Much of the population can’t afford dental care or doesn’t take advantage of public insurance benefits.

CDC guidelines for evaluating public health surveillance systems recommend that health-related events (in this case oral diseases and conditions) be considered for surveillance if they affect many people, require large expenditures of resources, are largely preventable, and are of public health importance [German]. ***Based on these criteria, oral health outcomes, associated health behaviors, and other factors linked to oral health are included in Mississippi’s oral health surveillance system.***

### Framework for a State Oral Health Surveillance System

According to the Council of State and Territorial Epidemiologists (CSTE), a state oral health surveillance system (OHSS) should provide information necessary for public health-decision making by routinely collecting data on oral health outcomes, access to care, risk factors and intervention strategies for the whole population, representative samples of the population, or priority subpopulations. In addition, a state OHSS should consider collecting information on the oral health workforce, infrastructure, financing, and policies influencing oral health outcomes. A state OHSS can access data from existing sources, supplemented by additional information, such as data from a Basic Screening Survey, to fill data gaps [Phipps].

Surveillance systems are not just data collection systems. They must include mechanisms to 1) communicate findings to those responsible for programmatic and policy decisions and to the public, and 2) ensure data are used to inform and evaluate public health measures to prevent and control oral diseases and conditions. According to the Association of State and Territorial Dental Directors’ *Best Practice Report on State Based Oral Health Surveillance Systems*, a state oral health surveillance system should (1) have an oral health surveillance plan, (2) define a clear purpose and objectives relating to the use of surveillance data for public health action, (3) include a core set of measures/indicators to serve as benchmarks for assessing progress in achieving good oral health, (4) analyze trends, (5) communicate surveillance data to decision makers and the public in a timely manner, and (6) strive to ensure that surveillance data is used to improve the oral health of state residents [ASTDD].

### Operational Definition for a State Oral Health Surveillance System

Healthy People 2020 (HP2020) Objective OH-16 – “Increase the number of states and the District of Columbia that have an oral and craniofacial health surveillance system” – deserves special mention. In 2013, CSTE developed an operational definition for HP2020 OH-16. This operational definition is a core or foundational set of surveillance elements. A state is considered to have an oral health surveillance system if they have ***all of the following ten items*** [Phipps].

- A written oral health surveillance plan that was developed or updated within the previous five years.
- Oral health status data for a representative sample of third grade children, including prevalence of caries experience, untreated tooth decay, and dental sealants on permanent molars meeting criteria for inclusion in the National Oral Health Surveillance System (NOHSS). Data must have been collected within the previous five years.
- Permanent tooth loss data for adults obtained within the previous two years.
- Annual data on the incidence of and mortality from cancers of the oral cavity and pharynx.
- Annual data on the percent of Medicaid- and CHIP-enrolled children who had a dental visit within the past year.
- Data on the percent of children 1-17 years who had a dental visit within the past year, obtained every four years.
- Data on the percent of adults ( $\geq 18$  years) and adults with diabetes who had a dental visit within the past year, obtained within the previous two years.
- Data on the fluoridation status of public water systems within the state, updated every two years.
- Annual data on state oral health programs and the environment in which they operate, including workforce and infrastructure indicators.
- Publicly available, actionable data to guide public health policy and programs disseminated in a timely manner. This may take the form of an oral disease burden document, publicly available reports, or a web-based interface providing information on the oral health of the state's population developed or updated within the previous five years.

## MISSISSIPPI'S ORAL HEALTH SURVEILLANCE SYSTEM

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### Purpose

The purpose of Mississippi's oral health surveillance system (MOHSS) is to provide a consistent source of updated reliable and valid information for use in developing, implementing, and evaluating programs to improve the oral health of Mississippi's residents. Assessment is the key objective of Mississippi's public health efforts to address the nature and extent of oral diseases and their risk factors by collecting, analyzing, interpreting, and disseminating oral health data. These activities provide a mechanism to routinely monitor state-specific oral health data and the impact of interventions within specific priority populations over time. Continual assessment and evaluation support development of oral health programs and policies, hence a surveillance system is a critical requirement for the oral health program. The logic model for Mississippi's OHSS is located in Appendix 1.

### Objectives

1. Estimate the extent and severity of oral disease and risk factors in Mississippi.
2. Measure utilization of oral health services in Mississippi.
3. Monitor utilization and effectiveness of community-based and school-based oral health prevention programs.
4. Identify populations at high risk of oral disease and the unmet needs of these populations.
5. Provide current, scientific, and reliable data for the state.
6. Use oral health data to plan, implement, and evaluate the impact of Mississippi's oral health programs and policies.
7. Provide information for decision-making and public health resource allocations.
8. Evaluate Mississippi's strengths and gaps in surveillance measurements and in surveillance of priority populations and identify opportunities to improve the OHSS.

### Oral Health Indicators

The indicators that form the framework of MOHSS include the full set of indicators outlined in the CSTE operational definition of an oral health surveillance system for HP2020 OH-16 [Phipps]. The MOHSS also includes a subset of oral health indicators approved by CSTE for inclusion in NOHSS. The CSTE approved indicators are being used because CSTE is the organization responsible for defining and recommending which diseases and conditions should be reportable within states and which should be voluntarily reported to the Centers for Disease Control and Prevention.

For a public health surveillance system to be effective and responsive, it must adapt to new health challenges and data sources. Consequently, the indicators included in the MOHSS may change during the 5-year time frame outlined by this plan. The indicators currently included in the MOHSS are outlined in Table 1. Refer to Appendix 2 for a list of the indicators with their data sources.

Table 1: Indicators Included in the Mississippi Oral Health Surveillance System by Domain and Age Group

| Domain                         | Preschool Children   |   | School Children   | Adults   | Older Adults   |
|--------------------------------|--|---|---|--|--|
| Oral Health Outcomes           | <b>Birth</b><br>Cleft lip & Palate   | <b>Head Start</b><br>Caries experience<br>Untreated tooth decay<br>Need for Treatment | <b>Kindergarten &amp; 3<sup>rd</sup> Grade</b><br>Caries experience*<br>Untreated tooth decay*<br>Sealant prevalence (3 <sup>rd</sup> grade)*<br>Need for Treatment | <b>18-64 Years</b><br>Any tooth loss*  | <b>65+ Years</b><br>6+ teeth lost*<br>Complete tooth loss* |
|                                | 1-17 Years <sup>†</sup><br>Parent's self report of child's oral health, oral health problems                                   |   |   | <b>All Ages</b><br>Incidence of and mortality from cancers of the oral cavity and pharynx* |  |
| Health Services/Access to Care | <b>Medicaid/CHIP 0-20 years</b><br>Dental visit*<br>Preventive Service<br>Treatment Service<br>Sealant Placement (6-9 & 10-14) |   |   | <b>18+ Years</b><br>Dental visit*  |  |
|                                | <b>1-17 Years</b><br>Dental visit & preventive dental visit*   |   |   | <b>Adults 18+ Years with Diabetes</b><br>Dental visit*                                     |  |
|                                | <b>Pregnant Women</b><br>Teeth Cleaning<br>Dental Visit  |   |   |  |  |
|                                | <b>Low-Income (FQHC patients)</b><br>Dental Visit  |   |   |  |  |
| Intervention Strategies        |  |   | School-based or school-linked dental sealant programs   |  |  |
|                                | Topical fluoride programs*   |   |   |  |  |
| Workforce and Infrastructure   | Community water fluoridation*  |   |   |  |  |
|                                | Number of dental professionals*<br>Number of safety net dental clinics*<br>Dental Health Professional Shortage Areas*          |   |   |  |  |

\* The core set of indicators recommended by CSTE for inclusion in a state OHSS

† These indicators may be modified or deleted based on the redesign of the National Survey of Children's Health

**Data Sources and Data Collection Timeline**

The majority of the indicators in Mississippi's OHSS are available from existing ongoing data sources such as the Behavioral Risk Factor Surveillance System. The indicators that will require primary data collection are: (1) the prevalence of decay experience and untreated decay in Head Start and 3<sup>rd</sup> grade children, (2) the prevalence of dental sealants in 3<sup>rd</sup> grade children (3) the number of school-based dental sealant programs, (4) the number of community-based topical fluoride programs, and (5) the number of safety-net dental programs. Information on the oral health status of Head Start and 3<sup>rd</sup> grade children will be obtained using the ASTDD Basic Screening Survey (BSS) protocol. The remaining information will be obtained through Department of Health surveys of state, local and safety-net programs. Existing data sources that will be used for the other indicators include the following:

- Behavioral Risk Factor Surveillance System (BRFSS) – tooth loss and dental visit among adults, older adults and adults with diabetes
- Pregnancy Risk Assessment and Monitoring System (PRAMS) – teeth cleaning and dental visits among pregnant women
- CMS-416: Annual Early Periodic Screening, Diagnosis and Treatment (EPSDT) Program Participation Report – dental visit among children eligible for Medicaid/CHIP
- Mississippi State Board of Dentistry (BOD) – number of dental professionals
- Mississippi Office of Primary Care – health professional shortage areas
- National Cancer Institute's Surveillance, Epidemiology and End Results Program (NCI/SEER) – incidence of cancers of the oral cavity and pharynx

- CDC’s National Program of Cancer Registries (CDC/NPCR) – incidence of and mortality from cancers of the oral cavity and pharynx
- National Survey of Children’s Health (NSCH) – oral health, oral health problems, dental visit, and preventive dental visit among children 1-17 years (may be modified or deleted based on the redesign of NSCH)
- National Vital Statistics System (NVSS) – mortality from cancers of the oral cavity and pharynx
- Uniform Data System (UDS) – number of federally qualified health centers with dental clinics
- Water Fluoridation Reporting System (WFRS) – population served by fluoridated water systems

**Table 2: Timeline for Collecting Oral Health Indicator Data**

| Data Source                 | 2018                           | 2019 | 2020                           | 2021 | 2022 |
|-----------------------------|--------------------------------|------|--------------------------------|------|------|
| BSS – 3 <sup>rd</sup> Grade |                                |      | Begin planning for 2019-20 BSS |      |      |
| BSS – Head Start            | Begin planning for 2018-19 BSS |      |                                |      |      |
| BRFSS                       | X                              |      | X                              |      | X    |
| PRAMS                       | X                              | X    | X                              | X    | X    |
| CMS-416                     | X                              | X    | X                              | X    | X    |
| BOD                         | X                              | X    | X                              | X    | X    |
| Primary Care                | X                              | X    | X                              | X    | X    |
| NCI/SEER                    | X                              | X    | X                              | X    | X    |
| CDC/NPCR                    | X                              | X    | X                              | X    | X    |
| NSCH*                       |                                | X    |                                |      |      |
| NVSS                        | X                              | X    | X                              | X    | X    |
| UDS                         | X                              | X    | X                              | X    | X    |
| WFRS                        | X                              |      | X                              |      | X    |

\* May be modified depending on the redesign of NSCH

**Data Dissemination and Use**

Surveillance results will be disseminated to interested programs and policy makers at the local, state, and national levels through presentations, published reports, and briefs. Presentations, reports, and briefs will be used to increase awareness about oral diseases and their risk factors, monitor trends and disparities, develop new interventions, and expand existing programs. Reports/briefs planned for distribution in the next 5 years include:

- 2019: Mississippi data briefs on the oral health of special population groups such as pregnant women and adults with diabetes
- 2021: Mississippi Smile Survey – a report on the oral health of Mississippi’s Head Start and 3<sup>rd</sup> grade children
- 2023: The Burden of Oral Disease in Mississippi – a full report highlighting the current oral health of Mississippi’s residents

Reports will contain current oral health data and trend data as available. Reports will be distributed electronically to MSDH Office of Oral Health program partners within the health department and across the state and shared with other state oral health programs as well as CDC and ASTDD. Reports will be

available electronically on the state website, and as funds will allow, a limited number will be printed for distribution at meetings.

Venues for presentation of surveillance results include but are not limited to the Mississippi Oral Health Coalition, Mississippi Dental Association annual meeting, Mississippi Dental Hygienists' Association annual meeting, the ASTDD/AAPHD co-sponsored National Oral Health Conference, the CSTE annual meeting, MCH annual meetings, and the Mississippi Primary Care Association annual meeting.

### Privacy and Confidentiality

The Mississippi OHSS follows Health Insurance Portability and Accountability Act (HIPAA) standards for patient privacy and protected health information. The system limits identifiers collected to only essential data elements, and the data are stored on a secure, private, electronic server at the Mississippi State Department of Health. Unique identifiers can only be seen by health department staff that have been trained on HIPAA, data security, and confidentiality. Unique identifiers will never be released to external partners and aggregate data will never be reported for counts less than five.

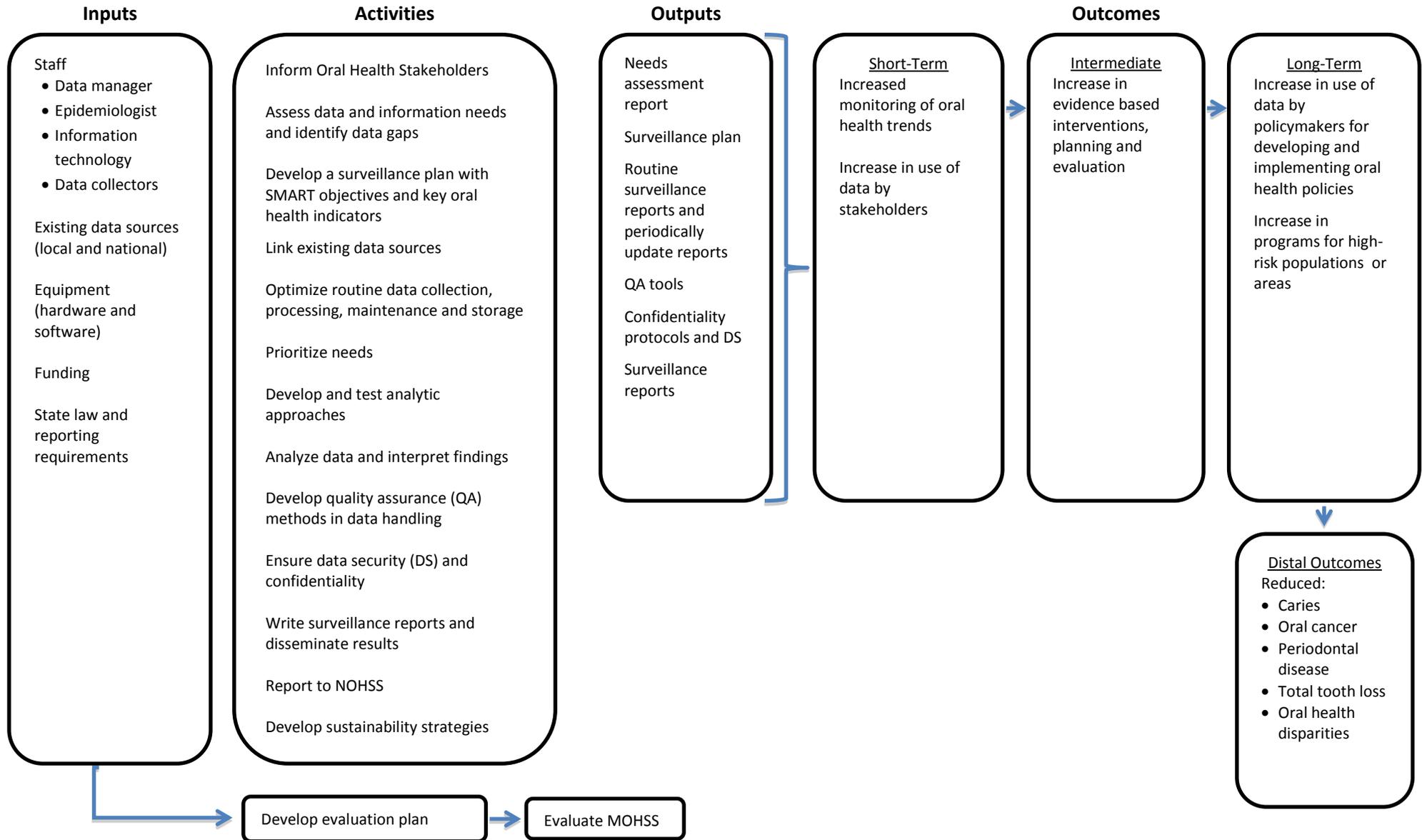
### Evaluation

The purpose of evaluating MOHSS is to ensure that the oral health indicators are being monitored effectively and efficiently and to increase the utility and productivity of the system. An evaluation will be performed in 2020 to determine the system's usefulness in monitoring oral health trends over time, determining the effectiveness of interventions, and planning future programmatic and policy initiatives. The Mississippi State Department of Health will evaluate the MOHSS based on CDC's framework for program evaluation including how well the following six steps outlined in *Updated Guidelines for Evaluating Surveillance Systems* were implemented [German].

- Engage Mississippi's stakeholders;
- Describe MOHSS;
- Focus the evaluation design;
- Gather credible evidence regarding the performance of MOHSS;
- Justify and state conclusions, make recommendations; and
- Ensure use of evaluation findings and share lessons learned.

The evaluation of MOHSS will focus on providing recommendations for improving the quality, efficiency, and usefulness of the system. MOHSS will also be evaluated to determine the system's sustainability, the timeliness of analysis of surveillance data, dissemination and use of the reports by stakeholders, and the surveillance system's impact on policy and legislative actions.

Appendix 1: Logic Model for Mississippi’s Oral Health Surveillance System



Appendix 2: Data Sources for the Indicators Included in Mississippi’s Oral Health Surveillance System

| Domain                     | Target Population  | Indicator                                    | Data Source              |
|----------------------------|--|--|--------------------------|
| Oral Health Outcomes       | Head Start   | Caries experience                            | Mississippi BSS          |
|                            |  | Untreated tooth decay                        | Mississippi BSS          |
|                            | 3 <sup>rd</sup> Grade  | Caries experience                            | Mississippi BSS          |
|                            |  | Untreated tooth decay                        | Mississippi BSS          |
|                            |  | Sealant prevalence                           | Mississippi BSS          |
|                            | 1-17 Years   | Parent’s self-report of child’s oral health* | NSCH                     |
|                            |  | Oral health problem in last year*            | NSCH                     |
|                            | 18-64 Years  | Any tooth loss                               | BRFSS                    |
|                            | 65+ Years  | 6+ teeth lost                                | BRFSS                    |
|                            |  | Complete tooth loss                          | BRFSS                    |
| All Ages                   | Incidence of and mortality from cancers of the oral cavity and pharynx | NCI/SEER, NVSS, CDC/NPCR                     |                          |
| Access to Care             | Medicaid/CHIP  | Dental visit                                 | CMS-416                  |
|                            | 1-17 Years   | Dental visit*                                | NSCH                     |
|                            |  | Preventive dental visit*                     | NSCH                     |
|                            | 18+ Years  | Dental visit                                 | BRFSS                    |
|                            | Adults with Diabetes   | Dental visit                                 | BRFSS                    |
| Pregnant women             | Dental visit   | PRAMS  |                          |
| Intervention Strategies    | All Ages   | Community water fluoridation                 | WFRS                     |
|                            | School Children  | School dental sealant programs               | Mississippi DOH          |
|                            | Children   | Topical fluoride programs                    | Mississippi DOH          |
| Workforce & Infrastructure | Dental Professionals   | Number of dental professionals               | Mississippi BOD          |
|                            | Low-income Communities   | Number of safety net dental clinic           | Mississippi DOH          |
|                            |  | Dental Health Professional Shortage Areas    | Mississippi Primary Care |

\* May be modified depending on the redesign of NSCH

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