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Children's Oral Health in Maine: The Surveillance System

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Capstone Report

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Table of Contents

Appendices

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Introduction

Oral health plays an important role in the overall health and well-being of individuals. Poor oral health can affect physical health and may contribute to chronic diseases such as heart disease and diabetes (Oral Health in Maine, 2013). Poor oral health among children can affect learning, socialization, and school attendance, and can lead to more oral health problems later in life (Oral Health in Maine, 2013). Dental caries are the most common chronic disease among children, five times more common than asthma (Bales, 2011). Although dental caries can be prevented, a significant proportion of Maine's children experiences dental decay. A statewide survey from 2011 showed that 22% of kindergartners and 33% of third graders had either treated or untreated cavities (Oral Health in Maine, 2013). About half of the children in each group had untreated cavities at the time of the screening. Childhood is the ideal time for preventive actions. Increased efforts in preventive interventions such as sealants, fluoride varnish, and fluoridated water are among the best preventive measures that support children's oral health. However, lack of understanding of the needs and best practices, insufficient infrastructure to implement preventive strategies through the public health system, and limitations on available resources can obstruct these efforts.

Furthermore, surveillance of oral disease and conditions are key elements in improving and maintaining the oral health of Maine's population (Oral Health in Maine, 2013). A preliminary review of the literature suggests that Maine has limited funding and infrastructure for collecting oral health data, and current oral health surveillance efforts include a mix of data collection methods. This surveillance process provides an overview of oral health across the

state; however, a complete and accurate oral health surveillance system would allow the state to more effectively measure and monitor the burden of oral health and help guide public health actions.

Background- Public Health Surveillance

The Future of Public Health report by the Institute of Medicine (IOM) from 1988 outlined three core functions of public health: assessment, policy development, and assurance (Association of State and Territorial Dental Directors [ASTDD], 2017a). The assessment function can be accomplished through public health surveillance. Public health surveillance is "...the ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation and evaluation of public health practice, closely integrated with the dissemination of these data to those who need to know and linked to prevention and control" (ASTDD, 2015, p. 1). Oral health surveillance provides data necessary to effectively design and evaluate strategies to improve the oral health of the population.

At the national level, an oral health surveillance system can help monitor the burden of oral health among people across the country. The Healthy People 2020 (HP2020) initiative includes a set of national goals and objectives for improving the oral health of all Americans. These oral health objectives are geared toward national-level surveillance and use sources such as the National Health and Nutrition Examination Survey (NHANES) to collect nationwide oral health data (Phipps, Kuthy, Marianon, & Isman, 2013). HP2020 has identified increasing state oral health surveillance systems as a national goal.

At the state level, most oral health surveillance systems are designed to measure and monitor the burden of oral disease consistent with HP2020 oral health objectives (ASTDD, 2017a). Starting in 1998, the Centers for Disease Control and Prevention (CDC) and the

Association of State and Territorial Dental Directors (ASTDD) began creating the National Oral Health Surveillance System (NOHSS) to help oral health programs monitor the burden of oral disease and the use of dental services, and to assess community water fluoridation status at the state and national levels (ASTDD, 2017a). With assistance from the Council of State and Territorial Epidemiologists (CSTE), oral health indicators were approved for inclusion in the NOHSS based on existing data sources available to most states. The CSTE is an "organization responsible for defining and recommending which diseases and conditions should be reportable within states and which should be voluntarily reported to the CDC" (ASTDD, 2017a, p. 3). As of July 2017, the CSTE has approved 36 indicators for inclusion in the NOHSS (see Appendix A for the list of CSTE approved indicators).

According to the CSTE, a state oral health surveillance system should routinely collect data on oral health outcomes, access to dental care, risk factors and intervention strategies using representative samples of the population, and collect oral health workforce, infrastructure and policy data (ASTDD, 2017a). To obtain this data, a state oral health surveillance system can use existing data sources, supplemented with primary data collection to assess oral health outcomes.

Purpose

The purpose of this Capstone is to determine the status of Maine's oral health surveillance system and to assess data availability and quality for children. Examining Maine's current surveillance system will provide information on how data is being collected and tracked, what oral health indicators are being used, and the accuracy of these measures (reach/confidence intervals). Additionally, comparing Maine's oral health surveillance system to national recommended best practices will inform improvements to the current data collection system. To

examine Maine's current oral health surveillance system for children, the following research questions were examined:

1. What are the current data collection methods in Maine for children's oral health? What indicators are used and what do they tell us? Is the data reliable and accurate?
2. Is this data comparable to national recommended best practices? If data is comparable, recommendations to strengthen Maine's oral health surveillance system will be provided.

Methods

Literature Review

The research questions were examined using a combination of qualitative and quantitative methods. A review of the literature was completed during the first month of the project using information from the Centers for Disease Control and Prevention (CDC), the Association of State and Territorial Dental Directors (ASTDD), and the Council of State and Territorial Epidemiologists (CSTE). These sources provide national and state level oral health surveillance information. National guidance from the ASTDD was used to identify best practices and recommendations. Maine's 2013 burden of oral health report, *Oral Health in Maine, January 2013* was also examined to determine where Maine stood previously with oral health surveillance and to provide a comparison of current practices and to consider the focus of future efforts.

Existing Oral Health Data Sources

A secondary data analysis was completed using existing ongoing sources of state level oral health data. The surveillance sources examined include the National Survey of Children's Health (NSCH); Office of Head Start Program Information Report (PIR); Maine Integrated Youth Health Survey (MIYHS); Centers for Medicare and Medicaid (CMS) Early Periodic

Screening, Diagnosis and Treatment (EPSDT) form CMS-416; Behavioral Risk Factor Surveillance System (BRFSS); Pregnancy Risk Assessment Monitoring System (PRAMS); State Cancer Registries; Water Fluoridation Reporting System (WFRS); Uniform Data System (UDS); emergency department data; and workforce and infrastructure data. These sources are compiled in a table that describes data collection methods and detailed information of the data including limitations (see Appendix B for data collection methods and limitations).

Additionally, the current sources for children's oral health data include the 2015 and 2017 Maine Integrated Youth Health Survey (MIYHS), the 2016 National Survey of Children's Health (NSCH), the 2016 Centers for Medicare and Medicaid EPSDT form CMS-416, and the 2017 Office of Head Start Program Information Report (PIR). These data sources were reviewed to see what indicators include oral health information about children (see Appendices C, D, and E for more information on children's oral health indicators and their sources). The MIYHS was further examined to determine the number of children reached through the survey and whether it is representative of the kindergarten and third grade population in Maine. Because the Office of Head Start PIR did not include any Council of State and Territorial Epidemiologists (CSTE) approved oral health indicators, it was excluded from further examination.

Interviews

After the review of existing secondary data sources, six key informant interviews were conducted to inform this Capstone concerning Maine's current oral health surveillance system. All six individuals were contacted middle to late February through email. The interviews took place between March 7th and March 26th, 2018. Five interviews were conducted over the phone and one was held in person. None of the interviews were recorded. Each interviewee was asked a different set of questions based on their background and familiarity with oral health in Maine

(for more interview information, see Appendix F). The information collected was used to fill in the informational gaps related to the status and the future direction of Maine's oral health surveillance system.

Institutional Review Board

The Capstone project plan was submitted to the University of Southern Maine Institutional Review Board and it was determined that this activity is "Not Research Involving Human Subjects".

Findings

Collection Methods for Children's Oral Health Data

In Maine, primary oral health data for children is currently collected through the Basic Screening Survey (BSS), which is conducted as part of the Maine Integrated Youth Health Survey (MIYHS). Children's oral health data can also be collected through other existing data sources, including the National Survey of Children's Health (NSCH) and the Centers for Medicare and Medicaid EPSDT form CMS-416. In addition, the Water Fluoridation Reporting System (WFRS) provides data for the percentage of individuals receiving fluoridated water, including children. These data sources are publicly available through various websites.

Maine Integrated Youth Health Survey (MIYHS). The Maine Integrated Youth Health Survey (MIYHS) is a school-based survey that gathers data on a range of health topics concerning youth using representative samples of the population. The survey is conducted every two years and is composed of four modules: K/3 module (kindergarten and third grade), 5/6 module (5th and 6th grades), middle school module (7th and 8th grades), and a high school module (9th - 12th grades). A parent survey is completed for children participating in the K/3 module, while the 5/6, middle school, and high school modules are filled out by students during school

hours. The K/3 module is the only portion of the MIYHS that uses oral health screenings to assess oral health outcomes (such as dental caries experience) for children and was the only module analyzed for this Capstone. Although none of the Council of State and Territorial Epidemiologists (CSTE) approved oral health indicators are drawn from the MIYHS parent questionnaire, several questions related to parent-reported oral health status, dental visits, problems accessing care and dental insurance are included and provide additional data to assess the oral health needs of children in Maine.

Basic Screening Survey (BSS). The Basic Screening Survey (BSS) is a primary oral health data source for Maine's children. The BSS is a non-invasive, open-mouth screening survey developed by the Association of State and Territorial Dental Directors (ASTDD) as a tool to guide states in reporting the National Oral Health Surveillance System (NOHSS) oral health indicators. When there is no other way to collect estimates on oral health outcomes, such as dental caries experience, the BSS can be used to collect this data (ASTDD, 2017a). In Maine, the BSS assesses and monitors the oral health status of a representative sample of kindergarten and third grade children enrolled in public schools. The BSS requires primary data collection and has been completed using different approaches: In 2015, the screening was done by a school nurse (after completing a training with an oral health professional), and in 2017, by traveling dental hygienists who visited each school to do the screenings. The same hygienists will be used for the 2019 screening survey. Conducting oral health screenings is voluntary by states and there is no obligation to report the data collected to the ASTDD or the CDC.

The Maine BSS provides oral health outcome data for four CSTE approved indicators for kindergarten and third grade children for inclusion in the NOHSS. These indicators are 1) dental

caries experience, 2) untreated dental caries, 3) urgent dental treatment need, and 4) presence of dental sealants among third graders.

National Survey of Children's Health (NSCH). The National Survey of Children's Health (NSCH) is a national parent-reported telephone survey that is conducted approximately every four years. The NSCH provides national and state-level data for children between the ages of one and seventeen. This survey includes two CSTE approved oral health indicators for inclusion in the NOHSS. The indicators are 1) preventive dental visit among children aged 1-17 years, and 2) dental visit in the past year among children aged 1-17 years; both questions assess access to care. The NSCH also provides data on parents' perception of their child's oral health and condition of their child's teeth.

Centers for Medicare and Medicaid EPSDT Form CMS-416. The CMS-416 provides national and state level oral health data for children ages one to twenty that are enrolled in Medicaid and the Children's Health Insurance Program (CHIP) on a yearly basis. CMS-416 includes four CSTE approved oral health indicators for inclusion in the NOHSS. These include 1) any dental service for children aged 1-20 years enrolled in Medicaid and CHIP, 2) preventive dental service for children aged 1-20 years enrolled in Medicaid and CHIP, 3) dental sealant use among 6-9-year-olds enrolled in Medicaid and CHIP, and 4) dental sealant use among 10-14-year-olds enrolled in Medicaid and CHIP.

Community water fluoridation. Community water fluoridation is an intervention strategy to protect the population from dental caries. The Water Fluoridation Reporting System (WFRS) is the primary data source for monitoring water fluoridation. The percent of people receiving fluoridated water is reported every two years. Community water fluoridation is a CSTE approved oral health indicator used to assess availability of intervention strategies.

Reach and Confidence Intervals

Number of children reached. As mentioned previously, the Basic Screening Survey (BSS) is conducted as part of the Maine Integrated Youth Health Survey (MIYHS) for children in kindergarten and third grades and gathers primary oral health data for caries experience, untreated dental caries, need for urgent dental treatment, and presence of dental sealants. In 2015, 270 Maine kindergarteners and 360 third graders were screened using the BSS protocol. The number of children reached increased slightly in 2017, with 453 kindergarteners and 468 third graders receiving oral health screenings (see Table 1 below for the total number of Maine children screened using the Basic Screening Survey in 2015 and 2017). This appears to be a small sample size to represent Maine's kindergarten and third grade populations.

Table 1. *Number of Maine Children Screened - Basic Screening Survey (BSS) 2015 & 2017*

	2015	**2017**
Kindergarten	270	453
Third Grade	360	468
Total Children Screened	630	921

Note. Data from the Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Confidence intervals. A confidence interval (CI) is a type of interval estimate that is calculated from the observed data collected and indicates the range that is likely to contain the true population parameter. This is reflected in the confidence interval, which is bounded by the Lower Confidence Limit (LCL) and the Upper Confidence Limit (UCL). If all students in the population answered the survey question, the analysts are 95% confident the student responses would lie between the LCL and the UCL. The 2017 MIYHS K/3 module was used to examine confidence intervals from the indicator data collected through the BSS (see Table 2 and Table 3 below for MIYHS 2017 indicators and confidence intervals). The difference between the LCL

and UCL appear to be wide for each indicator, which is likely due to the small sample of kindergarten and third grade students participating in the survey.

Table 2. *MIYHS 2017 Oral Health Indicators and Confidence Intervals for Kindergarteners*

Kindergarten Indicators	%	Confidence Interval (Cl) 95%
Presence of treated dental caries	23.7%	(16.6% - 30.8%)
Presence of untreated dental caries	17.2%	(9.6 - 24.8%)
Caries experience (calculated from treated and untreated dental caries)	32.7%	(24.4% - 41.0%)
Presence of sealants	5.2%	(2.2% - 8.3%)
Early/urgent dental care needed	18.0%	(10.5% - 25.4%)

Note. Data from 2017 Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Table 3. *MIYHS 2017 Oral Health Indicators and Confidence Intervals for Third Graders*

Third Grade Indicators	%	Confidence Interval (Cl) 95%
Presence of treated dental caries	27.3%	(20.5% - 34.1%)
Presence of untreated dental caries	15.0%	(8.6% - 21.4%)
Caries experience (calculated from treated and untreated dental caries)	36.9%	(30.4% - 43.4%)
Presence of sealants	48.6%	(38.9% - 58.3%)
Early/urgent dental care needed	13.7%	(7.7% - 19.6%)

Note. Data from 2017 Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Given the wide confidence intervals for each oral health indicator, a goal was set forth by the MIYHS to narrow the intervals to a single digit level, to be more representative of the population. One way to do this is by adding more schools to the sample, which is the current plan for the 2019 survey. The MIYHS hopes to expand the scope of the survey to encompass more children in kindergarten and third grades by reaching more schools willing to participate across the state. With a larger sample size, the confidence intervals should narrow, and the percentage should be more accurate and more representative of children's oral health status in Maine.

Data Reliability and Accuracy

The Maine Integrated Youth Health Survey (MIYHS) currently provides reliable oral health data for children in Maine. Starting in 2015, raw data from the MIYHS were weighted to adjust for non-responding schools and students; a process that makes data representative of the population from which it was drawn (Maine Integrated Youth Health Survey, 2015b). Because of this process, MIYHS data can more accurately represent oral health status among Maine's children and is consistent for the sample size. Additionally, a new sampling protocol was implemented in 2015 for the MIYHS K/3 module to align with the guidelines for submitting oral health screening data to the National Oral Health Surveillance System (NOHSS) to more accurately report data. This data is voluntarily reported to the Association of State and Territorial Dental Directors (ASTDD) every two years using the NOHSS data submission form.

One limitation to note is the small number of schools reached through the MIYHS. In both 2015 and 2017, only 22 schools across the state participated in the survey, which may limit data accuracy. However, the data collected from participating schools is consistent with previous years, which allows newer MIYHS data to be compared with previous MIYHS data. Still, caution should be used when comparing trends given the wide confidence intervals previously mentioned (see Appendix G for data tables with year comparisons). Due to steady federal funding, the MIYHS is expected to continue collecting data on Maine's children every two years.

The National Survey of Children's Health (NSCH) and the CMS-416 are existing national data sources that also provide reliable and accurate oral health data for Maine's children. The CMS-416 provides consistent annual oral health data, while the NSCH provides data every four years. Both sources are expected to continue providing state level oral health data, however, the NSCH indicators may change over time depending on the future design of the survey.

Comparability of Data to National Recommended Best Practices

The data collected in Maine for children's oral health through the Maine Integrated Youth Health Survey (MIYHS) with the Basic Screening Survey (BSS), the National Survey of Children's Health (NSCH), and the CMS-416 are comparable to national recommended best practices because they contain Council of State and Territorial Epidemiologists (CSTE) approved oral health indicators for inclusion in the NOHSS. These sources routinely collect oral health data in accordance with national best practices and the data collected can be used to disseminate findings to key state audiences to improve the oral health of Maine's children.

National Best Practices- Surveillance

The Association of State and Territorial Dental Directors (ASTDD) is a national non-profit organization that helps state oral health programs develop and implement programs and policies to prevent of oral diseases (ASTDD, n.d.). In July 2017, the ASTDD developed a best practice report for state-based oral health surveillance systems. In this report, the ASTDD strongly recommends that each state have (1) an oral health surveillance plan and (2) implements and maintains a robust state-based oral health surveillance system (ASTDD, 2017a). These recommendations are consistent with recommendations from the Council of State and Territorial Epidemiologists (CSTE). As previously mentioned, the CSTE determined that state oral health surveillance systems should monitor oral health status, access to dental care, risk factors and risk determinants, availability of interventions, workforce issues, public health infrastructure, and public policies, and disseminate these data to key state audiences (ASTDD, 2017a).

For a state to be classified as having an oral health surveillance system, it must meet the operational definition developed by the CSTE, which includes ten specific elements (listed below) (Phipps et al., 2013). States are encouraged to expand their oral health surveillance

system to include a wider variety of oral health indicators based on the needs and resources of the state.

Ten Elements for a State Oral Health Surveillance System:

1. A written oral health surveillance plan that was developed or updated within the previous five years.
2. 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.
3. Permanent tooth loss data for adults obtained within the previous two years.
4. Annual data on the incidence of and mortality from cancers of the oral cavity and pharynx.
5. Annual data on the percent of Medicaid and CHIP-enrolled children who had a dental visit within the past year.
6. Data on the percent of children 1-17 years who had a dental visit within the past year, obtained every four years.
7. Data on the percent of adults (≥18 years) and adults with diabetes who had a dental visit within the past year, obtained within the previous two years.
8. Data on the fluoridation status of public water systems within the state, updated every two years.
9. Annual data on state oral health programs and the environment in which they operate, including workforce and infrastructure indicators.
10. 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.

Status of Maine's Oral Health Surveillance System

Following the Council of State and Territorial Epidemiologists (CSTE) operational definition for a state oral health surveillance system, Maine cannot be classified as having an oral

health surveillance system because it currently lacks the following three elements: 1) a written oral health surveillance plan; 2) annual data on state oral health programs submitted to the Association of State and Territorial Dental Directors (ASTDD); and 3) publicly available, actionable oral health data to guide public health policy and programs disseminated in a timely manner. In fact, according to the operational definition, Maine has never met the criteria for an oral health surveillance system because a surveillance plan has never been created.

In addition, Maine currently lacks the essential resources and infrastructure for oral health surveillance. Having an oral health program is critical to the success of any state's oral health improvement efforts, however, Maine does not have a functioning oral health program at the state level and was the only state that did not have an oral health program during the 2015-2016 Fiscal Year (ASTDD, 2017b). Additionally, Maine was without an oral health program director in both 2016 and 2017, therefore oral health data was never reported to the CDC or included in the ASTDD Synopses Report. Because of Maine's current situation with oral health surveillance, data is not being analyzed or disseminated to support policies and programs that promote oral health for children or adults.

Although all other states have an oral health program, most states face challenges with oral health surveillance due to limited infrastructure and insufficient resources. According to the ASTDD, "In 2013/2014, 59% of states had minimal or no oral health epidemiology capacity and 45% did not have a written oral health surveillance plan, key components of any surveillance system" (2015, p. 1). In many states, the state oral health surveillance system is largely dependent on federal funding, which Maine did not seek. States funded by the CDC to strengthen their oral health programs receive support for epidemiologists and an evaluator to help develop and maintain a state oral health surveillance system. Additionally, in Maine, there is no funding

to evaluate oral health programs, such as ongoing school-based sealant and topical fluoride programs, which are essential for caries prevention in children. Although existing oral health data sources are available, most of which are publicly available, without the necessary funding and infrastructure, it will require a concerted effort for Maine to build a surveillance system.

Recommendations to Strengthen Maine's Surveillance System

Building an oral health surveillance system in Maine that aligns with the latest recommendations and best practices is an essential step for the state to take to measure and monitor children's oral health and guide public health actions. After reading through the 2017 Association of State and Territorial Dental Directors (ASTDD) *Best Practice Approach: State-Based Oral Health Surveillance System* report and determining what Maine's oral health surveillance system is missing, the following recommendations were identified as priorities to improve Maine's oral health surveillance system.

Recommendation 1- Create a Surveillance Plan

One of the first steps for developing or updating a state oral health surveillance system is to develop an oral health surveillance plan, which is "a written roadmap for establishing, maintaining, and evaluating a surveillance system" (ASTDD, 2017a, p. 6). Creating an oral health surveillance plan can help Maine: 1) identify the indicators needed to monitor the oral health of its residents, 2) determine timelines for oral health data collection, and 3) develop strategies for disseminating data to key stakeholders and policy makers (ASTDD, 2016). The ASTDD provides a template on their website (http://www.astdd.org), which is a step-by-step guide to help individual states create an oral health surveillance plan. This plan should define the purpose, objectives, oral health indicators, data sources and collection timeline, data dissemination and use, as well as an evaluation protocol (ASTDD, 2016). Although Maine needs

to create an oral health surveillance plan, there is currently no state funding allocated to support this action and there are no plans at the state level to create a surveillance plan.

Recommendation 2- Disseminate Oral Health Data

The ASTDD recommends that states have publicly available and actionable oral health data disseminated in a timely manner to guide public policy and programs. Previously, Maine released the *Oral Health in Maine, January 2013* report to provide an overview of available information on the burden of oral disease for children and adults in Maine and to guide policy and programs. This report was created using recommended guidelines from the ASTDD and the CDC. According to the Council of State and Territorial Epidemiologists (CSTE) operational definition for a state oral health surveillance system, this type of document will need updating this year (2018) since it has been five years. However, due to funding and structure changes at the state level, Maine no longer has the resources to update an in-depth oral health burden report. However, it is worth noting that the CDC no longer recommends this type of report due to the length and effort needed by the under-resourced state programs. It is now recommended oral health data be disseminated in a variety of forms including publicly available reports, infographics, data briefs, fact sheets and newsletters. For example, data collected from the Maine Integrated Youth Health Survey (MIYHS), the National Survey of Children's Health (NSCH), and the CMS-416 could be analyzed and disseminated through an infographic or data brief to show oral health outcomes and access to dental care for Maine's children.

Recommendation 3- Add Head Start Oral Health Indicators

The final recommendation is the addition of oral health indicators for Head Start children between the ages of three and five. The CSTE has approved three indicators for children attending Head Start, which include 1) dental caries experience, 2) untreated dental caries, and 3)

urgent dental treatment need. Through a partnership with Head Start, data for these oral health indicators can be collected using the Basic Screening Survey (BSS) protocol for preschool children, similar to the one used for kindergarten and third grade children that is conducted as part of the Maine Integrated Youth Health Survey (MIYHS). Additionally, collecting data on school-based or school-linked dental sealant and topical fluoride programs could be added to Maine's oral health surveillance system to help assess oral health intervention strategies, which are essential for caries prevention for Maine's children. (See Table 4 below for indicators to include in Maine's oral health surveillance system by domain and age group).

Table 4. *Indicators to Include in Maine's Oral Health Surveillance System by Domain & Age Group*

<table>
<tr><th>Domain</th><th>Preschool Children</th><th colspan="2">School Children</th></tr>
<tr><td>Oral Health Outcomes</td><td>Head Start
Dental caries experience
Untreated dental caries
Urgent dental treatment need</td><td>Kindergarten *
Dental caries experience
Untreated dental caries
Sealant prevalence
Urgent dental treatment need</td><td>3rd Grade *
Dental caries experience
Untreated dental caries
Sealant prevalence
Urgent dental treatment need</td></tr>
<tr><td rowspan="3">Access to Care</td><td colspan="3">Medicaid/CHIP 1-20 years
Dental visit</td></tr>
<tr><td colspan="3">1-17 Years
Dental visit & preventive dental visit</td></tr>
<tr><td></td><td colspan="2">Grades 9-12 *
Dental visit among adolescents</td></tr>
<tr><td rowspan="3">Intervention Strategies</td><td></td><td colspan="2">School-based or school-linked dental sealant programs</td></tr>
<tr><td colspan="3">Topical fluoride programs</td></tr>
<tr><td colspan="3">Community water fluoridation</td></tr>
<tr><td>Workforce and Infrastructure</td><td colspan="3">Number of dental professionals
Number of safety net dental clinics
Dental Health Professional Shortage Areas</td></tr>
</table>

Note: Blue cells: The core set of indicators recommended by CSTE for inclusion in a state oral health surveillance system
Green cells: Additional indicators that can be added by the state oral health program
* Maine is currently collecting this data and it can be accessed through the Maine Integrated Youth Health Survey (MIYHS)

Discussion and Conclusion

Building an oral health surveillance system in Maine to monitor the burden of oral disease is an important goal since surveillance is a core function of public health. Although the state could benefit from federal funding to hire an epidemiologist to analyze and evaluate the

available data and to disseminate it to key audiences, this does not appear to be feasible at this time. One alternative option is to use a state oral health coalition to move forward with oral health surveillance. A group willing to spearhead these efforts can create a surveillance plan to collect important oral health data. Once new data is publicly available from the existing oral health data sources, the coalition can gather, analyze and disseminate the information to key stakeholders in a timely manner through a public report, such as an infographic or data brief. The State of Kentucky is a prime example of this. According to the Data and Oral Health Surveillance Coordinator at the ASTDD, the Kentucky Oral Health Coalition collected and analyzed oral health data and released a public report to improve the oral health of its residents.

The ASTDD has a multitude of resources to help individual states make progress toward developing or rebuilding an oral health surveillance system. Additionally, observing what other states have done to overcome surveillance obstacles could help Maine move forward with oral health surveillance. Although several interviewees for this Capstone expressed Maine's current lack of infrastructure, it appears that most of the pieces are here, they just need to be put together. With a concerted effort, Maine can create an oral health surveillance system using currently available data and can help make oral health a higher priority for Maine.

In summary, our ability to improve the oral health of children depends significantly on data and surveillance. However, Maine has struggled to create an oral health surveillance system that routinely collects data on oral health outcomes, access to care, risk factors and intervention strategies, and to disseminate the information to key state audiences. Although the state was able to create an in-depth document in 2013 to provide information on the burden of oral disease among children and adults in Maine, it was a huge effort and the oral health program structure has fallen apart at the state level since that time. Following the national guidance and

recommendations set forth by the ASTDD, Maine can create an oral health surveillance system that aligns with best practices to improve the oral health of children across the state.

Limitations and Lessons Learned

There are several limitations to this study. Creating or updating a state oral health surveillance system is a multifaceted objective that involves accessing a wide range of exiting data sources. These data sources remain scattered across numerous websites and finding the most recent state-level data took a considerable amount of time during this project. The data collected through these sources have limitations and most are not able to show regional differences in oral health outcomes, access to dental care, or availability of intervention strategies across the state. Additionally, some state level data were difficult to obtain due to missing or incomplete information, since the reporting of oral health data is voluntary. Without an oral health director or a functioning oral health program at the state level, Maine's most recent data were never reported to the Association of State and Territorial Dental Directors (ASTDD) or the CDC, and some information remains unknown at this time. Additionally, not all data is publicly available. Maine schools have a private database for school-based sealant and fluoride programs, making it difficult to track those indicators. There is also considerable lag time in data reporting, as data often lags a year or more. The CDC oral health website has limited indicator data for children, some of which is not up-to-date, including the status of community water fluoridation. Although six key informant interviews were conducted during this Capstone, questions about the current and future of Maine's surveillance system remain.

Although there were many lessons learned throughout this project, the most valuable lesson is that while data are available for many oral health indicators through various websites, it would be better for those seeking oral health data to have access to this information all in one

place. If oral health data were continually entered in the CDC or ASTDD websites when new data was available, it would be easier for states to collect, analyze, and disseminate the findings to key stakeholders to support policies and programs that promote children's oral health.

Dissemination

This report was created for the Partnership for Children's Oral Health; a partnership that seeks to promote oral health and aims to eradicate dental caries among Maine's children. The Partnership will receive a copy of this report and PowerPoint after the final presentation on May 2, 2018 (see Appendix H for PowerPoint Slides). The University of Southern Maine (USM) Muskie School of Public Service will also receive a copy of the final report, and it will be published in the USM Digital Commons.

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Appendix A

List of 36 CSTE Approved Indicators

1. Preventive dental visit among children aged 1-17 years
2. Preventive dental service for children aged 1-20 years enrolled in Medicaid/CHIP
3. Dental visit among children aged 1-17 years
4. Any dental service for children aged 1-20 years enrolled in Medicaid/CHIP
5. Dental visit among adolescents in grades 9-12
6. Dental visit among adults aged ≥18 years
7. Dental visit among adults aged ≥18 years with diagnosed diabetes
8. Population receiving oral health services at Federally Qualified Health Centers
9. Teeth cleaning among women before pregnancy
10. Teeth cleaning among women during pregnancy
11. Dental caries experience among children aged 3-5 years attending Head Start
12. Dental caries experience among children attending kindergarten
13. Dental caries experience among 3rd grade children
14. Untreated dental caries among children aged 3-5 years attending Head Start
15. Untreated dental caries among children attending kindergarten
16. Untreated dental caries among 3rd grade children
17. Untreated dental caries among adults 65+ years in long-term or skilled nursing facilities
18. Untreated dental caries among adults 65+ years attending congregate meal sites
19. Urgent dental treatment need among children aged 3-5 years attending Head Start
20. Urgent dental treatment need among children attending kindergarten
21. Urgent dental treatment need among 3rd grade children
22. Dental treatment need among adults 65+ years in long-term or skilled nursing facilities
23. Dental treatment need among adults 65+ years attending congregate meal sites
24. Dental sealants among 3rd grade children
25. Dental sealant use among children aged 6-9 years enrolled in Medicaid/CHIP
26. Dental sealant use among children aged 10-14 years enrolled in Medicaid/CHIP
27. No tooth loss among adults aged 18-64 years
28. Six or more teeth lost among adults aged ≥65 years
29. All teeth lost among adults aged ≥65 years
30. Incidence of invasive cancer of the oral cavity or pharynx
31. Mortality from invasive cancer of the oral cavity or pharynx
32. School-Based Health Centers that provide dental sealants
33. School-Based Health Centers that provide dental care
34. School-Based Health Centers that provide topical fluoride
35. Population served by community water fluoridation
36. State-based oral health surveillance system

Appendix B

Data Collection Methods and Limitations

Data Sources	Source Information	Limitations of Data Source
Data Sources for Children		
National Survey of Children's Health (NSCH)	Access to care- preventive dental visit and dental visits in the past year among children 1-17 years; parents' perception of child's oral health and oral health problems over past 12 months	Indicator does not validate types of dental care children actually received. National Survey of Children's Health is a parent-reported telephone survey and subject to limitations such as recall bias and non-coverage bias.
Office of Head Start Program Information Report (PIR)	PIR tells us the need for treatment among Head Start children	Need is based on opinion and is not a CSTE approved indicator for inclusion in the National Oral Health Surveillance System. The Program Information Report (PIR) doesn't provide data on decay experience and untreated tooth decay among children in Head Start (approved CSTE indicators). PIR data are self-reported by Head Start programs and compiled annually for use at the federal, regional, state and local levels. Need for preventive or restorative dental treatment is based on the examining dentist's opinion, and there are no standard definitions.
Maine Integrated Youth Health Survey (MIYHS) w/ Basic Screening Survey (BSS) Kindergarten	Oral health outcomes- dental caries experience, untreated dental caries, presence of sealants, and early/urgent dental treatment	An oral health screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan. Indicators are for children enrolled in public schools and may not be representative of the entire kindergarten population. As with all surveys, state oral health survey data are subject to systematic error resulting from nonresponse (e.g., refusal to participate in the survey). Some schools with very small enrollments (such as those found on Maine's islands and/or in very rural areas) may be underrepresented due to enrollment-based sampling exclusions. Because of the anonymous nature of the questionnaire and the difficulty in translating questions into multiple languages, Parents of children with very limited English language proficiency may be underrepresented. Self-report data may be prone to bias due to forgetting, deception, or misunderstanding of the questions, all of which can contribute to underreporting or over-reporting of some behaviors.
MIYHS w/ BSS Third Grade	Oral health outcomes- dental caries experience, untreated dental caries, presence of sealants, and early/urgent dental treatment	An oral health screening is not a thorough clinical examination and does not involve making a clinical diagnosis resulting in a treatment plan. Indicators are for children enrolled in public schools and may not be representative of the entire third grade population. As with all surveys, state oral health survey data are subject to systematic error resulting from nonresponse (e.g., refusal to participate in the survey… same as above.
Centers for Medicare & Medicaid CMS-416: Annual EPSDT Participation Report (CMS-416)	Access to care (preventive dental service and any dental service for children aged 1-20 years enrolled in Medicaid/CHIP); Oral health outcomes (dental sealant use among children aged 6-9 years and 10-14 years enrolled in Medicaid/CHIP)	The indicator does not quantify the number (intensity) of preventive dental visits or type of service in a year or the appropriateness of the service provided. Like other administrative data, data are subject to reporting error and data completeness varies widely from state to state. Because of variation in state policy, undercounting of services also occurs in states where health centers report encounter-based data only. In general, data include services provided under both fee-for-service and managed care delivery systems. Despite the CMS requirement for complete reporting including services provided under both fee-for-service and managed care delivery systems, under-counting of dental service utilization may occur in states with large managed care populations.

Data Collection Methods and Limitations

Data Sources	Source Information	Limitations of Data Source
Data Sources for Adults		
Behavioral Risk Factor Surveillance System (BRFSS)	Dental Visit Among Adults Aged ≥18 Years (access to care)	Indicator does not convey reasons for visiting a dentist or whether dental care was actually received. As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from non-coverage (e.g., on college campuses or in the military), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias). To address these concerns, BRFSS began including cellular telephone–only users in the 2011 data collection. Because of changes in sampling and weighting methods, 2012 for oral heath indicators is a new baseline for BRFSS, and comparisons with previous years' data are inappropriate.
Behavioral Risk Factor Surveillance System (BRFSS)	Dental Visit Among Adults Aged ≥18 Years with Diabetes (access to care)	Approximately one fourth of case of diabetes are undiagnosed (2); this indicator does not adjust for undiagnosed cases of diabetes. The dental visit indicator does not convey reasons for visit or whether dental care was actually received. As with all self-reported sample surveys, BRFSS data might be subject to systematic error resulting from non-coverage (e.g., on college campuses or in the military), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias). To address these concerns, BRFSS began including cellular telephone–only users in the 2011 data collection. Because of changes in sampling and weighting methods, 2012 for oral heath indicators is a new baseline for BRFSS, and comparisons with previous years' data are inappropriate.
Pregnancy Risk Assessment Monitoring System (PRAMS)	Teeth Cleaning Among Women Before and During Pregnancy (access to care)	Indicator does not convey reason for teeth cleaning or whether complete dental care was actually received. PRAMS data is only collected from women who delivered a live-born infant, not all women of reproductive age. Women with fetal death or abortion are excluded in the survey. PRAMS data are self-reported and may be subject to recall bias and under/over reporting of behaviors based on social desirability. While most self-report surveys such as PRAMS might be subject to systematic error resulting from non-coverage (e.g. lower landline telephone coverage due to transition to cell phone only households or undeliverable addresses), nonresponse (e.g. refusal to participate in the survey or to answer specific questions), or measurement bias (e.g. recall bias), PRAMS attempts to contact potential respondents by mail and landline/cell telephone to increase response rates. Another limitation is that PRAMS estimates only cover the population of residents in each state who also deliver in that state; therefore, residents who delivered in a different state are not captured in their resident state.
Data Systems for Population		
State Cancer Registries	Incidence of Invasive Cancer of the Oral Cavity or Pharynx (oral health outcome)	Cancer of the oral cavity and pharynx has a long latency period and years might pass before changes in behavior or clinical practice patterns affect the incidence of oral and pharyngeal cancer. Data from some statewide central cancer registries may not meet standards for data completeness and quality. Therefore, nationwide estimates calculated from aggregated state data might not include data from each state. However, state registry data should accurately represent state cancer incidence in the majority of states, particularly where completeness and quality of registry data are high.

Data Collection Methods and Limitations

Data Sources	Source Information	Limitations of Data Source
Water Fluoridation Reporting System (WFRS)	Population Served by Community Water Fluoridation (community intervention)	Some individuals may have been counted twice. Water systems may report total persons served, which could include persons with primary and secondary residences, such as college students or recreational homes. Water system data are estimates, perfect deduplication is not possible. States' data collection/reporting standardization should be improved.
HRSA Primary Care: The Health Center Program Health Center Data (Uniform Data System)	Population Receiving Oral Health Services at Federally Qualified Health Centers (access to care)	Indicator does not convey what dental service(s) is (are) provided for each dental visit, and whether dental services rendered at FQHCs actually meet the dental needs of the patients. Denominator does not exclude patients of FQHCs that do not have dental clinics. Stratified dental patient characteristics by age, gender, race, ethnicity or insurance status are not available. The data quality and accuracy may depend on grantee health center programs' compliance in data collection and reporting.
Emergency Department - ED visits	Visits for dental issues, frequent ED users, preventable dental conditions, age of individual seeking ED treatment for oral health, payer of ED visits	Indicators must be decoded from ED data. State Emergency Department Database (SEDD) costs money to access state-level data, user is required to take an online training course before access; need statistical software. ED discharge databases such as SEDD do not include information from urgent care clinics; SEDD ED discharge databases include information on patients that were discharged from the ED, but do not include information on patients that presented at the ED and were subsequently admitted to the hospital; Some patients may live in one state but seek ED care in a bordering state; the resident state ED database will not capture information on patients obtaining cross-state care. If a state wants to determine the extent of cross-state care, many ED datasets use unique identifiers associated with an ED visit, not a specific person. Because of this, repeat visits by a person cannot be identified and the extent of repeat visits to EDs for the same oral problem cannot be quantified; Drug-seeking behavior may result in oral pain given as the reason for visit, skewing the picture of true oral care in ED.
Workforce and Infrastructure	Workforce- Number of dental professionals; Low-income communities- Number of safety net dental clinic; Dental Health Professional Shortage Areas; Infrastructure - state-based oral health surveillance system	Infrastructure - Although having publicly available oral health data is one of the elements defined for this indicator, data may not reflect the extent to which specific data are used to guide public health programs and policies. Like other self-reported administrative data, data are subject to reporting error (e.g., recall bias, respondents' knowledge and interpretation of the questions).

Note. Information for Appendix B- Data Collection Methods and Limitations was retrieved from the Council of State and Territorial Epidemiologists (CSTE). (2015). *Revision to the national oral health surveillance system (NOHSS) indicators*. Retrieved from http://c.ymcdn.com/sites/www.cste.org/resource/resmgr/2015PS/2015PSFinal/15-CD-01-ALL.pdf

Appendix C

Current Children's Oral Health Indicators and Information Collected

Population	Indicators	Data Source	Information Collected
Head Start Children	Need for treatment	Office of Head Start Program Information Report (PIR) (2017)	Percentage of children with a dental home; Number of children with continuous, accessible dental care provided by a dentist; Number of children who received preventive care since last year's PIR was reported; Number of all children, including those enrolled in Medicaid or CHIP, who have completed a professional dental examination since last year's PIR was reported- Of these, the number of children diagnosed as needing dental treatment since last year's PIR was reported- Of these, the number of children who have received or are receiving dental treatment; Specify the primary reason that children who needed dental treatment did not receive it https://eclkc.ohs.acf.hhs.gov/data-ongoing-monitoring/article/program-information-report-pir
Kindergarten Children	Dental caries experience; Untreated dental caries; Urgent dental treatment among children attending Kindergarten	Maine Integrated Youth Health Survey (MIYHS) (2017) with oral health assessment (Basic Screening Survey)	MIYHS questionnaire (parent reported)- preventive dental visit in the past 12 months, dental treatment in the past 12 months, need for dental care but couldn't get it at that time, dental insurance, sealants through a dentist or school program, varnish treatment through a dentist or school program, missed school in the past three months due to dental problems Basic Screening Survey (BSS)- Presence of Treated Dental Caries (Observed during oral health assessment) Presence of Untreated Dental Caries (Observed during oral health assessment) Caries Experience (Presence of treated or untreated dental caries) Presence of Sealants (Observed during oral health assessment) Early / Urgent Dental Care Needed (Observed during oral health assessment) https://data.mainepublichealth.gov/miyhs/
Third Grade Children	Dental caries experience; Untreated dental caries; Urgent dental treatment; Presence of sealants among children attending third grade	Maine Integrated Youth Health Survey (MIYHS) (2017) with oral health assessment (Basic Screening Survey)	MIYHS questionnaire (parent reported)- preventive dental visit in the past 12 months, dental treatment in the past 12 months, need for dental care but couldn't get it at that time, dental insurance, sealants through a dentist or school program, varnish treatment through a dentist or school program, and missed school in the past three months due to dental problems Basic Screening Survey (BSS)- Presence of Treated Dental Caries (Observed during oral health assessment) Presence of Untreated Dental Caries (Observed during oral health assessment) Caries Experience (Presence of treated or untreated dental caries) Presence of Sealants (Observed during oral health assessment) Early / Urgent Dental Care Needed (Observed during oral health assessment) https://data.mainepublichealth.gov/miyhs/

Current Children's Oral Health Indicators and Information Collected

Population	Indicators	Data Source	Information Collected
5th and 6th Grade Children	Last dental visit; Any missed school from tooth problems; Sugar sweetened beverage consumption	Maine Integrated Youth Health Survey (MIYHS) (2017)	When was the last time you saw a dentist or dental hygienist for a check-up, exam, teeth cleaning, or other dental work? Have you missed any school this year because of problems with your teeth? During the past 7 days, how many times did you drink a can, bottle, or glass of soda, sports drink, energy drink, or other sugar-sweetened beverage? https://data.mainepublichealth.gov/miyhs/
7th and 8th Grade Children	Last dental visit; Sugar sweetened beverage consumption	Maine Integrated Youth Health Survey (MIYHS) (2017)	When was the last time you saw a dentist or dental hygienist for a check-up, exam, teeth cleaning, or other dental work? Sugar-sweetened beverages: at least one daily in the past week? https://data.mainepublichealth.gov/miyhs/
Adolescents in Grades 9-12	Last Dental Visit among adolescents in grades 9-12; sugar sweetened beverage consumption	Maine Integrated Youth Health Survey (MIYHS) (2017)	2017 When was the last time you saw a dentist or dental hygienist for a check-up, exam, teeth cleaning, or other dental work? Sugar-sweetened beverages: at least one daily in the past week? https://data.mainepublichealth.gov/miyhs/
Children 1-17 Years	Preventive Dental Visit Among Children Aged 1-17 Years; Dental Visit Among Children Aged 1-17 Years; parent reported child-oral health and oral health problems	National Survey of Children's Health (NSCH) (2016)	2016 During the past 12 months, did this child see a dentist or other oral health care provider for any kind of dental or oral health care? If yes, During the past 12 months, did this child see a dentist or other oral health care provider for dental care, such as check-ups, dental cleanings, dental sealants, or fluoride treatments? If yes, during the past 12 months, what preventive dental services did this child receive? http://www.childhealthdata.org/browse/survey/results?q=4688&r=21
Children 1-20 Years with Medicaid/CHIP	Dental Sealant Use Among Children Aged 6-9 & 10-14 Years Enrolled in Medicaid/CHIP; and dental and preventive dental services	CMS- 416 (2016)	Total eligible receiving any dental services, Total eligible receiving preventive dental services, total eligible receiving dental treatment services, total eligible receiving a sealant on a permanent molar tooth, total eligible receiving dental diagnostic services, total eligible receiving oral health services provided by a non-dentist provider, and total eligible receiving any dental or oral health service. https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

Note. Information for Appendix C- Current Children's Oral Health Indicators and Information Collected was retrieved from the Office of Head Start Program Information Report (PIR) (2017)- https://eclkc.ohs.acf.hhs.gov/data-ongoing-monitoring/article/program-information-report-pir; Maine Integrated Youth Health Survey (MIYHS) (2017)- https://data.mainepublichealth.gov/miyhs/; Data Resource Center for Child & Adolescent Health (2016) National Survey of Children's Health (NSCH)- http://www.childhealthdata.org/browse/survey/results?q=4688&r=21; and Centers for Medicare and Medicaid CMS-416 FY 2016 Data (2017)- https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

Appendix D

Child Indicators by Data Source

Data Source	CSTE Approved Indicators	Domain
MIYHS	Dental caries experience among children attending kindergarten	Oral Health Outcomes
MIYHS	Dental caries experience among 3rd grade children	Oral Health Outcomes
MIYHS	Untreated dental caries among children attending kindergarten	Oral Health Outcomes
MIYHS	Untreated dental caries among 3rd grade children	Oral Health Outcomes
MIYHS	Urgent dental treatment need among children attending kindergarten	Oral Health Outcomes
MIYHS	Urgent dental treatment need among 3rd grade children	Oral Health Outcomes
MIYHS	Dental sealants among 3rd grade children	Oral Health Outcomes
MIYHS	Dental visit among adolescents in grades 9-12	Access to Care
NSCH	Dental visit among children aged 1-17 years	Access to Care
NSCH	Preventive dental visit among children aged 1-17 years	Access to Care
CMS-416	Preventive dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Access to Care
CMS-416	Any dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Access to Care
CMS-416	Dental sealant use among children aged 6-9 years enrolled in Medicaid/CHIP	Oral Health Outcomes
CMS-416	Dental sealant use among children aged 10-14 years enrolled in Medicaid/CHIP	Oral Health Outcomes
WFRS	Population served by community water fluoridation	Community Intervention

Blue cells: The core set of indicators recommended by CSTE for inclusion in a state oral health surveillance system
Green cells: Additional indicators that can be added by the state oral health program

MIYHS- Maine Integrated Youth Health Survey
NSCH- National Survey of Children's Health
CMS-416- Centers for Medicare and Medicaid (CMS) Annual Early Periodic Screening, Diagnosis and Treatment (EPSDT) Program Participation Report
WFRS- Water Fluoridation Reporting System

Appendix E

Child Indicators by Population Group

Population Group	CSTE Approved Indicators	Data Source and Link to Data Source or Interactive Data System
Kindergarten Children	Dental caries experience among children attending kindergarten	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
	Untreated dental caries among children attending kindergarten	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
	Urgent dental treatment need among children attending kindergarten	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
Third Grade Children	Dental caries experience among 3rd grade children	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
	Untreated dental caries among 3rd grade children	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
	Urgent dental treatment need among 3rd grade children	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
	Dental sealants among 3rd grade children	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
Medicaid/CHIP Children 6-9 Years	Dental sealant use among children aged 6-9 years enrolled in Medicaid/CHIP	Centers for Medicare and Medicaid CMS-416 https://www.medicaid.gov/medicaid/benefits/epsdt/index.html
Medicaid/CHIP Children 10-14 Years	Dental sealant use among children aged 10-14 years enrolled in Medicaid/CHIP	Centers for Medicare and Medicaid CMS-416 https://www.medicaid.gov/medicaid/benefits/epsdt/index.html
Adolescents in Grades 9-12	Dental visit among adolescents in grades 9-12	Maine Integrated Youth Health Survey (MIYHS) http://data.mainepublichealth.gov/miyhs/
Children 1-17 Years	Preventive dental visit among children aged 1-17 years	National Survey of Children's Health (NSCH) http://childhealthdata.org/learn/NSCH
	Dental visit among children aged 1-17 years	National Survey of Children's Health (NSCH) http://childhealthdata.org/learn/NSCH
Medicaid/CHIP Children 1-20 Years	Preventive dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Centers for Medicare and Medicaid CMS-416 https://www.medicaid.gov/medicaid/benefits/epsdt/index.html
	Any dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Centers for Medicare and Medicaid CMS-416 https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

Blue cells: Core set of indicators recommended by CSTE for inclusion in a state oral health surveillance system
Green cells: Additional indicators that can be added by the state oral health program

Appendix F

Interview Information

The first interview for this Capstone was with the former Oral Health Program Director and current Maine Oral Health Coalition Coordinator. I asked her about oral health surveillance in Maine, including the gaps and limitations. The second interview was with an Associate Research Professor at the University of Southern Maine. I asked her about the current surveillance system and any plans with Maine's oral health surveillance; about the Maternal Child Health Block Grant and potential for oral health funding; and about oral health data collection for school-based sealant and fluoride programs. The third interview was with the Maine Integrated Youth Health Survey (MIYHS) Project Coordinator. I asked him about the 2015 and 2017 surveys, how many children and schools were reached (2017 methodology report not yet released), potential changes for the 2019 MIYHS, any obligations to continue reporting on children's oral health, and about whether MIYHS confidence intervals are representative of this population in Maine.

The fourth interview was with an individual who had prepared a report on children's oral health indicators for the Sadie and Harry Davis Foundation in 2015. I asked her about the current oral health surveillance system and ways that Maine could improve current data collection for children. The fifth interview was with the Data and Oral Health Surveillance Coordinator at the Association of State and Territorial Dental Directors (ASTDD). I asked her about Maine's status with oral health surveillance and about recommendations to help the state move forward with surveillance efforts. The final interview was with the Oral Health and Rural Health Director at the Maine CDC. I asked her about school-based sealant and topical fluoride programs, the number of schools being reached (which is down slightly from 2013), and about school data collection, which is not a publicly available data source.

Appendix G

Data Tables

The following data tables contain Maine's most recent oral health data for children from the Maine Integrated Youth Health Survey (MIYHS), Centers for Medicare and Medicaid CMS 416, and the National Survey of Children's Health (NSCH), along with data from previous years.

Table G1: *Oral Health Indicators for Kindergarten Children: Maine*

Oral Health Indicator	**2011**	**2015**	**2017**	**95% Confidence Interval (2017)**
Caries experience (treated or untreated tooth decay)	21.6%	27.7%	32.7%	(24.4% - 41.0%)
Presence of untreated dental caries	12.7%	6.7%	17.2%	(9.6%- 24.8%)

Note. Data from the Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Table G2: *Oral Health Indicators for Third Grade Children: Maine*

Oral Health Indicator	**2011**	**2015**	**2017**	**95% Confidence Interval (2017)**
Caries experience (treated or untreated tooth decay)	32.7%	40.9%	36.9%	(30.4% - 43.4%)
Presence of untreated dental caries	14.6%	15.6%	15.0%	(8.6% - 21.4%)
Dental sealant on at least one permanent molar (presence of dental sealants)	68.5%	72.8%	48.6%	(38.9% - 58.3%)

Note. Data from the Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Table G3: *Medicaid Services, 1-2-Year-olds in Maine*

Indicator	**2010**	**2014**	**2016**
Children ages 1-2 eligible for MaineCare	14,426	14,228	13,613
Children ages 1-2 receiving any dental services	823	2,607	2,519
	5.7%	18.3%	18.5%
Children ages 1-2 receiving any preventive dental services	679	2,375	2,239
	4.7%	16.7%	16.4%
Children ages 1-2 receiving any dental treatment	111	218	235
	0.8%	1.5%	1.7%

Note. Data from the CMS-416. https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

Table G4: *Medicaid Services, 3-5-Year-olds in Maine*

Indicator	**2010**	**2014**	**2016**
Children ages 3-5 eligible for MaineCare	20,515	21,451	19,358
Children ages 3-5 receiving any dental services	4,599	9,197	8, 176
	22.4%	42.9%	42.2%
Children ages 3-5 receiving any preventive dental services	3,842	8,614	7,696
	18.7%	40.16%	39.7%
Children ages 3-5 receiving any dental treatment	1,233	2,714	2,476
	6.1 %	12.7%	12.7%

Note. Data from the CMS-416. https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

Table G5: Medicaid Services, 6-9-Year-olds in Maine

Indicator	**2010**	**2014**	**2016**
Children ages 6-9 eligible for MaineCare	24,938	28,842	27,247
Children ages 6-9 receiving any dental services	7,129	15,821	13,985
	28.6%	54.9%	51.3%
Children ages 6-9 receiving any preventive dental services	6,102	14,877	13,069
	24.5%	51.6%	47.9%
Children ages 6-9 receiving any dental treatment	2,898	6,368	5,988
	11.6%	22.1%	21.9%
Children ages 6-9 receiving sealant on permanent molar tooth	2,100	4,267	3,874
	8.4%	14.8%	14.2%

Note. Data from the CMS-416. https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

National Comparison

Table G6: *Dental Visits in Past Year for Children 1-17-Years as Reported by Parents*

Indicator	**2007**	**2011-12**	**2016**	**95% Confidence Interval**
One or more preventive dental visits in past year (as reported by parent)				
• Maine	80.9%	80.5%	84%	(80.4% – 87.0%)
• U.S.	78.4%	77.2%	78.7%	(77.8% – 79.6%)
Condition of child's teeth is excellent or very good (as reported by parent)				
• Maine	79.7%	79.5%	81.6%	(77.8% – 84.9%)
• U.S.	70.7%	71.3%	78.1%	(77.1% – 79.0%)

Note. Data from the National Survey of Children's Health. http://childhealthdata.org/browse/survey

Appendix H

PowerPoint Slides

Slide #1

Children's Oral Health in Maine:

THE SURVEILLANCE SYSTEM

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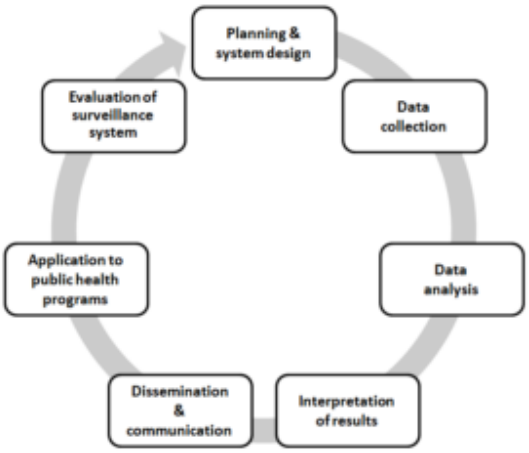
Slide #2

Background- Public Health Surveillance

Public health surveillance is "...the ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation and evaluation of public health practice, closely integrated with the dissemination of these data" (ASTDD, 2015)

Surveillance is a core function of public health- Assessment

Overarching purpose of surveillance: providing actionable information to guide public health policy and programs



The Surveillance Cycle

Slide #3

Oral Health Surveillance

- Who are the experts?
  - Association of State and Territorial Dental Directors (ASTDD)
  - Council of State and Territorial Epidemiologists (CSTE)

- What does an oral health surveillance system do?
  - Measure & monitor burden of oral disease consistent with HP2020 oral health objectives

- National Oral Health Surveillance System
- State Oral Health Surveillance System

Factors Impacting Oral Health Outcomes

Slide #4

Purpose

- To Determine:
  - The current status of Maine's oral health surveillance system and assess data availability and quality for children
  - How data is being collected and tracked
  - How accurate these measures are (reach/confidence intervals)

Research Questions

- What are the current data collection methods in Maine for children's oral health? What indicators are used and what do they tell us? Is the data reliable and accurate?
- Is the data comparable to recommended best practices? If data is comparable, recommendations to strengthen Maine's oral health surveillance system will be provided.

Slide #5

Methods

- Analyzed existing data sources for oral health surveillance
  - Behavioral Risk Factor Surveillance System (BRFSS), Pregnancy Risk Assessment Monitoring System (PRAMS), Water Fluoridation Reporting System (WFRS), National Survey for Children's Health (NSCH), etc.
- Conducted six key informant interviews to fill in gaps
- Looked toward ASTDD best practices recommendations
- Compared Maine's oral health surveillance system to the best practices
- Identified priorities to improve Maine's surveillance system

Slide #6

Findings

Oral Health Indicators By Data Source- Maine

Data Source	CSTE Approved Indicators	Domain
MIYHS	Dental caries experience among children attending kindergarten	Oral Health Outcomes
MIYHS	Dental caries experience among 3rd grade children	Oral Health Outcomes
MIYHS	Untreated dental caries among children attending kindergarten	Oral Health Outcomes
MIYHS	Untreated dental caries among 3rd grade children	Oral Health Outcomes
MIYHS	Urgent dental treatment need among children attending kindergarten	Oral Health Outcomes
MIYHS	Urgent dental treatment need among 3rd grade children	Oral Health Outcomes
MIYHS	Dental sealants among 3rd grade children	Oral Health Outcomes
MIYHS	Dental visit among adolescents in grades 9-12	Access to Care
NSCH	Dental visit among children aged 1-17 years	Access to Care
NSCH	Preventive dental visit among children aged 1-17 years	Access to Care
CMS-416	Preventive dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Access to Care
CMS-416	Any dental service for children aged 1-20 years enrolled in Medicaid/CHIP	Access to Care
CMS-416	Dental sealant use among children aged 6-9 years enrolled in Medicaid/CHIP	Oral Health Outcomes
CMS-416	Dental sealant use among children aged 10-14 years enrolled in Medicaid/CHIP	Oral Health Outcomes
WFRS	Population served by community water fluoridation	Community Intervention

MIYHS- Maine Integrated Youth Health Survey

NSCH- National Survey of Children's Health

CMS-416- Centers for Medicare and Medicaid (CMS) Annual Early Periodic Screening, Diagnosis and Treatment (EPSDT) Program Participation Report

WFRS- Water Fluoridation Reporting System

Blue cells: The core set of indicators recommended by Council of State and Territorial Epidemiologists (CSTE) for inclusion in a state oral health surveillance system

Green cells: Additional indicators that can be added by the state oral health program

Slide #7

Reach and Confidence Intervals

Table 1. *Children Screened Using Basic Screening Survey 2015 & 2017*

	2015	2017
Kindergarten	270	453
Third Grade	360	468
Total Reached	630	921

Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Table 2. *Confidence Intervals for 2017 Oral Health Indicators MIYHS- Kindergarten*

Kindergarten Indicators	%	Confidence interval (CI)
Presence of treated dental caries	23.7%	(16.6% - 30.8%)
Presence of untreated dental caries	17.2%	(9.6 - 24.8%)
Caries experience (calculated)	32.7%	(24.4% - 41.0%)
Presence of sealants	5.2%	(2.2% - 8.3%)
Early/urgent dental care needed	18.0%	(10.5% - 25.4%)

Table 3. *Confidence Intervals for 2017 Oral Health Indicators MIYHS- Third Grade*

Third Grade Indicators	%	Confidence interval (CI)
Presence of treated dental caries	27.3%	(20.5% - 34.1%)
Presence of untreated dental caries	15.0%	(8.6% - 21.4%)
Caries experience (calculated)	36.9%	(30.4% - 43.4%)
Presence of sealants	48.6%	(38.9% - 58.3%)
Early/urgent dental care needed	13.7%	(7.7% - 19.6%)

Slide #8

National Best Practices

astdd
Where oral health lives

ASTDD Recommends States:

(1) Develop an oral health surveillance plan

(2) Implement and maintain a robust state-based oral health surveillance system that:

- Monitors oral health status
- Access to dental care
- Individual risk factors and risk determinants
- Availability of interventions
- Workforce issues
- Public health infrastructure
- Public policies
- Disseminates information

Slide #9

Operational Definition - Ten CSTE Items For a Surveillance System

1. Oral health status data for a representative sample of third grade children meeting criteria for inclusion in the National Oral Health Surveillance System (NOHSS). Data must have been collected within the previous five years.	5. Data on the percent of children 1-17 years who had a dental visit in the previous year, obtained every four years.
2. Permanent tooth loss data for adults obtained within the previous two years.	6. Data on the percent of adults (≥18 years) and adults with diabetes who had a dental visit in the previous year, obtained within the previous two years.
3. Annual data on oral and pharyngeal cancer incidence and mortality.	7. Data on the fluoridation status of public water systems within the state, updated every two years.
4. Annual data on the percent of Medicaid- and CHIP-enrolled children who had a dental visit in the previous year.	8. Annual data on state oral health programs and the environment in which they operate, including workforce and infrastructure indicators, submitted to the Annual Synopses of State and Territorial Dental Public Health Programs.

9. A written oral health surveillance plan that was developed or updated within the previous five years.

10. 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.

Slide #10

Status of Maine's Oral Health Surveillance System

Currently lacks:

1) A written oral health surveillance plan;

2) Publicly available, actionable oral health data to guide public health policy and programs disseminated in a timely manner; and

3) Annual data on state oral health programs submitted to ASTDD

- No Oral Health Program at State level
- Only State without Oral Health Program during 2015-2016 Fiscal Year
- Not currently analyzing or disseminating oral health data to support policies and programs

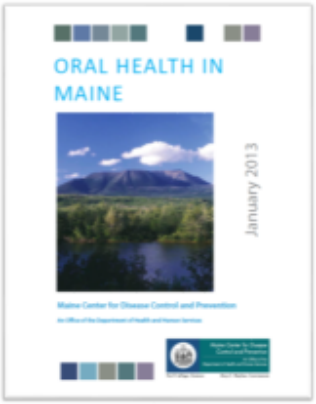
Slide #11

Recommendations

1. Create a surveillance plan -- a written roadmap for establishing, maintaining, and evaluating a surveillance system
   - Use the template provided by ASTDD

2. Update data from 2013 burden report- *Oral Health in Maine*
   - Create infographic or data brief

3. Create partnership with Head Start to add Basic Screening Survey (BSS)
   - Approved CSTE indicator for children aged 3-5



Slide #12

Indicators to Include in Maine's Oral Health Surveillance System by Domain and Age Group

Domain	Preschool Children	School Children	
Oral Health Outcomes	Head Start Dental caries experience Untreated dental caries Urgent dental treatment need	Kindergarten * Dental caries experience Untreated dental caries Sealant prevalence Urgent dental treatment need	3rd Grade * Dental caries experience Untreated dental caries Sealant prevalence Urgent dental treatment need
Access to Care	Medicaid/CHIP 1-20 years Dental visit		
	1-17 Years Dental visit & preventive dental visit		
		Grades 9-12 * Dental visit among adolescents	
Intervention Strategies		School-based or school-linked dental sealant programs	
	Topical fluoride programs		
	Community water fluoridation		
Workforce and Infrastructure	Number of dental professionals Number of safety net dental clinics Dental Health Professional Shortage Areas		

Blue cells: The core set of indicators recommended by CSTE for inclusion in a state oral health surveillance system
Green cells: Additional indicators that can be added by the state oral health program
** Maine is currently collecting this data and it can be accessed through the Maine Integrated Youth Health Survey (MIYHS)*

Slide #13

Limitations and Lessons Learned

Limitations:

- Data sources are scattered across numerous websites
- Some data must be requested, is outdated, or is incomplete
- Data often lags a year or more
- Not all data is publicly available
- Data collection is voluntary

Lessons Learned:

- Those seeking oral health information would be better served by a "one-stop shop"
    - Public website with CSTE indicators listed in one place (ASTDD or CDC)

Slide #14

Quick Look at Children's Oral Health Outcomes in Maine

Table 4: Kindergarten Children

Indicator	2011	2015	2017	Confidence interval (2017)
Caries experience (treated or untreated tooth decay)	21.6%	27.7%	32.7%	(24.4% - 41.0%)
Presence of untreated dental caries	12.7%	6.7%	17.2%	(9.6%- 24.8%)

Table 5: Third Grade Children

Indicator	2011	2015	2017	Confidence interval (2017)
Caries experience (treated or untreated tooth decay)	32.7%	40.9%	36.9%	(30.4% - 43.4%)
Presence of untreated dental caries	14.6%	15.6%	15.0%	(8.6% - 21.4%)
Dental sealant on at one least permanent molar (presence of dental sealants)	68.5%	72.8%	48.6%	(38.9% - 58.3%)

Source for Table 1 and Table 2- Maine Integrated Youth Health Survey https://data.mainepublichealth.gov/miyhs/

Slide #15

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