



Keep Smiling Vermont
**THE ORAL HEALTH OF
VERMONT'S CHILDREN**
2016-2017



ACKNOWLEDGMENTS

The Vermont Department of Health sincerely thanks all of the Vermont schools and students that participated in this project. We particularly thank all of the school administrators and school nurses that assisted the oral health screeners in obtaining parental consents, organizing the screening day and helping facilitate the screening process. Without the cooperation of the schools this project would not have been possible.

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EXECUTIVE SUMMARY

With *Keep Smiling Vermont 2016–2017*, the Vermont Department of Health takes its fourth look at the oral health status of a representative sample of elementary school children throughout the state. Previous surveys were completed during the 2002–2003, 2009–2010, and 2013–2014 school years. For the 2016–2017 survey, a total of 2,245 kindergarten and third grade children in 31 public elementary schools received a dental screening and an optional questionnaire was completed by 848 parents.

KEY FINDINGS

1. About one-third of Vermont's children have experienced tooth decay. Although Vermont's children have less tooth decay than the general U.S. population, too many still suffer from this preventable disease.
2. Since 2002–2003, there has not been a significant decline in the prevalence of tooth decay among Vermont's third grade children. Vermont has not reached the Healthy Vermonter's goal for the percent of children with dental decay.
3. One in ten children are in need of dental care.
4. Only 55% of third graders have dental sealants, a rate that has not improved in recent years.
5. Poverty has a significant impact on a child's oral health. Children eligible for the national school lunch program are more likely to have tooth decay.
6. Parent/guardian education has a significant impact on a child's oral health. Children whose parents/guardians have less than a college degree are more likely to have tooth decay.
7. Parent/guardian's oral health has a significant impact on a child's oral health. Children whose parents/guardians have lost three or more teeth due to dental disease are more likely to have tooth decay.
8. Most children in Vermont are drinking one or more sugar-sweetened beverages per day, a risk factor for tooth decay.

In addition, no difference in oral health was found between third graders in schools with Tooth Tutors and schools without Tooth Tutors.

The results of *Keep Smiling Vermont* support the need for community-based prevention and education programs, screening and referral services, and restorative dental care targeted toward children at highest risk of decay. Because teeth develop before birth and start to appear in the mouth when a child is about 6 months old, efforts to prevent tooth decay must start during pregnancy and continue throughout childhood.

INTRODUCTION

GOOD ORAL HEALTH IS IMPORTANT

Although tooth decay (dental caries) is a preventable bacterial disease, it continues to be the most common chronic disease of children in the United States. In fact, it is five times more common than asthma and two times more common than childhood obesity.^{1, 2, 3} Nationwide, tooth decay affects more than half of all children by the third grade.⁴

The public perception is largely that tooth decay is an insignificant occurrence. If left untreated, however, poor oral health has significant consequences on children and their families including:

- **Pain:** Tooth decay can cause acute or chronic pain. Many children are not aware that teeth are not supposed to hurt.
- **Infection:** Infected teeth are reservoirs of bacteria that flood the rest of the body, leaving the child prone to many other childhood infections, including ear infections and sinus infections. Development of secondary infections, in more severe cases, may require emergency care or hospitalization.
- **Nutrition problems:** Chronically painful and infected teeth make chewing and swallowing uncomfortable and difficult. Children with dental disease often do not get the nutrition they need to grow.
- **Tooth and space loss:** Chronic childhood tooth decay often results in the early loss of “baby” teeth. This can result in space loss due to movement of remaining teeth into the space, leaving insufficient room for the adult teeth to come into the mouth.
- **Sleep deprivation:** Children with chronically painful teeth have trouble getting a good night’s sleep.
- **Attention problems:** Children with infected and painful teeth have a hard time relaxing, sitting still, and paying attention in class.
- **Slower social development:** Disfigured or missing teeth can lead to difficulties speaking and can negatively affect a child’s self-esteem. When a child’s front teeth are damaged or missing in their very crucial early years of development, they often can’t form words correctly.

INTRODUCTION

- **Missed school days:** Children with infected and painful teeth miss more school days than other children, disrupting their educational and social experiences. One study demonstrated that children between 5 to 17 years of age in the United States missed 1,611,000 school days due to acute dental problems – an average of 3.1 days per 100 students.⁵
- **Missed work hours:** Parents are more likely to miss work because of their child's dental problems.
- **Increased costs of dental care:** As tooth destruction progresses, the treatment costs for families and states increase considerably.
- **Poor overall health:** Dental disease impacts overall health and children with poor oral health often have poor overall health.

TOOTH DECAY IS PREVENTABLE

With early prevention efforts, tooth decay can be prevented. Medical, dental and public health professionals must focus dental disease prevention efforts on families with children less than 2 years of age because *two is too late*. The American Dental Association, the American Academy of Pediatric Dentistry, and the American Association of Pediatricians all recommend preventive dental care and parent education by age 1. Evidence based strategies for preventing tooth decay in children include:

- **Fluoride varnish:** Biannual application of fluoride varnish to the teeth of all infants and children starting when the first tooth comes into the mouth at about 6 months of age has been shown to prevent tooth decay. Fluoride varnish can be applied at medical and dental clinics and in community settings such as preschools and WIC programs.
- **Brushing with fluoride toothpaste:** Parents should brush their children's teeth with fluoride toothpaste twice a day as soon as they can see the first tooth coming in.
- **Community water fluoridation:** Fluoridation has been shown to prevent tooth decay in both children and adults.
- **Fluoride supplements:** Daily fluoride supplementation starting at 6 months of age is recommended for children whose water supply does not contain fluoride.

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- **Good eating habits:** Parents should limit food and drink exposure over the course of the day to three meals and two snacks (with healthy food choices and limited juice). Frequent exposure to sugars in foods and drinks makes it more likely that children will develop tooth decay.
- **Early and regular dental visits:** All children should be referred to a dentist as early as 6 months of age to establish a dental home. Young children should have a thorough initial dental examination and regular dental visits at least once a year; some high risk children may need and benefit from more frequent visits.
- **Dental sealants:** Protective dental sealants should be applied to the chewing surface of the permanent molars soon after they come into the mouth around 6 and 12 years of age.
- **Family oral health:** Decreasing dental disease among a child's caregivers, especially mothers, benefits the oral health of the child. By encouraging optimal oral health among pregnant mothers and caregivers early education regarding infant oral health can be shared.

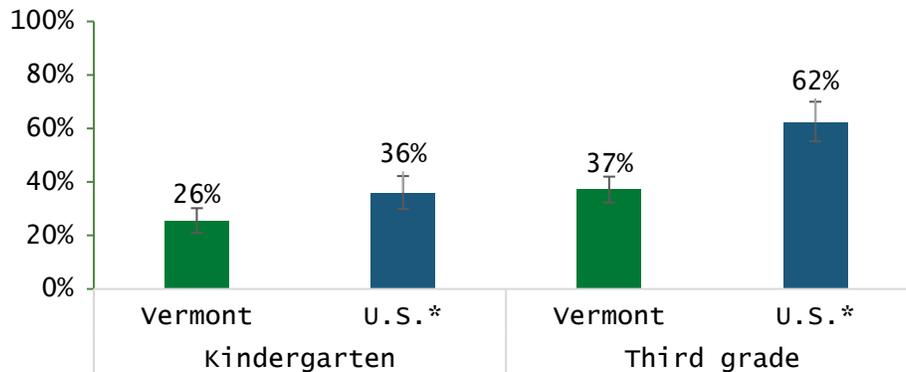
Preventing tooth decay improves a child's health and keeps them from having costly dental care. Because of this, ending cavities saves money for both the family and society. Annual spending on dental care in the U.S. is well over \$100 billion, representing nearly 20% of children's overall health spending.⁶ Early dental visits may reduce the need and cost associated with future treatment.

Addressing the oral health needs of Vermont's infants, toddlers, and young children requires the development of policies and strategies that will ensure all children receive the oral health care they need. There is no better investment in the future of Vermont than supporting the health and well-being of our children.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #1: ABOUT ONE-THIRD OF VERMONT'S CHILDREN HAVE EXPERIENCED TOOTH DECAY. ALTHOUGH VERMONT'S CHILDREN HAVE LESS TOOTH DECAY THAN THE GENERAL U.S. POPULATION, TOO MANY STILL SUFFER FROM THIS PREVENTABLE DISEASE.

Percent of Vermont's Kindergarten and Third Grade Children with Decay Experience (Treated and/or Untreated Decay) Compared to the National Average



* Source for U.S. data: National Health and Nutrition Examination Survey (NHANES), secondary analysis of publicly available datasets

-U.S. 5 year-olds in NHANES (2005-2010) are used as the comparison group for kindergarteners.

-U.S. third graders in NHANES (2011-2014) are used as the comparison group for third graders.

Tooth decay experience or being affected by tooth decay means that a child has had tooth decay in the primary (baby) and/or permanent (adult) teeth during his or her lifetime. Decay experience can be past (fillings, crowns, or teeth that have been extracted because of decay) or present (untreated tooth decay or cavities). Although Vermont is doing better than the nation as a whole, having 26% of kindergarten and 37% of third grade children with decay experience is still too high.

If we want to eradicate tooth decay in Vermont's children, we have to get them started right with early prevention efforts. Medical, dental and public health professionals must focus dental disease prevention efforts on children less than two years of age because two is too late. The American Dental Association, the American Academy of Pediatric Dentistry and the American Association of Pediatricians all recommend preventive dental care and parent education by age one.

The Problem

Too many children in Vermont are affected by tooth decay.

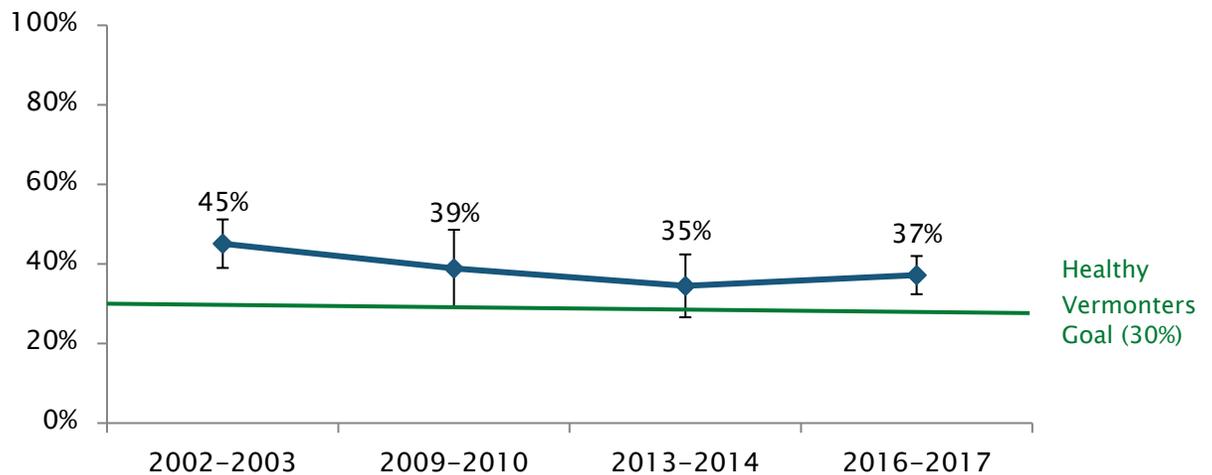
To Address this Problem Vermont Must...

Expand access to community based primary prevention programs.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #2: SINCE 2002–2003, THERE HAS NOT BEEN A SIGNIFICANT DECLINE IN THE PREVALENCE OF TOOTH DECAY AMONG VERMONT'S THIRD GRADE CHILDREN. VERMONT HAS NOT REACHED THE HEALTHY VERMONTERS GOAL FOR THE PERCENT OF CHILDREN WITH DENTAL DECAY.

Percent of Vermont's Third Grade Children with Decay Experience (Treated and/or Untreated Decay) by Year



Although the percentage of third grade children with decay experience in 2016–2017 is lower than in 2002–2003, the difference is not statistically significant. Unless substantial improvements are made in the next three years, the Healthy Vermonters goal of only 30% of third grade children with decay experience will not be met. This suggests that Vermont needs to expand primary prevention programs. Primary prevention programs, provided by both medical and dental professionals, may include parent and caregiver education, dental sealants and topical fluoride applications.

The Problem

Too many children in Vermont are affected by tooth decay.

To Address this Problem Vermont Must...

Expand access to community based primary prevention programs.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #3: ONE IN TEN CHILDREN ARE IN NEED OF DENTAL CARE.



About one in ten (10.5%) of Vermont's kindergarten and third grade children need dental care - with 1% needing urgent dental care because of pain or infection and 9% needing early dental care. In 2016–2017, there were close to 12,000 kindergarten and third grade children in Vermont. If 10% need dental care, this means that about 1,200 kindergarten and third grade children are in the classroom with a cavity and about 120 of them attend school in pain or with an oral infection, both of which can affect their ability to concentrate and learn. If these percentages are applied to all children in kindergarten to sixth grade, almost 4,180 children need dental care and more than 400 experience pain or an oral infection due to dental disease on any given day.

The *Keep Smiling Vermont* survey did not include complete diagnostic dental examinations. Instead, dental screenings were performed. This is a quick look inside the mouth with a dental mirror, without x-rays and the more advanced diagnostic tools. Because of this, some problems were likely missed. It is reasonable to assume that these findings actually underestimate the number of children needing dental care.

The Problem

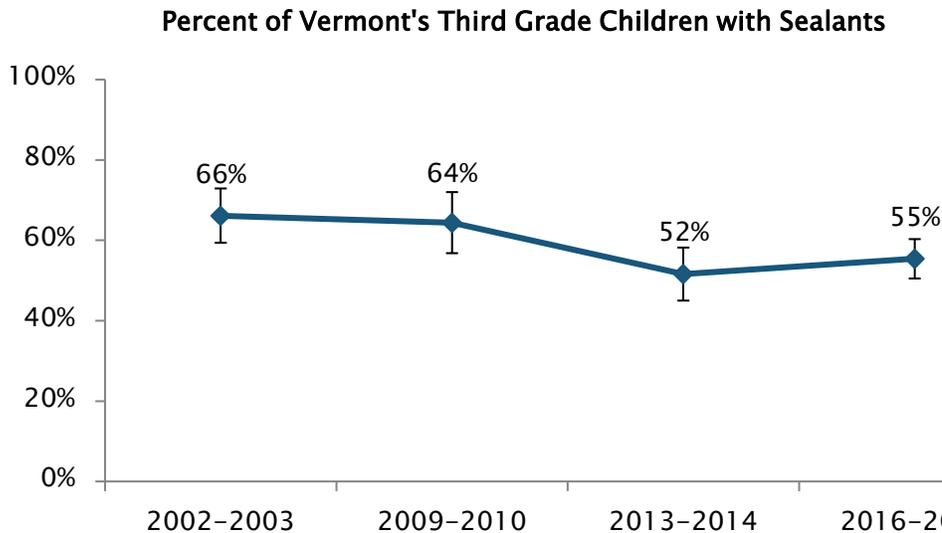
Too many children in Vermont need dental care.

To Address this Problem Vermont Must...

Expand community-based screening and referral programs that include a case management component so that children in need have better access to dental care.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #4: ONLY 55% OF THIRD GRADERS HAVE DENTAL SEALANTS, A RATE THAT HAS NOT IMPROVED IN RECENT YEARS.



Dental sealants are thin plastic coatings that are applied to the grooves on the chewing surfaces of the permanent back teeth, which usually appear when a child is about 6 years of age. Sealants protect the chewing surfaces from tooth decay by keeping germs and food particles out of these grooves. They are a safe, effective way to prevent tooth decay among school-aged children. The Surgeon General's report on oral health indicates that sealants can reduce decay in school-aged children by more than 70%.¹ A 2012 study completed by a dental insurance company found that children who had sealants placed on first molars experienced fewer dental problems during their childhood. The study examined dental claims for children with continuous insurance coverage and found that those who did not have sealants on their first molars incurred 34% more dental expenditures by age 15 than those who had received sealants.⁷ Sealants can be applied in a dentist's office or through school-based sealant programs. School-based sealant programs are especially important for reaching children from low-income families who are less likely to receive private dental care.

The Problem

Not enough children in Vermont have protective dental sealants.

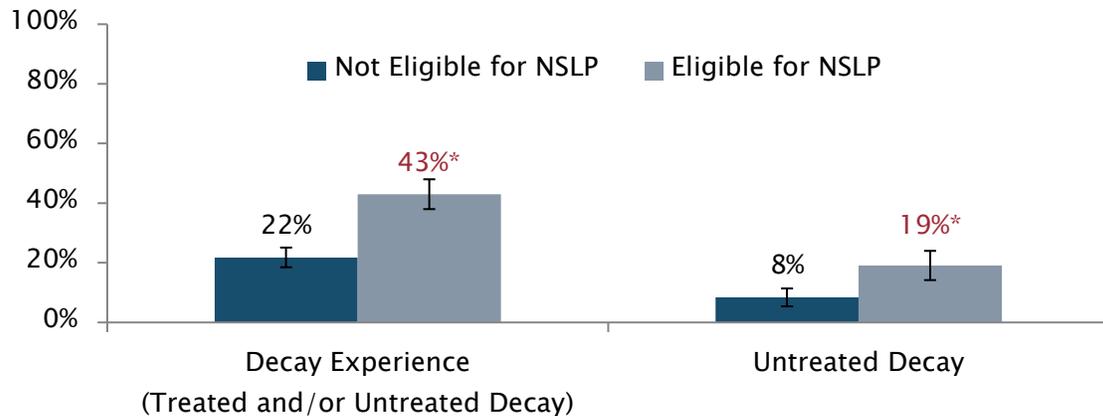
To Address this Problem Vermont Must...

Increase access to preventive dental sealants by providing education on the importance of sealants and encouraging the expansion of school-based sealant programs.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #5: POVERTY HAS A SIGNIFICANT IMPACT ON A CHILD'S ORAL HEALTH. CHILDREN ELIGIBLE FOR THE NATIONAL SCHOOL LUNCH PROGRAM ARE MORE LIKELY TO HAVE TOOTH DECAY.

Percent of Vermont's Kindergarten and Third Grade Children with Decay Experience and Untreated Decay by Eligibility for the National School Lunch Program (NSLP)



*Significantly different from Vermonters not eligible for NLSLP

The National School Lunch Program (NSLP) is a federally assisted meal program operating in public and nonprofit private schools. It provides nutritionally balanced, low-cost or free lunches to children each school day. Eligibility for NSLP is often used as an indicator of socioeconomic status. To be eligible for NSLP during the 2016–2017 school year, annual income could not exceed 185% of the federal poverty level.⁸ Children eligible for NSLP are significantly more likely to have decay experience and untreated decay. This suggests that lower-income children are not getting the benefit of early preventive services and are less likely to access a dentist for restorative treatment.

The Problem

Low-income children have more dental disease.

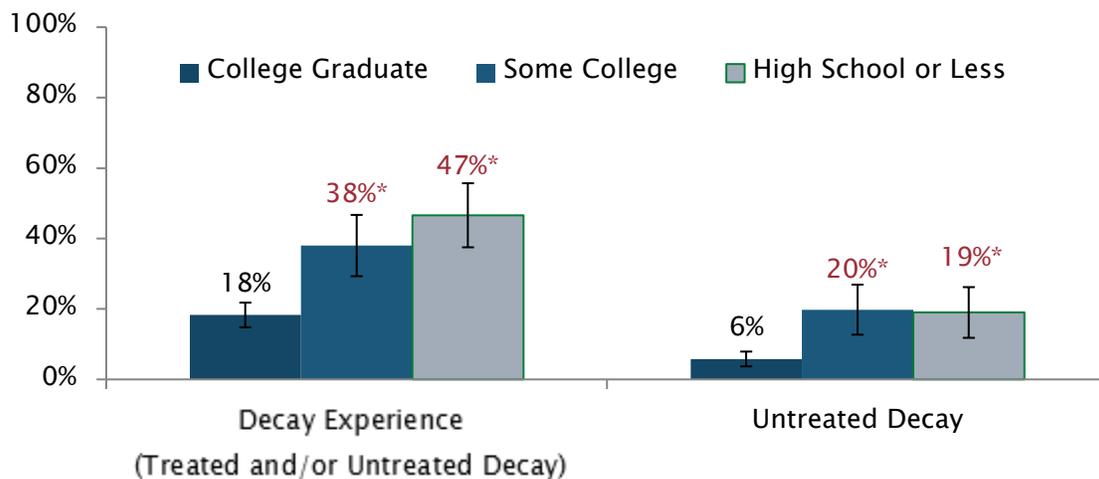
To Address this Problem Vermont Must...

Expand community based prevention programs, screening and referral services, and restorative dental care programs that target low-income children.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #6: PARENTAL EDUCATION HAS A SIGNIFICANT IMPACT ON A CHILD'S ORAL HEALTH. CHILDREN WHOSE PARENTS HAVE LESS THAN A COLLEGE DEGREE ARE MORE LIKELY TO HAVE TOOTH DECAY.

Percent of Vermont's Kindergarten and Third Grade Children with Decay Experience and Untreated Decay by Parent/Guardian Education



*Significantly different from Vermonters whose parents/guardians are college graduates

*Because of the optional nature of the questionnaire, results may not be representative of the state. These data are not adjusted for sampling scheme.

There is a significant link among education, employment, income and health. Greater educational attainment generally results in more employment opportunities, higher income and better access to medical and dental care. In addition, higher education is associated with better health literacy and improved health behaviors. In Vermont, children of college graduates have significantly lower rates of tooth decay, including untreated decay.

The Problem

Lower parent/guardian education increases a child's risk of tooth decay.

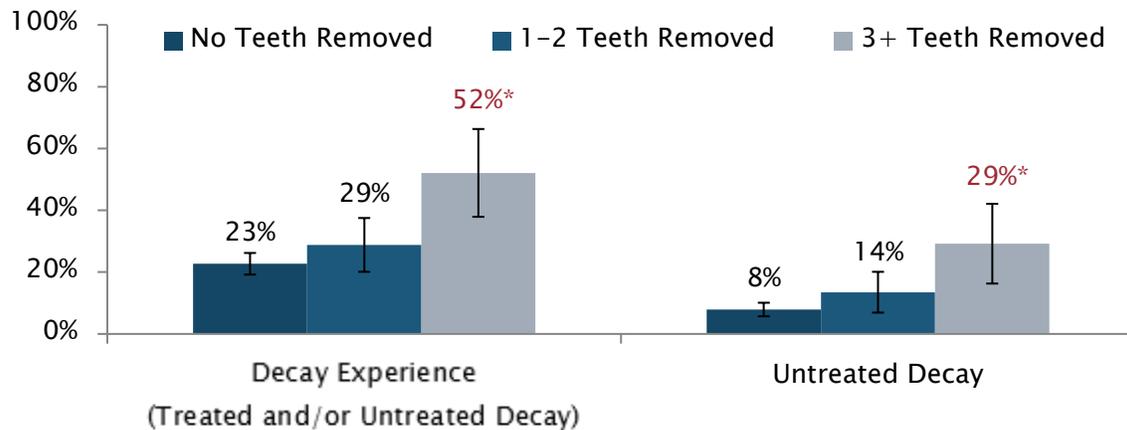
To Address this Problem Vermont Must...

Assure that educational materials are appropriate for parents/guardians with less than a college education and target health education services to populations with lower educational attainment.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #7: PARENT/GUARDIAN'S ORAL HEALTH HAS A SIGNIFICANT IMPACT ON A CHILD'S ORAL HEALTH. CHILDREN WHOSE PARENTS/GUARDIANS HAVE LOST THREE OR MORE TEETH DUE TO DENTAL DISEASE ARE MORE LIKELY TO HAVE TOOTH DECAY.

Percent of Vermont's Kindergarten and Third Grade Children with Decay Experience and Untreated Decay by Parent/Guardian Tooth Loss*



*Significantly different from Vermonters whose parents/guardians have no tooth loss

*Because of the optional nature of the questionnaire, results may not be representative of the state. These data are not adjusted for sampling scheme.

There are several well-supported pathways through which a parent/guardian's oral health impacts their child's risk of tooth decay. These pathways include parent-to-child transmission of the bacteria that causes tooth decay, attitudes toward use of the dental care delivery system, dental anxiety and fear, oral health behaviors such as tooth brushing, plus dietary habits and food choices.⁹ Compared to children whose parents/guardians have not lost a tooth due to dental disease, children whose parents/guardians have lost three or more teeth because of tooth decay or gum disease are more than twice as likely to have decay experience and more than three times more likely to have untreated decay.

The Problem

Poor parent/guardian oral health increases a child's risk of tooth decay.

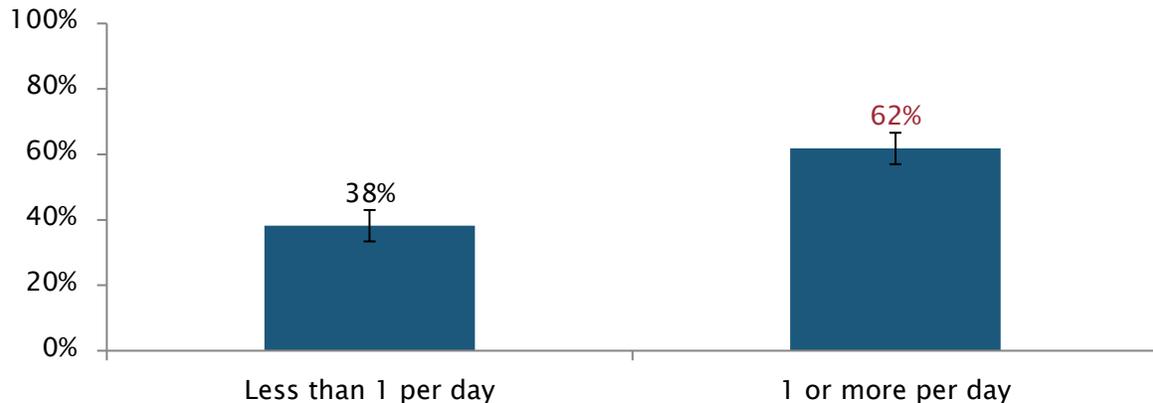
To Address this Problem Vermont Must...

Assure that parents/guardians of young children have access to preventive and restorative dental care.

ORAL HEALTH OF VERMONT'S CHILDREN

KEY FINDING #8: MOST CHILDREN IN VERMONT ARE DRINKING ONE OR MORE SUGAR-SWEETENED BEVERAGES PER DAY, A RISK FACTOR FOR TOOTH DECAY.

Percent of Vermont's Kindergarten and Third Grade Children who Drink Sugar-Sweetened Beverages*



*Because of the optional nature of the questionnaire, results may not be representative of the state. These data are not adjusted for sampling scheme.

Sugar-sweetened beverages (SSBs) are drinks sweetened with various forms of added sugars like brown sugar, high-fructose corn syrup, honey, raw sugar, and sucrose. Examples of SSBs include regular soda, fruit drinks, sports drinks, energy drinks, and sweetened waters. SSBs are the leading source of added sugars in the American diet. According to the Centers for Disease Control and Prevention, frequently drinking SSBs is associated with weight gain/obesity, type 2 diabetes, heart disease, and tooth decay. Replacing SSBs with plain water is a good way to reduce the intake of added sugars.

The Problem

Too many children drink sugar-sweetened beverages on a daily basis.

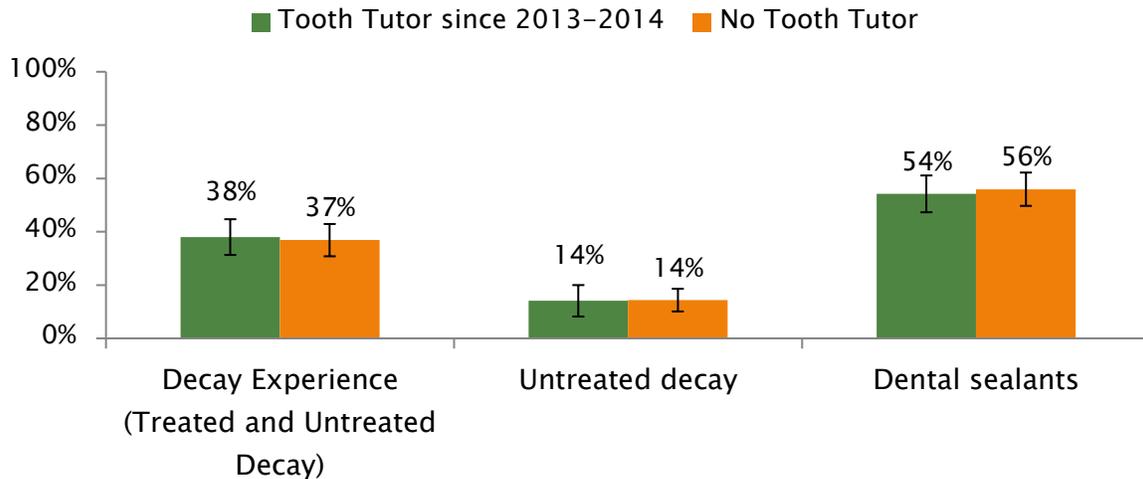
To Address this Problem Vermont Must...

Develop strategies to reduce the consumption of sugar-sweetened beverages.

TOOTH TUTOR SCHOOL-LINKED DENTAL SEALANT PROGRAM

THIRD GRADERS IN SCHOOLS WITH TOOTH TUTORS DO NOT HAVE LOWER RATES OF TOOTH DECAY OR HIGHER RATES OF SEALANTS THAN THIRD GRADERS IN SCHOOLS WITHOUT TOOTH TUTORS.

Comparing Third Graders in Schools With and Without Tooth Tutors



The Tooth Tutor School-linked Sealant Program aims to connect children with local dental homes where they can receive comprehensive dental care, including sealants. Third graders in schools with Tooth Tutors do not have lower rates of tooth decay or higher rates of sealants than third graders in schools without Tooth Tutors, even after controlling for National School Lunch Participation and race/ethnicity. Several factors should be considered as to why an impact of Tooth Tutors may be difficult to see. First, the disease process may have started before elementary school, before the Tooth Tutors were able to influence children's oral health. Second, Tooth Tutors target their work with a small percentage of children so it may be difficult to see the impact of their work in a larger group of students. Also, the timing of data collection may lead to an underestimate of the impact of the program. The data were collected in the middle of the school year and the impact of the Tooth Tutor program may not be apparent until the end of the school year since identifying the target group, connecting the child with care, and the child receiving care can take most of the school year.

KEY STRATEGIES TO IMPROVE ORAL HEALTH

Several key strategies have been identified to improve the oral health of children in Vermont:

- Promote evidence-based strategies to reduce dental disease, including fluoride varnish application in the medical home, community water fluoridation or fluoride supplementation, and dental sealants.
- Expand comprehensive decay prevention to include pregnant women, infants and toddlers, by expanding the Health Department's Local Health Office's Public Health Dental Hygienist program; providing trainings to medical practitioners to assess the oral health of young children, apply fluoride varnish, educate parents and guardians about pediatric oral health, and make dental referrals; and providing trainings to dental practitioners on seeing children by age 1 and pregnant women.
- Teach parents/guardians how to use the dental health care system and advocate for oral health for themselves and their children.
- Increase the number of dental insurance (private and public) enrollees who use their dental benefits for themselves and their children.
- Expand place-based dental care (bring the care to people), such as preschool, community, and school-based dental programs.
- Promote adherence to the Early and Periodic Screening, Diagnostic and Treatment periodicity schedule. These recommendations outline preventive pediatric oral health services that children should receive at their pediatric or general dental home.
- Promote the integration of oral health and primary medical care. Increase communication and care coordination between medical and dental practitioners.
- Promote oral health as part of general health and well-being to all Vermonters.
- Partner with the Health Department's Physical Activity and Nutrition Program, and others, to reduce the consumption of sugar-sweetened beverages and to ensure oral health is included in nutrition messaging.
- Build capacity in dental public health.
- Increase the number of dental providers throughout Vermont, particularly in underserved areas, that accept Medicaid.
- Promote higher utilization of existing or new workforce models and their ability to work to the fullest extent of their scope of practice.
- Increase private and public sector participation in mobilizing resources and developing policy to pursue and sustain these strategies.

SURVEY METHODS

Keep Smiling Vermont screened children in kindergarten and third grade from a representative sample of Vermont's public elementary schools. The sampling frame consisted of all public schools with 20 or more children in kindergarten and/or third grade. Some communities have kindergarten and third grade in different schools. If both the kindergarten and third grade schools were included in the sampling frame, children in these communities would have a higher probability of being selected. For this reason, the sampling frame was further limited to schools with only third grade, although the enrollment number used for selection included both kindergarten and third grade for the community.

To assure representation by geographic region, school participation in Vermont's Tooth Tutor program and socioeconomic status, the sampling frame was implicitly stratified by geographic location (rural/urban), Tooth Tutor participation (no/yes) and percent of the school's students eligible for the national school lunch program (NSLP). If a school with only third grade was selected, the appropriate feeder school was added to the sample. A systematic probability proportional to size sampling scheme was used to select a sample of 27 third grade schools. Three of the selected third grade schools did not have kindergarten students so the appropriate kindergarten feeder schools (n=5) were added to the sample for a total of 32 schools. If a school refused to participate, a replacement school from the same sampling interval was randomly selected. Data is available for all 27 sampling intervals. One third grade school had two kindergarten feeder schools but only one of the feeder schools was screened, which resulted in 31 participating schools rather than 32. Of the 2,801 children enrolled in the 31 participating schools, 2,245 were screened for an overall response rate of 80% (79% for kindergarten and 81% for third grade children).

One trained dental hygienist completed the screenings at the participating schools. The following information was collected for each child: grade, age, race/ethnicity, presence of untreated decay, presence of treated decay, urgency of need for dental care, and presence of dental sealants in the permanent first molar teeth. To obtain information on factors associated with tooth decay, parents/guardians were asked to complete an optional questionnaire. For the children with a dental screening, 728 (32%) had a corresponding parent/guardian questionnaire. Because of the optional nature of

SURVEY METHODS

the questionnaire, results may not be representative of the state. We used the *Basic Screening Survey* clinical indicator definitions and data collection protocols.¹⁰

All statistical analyses were performed using the complex survey procedures within SAS (Version 9.3; SAS Institute Inc., Cary, NC). Sample weights were used to produce population estimates based on selection probabilities.

DATA TABLES AND FIGURES

Table 1: Percent of Vermont’s children with decay experience (treated and/or untreated decay) by selected characteristics, 2016–2017

Demographic Characteristic	Kindergarten & Third Grade (n=2,244)		
	Weighted Percent	Lower 95% CL	Upper 95% CL
All Children	31.4	27.4	35.5
Grade			
Kindergarten	25.6	21.0	30.3
Third Grade	37.2	32.4	42.1
Gender			
Male	30.6	24.3	36.8
Female	32.3	27.8	36.8
Race/Ethnicity			
White	30.6	25.8	35.3
Minority	38.3	30.8	45.8
School NSLP Participation			
LE 25%	23.2	18.1	28.3
25% to 49%	30.6	26.7	34.5
GE 50%	39.3	31.6	47.0
Child NSLP Participation			
No	21.8	18.5	25.1
Yes	43.0	38.0	48.0

CL = Confidence limit, NSLP = National School Lunch Program

NOTE: Information on decay experience was missing for one child in kindergarten

Decay experience: Refers to having untreated decay or a dental filling, crown, or other type of restorative dental material. Also includes teeth that were extracted because of tooth decay.

Related Healthy People 2020 Objective

OH-1.2: Reduce the proportion of children aged 6–9 years who have dental caries experience in their primary or permanent teeth from 54.4 in 1999–2004 to 49.0% in 2020

Current National Estimates (NHANES, 2005–2010, 2011–2012, 2011–2014)

- 62% of children in 3rd grade had decay experience in 2011–2014
- 36% of 5 year old children had decay experience in 2005–2010
- 56% of children aged 6–8 years had decay experience in their primary teeth in 2011–2012

Disparities (p<0.05)

- Age: Third grade children have more decay experience
- Socioeconomic status (SES): Lower income children/schools have more decay experience

DATA TABLES AND FIGURES

Table 2: Percent of Vermont's children with untreated decay by selected characteristics, 2016–2017

Demographic Characteristic	Kindergarten & Third Grade (n=2,245)		
	Weighted Percent	Lower 95% CL	Upper 95% CL
All Children	13.6	10.7	16.5
Grade			
Kindergarten	12.9	8.7	17.0
Third Grade	14.3	10.9	17.8
Gender			
Male	12.3	8.1	16.4
Female	15.1	12.3	17.9
Race/Ethnicity			
White	13.3	10.1	16.5
Minority	18.9	12.9	24.9
School NSLP Participation			
LE 25%	8.6	5.6	11.5
25% to 49%	13.9	9.8	18.0
GE 50%	17.4	11.2	23.6
Child NSLP Participation			
No	8.4	5.4	11.4
Yes	19.1	14.2	23.9

CL = Confidence limit, NSLP = National School Lunch Program

Untreated decay: Dental cavities or tooth decay that have not received appropriate treatment.

Related Healthy People 2020 Objective

OH-2.2: Reduce the proportion of children aged 6–9 years with untreated dental decay from 28.8% in 1999–2004 to 25.9% in 2020

Current National Estimates (NHANES, 2005–2010, 2009–2010, 2011–2012, 2011–2014)

- 22% of 3rd grade children had untreated decay in 2011–2014
- 21% of 5 year old children had untreated decay in 2005–2010
- 17% of 6–9 year olds had untreated decay in their primary or permanent teeth in 2009–2010
- 20% of 6–8 year olds had untreated decay in their primary teeth in 2011–2012

Disparities (p<0.05)

- Socioeconomic status (SES): Lower income children have a higher prevalence of untreated decay

DATA TABLES AND FIGURES

Table 3: Percent of Vermont's *third grade* children with dental sealants by selected characteristics, 2016–2017

Demographic Characteristic	Third Grade (n=1,165)		
	Weighted Percent	Lower 95% CL	Upper 95% CL
All Third Grade Children	55.4	50.5	60.3
Gender			
Male	53.1	46.7	59.6
Female	57.7	51.8	63.7
Race/Ethnicity			
White	55.6	49.6	61.6
Minority	52.8	44.0	61.6
School NSLP Participation			
LE 25%	54.2	47.7	60.6
25% to 49%	55.0	49.9	60.0
GE 50%	56.9	44.5	69.4
Child NSLP Participation			
No	59.4	51.9	66.8
Yes	51.5	46.1	56.8

CL = Confidence limit, NSLP = National School Lunch Program

NOTE: Information on dental sealants was missing for 20 children

Dental Sealants: Plastic-like coatings that are applied to the chewing surfaces of back teeth. The applied sealant resin bonds into the grooves of teeth to form a protective physical barrier.

Related Healthy People 2020 Objective

OH-12.2: Increase the proportion of children aged 6–9 years who have received dental sealants on one or more of their permanent first molar teeth from 25.5% in 1999–2004 to 28.1% in 2020

Current National Estimates (NHANES, 2009–2010, and 2011–2012, 2011–2014)

- 42% of 3rd grade children had dental sealants in 2011–2014
- 32% of children aged 6–9 years had dental sealants in 2009–2010
- 31% of children aged 6–8 years had dental sealants in 2011–2012

Disparities (p<0.05)

- None

DATA TABLES AND FIGURES

Table 4: Percent of Vermont’s children needing early or urgent dental care by selected characteristics, 2016–2017

Demographic Characteristic	Kindergarten & Third Grade (n=2,239)		
	Weighted Percent	Lower 95% CL	Upper 95% CL
All Children	10.5	7.8	13.2
Grade			
Kindergarten	10.6	7.1	14.2
Third Grade	10.4	7.5	13.3
Gender			
Male	9.8	6.4	13.2
Female	11.3	8.6	14.1
Race/Ethnicity			
White	10.1	7.1	13.0
Minority	16.2	9.7	22.7
School NSLP Participation			
LE 25%	7.4	4.0	10.9
25% to 49%	11.2	6.9	15.5
GE 50%	12.1	7.0	17.3
Child NSLP Participation			
No	6.0	3.6	8.3
Yes	16.3	11.9	20.6

CL = Confidence limit, NSLP = National School Lunch Program

Note: Information on urgency of need for dental care was missing for 4 kindergarten and 2 third grade children

Early or urgent dental care: A child has untreated decay that should be treated within the next 6 months or needs other restorative dental care. Some children with untreated decay may not need dental treatment because the tooth is about to exfoliate.

Related Healthy People 2020 Objective/ Current National Estimates

- None

Disparities

- Socioeconomic status (SES): Compared to children not eligible for NSLP, children eligible for NSLP have a significantly higher need for dental care

DATA TABLES AND FIGURES

Table 5: Percent of Vermont’s children needing *urgent dental care* by selected characteristics, 2016–2017

Demographic Characteristic	Kindergarten & Third Grade (n=2,239)		
	Weighted Percent	Lower 95% CL	Upper 95% CL
All Children	1.0	0.6	1.4
Grade			
Kindergarten	1.0	0.2	1.8
Third Grade	0.9	0.4	1.5
Gender			
Male	0.6	0.2	1.0
Female	1.4	0.6	2.2
Race/Ethnicity			
White	1.0	0.4	1.5
Minority	1.2	0.0	2.8
School NSLP Participation			
LE 25%	0.6	0.1	1.1
25% to 49%	1.1	0.3	1.9
GE 50%	1.2	0.4	2.0
Child NSLP Participation			
No	0.7	0.0	1.5
Yes	1.3	0.6	2.0

CL = Confidence limit, NSLP = National School Lunch Program

Note: Information on urgency of need for dental care was missing for 4 kindergarten and 2 third grade children

Urgent dental care: A child has pain or infection due to a dental problem; ideally they should receive dental care as soon as possible.

Related Healthy People 2020 Objective/ Current National Estimates

- None

Disparities

- None

DATA TABLES AND FIGURES

Table 6: Mean number of treated and untreated teeth among Vermont’s children by selected characteristics, 2016–2017

Demographic Characteristic	Kindergarten & Third Grade (n=2,244)		
	Mean	Lower 95% CL	Upper 95% CL
All Children	1.1	0.9	1.3
Grade			
Kindergarten	1.0	0.8	1.3
Third Grade	1.2	1.0	1.5
Gender			
Male	1.2	0.9	1.5
Female	1.1	0.9	1.3
Race/Ethnicity			
White	1.1	0.9	1.4
Minority	1.2	0.9	1.6
School NSLP Participation			
LE 25%	0.7	0.5	1.0
25% to 49%	1.2	0.9	1.5
GE 50%	1.4	0.9	1.9
Child NSLP Participation			
No	0.7	0.5	0.9
Yes	1.6	1.3	1.9

CL = Confidence limit, NSLP = National School Lunch Program

Note: Information on the number of treated and/or untreated teeth was missing for 1 kindergarten student

Related Healthy People 2020 Objective/ Current National Estimates

- None

Disparities (p<0.05)

- Socioeconomic status (SES): Low income children have a higher mean number of teeth with decay experience

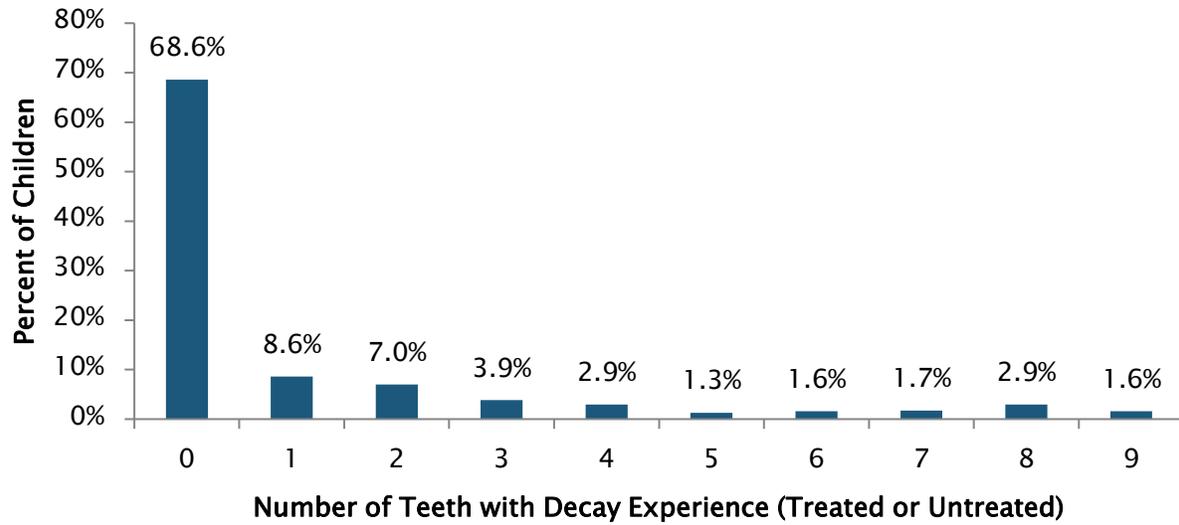
DATA TABLES AND FIGURES

Table 7: Percent of Vermont's kindergarten and third grade children with decay experience and untreated decay by parent/guardian questionnaire variables – limited to those with a parent/guardian questionnaire and a dental screening (n=728), 2016–2017 (not adjusted for sampling scheme)

Question	Percent with Decay Experience			Percent with Untreated Decay		
	Percent	Lower 95% CL	Upper 95% CL	Percent	Lower 95% CL	Upper 95% CL
Dental visit in last year						
No	24.0	12.1	35.9	20.0	8.9	31.1
Yes	26.2	22.9	29.5	9.4	7.2	11.6
Child's dental care is paid by						
Cash Only	24.5	12.4	36.6	8.2	0.5	15.8
Medicaid or Medicaid/Cash	37.6	31.8	43.4	16.9	12.4	21.4
Private, Tricare, Private/Cash or Tricare/Cash	18.2	14.3	22.1	6.6	4.1	9.1
Servings of sugar sweetened beverages/day						
0	20.8	16.0	25.6	6.9	3.9	9.9
> 0 and < 3	28.4	24.0	32.8	11.3	8.2	14.4
3 or more	37.5	22.5	52.5	25.0	11.5	38.5
Parent education						
High school/GED or less	46.6	37.5	55.7	19.0	11.8	26.1
Some College	38.0	29.3	46.7	19.8	12.7	27.0
College graduate	18.3	14.8	21.8	5.8	3.7	7.9
Parent's number of permanent teeth removed						
0	22.7	19.2	26.2	7.9	5.7	10.2
1–2	28.8	20.1	37.6	13.5	6.9	20.0
3 or more	52.1	37.9	66.3	29.2	16.3	42.1

DATA TABLES AND FIGURES

Figure 1: Number of teeth with decay experience (treated or untreated) among Vermont's kindergarten and third grade children, 2016–2017



REFERENCES

- ¹ U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.
- ² Prevalence of Childhood Obesity in the United States, 2011–2012. Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/obesity/data/childhood.html>
- ³ Dye BA, Thornton–Evans G, Li X, Iafolla TJ. Dental caries and sealant prevalence in children and adolescents in the United States, 2011–2012. NCHS data brief, no 191. Hyattsville, MD: National Center for Health Statistics. 2015.
- ⁴ National Health and Nutrition Examination Survey (NHANES) 2011–2014, secondary analysis of publicly available data sets.
- ⁵ National Center for Health Statistics. Current estimates from the National Health Interview Survey, 1996 (Vital and Health Statistics; Series 10, Data from the National Health Survey; no. 200). Hyattsville, MD: U.S. Department of Health and Human Services, National Center for Health Statistics, 1996.
- ⁶ Griffin, SO, Barker LK, Wei L, et al. Use of Dental Care and Effective Preventive Services in Preventing Tooth Decay Among U.S. Children and Adolescents — Medical Expenditure Panel Survey, United States, 2003–2009 and National Health and Nutrition Examination Survey, United States, 2005–2010. *MMWR_Surveill Summ* 2014;63 Suppl 2:54–60.
- ⁷ Personal communication with Kay Fay, Hawaii Dental Services, January 2016.
- ⁸ U.S. Department of Agriculture, Child Nutrition Programs, School Lunch Program, Income Eligibility Guidelines SY 2016–2017, Available at: <https://www.federalregister.gov/documents/2016/03/23/2016-06463/child-nutrition-programs-income-eligibility-guidelines>
- ⁹ Dye BA, Vargas CM, Lee JJ, Magder L, Tinanoff N. Assessing the relationship between children's oral health status and that of their mothers. *J Am Dent Assoc* 2011;142:173–83
- ¹⁰ Association of State and Territorial Dental Directors. Basic screening surveys: an approach to monitoring community oral health. Available at: <http://www.astdd.org/basic-screening-survey-tool>.