



Dental Public Health Project/Activity Descriptive Report Form

Please provide a detailed description of your **successful dental public health project/activity** by fully completing this form. Expand the submission form as needed but within any limitations noted. Please return completed form to: lcofano@astdd.org

NOTE: Please use Arial 10 pt. font.

CONTACT PERSON PREPARING THE SUBMISSION AND TO ANSWER QUESTIONS

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PROVIDE CONTACT INFORMATION FOR ONE ADDITIONAL PERSON WHO COULD ANSWER QUESTIONS REGARDING THIS PROGRAM

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SECTION I: ACTIVITY OVERVIEW

Title of the dental public health activity:

CariedAway: Delivering Essential Dental Care in Schools

Public Health Functions* and the 10 Essential Public Health Services to Promote Oral Health:

Check one or more categories related to the activity.

"X"	Assessment
	1. Assess oral health status and implement an oral health surveillance system.
	2. Analyze determinants of oral health and respond to health hazards in the community
	3. Assess public perceptions about oral health issues and educate/empower them to achieve and maintain optimal oral health
Policy Development	
	4. Mobilize community partners to leverage resources and advocate for/act on oral health issues
	5. Develop and implement policies and systematic plans that support state and community oral health efforts
Assurance	
	6. Review, educate about and enforce laws and regulations that promote oral health and ensure safe oral health practices
X	7. Reduce barriers to care and assure utilization of personal and population-based oral health services
	8. Assure an adequate and competent public and private oral health workforce
X	9. Evaluate effectiveness, accessibility and quality of personal and population-based oral health promotion activities and oral health services
X	10. Conduct and review research for new insights and innovative solutions to oral health problems

[*ASTDD Guidelines for State and Territorial Oral Health Programs that includes 10 Essential Public Health Services to Promote Oral Health](#)

Healthy People 2030 Objectives: Please list HP 2030 objectives related to the activity described in this submission. If there are any state-level objectives the activity addresses, please include those as well.

OH-1: Reduce proportion of children and adolescents with lifetime of tooth decay experience

OH-2: Reduce the proportion of children and adolescents with active and untreated tooth decay

OH-9: Increase the proportion of low-income youth who have a preventive dental visit

AHS-05: Reduce the proportion of people who cannot get the dental care they need when they need it

Provide 3-5 Key Words (e.g. fluoride, sealants, access to care, coalitions, policy, Medicaid, etc.) These will assist those looking for information on this topic:

Use of Oral Health Data, Acquiring Oral Health Data, Access to Care: Children Services, Access to Care: School-Based Oral Health, Prevention: Children Oral Health, Prevention: Sealants, Silver Diamine Fluoride, Glass Ionomer, Fluoride Varnish, Fluoride Toothpaste, Interim Therapeutic Restorations.

Executive Summary:

Provide a brief description of the dental public health activity. Include information on: (1) what is being done; (2) who is doing it and why; (3) associated costs; (4) outcomes achieved (5) lessons learned, both positive and negative.

Following the 2000 Surgeon General's Report on Oral Health in America we considered which oral health malady, age group, and interventions might provide the greatest beneficial impact.

Caries, the most prevalent oral, systemic, and life-span disease, became our focus. We considered critical ages and interventions periods. We decided on school-age children, school-based care, and prevention based on current CDC recommendations, available preventive interventions, and the absence of outcome measures. In parallel quality and improvement measures and the HealthyPeople 2010 goals emerged from multiple federal and academic centers.

We incorporated all of the above-mentioned and opted for an all-in care bundle - multiple effective interventions twice per year, for all teeth, in all children, in all grades, delivered by dental hygienists. The interventions were glass ionomer for both sealants and interim therapeutic restorations, fluoride varnish, and fluoride toothpaste. Our short- and long-term results indicated that this approach is effective (>50 caries reduction), cost-saving, and cost effective, and meets all the quality, health, and HealthyPeople goals.¹

Ten years after the first Surgeon General's Report on Oral Health the following began emerging: the Centers for Medicare and Medicaid (CMS) interest in value-based care; U.S. Food and Drug Administration (FDA) approval of silver diamine fluoride (SDF); national guidelines for non-restorative dental care; HealthyPeople 2020 and 2030 goals; the 2020 Surgeon General's Report on Oral Health in America; and the World Health Organization (WHO) Global Oral Health Strategy for essential dental care.²

We are now integrating all of these guidance documents. The current work compares the efficacy of the original more complex all-in bundle with a simpler all-in bundle that substitutes SDF for glass ionomer. The results of both bundles appear to have similar clinical outcomes (~50% caries arrest, ~80% caries prevention), and both improve oral health related quality of life. Importantly, these results accrued during a 2-year, COVID-19 pandemic induced, care hiatus. As importantly, all of these interventions are aerosol-free.³

The lessons learned are relatively simple. Comprehensive school-based caries prevention programs can be effective and cost saving but are not sustainable given current Medicaid reimbursement methods and state practice restrictions.

The opportunity is also relatively simple. If Medicaid were to provide a bundled payment for cycle of school-based care, and if State rules for school-based and private practice were aligned, then the cost savings would be sufficient to cover essential adult dental care benefits.⁴

¹ Short-term outcomes: [https://jada.ada.org/article/S0002-8177\(14\)61899-7/fulltext](https://jada.ada.org/article/S0002-8177(14)61899-7/fulltext)
Long-term outcomes: [https://jada.ada.org/article/S0002-8177\(20\)30842-4/fulltext](https://jada.ada.org/article/S0002-8177(20)30842-4/fulltext)
Economics: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6749793/pdf/10.1177_2380084419837587.pdf

² ADA Guidance: [https://jada.ada.org/article/S0002-8177\(18\)30469-0/fulltext](https://jada.ada.org/article/S0002-8177(18)30469-0/fulltext)
WHO Global Oral Health Strategy: https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_10Add1-en.pdf
WHO Essential Dental Medicines: <https://apps.who.int/iris/bitstream/handle/10665/345554/WHO-MHP-HPS-EML-2021.01-eng.pdf>
Essential Dental Care: <https://journals.sagepub.com/doi/full/10.1177/0022034520979830>

³ Quality of Life: <https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-022-02159-5>
Clinical outcomes: <https://www.medrxiv.org/content/10.1101/2022.04.26.22274321v1.full.pdf>

⁴ Economics: <https://ajph.aphapublications.org/doi/epdf/10.2105/AJPH.2016.303614>

Summary Details

1. We provide twice yearly, comprehensive, elementary school-based caries prevention to all students in all grades who have a signed parental informed consent form. We tested two types of care that we named "Simple" and "Complex." Both types of care are aerosol free.

Based on efficacy (see table below), we postulated that the two would be equally effective, and that simple would be less costly.

- a. Simple care: SDF + fluoride varnish + fluoride toothpaste and toothbrush
- b. Complex care: Glass ionomer sealants + glass ionomer interim therapeutic restorations + fluoride varnish + fluoride toothpaste and toothbrush.
- c. Based on efficacy (see table below) we postulated, that simple would be less costly, and non-inferior to complex (see #4)
- d. We do not provide a prophylaxis, nor do we take radiographs

CariedAway Protocols and % Cavity Reduction

		Simple Prevention		Complex Prevention	
Terminology	Focus	Toothpaste + F-varnish	SDF	Toothpaste + F-varnish	Seal + ITR
1° Prevention	Smooth surface	25%+40%		25%+40%	
	Pits and fissure		80%		80%
2° Prevention	Caries arrest		80%		80%

Niederman R, et al. Dentistry. DCP3, World Bank, 2015

2. Registered dental hygienists provide comprehensive caries prevention in schools. The goal is to increase reach (bring care to kids rather than kids to care) and effectiveness (comprehensive caries prevention) to increase program impact.
3. Complex costs are ~\$100 per child (~\$85 for personnel; ~\$15 supplies). This is cost-saving and cost-effective (See: <https://pubmed.ncbi.nlm.nih.gov/31009589/>). We are currently assessing the costs for Simple.
4. Effectiveness of both Simple and Complex are ~50% reduction in untreated caries and ~80% caries prevention. This result was maintained across the 2-year COVID-19 pandemic care hiatus.
See: [https://jada.ada.org/article/S0002-8177\(20\)30842-4/fulltext](https://jada.ada.org/article/S0002-8177(20)30842-4/fulltext)

The program is aerosol free, evidence-based, effective, and meets all six IOM quality aims, the Institute for Healthcare Improvement (IHI) triple aim and adheres to the American Dental Association (ADA) guidance for non-restorative care.

5. Lessons learned:
 - a. Informed consent can be improved using a school's electronic communication:
 - i. Sending electronic informed consent multiple times per year
 - ii. Having the consent cover the entire time a child is in the school
 - b. Programs are not sustainable under current Medicaid fee for service compensation architecture. Instead, programs rely on donations or grants. Consequently, a quarter of the programs closed permanently during COVID-19. The remainder are determining how to restart. Specifically,
 - i. Medicaid does not compensate for program:
 - 1) Startup costs (e.g. school and city approval)
 - 2) Pre-care work for informed consent and scheduling
 - 3) Either SDF or interim therapeutic restorations (ITR)

- 4) Post-care work for care coordination and both quarterly and annual reports
 - 5) Medicaid billing and reconciliation
- c. Medicaid pays private DDS higher fees than school programs and does not require reporting
 - d. Dental practice act limit care provision in schools to certified public health dental hygienists rather than just RDH.
 - e. RDH training programs do not include training in essential dental care (e.g. use of SDF, glass ionomer sealants or ITRs).

SECTION II: DETAILED ACTIVITY DESCRIPTION

Provide detailed narrative about the dental public health activity using the headings provided and answering the questions. Include specifics to help readers understand what you are doing and how it's being done. References and links to information may be included.

****Complete using Arial 10 pt.**

Rationale and History of the Activity:

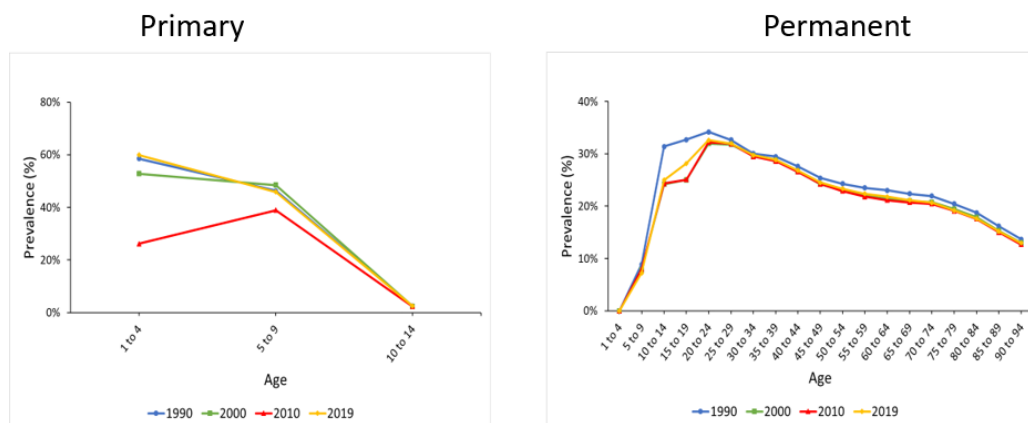
1. What were the key issues that led to the initiation of this activity?

Based on average data from the Institute for Health Metrics and Evaluation the United States (and its territories), has significant, unchanging, and costly clinical dental problems of at least 30-years duration. Data from New Hampshire (and other states) is very similar to national data.

NH (and US) Clinical Problem

No Change in Caries Prevalence 1990-2019

Dental Expenditures Increased ~3x



New Hampshire elected to attempt addressing this problem by testing an evidence-based, comprehensive, caries prevention program that provided care twice per year to all grades and all teeth, rather than incremental care limited to 6- and 12-year-olds and 1st and 2nd molars.

2. What rationale/evidence (may be anecdotal) did you use to support the implementation of this activity?

We carried out systematic reviews to identify school-based caries prevention protocols with demonstrated clinical efficacy. We could not identify any. We then carried out systematic reviews of caries preventive agents and methods with quantitative demonstration of clinical efficacy. Rather than testing each method individually, we postulated that if we provided all children with all interventions to all children in all grades and all teeth and we did not see a decline in caries, our knowledge of caries and prevention must be flawed.

See: https://dcp-3.org/sites/default/files/chapters/DCP3_Essential%20Surgery_Ch10.pdf

3. What month and year did the activity begin and what milestones have occurred along the way? (May include a timeline.)

In 2015, after 5 years of observing, and consulting with the principals of CariedAway, we collaborated with the New York University College of Dentistry and secured National Institutes of Health (NIH) funding to implement a comprehensive caries prevention program.

The milestones were relatively simple.

- Train the dental hygienists in using SDF and providing glass ionomer sealants and glass ionomer ITR.
- Train the dental hygienists in using an electronic dental health record on iPads specifically developed for school-based caries prevention.
- Obtain informed consent and schedule care
- Provide care
- Carry out care coordination and bill Medicaid.

The sections below follow a logic model format. For more information on logic models go to: [W.K. Kellogg Foundation: Logic Model Development Guide](#)

INPUTS	PROGRAM ACTIVITIES	OUTPUTS	OUTCOMES
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1. What resources were needed to carry out the activity? (e.g., staffing, volunteers, funding, partnerships, collaborations with various organizations, etc.)

Five-year National Institutes of Health (NIH) grant funding
 Evidence-focused leadership
 Engagement of: NH Department of Health and Human Services Dental and Medicaid, NH dental society, Northeast Delta Dental, representatives of NH school principals, nurses and parents
 Prevention focused clinicians

INPUTS	PROGRAM ACTIVITIES	OUTPUTS	OUTCOMES
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2. Please provide a detailed description the key aspects of the activity, including the following aspects: administration, operations, and services.

This program builds on a pre-existing sealant program to improve reach, effectiveness, sustainability, and therefore impact.

INPUTS	PROGRAM ACTIVITIES	OUTPUTS	OUTCOMES
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3. What outputs or direct products resulted from program activities (e.g., number of clients served, number of services units delivered, products developed, accomplishments.)?

We developed:

- A proprietary electronic dental health record that lives on an iPad (does not require internet) that allows us to assess inputs, activities, outputs, and outcomes quantitatively.
- Publications addressing effectiveness, cost-savings, cost-effectiveness, and oral health related quality of life.

INPUTS	PROGRAM ACTIVITIES	OUTPUTS	OUTCOMES
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4. What outcomes did the program achieve? (e.g., health statuses, knowledge, behavior, care delivery system, impact on target population, etc.) Please include the following aspects:

- a. How outcomes are measured
- b. How often they are/were measured
- c. Data sources used
- d. Whether intended to be short-term (attainable within 1-3 years), intermediate (achievable within 4-6 years), or long-term (impact achieved in 7-10 years)

Outcomes:

>50% caries reduction, and > 50% caries prevention, pre-pandemic when we saw children 2X/year
 See: <https://www.sciencedirect.com/science/article/abs/pii/S0002817720308424>

Care also improves a child’s oral health related quality of life.
<https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-022-02159-5>

During the pandemic we did not see children for up to 2 years, and the results appear to be the same: >50% caries reduction and prevention.

Budgetary Information:

NOTE: Charts and tables may be used to provide clarity.

1. What is the annual budget for this activity?

The cost is approximately \$100/child per visit for complex care. We are currently examining the costs for simple care.

2. What are the costs associated with the activity? (Including staffing, materials, equipment, etc.)

Approximately \$15 supplies per visit and approximately \$85 for personnel

3. How is the activity funded?

Grant funding + Medicaid billing + contributions

4. What is the plan for sustainability?

School-based programs are not sustainable given current Medicaid fee for service compensation. This program is possible because Medicaid fees are substantially subsidized with grant funds.

We are currently examining alternate Medicaid reimbursement policies. Our current modeling suggests a bundled payment for cycle of care would be effective nationally. Specifically, our preliminary model indicates that if the NH program were implemented nationally, Medicaid fees could provide comprehensive caries prevention to all U.S. children at half of Medicaid’s current expenditures for children’s dental health.

Lessons Learned and/or Plans for Addressing Challenges:

1. What important lessons were learned that would be useful for others looking to implement a similar activity? Was there anything you would do differently?

Medicaid needs to adopt a compensation system that supports and incentivizes school-based prevention programs (See: <https://pubmed.ncbi.nlm.nih.gov/28661798/>)

- Measure success based on caries arrest and caries prevention
- Eliminate all surrogate process measures (e.g. sealant placed, sealants retained, varnish or SDF placed, retention)

2. What challenges did the activity encounter and how were those addressed?

Informed consent rates locally and nationally, in all school-based programs hover around 30%. This means that about 70% of kids who could benefit from prevention do not get it. We see multiple opportunities to increase informed consent. They include:

- Electronic informed consent disseminated from schools with electronic communication systems
- Multiple electronic distributions each year
- Multi-year informed consent that last as long as the child is in the school

Medicaid reimbursement systems and state regulations are largely based on outdated process measures rather than outcome measures (see #1 directly above).

Available Information Resources:

Share any models, tools, and/or guidelines developed by the program specifically for this activity that may be useful to others seeking additional information. Hyperlink resources if possible.
(See links above)

I find the following Driver Diagram more useful than the Logic Model

Aim	Primary Drivers	Secondary Drivers
Equity Impact	Reach	Direct: Informed consent (School faculty and parents)
		Indirect: DOE & DOH acceptance (Local and state),
		Indirect: Clinician and Dental Board acceptance
	Effectiveness	Implement: Optimize evidence-based preventive intervention delivery
		Eliminate: Non-evidence-based diagnostics and interventions
		RDH effectiveness
	Sustainability	Electronic dental records
		Clinical team productivity
		Clinical team compensation
Care reimbursement (Political and clinician buy in)		

TO BE COMPLETED BY ASTDD	
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