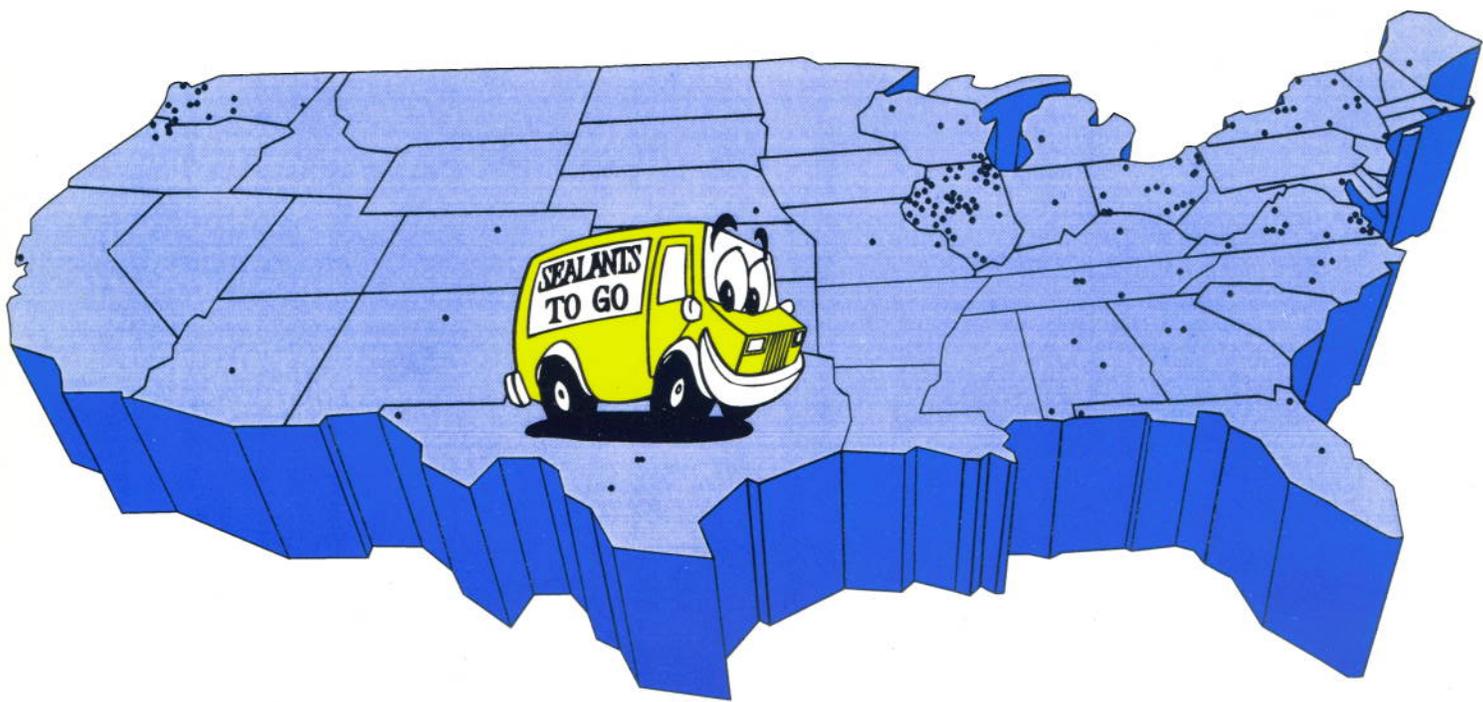


School-Based & School-Linked Public Health Dental Sealant Programs in the United States, 1992-93



Association of State and
Territorial Dental Directors



Ohio Department of Health

**SCHOOL-BASED AND SCHOOL-LINKED
PUBLIC HEALTH DENTAL SEALANT PROGRAMS
IN THE UNITED STATES, 1992-93**

Prepared for the Association of State and Territorial Dental Directors by the Ohio Department of Health, Bureau of Oral Health Services:

Mark D. Siegal, DDS, MPH
Bureau Chief

James A. Lalumandier, DDS, MPH
Research and Evaluation Administrator

Carrie L. Farquhar, RDH, BS
Dental Care Resources Program Coordinator

Jo M. Bouchard, RDH, MPH
District Supervisor and Special Projects Administrator

This survey was conducted in preparation for the National Public Health Dental Sealant Program Conference held in Columbus, Ohio in August, 1994. This monograph was made possible, in part, through a contribution from Oral Health America.

Published by the Association of State and Territorial Dental Directors
Columbus, Ohio
1997

ABSTRACT

Objectives: Public health sealant programs often target children with poor access to dental care, but little is known about the characteristics of such programs. This study describes school-based and school-linked public health sealant programs in the United States.

Methods: A 38-item pretested questionnaire was mailed to 144 public health agencies potentially operating sealant programs in schools. Data were analyzed for those programs that operated during the 1992-93 school year.

Results: 120 programs (in 25 states) were school-based and/or school-linked. Two-thirds were concentrated in Illinois, Ohio, New York and Virginia. Of the 88 programs operating during the 1992-93 school year, 86 returned questionnaires. The percent of students eligible for the free and reduced cost meal program was a school selection criterion for 69 percent of programs and grade level was used by 73 percent to select individuals. On a typical day, programs spent about 5 hours providing services to 11 children. Permanent molars accounted for approximately 90 percent of teeth sealed. On average, over 6000 sealants (median=3006) were placed per program with the typical child receiving approximately 4 sealants at a cost of \$36.38 (\$8.17 per tooth).

Conclusions: The majority of public health sealant programs were concentrated in a handful of states. Programs targeted sealants on a population basis (grade level, income

indicators) more than on an individual basis (caries status, tooth morphology). Differences in data collection methods among programs make quantitative analysis difficult.

KEY WORDS: pit and fissure sealants, public health sealant programs

INTRODUCTION

Dental caries affects many schoolchildren in the United States. The likelihood of a student having had dental caries increases with age, from 54 percent of 6-8 year old children to 67 percent of those 15 years of age (1). At least 83 percent of caries in permanent teeth occurs on tooth surfaces with developmental defects called pits and fissures, mostly on permanent molars (2). Recognizing that the application of dental sealant is the most effective approach to preventing pit and fissure caries, the United States Public Health Service set a national objective for the year 2000 of 50 percent of eight and 14 year old children having one or more sealants (3).

Sealant is an adhesive plastic material which, when bonded to dental enamel, isolates vulnerable pits and fissures from decay-causing bacteria and their acid products. Although sealant has been available since the early 1970's, less than eight percent of students examined in a 1986-87 national survey had sealed teeth (4). Since that time, however, state surveys have reported sealant prevalence ranging from 15 to 39 percent (5-7) and a national survey conducted between 1988 and 1991 found 21 percent of children aged eight and 27 percent of those aged 14 to have at least one sealed permanent molar (1).

Perhaps because of the high need for and low prevalence of sealants, a number of community-based public health programs arose to provide sealants to children, mostly in school settings. This approach was intended to

complement the care provided in private dental offices in order to reach vulnerable populations, less likely to receive private care.

A comprehensive report promoting the use of sealants, through appropriate patient and tooth selection and application technique, was published by the Massachusetts Department of Public Health in 1986 (8). Eight years later the Association of State and Territorial Dental Directors and others convened the Workshop on Guidelines for Sealant Use in Albany, New York (9). The workshop sought to update guidelines for sealant use in light of more recent caries prevalence data and clinical strategies for the conservative management of caries. Both efforts developed separate recommendations for sealant use in individual office settings and community settings (mostly school-based programs). The workshop distinguished the two by assuming that a full array of caries diagnostic and treatment options were available in the former and only sealant application and visual diagnosis in the latter.

While sealant use in private dental practice has been described in a number of national and state-specific studies (10-15), the characteristics of community-based sealant programs have been reported in only one national study. That survey, by Cohen and Horowitz (16), generated its sample by surveying state dental directors or, in states without dental directors, a designated health department administrator. Sealant programs, however, tend to be locally

operated. Furthermore, program characteristics were described for only the largest and most comprehensive sealant program in each state rather than for all programs. Of the 29 sealant programs analyzed, 11 were the only programs placing sealants in their respective states, while the remainder represented the largest and most comprehensive operation in the state.

The purpose of our survey was to identify and describe school-based and school-linked public health sealant programs in the United States by directly questioning each program director. This methodology would enable us to describe those programs in a greater level of detail than previously reported and to evaluate the effect of limiting sample selection, as was done in the other national survey.

METHODS

A 38-item pretested questionnaire, which incorporated questions from an instrument developed by Cohen and Horowitz was mailed to 144 public health programs in 28 states. The list of potential sealant programs surveyed was generated by canvassing all state dental directors, or surrogates in states without a dental director. In the summer of 1994, our surveys were mailed to each program on the list. Nonresponders received one additional mailing and extensive telephone follow-up.

The survey was divided into two sections. The first section included general questions about sealant program characteristics and the second asked

specific questions pertaining to school-based or school-linked programs.

For this survey, we considered public health sealant programs to be those dedicated to sealant placement, as opposed to primary dental care programs that place sealants in the course of comprehensive care or programs limited to sealant promotion activity. We defined school-based programs as those conducted completely within the school setting. School-linked programs were defined as those connected with schools in some way but where sealant placement occurs at a site other than the schools. For example, school-linked programs may distribute consent forms and/or conduct dental screening at school. We categorized sealant programs which were hybrids of the two models as school-based/linked programs. We did not survey programs operated by the federal government and targeted to specific populations.

Questionnaire data from all programs operating in 1992-93 were entered into a SAS data base and analyzed using PC-SAS. Since only one other national survey was conducted to describe public health sealant programs, we elected to compare our findings to those. In order to duplicate that survey's methodology, we also analyzed a subset of 21 programs representing either the only sealant program (n=9) with 1992-93 data in a particular state or the program in that state placing the greatest number of sealants (n=12).

RESULTS

Sample Response

Of the 144 potential sealant programs surveyed, 120 met our definition. We made the determination through either survey responses or telephone contacts. These 120 programs were slightly more than one-half school-based, nearly one-sixth school-linked, and one-third combination school-based/linked. Although the programs were dispersed among 25 states, two-thirds were found in four states: Illinois (n=35), Ohio (n=17), New York (n=12) and Virginia (n=12). In order to assure completeness of data, we elected to analyze responses for the 1992-93 school year only. This eliminated 32 new programs established after the 1992-93 school year from the analysis, leaving us with 88 programs from 21 states. Indiana, Kentucky, Michigan, and South Carolina were the four states eliminated from analysis because the programs that responded from those states did not operate in the 1992-93 school year.

Of the 88 programs, only two did not return their surveys for a response rate of 97.7 percent. While the 86 responding programs were dispersed over 21 states, two-thirds of programs were located in the same four states: Illinois (n=22), Ohio

(n=16), New York (n=12) and Virginia (n=7). Table 1 shows the distribution of school-based, school-linked and school-based/linked programs.

Program Initiation

The first public health sealant program identified by the survey dated back to the early 1970s, in Tennessee. The average start-up year for the 86 programs was 1988. Thirty percent (n=26) of those programs commenced during the 1992-93 school year. Many programs (n=53) sought guidance from their state dental director or from other established sealant programs prior to making policy decisions.

Program Funding

In addition to state, local and charitable funding, Medicaid reimbursement was available in all states surveyed. Presently all 50 state Medicaid programs reimburse for sealants. However, 55 (64%) of the 86 responding programs did not take advantage of Medicaid reimbursement. In our sample, the average Medicaid reimbursement for sealants was \$11.29 per tooth, ranging from \$3 to \$18 at the time of the survey. The Medicaid fee for sealants in a given state was not associated with the number or size of the public health sealant programs.

Table 1

Categories of Sealant Programs			
<u>Categories</u>	<u>1992-93 school year</u>	<u>New programs</u>	<u>Total</u>
School-based	42	19	61
School-linked	12	7	19
School-based/linked	34	6	40
Total	88	32	120

Program Personnel

Each state dental practice act and rules and regulations determine who can examine patients, who can place sealants and whether a dentist must be present for placement. All states represented in our survey allowed dental hygienists to place sealants, but only seven allowed Expanded Function Dental Auxiliaries (EFDA) and eight states allowed dental assistants. Even for dental hygienists, a dentist must be physically present for sealant placement in five of the 21 states analyzed. Furthermore, in all but two states a dentist must examine each child and determine which teeth should be sealed prior to sealant placement.

Program Targeting

Of the 86 programs, 28 targeted only urban areas, 25 focused on rural and 33 placed sealants in both urban and rural communities. Eighty-three percent of programs targeted schools, the remainder offered sealants to all schools. Two-thirds of the programs that targeted schools used the percent of students eligible for the free and reduced cost meal program as a criterion for school selection, sometimes exclusively. Other criteria used to select schools were percent of population at or below the federal poverty level (31%), communities identified as high need based on an oral health survey (30%), general availability of dental care (26%), and the level of fluoride in the community drinking water (22%).

When selecting individuals to participate, sealant programs relied most heavily on

grade level and eligibility for the free and reduced cost meal program. In 13 percent of the cases, grade was the only factor and in another 61 percent grade again played a role. In the 63 sealant programs in which grade was a factor in selecting students, 18 programs focused on second and sixth grades, eight only treated second graders, and five placed sealants on second and third graders. The other half of the sealant programs concentrated on 19 different combinations of grades.

When selecting teeth to seal, the type, morphology and presence of occlusal decay influenced decisions. Respondents estimated that permanent first molars accounted for 68.2 percent of all teeth sealed. Permanent second molars (21.1%), primary molars (4.1%), bicuspids (4.1%), and others (0.4%) made up the remainder. Table 2 shows the influence of occlusal morphology and the existence of occlusal decay on selecting teeth to seal. Teeth with deep, narrow pits and fissures and those without occlusal decay were most likely to be selected.

Program Barriers

Of the 86 programs, 52 (60%) encountered barriers to implementing a sealant program in school. One-third of the programs noted that school administrators were initially against the program being offered in their schools. Restrictions in some state dental practice acts (n=13), a lack of dental professionals (n=20) and inadequate facilities (n=6) also were identified as barriers to program implementation.

Table 2

Frequency of Sealant Placement According to Occlusal Morphology & Caries Status*						
<u>Percent That Placed Sealant (0=never, 1=less often, 5=more often)</u>						
Clinical Characteristics	0	1	2	3	4	5
Occlusal Morphology						
Deep, narrow pits & fissures	0.0%	3.5%	0.0%	2.3%	9.3%	84.9%
Broad, coalesced grooves	3.5%	15.1%	3.5%	23.3%	22.1%	32.6%
Caries Status						
No caries	3.5%	3.5%	1.2%	4.7%	15.1%	72.1%
Incipient caries	12.8%	9.3%	12.8%	18.6%	27.9%	18.6%
Small frank caries	54.7%	19.8%	9.3%	8.1%	8.1%	0.0%
Moderate caries	87.2%	9.3%	0.0%	1.2%	2.3%	0.0%
Large caries	93.0%	5.8%	0.0%	1.2%	0.0%	0.0%

*Assuming there are no proximal caries or other contraindications to sealant application

Although most were supported by local dentists, nine (11%) programs met some resistance. The main concern of the local dentists was a fear of losing patients who could otherwise afford to pay for sealants and a feeling that sealants can not be placed properly in a portable dental care environment.

Twenty-three (27%) programs had questions raised regarding liability related to placing sealants. The majority of those questions came from dentists and dental hygienists rather than teachers, principals or school nurses. Only three programs mentioned an untoward incident occurring during sealant placement: one child swallowed an instrument and two children had slight blistering to their faces due to the conditioner.

Sealant Application Technique

Respondents reported a variety of application techniques. A brush or rubber cup in a rotary instrument was used to clean teeth in 63 percent of programs, a toothbrush in 29 percent, and other techniques in 8 percent. To isolate teeth, over 95 percent of programs used cotton rolls or a combination of cotton rolls, holders, isolators, and/or gauze squares. Only eight programs (9%) limited isolation to strictly cotton rolls. No program, however, used rubber dam for isolation.

In our sample, 70 percent of programs used an operator and dental assistant team (four-handed), 19 percent used operator only (two-handed) and 11 percent used a combination of four-handed and two-handed techniques.

Half of the programs applied sealants by quadrant, a quarter by one side of the mouth, and 20 percent sealed one tooth at a time.

Program Productivity

There was wide variation in the number of schools in which each program provided sealants during the 1992-93 school year. Table 3 shows that the number of schools ranged from one to 228 with a median of nine schools per program. Likewise, the number of sealants placed per program varied greatly from eight to 45,275 during the same time frame. While the mean number of sealants placed per program was just over 6000, the median number of 3006 sealants is more meaningful and representative of the 86 sealant programs. On average, 4.45 teeth were sealed per child. The number of hours spent placing sealants on a typical day ranged from two to seven, with a mean of 5.1. On average, just over 11 children per day received sealants (range=1-25).

Table 3

Number of Schools Served by Sealant Programs	
Schools <u>(n=1636)</u>	Programs <u>(n=86)</u>
1-10	45
11-25	29
26-50	6
51-75	3
76-100	0
101-200	1
201-250	2

Program Efficiency

We limited our analysis of efficiency to the 68 programs that provided the following information: total budget for sealant program; number of teeth sealed; and the number of children who were eligible to participate, signed up for the program, examined to determine need for sealants, and who actually received dental sealants. For this subset, the average cost per child was \$36.38 (\$8.17/tooth). Of all children eligible to participate, 58.6 percent returned consent forms, 56.0 percent were examined, and 40.6 percent actually received sealants.

Quality Assurance

All programs had some quality assurance component. Nearly 80 percent had written protocols, 71 percent provided continuing education for their staff, 64 percent completed on-site process reviews, 62 percent reviewed individual program statistics, and 71 percent checked for sealant retention. The majority of programs that did retention checks, did them approximately one year after sealant application. On average, 91 percent of sealants were reported to be fully retained after one year.

Subset Analysis

In order to compare our findings about program characteristics with the only other national study of public health sealant programs (16), we analyzed data from the largest program and/or only program per state and of those variables collected by Cohen and Horowitz. The combination of urban/rural populations (n=9) were most commonly targeted, followed by urban (n=7) and rural (n=5).

Of these 21 programs, one-third conducted their sealant program completely in one type of location (i.e., six in school buildings and one in public health clinics). The other two-thirds utilized a combination of school buildings, public health clinics, mobile dental vans and private dental offices. On average, each of these 21 programs treated 3619 children (median=2124, range=50-11,636) during the 1992-93 school year. The mean number of sealants placed per program was 15,920 (median=8500, range=50-45,275) with the typical child receiving five. We calculated that 41.5 percent of the total eligible target population received sealants. Additionally, we found that only five of our 21 largest programs received Medicaid reimbursement.

DISCUSSION

Although the first school-based dental sealant program came into existence in 1972, only one published study addresses the characteristics and impact of such programs, nationwide. Our survey adds to the literature on the subject; provides an opportunity to evaluate the sampling methodology used in the previous survey, by including *all* known programs; and can serve as a baseline against which to compare future sealant program development. The timing of our survey, 1994, is appropriate for such a baseline because it immediately preceded three events that could influence the future direction of school-based sealant programs: The Workshop on Guidelines for Sealant Use, the National Public Health Dental Sealant Program Conference and the stab-

lishment of the National School-Based Oral Health/Dental Sealant Resource Center (17). Furthermore, our more comprehensive survey provides additional opportunity to explore and describe characteristics of school-based sealant programs.

The exact number of public health sealant programs is constantly in flux, some being added while others are eliminated for various reasons. In the process of analyzing data and writing the report, several programs have been eliminated while many more were added, moving the total from 120 to 143, nationwide.

Another important, but often overlooked, factor in correctly counting the number of programs is the definition of a public health sealant program. Our definition was limited to those public health programs dedicated to sealant placement. Cohen and Horowitz (16) indicated that 144 community-based sealant programs in 29 states existed in their 1991 survey and Narendran and Burk (18) reported that 21 states were conducting sealant programs in 1985. Neither study, however, reported a definition of a public health sealant program. While both earlier studies relied on state dental directors to determine the number of programs, we surveyed sealant program directors. This process eliminated several state-identified programs that did not meet our definition. Comparison of our findings with these other reports is confounded by the lack of definition of sealant program in the other studies.

National Survey Comparison

When comparing our results with those collected from the nationwide survey of 1991, we had to limit our analysis of program characteristics as previously described. Both surveys found that sealant programs most frequently served a combination of rural and urban areas followed closely by urban. While the limited methodology showed the majority of sealants to be provided in more than one type of facility, analysis of our 86 sealant programs contradicted this finding. Nearly two-thirds of programs operated in a single setting, most often schools.

The numbers of children and teeth sealed in both studies are similar but the ranges are very different. Cohen and Horowitz reported that the number of children receiving sealants during the 1990-1991 school year ranged from 69 to 17,201 (mean=3679, s.d.=4528). Using the same methodology, we reported that the number of children receiving sealants per program during the 1992-93 school year ranged from 50 to 11,636 (mean=3619; s.d.=3859). Not surprisingly, the mean number of children receiving sealants from all of our 86 sealant programs drastically decreased to 1465. According to Cohen and Horowitz, the number of sealants placed per program ranged from 273 to 70,000 (mean=14,580; s.d.=19,047). Analyzing only the largest program per state, we found that number to range from 50-45,275 (mean=15,920; s.d.=16,505). Again, the mean number of teeth sealed by all 86 responding programs was significantly lower. In our subset of programs, on average fewer children were treated but those treated

received more sealants. Cohen and Horowitz reported that approximately four sealants were placed per child, while our subset indicated that each child received nearly five sealants. On analyzing all 86 programs, the number of sealants placed was midway between both subanalyses.

Cohen and Horowitz's estimate of the percent of eligible children receiving sealants through the surveyed programs was almost 50 percent higher than our findings (62.0% vs. 41.5%). Such a precipitous decline in program participation rates over a short interval seems unlikely. Therefore, we considered differences in the methodologies employed in the two surveys as a possible explanation for some of the discrepancy. First, while our survey went directly to sealant program directors, Cohen and Horowitz surveyed state dental directors asking that they consult with sealant program directors or refer the survey to them for completion. The authors did not indicate any knowledge of the extent to which sealant program directors ultimately were involved in completing the survey. Secondly, the 1991 survey asked respondents only for the number of children receiving sealants and the percent of the total eligible population actually receiving them through the school program, not defining the term eligible population. Our survey requested specific data for each step in the process, specifically the numbers of students who: were eligible to participate, returned parental consent, were examined for sealant need, and actually received sealants. We calculated the percent receiving sealants from these data.

Furthermore, that only four of ten children eligible to receive sealants in school programs actually did so may not be of great concern. Depending on the manner in which programs are targeted, a number of eligible children may not be from low income families and would more appropriately receive sealants in private dental offices. For example, a program may target a school because it has 55 percent of children eligible for the free or reduced cost meal program, and may target grade levels to maximize efficiency, but may not target individual children because the schools do not wish to risk stigmatizing children from low income families by singling them out. In this instance, many of the 45 percent of children eligible for sealants but not for free or reduced cost meals may have the means to receive sealants through private dental offices. This situation could be consistent with increases in sealant use and prevalence reported in more recent surveys of dentists (10,14,15) and state level examination surveys of children (5-7). The latter increases exceed what could be accounted for by school-based programs.

Both absenteeism and targeting of sealants to children with identified risk factors, such as past caries experience, could further reduce the percent of eligibles who actually receive sealants at school. Absenteeism appears to be a significant consideration as 15 percent of children in our survey with consent were never screened and 21 percent of those screened did not receive sealants. Although our survey suggested that school-based programs generally are not

selecting students based on individual factors, this could become a future consideration if the Albany workshop recommendations (9) become widely adopted.

Of interest, particularly in times when funding is a general concern of public programs, is that both surveys found infrequent use of Medicaid funding. Fully 16 (76%) of our 21 largest programs and 17 (59%) of their 29 largest programs did not report Medicaid reimbursement. Medicaid reimbursement for sealants currently is available in all states. Some states, however, may interpret federal rules to prohibit billing Medicaid for services that are otherwise offered at no charge. Under those circumstances, the payment structure of individual sealant programs would determine the ability to receive Medicaid reimbursement. Additionally, programs that are operated not by health agencies, such as school systems, may not be accustomed to, or eligible for, Medicaid billing.

While we have noted differences between the two national surveys using the same methodology, several significant examples of differences occurred with our data when we analyzed only the subset of 21 programs. This subset of programs did not always represent the 86 programs studied, in particular with regard to the mean number of children and teeth treated. On average, our subset of programs treated more than twice as many children and placed twice as many sealants as the average of all 86 programs studied.

Recent Guideline Comparison

The Workshop on Guidelines for Sealant Use (9) developed recommendations for community sealant programs in the context of seven major decisions related to developing a community sealant program. The first four decisions related to whether or not to initiate a direct service sealant program such as those surveyed. The remainder of this subsection considers how our 86 programs, operating in 1992-93, compare with the program design considerations identified in decisions 5-7. The seven decisions, published in 1995, are:

1. Defining the Community
2. Assessing Community Need for Sealants
3. Weighing Support and Constraints
4. Selecting Approaches for Increasing Sealant Prevalence
5. Defining Specific Populations - for school programs this decision translates into selecting schools to participate. Over 80 percent of surveyed programs used criteria to select schools. Grade level and free and reduced cost lunch program eligibility were the most common factors. The guidelines recognized these factors along with caries risk status, geography and disability as possible criteria to apply to population groups in defining the target population. Thirty percent of programs indicated that findings of an oral health survey was a criterion. While geography as a factor is implied by school districting, there were no reports of programs targeting populations of

people with disabilities.

6. Identifying Individuals to be Evaluated - the guidelines acknowledged that programs could offer sealants to all children, all children in selected grades, or could limit the offer to those with poor access to care as indicated by family income or another measure. Three-quarters of programs in our survey limited participation of individuals to those eligible for the free and reduced cost lunch program. Less than 10 percent limited eligibility to children without a family dentist.
7. Identifying Teeth/Tooth Surfaces - in this section the guidelines raised the standard for targeting in community programs by suggesting that programs look more closely at individual risk factors before applying sealants. The survey found that programs are targeting the teeth identified at the workshop as being at greatest caries risk, 89.3 percent of teeth sealed were permanent molars. Workshop participants acknowledged that a need to "err on the safe side" could result in a higher percentage of children evaluated in community programs receiving sealants than in individual care programs.

Our survey posed a question about the likelihood of sealing teeth with various caries activity and pit and fissure morphology that also was posed in a 1992 survey of Ohio dentists (15). Our 86 programs were more likely to seal broad, well

coalesced grooves and caries-free teeth than the Ohio dentists, more likely to seal incipient lesions and less likely to seal frank caries. This comparison supports the guidelines' assumption that children evaluated for sealants in community programs will be more likely to actually have them applied than those evaluated in individual care settings. When considering the cost-benefit relationship of sealing lower risk teeth, sealant programs seem to weigh a relatively low cost (\$8.17/tooth) against the perceived increased risk of caries attack and its consequences in low income children, although such risk is not easily quantified.

To summarize, targeting for community sealant programs in 1992-93 was done more on a population (grade level, family income) and tooth type (permanent molars) basis than an individual child or tooth-specific basis (caries status, occlusal morphology). The typical program selected both schools and individual children based on free and reduced cost meal program eligibility, limited programs to specific grade levels, and generally sealed permanent molars that were caries-free or had incipient caries. Future surveys will determine if this pattern changes following the wide dissemination of the recommendations from the Workshop on Guidelines for Sealant Use.

Limitation

The major limitation in aggregating data from public health sealant programs was

the considerable variability in the data they collect and maintain. In particular, the ability of programs to provide reliable budget and funding information was disappointing.

While all but four respondents reported on their sealant program budget, very few were able to indicate where the funds originated. All programs reported the number of teeth sealed during the 1992-93 school year, however four programs did not record the number of children treated. Even less was known about the number of children eligible to participate, signed up, or examined for the sealant program. Only 63 (73%) programs were able to report the number of children in need of restorative dental care.

The variability in data collection make it difficult and sometimes impossible to compare programs. There is a need to standardize data collection for public health sealant programs and to continue to survey them to better understand their operation and impact as a public health system.

REFERENCES

1. Gift HC, Drury TF, Nowjack-Raymer RE, Selwita RH. The state of the nation's oral health: mid-decade assessment of Healthy People 2000. *J Public Health Dent* 1996;56(2):84-91.
2. Brown LJ, Kaste LM, Selwitz RH, Furman LJ. Dental caries and sealant usage in U.S. children, 1988-91: selected findings from the third National Health and Nutrition Examination Survey. *J Am Dent Assoc* 1996;127(3):335-43.
3. US Department of Health and Human Services, Public Health Service. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. DHHS Publication No. (PHS) 91-50213. U.S. Government Printing Office, 1990.
4. US Public Health Service, National Institute of Dental Research. Oral health of United States children. The national survey of dental caries in U.S. schoolchildren: 1986-87. NIH Publication No 89-2247. Washington, DC: US Government Printing Office, 1989.
5. Phipps KR, Mason JD, Fleming DW. Dental Health of school children – Oregon, 1991-92. *MMWR* 1993;42:887-91.
6. Ohio Department of Health. The Oral Health of Ohioans, 1993. Columbus, 1995.
7. Indiana State Department of Health and Oral Health Research Institute, Indiana University School of Dentistry. Indiana Oral Health Survey, 1992-93 Final Report. Indianapolis, 1994.
8. Preventing pit and fissure caries: a guide to sealant use. Massachusetts Department of Public Health, Boston MA, 1986.
9. Workshop on guidelines for sealant use: preface and workshop recommendations. *J Public Health Dent* 1995;55(5) Special Iss:263-73.
10. Rubenstein LK, Dinius A. Dental sealant usage in Virginia. *J Public Health Dent* 1986;46(3):147-51.
11. Faine RC, Dennen T. A survey of private dental practitioners' utilization of dental sealants in Washington State. *ASDC J Dent Child* 1986;53(5):337-42
12. Cohen LA, Romberg E, LaBelle AD. The use of pit and fissure sealants in private practice: A national survey. *J Public Health Dent* 1988;48(1):26-35.
13. Gonzalez CD, Frazier PJ, Messer LB. Sealant use by general practitioners: a Minnesota survey. *ASDC J Dent Child* 1991;58(1):38-45.
14. Bowman PA, Fitzgerald CM. Utah dentists sealant usage survey. *ASDC J Dent Child* 1990;57(2):134-8.
15. Siegal MD, Garcia AI, Kandray DP, Giljahn LK. The use of sealants by Ohio dentists. *J Public Health Dent* 1996;56(1):12-21.
16. Cohen LA, Horowitz AM. Community-based sealant programs in the United States: results of a survey. *J Public Health Dent* 1993;53:241-5.
17. Update: 1994, A year for sealant promotion. *J Public Health Dent* 1995;55(5) Special Iss:312-3.
18. Narendran S, Burk BA. Current status of state dental programs [Abstract]. *J Public Health Dentistry* 1987;47:32.

For More Information

The National Maternal and Child Oral Health Resource Center offers several resources for agencies or organizations interested in developing school-based/school-linked sealant programs, including:

Seal America: The Prevention Invention -- A manual detailing how to establish a school-based dental sealant program. Along with the manual is a videotape with one segment targeted to school administrators and another to schoolchildren.

National Public Health Sealant Program Conference -- A two videotape set of highlighted presentations from the 1994 conference held in Columbus, Ohio.

Guidelines for Sealant Use -- Reprints from the Workshop on Guidelines for Sealant Use at which an expert panel met in Albany, New York to update recommendations for determining when to place sealants in community-based sealant programs (e.g., school settings) in individual care settings.

Sealant Application Technique -- Reprints of an article based on a thorough literature search supporting acceptable techniques for applying sealant to teeth.

Address correspondence to:

National Maternal and Child Oral Health Resource Center
2000 15th Street, North
Suite 701
Arlington, VA 22201-2617

Telephone: 703-524-7802
Fax: 703-524-9335
E-mail: sspisak@ncemch.georgetown.edu
Website: www.ncemch.org