

LONGITUDINAL EVALUATION OF THE INYO COUNTY SCHOOL-BASED ORAL HEALTH PROGRAM 2004-2008

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Inyo County Office of Education Oral Health Program was carried out in elementary schools throughout the County for four years beginning in school year 2004-05. Services provided were a comprehensive educational program, screening, sealants, and case management. All children present on the day of the screening services received the educational program. Parental consent was required for participation in the screening, sealant programs. Case management services were provided to children found to have dental treatment needs or when parents asked for assistance in finding a dentist or information about Healthy Families on the Consent Form.

This report evaluates the screening, sealant and case management programs. In the first year of the program the Lo Inyo Elementary School, Owens Valley Elementary School, Big Pine Elementary school and the Death Valley Schools were served. Bishop area schools and Round Valley Elementary were added the following year. All grades, preschool through grade six participated in the program except at the Bishop schools of Elm Street School and Pine Street School. Only second grade at Elm Street School and fifth Grade at Pine Street School participated in the program. These two schools have the largest enrollment. The different standards for eligibility for students attending these schools have implications for a longitudinal study of outcomes. Each of the three years these two schools participated yielded a new cohort. The impact of the program in these schools will be due to any impact the presence of the program would have on the general beliefs of the population and not the services for individual children.

DATA SOURCES

Documents used by the school-based program were Parent Consent Forms and a tracking record for screening and sealants placed. The following data elements were extracted from the sealant program documentation:

Consent Forms:

All Consent Forms returned and filed with the classroom records are the basis of this report. Consent Forms distributed but not returned are not included in the report. Consent Forms were distributed to all students in the target grades each year. Some students may have as many as four Consent Forms on file. In some cases Consent Forms were not filed with the classroom records either due to the need for followup or because the document was received at a later date to support a verbal consent. Unfiled Consent Forms were not included in the analysis.

1477 individual students participated in the program by returning at least one Consent Form. 2129 Consent Forms were returned over the four years of the program. During the process of analyzing data extracted from Consent Forms and comparing it to Services Provided we became aware that one packet of approximately 150 Consent Forms from Lo Inyo was not entered into

the database. This should not affect the evaluation. Lo Inyo participated during all four years and the analysis can take into account the missing information.

Data elements extracted from the Consent Forms are:

- 1 School
- 2 Name of student (Last name, first name and Program ID)
- 3 Date of birth
- 4 Date of consent (the date can be converted to Year of Program)
- 5 Permission for screening (Y/N)
- 6 Permission for sealants (Y/N)
- 7 Type of insurance (Medicaid, Private insurance, IHS, other, none)
- 8 Has a regular dentist (Y/N)
- 9 Need assistance in finding dentist (Y/N)

Services record: The services record includes information on whether or not the student participated in the educational component and screenings. Also recorded are which teeth had sealants applied and the dental treatment need for the student. Students participated in the screening and sealant programs only if parental permission was granted and the student was present on the day the service was provided. All students who were present in class on the day education was provided participated in this aspect of the program. Students who returned at least one Consent Form during the four years of the program were assumed to have participated in the education aspect if they were not recorded as absent. Students who never returned a Consent Form are excluded from the analysis because demographic and insurance data is missing.

2248 records reporting services provided are used in this report. This number is higher than the number of Consent Forms returned. Some of the discrepancy is due to Consent Forms that may not have been returned to the classroom file after resolving problems or completing followup. However, the largest group of Consent Forms missing from the database about 100 Consent Forms from Lo Inyo year 05-06.

Data elements extracted from the services record are:

- 1 School
- 2 Name of student (Last name, first name and Program ID)
- 3 Date of service (the date can be converted to Year of Program)
- 4 Education provided (Y/N)
- 5 Treatment need (implies screening provided) (categories 1,2,3, or 4)
- 6 Molar teeth sealed (Y/N for teeth #s 2,3,14,15,18,19,30,31)

ACCEPTANCE OF THE PROGRAM

Overall, participation in the voluntary program was good, with about 75% returning Consent Forms. Among children returning their Consent Forms, screening services were requested more (88%) than sealant services (74%). About half of the children in classrooms that participated more than one year, consented to services more than one year.

The number of children eligible for the program is based on the grade enrollment reported to the State of California and available at www.ed-data.k12.ca.us. The eligible number of participants

in the first year (2004-05), excluding the preschools, is estimated at 456 and in subsequent years the eligible population was about 940 each year. About 75% of the eligible children had Consent Forms on file. (Note: Lo Inyo 2005-06 and 2007-8 are excluded because of incomplete information.) More important, the comparative value to parents of the services provided by the program is evaluated. 1353 returned Consent Forms were examined. One assumes that parents who returned the Consent Forms were more interested in their child's oral health than those that did not. Among parents who returned Consent Forms, 88% wanted their child to have a screening exam and 74% wanted their child to have sealants if needed. (Preschool children were not offered sealants because they usually do not have erupted permanent teeth). About half the children who participated did so more than once during the four years. Children who participated more than one year consented to the sealant services slightly more (78%) than the rate for the program as a whole.

1353 Consent Forms returned at least once
1186 (88%) Screening consent at least once
1001 (74%) Sealant consent at least once

Among children enrolled in classrooms participating more than one year

945 Consent Forms returned **at least** once
790 (93%) Screening consent **at least** once
445 (52%) Children returned Consent Forms **more than** once
390 (88%) Screening consent **more than** once

Among children enrolled in classrooms offering sealants more than one year

910 Consent Forms returned **at least** once
612 (67%) Sealant consent **at least** once
397 (44%) Children returned Consent Forms **more than** once
312 (78%) Sealant consent **more than** once

NEED

Although children participating in the program had dental insurance at about the same rate as children residing in Eastern Sierra counties, their access to a regular dentist is poor. Children participating in the program reported an increasing enrollment in dental insurance programs. The program was used by families even when their children had a regular dentist. Screening services were more important to families than the sealant services.

Dental insurance questions and questions about having a regular dentist were not answered consistently on the Consent Forms. 2128 Consent Forms were used in this analysis. 453 (21%) did not answer the question about insurance status. The percentage of parents who responded that they had a dentist for their child is shown in Table 1. As expected, parents who did not answer the insurance question rarely answered the question about having a regular dentist, therefore this category has the lowest proportion of children reported having a regular dentist.

About half of the children with private dental insurance report having a dentist and nearly 40% of children with public dental insurance report having a regular dentist. Children with no dental insurance report having a regular dentist at a rate of 35%. Overall, about 40% of parents report that their children have a regular dentist. Since this question was not consistently answered, there may be more children who do have a regular dentist. Among parents who answered the insurance question (1675) 78% (1314) reported that their child had dental insurance, either public or private. The California Health Interview Survey (2005) for Eastern Sierra Counties reports that 78% of children ages 4-12 have dental insurance and only 6% do not have a regular dentist. Children in Inyo County have dental insurance in the same proportion as the Eastern Sierra rural counties of California, unfortunately, their access to dental care remains much lower than the region as a whole. Since many parents did not respond the question about having a regular dentist we do not know how many children actually did have a regular dentist and their parents just did not answer the question. Nevertheless, only 40% of the parents returning Consent Forms indicated their child had a regular dentist. Access to preventive dental services through the school program is crucial for Inyo County students.

Table 1. Type of Dental Insurance and Response of Yes to having a dentist		
Insurance Type	# in category	% has dentist
Insurance question not answered	453 (21%)	20%
DentiCal	520 (25%)	38%
Healthy Families	113 (5%)	41%
None	361(17%)	35%
Other does cover sealants	271 (13%)	54%
Other not covers sealants	410 (19%)	52%
TOTAL	2128	39%

473 children had more than one Consent Form on file. The first and last Consent Forms were examined to determine changes in regular dentist status and changes in insurance status. (See Table 2)

Parents of 104 children reported having a regular dentist on their first Consent Form. 217 reported having a regular dentist on their second Consent Form. These data are not meaningful because so few people completed this section of the form. They do, however, show either a growing confidence in reporting or an increase in the number of children with dental insurance.

The number of children with no insurance decreased by 30%. Only 13 children were reported as losing insurance. Public insurance (DentiCal and Healthy Families) enrollment increased slightly from 128 to 141. The increase in insurance coverage may be due in part to better reporting of insurance status. On the first Consent Form 128 forms did not have insurance status. On the last Consent Form only 86 forms did not have insurance status. There is nevertheless evidence that some people obtained insurance during the period of involvement with the program. Of the 94 people reporting that they did not have insurance on the first Consent Form, 32 said they had some type of dental insurance when completing the last Consent Form.

		Last				
First	No response	Healthy Families	DentiCal	Private	None	
No response	38	2	23	49	16	128
Healthy Families	1	8	6	2	1	18
DentiCal	12	4	74	15	5	110
Private	11	5	5	95	7	123
None	24	3	11	18	38	94
	86	22	119	179	67	473

820 Consent Forms indicated that the child had a regular dentist. Of these, 697 (85%) gave consent for a dental screening and 536 (65%) gave consent for dental sealants. The program was used by families even when their children had a regular dentist. Screening services were more important to families than the sealant services. Several parents wrote on the Consent Forms that their child was in regular recall and had sealants done at their own dentist and did not need the services of the school program.

The overwhelming majority of parents returning Consent Forms asked for a screening (86%) and sealants (70%) for their child.(Table 3) The program was used by families even if they had dental insurance. Children using public programs and with no insurance had slightly higher participation than those with private dental insurance. Parents who did not wish for their child to participate in the screening and sealants were less likely to complete the section on dental insurance.

	Type of Insurance											
	No response		Healthy Families		DentiCal		Private Insurance		No insurance		TOTAL	
Consent for screening												
Yes	277	61%	103	91%	501	97%	602	88%	341	94%	1824	86%
No	176	39%	10	9%	18	3%	79	12%	20	6%	303	14%
TOTAL	453		113		519		681		361		2127	
Consent for sealants												
Yes	229	51%	81	72%	416	80%	447	66%	306	85%	1479	70%
No	224	49%	32	28%	103	20%	234	34%	55	15%	648	30%
TOTAL	453		113		519		681		361		2127	

UTILIZATION OF SCREENING AND SEALANT SERVICES

Just under 650 children participated annually in the screening program. This is about 75-80% of the eligible population. Screening services were used by all segments of the population, including those with dental insurance and those with a regular dentist. This is an important service provided to children in the County. Sealants were provided for about 175-200 children each year. When compared to the screening services fewer children had consent for sealants. The total number of children who received sealants is obscured by the inclusion of only 5th and 2nd graders in the city of Bishop. One would expect that in coming years few children in the 5th grade will need sealants. All of their 1st molars would have been sealed in 2nd grade and few would have erupted 2nd molars. The number of children receiving dental sealants should stabilize at about 160 annually.

During the four years of the program 2,248 screening exams were provided for 1,211 children and 700 visits for dental sealants were provided for 622 children. 32% of participating children had more than one screening exam and 11% of participating children had more than one visit for sealants. (Table 5) After the first year when only half the schools participated, the number of screenings provided stabilized at just under 650. (Table 4) It is not possible to estimate the number of sealants visit that are likely to be needed in future years because of the structure of the program in Bishop elementary schools. Only 2nd and 5th grade students participated. Each of the three years Bishop elementary schools participated a new cohort of students entered these grades. Had the program continued until 2008-09 the first cohort of 2nd graders would be entering 5th grade. One would expect that the number of children receiving sealants would decline in 2008-09 because most of the 2nd graders would already have sealants.

Service	Total	05	06	07	08
Screening	2248	352	620	646	630
Sealants	700	136	186	212	166
Teeth sealed	2039	478	629	651	543

Screening		Sealants	
# of visits	# of students	# of visits	# of students
1	818	1	551
2	204	2	65
3	108	3	5
4	81	4	1
	1211		622

The sealant program targeted molar sealants. First molars erupt at about age 6 and second molars erupt at about age 12. Most school sealant program target grades 1-2 for first molar sealants and grades 5 or 6 for second molar sealant. Each child has a potential 4 first molars and 4 second molars to seal. There were 700 visits where sealants were placed. 2,075 sealants were placed on first molar teeth and 228 sealants were place on 2nd molar teeth. The overwhelming majority of sealants were placed on first molar teeth. Only 69 children 12 years old or older

received screening exams. It is unlikely that children younger than 12 years old would have second molars erupted enough to place a sealant. Only 9% of the children receiving 2nd molar sealants were from Pine Street Elementary School, the school that was to target 5th graders for 2nd molar sealants. Targeting 5th graders for second molar sealants is not effective in this community. Few children in this age group have teeth erupted enough to qualify.

Dental sealants are most effective when placed as close to the eruption time as possible. It is often the case that a child will have new teeth erupting over a course of two years. Most of the children in this program had only one visit at which sealants were placed. This may be due to the policy of targeting second and fifth grades in the most populous schools. These students had access to the program only once. 49 children had one or more first molars resealed. A total of 88 first molars were resealed. Two children had one or more second molars resealed. A total of 4 second molars were resealed.

The Schools that have had access to sealants every year (Big Pine, Owens Valley, Lo Inyo, and Round Valley) have seen the decline in the number of sealants placed that is typical when only newly erupted teeth are sealed. In the first year there is typically a larger number of teeth available because of unmet need. Then in subsequent years the number of teeth needing sealants is less. In planning for the continuation of the program, schools where children are seen every year should have a lower need for sealants. Most of the effort of the program will be in screening which is a quick procedure. If only second and fifth grade students are targeted as in Pine Street and Elm Street schools, the need for sealants among the second grade students will not decrease. One can plan that the number of sealants placed will remain the same or increase if more parents give consent. Since few of the fifth grade students had erupted second molars suitable for sealants, the number of teeth needing sealants will decrease when current second graders arrive in fifth grade. In School year 08-09 most of the 262 teeth sealed when children were in second grade will have sealants intact and the need for first molar sealants will be reduced.

PLANNING FOR THE FUTURE

Table 6 shows utilization by school. This information may assist the Inyo County Office of Education and Inyo County Health Department in planning for the future of the school program.

The highest rates of acceptance of the program are in the smaller schools outside of Bishop. One possible explanation for this may be that travel time to a dental office is longer for students not residing in Bishop where most of the dental offices are located. Parents of children living in Bishop may have better access to regular dental services and not feel the need to use the school program.

Targeting children in 5th grade for 2nd molar sealants was ineffective. The response rate for the program was poor in Pine Street Elementary school. Most 2nd molar sealants were applied to children in the outlying schools.

The number of children needing sealants should stabilize at a lower level than was seen in the initial year of the program at each school, and the demand for screening services will continue.

Cautions when interpreting the data in Table 6 are:

- The eligible population is a count obtained from the State of California enrollment statistics for the grades participating in the program. This may differ from the actual number of children enrolled at the time the Program to place at that school.
- In some cases the preschool participants were included with the elementary school and in some cases they were not.
- All children participating in the program had consent from their parent or guardian to participate. When data was entered into a database for analysis, the written Consent Form from which data was extracted may not have been filed with the classroom packet and would not have been included.
- In school year 2005-06 Elm Street and Pine Street Schools were combined and recorded as Bishop Elementary.

School		05	06	07	08
Big Pine (K-8)	Eligible population	110	100	114	
	Consents returned	104	100	113	73
	Screening consent	90	91	101	65
	Screening completed	97	99	109	84
	Sealant consent	82	68	76	43
	Students sealed	19	34	34	17
	Teeth sealed	76	123	96	43
Owens Valley (K-8)	Eligible population		30	29	
	Consents returned		26	20	12
	Screening consent		17	17	12
	Screening completed		26	25	16
	Sealant consent		14	11	11
	Students sealed		5	7	4
	Teeth sealed		14	20	11
Round Valley (K-8)	Eligible population		102	88	
	Consents returned		92	61	66
	Screening consent		72	45	59
	Screening completed		100	49	97
	Sealant consent		55	41	48
	Students sealed		15	7	17
Death Valley (K-8)	Eligible population	36	44	32	
	Consents returned	36	43	25	23
	Screening consent	34	40	24	22
	Screening completed	35	39	31	18
	Sealant consent	34	37	19	21
	Students sealed	26	21	17	14

School		05	06	07	08
Pine St. Elem (grade 5)	Eligible population		163	171	
	Consents returned		71	109	86
	Screening consent		54	82	71
	Screening completed			127	81
	Sealant consent		46	68	50
	Students sealed			52	38
Elm St. (grade 2)	Eligible population		134	142	
	Consents returned			119	107
	Screening consent			100	98
	Screening completed			111	125
	Sealant consent			89	76
	Students sealed			52	51
Bishop Elem	Screening completed		147		
	Students sealed		76		
Lo Inyo (K-8)	Eligible population	191*	211*	207*	
*Not including preschool	Consents returned	192	87	238	167
	Screening consent	159	80	206	143
	Screening completed	203	281	183	196
	Sealant consent	154	73	173	118
	Students sealed	90	35	43	25
Preschool	Consents returned	34	49	23	52
	Screening consent	27	49	19	48
	Screening completed	17	28	11	13

CASE MANAGEMENT

A case manager was to follow up with children who had treatment needs identified in the screening exams. The case management program effectively targeted children with the greatest treatment need.

Children with immediate, life threatening treatment need are classified as Category IV. Five children met this criterion. Four are in active case management receiving assistance with insurance, making dental appointments and transportation to the dentist. One stated no assistance was needed. The case manager reported that she had heard the child had attended a dentist appointment at a local office.

Children with obvious dental caries are classified as Category III. Seventy-four children met this criterion. A case file was opened for 69 of these children, four of whom had a case file opened each of the two years covered by the case management study for a total of 73 records. The case manager was unable to contact 34 of these. Of the remaining 39 case records contacted by the case manager, 28 did not want assistance. Of the 11 children accepting assistance, 7 received case management, 5 received assistance with insurance, 3 had help with transportation, 5 had help with making dental appointments and 7 used help finding a dentist.

Children with areas that may require attention, but are not urgent are classified as Category II. 339 children met this criterion. A case file was opened for 53 of these children. The case manager was unable to contact parents of 9 children, 7 did not want assistance. 1 was provided assistance with insurance, 1 assistance with transportation, 4 assistance with dental appointments, 5 with help finding a dentist, and 2 were in case management.

Children with no restorative treatment need are classified as Category I. Case management files were opened for 12 children in this category but no services were provided to these children.

The case management program effectively targets services to children most in need.

ORAL HEALTH IMPACT

Improvements in dental restorative treatment need were detected in communities that participated in the program for all four years and among children that participated for one year or more.

Screening results are shown in the following charts for all participating children by age. The Charts on page 11 show results for all students participating in the program by age. Since tooth eruption is age related the analysis is by age rather than grade. When all communities are combined, there are no discernable improvements in treatment need from Year 2005-05 to Year 2007-08. The lack of improvement may be due to the large influx of new participants in the Bishop area schools. Additional analyses were carried out using only schools that had participated for four years (to determine the community impact) and individual children with more than one screening (to determine the individual impact)

Treatment Need Categories are:

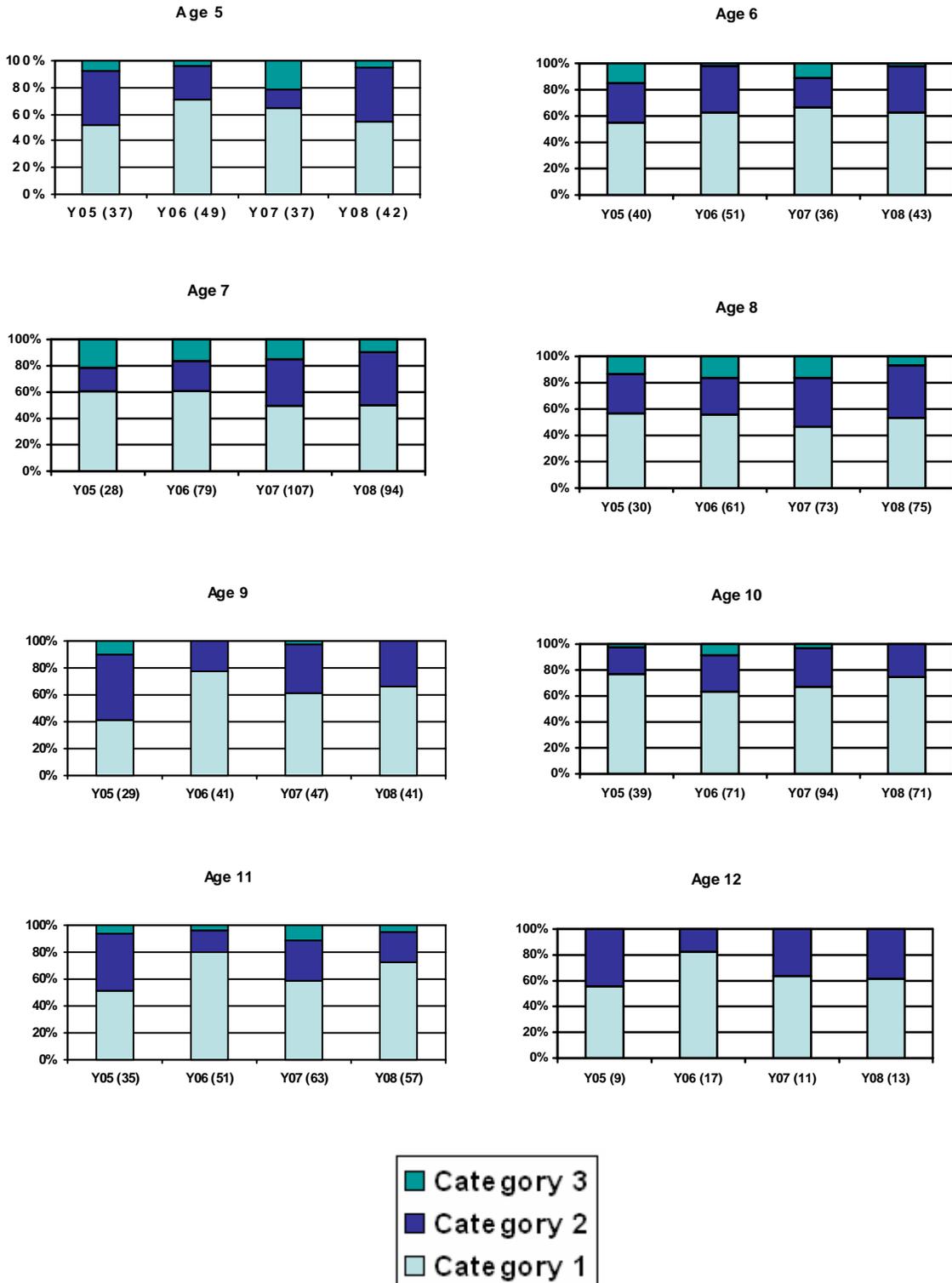
Cat 1 = No discernable treatment need. Regular Checkups recommended.

Cat 2 = Areas of possible treatment needed. Complete dental exam and evaluation needed.

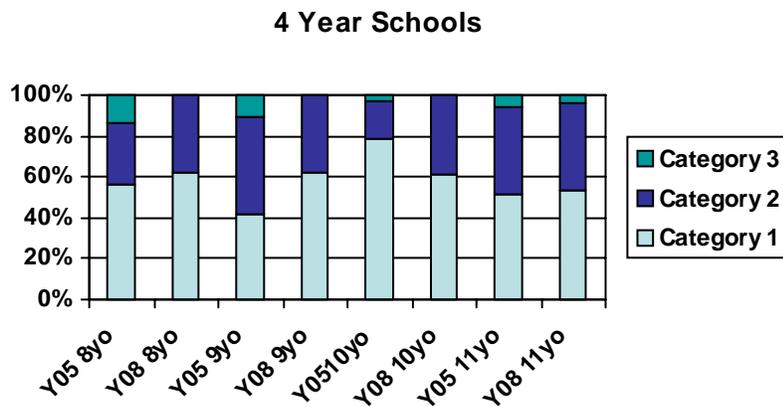
Cat 3 = Obvious dental problem. Treatment needed.

Cat 4 = Severe caries. Immediate treatment required. Potential life-threatening condition.

TREATMENT NEED BY AGE AND BY YEAR



A better assessment of the health impact of the program is the evaluation of changes in the classrooms that were served for the entire four years of the program. Children enrolling in the preschool program at age 4 would be age 8 at the conclusion of the program. The following chart, “4 Year Schools” shows the treatment need by age in the first year of the program (Y05) and the second year of the program (Y08). The most significant finding shown in this chart is the reduction in the number of children with frank caries requiring restoration (Category 3). At the conclusion of the program no children age 8, 9 and 10 had definite treatment needs and only 4% of the 11 y.o. children (compared to 6% at the beginning of the program) had definite treatment needs. The combination of community awareness, oral health education, preventive dental services, and case management combined to improve the oral health status of participating classrooms.



On an individual level, 386 children age 8-11 had two or more screening exams. Table 7 shows the treatment need category for these children at the first screening and at the last screening exam they had. Of most concern is the children in Category 3, obvious treatment need. 31 children were identified during their first screening exam, 6 children no longer had a need for treatment at their last screening exam, 17 had a possible need (Category 2) and only 8 children persisted in their level of treatment need. On the first set of screening exams, 31 children were determined to be Category 3. On the last set of screening exams, only 19 children were determined to be Category 3. Fewer children had unmet treatment need after participating in the program.

First Screen	Last Screen				Total
	Cat 1	Cat 2	Cat 3	Cat 4	
Cat 1	187	50	5	0	242
Cat 2	50	56	6	1	113
Cat 3	6	17	8	0	31
Total	243	123	19	1	386

SUMMARY OF FINDINGS

- The Inyo County school-based oral health program was well accepted by parents and children, particularly in the outlying school districts.
- Parents gave consent for their children to participate even when they had dental insurance and had a regular dentist. The program appeared to be valued by all segments of the population.
- Over the four years, the rate of screening stabilized at about 650 annually.
- It can be anticipated that the rate of sealant placement will stabilize at about 160 children annually.
- In the future, targeting children in 5th grade at Pine Street Elementary school will not be productive for sealant placement.
- Case management is an essential component of the program. This service assured that children identified as needing dental restorative treatment, received care.
- In evaluating the impact of the program on the community as a whole, that is the school, Dental treatment needs of children in participating communities reduced during the four years of the program.
- In evaluating the impact of the program on individual participants, dental treatment needs of participating children reduced during their participation.
- The four components of the school-based oral health program were education, screening, sealants, and case management. All four components were essential to improve student awareness oral health, increase parent awareness of oral health needs of their children, improve access to a vital preventive service and assure that children with treatment needs have access to restorative care.