Conference Paper

The Indian Health Service Early Childhood Caries Collaborative: A Five-year Summary

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Abstract: ***Purpose:*** *The purpose of this study was to assess a national initiative's effect on prevalence of early childhood caries and untreated decay in zero- to five-year-old Indian/Alaska Native preschool children.* ***Methods:*** *The Indian Health Service (IHS) conducted a five-year Early Childhood Caries Collaborative from October 1, 2009 to September 30, 2014. The program used educational materials and routine communication with the 322 IHS and United States tribal dental programs, with an emphasis on early access to care, dental sealanth, fluoride varnish, and interim therapeutic restorations (ITRs). Prevalence and untreated decay data were obtained through the nationwide oral health survey (2010 and 2014). Data were also collected on access to care, sealants, fluoride, and ITRs.* ***Results:*** *The number of zero- to five-year-olds with a dental visit increased seven percent: dental sealants placed increased 65 percent; and fluoride varnish applications increased 161.2 percent. Between 2010 and 2014, the percentage of one- to two-year-olds with decay experience and untreated decay declined, but the difference was not statistically significant.* ***Conclusions:*** *Early childhood caries prevention strategies, such as early access to dental care, sealants, fluoride varnish, and interim therapeutic restorations, demonstrated some initial improvement in the oral health status of zero- to five-year-old Indian/Alaska Native children.*
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The Indian Health Service (**IHS**), an agency within the U.S. Department of Health and Human Services, is responsible for providing health services to 2.2 million American Indians and Alaska Natives (**AI/AN**) from 566 federally recognized tribes in the United States. Health care is provided through a Congressional appropriation of $4.4 billion and carried out through 45 hospitals, 310 health centers, 164 Alaska village clinics, and 104 health stations in 35 states. Oral health care is provided at 322 dental programs by 290 federally hired dentists and an estimated 300-plus tribally hired dentists.[1]

Shortly after it became an agency, the IHS began an annual nationwide oral health monitoring system in 1957, which was terminated in 1978 and replaced by nationwide surveys in 1984, 1991, and 1999. These surveys sampled IHS dental clinic patients to determine the prevalence and severity of dental diseases in specific age groups: two- to five-year-olds; six- to 14-year-olds; 15- to 19-year-olds, 35- to 44-year-olds; and 55 years and older.[2-3] In 2010, partly due to concerns about overrepresentation of early childhood caries (**ECC**) prevalence in a clinic-based sample of preschool children, the IHS began to use a community-based survey methodology: the Basic Screening Survey (**BSS**), developed by the Association of State and Territorial Dental Directors.[5] Subsequently, the IHS used the BSS to survey one- to five-year-old AI/AN children in 2010, six- to nine-year-old AI/AN children in 2011 to 2012, 13- to 15-year-old AI/AN youth in 2013, and one- to five-year-old AI/AN children once again in 2014.

The 1983 to 1984 survey first brought attention to the problem of baby bottle tooth decay (**BBTD**, now called early childhood caries) in AI/AN children. Using the definition of BBTD at the time (two or more maxillary incisors with decay), 52 percent of zero- to four-year-old AI/AN children experienced BBTD.[2] The 1991 survey showed a similar prevalence of BBTD (51.7 percent), but it also reported a decrease in the number of decayed, missing, and filled teeth (**dmft**) among zero- to nine-year-old AI/AN children: from 6.2 in 1974 to 5.9 in 1984 to 4.5 in 1991.[3] The 1999 survey showed a decrease in BBTD, as defined in the 1984 survey, to 46.2 percent; unfortunately, however, it showed that 79.3 percent of two- to five-year-old AI/AN children had caries experience.[4]

In 2010, 8,461 AI/AN children one to five years old were screened by 178 trained dentists, hygienists, and therapists at 63 different IHS or tribal sites, making this survey the largest ever sample of this age group in an IHS survey (the 1999 IHS Oral Health Survey, by comparison, had a sample of 2,663 AI/AN children two to five years old). The prevalence of caries experience among children two to five years old was 62.3 percent, a substantial decrease from the 79.3 percent reported in the 1999 survey. This decrease in prevalence could be at least partly explained by the different methodologies employed in the 1999 survey (a clinic-based sample) and the 2010 survey (a community-based sample).[6]

The 2010 survey also highlighted a key point: the disproportionate distribution of ECC in the AI/AN population. AI/AN children two to five years old had twice as many decayed and filled teeth (3.69) as the next highest racial/ethnic group, U.S. Hispanics (1.69), and almost four times that of U.S Caucasians (0.98). Another key finding from the 2010 survey was that the proportion of AI/AN children affected by ECC rises rapidly as they age: by age two, 44 percent of AI/AN children have decay experience, and by age five, 75 percent of children have decay experience.[7] As a result of these findings, the IHS Division of Oral Health created the IHS Early Childhood Caries Collaborative in 2010.

The IHS had conducted ECC (or BBTD) initiatives prior to the 2010 Early Childhood Caries Collaborative. In the late 1990s, for example, a pilot project was conducted to evaluate

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the effectiveness of fluoride varnish in preventing ECC; however, a final evaluation and subsequent published findings were never completed. In fact, there are few examples of published findings of past IHS ECC efforts, leading some to speculate that, "at best, we have had minor, transient victories from our efforts."[8]

The purpose of this study was to assess the effect of the Indian Health Service Early Childhood Caries Collaborative on increasing access to care, sealants, fluoride varnish, and interim therapeutic restorations (**ITRs**) in zero- to five-year-old Indian/Alaska Native preschool children.

Methods

The IHS Early Childhood Caries Collaborative was constructed as a five-year program based on the premise of promoting specific best practices to reduce the prevalence and severity of ECC in AI/AN children. With an overall goal of reducing the prevalence of ECC by 25 percent from fiscal year 2010 to 2015 in the AI/AN population, the program delineated four objectives to meet this goal in zero- to five-year-old AI/AN children: (1) increase access to dental care by 25 percent; (2) increase the number of children receiving fluoride varnish by 25 percent; (3) increase the number of sealants applied by 25 percent; and (4) increase the number of ITRs by 50 percent.[9]

To achieve maximum participation, the IHS Division of Oral Health invited other disciplines to engage in work aimed at educating the AI/AN population about ECC and increasing access to oral health care for zero- to five-year-olds. As reported in the 2010 survey, by age two almost half (44 percent) of AI/AN children had decay experience, yet children younger than two years old don't typically present to IHS or tribal dental clinics seeking routine preventive care.[7] However, other health care partners co-located in IHS or tribal health clinics—including physicians, mid-level providers, community/public health nurses, pharmacists, and community health representatives (field health workers specific to the IHS)—routinely treat children of this age for routine health care such as immunizations. Using these health care partners to help educate parents and refer young children to dental clinics would inevitably lead to increased access to care, and research had shown that early access to dental care decreased the incidence of developing caries in young children.[10] Thus, the IHS used the collaboration as a cornerstone of the five-year program.

Each of the components of the program (access, sealants, fluoride varnish, and ITRs) was based on well-established best or promising practices. Multiple studies over the last 40 years have shown the efficacy of fluoride varnish in reducing the incidence of dental caries in young children, with as much as a 44 percent reduction in caries incidence.[11-13] Similarly, research has shown that sealants applied on primary molars is a cost-effective population strategy for reducing caries and the need for further dental treatment.[14] ITRs, while not a primary prevention measure, were chosen as one of the key components of the IHS Early Childhood Caries Collaborative because of the large proportion of patients with untreated decay (43.6 percent), as reported in the 2010 survey and because the American Academy of Pediatric Dentistry developed a policy statement endorsing ITRs in 2010.[15] ITRs are glass ionomer restorations that can be placed on primary teeth to arrest caries, and often the procedure in placing ITRs requires little anesthesia or trauma to the patient, making this an optimal interim treatment for caries in very young children.

The IHS Division of Oral Health was responsible for promoting the Early Childhood Caries Collaborative throughout the Nation. A national team was created to promote this initiative in each of the 12 geographic and administrative regions of the IHS, with multiple national, regional, and local presentations given to dental staff and prospective health care collaborators. A packet of educational materials was distributed to both groups in early 2010 and again in 2013. Regular updates on the initiative and progress were reported by the national committee to IHS dentists, dental hygienists, dental assistants, physicians, mid-level providers, community health representatives, nurses, and community health representatives through established IHS electronic mail distribution lists. The national team also created four educational videos, continuing education courses on caries stabilization (which included some discussion of behavior management in the pediatric population), fluoride varnish applications (the latter of which was aimed at non-dental collaborative partners), a list of best practices (as reported by programs from across the country), and other resource material, all available on a specially designed web page: www.ihs.gov/doh/ecc.

Throughout the IHS Early Childhood Caries Collaborative, data were housed on a specially designed National Dental Data Mart and Reporting System. This Data Mart was populated from the National Data Warehouse used by the IHS to store and compile all data; the National Data Warehouse received data through monthly or quarterly data exports from the IHS and tribal health facilities across the country.

At the conclusion of the five-year IHS Early Childhood Caries Collaborative, the IHS once again embarked on a national oral health survey of one- to five-year-old AI/AN children. In both 2010 and 2014, data were collected through a basic screening survey conducted in community settings (Head Start centers, day care centers, medical clinics, health fairs, etc.) In 2010, a total of 63 sites conducted screenings on 8,461 AI/AN children one to five years old; in 2014, a total of 81 sites conducted screenings on 11,873 AI/AN children one to five years old. In both survey years, examiners were trained through participation in a national webinar, and a standard basic screening survey form was used by all examiners. For purposes of comparing the two surveys, only data from those sites (59 total) that participated in both surveys were compared. Data from these surveys were used to evaluate the impact of the five-year program on oral health outcomes, while data from the Dental Data Mart were used to evaluate the effectiveness of the five-year program in meeting the objectives set forth at the beginning of the initiative (increase access, sealants, fluoride varnish patients, and ITRs).

Results

Progress and results of the four aforementioned objectives of the IHS Early Childhood Caries Collaborative were tracked throughout the five years of the initiative, the results of which are described in Table 1.

Of the four IHS Early Childhood Caries Collaborative goals, access to dental care was perhaps the most critical. The number of zero- to five-year-olds with a visit to an IHS or tribal dental clinic rose from 50,421 per year between 2005 and 2009 to 54,415 per year between 2010 and 2014; an increase of 7.9 percent. Most significant was the increase in zero- to two-year-old access, from 13,897 per year from 2005 to 2009 to 14,924 per year from 2010 to 2014, an increase of 7.4 percent (Figure 1).

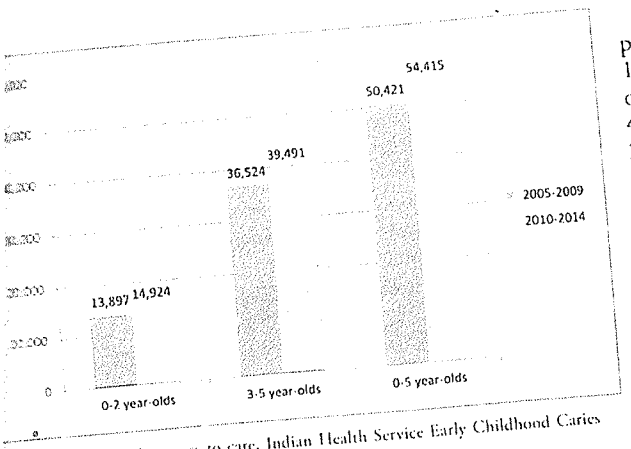

Figure. Changes in access to care, Indian Health Service Early Childhood Caries Collaborative 2010-14.

Regarding the objective of increasing the number of dental sealants, the sheer number of dental sealants placed in the five-year Collaborative increased by 65 percent, from 73,348 in the five-year period prior to the initiative to 121,018 during the five years of the program. The most dramatic gain was in the zero- to two-year-old age group, with an increase from 8,122 to 14,666 sealants, an 80.6 percent increase (Table 1). Moreover, the number of zero- to five-year-old patients benefitting from dental sealants on primary molars increased by 43.3 percent, from 20,276 in the five years prior to the initiative to 29,050 during the initiative, including a 50.3 percent increase in the critical zero- to two-year-old age group (Table 1). These increases, both in numbers of sealants and sealant patients, resulted in an increase in the number of sealants per patient in zero- to five-year-olds from 3.62 in the 2005 to 2009 period to 4.17 from 2010 to 2014 (Table 1).

Fluoride varnish applications and patients also increased as part of the IHS Early Childhood Caries Collaborative (Table 1). Total fluoride varnish applications increased by 82.3 percent over the course of the five-year initiative, from a mean of 42,394 per year between 2005 and 2009 to 77,279 per year from 2010 to 2014. The total number of applications by non-dental providers also increased significantly. Counting the medical International Classification of Diseases code of V07.31, the total number of fluoride varnish applications among medical providers increased by almost 300 percent, from a mean of 2,050 per year between 2005 and 2009 to 10,252 per year from 2010 to 14. Moreover, the overall contribution of total fluoride varnish applications by medical providers increased significantly, with 4.8 percent of total fluoride varnish applications per year being from medical providers between 2005 and 2009 compared to 10.5 percent of total fluoride varnish applications per year being from medical providers between 2010 and 2014.

Through a concerted effort by both dental clinics and collaborative partners, the number of zero- to five-year-old AI/AN children benefitting from at least one application of fluoride varnish increased from 28,373 per year from 2005-09 to 47,727 per year during the initiative, an increase of 68.2 percent, and this increase was apparent in both the zero- to two-year-old (64.3 percent) and three- to five-year-old (69.7 percent) age groups. More strikingly, a much larger proportion of children accessing dental services received fluoride varnish applications; prior to the initiative, only 56.3 percent of children accessing dental care received fluoride varnish applications, while during the initiative 87.7 percent of children accessing dental care received at least one application of fluoride varnish.

The number of ITRs, a secondary preventive measure aimed at reducing untreated decay rates, increased substantially as part of the IHS Early Childhood Caries Collaborative (Table 1).

Table 1. RESULTS OF THE FIVE-YEAR INDIAN HEALTH SERVICE EARLY CHILDHOOD CARIES COLLABORATIVE*

	Year	0-2 ys	% change	3-5 ys	% change	0-5 ys	% change
Access to dental care	2010-14	14,924/year	7.4	39,491/year	8.1	54,415/year	7.9
	2005-09	13,897/year		36,524/year		50,421/year	
Sealants	2010-14	14,666	80.6	106,352	63.1	121,018	65.0
	2005-09	8,122		65,226		73,348	
Sealant patients	2010-14	3,558	50.3	25,492	42.3	29,050	43.3
	2005-09	2,368		17,908		20,276	
Sealants per patient	2010-14	4.12	20.1	4.17	14.6	4.17	15.2
	2005-09	3.43		3.64		3.62	
Fluoride varnish applications	2010-14	19,220/year	77.8	58,059/year	83.8	77,279/year	82.3
	2005-09	10,808/year		31,586/year		42,394/year	
Fluoride varnish patients	2010-14	12,536/year	64.3	35,191/year	69.7	47,727/year	68.2
	2005-09	7,631/year		20,742/year		28,373/year	
Fluoride applications per patient	2010-14	1.53	7.7	1.65	8.6	1.62	8.7
	2005-09	1.42		1.52		1.49	
Fluoride patients/patients accessing care	2010-14	84.0%	53.0	89.1%	56.9	87.7%	55.8
	2005-09	54.9%		56.8%		56.3%	
Interim therapeutic restorations	2010-14	11,251	323.3	34,742	132.4	45,993	161.2
	2005-09	2,658		14,952		17,610	

* All data reported is for five years, except as noted otherwise.

Overall, the number of ITRs increased by 161.2 percent in zero- to five-year-old AI/AN children: from 17,610 in the five years preceding the initiative to 45,993 during the five years of the initiative. This increase was even more evident in the zero- to two-year-old age group, with an increase of 323.3 percent, from 2,658 to 11,251, over the same time periods.

Data from the 2010 and 2014 oral health surveys were used to assess the impact of the Collaborative on oral health outcomes. Although not statistically significant ($P>0.05$), there was a trend toward a lower prevalence of decay experience and untreated decay in 2014 compared to 2010 (Table 2). This was especially true for one- to two-year-olds. In 2010, 21.2 percent of one-year-olds had decay experience compared to 18.1 percent in 2014, a 15 percent reduction. For two-year-olds, the percent with decay experience decreased by 10 percent, from 43.7 percent in 2010 to 39.4 percent in 2014. Among

Table 2. PERCENT OF AMERICAN INDIAN AND ALASKA NATIVE CHILDREN WITH DECAY EXPERIENCE, UNTREATED DECAY, PRIMARY MOLAR SEALANTS, AND URGENCY OF NEED FOR DENTAL CARE BY AGE, 2010 VERSUS 2014

Variable*	Year	1 y (N=890)	2 ys (N=1,112)	3 ys (N=2,398)	4 ys (N=2,827)	5 ys (N=1,234)	1-5 ys (N=8,461)	2-5 ys (N=7,571)	3-5 ys (N=6,459)
Decay experience percent (95% CI)	2010	21.2 (14.9-27.4)	43.7 (36.6-50.7)	60.8 (55.0-66.6)	69.5 (64.3-74.8)	75.1 (67.1-83.1)	54.1 (49.3-59.0)	62.3 (57.1-67.4)	68.4 (63.2-73.6)
	2014	18.1 (13.6-22.6)	39.4 (33.1-45.7)	59.9 (53.0-66.8)	69.4 (63.7-75.0)	75.6 (69.2-82.1)	54.1 (48.9-59.3)	61.7 (55.9-67.4)	68.5 (62.7-74.4)
Untreated decay percent (95% CI)	2010	18.2 (12.9-23.5)	36.7 (30.7-42.8)	46.0 (39.4-52.7)	44.4 (39.5-49.4)	47.1 (39.0-55.2)	38.5 (33.7-43.4)	43.6 (38.4-48.8)	45.8 (40.3-51.4)
	2014	16.9 (12.6-21.2)	34.0 (28.3-39.8)	43.0 (36.4-49.6)	42.6 (37.6-47.7)	43.8 (36.4-51.2)	36.8 (32.0-41.7)	41.0 (35.6-46.4)	43.2 (37.6-48.8)
Primary molar sealants percent (95% CI)	2010	1.2 (0.0-2.8)	3.5 (0.8-6.1)	6.0 (4.3-7.6)	11.7 (8.1-15.4)	12.8 (7.8-17.8)	7.1 (5.3-8.9)	8.5 (6.4-10.7)	10.2 (7.6-12.7)
	2014	0.3 (0.0-0.8)	3.3 (1.4-5.2)	8.5 (4.7-12.4)	7.9 (4.3-11.4)	10.2 (5.5-15.0)	6.3 (3.7-15.0)	7.6 (4.5-10.6)	8.9 (5.0-12.8)
Early or urgent care percent (95% CI)	2010	17.5 (12.6-22.5)	34.6 (28.6-40.6)	43.3 (37.1-49.6)	42.4 (37.4-47.4)	43.5 (37.5-49.5)	36.3 (31.9-40.7)	41.0 (36.4-45.5)	43.1 (38.4-47.8)
	2014	16.8 (12.4-21.1)	31.5 (26.3-36.7)	41.4 (35.3-47.4)	40.5 (34.4-46.5)	41.6 (33.6-49.5)	35.0 (30.0-40.0)	38.9 (33.2-44.5)	41.1 (35.1-47.1)
Urgent care percent (95% CI)	2010	3.6 (1.6-5.5)	4.3 (1.9-6.7)	6.1 (3.4-8.7)	5.8 (3.8-7.9)	8.8 (4.5-13.1)	5.7 (3.8-7.6)	6.2 (4.0-8.5)	6.9 (4.2-9.5)
	2014	2.9 (0.3-5.5)	5.9 (3.6-8.2)	6.5 (4.0-8.9)	6.5 (4.5-8.6)	6.1 (3.9-8.3)	5.7 (4.2-7.2)	6.2 (4.7-7.8)	6.4 (4.7-8.0)

* CI=confidence interval.

Table 3. MEAN NUMBER OF DECAYED, MISSING, AND FILLED TEETH (dmft) AMONG AMERICAN INDIAN AND ALASKA NATIVE CHILDREN BY AGE, 2010 VERSUS 2014

Variable*	Year	1 y (N=875)	2 ys (N=1,097)	3 ys (N=2,356)	4 ys (N=2,762)	5 ys (N=1,233)	1-5 ys (N=8,323)	2-5 ys (N=7,448)	3-5 ys (N=6,351)
Decayed teeth N (95% CI)	2010	0.79 (0.50-1.08)	1.69 (1.34-2.04)	2.26 (1.84-2.69)	1.98 (1.65-2.32)	2.05 (1.58-2.51)	1.76 (1.46-2.05)	2.00 (1.68-2.32)	2.10 (1.76-2.44)
	2014	0.70 (0.46-0.94)	1.65 (1.26-2.05)	2.25 (1.82-2.69)	2.08 (1.71-2.48)	1.97 (1.47-2.48)	1.77 (1.47-2.07)	1.99 (1.65-2.34)	2.10 (1.74-2.46)
Missing teeth N (95% CI)	2010	0.04 (0.00-0.08)	0.18 (0.10-0.25)	0.39 (0.29-0.49)	0.47 (0.35-0.58)	0.76 (0.53-0.99)	0.37 (0.28-0.46)	0.45 (0.33-0.56)	0.54 (0.40-0.67)
	2014	0.04 (0.01-0.07)	0.15 (0.07-0.23)	0.41 (0.29-0.54)	0.63 (0.49-0.78)	0.85 (0.64-1.07)	0.44 (0.34-0.53)	0.52 (0.41-0.64)	0.64 (0.51-0.77)
Filled teeth N (95% CI)	2010	0.11 (0.02-0.19)	0.47 (0.27-0.66)	1.26 (0.96-1.57)	2.13 (1.80-2.46)	2.90 (2.37-3.42)	1.37 (1.16-1.59)	1.69 (1.42-1.96)	2.09 (1.75-2.42)
	2014	0.05 (0.01-0.09)	0.36 (0.23-0.48)	1.41 (1.11-1.72)	2.62 (2.33-2.92)	3.27 (2.80-3.74)	1.63 (1.43-1.83)	1.96 (1.72-2.21)	2.46 (2.15-2.77)
dmft N (95% CI)	2010	0.94 (0.61-1.26)	2.33 (1.95-2.72)	3.91 (3.36-4.47)	4.58 (4.07-5.08)	5.70 (4.87-6.52)	3.50 (3.07-3.93)	4.13 (3.64-4.62)	4.72 (4.17-5.28)
	2014	0.80 (0.56-1.03)	2.16 (1.66-2.66)	4.08 (3.48-4.68)	5.34 (4.69-5.99)	6.10 (5.35-6.84)	3.84 (3.36-4.32)	4.48 (3.93-5.03)	5.20 (4.58-5.81)

* CI=confidence interval.

three-year-olds, there was only a slight decrease in decay experience, from 60.8 percent in 2010 to 59.9 percent in 2014, a result that was statistically not significant. Similarly, in four-year-olds and five-year-olds, there was only a slight decrease or increase (five-year-olds) in decay experience, and neither was statistically significant.

Untreated decay decreased across all age groups from 2010 to 2014 (Table 2). This included drops from 18.2 to 16.9 percent in one-year-olds, 36.7 to 34.0 percent in two-year-olds, 46.0 to 43.0 percent in three-year-olds, 44.4 to 42.6 percent in four-year-olds, and 47.1 to 43.8 percent in five-year-olds. Overall, the decrease was only 4.4 percent, from 38.5 to 36.8 percent, and this result was not statistically significant. Similarly, changes in the number of children with primary sealants, proportion of children requiring early or urgent care, and proportion of children requiring only urgent care all had small increases or decreases, but these results were not statistically significant.

As with decay prevalence, the dmft scores followed a similar trajectory (Table 3). The dmft scores decreased in AI/AN children, from 0.94 to 0.80 in one-year-olds and from 2.33 to 2.16 in two-year-olds from 2010 to 2014. In one-year-olds, the main reason for this drop was a decrease in decayed teeth, from 0.79 to 0.70; in two-year-olds, the main reason was a decrease in filled teeth, from 0.47 to 0.36. Both drops are somewhat indicative of the impact of the Collaborative on the youngest age groups. In three-, four-, and five-year-olds, dmft increased, with the primary reason being an increase in filled teeth, a fact that correlates with the decrease in untreated decay seen in three- and four-year-olds, as shown in Table 2.

Discussion

The five-year Early Childhood Caries Collaborative conducted by the Indian Health Service resulted in a substantial increase in early access to dental sealants on primary molars, multiple applications of fluoride varnish, and the placement of ITRs. These ECC prevention strategies may be associated with the trend toward a decline in the prevalence of decay experience and untreated decay in AI/AN one- to two-year-olds.

Many of the gains seen in specific prevention strategies during the initiative resulted from a paradigm shift in the way general dentists treated young children. The initiative promoted ECC prevention strategies and early care for young AI/AN children by general dentists, and the resulting paradigm shift is evident in the increases in zero- to two-year-old access (7.4 percent increase), sealants in zero- to two-year-olds (80.6 percent increase), the numbers of zero- to two-year-olds receiving fluoride varnish (64.3 percent increase), and the number of ITRs placed in zero- to two-year-olds (323.3 percent increase).

As part of the IHS Early Childhood Caries Collaborative, many best practices in ECC prevention were described by participating programs. However, it is difficult to measure the specific impact of the best practices, although this may be investigated in future research. One such best practice was case management; programs reporting high increases in access to care, particularly among zero- to two-year-olds, often had dedicated case managers who would track health system users and encourage parents to bring children into the dentist for a screening or examination, following up afterward with each family to encourage treatment completion and prevention services. Another best practice was the use of collaborative partners previously mentioned, although it is difficult to determine what role these partners had in increasing access to dental services. There were also examples of policy changes, such as including a dental exam as part of a well-child visit or requiring a dental screening before enrollment in tribal day care that increased dental access for zero- to two-year-olds in some communities. Finally, clinics reporting increases in access, sealants, fluoride, and ITRs all reported the paradigm shift previously mentioned, indicating that general dentists had adopted these prevention strategies for young children who were previously referred for all dental care to pediatric dentists.

Using ECC prevention strategies such as early access to dental care, sealants on primary molars, multiple applications of fluoride varnish, and, as a secondary prevention measure, ITRs, the five-year IHS Early Childhood Caries Collaborative demonstrated some initial improvement in the oral health status of zero- to five-year-old AI/AN children. Early results show some improvement in prevalence and untreated decay rates, but these early results are not statistically significant ($P>0.05$). Additional research or projects are needed to show long-term success in preventing ECC in the American Indian/Alaska Native population.

Conclusions

Based on this study's results, the following conclusions can be made:

1. Early childhood caries prevention strategies, including early access to care, sealants on primary molars, multiple fluoride varnish applications, and interim therapeutic restorations, showed a trend toward a lower prevalence of decay experience, especially in one- to two-year-olds.
2. These ECC strategies produced an initial improvement in the oral health status of zero- to five-year-old Indian/Alaska Native children.

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