

An Epidemiologic Study of Dental Caries in Preschool Children in the United States by Race and Socioeconomic Level

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The prevalence of dental caries in 1,155 white and black preschool children was studied in the United States in 1969 and 1970. The results demonstrated that white children of the lower socioeconomic level had a significantly greater prevalence of dental caries than middle class white children, but a significantly lower prevalence than black children, most of whom represented the lower social class.

Although the literature contains many reports concerning the prevalence of dental caries in schoolchildren and adults, there is a paucity of information about the prevalence of dental caries in preschool aged children. Estimates of proportions of children with one or more def teeth have ranged from 18 to 34% for the 2-year-old child to 78% for the 5-year-old child.¹⁻³ When black and white school aged children are compared, a higher caries prevalence has ordinarily been reported for blacks.⁴⁻⁷ Associations between caries experience and socioeconomic status have been contradictory.^{3,4, 8-12} Most findings have been applicable only to a finite population group in a specific locality. Therefore, a study of dental caries in preschool children drawn from a wider base seemed necessary. Such a study was carried out with a quasi-random sample in the years 1969 and 1970.

Materials and Methods

A survey of the nutritional status of preschool children in the United States was

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conducted in 1969 and 1970. Seventy-four sample areas were chosen.¹³ These areas were further subdivided into sampling units. Dental examinations were carried out in 60 to 80% of these sampling units. The sample included children from about 36 states.

One thousand one hundred and fifty-five white and black children between the ages of 1 and 6 years were examined by one dentist (P.F.I.). A mouth mirror, dental explorer, and portable dental light were used to detect lesions. The children were seated in a portable dental chair or held on the lap of an adult, usually the mother. Dental caries was expressed in a modification of the def index. It was possible to ascertain from the mother the reason for the relatively few missing deciduous teeth. If she indicated that a carious lesion had been the reason for a tooth loss, the tooth was categorized as "e" (extracted) and was considered a tooth with caries experience. Comparisons were based on the total number of deciduous teeth and deciduous tooth surfaces with caries experience as well as presence or absence of caries. Only obvious lesions in which soft dentin could be detected were considered carious lesions. Deep pits and fissures that were sound were not recorded as carious. No oral radiographs were made. An assistant recorded the findings.

In addition to the dental examination, each child was rated according to socioeconomic status. The method used was the Warner Index Stratification Characteristic, which is based on the ratings of occupation, source of income, dwelling type, and dwelling area.¹⁴

Results

The numbers of deciduous teeth and surfaces with caries experience were determined

TABLE 1
MEAN TOTAL NUMBER OF DEF TEETH AND MEAN DEFECTIVE TOOTH
SURFACES IN WHITE BOYS AND GIRLS
(United States, 1969-1970)

Age (yr)	Boys				Girls			
	Mean Age	N	Mean Teeth	Mean Surfaces	Mean Age	N	Mean Teeth	Mean Surfaces
1	1.49	86	0.02	0.02	1.48	73	0.26	0.26
2	2.54	80	0.25	0.25	2.47	106	0.24	0.43
3	3.53	97	1.94	3.00	3.55	103	1.32	1.64
4	4.52	102	2.75	3.69	4.52	105	2.38	3.39
5	5.48	102	3.69	5.64	5.48	103	3.78	5.99

for each child. Mean numbers were computed separately for white children of both sexes by one-year age intervals. The findings are shown in Table 1. Since sex differences in dental caries experience were not apparent, data for boys and girls were combined and white children were then compared with black children for the mean total number of defective teeth and surfaces by one-year age intervals (Table 2). With the exception of the first age interval, black children had more affected teeth and surfaces than did white children in each age-group comparison. The standard deviations for the mean total number of affected teeth were usually greater than the mean; the confidence intervals were asymmetrical. For this reason, differences in caries experience between groups were analyzed by percentages of children with one or more decayed teeth vs those who were cariesfree. Table 3 shows that black children had a higher prevalence of dental caries at each age level. The differences in caries prevalence between all black and white preschool children were highly significant.

White children of the middle and lower socioeconomic levels were then compared for prevalence of dental caries by age and sex. For all comparisons, white children of the middle class in both sex groups had a higher percentage of cariesfree individuals than did children of the lower class (Table 4). With age and sex groups pooled, the difference in caries prevalence was highly significant.

To determine if the racial differences in the prevalence of dental caries could be attributed to factors related solely to socioeconomic status, the black children (almost all of whom represented the lower socioeconomic level by the Warner rank¹⁴), were compared with the white lower class children. This comparison indicated that black children had a higher caries attack rate than white children of the lower socioeconomic level. The difference in the prevalence of dental caries between all black children and white children of the lower socioeconomic level, ages 1 to 6 combined, are shown in Table 5. The results indicate that lower class white children had a significantly lower caries attack than did black children.

TABLE 2
MEAN TOTAL NUMBER OF DEF TEETH AND MEAN DEFECTIVE TOOTH SURFACES IN
BLACK AND WHITE CHILDREN
(boys and girls combined, United States, 1969-1970)

Age (yr)	White Children					Black Children				
	Mean Age	N	Mean Teeth	SD*	Mean Surfaces	Mean Age	N	Mean Teeth	SD*	Mean Surfaces
1	1.49	159	0.13	1.16	0.13	1.47	38	0.03	0.16	0.03
2	2.50	186	0.24	1.04	0.35	2.50	32	1.50	3.22	1.97
3	3.54	200	1.62	2.93	2.30	3.48	41	2.61	3.04	3.49
4	4.52	207	2.57	3.64	3.54	4.52	45	3.84	3.74	5.56
5	5.48	205	3.97	3.73	5.81	5.55	42	5.12	4.84	8.52

* SD, standard deviation.

TABLE 3
PREVALENCE OF DENTAL CARIES IN 1,155 WHITE AND BLACK CHILDREN

Age (yr)	White Children		Black Children		χ^2
	N	% Caries free	N	% Caries free	
1	159	98.5	38	98.4	
2	186	88.7	32	65.6	
3	200	59.5	41	31.7	
4	207	45.9	45	24.4	
5	205	29.3	42	26.2	
All ages	957	62.1	198	47.0	15.56*

* $P < 0.001$, chi-square with one degree of freedom.

TABLE 4
PREVALENCE OF DENTAL CARIES IN 957 WHITE BOYS AND GIRLS BY AGE AND SOCIOECONOMIC STATUS

Group	Age (yr)	Middle Class		Lower Class		χ^2
		N	% Caries free	N	% Caries free	
Boys	1	44	100.0	42	97.6	
	2	41	95.1	39	76.9	
	3	50	64.0	47	46.8	
	4	45	55.6	57	36.8	
	5	50	30.0	52	28.8	
	All ages	230	67.4	237	54.4	8.19*
Girls	1	34	97.1	39	94.9	
	2	60	91.7	46	89.1	
	3	44	68.2	59	59.3	
	4	55	49.1	50	44.0	
	5	55	32.7	48	25.0	
	All ages	248	65.7	242	60.7	1.31
Boys and Girls combined	1	78	98.7	81	96.3	
	2	101	93.1	85	83.5	
	3	94	66.0	106	53.8	
	4	100	48.0	107	40.2	
	5	105	31.4	100	27.0	
	All ages	478	66.5	479	57.6	8.05*

* $P < 0.01$, chi-square with one degree of freedom.

TABLE 5
DIFFERENCES IN PREVALENCE OF DENTAL CARIES BETWEEN ALL BLACK CHILDREN AND WHITE LOWER CLASS CHILDREN (boys and girls combined), AGES 1 TO 6 YEARS COMBINED

Group	N	One or More Carious Teeth		Caries free		χ^2
		N	%	N	%	
White lower class children	479	203	42.4	276	57.6	6.39*
All black children	198	105	53.0	93	47.0	

* $P < 0.02$.

Discussion

These findings are not compatible with commonly expressed beliefs that black children and children of the lower socioeconomic groups have more favorable caries experience than white children or children in the higher socioeconomic strata. Because children of both racial groups were chosen from urban and rural areas alike, the observed racial differences in dental caries experience are not considered to be the result of urban-rural differences. Although information about the length of exposure to a fluoridated water supply was not available, the random selection procedures used make it unlikely that this variable could account for the racial differences observed.

Although earlier studies^{4,6} show that black children have lower caries experience, other more recent studies^{5,7} have found little or no difference in caries experience in the permanent teeth of black and white children. Comparison of the present results with those reported by Summers⁵ for 5-year-old children of Detroit before fluoridation suggests that black children of this study have a much greater caries incidence; white children have about the same. Such findings suggest that there may be a secular trend of increased caries experience for black children. The higher caries prevalence among children of the lower socioeconomic level is compatible with some previous reports.

Conclusions

The prevalence and severity of dental caries in the deciduous dentition of preschool children are significantly greater in black children than in white children. White children from the lower socioeconomic level have a significantly greater prevalence of dental caries than white children from the middle socioeconomic level, but a lower prevalence than black children. No sex differences in caries experience were observed.

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