

MEDICAL EVALUATION OF NUTRITIONAL STATUS

X. SUSCEPTIBILITY TO DENTAL CARIES AND FAMILY INCOME¹

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OBSERVATIONS (1) on nearly a quarter million white elementary school pupils have indicated that children who live in affluent communities and those who reside in relatively poor urban areas, display, in general, a quite similar tendency to be attacked by dental caries. On the basis of those findings, it would appear reasonable to conclude that the socio-economic status of a community has no significant influence on the amount of dental caries experienced by children of school age. The results of the present study support this conclusion. The material to be discussed here reveals that two groups of New York City children—one attending a private, the other a public, school—are attacked by dental caries to about the same degree irrespective of the fact that marked socio-economic differences exist between the two groups.

Persons Examined. The data of the present report consist of dental examinations of the 2,595 New York City high school pupils, shown by age, sex, and income level in Table 1. Of those children, 2,242 were attending a public high school on the lower East Side of Manhattan (Seward Park High School), and 353 were enrolled in a private school in the suburban metropolitan area (Fieldston School).

Many children in both schools were of Jewish parentage. At the

¹The dental examination findings on which this report is based are part of a larger group of data collected for studies on the Medical Evaluation of Nutritional Status. The studies were undertaken as a cooperative investigation by the Milbank Memorial Fund; the New York City Department of Health; the Division of Public Health Methods of the National Institute of Health, United States Public Health Service; and the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics.

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Published papers of the project are listed under Nos. 3 to 10 in the bibliography.

INCOME LEVEL AND SEX	CHRONOLOGICAL AGE AT LAST BIRTHDAY									All Ages
	11	12	13	14	15	16	17	18	19	
Boys										
High	4	27	38	29	30	28	18	7	1	182
Low	-	4	30	148	274	355	287	103	13	1,214
Girls										
High	5	24	24	24	32	31	28	3	-	171
Low	-	2	29	132	326	322	169	43	5	1,028
TOTAL	9	57	121	333	662	736	502	156	19	2,595

Table 1. New York City school children who received dental examination, distribution by income level of parents, and by sex and age.

public school about 15 per cent of the children were of Italian descent and 75 per cent in all were from families in which both parents were foreign born. Private school children were predominantly of American-born Jewish parentage.

The income levels represented at the two schools were distinctly different. The children attending the private school were from families of high income, whereas the pupils at the public school were from families of which more than 86 per cent had incomes of less than \$10 a week per capita and nearly one-third were receiving relief from public or private agencies.

Measurement of Caries Susceptibility. The pupils at the two schools were given complete dental examinations by a dentist using mirror and explorer. The examination results were recorded according to the procedure described in detail in an earlier report (2). A child's susceptibility to dental caries was measured by the number of his permanent teeth showing evidence of caries experience (i.e., the number of decayed, missing, and filled teeth). Any tooth so stigmatized is designated by the symbol "DMF". Comparison is made of the caries tendency of children in the two income groups in terms of the average number of DMF teeth per child and the percentage of children showing specified numbers of DMF teeth.

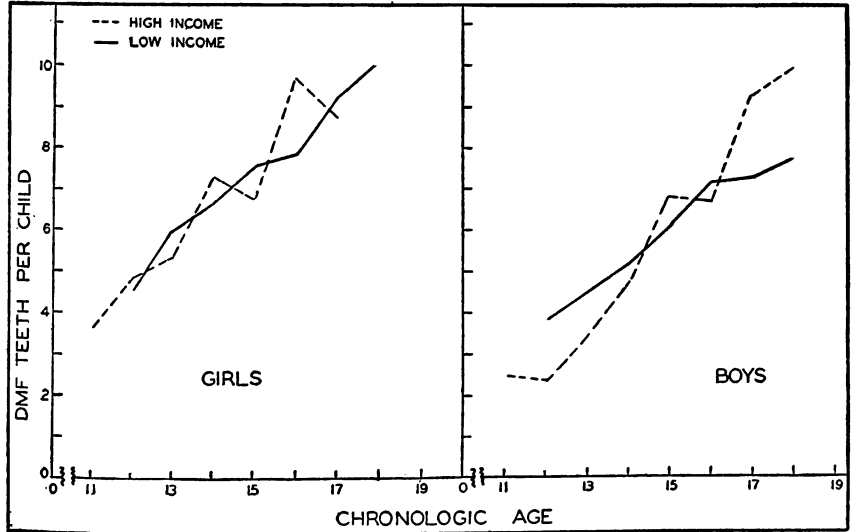
INCOME LEVEL AND SEX	CHRONOLOGICAL AGE AT LAST BIRTHDAY								
	11	12	13	14	15	16	17	18	19
Boys									
High	2.5	2.4	3.4	4.7	6.9	6.7	9.3	10.0	0
Low	—	3.8	4.5	5.2	6.2	7.2	7.3	7.8	6.4
Girls									
High	3.6	4.8	5.3	7.3	6.8	9.7	8.8	3.7	—
Low	—	4.5	6.0	6.6	7.5	7.8	9.2	10.1	9.6

Table 2. Average number of DMF teeth per child among 2,595 New York City high school children, arranged by income level, sex, and age.

Findings. The average numbers of DMF permanent teeth among children of high and low-income families are shown, by sex and age, in Table 2. The data indicate that children of either income level tend to show, at the same chronological age, about the same average number of DMF teeth. The conclusion is illustrated graphically by Figure 1.

Further substantiation of these findings is provided by the material of Table 3, for which graphic illustration is given in Figures 2 and 3. The percentages of children who have specified numbers

Fig. 1. Number of DMF teeth per child by chronological age; New York City high school pupils arranged by sex and income level.



NUMBER OF DMF TEETH	INCOME LEVEL OF PARENTS			
	Boys		Girls	
	High	Low	High	Low
None	11.5	7.9	8.0	2.3
1	6.1	4.8	0.7	2.6
2	8.6	5.7	4.4	5.2
3	3.9	8.4	3.7	5.2
4	11.7	10.0	12.9	8.1
5	5.7	8.8	3.7	8.0
6	10.6	12.6	12.0	9.5
7	7.5	10.3	6.9	10.5
8	10.6	8.4	9.1	13.2
9	5.7	5.8	7.6	10.7
10	3.2	3.9	8.2	6.7
11	2.1	3.7	6.9	3.9
12	2.0	2.9	2.1	4.4
13	2.1	1.8	2.7	2.5
14	1.7	1.1	2.0	1.9
15	2.5	2.7	1.5	1.7
16	—	0.4	2.7	1.3
17	1.8	0.2	1.6	0.8
* 18	0.7	0.3	0.7	0.5
19	—	0.2	0.7	0.3
20 or More	2.2	0.7	2.2	0.5
TOTAL	100.0	100.0	100.0	100.0

Table 3. Age-corrected percentages of New York City high school children of each sex having specified numbers of DMF teeth. Data based on 2,354 children aged 13 to 17 years, and arranged by income level.

of DMF permanent teeth are in the main quite similar for both income groups. For example, about 5 per cent of the girls of low-income families and 4 per cent of the girls of high-income families have 2 DMF teeth; 50 per cent of the girls of high, and about the same percentage of girls of low-income level have as many as 7 DMF teeth; and nearly 3 per cent of the girls of the low-income group, and practically the same percentage of those of high income, have as many as 13 DMF teeth. A similar parallelism obtains for both income groups of boys. These several findings indicate rather clearly that family income has no selective effect on the caries susceptibility of the high school children.

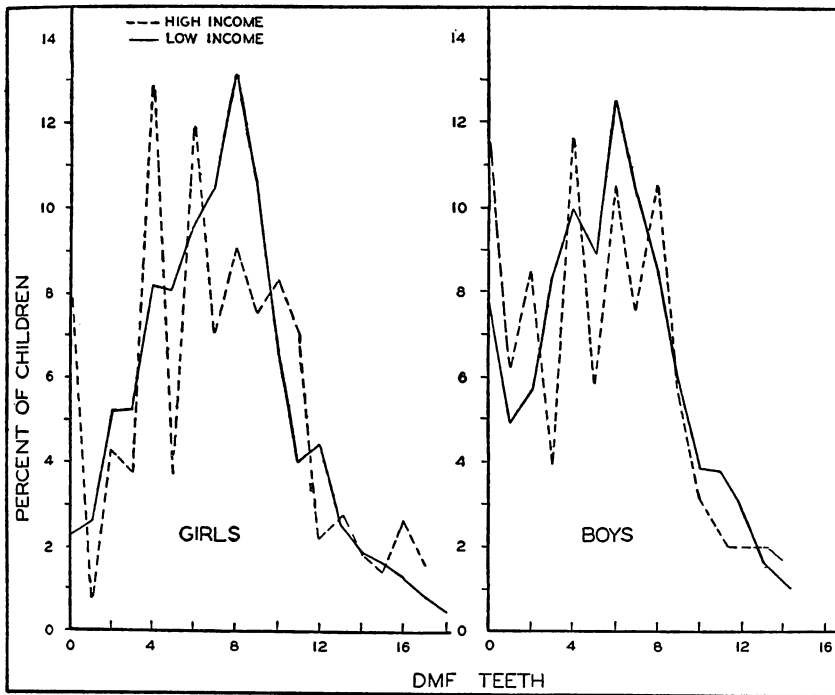
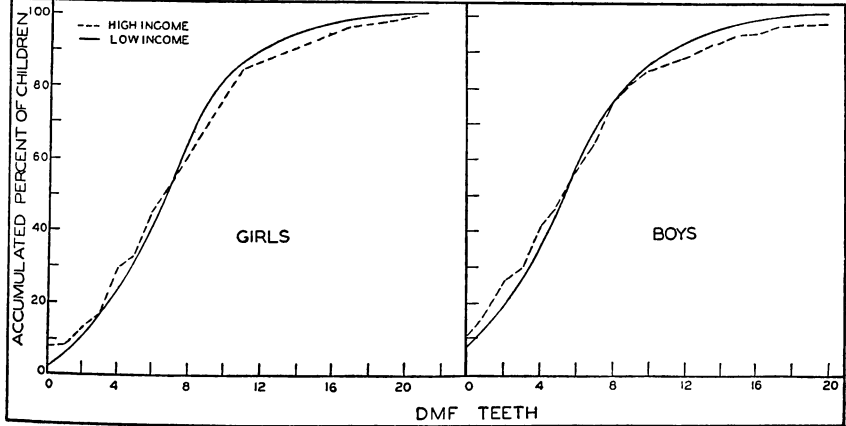


Fig. 2. Percentages of children having specified numbers of DMF teeth; New York City high school pupils arranged by sex and income level.

Comment. It is generally recognized that economic status and health are closely related. It has been clearly shown that persons of

Fig. 3. Accumulated percentages of children having specified numbers of DMF teeth; New York City high school pupils arranged by sex and income level.

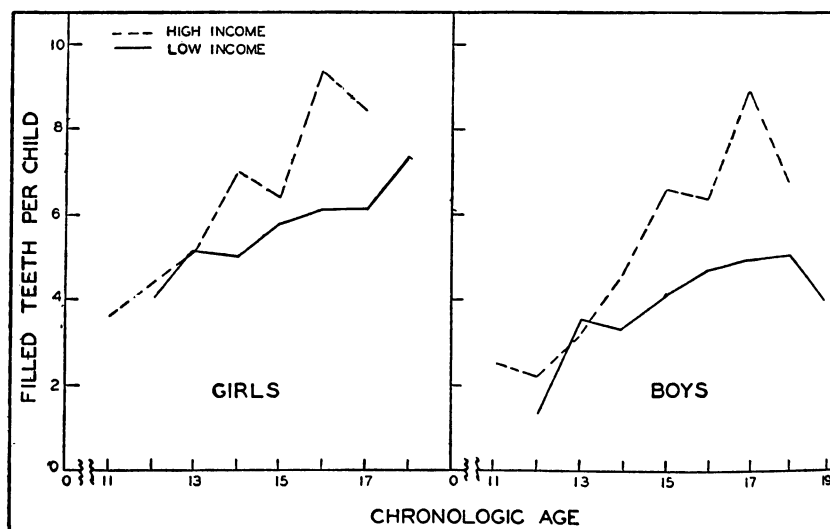


ITEM	CHRONOLOGICAL AGE AT LAST BIRTHDAY								
	11	12	13	14	15	16	17	18	19
<i>Filled Teeth</i>									
Boys									
High Income	2.5	2.2	3.2	4.6	6.6	6.4	8.8	6.7	0
Low Income	—	1.3	3.5	3.3	4.1	4.7	4.9	5.0	3.9
Girls									
High Income	3.6	4.4	5.0	7.0	6.4	9.4	8.4	3.3	—
Low Income	—	4.0	5.1	5.0	5.8	6.1	6.1	7.3	9.0
<i>Extracted Teeth</i>									
Boys									
High Income	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Low Income	—	0.5	0.3	0.7	0.9	1.1	1.3	1.1	0.9
Girls									
High Income	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	—
Low Income	—	0.0	0.4	0.6	0.8	1.0	1.3	2.1	0.6

Table 4. Average number of filled and extracted teeth per child among 2,595 children, arranged by income level, age, and sex.

low-income level have, in general, more illness than individuals in comfortable economic circumstances (11, 12, 13). In recent findings of the National Health Survey (14), it is reported that among persons on relief, the occurrence of nonrespiratory tuberculosis is

Fig. 4. Number of filled teeth per child, by chronological age; New York City high school pupils arranged by sex and income level.



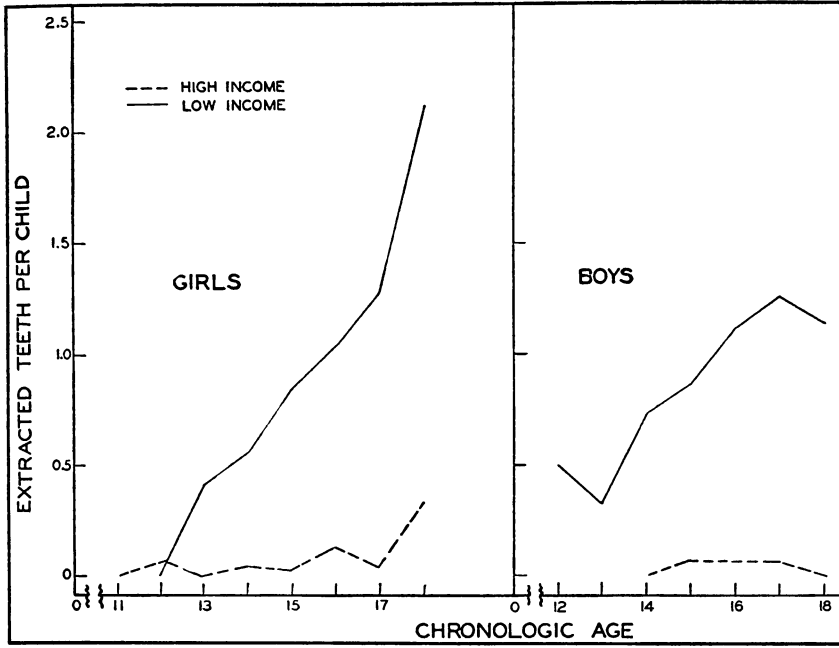


Fig. 5. Number of extracted teeth per child, by chronological age; New York City high school pupils arranged by sex and income level.

eight times as frequent; that of blindness and deafness, five times; orthopedic impairment, three times; nervous and mental diseases, nearly three times; and disabilities due to accident twice as frequent as among persons in families with incomes of \$3,000 or more a year.

The findings reported here provide a striking exception to the more or less general rule. The material of the present report reveals that among children from well-to-do, and among those from relatively poor families, there are about equal numbers who have few carious teeth and about as many of the one group as of the other have large numbers of teeth that have been attacked by caries. The children of the families of high income receive diets of better quality and quantity (8, 9). The data in Table 4, shown graphically in Figures 4 and 5, indicate also that the well-to-do children receive more dental care in the form of fillings and they have fewer teeth extracted. In spite of the fact that the environment of the well-to-do

children may be assumed to be more favorable for health than that of the poorer children; yet the clear-cut differences in environmental factors such as diet, housing, dental fillings, and other extrinsic variables seem to produce little difference in the caries susceptibility of the two groups.

These observations taken as a whole lead to the view that caries susceptibility is determined by factors other than the environmental variables associated with socio-economic status.

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