

Decayed, Missing, and Filled Teeth Among Youths 12-17 Years

United States

Estimates of decayed, missing, and filled (DMF) permanent teeth among youths, by age, race, sex, and selected demographic characteristics, with a brief discussion of prevailing trends.

DHEW Publication No. (HRA) 75-1626

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

Health Resources Administration
National Center for Health Statistics
Rockville, Md. October 1974



Library of Congress Cataloging in Publication Data

Kelly, James E.

Decayed, missing, and filled teeth among youths 12-17 years.

(National Center for Health Statistics. Data from the National Health Survey, series 11, no. 144) (DHEW publication No. (HRA) 75-1626)

Supt. of Docs. No.: HE 20.2210: 11/143

Bibliography: p.

1. Dental caries--United States--Statistics. 2. Youth--United States--Diseases--Statistics. 3. United States--Statistics, Medical. I. Harvey, Clair, joint author. II. Title. III. Series: United States. National Center for Health Statistics. Vital and health statistics. Series 11: Data from the National Health Survey. Data from the health examination survey, no. 144. IV. Series: United States. Dept. of Health, Education, and Welfare. DHEW publication no. (HRA) 75-1626. [DNLM: 1. Dental health surveys--In adolescence--U.S. 2. DMF index. W2 A N148vk no. 144]

RA407.3.A347 no. 144 312'.0973s [312'.3'047670973] ISBN 0-8406-0022-4 74-10925

NATIONAL CENTER FOR HEALTH STATISTICS

EDWARD B. PERRIN, Ph.D., *Director*

PHILIP S. LAWRENCE, Sc.D., *Deputy Director*

JACOB S. FELDMAN, Ph.D., *Acting Associate Director for Analysis*

GAIL F. FISHER, *Associate Director for the Cooperative Health Statistics System*

ELIJAH L. WHITE, *Associate Director for Data Systems*

IWAO M. MORIYAMA, Ph.D., *Associate Director for International Statistics*

EDWARD E. MINTY, *Associate Director for Management*

ROBERT A. ISRAEL, *Associate Director for Operations*

QUENTIN R. REMEIN, *Associate Director for Program Development*

PAUL E. LEAVERTON, *Acting Associate Director for Research*

ALICE HAYWOOD, *Information Officer*

DIVISION OF HEALTH EXAMINATION STATISTICS

ARTHUR J. MCDOWELL, *Director*

GARRIE J. LOSEE, *Deputy Director*

HENRY W. MILLER, *Chief, Operations and Quality Control Branch*

JEAN ROBERTS, *Chief, Medical Statistics Branch*

JAMES E. KELLY, D.D.S., *Chief NCHS Dental Adviser*

LAWRENCE E. VAN KIRK, D.D.S., *Dental Adviser*

Vital and Health Statistics-Series 11-No. 144

DHEW Publication No. (HRA) 75-1626

Library of Congress Catalog Card Number 74-10925

CONTENTS

	Page
Introduction	1
Findings	3
The DMF Index and Its Components	3
Age	3
Sex	4
Race	5
Other Demographic Variables	6
DMF Teeth by Income and Education	6
DMF Components	7
Region of Residence	7
Correlation Analysis of DMF Teeth and Selected Demographic Characteristics	7
Discussion	8
Summary	11
References	11
List of Detailed Tables	12
Appendix I. The Dental Examination and the Training of Examiners	28
The Examination	28
The Examiners	28
Appendix II. Demographic and Socioeconomic Terms	31
Appendix III. Statistical Notes	32
The Survey Design	32
Reliability	32
Sampling and Measurement Error	33
Expected Values	33
Small Numbers	34
Tests of Significance	34

SYMBOLS

Data not available-----	---
Category not applicable-----	...
Quantity zero-----	-
Quantity more than 0 but less than 0.05-----	0.0
Figure does not meet standards of reliability or precision-----	*

DECAYED, MISSING, AND FILLED TEETH AMONG YOUTHS 12-17 YEARS

James E. Kelly, D.D.S., and Clair R. Harvey, *Division of Health Examination Statistics*

INTRODUCTION

During 1966-70, the Division of Health Examination Statistics conducted a survey that collected information about the health of the U.S. population aged 12-17 years. The survey was the third of the Health Examination Survey programs undertaken on a continuing basis to obtain statistical information about the health of specific segments of the U.S. population. The conduct and operation of the survey of youths were essentially the same as those of two preceding surveys, one of adults aged 18-79 and the other of children aged 6-11.¹⁻³ Physicians, dentists, psychologists, nurses, and technicians conducted the examinations in mobile examination centers, which visited 40 scientifically selected locations in 25 States.

The universe, or target population, from which the sample of youths was drawn totaled approximately 22.7 million (table III, appendix III). It was defined as all noninstitutionalized youths aged 12-17 living in the United States (including Alaska and Hawaii) except those living on lands reserved for the use of American Indians. A probability sample of approximately 7,500 youths was selected so that statistically valid estimates about the health of the Nation's youth could be made.

Each sample youth who participated in the survey received the same examination. As in the previous survey of children's health, many of the tests and measurements made on youths focused on factors related to biological and psychological aspects of growth and development. A pediatrician examined the nose,

throat, ears, heart, and neuromuscular system of each youth. The teeth and their supporting structures were examined by a dentist; and tests of intellectual development, school achievement, and personality development were conducted by a psychologist. Other procedures included tests of vision, hearing, exercise tolerance, grip strength, and breathing capacity. Blood pressure levels and electrocardiograms were recorded, as well as height, weight, and other body measurements.

Before sample youths were examined, certain information was obtained from their parents. The information included demographic and socioeconomic data about household members as well as a medical history and behavioral data about the sample youths.

The dental examination was conducted by seven dentists employed at various times during the survey. The examiners derived their findings on a uniform basis by following as closely as possible written, objective standards. The standards were guidelines that, in effect, narrowed the range of examiner variability by eliminating many borderline or questionable conditions that are persistent sources of examiner disagreement. To avoid procedures that might have introduced systematic bias, the examining dentists did not dry or isolate teeth, remove oral debris and calculus, or probe tooth surfaces that were not overtly decayed.

Teeth were classified as sound, filled, decayed, filled-defective, and nonfunctional-carious. The absence of permanent teeth was noted and classified under one of four headings: unerupted, extracted because of decay, lost

because of accidental injury, and extracted because of crowding. The presence of artificial teeth and exposed root remnants was recorded. Radiographs of the teeth were not taken. An adjustable examining chair, a standard light source, and a mouth mirror and explorer were used during the examination, which usually lasted about 10 minutes.

Definitions of dental conditions and the procedures for conducting the examinations were largely the same as those used during the earlier surveys of adults (1960-62) and children (1963-65).^{1,2} The same two dentists who trained new examiners during both previous surveys also trained those for the survey of youths and periodically reviewed their findings. Appendix I contains the definitions and criteria used by the examiners and describes how the examiners were trained and how their procedures were reviewed.

Interexaminer variability during the survey was sufficiently small that it would not significantly bias the dental findings on youths (appendix I). Because the examination procedure, the training of examiners, and the quality control measures were essentially the same during the surveys of adults, children, and youths, there is reason to believe that the findings of the three surveys are comparable. It should be realized, however, that the standardized examination procedure undoubtedly reduced the sensitivity of the examination. Thus when compared with findings that would be obtained by clinical evaluations, the survey findings are in some instances conservative. Specifically, counts of nonfunctional and decayed teeth are systematically underestimated from the clinical viewpoint, whereas complementary counts of sound and functional teeth are correspondingly overestimated. Estimates of the number of filled and missing teeth, on the other hand, are derived from more objective counts, which are highly comparable by most standards.

At the close of the survey, 90.0 percent of 7,514 sample youths had been examined. With respect to age, sex, race, geographic region, population density, and population growth in area of residence, the examined sample may be regarded as closely representative of the population from which it was drawn. It seems unlikely,

therefore, that nonresponse appreciably biased estimates based on survey findings.

This report contains national estimates of the number of decayed, missing, and filled (DMF) teeth among youths by age, sex, race, and other selected demographic characteristics. (Appendix II defines demographic and socioeconomic terms.) Similar estimates of the occurrence of decayed, missing, and filled teeth among U.S. adults and children are published in the *Vital and Health Statistics* series.^{4,5}

In the text and tables that follow, the occurrence of decay among specified groups of youths is described by citing the mean number of decayed (D), missing (M), and filled (F) teeth per person found among them; and in several places, DMF findings on youths are compared with the earlier findings on adults and children. DMF teeth are defined as the total number of *permanent* teeth that are decayed, filled, and either missing or indicated for extraction (nonfunctional-carious). Youths aged 12-17 years rarely lose teeth because of periodontal disease, but many frequently lose teeth because of neglected decay. Other youths sometimes lose teeth because of accidents or have them extracted because of crowding. Thus when the teeth lost by youths for reasons other than decay are excluded from the DMF counts, the DMF index accurately records the number of permanent teeth that have been attacked by decay at least once.

The occurrence of decayed, missing, and filled primary teeth among youths is not described in this report. Relatively few youths 12-17 years have unshed primary teeth, and those who do usually have no more than one or two. For instance, 11-year-old children were found to average only about one decayed or filled primary tooth per child.⁵

The number of decayed (untreated) teeth, the number of filled teeth, and the number of missing or nonfunctional teeth—the components of the DMF index—are also presented by specified demographic characteristics. Each component is an indicator of the relative adequacy or inadequacy of dental care received. A relatively large F component reflects favorably on the adequacy of previous care, whereas relatively large D and M components indicate lower levels of care.

FINDINGS

The DMF Index and Its Components

Age.—The 22.7 million U.S. youths aged 12-17 averaged an estimated 6.2 DMF teeth per person (table 1 and figure 1). The overall estimate comprises 1.7 decayed teeth, 0.7 missing, and 3.8 filled. The average number of DMF teeth increases steadily with advancing age, rising from a low of 4.0 for 12-year-olds to a high of 8.7 for 17-year-olds.

The twofold increase in the number of DMF teeth per person among youths 12-17 years reflects corresponding increases in all three DMF components—decayed, missing, and filled teeth. Thus each component count is about twice as great for 17-year-olds as for 12-year-olds. The proportionate contribution of each component to the DMF index does not vary appreciably with age: between 20 and 30 percent of the average DMF per person for every given age are D teeth, about 10 percent are M teeth, and about 60 percent are F teeth.

The number and the percent distribution of youths with specified numbers of DMF teeth are shown according to sex in table 2. Only about one-tenth of the youths do not have at least one tooth that had been attacked by decay. By contrast, about 57 percent have 5 DMF teeth or more, and about 7 percent have 15 or more.

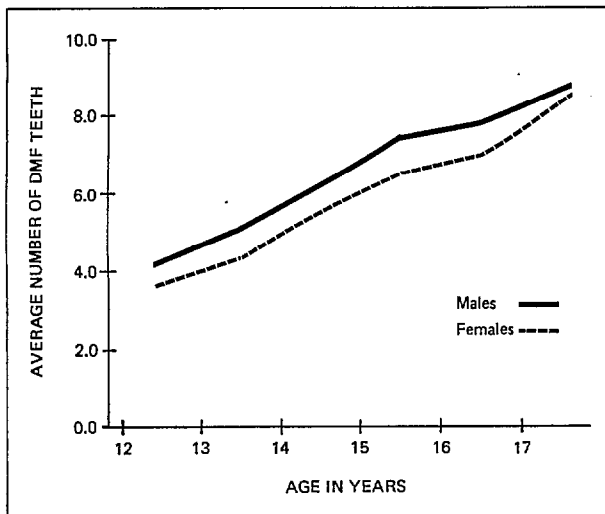


Figure 1. Average number of decayed, missing, and filled (DMF) teeth per person among youths 12-17 years, by age and sex: United States, 1966-70.

Table 2 includes the number and the percent distribution of youths with specified numbers of decayed teeth, of missing teeth, and of filled teeth. Several estimates in the table indicate that most youths whose teeth decay visit their dentists in time to have the affected teeth restored. For instance, about two of every three youths have at least one filled tooth, and one of every three has as many as five filled teeth or more. In addition, about three of every four have less than three untreated decayed teeth, and one of every two has none at all.

On the other hand, other estimates in the same table indicate that many youths fail either to receive dental care or to receive it as promptly as they should. In fact, evidence that dental neglect is not uncommon during ages 12-17 appears in the distribution of each DMF component. First, about one of every four youths has at least three decayed teeth that are restorable, and 1 of every 12 has five or more. Next, about one-third of all youths have at least one tooth that is classified as missing because dental treatment had not been received promptly enough. Finally, although only about one-tenth of all youths have never had a decayed permanent tooth, about one-third of all have no filled teeth. Thus, about one out of every five youths has at least one tooth that needs filling or at least one that is classified as missing.

The percent distribution of youths with specified numbers of DMF and D, M, and F teeth is presented according to sex and age in table 3. The percent with no DMF teeth decreases rapidly and consistently with advancing age, declining from a high of about 16 for those aged 12 years to a low of about 6 percent for those aged 17. The increasing frequency of D, M, and F teeth that occurs with advancing age is also apparent. For example, the percent of youths with no F teeth falls steadily with age, declining from a high of about 41 for 12-year-olds to about 31 for 15-year-olds and, finally, to about 25 for 17-year-olds. From age 12 to age 17, the decline in the percent of youths with no D teeth and in the percent with no M teeth—about 20 percent in both instances—is only about half as large as the decline in the percent of those with no F teeth.

The preceding estimates reflect the relatively high frequency of tooth decay that characterizes

adolescence. The same age-related trends in the occurrence of DMF teeth among youths were found during the earlier survey of children. For instance, the percent of children with no DMF teeth fell abruptly from about 85 at age 6 to about 24 at age 11. In addition, average DMF counts per child rose from only a small fraction for the youngest children to about three for the oldest. It was pointed out in the previous report that contained estimates of DMF teeth for children that the low DMF counts occurred largely because many younger children have only a few permanent teeth and some have none at all.⁵ Further, because more than half of the permanent teeth erupt during ages 6-11 years, many teeth are exposed only briefly during childhood to the risk of decay.

The increase in the incidence of decay that occurs with lengthening posteruptive exposure can be clearly seen in table 4. The number of DMF teeth per 100 erupted permanent teeth is about 15 for 12-year-olds of all races. The rate increases steadily with advancing age, rising to about 30 for 17-year-olds. With only a few exceptions, the rate for both white and Negro youths is higher at each successive year of age.

The number of DMF teeth per 100 permanent teeth among U.S. children rose from about 4 for 6-year-olds to about 12 for 11-year-olds.

Sex.—The average number of DMF teeth per person differs according to the sex of youths (table 1 and figure 2). The overall indexes for males 12-17 years of all races and for white and Negro males of those ages are not significantly lower than those for comparable females. However, average counts for 12-, 13-, and 14-year-old males of all races are significantly lower than the corresponding counts for females. Moreover, both white and Negro males of every given age have lower indexes than females of the same race and age.

Differences associated with sex in the average number of DMF teeth per person were also consistently found among both U.S. adults and U.S. children.^{4,5} At each year of age except one, white boys 6-11 averaged fewer DMF teeth than white girls, a difference not found among Negro children. Among adults 18-79 who had at least one natural tooth, both white men and Negro men, except for those 65-74 years among the latter, consistently had higher DMF indexes than comparable women.

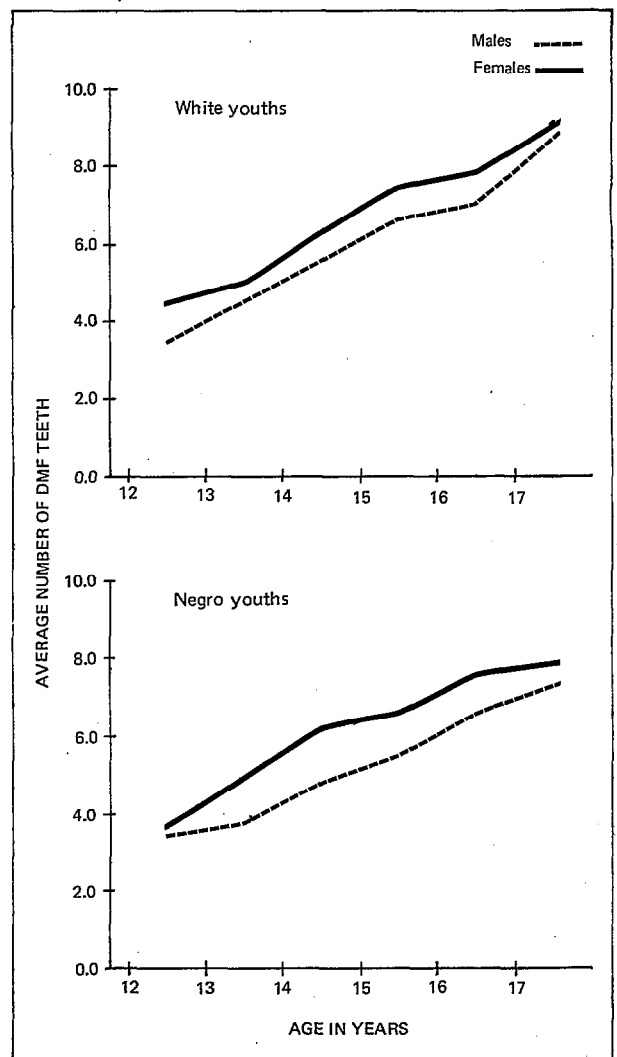


Figure 2. Average number of decayed, missing, and filled (DMF) teeth per person among youths 12-17 years, by age, sex, and race: United States, 1966-70.

Among youths, the higher DMF counts for females reflect a difference in the number of filled teeth associated with sex (table 1). For instance, the average number of F teeth per youth is 4.5 for white females compared with 3.8 for white males, and 1.4 for Negro females compared with 0.8 for Negro males. The average numbers of D and of M teeth per youth do not vary significantly by sex.

The average number of DMF teeth per 100 erupted permanent teeth is lower for males than it is for females (table 4). Although differences in the rate of tooth decay associated with the sex of youths are not pronounced, they do

occur with remarkable consistency. Specifically, white males of every given age and Negro males of every given age except one have lower rates than comparable females. The same difference by sex was also consistently found among white children 6-11 years but not among Negro children of those ages.

Estimates of the average number of erupted permanent teeth per youth are shown in table A by age, race, and sex. The overall average for youths of all ages is fractionally but significantly lower for white males (27.3) than for white females (27.6) and for Negro males (27.8) than for Negro females (28.2). The higher estimates for females result from differences in the number of erupted teeth in younger youths. Specifically, differences between the estimates for white males and females are statistically significant only at ages 12 and 13 and between those of Negro males and females only at ages 12 and 14.

Among children 6-11 years, boys also consistently had fewer erupted permanent teeth than girls of the same race and age.

Race.—Differences in the average number of DMF teeth per youth also are consistently associated with race (table 1 and figure 3). Average DMF counts for white males, except those aged 12, and for white females of every given age are slightly higher than the corresponding counts for Negro youths of the same sex and age.

Differences between estimates of the DMF components for white and Negro youths occur consistently and are statistically significant. The race difference observed for each component resulted largely because white youths had received substantially more dental treatment than Negro youths. The frequency of decay was only slightly higher among white youths than Negro youths, as noted above. However, the estimates in table 1 show that white youths have about

Table A. Average number and standard error of the number of erupted permanent teeth among youths, by age, race, and sex: United States, 1966-70

Age	Total ¹			White			Negro		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Average number of erupted teeth per youth								
12-17 years	27.5	27.4	27.7	27.4	27.3	27.6	28.0	27.8	28.2
12 years	25.8	25.2	26.4	25.6	25.0	26.3	26.5	26.0	27.0
13 years	27.2	26.9	27.4	27.1	26.8	27.4	27.6	27.5	27.6
14 years	27.7	27.6	27.8	27.7	27.6	27.7	28.0	27.8	28.1
15 years	27.9	27.9	28.0	27.9	27.9	27.9	28.3	29.2	28.4
16 years	28.2	28.1	28.2	28.1	28.0	28.1	28.6	28.6	28.6
17 years	28.5	28.6	28.4	28.4	28.6	28.2	29.4	29.1	29.6
	Standard error								
12-17 years	0.03	0.05	0.04	0.04	0.06	0.04	0.07	0.09	0.09
12 years	0.12	0.20	0.11	0.12	0.24	0.12	0.24	0.45	0.22
13 years	0.05	0.09	0.05	0.06	0.10	0.05	0.13	0.16	0.13
14 years	0.02	0.05	0.04	0.03	0.06	0.04	0.08	0.09	0.09
15 years	0.03	0.05	0.04	0.03	0.05	0.04	0.07	0.07	0.11
16 years	0.03	0.04	0.05	0.04	0.04	0.05	0.06	0.07	0.16
17 years	0.05	0.06	0.09	0.05	0.06	0.09	0.12	0.21	0.21

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

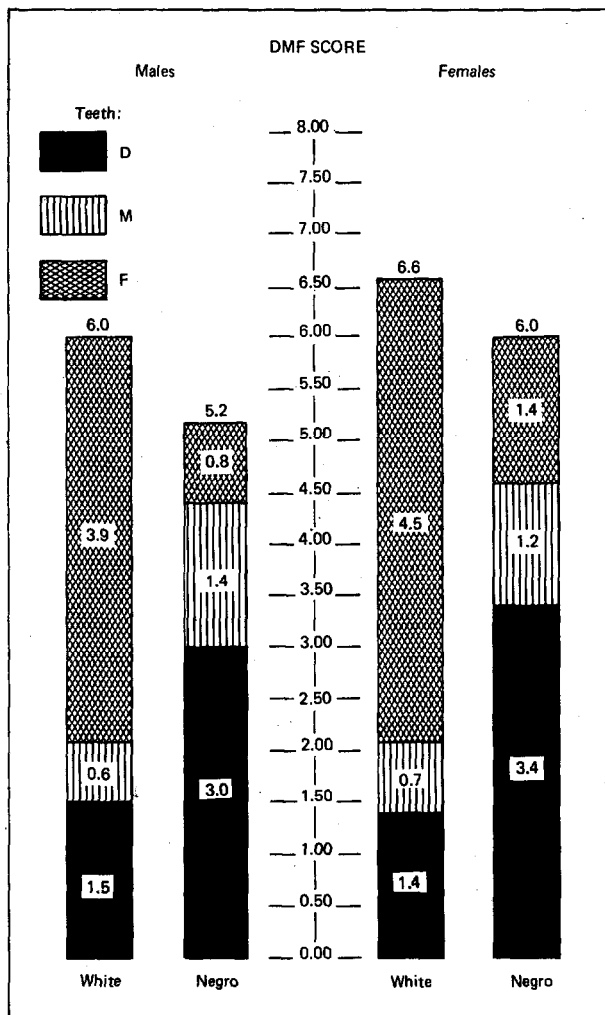


Figure 3. Average number of decayed (D), missing (M), and filled (F) teeth and average number of DMF components per person among youths 12-17 years, by sex and race: United States, 1966-70.

four times as many filled teeth per person as Negro youths. Thus, the DMF indexes for Negro youths include about twice as many D teeth and twice as many M teeth as the corresponding indexes for white youths. The same differences in DMF components were also found in the previous surveys conducted among children and adults.

At every given year of age, the rate of decay is slightly higher for white youths than for Negro youths (table 4). Yet the estimates in table A indicate that Negro youths consistently have slightly more erupted teeth per person than white youths. The two findings, taken together, suggest that white youths are somewhat more

susceptible to tooth decay than Negro youths are. Similar findings were also obtained during the survey of children's health.

Other Demographic Variables

Because estimates of the average number of DMF teeth per youth increased with age, actual and expected (age-adjusted) estimates of the average number of DMF per youth are presented in the following section. The U.S. population 12-17 years of age has been classified by family income, education of head of household, and geographic region, and any differences that appeared in the average DMF per youth among various groups were examined. For example, the estimates for white males whose family income was within one of five income ranges were examined to determine whether the average DMF count for a given income group differed significantly from those for other groups. In addition, average scores for all income groups were compared to determine whether the DMF index trended higher or lower with increasing income. The comparisons were made among youths of the same race and sex, and an adjustment was made for differences in the age distribution of the youths within each income and education group and within each geographic region by calculating age-adjusted values.

Expected values were calculated by weighting the age-sex-race-specific average DMF per youth for the total U.S. population of youths 12-17 years by the number of youths in that age-sex-race group within specified ranges of income or education. Actual and expected values may differ by chance. But, when the difference between them is statistically significant, one may conclude that the average DMF of a given sex-race-income group or of a sex-race-education group is excessively larger or smaller than the average of that sex-race group for the United States and that this excess is independent of age.

Because of the relatively limited number of sample youths, sampling variability for specific age groups is usually quite large. It is for this reason that summary comparisons of actual and expected values were preferred to comparisons of mean age-specific values.

DMF teeth by income and education.—The estimates in table 5 do not convincingly indicate that the number of DMF teeth among youths is

associated with family income. The average number of DMF teeth per person for white females, except for those whose families earned \$10,000-\$14,999 yearly, rises consistently with increasing income. However, the estimates for white males and for Negro youths of both sexes do not follow a trend with increasing income, nor does any estimate in table 5 differ significantly from any other estimate that it can validly be compared with.

In the 1963-65 survey, average DMF counts for white boys and girls rose slightly but consistently with increasing family income, whereas counts for Negro children declined slightly. Estimates of DMF teeth previously reported for U.S. adults were directly and positively associated with levels of income.

Estimates of the actual and expected average number of DMF teeth per youth according to the education of the parent or guardian designated "head of household" are presented by age and race in table 6. The prevalence of DMF teeth does not appear to be associated with the educational attainment of the youths' parents.

Estimates of DMF counts per person by family income and parent's education continue to differ consistently by race and by the sex of the white youths. Within all given levels of income and all but one level of education, white females have higher counts than white males. The difference by race in average counts is more consistently associated with education than with income: Within all but two levels of education, white males have higher counts than Negro males, and within all but two levels, white females have higher counts than Negro females.

DMF components.—Both family income and the education of parents are significantly associated with each DMF component (tables 5 and 6). For example, the DMF index for youths of all races whose families earned less than \$3,000 yearly consists of 2.7 D teeth, 1.2 M teeth, and 1.6 F teeth. The average number of both D and M teeth decreases with rising income, falling to a low of 0.8 and 0.2, respectively, for youths whose families earned \$15,000 or more. By contrast, the number of F teeth increases steadily, rising to a high of 5.4 for youths whose families earned the highest incomes. The trend is more consistent among white youths than it is among Negro youths. Many of the differences

between actual and expected estimates of the components for both white and Negro youths are statistically significant.

Differences in the occurrence of D, M, and F teeth among both U.S. children and adults were also highly associated with income and education, with the more advantaged averaging higher numbers of F teeth than expected and the less advantaged averaging higher numbers of both D and M teeth.

Region of residence.—Estimates of the average number of DMF teeth per person by race, sex, and geographic region of residence (appendix II) are presented in table 7. Youths living in the Northeast Region have significantly higher DMF counts than those living elsewhere. The higher counts among youths of all races in the Northeast reflect the higher-than-expected counts found among both white males and females, not among Negro males and females. The average number of DMF teeth per person among white and Negro youths living in regions other than the Northeast does not differ significantly.

The average numbers of D, M, and F teeth per youth are also presented in table 7. Several regional variations are to be noted. First, Negro youths in the Midwest and West have lower numbers of D teeth per person than expected. Both white and Negro youths living in the West and white females living in the Midwest have fewer M teeth per person than expected, whereas white youths living in the South have more than expected. Finally, white youths and Negro females in the Northeast have higher estimates of F teeth per person than expected, and white females in the South have lower F estimates than expected.

CORRELATION ANALYSIS OF DMF TEETH AND SELECTED DEMOGRAPHIC CHARACTERISTICS

The relationship of the number of DMF teeth youths have with certain demographic characteristics can also be examined by correlation analysis. Simple correlation coefficients indicate whether or not two variables are statistically associated and, if so, whether the association is positive or negative. The simple coefficients and their corresponding errors in table B indicate that the number of DMF teeth is significantly

Table B. Correlation coefficients between the number of DMF teeth and selected demographic variables of youths 12-17 years, with standard errors of the estimates: United States, 1966-70

Selected variable	Simple coefficients	Standard error
Age33	.013
Education of parent01	.040
Family income06	.039
Size of place	-.00	.044
Race04	.048

associated with age but not with family income, parent's education, or size of place of residence.

Variations in the average number of DMF teeth per youth by size of place of residence were also examined; but because the estimates do not vary significantly, they are not discussed in the text nor are they shown in the detailed tables. Partial coefficients are not included in table B because family income, parent's education, and size of place of residence are not significantly associated with DMF teeth.

DISCUSSION

The estimates in this report together with those in two previous reports provide statistical information about the occurrence and distribution of decayed, missing, and filled teeth throughout the noninstitutionalized U.S. population of children 6-11 years, youths 12-17 years, and adults 18-79 years. The three surveys on which the national estimates are based were conducted one after the other during a 10-year period. Essentially the same examination procedure was carefully followed throughout. In addition, the same two dentists trained and periodically retrained the 15 other dentists who collected most of the dental findings. Although it is notoriously difficult to control inter-examiner variability, and it is especially important to do so whenever relatively few examiners are used, it is nevertheless believed that the quality control measures taken to obtain comparable findings were largely successful.

The average number of DMF teeth per person for the U.S. population 6-44 years is plotted by

age in figure 4. The counts increase rapidly from age 6 through age 25. The rising trend continues during ages 25-44, but the rate of increase is slower than it was before. With only one exception—the apparently higher-than-expected rise in the index for adults 18-21 years—the curve is relatively smooth. Estimates for adults 45 years or over are not shown because older adults have an increasingly large proportion of missing teeth that were extracted because of advanced periodontal disease.

The DMF components are also plotted by age in figure 4. The number of decayed teeth rises rapidly during childhood and early adolescence. At about age 14, there is a leveling off of the trend which lasts through age 21. Thereafter the D counts slowly decline.

Although M counts increase during childhood and adolescence, it will be noticed that 17-year-olds still have only about one missing tooth per person. There is then, during ages 18-21, a sharp upturn which marks a fourfold increase in the number of M teeth per person. That sudden jump is partly, perhaps largely, an artifact introduced by a difference between the examination procedures used during the surveys of adults and youths. In the survey of adults, the M component included third molars that were absent for any reason: they may not have erupted or they may have been extracted because of decay, crowding, or impaction. In the survey of youths, the M component contained only third molars that had been extracted because of decay.

It was estimated previously that as a result of including unerupted third molars, the estimate of missing teeth per person for young adults 18-24 is exaggerated at least by 0.4 and at most by 2.1.⁶ The smoothing of the break in the curve of M teeth that results from lowering the M count for young adults from 4.9 to 2.8 suggests that the overestimate of M teeth is closer to 2.1 than to 0.4. But regardless of the magnitude of the overestimation, it is obvious that the number of missing teeth begins to rise steeply at about age 18.

It is also noteworthy that a reduction of two teeth in the DMF index for adults aged 18-21 would result in a smoother DMF curve.

The curve plotting the F component also inclines sharply upward during childhood and

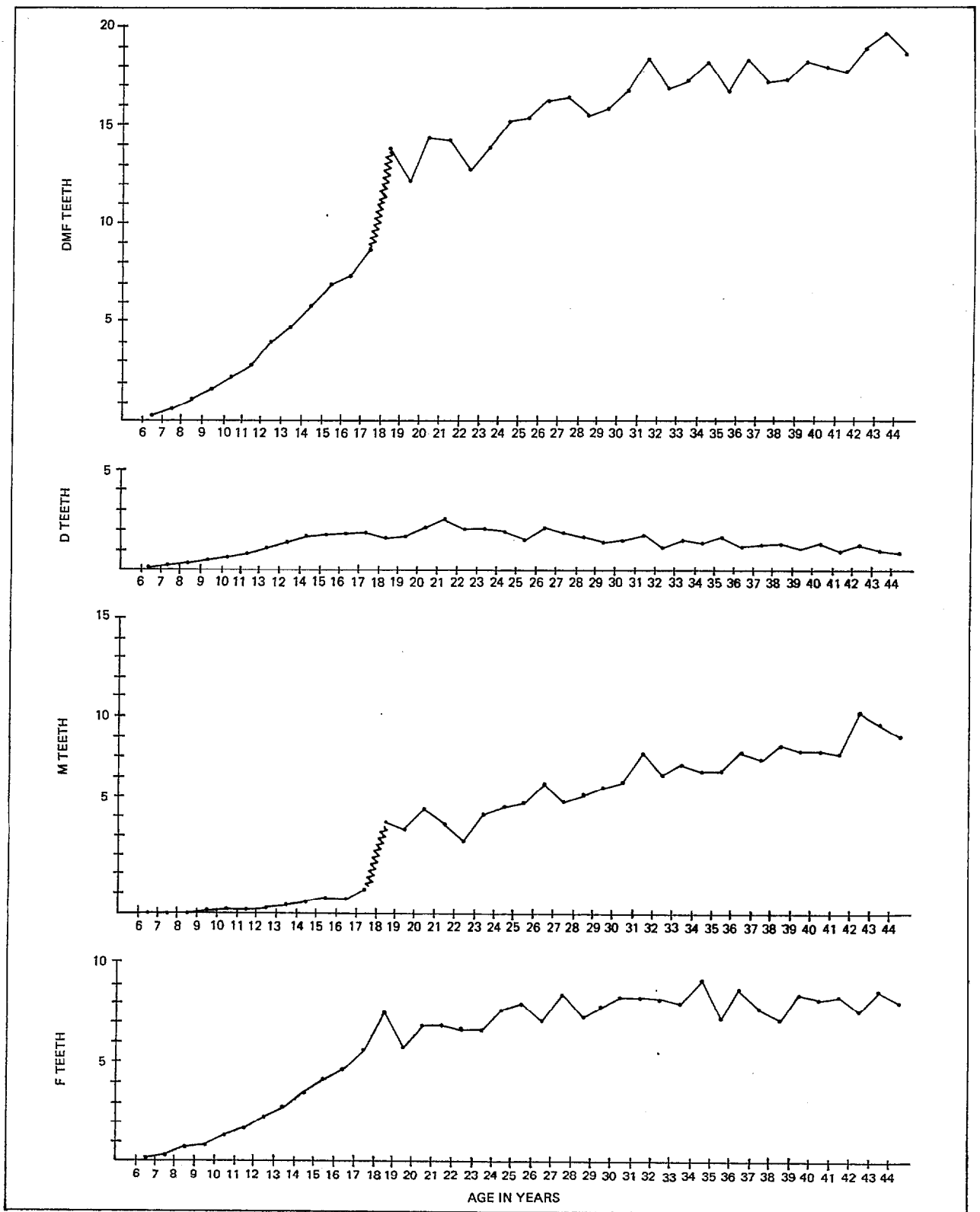


Figure 4. Average number of DMF, decayed (D), missing (M), and filled (F) teeth per person among children 6-11 (1963-65), youths 12-17 (1966-70), and adults 18-44 (1960-62), by age: United States.

adolescence. The uptrend slows at about age 21, and at age 35 or thereabouts the number of filled teeth per person begins to decline slowly.

The apparent intersurvey continuity of the trends in DMF teeth suggests that the dental examinations were conducted on a largely uniform basis. In addition, the fact that many trends and differences in the occurrence of DMF teeth are associated with the same demographic characteristics throughout the population aged 6-79 further suggests that the DMF estimates are comparable. It must be added, however, that other DMF findings do not prevail consistently during childhood, adolescence, and adulthood. The correspondence or lack of correspondence between the findings presented here and those presented earlier is pointed out in the preceding text.

The import of the national estimates of decayed, missing, and filled teeth can be summed up as follows: Tooth decay is a lifelong threat to the dental health of Americans so long as, of course, they have any of their own teeth. Differences in the prevalence of tooth decay, measured by DMF teeth, and therefore differences in the need for dental care associated with various demographic characteristics except age are actually rather small, often having greater epidemiologic interest than practical significance. By contrast, the associations of filled teeth with increasing income and decayed and extracted teeth with decreasing income are meaningful delineators of levels of dental care throughout the population. The relationship of the dental health of U.S. youths with their family income is shown in figure 5.

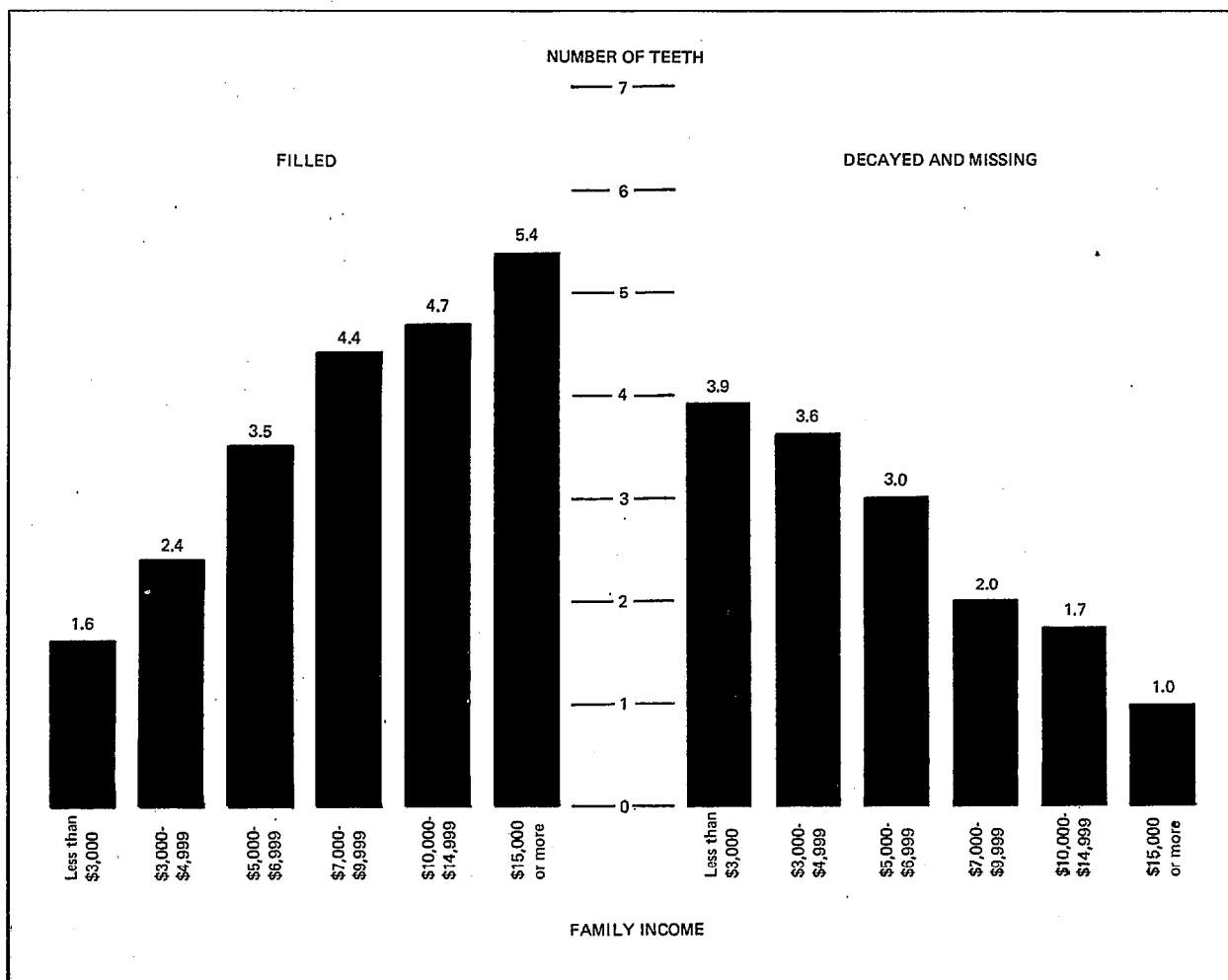


Figure 5. Average number of filled and of decayed and missing permanent teeth per person among youths 12-17 years, by family income: United States, 1966-70.

SUMMARY

U.S. youths 12-17 years of age have an estimated 6.2 decayed, missing, and filled teeth per person. The estimate comprises 1.7 D, 0.7 M, and 3.8 F teeth. Reflecting increases with advancing age in each of its components, the DMF index rises from a low of 4.0 for 12-year-old youths to a high of 8.7 for 17-year-old youths.

The estimates are based on examinations conducted during 1966-70 on 7,514 youths selected by probability sampling to represent the 22.7 million composing the noninstitutionalized civilian population 12-17 years living in the United States at that time.

The occurrence of decayed, missing, and filled teeth among youths differs according to their sex. At every given age, both white and Negro males have lower DMF counts per person than females of the same race. As a result, the DMF index for males of all races is 5.8, whereas that for comparable females is 6.5, the difference being due to the greater number of F teeth among the latter.

The average number of decayed, missing, and filled teeth also differs by race. In every age-sex group except one, white youths have slightly higher DMF indexes than Negro youths, resulting in index values of 6.3 for white youths of

both sexes and 5.6 for Negro youths of both sexes. In addition, white youths have about four times as many F teeth per person as Negro youths, 4.2 compared with 1.1, but only about half as many D (untreated) teeth and M teeth, 1.5 and 0.6, respectively, compared with 3.2 and 1.3.

The number of DMF teeth is not associated with either family income or parent's education. The index components, by contrast, are strongly associated with both variables. For example, the DMF index for youths of all races whose families earned less than \$3,000 yearly consists of 2.7 D teeth, 1.2 M teeth, and 1.6 F teeth. The average numbers of D and M teeth decrease with rising income, falling to a low of 0.8 and 0.2, respectively, for youths whose families earned \$15,000 or more. By contrast, the number of F teeth increases steadily, rising to a high of 5.4 for youths whose families earned the highest incomes. The trend was more consistent among white youths than among Negro youths.

Regional estimates indicate that white youths living in the Northeast have a higher DMF count than those living elsewhere. The average number of DMF teeth per person among youths living in the South, Midwest, and West does not differ significantly. The average numbers of D teeth, M teeth, and F teeth per person also show several significant regional variations.

REFERENCES

¹National Center for Health Statistics: Plan and initial program of the Health Examination Survey. *Vital and Health Statistics*. Series 1, No. 4. DHEW Pub. No. (HRA) 74-1038. Health Resources Administration. Washington. U.S. Government Printing Office, Nov. 1973.

²National Center for Health Statistics: Plan, operation, and response results of a program of children's examinations. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 1-No. 5. Public Health Service. Washington. U.S. Government Printing Office, Oct. 1967.

³National Center for Health Statistics: Plan and operation of a health examination survey of U.S. youths 12-17 years of age. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 1-No. 8. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1969.

⁴National Center for Health Statistics: Decayed, missing, and filled teeth in adults: United States, 1960-1962. *Vital and Health Statistics*. Series 11, No. 23. DHEW Pub. No. (HRA) 74-1278. Health Resources Administration. Washington. U.S. Government Printing Office, Aug. 1973.

⁵National Center for Health Statistics: Decayed, missing, and filled teeth among children: United States. *Vital and Health Statistics*. Series 11, No. 106. DHEW Pub. No. (HSM) 72-1003. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Aug. 1971.

⁶National Center for Health Statistics: Selected dental findings in adults by age, race, and sex: United States, 1960-1962. *Vital and Health Statistics*. Series 11, No. 7. DHEW Pub. No. (HRA) 74-1274. Health Resources Administration. Washington. U.S. Government Printing Office, Aug. 1973.

LIST OF DETAILED TABLES

	Page
Table 1. Average number of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by age, sex, and race: United States, 1966-70	13
2. Number and percent distribution of youths 12-17 years, with standard error of the percent, by number of decayed (D), missing (M), and filled (F) teeth, according to sex: United States, 1966-70	15
3. Percent distribution of youths 12-17 years, with standard error of the percent, by number of decayed (D), missing (M), and filled (F) teeth, according to sex and age: United States, 1966-70	16
4. Number of decayed, missing, and filled (DMF) teeth per 100 erupted permanent teeth among youths 12-17 years, with standard errors of the estimates, by age, sex, and race: United States, 1966-70	18
5. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and family income: United States, 1966-70	19
6. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and education of head of household: United States, 1966-70	22
7. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and region of residence: United States, 1966-70	25

Table 1. Average number of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by age, sex, and race: United States, 1966-70

Age and sex	All DMF teeth			D teeth			M teeth			F teeth		
	Total ¹	White	Negro	Total ¹	White	Negro	Total ¹	White	Negro	Total ¹	White	Negro
Both sexes	Number of teeth											
12-17 years . .	6.2	6.3	5.6	1.7	1.5	3.2	0.7	0.6	1.3	3.8	4.2	1.1
12 years	4.0	4.0	3.7	1.2	1.1	2.3	0.4	0.4	0.7	2.3	2.6	0.7
13 years	4.7	4.8	4.4	1.5	1.3	2.6	0.5	0.4	1.0	2.8	3.1	0.8
14 years	5.9	5.9	5.6	1.8	1.5	3.3	0.6	0.6	1.2	3.5	3.8	1.2
15 years	7.0	7.1	6.0	1.9	1.6	3.5	0.8	0.8	1.4	4.2	4.7	1.1
16 years	7.4	7.4	7.2	1.9	1.6	4.0	0.8	0.7	1.7	4.6	5.1	1.4
17 years	8.7	8.9	7.4	2.0	1.7	3.8	1.1	1.0	1.9	5.6	6.2	1.7
Male												
12-17 years . .	5.8	6.0	5.2	1.7	1.5	3.0	0.7	0.6	1.4	3.5	3.8	0.8
12 years	3.6	3.6	3.6	1.2	1.0	2.3	0.4	0.3	0.7	2.1	2.3	0.6
13 years	4.4	4.5	3.8	1.3	1.2	2.2	0.5	0.4	1.1	2.6	2.9	0.5
14 years	5.5	5.6	5.1	1.8	1.6	3.1	0.6	0.5	1.3	3.1	3.4	0.8
15 years	6.6	6.7	5.5	1.8	1.6	3.0	0.8	0.7	1.7	4.0	4.4	0.8
16 years	7.0	7.0	6.7	1.9	1.6	4.0	0.9	0.8	1.7	4.2	4.7	1.1
17 years	8.6	8.8	7.1	2.2	2.0	3.8	1.2	1.1	1.8	5.2	5.7	1.4
Female												
12-17 years . .	6.5	6.6	6.0	1.7	1.4	3.4	0.7	0.6	1.2	4.1	4.5	1.4
12 years	4.3	4.4	3.7	1.3	1.2	2.4	0.4	0.4	0.6	2.6	2.8	0.7
13 years	5.1	5.1	5.0	1.6	1.4	3.0	0.5	0.4	0.8	3.0	3.3	1.1
14 years	6.3	6.3	6.1	1.7	1.4	3.4	0.7	0.6	1.0	3.8	4.2	1.6
15 years	7.4	7.5	6.6	2.0	1.7	4.0	0.9	0.8	1.2	4.5	5.0	1.4
16 years	7.8	7.8	7.6	1.8	1.5	4.1	0.8	0.7	1.7	5.1	5.6	1.7
17 years	8.8	9.0	7.7	1.8	1.4	3.8	1.0	0.9	1.9	6.0	6.6	2.0

See footnotes at end of table.

Table 1. Average number of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by age, sex, and race: United States, 1966-70—Con.

Age and sex	All DMF teeth			D teeth			M teeth			F teeth		
	Total ¹	White	Negro	Total ¹	White	Negro	Total ¹	White	Negro	Total ¹	White	Negro
Both sexes	Standard error											
12-17 years . . .	0.28	0.30	0.64	0.17	0.14	0.69	0.04	0.04	0.14	0.19	0.21	0.16
12 years	0.24	0.25	0.62	0.16	0.12	0.67	0.03	0.03	0.09	0.16	0.18	0.16
13 years	0.27	0.28	0.59	0.16	0.14	0.53	0.05	0.04	0.21	0.17	0.19	0.23
14 years	0.25	0.26	0.67	0.22	0.19	0.88	0.04	0.04	0.17	0.17	0.18	0.23
15 years	0.36	0.38	0.83	0.17	0.15	0.77	0.05	0.06	0.17	0.28	0.32	0.20
16 years	0.36	0.38	0.87	0.22	0.19	0.80	0.08	0.08	0.20	0.25	0.28	0.30
17 years	0.38	0.41	0.82	0.20	0.18	0.72	0.12	0.13	0.23	0.31	0.34	0.35
Male												
12-17 years . . .	0.28	0.29	0.67	0.18	0.16	0.68	0.04	0.04	0.16	0.18	0.20	0.14
12 years	0.22	0.21	0.75	0.15	0.11	0.75	0.03	0.03	0.11	0.13	0.16	0.22
13 years	0.26	0.26	0.74	0.15	0.14	0.50	0.06	0.05	0.38	0.17	0.19	0.15
14 years	0.27	0.27	0.74	0.24	0.20	0.90	0.05	0.05	0.22	0.22	0.25	0.20
15 years	0.41	0.42	0.88	0.17	0.17	0.77	0.06	0.07	0.24	0.33	0.36	0.21
16 years	0.38	0.41	0.90	0.26	0.25	0.78	0.10	0.12	0.20	0.26	0.30	0.35
17 years	0.45	0.49	1.00	0.27	0.27	0.77	0.19	0.20	0.32	0.29	0.32	0.49
Female												
12-17 years . . .	0.29	0.32	0.65	0.17	0.14	0.72	0.04	0.05	0.12	0.22	0.24	0.24
12 years	0.33	0.36	0.64	0.18	0.15	0.64	0.05	0.06	0.15	0.23	0.27	0.23
13 years	0.32	0.35	0.48	0.20	0.21	0.60	0.05	0.05	0.17	0.21	0.24	0.34
14 years	0.30	0.33	0.74	0.22	0.21	0.90	0.05	0.06	0.15	0.23	0.24	0.30
15 years	0.40	0.43	0.87	0.20	0.17	0.79	0.07	0.08	0.18	0.34	0.40	0.33
16 years	0.37	0.40	1.06	0.20	0.17	0.95	0.09	0.08	0.28	0.30	0.32	0.40
17 years	0.37	0.41	0.85	0.18	0.15	0.72	0.14	0.15	0.32	0.36	0.41	0.41

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 2. Number and percent distribution of youths 12-17 years, with standard error of the percent, by number of decayed (D), missing (M), and filled (F) teeth, according to sex: United States, 1966-70

Number of affected teeth	Both sexes		Male		Female		Both sexes	Male	Female
	Number in thousands	Percent distribution	Number in thousands	Percent distribution	Number in thousands	Percent			
							Standard error		
DMF teeth	22,692	100.0	11,489	100.0	11,203	100.0			
0	2,369	10.4	1,359	11.8	1,009	9.0	1.62	1.77	1.54
1	1,348	5.9	723	6.3	625	5.6	0.57	0.67	0.60
2	1,600	7.1	888	7.7	711	6.4	0.68	0.84	0.72
3	1,700	7.5	923	8.0	776	6.9	0.40	0.51	0.51
4	2,724	12.0	1,432	12.5	1,291	11.5	0.53	0.80	0.60
5	1,943	8.6	1,003	8.7	941	8.4	0.34	0.48	0.44
6	1,874	8.3	977	8.5	897	8.0	0.37	0.49	0.47
7	1,598	7.0	814	7.1	785	7.0	0.44	0.54	0.57
8	1,773	7.8	825	7.2	948	8.5	0.48	0.60	0.60
9	1,088	4.8	470	4.1	618	5.5	0.32	0.35	0.45
10	998	4.4	381	3.3	617	5.5	0.51	0.43	0.66
11	720	3.2	307	2.7	413	3.7	0.34	0.33	0.51
12	520	2.3	237	2.1	283	2.5	0.25	0.23	0.40
13	423	1.9	229	2.0	194	1.7	0.21	0.24	0.26
14	408	1.8	163	1.4	245	2.2	0.21	0.26	0.30
15	348	1.5	144	1.3	204	1.8	0.18	0.19	0.32
16	308	1.4	162	1.4	146	1.3	0.19	0.29	0.20
17	255	1.1	119	1.0	136	1.2	0.19	0.26	0.19
18	199	0.9	81	0.7	119	1.1	0.12	0.13	0.21
19	145	0.6	68	0.6	78	0.7	0.11	0.16	0.12
20	94	0.4	46	0.4	48	0.4	0.06	0.07	0.08
21 or more	257	1.1	138	1.2	119	1.1	0.22	0.23	0.25
D teeth	22,692	100.0	11,489	100.0	11,203	100.0			
0	11,077	48.8	5,666	49.3	5,411	48.3	2.08	2.18	2.17
1	3,758	16.6	1,880	16.4	1,878	16.8	0.72	0.68	0.95
2	2,430	10.7	1,251	10.9	1,179	10.5	0.46	0.53	0.68
3	1,586	7.0	730	6.4	856	7.6	0.35	0.34	0.58
4	1,072	4.7	529	4.6	543	4.8	0.42	0.39	0.52
5	761	3.4	456	4.0	305	2.7	0.29	0.43	0.26
6	590	2.6	270	2.4	320	2.9	0.37	0.38	0.44
7	409	1.8	210	1.8	199	1.8	0.28	0.33	0.28
8	247	1.1	125	1.1	122	1.1	0.25	0.25	0.31
9	208	0.9	104	0.9	104	0.9	0.26	0.31	0.25
10	147	0.7	62	0.5	85	0.8	0.15	0.16	0.16
11	101	0.4	56	0.5	45	0.4	0.13	0.18	0.11
12 or more	306	1.3	150	1.3	156	1.4	0.50	0.50	0.54
M teeth	22,692	100.0	11,489	100.0	11,203	100.0			
0	16,296	71.8	8,297	72.2	7,998	71.4	1.13	1.15	1.32
1	2,516	11.1	1,262	11.0	1,254	11.2	0.51	0.59	0.68
2	1,771	7.8	912	7.9	859	7.7	0.42	0.53	0.53
3	842	3.7	418	3.6	424	3.8	0.25	0.34	0.35
4	557	2.5	275	2.4	282	2.5	0.23	0.42	0.26
5	262	1.1	110	1.0	152	1.4	0.13	0.17	0.23
6	177	0.8	62	0.5	115	1.0	0.12	0.09	0.22
7 or more	271	1.2	153	1.4	119	1.0	0.19	0.23	0.21
F teeth	22,692	100.0	11,489	100.0	11,203	100.0			
0	7,631	33.6	4,105	35.7	3,526	31.5	2.37	2.49	2.50
1	1,528	6.7	797	6.9	731	6.5	0.40	0.49	0.53
2	1,729	7.6	1,003	8.7	726	6.5	0.46	0.52	0.59
3	1,763	7.8	943	8.2	820	7.3	0.31	0.57	0.49
4	2,272	10.0	1,129	9.8	1,143	10.2	0.45	0.62	0.56
5	1,307	5.8	633	5.5	674	6.0	0.31	0.37	0.53
6	1,270	5.6	660	5.7	610	5.4	0.38	0.46	0.42
7	1,096	4.8	497	4.3	599	5.4	0.33	0.40	0.51
8	1,090	4.8	440	3.8	650	5.8	0.40	0.45	0.56
9	685	3.0	311	2.7	375	3.3	0.26	0.33	0.41
10	518	2.3	191	1.7	328	2.9	0.27	0.26	0.37
11	462	2.0	170	1.5	292	2.6	0.30	0.23	0.43
12	324	1.4	121	1.1	203	1.8	0.19	0.20	0.30
13	243	1.1	117	1.0	125	1.1	0.15	0.14	0.23
14	242	1.1	117	1.0	124	1.1	0.14	0.15	0.23
15	140	0.6	51	0.4	90	0.8	0.09	0.10	0.18
16	147	0.7	88	0.8	60	0.5	0.14	0.22	0.13
17 or more	245	1.1	116	1.0	127	1.1	0.19	0.28	0.18

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 3. Percent distribution of youths 12-17 years, with standard error of the percent, by number of decayed (D), missing (M), and filled (F) teeth, according to sex and age: United States, 1966-70

Number of teeth	Both sexes						Male						Female					
	12 years	13 years	14 years	15 years	16 years	17 years	12 years	13 years	14 years	15 years	16 years	17 years	12 years	13 years	14 years	15 years	16 years	17 years
	Percent distribution																	
DMF teeth	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0	15.7	13.2	10.1	8.4	8.5	5.9	17.8	13.8	11.5	9.6	10.3	7.2	13.7	12.5	8.6	7.3	6.7	4.6
1	7.8	8.2	6.6	5.3	4.3	3.0	8.8	8.9	7.4	4.6	4.3	3.1	6.8	7.4	5.8	6.0	4.2	2.9
2	11.2	8.1	7.0	5.7	5.2	4.5	11.2	8.3	9.0	7.2	5.1	5.1	11.2	7.9	5.0	4.3	5.4	3.9
3	11.3	8.9	6.9	5.8	6.2	5.4	12.1	9.6	8.3	6.0	7.2	4.3	10.4	8.3	5.4	5.5	5.3	6.4
4	20.1	17.0	11.7	8.8	6.6	6.5	20.2	17.8	12.3	9.5	6.8	6.9	20.1	16.2	11.0	8.1	6.3	6.1
5	9.7	10.3	8.8	8.1	8.2	5.9	9.5	10.6	7.2	10.0	7.9	6.8	9.9	10.0	10.4	6.0	8.6	5.0
6	7.6	8.7	9.8	8.3	8.6	6.5	7.4	9.9	10.0	7.3	9.3	7.0	7.7	7.4	9.6	9.4	7.8	5.9
7	4.0	6.1	9.0	9.2	7.9	6.1	3.4	5.9	7.6	10.3	9.9	5.7	4.7	6.3	10.5	8.1	5.9	6.5
8	4.2	6.4	8.4	9.3	9.0	10.1	3.1	5.1	7.4	9.2	8.4	10.6	5.2	7.8	9.4	9.5	9.6	9.5
9	2.6	2.9	4.8	6.2	6.1	7.5	2.0	2.3	4.2	5.1	5.5	5.8	3.2	3.6	5.5	5.3	6.7	9.3
10	1.6	3.1	3.9	5.6	6.4	6.3	0.9	2.7	2.4	2.9	5.5	6.0	2.4	3.5	5.4	8.3	7.4	6.6
11	1.5	1.3	2.8	5.0	5.0	3.8	1.6	0.8	2.6	4.8	3.5	2.9	1.5	1.7	3.0	5.1	6.5	4.8
12	0.6	1.6	1.6	2.5	3.4	4.3	0.5	1.7	1.7	1.9	3.2	3.7	0.8	1.6	1.5	3.2	3.6	4.8
13	0.1	1.1	1.5	2.1	2.2	4.5	0.1	0.5	2.0	2.6	2.3	4.8	0.1	1.6	1.1	1.6	2.1	4.3
14	0.2	0.5	2.0	2.1	2.1	4.3	0.2	0.3	1.5	1.5	1.3	4.1	0.2	0.7	2.5	2.7	3.0	4.4
15	0.5	0.4	1.8	2.0	1.7	3.1	0.3	-	1.7	1.4	1.9	2.5	0.7	0.7	1.9	2.6	1.5	3.7
16	0.3	0.5	1.0	1.2	2.2	3.2	0.6	0.8	0.8	1.1	1.5	3.9	-	0.2	1.1	1.3	2.9	2.5
17	0.3	0.7	0.3	1.5	1.9	2.1	-	0.3	0.4	1.4	1.9	2.4	0.5	1.2	0.3	1.6	1.9	1.9
18	-	0.5	0.8	1.2	1.3	1.6	-	0.3	0.5	1.0	1.4	1.2	-	0.8	1.1	1.4	1.2	2.0
19	0.3	0.2	0.6	0.8	1.0	1.1	-	0.1	0.7	0.8	0.6	1.3	0.5	0.3	0.4	0.7	1.3	0.9
20	-	0.1	0.2	0.6	0.7	1.0	-	-	0.5	0.6	0.5	0.9	-	0.2	-	0.5	0.8	1.2
21 or more	0.4	0.2	0.4	1.3	1.5	3.3	0.3	0.3	0.3	1.2	1.7	3.8	0.4	0.1	0.5	1.5	1.3	2.8
D teeth	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0	54.7	50.1	47.5	46.6	47.6	45.7	54.9	52.9	47.9	47.4	47.1	44.7	54.5	47.2	47.1	45.9	48.0	46.7
1	15.6	19.2	17.0	15.5	16.4	15.5	16.9	18.9	15.2	15.9	16.7	14.4	14.3	19.5	19.0	15.1	16.0	16.6
2	12.1	10.0	10.1	10.7	10.0	11.5	12.8	9.3	10.8	10.8	10.3	11.4	11.4	10.7	9.3	10.6	9.6	11.5
3	6.8	6.3	6.2	7.4	6.8	8.5	5.4	6.0	6.1	6.7	5.7	8.4	8.3	6.7	6.4	8.0	8.0	8.6
4	4.1	4.2	6.2	4.2	5.1	4.5	3.9	3.3	6.0	4.0	5.4	5.2	4.4	5.2	6.4	4.4	4.8	3.8
5	1.8	2.8	4.0	4.7	3.7	3.3	2.5	3.7	4.3	5.0	4.6	4.0	1.0	1.8	3.7	4.4	2.8	2.7
6	1.8	2.8	2.2	3.5	2.1	3.2	1.1	2.7	2.8	3.1	1.7	2.6	2.5	3.0	1.5	3.8	2.5	3.9
7	1.0	1.3	2.2	2.3	2.1	1.9	0.6	1.3	2.4	2.6	2.2	2.0	1.3	1.4	2.0	2.1	2.1	1.8
8	0.5	1.0	1.3	1.0	1.8	1.0	0.5	0.4	1.2	0.9	2.1	1.5	0.4	1.6	1.5	1.1	1.5	0.5
9	0.4	0.6	0.6	1.6	1.0	1.4	0.3	0.4	0.7	1.6	1.3	1.2	0.5	0.8	0.5	1.5	0.7	1.6
10	0.3	0.4	0.7	0.7	1.1	0.8	0.4	0.5	0.9	0.6	-	0.7	0.2	0.2	0.4	0.9	2.2	0.8
11	0.3	0.2	0.4	0.4	0.8	0.7	0.2	-	0.5	0.5	1.1	0.8	0.5	0.3	0.3	0.3	0.5	0.6
12 or more	0.6	1.1	1.6	1.4	1.5	2.0	0.5	0.6	1.2	0.9	1.8	3.1	0.7	1.6	1.9	1.9	1.3	0.9
M teeth	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0	80.4	77.8	72.2	68.1	66.7	64.0	81.4	78.8	73.6	68.9	66.4	62.3	79.4	76.7	70.8	67.4	67.0	65.7
1	8.8	10.6	11.6	10.3	13.0	12.6	8.7	10.3	12.7	9.0	13.1	12.4	8.9	10.9	10.5	11.6	12.8	12.9
2	6.1	5.9	7.2	10.1	9.2	8.6	5.3	5.5	6.5	11.7	9.3	9.8	7.0	6.3	7.9	8.5	9.1	7.4
3	2.3	2.8	4.0	4.3	4.1	5.0	2.5	3.1	2.6	3.7	4.3	5.9	2.1	2.5	5.3	4.9	4.0	4.1
4	1.3	1.5	2.6	3.2	2.8	3.4	1.2	1.2	2.4	3.2	3.0	3.6	1.4	1.9	2.9	3.2	2.6	3.2
5	0.5	0.6	1.0	1.7	1.5	1.8	0.6	0.2	0.8	1.4	1.2	1.9	0.4	1.0	1.3	2.0	1.8	1.7
6	0.1	0.3	0.6	1.2	1.2	1.6	-	0.2	0.3	1.1	1.0	0.7	0.2	0.3	0.9	1.2	1.4	2.5
7 or more	0.5	0.5	0.8	1.1	1.5	3.0	0.3	0.7	1.1	1.0	1.7	3.4	0.6	0.4	0.4	1.2	1.3	2.5
F teeth	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0	41.3	37.9	34.7	31.2	29.8	25.3	43.2	37.4	38.1	33.9	32.3	28.2	39.5	38.5	31.3	28.4	27.3	22.3
1	7.8	7.9	7.1	6.0	5.8	5.5	7.6	8.7	8.7	4.9	6.4	4.9	8.1	7.0	5.5	7.1	5.1	6.2
2	9.8	8.6	7.9	8.0	5.5	5.5	11.0	8.9	8.8	9.8	7.1	6.4	8.6	8.3	6.9	6.2	3.8	4.7
3	10.4	9.3	7.9	7.4	6.8	4.4	11.2	11.1	8.7	6.9	5.9	4.7	9.5	7.4	7.0	7.9	7.6	4.2
4	13.6	12.7	11.2	7.2	7.5	7.1	13.1	13.2	8.8	6.8	8.2	8.4	14.1	12.1	13.8	7.7	6.9	5.8
5	6.1	6.8	5.2	6.5	5.0	4.8	6.2	5.5	3.2	7.2	5.3	5.6	5.9	8.2	7.3	5.8	4.6	3.9
6	3.1	4.8	6.1	6.2	7.0	6.7	2.3	5.7	6.2	5.9	7.5	7.4	3.8	3.9	6.0	6.6	6.4	6.1
7	2.3	2.9	4.7	6.3	7.2	6.0	1.6	2.7	4.7	6.5	6.0	4.9	3.1	3.1	4.8	6.0	8.5	7.1
8	2.8	3.8	4.6	5.6	5.8	6.6	1.9	2.9	3.5	5.7	5.0	4.2	3.8	1.7	5.6	5.4	6.7	9.0
9	0.7	1.6	3.2	2.6	4.9	5.6	0.4	1.5	3.3	2.6	3.6	5.2	1.0	1.6	2.1	2.6	6.2	6.0
10	0.8	0.7	2.2	3.2	3.0	4.2	0.3	0.5	1.7	1.4	2.8	3.5	1.3	0.9	3.7	5.0	3.2	4.8
11	0.5	1.0	0.8	2.6	3.5	4.1	0.5	0.4	-	1.3	2.8	4.3	0.5	1.6	1.6	4.1	4.2	4.0
12	0.2	0.6	1.0	1.3	1.8	3.9	0.5	0.9	1.3	0.4	1.4	2.0	-	0.4	0.6	2.3	2.3	5.8
13	0.2	0.6	0.5	1.3	1.5	2.6	-	0.3	0.6	1.6	1.2	2.7	0.4	1.0	0.4	1.0	1.8	2.4
14	-	0.2	1.2	1.2	1.5	2.5	-	-	1.1	1.4	1.3	2.6	-	0.4	1.3	0.9	1.7	2.5
15	-	0.2	0.5	1.2	0.9	1.1	-	-	0.3	1.0	0.8	0.6	-	0.4	0.7	1.3	1.0	1.6
16	0.1	0.2	0.6	0.7	0.8	1.6	0.1	0.3	0.5	0.9	1.0	1.9	-	0.1	0.7	0.6	0.7	1.2
17 or more	0.3	0.2	0.6	1.5	1.7	2.5	0.1	-	0.5	1.8	1.4	2.5	0.4	0.4	0.7	1.1	2.0	2.4

See footnote at end of table.

Table 3. Percent distribution of youths 12-17 years, with standard error of the percent, by number of decayed (D), missing (M), and filled (F) teeth, according to sex and age: United States, 1966-70—Con.

Number of teeth	Both sexes						Male						Female					
	12 years	13 years	14 years	15 years	16 years	17 years	12 years	13 years	14 years	15 years	16 years	17 years	12 years	13 years	14 years	15 years	16 years	17 years
DMF teeth	Standard error																	
0	2.43	1.95	1.83	1.57	1.71	1.17	2.38	2.29	2.46	1.97	2.37	1.57	3.00	2.30	1.40	2.03	1.66	1.16
1	0.98	1.05	0.89	0.95	0.76	0.56	1.13	1.28	1.55	0.86	1.31	0.72	1.13	1.14	1.06	1.36	0.84	0.95
2	1.23	1.05	0.87	1.01	0.69	0.97	1.31	1.24	1.08	1.54	0.75	1.31	1.45	1.39	1.62	1.02	1.31	1.00
3	1.12	0.80	0.82	0.82	0.83	0.93	1.48	1.09	1.62	1.03	1.59	0.89	1.51	1.01	0.86	1.32	1.05	1.36
4	1.75	1.31	1.07	0.83	0.62	0.80	2.26	2.21	1.22	1.17	0.85	1.17	1.78	1.59	1.59	1.29	0.94	1.25
5	0.96	0.97	1.09	0.80	0.86	0.91	1.18	1.41	1.40	1.16	0.99	1.43	1.63	1.12	1.38	1.15	1.27	1.16
6	0.98	0.99	0.77	0.87	0.91	1.23	1.20	1.45	1.35	1.21	1.43	1.37	1.41	1.19	1.21	1.02	1.21	1.52
7	0.78	0.86	1.12	1.17	0.62	0.93	0.79	1.08	1.44	1.56	1.27	0.97	1.37	1.24	1.77	1.22	1.11	1.39
8	0.92	0.65	0.77	1.28	0.91	0.87	0.74	0.91	1.04	1.71	1.16	1.44	1.46	1.31	1.15	1.58	1.25	1.24
9	0.46	0.58	0.73	0.47	0.66	0.91	0.48	0.85	0.87	0.67	1.37	1.04	0.80	0.62	1.08	0.74	1.45	1.53
10	0.52	0.64	0.60	0.77	1.01	0.88	0.47	0.79	0.67	0.63	1.01	0.94	0.93	0.85	0.98	1.28	1.32	1.35
11	0.45	0.26	0.59	0.85	1.13	0.76	0.51	0.47	0.80	0.89	1.06	0.80	0.56	0.42	0.97	1.41	1.40	1.22
12	0.30	0.46	0.39	0.52	0.66	0.65	0.26	0.62	0.58	0.41	0.99	0.76	0.49	0.58	0.58	0.80	0.68	1.20
13	0.08	0.29	0.43	0.42	0.48	0.78	0.13	0.29	0.72	0.50	0.61	0.88	0.09	0.45	0.36	0.62	0.63	1.06
14	0.18	0.22	0.39	0.52	0.55	0.86	0.16	0.22	0.39	0.62	0.50	1.40	0.20	0.38	0.74	0.53	0.78	1.07
15	0.26	0.25	0.36	0.38	0.40	0.63	0.25	-	0.32	0.45	0.74	0.64	0.37	0.51	0.65	0.56	0.52	0.98
16	0.14	0.27	0.30	0.29	0.41	0.78	0.28	0.40	0.35	0.37	0.55	1.24	-	0.17	0.40	0.50	0.69	0.65
17	0.15	0.26	0.12	0.49	0.31	0.53	-	0.19	0.26	0.74	0.45	0.86	0.31	0.46	0.16	0.58	0.48	0.57
18	-	0.18	0.25	0.43	0.49	0.50	-	0.03	0.26	0.48	0.62	0.55	-	0.38	0.48	0.68	0.66	0.87
19	0.18	0.14	0.25	0.37	0.32	0.38	-	0.14	0.37	0.54	0.29	0.43	0.38	0.24	0.25	0.34	0.51	0.51
20	-	0.08	0.14	0.24	0.19	0.31	-	-	0.28	0.38	0.28	0.42	-	0.17	-	0.17	0.38	0.47
21 or more	0.17	0.11	0.13	0.32	0.39	0.99	0.20	0.19	0.19	0.38	0.46	1.30	0.28	0.11	0.19	0.52	0.46	1.02
D teeth																		
0	2.64	2.21	2.67	2.17	2.54	2.54	2.49	2.44	3.22	3.23	2.78	3.35	3.66	3.34	2.65	2.27	3.22	2.89
1	1.21	1.51	1.10	1.24	1.52	1.09	1.79	1.71	1.69	1.62	1.76	1.64	1.64	2.19	1.60	1.55	2.09	2.17
2	1.19	0.75	0.64	1.04	0.93	1.03	1.49	1.25	0.98	1.13	1.28	1.56	1.52	1.39	0.91	1.67	1.22	1.64
3	0.87	0.77	0.76	0.78	0.59	0.83	0.65	1.08	1.01	0.75	0.73	1.29	1.63	1.21	1.04	1.46	1.17	1.08
4	0.84	0.74	0.67	0.64	0.60	0.52	0.87	0.75	0.68	0.75	0.97	0.86	0.94	1.09	1.14	0.88	0.80	0.81
5	0.45	0.53	0.67	0.78	0.56	0.90	0.73	0.83	1.04	1.19	0.97	1.40	0.42	0.50	0.74	0.69	0.55	0.93
6	0.57	0.73	0.46	0.85	0.70	0.71	0.51	0.82	0.75	0.65	0.80	0.74	1.03	0.95	0.49	1.36	0.85	0.96
7	0.43	0.32	0.58	0.44	0.57	0.57	0.29	0.39	0.80	0.79	0.71	0.80	0.62	0.50	0.59	0.45	0.62	0.65
8	0.24	0.32	0.47	0.27	0.61	0.27	0.29	0.26	0.53	0.39	0.95	0.49	0.27	0.62	0.59	0.44	0.68	0.28
9	0.23	0.32	0.35	0.54	0.36	0.55	0.18	0.25	0.49	0.55	0.48	0.59	0.34	0.51	0.33	0.73	0.36	0.65
10	0.21	0.22	0.25	0.25	0.37	0.32	0.36	0.38	0.34	0.23	-	0.53	0.23	0.21	0.21	0.37	0.75	0.38
11	0.16	0.13	0.20	0.14	0.30	0.44	0.16	-	0.27	0.27	0.50	0.80	0.28	0.27	0.19	0.20	0.26	0.34
12 or more	0.17	0.50	0.80	0.66	0.64	0.65	0.35	0.51	0.65	0.55	0.79	0.80	0.34	0.66	1.07	0.86	0.56	0.71
M teeth																		
0	1.34	1.80	1.43	1.83	2.28	1.92	1.84	1.93	2.07	2.28	2.07	2.53	1.92	2.08	1.89	2.71	3.19	2.48
1	0.98	1.07	1.22	0.87	1.11	1.16	1.54	1.32	1.79	0.82	2.06	2.05	1.07	1.21	1.24	1.48	1.46	1.71
2	0.76	0.78	0.76	0.91	0.85	0.97	0.91	1.10	1.15	1.34	0.85	1.19	1.19	0.94	0.96	1.08	1.40	1.52
3	0.25	0.45	0.70	0.65	0.88	0.71	0.79	0.57	0.84	0.55	1.19	1.27	0.90	0.59	1.07	1.11	0.74	1.01
4	0.34	0.29	0.49	0.42	0.45	0.75	0.57	0.45	0.90	0.60	0.82	0.91	0.42	0.43	0.46	0.70	0.60	0.92
5	0.21	0.19	0.27	0.50	0.46	0.44	0.28	0.15	0.36	0.49	0.53	0.63	0.31	0.35	0.32	0.82	0.54	0.61
6	0.09	0.16	0.19	0.31	0.30	0.47	-	0.25	0.03	0.38	0.43	0.36	0.19	0.20	0.39	0.44	0.57	0.80
7 or more	0.14	0.24	0.29	0.27	0.37	0.67	0.18	0.40	0.51	0.39	0.60	0.83	0.19	0.26	0.15	0.27	0.39	0.85
F teeth																		
0	2.88	2.61	2.79	2.85	2.59	2.44	3.07	2.59	3.90	3.25	3.28	2.55	3.67	3.31	2.49	3.49	2.89	2.85
1	0.77	0.83	0.86	1.08	0.43	0.73	0.86	1.14	1.38	0.90	1.11	1.01	1.21	0.94	0.98	1.87	0.91	1.21
2	0.87	0.76	0.65	0.89	0.75	0.95	1.10	1.19	1.13	1.31	1.46	1.44	1.47	1.11	1.20	1.42	1.02	1.04
3	1.03	0.85	1.04	1.04	0.62	0.70	1.56	1.52	1.59	1.13	1.01	1.02	0.93	0.96	1.22	1.44	1.29	1.14
4	1.66	0.79	1.08	0.78	0.82	0.95	1.83	1.36	1.45	1.00	1.06	1.79	1.87	1.16	1.42	1.01	1.20	1.14
5	0.70	1.07	0.85	0.73	0.72	0.59	0.82	1.40	0.82	0.93	0.72	1.02	1.39	1.11	1.22	1.11	1.25	1.07
6	0.67	0.59	0.64	1.19	0.66	1.08	0.57	0.90	0.70	1.19	1.11	1.43	1.08	0.90	1.05	1.56	1.02	1.30
7	0.40	0.62	0.86	0.63	0.85	0.93	0.37	0.73	1.17	0.74	1.27	1.40	0.61	0.81	1.01	1.18	1.56	1.50
8	0.86	0.62	0.58	0.86	0.80	0.79	0.71	0.83	0.74	1.12	1.02	1.31	1.31	0.95	0.86	1.20	1.03	1.29
9	0.22	0.42	0.44	0.61	0.67	0.85	0.24	0.56	0.75	0.63	0.68	1.28	0.30	0.64	0.64	0.78	1.22	1.32
10	0.20	0.19	0.48	0.57	0.53	0.78	0.22	0.26	0.53	0.39	0.77	0.93	0.50	0.30	0.65	1.01	0.68	1.06
11	0.25	0.28	0.23	0.50	1.01	0.95	0.30	0.25	-	0.35	1.01	1.29	0.31	0.47	0.48	1.03	1.14	0.89
12	0.08	0.35	0.26	0.36	0.32	0.71	0.16	0.57	0.50	0.23	0.40	0.68	-	0.23	0.32	0.69	0.71	1.10
13	0.13	0.24	0.18	0.36	0.42	0.62	-	0.21	0.27	0.39	0.62	0.75	0.28	0.36	0.25	0.57	0.59	0.82
14	-	0.15	0.33	0.40	0.48	0.44	-	-	0.26	0.64	0.66	0.50	-	0.30	0.62	0.43	0.56	0.57
15	-	0.13	0.19	0.36	0.22	0.28	-	-	0.20	0.38	0.34	0.33	-	0.27	0.30	0.57	0.42	0.46
16	0.05	0.12	0.19	0.27	0.23	0.56	0.11	0.21	0.30	0.51	0.32	0.90	-	0.14	0.23	0.33	0.34	0.50
17 or more	0.17	0.12	0.14	0.44	0.40	0.73	0.12	-	0.28	0.61	0.65	1.01	0.32	0.25	0.28	0.57	0.53	0.81

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 4. Number of decayed, missing, and filled (DMF) teeth per 100 erupted permanent teeth among youths 12-17 years, with standard errors of the estimates, by age, sex and race: United States, 1966-70

Age	Total ¹			White			Negro		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Number of DMF teeth								
12-17 years	22.5	21.4	23.6	22.9	21.8	24.0	20.2	18.8	21.4
12 years	15.4	14.4	16.4	15.7	14.5	16.9	13.9	14.0	13.8
13 years	17.5	16.3	18.6	17.7	16.7	18.8	16.0	14.0	18.0
14 years	21.2	19.8	22.6	21.4	20.1	22.8	20.1	18.3	21.7
15 years	24.9	23.5	26.4	25.4	24.0	26.9	21.4	19.7	23.2
16 years	26.1	24.8	27.5	26.4	25.1	27.6	25.1	23.6	26.6
17 years	30.4	29.9	31.0	31.3	30.9	31.7	25.3	24.3	26.1
	Standard error								
12-17 years	1.04	1.05	1.07	1.10	1.08	1.17	2.28	2.41	2.31
12 years	0.93	0.84	1.25	0.96	0.80	1.40	2.30	2.77	2.36
13 years	0.99	0.96	1.19	1.04	0.98	1.30	2.13	2.69	1.74
14 years	0.90	0.97	1.10	0.97	0.98	1.22	2.40	2.64	2.62
15 years	1.32	1.49	1.45	1.39	1.56	1.55	2.92	3.16	3.04
16 years	1.30	1.40	1.33	1.40	1.50	1.46	3.07	3.18	3.71
17 years	1.34	1.63	1.28	1.48	1.76	1.46	2.83	3.61	2.79

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 5. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and family income: United States, 1966-70

Family income and race	Both sexes			Males			Females		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
Total¹	DMF index								
Less than \$3,000	5.5	6.3	-0.8	5.3	6.0	-0.7	5.6	6.5	-0.9
\$3,000-\$4,999	5.9	6.1	-0.2	5.7	5.8	-0.1	6.1	6.4	-0.3
\$5,000-\$6,999	6.5	6.2	0.3	6.2	5.9	0.3	6.7	6.5	0.2
\$7,000-\$9,999	6.4	6.1	0.3	6.1	5.8	0.3	6.9	6.5	0.4
\$10,000-\$14,999	6.2	6.2	0.0	5.8	5.8	0.0	6.6	6.6	0.0
\$15,000 or more	6.5	6.3	0.2	5.8	5.8	0.0	7.2	6.8	0.4
Unknown	6.1	6.3	-0.2	5.8	6.0	-0.2	6.4	6.8	-0.4
White									
Less than \$3,000	5.5	6.4	-0.9	5.4	6.2	-0.8	5.6	6.5	-0.9
\$3,000-\$4,999	5.9	6.2	-0.3	5.6	6.0	-0.4	6.2	6.4	-0.3
\$5,000-\$6,999	6.6	6.3	0.3	6.5	6.0	0.5	6.7	6.6	0.1
\$7,000-\$9,999	6.5	6.2	0.3	6.2	5.9	0.3	6.8	6.6	0.2
\$10,000-\$14,999	6.3	6.3	0.0	5.8	5.9	-0.1	6.7	6.6	0.1
\$15,000 or more	6.5	6.4	0.1	5.8	5.9	-0.1	7.3	6.9	0.4
Unknown	6.2	6.4	-0.2	6.0	6.0	0.0	6.4	6.9	-0.5
Negro									
Less than \$3,000	5.4	5.7	-0.3	5.2	5.3	-0.1	5.6	6.1	-0.5
\$3,000-\$4,999	6.2	5.5	0.7	6.2	5.1	1.1	6.2	6.0	0.2
\$5,000-\$6,999	5.7	5.6	0.1	4.8	5.1	-0.3	6.4	6.0	0.5
\$7,000-\$9,999	5.7	5.5	0.2	4.9	5.3	-0.4	6.8	5.8	0.9
\$10,000-\$14,999	4.5	6.0	-1.5	3.4	5.2	-1.8	5.2	6.5	-1.3
\$15,000 or more	5.6	5.8	-0.2	5.6	5.6	0.0	5.4	6.0	-0.6
Unknown	5.5	5.8	-0.3	4.4	5.4	-1.0	6.5	6.1	0.4
Total¹	Average number of D teeth								
Less than \$3,000	2.7	1.7	1.0	2.8	1.7	1.1	2.6	1.7	0.9
\$3,000-\$4,999	2.4	1.7	0.7	2.4	1.7	0.7	2.4	1.7	0.7
\$5,000-\$6,999	2.0	1.7	0.3	2.0	1.7	0.3	2.0	1.7	0.3
\$7,000-\$9,999	1.4	1.7	-0.3	1.4	1.7	-0.3	1.4	1.7	-0.3
\$10,000-\$14,999	1.1	1.7	-0.6	1.0	1.7	-0.7	1.2	1.7	-0.5
\$15,000 or more	0.8	1.7	-0.9	0.8	1.7	-0.9	0.8	1.7	-0.9
Unknown	1.8	1.7	0.1	1.8	1.7	0.1	1.7	1.7	0.0
White									
Less than \$3,000	2.4	1.5	0.9	2.6	1.5	1.1	2.2	1.4	0.8
\$3,000-\$4,999	2.0	1.5	0.5	2.0	1.5	0.5	1.9	1.4	0.5
\$5,000-\$6,999	1.9	1.5	0.4	1.9	1.5	0.4	1.8	1.4	0.4
\$7,000-\$9,999	1.3	1.5	-0.2	1.4	1.5	-0.1	1.3	1.4	-0.1
\$10,000-\$14,999	1.0	1.5	-0.5	0.9	1.5	-0.6	1.2	1.4	-0.2
\$15,000 or more	0.8	1.5	-0.7	0.8	1.5	-0.7	0.8	1.4	-0.6
Unknown	1.6	1.5	0.1	1.8	1.5	0.3	1.3	1.4	-0.1
Negro									
Less than \$3,000	3.3	3.2	0.1	3.2	3.0	0.2	3.4	3.4	0.0
\$3,000-\$4,999	3.6	3.2	0.4	3.5	2.9	0.6	3.7	3.4	0.3
\$5,000-\$6,999	3.2	3.2	0.0	2.9	3.0	-0.1	3.5	3.4	0.1
\$7,000-\$9,999	2.8	3.2	-0.4	2.5	3.0	-0.5	3.3	3.4	-0.1
\$10,000-\$14,999	2.1	3.3	-1.2	1.7	3.0	-1.3	2.3	3.6	-1.3
\$15,000 or more	2.5	3.3	-0.8	3.7	3.2	0.5	1.4	3.3	-1.9
Unknown	3.0	3.3	-0.3	2.1	3.1	-1.0	3.7	3.4	0.3

See footnotes at end of table.

Table 5. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and family income: United States, 1966-70—Con.

Family income and race	Both sexes			Males			Females		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
<u>Total</u> ¹	Average number of M teeth								
Less than \$3,000	1.2	0.7	0.5	1.1	0.7	0.4	1.1	0.7	0.4
\$3,000-\$4,999	1.2	0.7	0.5	1.2	0.7	0.5	1.1	0.7	0.4
\$5,000-\$6,999	0.9	0.7	0.2	1.0	0.7	0.3	0.9	0.7	0.2
\$7,000-\$9,999	0.6	0.7	-0.1	0.6	0.7	-0.1	0.6	0.7	-0.1
\$10,000-\$14,999	0.4	0.7	-0.3	0.3	0.7	-0.4	0.4	0.7	-0.3
\$15,000 or more	0.2	0.7	-0.5	0.1	0.7	-0.6	0.3	0.8	-0.5
Unknown	0.7	0.7	0.0	0.8	0.7	0.1	0.6	0.8	-0.2
<u>White</u>	Average number of M teeth								
Less than \$3,000	1.2	0.6	0.6	1.0	0.6	0.4	1.2	0.6	0.6
\$3,000-\$4,999	1.0	0.6	0.4	1.0	0.6	0.4	1.1	0.6	0.5
\$5,000-\$6,999	0.8	0.6	0.2	0.9	0.6	0.3	0.7	0.6	0.1
\$7,000-\$9,999	0.5	0.6	-0.1	0.5	0.6	-0.1	0.6	0.6	0.0
\$10,000-\$14,999	0.4	0.6	-0.2	0.3	0.6	-0.3	0.4	0.6	-0.2
\$15,000 or more	0.2	0.6	-0.4	0.1	0.6	-0.5	0.2	0.7	-0.5
Unknown	0.7	0.6	0.1	0.8	0.6	0.2	0.6	0.7	-0.1
<u>Negro</u>	Average number of M teeth								
Less than \$3,000	1.1	1.3	-0.2	1.2	1.4	-0.2	1.0	1.2	-0.2
\$3,000-\$4,999	1.6	1.2	0.4	1.9	1.3	0.6	1.2	1.2	0.0
\$5,000-\$6,999	1.4	1.3	0.1	1.1	1.3	-0.2	1.6	1.2	0.4
\$7,000-\$9,999	1.5	1.3	0.2	1.6	1.4	0.2	1.4	1.1	0.3
\$10,000-\$14,999	0.8	1.4	-0.6	0.7	1.4	-0.7	0.9	1.4	-0.5
\$15,000 or more	0.8	1.3	-0.5	0.3	1.4	-1.1	1.3	1.2	0.1
Unknown	1.0	1.3	-0.3	0.8	1.4	-0.6	1.1	1.2	-0.1
<u>Total</u> ¹	Average number of F teeth								
Less than \$3,000	1.6	3.8	-2.2	1.4	3.6	-2.2	1.8	4.0	-2.2
\$3,000-\$4,999	2.4	3.7	-1.3	2.1	3.4	-1.3	2.6	4.0	-1.4
\$5,000-\$6,999	3.5	3.8	-0.3	3.2	3.5	-0.3	3.8	4.1	-0.3
\$7,000-\$9,999	4.4	3.7	0.7	4.0	3.4	0.6	4.8	4.0	0.8
\$10,000-\$14,999	4.7	3.8	0.9	4.5	3.4	1.1	5.0	4.1	0.9
\$15,000 or more	5.4	3.9	1.5	4.8	3.4	1.4	6.1	4.3	1.8
Unknown	3.6	3.9	-0.3	3.2	3.5	-0.3	4.1	4.3	-0.2
<u>White</u>	Average number of F teeth								
Less than \$3,000	1.9	4.2	-2.3	1.7	4.0	-2.3	2.1	4.4	-2.3
\$3,000-\$4,999	2.9	4.1	-1.2	2.6	3.9	-1.3	3.2	4.4	-1.2
\$5,000-\$6,999	3.9	4.2	-0.3	3.6	3.9	-0.3	4.2	4.5	-0.3
\$7,000-\$9,999	4.6	4.1	0.5	4.3	3.8	0.5	5.0	4.5	0.5
\$10,000-\$14,999	4.9	4.2	0.7	4.6	3.8	0.8	5.1	4.5	0.6
\$15,000 or more	5.5	4.3	1.2	4.9	3.8	1.1	6.2	4.8	1.4
Unknown	3.9	4.3	-0.4	3.4	3.9	-0.5	4.6	4.8	-0.2
<u>Negro</u>	Average number of F teeth								
Less than \$3,000	1.0	1.1	-0.1	0.8	0.9	-0.1	1.2	1.4	-0.2
\$3,000-\$4,999	1.0	1.1	0.1	0.7	0.8	-0.1	1.2	1.4	-0.2
\$5,000-\$6,999	1.1	1.1	0.0	0.8	0.8	0.0	1.3	1.4	-0.1
\$7,000-\$9,999	1.4	1.1	0.3	0.8	0.9	0.1	2.2	1.3	0.9
\$10,000-\$14,999	1.6	1.2	0.4	1.0	0.8	0.2	2.0	1.5	0.5
\$15,000 or more	2.3	1.2	1.1	1.7	1.0	0.7	2.8	1.5	1.3
Unknown	1.6	1.2	0.4	1.4	0.9	0.5	1.7	1.5	0.2

See footnotes at end of table.

Table 5. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and family income: United States, 1966-70—Con.

Family income and race	Both sexes			Both sexes		
	Both sexes	Male	Female	Both sexes	Male	Female
	Standard error			Standard error		
	DMF index			M teeth		
<u>Total¹</u>						
Less than \$3,000	0.58	0.61	0.60	0.11	0.12	0.13
\$3,000-\$4,999	0.45	0.44	0.51	0.11	0.14	0.12
\$5,000-\$6,999	0.40	0.44	0.42	0.09	0.14	0.12
\$7,000-\$9,999	0.26	0.29	0.28	0.05	0.06	0.06
\$10,000-\$14,999	0.28	0.30	0.29	0.03	0.04	0.03
\$15,000 or more	0.32	0.32	0.37	0.04	0.02	0.08
Unknown	0.41	0.52	0.42	0.13	0.21	0.11
<u>White</u>						
Less than \$3,000	0.89	0.97	0.86	0.18	0.21	0.17
\$3,000-\$4,999	0.57	0.51	0.66	0.11	0.09	0.15
\$5,000-\$6,999	0.40	0.41	0.45	0.10	0.16	0.12
\$7,000-\$9,999	0.28	0.32	0.29	0.05	0.06	0.06
\$10,000-\$14,999	0.29	0.30	0.31	0.03	0.04	0.04
\$15,000 or more	0.33	0.33	0.40	0.04	0.02	0.08
Unknown	0.46	0.55	0.52	0.14	0.24	0.12
<u>Negro</u>						
Less than \$3,000	0.71	0.77	0.79	0.12	0.16	0.18
\$3,000-\$4,999	0.68	0.72	0.77	0.30	0.42	0.21
\$5,000-\$6,999	1.31	1.60	1.18	0.23	0.31	0.20
\$7,000-\$9,999	0.75	0.90	0.88	0.32	0.45	0.19
\$10,000-\$14,999	0.54	0.60	0.81	0.11	0.12	0.19
\$15,000 or more	2.81	2.08	4.46	1.53	0.26	2.04
Unknown	0.44	0.53	0.53	0.28	0.43	0.30
<u>Total¹</u>						
	D teeth			F teeth		
Less than \$3,000	0.45	0.50	0.44		0.26	0.32
\$3,000-\$4,999	0.33	0.38	0.32		0.25	0.31
\$5,000-\$6,999	0.26	0.27	0.28		0.24	0.24
\$7,000-\$9,999	0.14	0.15	0.14		0.17	0.21
\$10,000-\$14,999	0.14	0.14	0.16		0.22	0.26
\$15,000 or more	0.15	0.17	0.17		0.26	0.37
Unknown	0.19	0.21	0.27		0.31	0.34
<u>White</u>						
Less than \$3,000	0.50	0.67	0.39	0.43	0.46	0.47
\$3,000-\$4,999	0.25	0.26	0.29	0.36	0.34	0.41
\$5,000-\$6,999	0.22	0.22	0.25	0.23	0.26	0.26
\$7,000-\$9,999	0.14	0.17	0.12	0.17	0.19	0.22
\$10,000-\$14,999	0.14	0.14	0.17	0.22	0.21	0.27
\$15,000 or more	0.15	0.17	0.17	0.28	0.25	0.39
Unknown	0.18	0.22	0.25	0.32	0.34	0.43
<u>Negro</u>						
Less than \$3,000	0.80	0.74	0.89	0.28	0.23	0.41
\$3,000-\$4,999	0.82	0.93	0.75	0.26	0.19	0.37
\$5,000-\$6,999	1.06	1.27	0.92	0.28	0.26	0.41
\$7,000-\$9,999	0.38	0.35	0.83	0.49	0.31	0.90
\$10,000-\$14,999	0.35	0.32	0.49	0.58	0.40	0.96
\$15,000 or more	0.86	2.42	1.41	1.44	1.64	1.24
Unknown	0.50	0.46	0.65	0.39	0.53	0.84

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 6. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and education of head of household: United States, 1966-70

Education and race	Both sexes			Male			Female		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
Total¹	DMF index								
None or less than 5 years	4.9	6.2	-1.3	4.8	5.9	-1.1	5.0	6.4	-1.4
5-7 years	6.3	6.2	0.1	6.2	6.0	0.2	6.4	6.5	-0.1
8 years	6.8	6.3	0.5	6.6	5.9	0.7	7.0	6.6	0.4
9-11 years	6.4	6.2	0.2	6.0	5.9	0.1	6.8	6.5	0.3
12 years	6.2	6.1	0.1	5.9	5.8	0.1	6.6	6.5	0.1
13-15 years	5.8	6.2	-0.4	5.1	5.7	-0.6	6.5	6.8	-0.3
16 years	6.1	6.1	0.0	5.4	5.4	0.0	6.8	6.7	0.1
17 years or more	6.0	6.1	-0.1	5.6	5.8	-0.2	6.6	6.5	0.1
White									
None or less than 5 years	4.6	6.2	-1.6	4.5	6.1	-1.6	4.6	6.4	-1.8
5-7 years	6.4	6.3	0.1	6.4	6.2	0.2	6.4	6.5	-0.1
8 years	7.0	6.4	0.6	6.8	6.0	0.8	7.2	6.7	0.5
9-11 years	6.6	6.3	0.3	6.3	6.0	0.3	6.9	6.6	0.3
12 years	6.3	6.2	0.1	6.0	5.9	0.1	6.6	6.6	0.0
13-15 years	5.9	6.3	-0.4	5.2	5.8	-0.6	6.6	6.8	0.2
16 years	6.2	6.2	0.0	5.4	5.5	-0.1	6.9	6.8	0.1
17 years or more	6.0	6.2	-0.2	5.6	5.9	-0.3	6.7	6.7	0.0
Negro									
None or less than 5 years	5.6	5.7	-0.1	5.6	5.2	0.4	5.6	6.1	-0.5
5-7 years	6.1	5.6	-0.5	5.8	5.2	0.6	6.4	6.0	0.4
8 years	5.8	5.7	0.1	6.1	5.2	0.9	5.6	6.2	-0.6
9-11 years	5.5	5.6	-0.1	4.8	5.3	-0.5	6.1	5.9	0.2
12 years	5.4	5.5	-0.1	4.4	5.0	-0.6	6.3	5.9	0.4
13-15 years	4.8	5.8	-1.0	4.1	5.3	-1.2	5.4	6.1	-0.7
16 years	3.9	4.6	-0.7	4.5	4.5	0.0	2.7	4.8	-2.1
17 years or more	6.3	5.4	0.9	6.3	5.7	0.6	6.2	4.4	1.8
Total¹	Average number of D teeth								
None or less than 5 years	2.8	1.7	1.1	3.0	1.6	1.4	2.7	1.7	1.0
5-7 years	2.7	1.7	1.0	2.6	1.7	0.9	2.8	1.7	1.1
8 years	2.1	1.7	0.7	2.2	1.6	0.6	2.0	1.7	0.3
9-11 years	1.9	1.7	0.2	1.8	1.6	0.2	2.0	1.7	0.3
12 years	1.4	1.7	-0.3	1.4	1.6	-0.2	1.4	1.7	-0.3
13-15 years	1.0	1.7	-0.7	1.0	1.6	-0.6	1.0	1.7	-0.7
16 years	0.7	1.6	-0.9	0.7	1.6	-0.9	0.7	1.7	-1.0
17 years or more	0.6	1.7	-1.1	0.6	1.6	-1.0	0.6	1.7	-1.1
White									
None or less than 5 years	2.4	1.5	0.9	2.6	1.5	1.1	2.2	1.4	0.8
5-7 years	2.3	1.5	0.8	2.3	1.5	0.8	2.3	1.4	0.9
8 years	1.9	1.5	0.4	2.0	1.4	0.6	1.9	1.4	0.5
9-11 years	1.7	1.5	0.2	1.6	1.4	0.2	1.7	1.4	0.3
12 years	1.3	1.4	-0.1	1.3	1.4	-0.1	1.2	1.4	-0.2
13-15 years	0.9	1.4	-0.5	1.0	1.4	-0.4	0.9	1.4	-0.5
16 years	0.7	1.4	-0.7	0.7	1.4	-0.7	0.7	1.4	-0.7
17 years or more	0.5	1.4	-0.9	0.5	1.4	-0.9	0.5	1.4	-0.9
Negro									
None or less than 5 years	3.7	3.2	0.5	3.8	3.0	0.8	3.6	3.4	0.2
5-7 years	3.7	3.1	0.6	3.4	2.9	0.5	4.1	3.4	0.7
8 years	3.7	3.2	0.5	3.8	3.0	0.8	3.6	3.5	0.1
9-11 years	2.9	3.2	-0.3	2.6	3.1	0.5	3.2	3.3	-0.1
12 years	2.6	3.1	-0.5	2.4	2.9	0.5	2.8	3.4	-0.6
13-15 years	2.0	3.2	-1.2	1.8	3.1	-1.3	2.2	3.4	-1.2
16 years	0.8	2.8	-2.0	0.4	2.7	-2.3	1.3	3.0	-1.7
17 years or more	3.3	3.1	0.2	2.8	3.2	-0.4	4.5	2.6	1.9

See footnotes at end of table.

Table 6. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and education of head of household: United States, 1966-70-Con.

Education and race	Both sexes			Male			Female		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
<u>Total</u> ¹	Average number of M teeth								
None or less than 5 years	1.0	0.7	0.3	1.0	0.7	0.3	1.0	0.7	0.3
5-7 years	1.4	0.7	0.7	1.5	0.7	0.8	1.3	0.7	0.6
8 years	1.0	0.7	0.3	1.0	0.7	0.3	1.0	0.7	0.3
9-11 years	0.9	0.7	0.2	0.8	0.7	0.1	0.9	0.7	0.2
12 years	0.5	0.7	-0.2	0.5	0.7	-0.2	0.6	0.7	-0.1
13-15 years	0.2	0.7	-0.5	0.2	0.7	-0.5	0.2	0.7	-0.5
16 years	0.2	0.7	-0.5	0.2	0.6	-0.4	0.2	0.7	-0.5
17 years or more	0.2	0.7	-0.5	0.2	0.7	-0.5	0.1	0.7	-0.6
<u>White</u>	Average number of M teeth								
None or less than 5 years	0.9	0.6	0.3	0.9	0.6	0.3	0.9	0.6	0.3
5-7 years	1.4	0.6	0.8	1.5	0.6	0.9	1.2	0.6	0.6
8 years	1.0	0.6	0.4	1.0	0.6	0.4	1.0	0.6	0.4
9-11 years	0.7	0.6	0.1	0.7	0.6	0.1	0.8	0.6	0.2
12 years	0.5	0.6	-0.1	0.5	0.6	-0.1	0.6	0.6	0.0
13-15 years	0.2	0.6	-0.4	0.1	0.6	-0.5	0.2	0.6	-0.4
16 years	0.2	0.6	-0.4	0.1	0.5	-0.4	0.2	0.6	-0.6
17 years or more	0.1	0.6	-0.5	0.1	0.6	-0.5	0.1	0.6	-0.5
<u>Negro</u>	Average number of M teeth								
None or less than 5 years	1.1	1.3	-0.2	1.1	1.4	-0.3	1.1	1.2	-0.1
5-7 years	1.6	1.3	0.3	1.6	1.4	0.2	1.5	1.2	0.3
8 years	1.3	1.3	0.0	1.5	1.3	0.2	1.1	1.2	-0.1
9-11 years	1.4	1.3	0.1	1.5	1.4	0.1	1.2	1.1	0.1
12 years	0.9	1.2	-0.3	1.0	1.3	-0.3	0.8	1.1	-0.3
13-15 years	0.8	1.3	-0.5	0.8	1.4	-0.6	0.8	1.2	-0.4
16 years	1.4	1.0	0.4	1.4	1.1	0.3	1.3	0.8	0.5
17 years or more	2.5	1.3	1.2	3.2	1.5	1.7	0.8	0.8	0.0
<u>Total</u> ¹	Average number of F teeth								
None or less than 5 years	1.1	3.8	-2.7	0.8	3.6	-2.8	1.3	4.0	-2.7
5-7 years	2.1	3.9	-1.8	2.0	3.6	-1.6	2.3	4.1	-1.8
8 years	3.7	3.9	-0.2	3.5	3.6	-0.1	3.9	4.2	-0.3
9-11 years	3.6	3.8	-0.2	3.4	3.5	-0.1	3.9	4.2	-0.3
12 years	4.3	3.8	0.5	4.0	3.5	0.5	4.6	4.1	0.5
13-15 years	4.6	3.9	0.7	3.9	3.4	0.5	5.3	4.3	1.0
16 years	5.2	3.8	1.4	4.5	3.2	1.3	5.9	4.3	1.6
17 years or more	5.2	3.8	1.4	4.7	3.5	1.2	5.9	4.1	1.8
<u>White</u>	Average number of F teeth								
None or less than 5 years	1.2	4.2	-3.0	0.9	4.0	-3.1	1.5	4.3	-2.8
5-7 years	2.7	4.3	-1.6	2.5	4.1	-1.6	2.8	4.4	-1.6
8 years	4.1	4.3	-0.2	3.8	4.0	-0.2	4.2	4.6	-0.4
9-11 years	4.2	4.2	0.0	4.0	4.0	0.0	4.4	4.6	-0.2
12 years	4.5	4.2	0.3	4.2	3.9	0.3	4.8	4.5	0.3
13-15 years	4.8	4.3	0.5	4.0	3.8	0.2	5.4	4.7	0.7
16 years	5.3	4.2	1.1	4.6	3.6	1.0	6.0	4.7	1.3
17 years or more	5.4	4.2	1.2	4.9	3.9	1.0	6.0	4.6	1.4
<u>Negro</u>	Average number of F teeth								
None or less than 5 years	0.7	1.2	-0.5	0.7	0.8	-0.1	0.8	1.5	-0.7
5-7 years	0.8	1.1	-0.3	0.8	0.8	0.0	0.8	1.5	-0.7
8 years	0.8	1.2	-0.4	0.8	0.9	-0.1	0.8	1.5	-0.7
9-11 years	1.2	1.2	0.0	0.7	0.9	-0.2	1.6	1.5	0.1
12 years	1.9	1.1	0.8	1.0	0.8	0.2	2.8	1.4	1.4
13-15 years	1.9	1.2	0.7	1.4	0.9	0.5	2.3	1.5	0.8
16 years	1.8	0.8	1.0	2.7	0.7	2.0	0.0	1.0	-1.0
17 years or more	0.5	1.0	-0.5	0.3	1.0	-0.7	0.9	1.0	-0.1

See footnotes at end of table.

Table 6. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and education of head of household: United States, 1966-70—Con.

Education and race	Standard error			Standard error		
	Both sexes	Male	Female	Both sexes	Male	Female
Total¹	DMF index			M, teeth		
None or less than 5 years	0.84	0.86	0.86	0.16	0.16	0.21
5-7 years	0.52	0.55	0.59	0.17	0.23	0.17
8 years	0.47	0.44	0.59	0.10	0.11	0.16
9-11 years	0.34	0.40	0.34	0.08	0.09	0.09
12 years	0.25	0.26	0.29	0.06	0.06	0.08
13-15 years	0.28	0.30	0.36	0.03	0.03	0.05
16 years	0.24	0.26	0.29	0.04	0.06	0.07
17 years or more	0.44	0.60	0.60	0.10	0.15	0.05
White						
None or less than 5 years	1.22	1.17	1.38	0.24	0.25	0.33
5-7 years	0.62	0.65	0.70	0.19	0.23	0.20
8 years	0.52	0.49	0.64	0.11	0.12	0.18
9-11 years	0.37	0.45	0.34	0.07	0.08	0.09
12 years	0.25	0.27	0.29	0.06	0.06	0.09
13-15 years	0.29	0.30	0.39	0.03	0.03	0.05
16 years	0.24	0.25	0.31	0.04	0.05	0.07
17 years or more	0.43	0.46	0.50	0.04	0.05	0.04
Negro						
None or less than 5 years	0.89	0.87	0.99	0.15	0.15	0.21
5-7 years	0.65	0.68	0.80	0.29	0.41	0.23
8 years	0.64	0.69	0.90	0.20	0.31	0.15
9-11 years	0.96	0.98	1.05	0.26	0.32	0.25
12 years	0.53	0.62	0.44	0.15	0.24	0.12
13-15 years	0.94	1.05	0.98	0.22	0.26	0.24
16 years	0.87	1.48	0.67	0.80	0.99	0.92
17 years or more	3.00	3.76	3.27	1.83	2.36	0.82
Total¹	D teeth			F teeth		
None or less than 5 years	0.65	0.66	0.67	0.24	0.35	0.26
5-7 years	0.41	0.42	0.45	0.19	0.28	0.21
8 years	0.25	0.28	0.24	0.28	0.31	0.36
9-11 years	0.22	0.23	0.23	0.25	0.28	0.26
12 years	0.16	0.19	0.17	0.16	0.14	0.22
13-15 years	0.13	0.10	0.18	0.21	0.27	0.30
16 years	0.11	0.11	0.16	0.22	0.23	0.29
17 years or more	0.10	0.11	0.14	0.33	0.34	0.47
White						
None or less than 5 years	0.79	0.86	0.76	0.44	0.51	0.57
5-7 years	0.32	0.35	0.36	0.25	0.36	0.31
8 years	0.24	0.27	0.23	0.32	0.35	0.41
9-11 years	0.16	0.16	0.18	0.29	0.33	0.30
12 years	0.16	0.19	0.17	0.17	0.17	0.20
13-15 years	0.13	0.10	0.19	0.23	0.27	0.32
16 years	0.11	0.11	0.17	0.22	0.22	0.28
17 years or more	0.09	0.11	0.11	0.38	0.42	0.48
Negro						
None or less than 5 years	0.95	0.78	1.12	0.31	0.42	0.39
5-7 years	0.83	0.78	0.93	0.20	0.27	0.19
8 years	0.70	0.79	0.74	0.27	0.34	0.32
9-11 years	0.80	0.87	0.78	0.24	0.22	0.32
12 years	0.53	0.52	0.62	0.44	0.21	0.88
13-15 years	0.60	0.84	0.56	0.65	0.37	1.03
16 years	0.48	0.54	1.14	0.83	1.36	0.00
17 years or more	1.42	1.73	2.41	0.32	0.23	0.72

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries and also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

Table 7. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and region of residence: United States, 1966-70

Race and geographic region	Both sexes			Male			Female		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
<u>Total¹</u>	Number of DMF teeth								
Northeast	7.6	6.1	1.5	6.9	5.8	1.1	8.2	6.5	1.7
Midwest	6.1	6.2	-0.1	5.9	5.8	0.1	6.4	6.5	-0.1
South	6.5	6.2	0.3	6.4	5.9	0.5	6.6	6.6	0.0
West	4.8	6.2	-1.4	4.4	5.9	-1.5	5.2	6.6	-1.4
<u>White</u>									
Northeast	7.8	6.2	1.6	7.2	5.9	1.3	8.3	6.6	1.7
Midwest	6.3	6.3	0.0	6.0	5.9	0.1	6.6	6.6	0.0
South	6.6	6.4	0.2	6.5	6.1	0.4	6.7	6.7	0.0
West	4.9	6.3	-1.4	4.5	6.0	-1.5	5.2	6.6	-1.4
<u>Negro</u>									
Northeast	6.2	5.6	0.6	4.9	5.1	-0.2	7.2	6.0	1.2
Midwest	4.8	5.7	-0.9	4.8	5.4	-0.6	4.8	6.0	-1.2
South	6.3	5.6	0.7	6.2	5.2	1.0	6.4	6.1	0.3
West	3.4	5.6	-2.2	2.8	5.3	-2.5	4.1	6.0	1.9
<u>Total¹</u>	Number of D teeth								
Northeast	1.8	1.7	0.1	1.8	1.7	0.1	1.8	1.7	0.1
Midwest	1.4	1.7	-0.3	1.3	1.7	-0.4	1.5	1.7	-0.2
South	2.6	1.7	0.9	2.6	1.7	0.9	2.6	1.7	0.9
West	1.0	1.7	-0.7	1.1	1.7	-0.6	1.0	1.7	-0.7
<u>White</u>									
Northeast	1.7	1.5	0.2	1.8	1.5	0.3	1.6	1.4	0.2
Midwest	1.4	1.5	-0.1	1.3	1.5	-0.2	1.5	1.4	0.1
South	1.9	1.5	0.4	2.0	1.5	0.5	1.9	1.4	0.5
West	1.0	1.5	-0.5	1.1	1.5	-0.4	1.0	1.4	-0.4
<u>Negro</u>									
Northeast	2.9	3.2	-0.3	2.3	3.0	0.7	3.3	3.4	-0.1
Midwest	1.9	3.3	-1.4	1.7	3.1	-1.4	2.0	3.4	-1.4
South	4.4	3.2	1.2	4.2	3.0	1.2	4.6	3.5	1.1
West	1.2	3.2	-2.0	1.4	3.0	-1.6	1.1	3.4	-2.3

See footnotes at end of table.

Table 7. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed (D), missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and region of residence: United States, 1966-70—Con.

Race and geographic region	Both sexes			Male			Female		
	Actual	Expected	Difference	Actual	Expected	Difference	Actual	Expected	Difference
<u>Total</u> ¹	Number of M teeth								
Northeast	0.8	0.7	0.1	0.7	0.7	0.0	0.8	0.7	0.1
Midwest	0.6	0.7	-0.1	0.6	0.7	-0.1	0.5	0.7	-0.2
South	1.2	0.7	0.5	1.1	0.7	0.4	1.2	0.7	0.5
West	0.4	0.7	-0.3	0.4	0.7	-0.3	0.4	0.7	-0.3
<u>White</u>									
Northeast	0.7	0.6	0.1	0.7	0.6	0.1	0.8	0.6	0.2
Midwest	0.5	0.6	-0.1	0.6	0.6	0.0	0.4	0.6	-0.2
South	1.1	0.6	0.6	1.0	0.6	0.4	1.2	0.6	0.6
West	0.3	0.6	-0.3	0.3	0.6	-0.3	0.3	0.6	-0.3
<u>Negro</u>									
Northeast	1.3	1.2	0.1	1.4	1.3	0.1	1.2	1.2	0.0
Midwest	1.5	1.3	0.2	1.6	1.4	0.2	1.5	1.2	0.3
South	1.4	1.3	0.1	1.5	1.4	0.1	1.3	1.2	0.1
West	0.7	1.3	-0.6	0.7	1.4	-0.7	0.6	1.2	-0.6
<u>Total</u> ¹	Number of F teeth								
Northeast	4.9	3.7	1.2	4.4	3.4	1.0	5.5	4.1	1.4
Midwest	4.1	3.8	0.3	3.9	3.4	0.5	4.4	4.1	0.3
South	2.7	3.8	-1.1	2.7	3.5	-0.8	2.8	4.1	-1.3
West	3.4	3.8	-0.4	2.9	3.5	-0.6	3.8	4.1	-0.3
<u>White</u>									
Northeast	5.4	4.1	1.3	4.8	3.8	1.0	6.0	4.5	1.5
Midwest	4.4	4.2	0.2	4.1	3.8	0.3	4.6	4.5	0.1
South	3.6	4.2	-0.6	3.5	3.9	-0.4	3.6	4.6	-1.0
West	3.5	4.2	-0.7	3.1	3.9	-0.5	3.9	4.5	-0.6
<u>Negro</u>									
Northeast	2.0	1.1	0.9	1.2	0.8	0.4	2.7	1.4	1.3
Midwest	1.4	1.1	0.3	1.5	0.9	0.6	1.3	1.4	-0.1
South	0.5	1.1	-0.6	0.5	0.8	-0.3	0.5	1.4	-0.9
West	1.5	1.1	0.4	0.8	0.9	-0.1	2.3	1.4	-0.9

See footnotes at end of table.

Table 7. Differences between actual and expected DMF indexes and between actual and expected average numbers of decayed, missing (M), and filled (F) teeth per person among youths 12-17 years, with standard errors of the estimates, by sex, race, and region of residence: United States, 1966-70—Con.

Race and geographic region	Standard error			Standard error		
	Both sexes	Male	Female	Both sexes	Male	Female
<u>Total¹</u>	DMF teeth			M teeth		
Northeast	0.39	0.47	0.34	0.10	0.08	0.12
Midwest	0.54	0.61	0.49	0.08	0.09	0.08
South	0.46	0.46	0.47	0.10	0.10	0.13
West	0.81	0.64	0.99	0.05	0.04	0.08
<u>White</u>						
Northeast	0.42	0.48	0.36	0.11	0.09	0.14
Midwest	0.58	0.66	0.53	0.06	0.09	0.06
South	0.35	0.36	0.33	0.11	0.11	0.15
West	0.86	0.69	1.03	0.04	0.04	0.07
<u>Negro</u>						
Northeast	0.29	0.31	0.52	0.29	0.37	0.24
Midwest	0.22	0.40	0.56	0.42	0.51	0.34
South	1.07	1.02	1.15	0.18	0.19	0.17
West	1.09	1.18	1.49	0.17	0.27	0.22
<u>Total¹</u>	D teeth			F teeth		
Northeast	0.30	0.36	0.24	0.32	0.29	0.35
Midwest	0.34	0.35	0.33	0.32	0.35	0.32
South	0.56	0.56	0.56	0.35	0.34	0.37
West	0.14	0.13	0.14	0.65	0.51	0.80
<u>White</u>						
Northeast	0.33	0.39	0.30	0.31	0.26	0.31
Midwest	0.36	0.38	0.35	0.31	0.35	0.31
South	0.35	0.37	0.34	0.38	0.37	0.38
West	0.14	0.14	0.14	0.85	0.56	0.85
<u>Negro</u>						
Northeast	0.30	0.30	0.44	0.45	0.40	0.52
Midwest	0.37	0.45	0.31	0.09	0.42	0.48
South	1.22	1.16	1.30	0.22	0.19	0.26
West	0.38	0.44	0.38	0.73	0.78	1.01

¹ Includes data for "other races," which are not shown separately.

NOTE.—Filled teeth include only teeth with satisfactory fillings. Decayed teeth include not only teeth with caries but also filled teeth with carious lesions or defective fillings. Missing teeth include both missing and nonfunctional teeth. DMF is the total of these three categories.

APPENDIX I

THE DENTAL EXAMINATION AND THE TRAINING OF EXAMINERS

The Examination

Two forms were used to record dental findings on sample youths examined during 1966-70. The first one had diagrams of the teeth, and the condition of each tooth was noted in the tooth's corresponding diagram. The initial form was replaced by a form that eliminated the time-consuming tasks of coding and keypunching (see figure I). The procedures and findings of the examination were not affected by the change in forms.

Instructions for determining the condition of individual teeth and recording the information in section 4, "Status of Tooth Spaces," of the new form were as follows:

Primary tooth present.—Primary tooth present coded under "P" in "Primary Teeth" section, and status coded under "Teeth Present."

Permanent tooth present.—Status coded only under "Teeth Present."

Teeth present.—In the section "Teeth Present," the following codes were used:

Normal.—Unfilled teeth without carious lesions were scored under "N."

Carious.—Unfilled teeth with carious lesions were marked under "D." Initially each tooth was examined visually for evidence of decay, decalcified areas, opacity of marginal ridges, and undermined enamel in pits and fissures. Once observed, suspected lesions were considered carious only when a break in the enamel could be demonstrated with an explorer.

Filled (including crown).—Teeth with satisfactory fillings or crowns and no carious lesions were scored under "F." Filled or crowned teeth with new or recurrent carious lesions were scored FD. (This required a mark under "F" and a mark under "D.") Non-carious filled teeth were indicated in like manner when the restoration was loose or when it was fractured and the base or pulpal wall of the cavity preparation was exposed.

Teeth with temporary fillings or crowns were also scored FD.

Nonfunctional-carious.—When decay had penetrated the pulp chamber of a tooth, the tooth was scored either under "XD" or, if only roots were remaining, under "XR." Carious teeth were nonfunctional when there was visible evidence of

1. Periapical abscess or pulpal exposure.
2. Extensive undermining of all enamel walls.

Retained deciduous tooth and roots.—When any portion of the succedaneous tooth could be seen, it was given an appropriate score under "Teeth Present" and the deciduous tooth was scored XP under "Primary Teeth" if any portion of the crown of the deciduous tooth was present and XR under "Primary Teeth" if only roots were remaining.

Missing tooth (unerupted, extracted, or replaced).—When neither a primary nor a permanent tooth was present (tooth space may be vacant or missing tooth may be replaced by a fixed or removable partial denture), a code was recorded to indicate the reason the permanent tooth was missing. When appropriate, an additional code was recorded to indicate the status of the tooth space. These codes were as follows: "O" designates unerupted teeth.

"C" designates teeth extracted because of caries.

"S-X" designates teeth extracted

- Because of accident (tooth spaces 7, 8, 9, 10, 23, 24, 25, 26).
- For orthodontic reasons (tooth spaces 4, 5, 12, 13, 20, 21, 28, 29).
- Because of impaction (tooth spaces 1, 16, 17, 32).

The Examiners

Each of the 6,757 sample youths who received dental examinations during 1966-70 was examined by one of five dentists. The dentists included two senior examiners, 1 and 2, who trained and supervised the other dentists, 3-7.

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL CENTER FOR HEALTH STATISTICS

Form Approved:
Budget Bureau No. 68-R1700

PHS-4611-5
REV. 3-66

DENTAL EXAMINATION - HEALTH EXAMINATION SURVEY

Name _____

Date of Birth: _____ MO _____ DAY _____ YEAR _____

I. SAMPLE NUMBER → _____

2. EXAMINER												RECORDER												Stand											
3. EDENTULOUS ARCHES - DENTURE STATUS												Present												Defective											
Upper						Absent						Present						Defective						Examinee											
Lower						Absent						Present						Defective						Examinee											
4. STATUS OF TOOTH SPACES																		5. PERIODONTAL INDEX				No P.I.													
Quadrant	Primary Teeth			Teeth Present					Tooth Space	Permanent Teeth Missing					Tooth Space	Periodontal Index		No P.I.																	
	Present	Crown	Root	Normal	Carious-Defective	Non-Functional	Carious Root	Missing Space Closed		Unreplaced	Extracted	Accident Impaction	Replaced	1		2	6	8																	
	P	XP	XR	N	D	F	XD	XR		MSC	O	C	S-X	R		1	2	6	8																
UPPER ARCH RIGHT																																			
UPPER ARCH LEFT																																			
LOWER ARCH LEFT																																			
LOWER ARCH RIGHT																																			

Figure 1. Dental examination—Health Examination Survey.

Sample youths were not assigned randomly or equally among the various examiners. At most survey locations children were examined by only one dentist—3, 4, 5, 6, or 7. At 14 of 40 locations, however, a small subsample was examined by either 1 or 2 or, as occurred at two locations, by both 1 and 2. Thus the senior dentists examined relatively few sample youths. The number and percent of youths examined by each dentist were as follows:

	<i>Number of sample youths examined</i>	<i>Percent of sample youths examined</i>
7 dentists	6,757	100.0
1	236	3.5
2	302	4.5
3	1,055	15.6
4	448	6.6
5	1,689	25.0
6	1,472	21.8
7	1,555	23.0

Most examinations completed by the senior dentists resulted from a planned series of replicate examinations. As a rule, the findings of the senior dentist were made part of the sample youth's examination record, and the findings of the dentist with whom he was paired were kept separate. The primary aim of the replicate examinations was to correct any examiner divergence from the accepted examination procedures.

Throughout the replicate examinations, the senior dentist completed his examination first, dictating his findings to a trained recorder. After completing the examination, the senior dentist recorded the findings of the other dentist, who had previously been absent from the examining

room. Appreciable interexaminer differences as well as any procedure that diverged from the accepted one were discussed and, if indicated, either resolved or corrected while the sample youth was still present. However, the findings originally recorded were not altered.

To indicate the level of agreement among examiners, the results of the replicate examinations are shown in table I. The direction of the disagreements that occurred is shown by a plus or minus sign. A plus sign indicates that a finding of the senior dentist was higher than that of another dentist, and a minus sign indicates the opposite.

Perfect agreement between the senior dentists and the examining dentists ranged from a low of about 57 percent on untreated decayed teeth to a high of 87 percent on missing teeth. Perfect agreement on DMF teeth occurred in about one-half of the examinations, whereas disagreements of more than one DMF tooth occurred in only about one-fourth of them.

The results of the replicate examinations indicate that the level of examiner agreement was not as high during the survey of youths as it was during the survey of children.⁵ The lower level of agreement during the survey of youths is at least partly due to the fact that the variability of DMF counts among youths is greater than the variability of those among children. For instance, about 54 percent of U.S. youths 12-17 had DMF counts ranging from 5 to a high of about 21; only about 4 percent of U.S. children 6-11 had counts ranging from 5 to a high of 13. Thus there is a greater probability of wider examiner disagreements occurring during examinations conducted on youths than during those conducted on children.

Table I. Percent distribution of differences in dental findings between senior dentists and other dentists on 407 replicate examinations: Health Examination Survey, 1966-70

Dental findings	All replicate examinations	Differences observed in number of affected teeth								
		-4 or more	-3	-2	-1	0	+1	+2	+3	+4 or more
		Percent distribution								
DMF teeth	100.0	1.2	1.7	7.4	15.5	47.9	12.5	8.1	2.5	3.2
D teeth	100.0	2.0	2.4	4.9	12.3	56.8	11.8	5.2	2.2	2.4
M teeth	100.0	.2	.2	1.5	3.9	87.0	5.2	1.2	.5	.3
F teeth	100.0	.2	.3	3.2	8.1	73.7	8.9	3.2	1.7	.7

APPENDIX II

DEMOGRAPHIC AND SOCIOECONOMIC TERMS

Age.—The age recorded for each youth was the age at last birthday on the date of examination. The age criterion for inclusion in the sample used in this survey was defined as age at time of interview. Since the examination usually took place 2-4 weeks after the interview, some of those who were 17 years old at the time of the interview became 18 years old by the time of the examination. There were 23 such cases. In the adjustment and weighting procedures used to produce national estimates, these 23 were included in the 17-year-old group.

Race.—The race classification recorded by observation was confirmed by comparison with the race classification on the youth's birth certificate. Race was recorded as "white," "Negro," or "other races." The last category included American Indian, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race other than white. Negroes and persons of mixed Negro and other parentage were recorded as "Negro."

Family income.—The income recorded was the total income received during the past 12 months by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the gross cash income (excluding pay in kind, e.g., meals, living quarters, or supplies provided in place of cash wages) except in the case of a family with its own farm or business, in which case net income was recorded. Also included in the family income figure were allotments and other money received by the family from a member of the Armed Forces whether he was living at home or not.

Education of head of household.—The highest grade that had been completed in school was recorded. The only grades counted were those that had been completed in a regular graded

school where persons were given formal education—either public or private school, either day or night school, and either full-time or part-time attendance. A regular school is one that advances a person toward an elementary or high school diploma or a college, university, or professional school degree. Education in vocational, trade, or business schools outside the regular school system was not counted in determining the highest grade of school completed.

Geographic region.—For purposes of stratification, the United States was divided as follows into four broad geographic regions of approximately equal population, which correspond closely to those used by the U.S. Bureau of the Census.

<i>Region</i>	<i>States Included</i>
Northeast	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas
Midwest	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii

APPENDIX III

STATISTICAL NOTES

The Survey Design

The Health Examination Survey was designed as a highly stratified multistage sampling of the noninstitutional population aged 12-17 years of the United States including Alaska and Hawaii. Youths living on lands reserved for the use of American Indians were not included in the sample. The first stage of the plan was a sample of 40 primary sampling units (PSU's) from nearly 2,000 PSU's into which the United States has been divided. A PSU is a county, two or three contiguous counties, or a standard metropolitan statistical area. Later stages resulted in the random selection of clusters of about 10 youths from a small neighborhood within the PSU. The total sample was composed of 7,514 youths in the 40 PSU's in 25 States. The structure of the design and conduct of the survey have been described in detail in a previous report.¹

Reliability

The methodological strength of the survey derives especially from its use of scientific probability sampling techniques and highly standardized and closely controlled measurement processes. This does not imply that statistics from the survey are exact or without error. Data from the survey are imperfect for three major reasons: (1) results are subject to sampling error, (2) the actual conduct of a survey never agrees perfectly with the design, and (3) the measurement processes themselves are inexact even though standardized and controlled.

Of the total of 7,514 sample youths, 6,768, or 90.0 percent, were examined. Analysis indicates that the examined persons are a highly representative sample of the noninstitutional

U.S. population 12-17 years of age. Imputation for the nonrespondents was accomplished by attributing to nonexamined persons the characteristics of comparable examined persons. The specific procedure used consisted of inflating the sampling weight for each examined person to compensate for nonexamined sample persons at the same survey location and in the same age-sex group.¹ It is impossible, of course, to be certain that the average number of, for instance, DMF teeth per person is the same for the examined and the nonexamined groups.

Only 11 examined sample youths did not receive a dental examination. Thus dental findings were recorded for the 6,757 youths classified in table II by age and sex; the estimated U.S. population aged 12-17 years is shown in table III by age, race, and sex.

No estimates of dental findings were made for the 11 youths who did not have the dental examination. In the national estimates of the findings among youths, it was assumed that the distribution of their dental findings would have been similar to those for the examined group of the same age, sex, and race.

Table II. Number of sample youths who received a dental examination, by age and sex: Health Examination Survey, 1966-70

Age	Male	Female
	Number of sample youths	
12-17 years	3,538	3,219
12 years	642	545
13 years	625	582
14 years	618	586
15 years	612	503
16 years	554	535
17 years	487	468

Table III. Estimated number of noninstitutionalized youths aged 12-17 years, by age, race, and sex: United States, 1966-70

Age	Total ¹	White		Negro	
		Male	Female	Male	Female
Number in thousands					
12-17 years	22,692	9,929	9,623	1,496	1,527
12 years	4,002	1,747	1,685	280	272
13 years	3,952	1,729	1,667	262	275
14 years	3,852	1,686	1,633	256	266
15 years	3,751	1,646	1,594	241	235
16 years	3,625	1,594	1,542	231	243
17 years	3,510	1,528	1,502	225	237

¹ Includes data for "other races," which are not shown separately.

Sampling and Measurement Error

Several references have been made in this report to efforts to evaluate both the bias and the variability of the measurement techniques. The probability design of the survey makes possible the calculation of sampling errors. Traditionally, the role of the sampling error has been the determination of how imprecise the survey results may be because they come from a sample rather than from all elements in the universe.

The task of presenting sample errors for a study of the type of the Health Examination Survey is complicated by at least three factors: (1) measurement error and "pure" sampling error are confounded in the data—it is not easy to find a procedure that will either completely include both or treat one or the other separately, (2) the survey design and estimation procedure are complex and accordingly require computationally involved techniques for calculation of variances, and (3) thousands of statistics come from the survey, many for subclasses of the population for which there are small numbers of sample cases. Estimates of sampling error are obtained from the sample data and are themselves subject to sampling error, which may be large when the number of cases in a cell is small or even occasionally when the number of cases is substantial.

Estimates of approximate sampling variability for selected statistics used in this report are included in the detailed tables. These estimates have been prepared by a replication technique that yields overall variability through observation of variability among random subsamples of the total sample. The method reflects both "pure" sampling variance and a part of the measurement variance.

In accordance with usual practice, the interval estimate for any statistic may be considered the range within one standard error of the tabulated statistic with 68-percent confidence or the range within two standard errors of the tabulated statistic with 95-percent confidence.

Expected Values

In tables 5-7, the actual average number of DMF teeth per person for each of various demographic variables is compared with the expected average. The computation of expected rates was done as follows:

Suppose it is estimated that in a subgroup there are N_i persons in the i th age group ($i = 1, 2 \dots 7$; sum of $N_i = N$). Suppose it is estimated that the average number of DMF teeth per person for the United States in the i th age-sex group is X_i . Then the expected

average number of DMF teeth for the subgroup is

$$\frac{1}{N} \sum_i N_i \bar{X}_i$$

Comparison of an actual value for, say, a region with the expected value for that region is undertaken on the assumption that a meaningful statement can be made that holds, in some average way, for all persons in the region. This may or may not be true. The specified region may have higher values for younger youths and lower values for older youths than those found in other regions. In that case, an average comparison will obliterate one or both of these differentials. In arriving at the general conclusions expressed in the text, an effort was made to consider all the specific data, including data not presented in this report, but it must be recognized that balancing such evidence is a qualitative exercise rather than a quantitative one. The standard error of the difference between an actual and expected value may be approximated by the standard error of the actual value.

Small Numbers

In some tables, magnitudes are shown for cells for which sample size is so small that the sampling error may be several times as great as the statistic itself. Obviously in such instances the statistic has no meaning in itself; it merely indicates that the true quantity is small. Such numbers have sometimes been included to convey an impression of the overall story of the table.

Tests of Significance

Tests of significance for percent and mean statistics were performed in two ways. The first

was to determine if the difference between two estimated averages was equal to or greater than two times the standard error of the difference. The test assumes, in accordance with usual practice, that a 68-percent confidence interval ranges within one standard error of the tabulated statistics and that a 95-percent confidence interval ranges within two standard errors. The latter is used as the level of significance in this report. An approximation of the standard error of the difference $d = x - y$ of two statistics x and y is given by the formula $S_d = (S_x^2 + S_y^2)^{1/2}$ where S_x and S_y are standard errors, respectively, of x and y .

For example, table 1 shows that the average DMF is 3.6 for white males aged 12 and 8.8 for white males aged 17; the corresponding standard errors are 0.21 and 0.49, respectively. The formula yields a standard error of the difference of $S_d = .5331$. Since the observed difference ($d = 5.2$) is greater than twice the standard error of the difference, it can be concluded that the average DMF for white males aged 12 is significantly lower than that for white males aged 17.

The second test was to determine if the difference between the estimated actual and expected values was at least two times the standard error of the actual value. For example, for females from families with less than \$3,000 yearly income, the difference between the actual and expected average DMF scores is -0.9 (table 5), and the standard error of the actual value is 0.6. Since the difference is less than twice the standard error, it is not statistically significant.

The criterion for significance among geographical regions was more stringent than that for other demographic characteristics. To determine whether the difference between estimated averages for youths in any two of the four geographic regions was significant, the difference was required to be at least 2.5 times the standard error.

VITAL AND HEALTH STATISTICS PUBLICATION SERIES

Formerly Public Health Service Publication No. 1000

- Series 1. Programs and collection procedures.*—Reports which describe the general programs of the National Center for Health Statistics and its offices and divisions, data collection methods used, definitions, and other material necessary for understanding the data.
- Series 2. Data evaluation and methods research.*—Studies of new statistical methodology including: experimental tests of new survey methods, studies of vital statistics collection methods, new analytical techniques, objective evaluations of reliability of collected data, contributions to statistical theory.
- Series 3. Analytical studies.*—Reports presenting analytical or interpretive studies based on vital and health statistics, carrying the analysis further than the expository types of reports in the other series.
- Series 4. Documents and committee reports.*—Final reports of major committees concerned with vital and health statistics, and documents such as recommended model vital registration laws and revised birth and death certificates.
- Series 10. Data from the Health Interview Survey.*—Statistics on illness, accidental injuries, disability, use of hospital, medical, dental, and other services, and other health-related topics, based on data collected in a continuing national household interview survey.
- Series 11. Data from the Health Examination Survey.*—Data from direct examination, testing, and measurement of national samples of the civilian, noninstitutional population provide the basis for two types of reports: (1) estimates of the medically defined prevalence of specific diseases in the United States and the distributions of the population with respect to physical, physiological, and psychological characteristics; and (2) analysis of relationships among the various measurements without reference to an explicit finite universe of persons.
- Series 12. Data from the Institutional Population Surveys.*—Statistics relating to the health characteristics of persons in institutions, and their medical, nursing, and personal care received, based on national samples of establishments providing these services and samples of the residents or patients.
- Series 13. Data from the Hospital Discharge Survey.*—Statistics relating to discharged patients in short-stay hospitals, based on a sample of patient records in a national sample of hospitals.
- Series 14. Data on health resources: manpower and facilities.*—Statistics on the numbers, geographic distribution, and characteristics of health resources including physicians, dentists, nurses, other health occupations, hospitals, nursing homes, and outpatient facilities.
- Series 20. Data on mortality.*—Various statistics on mortality other than as included in regular annual or monthly reports—special analyses by cause of death, age, and other demographic variables, also geographic and time series analyses.
- Series 21. Data on natality, marriage, and divorce.*—Various statistics on natality, marriage, and divorce other than as included in regular annual or monthly reports—special analyses by demographic variables, also geographic and time series analyses, studies of fertility.
- Series 22. Data from the National Natality and Mortality Surveys.*—Statistics on characteristics of births and deaths not available from the vital records, based on sample surveys stemming from these records, including such topics as mortality by socioeconomic class, hospital experience in the last year of life, medical care during pregnancy, health insurance coverage, etc.

For a list of titles of reports published in these series, write to:

Office of Information
National Center for Health Statistics
Public Health Service, HRA
Rockville, Md. 20852