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VITAL and HEALTH STATISTICS
DATA FROM THE NATIONAL HEALTH SURVEY

Need for Dental Care Among Adults

United States - 1960 - 1962

Percents of persons in need of immediate dental care as determined by examinations conducted on a probability sample of the adult population 18-79 years of age.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Health Survey, the Bureau of the Census, under a contractual agreement, participated in the design and selection of the sample, and carried out the first stage of the field interviewing and certain parts of the statistical processing.

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CONTENTS

THIS REPORT contains estimates of the proportions of U.S. adults in need of dental care in relation to basic demographic and socioeconomic variables. The estimates are based on examinations conducted during 1960-62 on a probability sample of U.S. adults aged 18-79 years, representative of the adult population at that time.

An estimated 40.1 percent of all persons having one or more natural teeth (approximately 91 million) had some condition which indicated a need to visit a dentist. The need for immediate dental care was significantly associated with race, sex, education, income, marital status, and geographic region.

The association of need for dental care with various demographic characteristics and with the presence of decayed teeth, periodontal disease, and poor oral hygiene is quantified in this report.

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	*

NEED FOR DENTAL CARE AMONG ADULTS

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INTRODUCTION

The need for dental care among adults is an elusive concept because it is difficult to measure uniformly and at the same time realistically. Although a dental condition can sometimes be equated with a unit of treatment—e.g., a decayed tooth and a dental restoration—the same condition will at other times require a different form of treatment. Realistically, a comprehensive treatment plan is often determined not so much by the condition of individual teeth as by the collective state of the teeth. Any formula for converting findings into units of treatment must therefore take into account not only the soundness of teeth and their supporting structures but also the number of teeth and their position in the dental arch.

During the past decade the National Center for Health Statistics has published estimates of the prevalence and severity of various dental conditions among U.S. adults 18-79 years of age. The estimates accurately describe the dental health of the U.S. civilian population according to standardized criteria applied in a controlled, single-visit dental examination.[1-5] Based on examinations conducted during 1960-62 on a probability sample of the adult population, an estimated 20 million men and women had lost all of their natural teeth. Other estimates also reflect the high prevalence of dental disease among U.S. adults. Excluding the 20 million edentulous adults, there were approximately 91 million others who had on the average 18 decayed, missing, and filled (DMF) teeth. Among these persons, moreover, about one-half had gingivitis, or inflammation of the gums, and approximately one-third had destructive periodontal disease.

The National Center for Health Statistics has also published estimates of the volume and frequency of dental visits and of the types of dental service performed.[6,7] Data collected by interview during July 1963-June 1964 indicate that only about two of every five Americans visited a dentist during the preceding year. An estimated 30 million people, largely children under 5 years of age, had never seen a dentist.[7] Approximately 294 million dental visits were made during the year prior to the survey period, or an average of 1.6 visits per person.[6]

Data about dental conditions collected by examination provide a sound basis for describing and evaluating the dental health of a population. Interview data concerning dental visits provide valuable information about the utilization of dental services and about the type and extent of dental care received. But neither type of data directly expresses the relative need for dental attention, much less the specific need for dental care and services.

During the 1960-62 dental examinations, an effort was made to relate the dental condition of each sample man and woman to his or her relative need for dental care. The need for care was not measured by counting the number of units of treatment that might have been indicated by one formula or another but by grouping people according to the immediacy with which, in the judgment of the examining dentist, they ought to seek dental attention. After completing the examination, the

dentist summarized the implication of the findings for urgent attention by checking one of the following boxes.

Should see own dentist:

☐ at next regular appointment

☐ at an early date.

The determination that a person should see his own dentist either at his next periodic appointment or earlier was arrived at in an essentially unstructured way. The evaluation was entered on the dental examination form and later transposed to a brief report which many sample people requested and authorized the survey personnel to send to their private dentists. The evaluation made no attempt to specify the relative weight that should be given to the presence and severity of periodontal disease, to the number of decayed and missing teeth, or to any other finding. By instruction, the examining dentist put a checkmark beside "at an early date" if he saw a condition that usually requires professional treatment for correction or if he found a questionable condition that should be more thoroughly evaluated. When none of the findings implied a need for care, a checkmark was placed beside "at next regular appointment."

To understand why the recommendations were worded as they were and why no others were included, it is important to realize that the survey examination differed in a number of ways from the one patients usually receive when seeking care from practitioners. Survey findings were derived on a uniform basis by following as closely as possible a written set of objective standards. The examining dentist was forbidden to dry or isolate teeth during the examination, to remove debris and calculus, and to probe any tooth surface that did not have an overt sign of decay. In short, the survey examination, true to its own purpose, was no substitute for a clinical evaluation, and each sample person was informed of its limitations. No treatment was recommended, and no treatment plan was suggested to either the sample person or his private dentist.

Although the basis for determining whether someone should or should not seek immediate dental attention was but generally specified, it is nonetheless reasonable to assume that the implicit basis for a decision was firmer than might be expected. For example, every dentist would undoubtedly agree that an abscessed tooth, especially when pain and swelling are present, demands immediate attention. A large degree of agreement about the need for immediate care would also result when one or more badly decayed teeth are found, when severe periodontal disease is present, and when large amounts of debris and calculus cover the teeth. On the other hand, when unmistakable signs of long lasting neglect are not seen, the likelihood of examiner disagreement undoubtedly increases.

In table A, the mean Simplified Oral Hygiene Index (OHI), the mean Periodontal Index (PI), and the mean number of decayed teeth per person are shown by whether or not there was immediate need for dental attention. These scales are a measure of the principal discriminating factors which, alone or in combination, determined the group into which most sample people were placed. Data in table A indicate the presence of decayed teeth was most closely related to the dentists' determination of a need for early dental care, with poor oral hygiene and periodontal disease significant but less important factors. There is an interesting indication that as age increased the Periodontal Index discriminated more among women than among men. (The DMF index has no statistical relationship to the determination of need for dental care.)

The relationship of the variables can be quantified in summary form by treating "should see dentist" as a binomial variate and by considering the interrelationship of the variables in the context of a linear correlation. The resulting correlation coefficients are shown in table B. Not unexpectedly, the presence of decayed teeth is the best predictor of need for immediate dental care if the influences of the other variables are accounted for and held constant. Race, also a binomial variate, was included in the correlation analysis because, as will be shown, it is the most consistent demographic predictor of a need for early dental care.[8,9] It is interesting to note that the effect of race virtually disappears when the effects of the clinical variables are accounted for and held constant.

Table A. Mean number of decayed teeth, Simplified Oral Hygiene Index, and Periodontal Index among adults according to need for dental visit, by sex and age: United States, 1960-62

Sex and age	Mean decayed		Mean OHI-S		Mean PI	
	Early appointment	Regular appointment	Early appointment	Regular appointment	Early appointment	Regular appointment
Both sexes						
All ages	3.54	0.61	2.29	1.05	1.84	0.63
Male						
All ages	3.49	0.60	2.45	1.24	1.98	0.80
18-24 years	5.04	0.78	2.03	1.13	0.93	0.37
25-34 years	4.11	0.54	2.27	1.10	1.50	0.45
35-44 years	3.02	0.57	2.50	1.16	1.96	0.71
45-54 years	2.95	0.56	2.63	1.39	2.39	0.97
55-64 years	2.82	0.73	2.63	1.42	2.83	1.40
65-74 years	2.31	0.52	3.11	1.78	3.08	1.85
75-79 years	3.61	0.13	2.43	1.86	3.06	3.11
Female						
All ages	3.60	0.62	2.09	0.90	1.68	0.50
18-24 years	4.64	0.87	1.74	0.86	0.75	0.29
25-34 years	4.29	0.76	1.83	0.84	1.06	0.33
35-44 years	3.69	0.61	2.09	0.82	1.59	0.43
45-54 years	2.90	0.48	2.39	1.00	2.15	0.65
55-64 years	2.28	0.37	2.45	1.01	2.85	0.81
65-74 years	2.19	0.33	2.42	1.21	2.76	0.96
75-79 years	3.23	0.40	3.04	*	4.90	*

NOTE: Data used to compute the mean number of decayed teeth include "filled defective" and "nonfunctional carious" teeth.

In summary, there is sufficient reason to believe that an omnibus evaluation of the need for dental care, although essentially judgmental, nonetheless provides a meaningful indication of the relative urgency for seeking care. The evaluation may then be studied in relation to various demographic and socioeconomic features. Such analysis is the subject of the findings subsequently presented in this report.

The following analysis presents national estimates of the number of adults whose need for dental attention was judged to be relatively urgent. The prevalence of need for dental care among the adult U.S. population is described by selected demographic characteristics, including age, sex, race, income, and education. (For definitions of demographic and other terms, see appendix II.)

The estimates are based on examinations conducted during 1960-62 on 6,653 men and women. The examined people were a probability sample of the approximately 111 million U.S. adults aged 18-79 who composed the civilian, noninstitutional population. The design and selection of the sample, the content and procedures of the dental examination, and the method of deriving national estimates are shown in detail in other reports.[1, 10, 11]

The estimates in this report apply only to those adults (approximately 91 million) who had one or more natural teeth. People who were

Table B. Correlation coefficients between need for dental care and selected variables: United States, 1960-62

Independent variable	Correlation coefficient	
	Simple	Partial in five-variable equation
Decayed teeth[1]	.52	.44
Oral Hygiene Index	.47	.24
Periodontal Index	.37	.08
Race	.15	.03

[1]Includes "filled defective" and "nonfunctional carious" teeth.

edentulous were excluded because they are no longer subject to the same needs for dental care as people with natural teeth. The proportion of edentulous people and various demographic characteristics associated with them are presented in a previous publication.[5] National estimates of the prevalence of dental conditions among dentulous adults have also been reported.[2,3,4]

The proportion of edentulous people increased rapidly with age and was greater among women than among men and among white than among Negro adults. As a result of excluding edentulous people, the composition of the study population differs from that of the U.S. adult population at large. The difference by age between the study population and the general population is shown in figure 1 and table 1.

FINDINGS

Sex, Race, and Age

Based on examinations, approximately 36.5 million men and women, two of every five persons who had natural teeth, had one or more dental conditions for which early care was indicated (table 1). The percent of persons in need of dental

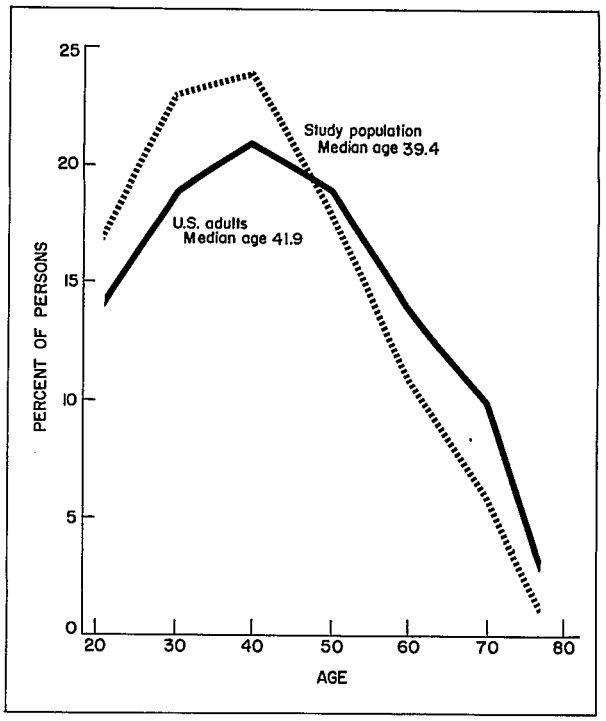

Figure 1. Percent of persons in study population and in the U.S. population, by age.

care varied significantly[a] by race and sex, the former being the variable for which the more dramatic association may be demonstrated. The need for dental care tends to increase somewhat with age, but the trend by age is less consistent and less cogent than the more directly demonstrable race and sex effects.

Need for immediate dental care was strongly associated with race (table 2). The percent of Negro adults needing early care was 61.5, or more than half again higher than the corresponding percent of white adults (37.6). This association prevailed with some variation but without significant exception for all of the clinical, demographic, and social variables studied in this analysis. The percent of Negro adults requiring dental care at an early date was also higher than that of white

[a]Tests of statistical significance used in this report are described in appendix I. In general they relate to a probability level of .05.

Table C. Percent of dentulous adults who should see dentist at early date, by race, sex, and broad age group: United States, 1960-62

Race and sex	All ages	18-44 years	45-79 years
	Percent		
All races, both sexes-----	40.1	38.7	42.5
Negro----------	61.5	58.4	66.8
White----------	37.6	36.5	39.5
Male----------	45.0	43.3	48.1
Female----------	35.5	34.6	37.1
Negro male----------	65.9	65.0	67.2
Negro female---------	57.5	53.1	66.2
White male----------	42.9	41.5	45.6
White female---------	32.7	32.1	33.8

adults within each of the seven age groups by which the data in the tables are classified. Because sampling variability increases rapidly at the upper end of the age distributions for Negro men and women, the extent of the racial difference by age, specific for each sex, is more meaningfully observed when the data are consolidated into the two broad age groups shown in table C.

Need for dental care was significantly greater among men than among women, although the difference by sex was not as large as that by race. The percent of males needing dental care was 45.0 as compared with 35.5 for females (table C). In addition, the difference by sex among age groups was relatively constant, varying from a low of about 4 percent to a high of about 17 percent.

The percent of males in need of dental care was higher than the corresponding percent of females for almost every variable by which men and women are cross-classified (tables 2-10). Exceptions, which may be found occasionally for several variables, are in no case statistically significant.

The proportions of men and women by age who require dental care at an early date are shown in figure 2. The proportion of people in need of dental care decreased slightly with advancing age through age 44 and increased slightly but steadily thereafter. The rising trend associated with age was more consistent among men than among women. About one of every two men 55 years and older had an apparent need for care, but only among women 75-79 years was the proportion equally high (table 2).

Income and Education

Family income and the need for immediate dental care were also closely associated. The relationship is an inverse one, with the proportion of men and women of all races who need to see their dentist at an early date decreasing sharply with rising levels of yearly income (table 3). For example, among families whose annual incomes were less than $2,000, about one of every two adults needed immediate dental care, while among those with incomes of $10,000 or more, only about one in every four adults needed immediate dental care. The trend was present among white men and women and Negro women, and it prevailed, more-

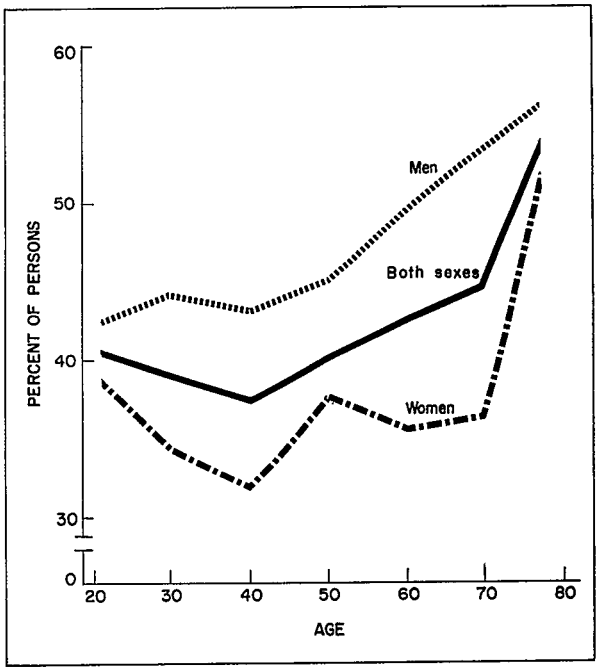

Figure 2. Percent of dentulous adults who should see dentist at early date, by sex and age.

over, within every given age range for the three groups. Among Negro men, however, the need for care and rising levels of income seemed directly, not inversely, related.

As expected, because of the relationship between income and education for most people, a significant inverse trend was also found to exist between levels of education and need for immediate care. Table 4 shows that the proportion of people of all races needing early care increased in an approximately linear relationship with decreasing levels of education. The proportion needing care among those who had completed 1 or more years of college is only about one in five; the proportion increases to about two in five among those who had completed from 1 to 4 years of high school, and to about one in two among those whose formal education ended before high school. The downward trend is consistent for both males and females (table 4). The trend also prevailed for persons in each age group.

As with family income the only exception to the trend associated with education occurred among Negro men (fig. 3). In fact, need for immediate care among Negro men tends to increase with rising levels of education. The difference in the direction of the trend between Negro men and the other sex-race groups is not due to differences in the age composition of the various educational attainment groups. Age-adjustment of the rates shown in figure 3 slightly changes the slope but does not alter the direction of the trend. Although lacking in statistical significance, the data strongly suggest that the trend among Negro men diverges from the general inverse relationship.

It is convenient to study the interrelation of education, family income, and race as predictors of a need for immediate care by multiple regression techniques. The simple correlation coefficients in table D reflect the relatively high correlation that exists between education and family income ($r = .38$).

The partial correlation coefficients in the table quantify the correlation between each variable and need for care when the associations between the other two variables and need for care are held constant. Thus, the contents of the table indicate that the association between need for

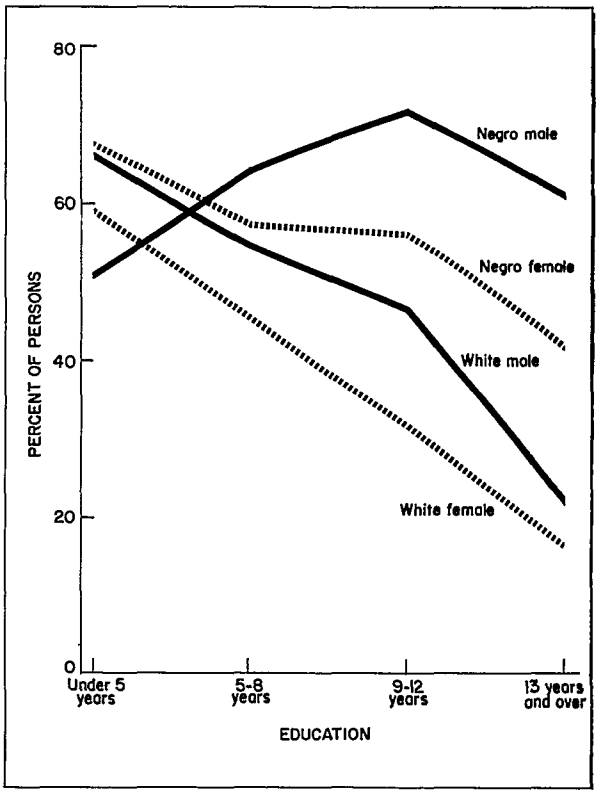

Figure 3. Percent of dentulous adults who should see dentist at early date, by sex, race, and education.

dental care and race is largely accounted for by differences in income and education.

Marital Status

Estimates of the proportion of dentulous U.S. adults who need immediate dental care are presented in table 5 by marital status. The estimates indicate that, when compared with people in other marital groups, a relatively large number of separated people (about three of every five) had conditions requiring immediate attention. Significantly higher proportions of separated people were also found to need early care among men and women of all races, among white adults, and among Negro adults. Because of high sampling variability, estimates for white men, white women, and Negro women cannot be presented.

Age-adjusted estimates of the proportion of white and Negro adults needing dental care are

Table D. Correlation coefficients between need for dental care and selected variables: United States, 1960-62

Independent variable	Correlation coefficient	
	Simple	Partial for four-variable equation
Education	-.22	-.16
Family income	-.19	-.10
Race	.15	.08

shown by marital status in table E. The estimates show that the association between need for care and marital status did not follow the same pattern for both white and Negro populations and that this difference by race did not reflect variations in the age composition of the groups. In the table, for example, the lowest proportions needing immediate care among Negro adults were in the divorced and separated groups; among white adults, on the other hand, separated people had the highest proportion needing care. In addition, never married white adults had the lowest proportion, whereas the corresponding group in the Negro population had the highest proportion.

The sex differential previously identified, where the proportions of males in need of dental care are significantly higher than those of females, was maintained on both a crude and age-adjusted basis within marital status groups without notable exception. There is evidence that the difference is substantially higher among never married persons. The age-adjusted percents for this group are 50.7 for males and 22.8 for females.

Usual Activity, Occupation, and Industry

The proportions of people requiring dental care at an early date are distributed in table 6 by sex, race, and usual activity. Classification by usual activity status limits comparison between sexes to those persons who were classified as "usually working" during the year prior to interview. For the usually working population, both sex and race differentials were maintained, with race being the more consequential. This was true for the sex- and race-specific proportions shown in table 6 as well as for the corresponding proportions after age adjustment. The proportion of persons in need of dental care was lower among working women than among women not so classified. This difference is statistically significant on an age-adjusted basis.

Because of their greater sampling variability, estimates by occupation are less definitive than those by usual activity. The estimates in table 7 suggest that two occupational groups—private household and service workers and operatives and kindred workers—tended to have higher than expected proportions of persons in need of dental attention. (See "Age Adjustments or Expected Values," appendix I.) The higher rates for white men and white women are statistically significant. The same pattern without statistical significance is present among corresponding groups of Negro men and women.

Male farmers and farm managers had relatively high proportions of persons in need of care; age-adjusted comparisons for Negroes in this particular category fall short of statistical significance. By contrast, professional, technical, and managerial and clerical and sales workers had relatively fewer persons in need of immediate care. After age-adjustment, the estimates by occupation follow a pattern that is remarkably similar for all four sex-race classes.

Table E. Percent of dentulous adults who should see dentist at early date, by race and marital status: United States, 1960-62

Marital status	White	Negro
Never married	31.8	67.2
Married	38.4	58.1
Divorced	40.4	48.3
Widowed	41.1	52.1
Separated	59.1	47.4

NOTE: Data adjusted for age and sex to total study population (approximately 91 million with one or more natural teeth) as standard.

Classification of white adults by industry (table 8) shows that workers in agriculture, forestry, and fisheries have significantly higher than expected proportions of persons who need early dental attention. White adults employed in the fields of finance, insurance, and real estate and white men in Government tended to have lower rates of people needing immediate care.

Residence

No large differences in the proportions of people in need of dental care were observed among the three geographic regions specially defined for this survey. The Northeast Region, comprising the Northern States bounded by Michigan, Ohio, Pennsylvania, and New Jersey, generally tended to have lower proportions needing care (table 9). After age-adjustment, however, the estimates for sex-race groups in the Northeast were not significantly different from those of comparable groups in the South and West.

People who lived outside the central cities of metropolitan areas had the lowest proportion of persons needing dental care within each sex-race group (table 10). White persons living on farms had significantly higher proportions of persons in need of dental care than white persons living elsewhere. This is not the case, however, for the Negro population. The trends for both white men and women are statistically significant on an age-adjusted basis.

SUMMARY

An estimated 36.5 million men and women—about 40 percent of all persons with one or more natural teeth—had one or more conditions for which early referral to a dentist was indicated. Composing this large segment of the adult population were 45.0 percent of all dentulous men and 35.5 percent of all dentulous women. People without natural teeth were excluded from the study population because they are no longer subject to the same dental conditions as dentulous adults.

National estimates of adults who need immediate dental attention are based on examinations conducted during 1960-62 on a probability sample of 6,653 U.S. adults. The sample was designed and selected to represent the approximately 111 million men and women in the civilian, noninstitutional U.S. population 18-79 years of age.

Table F. Percent of dentulous adults who should see dentist at early date, by selected characteristics: United States, 1960-62

Characteristic	Percent
All persons	40.1
Sex	
Male	[1]45.0
Female	[1]35.5
Race	
Negro	[1]61.5
White	[1]37.6
Education	
Under 5 years	[1]56.8
5-8 years	[1]51.8
9-12 years	[1]40.9
13 years and over	[1]20.8
Family income	
Under $2,000	[1]51.2
$2,000-$3,999	[1]50.5
$4,000-$6,999	[1]40.3
$7,000-$9,999	[1]32.4
$10,000 and over	[1]23.6
Marital status	
Separated	[1]62.3
Widowed	43.8
Divorced	43.7
Married	39.8
Never married	36.5
Region	
South	43.2
West	41.8
Northeast	[1]36.0

[1] Difference between percent shown and corresponding percent of persons not so characterized is statistically significant at .95 level.

National estimates of the proportion of people with one or more natural teeth who have dental conditions requiring immediate dental care are summarized in table F by sex, race, and various other demographic characteristics. The presence of decayed teeth was most highly correlated with the need to see a dentist at an early date. Poor oral hygiene and periodontal disease were other conditions for which immediate referral was recommended.

Need for immediate dental care was more strongly associated with race than with any other demographic characteristic. The estimated percent of Negro men and women needing early care was 61.5, or more than half again higher than the corresponding percent of white adults (37.6). Moreover, within every given age group relatively more Negro than white adults had neglected dental conditions.

The proportion of people needing dental care declined slightly with advancing age until age 44 and increased steadily thereafter. At any given age, relatively more white and Negro men needed care than women of the same race.

Income and education were also related to the need for immediate care. Except for Negro men, the relationship is an inverse one, with relatively large numbers of people needing care among those who are economically and educationally more disadvantaged. For example, proportionally twice as many men and women with annual family incomes of less than $2,000 needed early care as those with annual incomes of $10,000 or more. Race was a stronger correlate of need for early care than either income or education, and education was a stronger one than income.

Differences in the proportions of people needing early care also varied significantly by marital status, usual activity, and occupation. In addition, relatively fewer adults living in the Northeast required early care compared with those living elsewhere.

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DETAILED TABLES

Table 1. Total population, total dentulous adults, and number and percent of persons who should see dentist at early date, by sex and age: United States, 1960-62

Sex and age	All persons	With one or more natural teeth		
		Total	Should see dentist at early date	
			Number	Percent
	Number in thousands			
Both sexes				
All ages	111,087	90,980	36,496	40.1
18-24 years	15,569	15,358	6,213	40.5
25-34 years	21,572	20,604	8,041	39.0
35-44 years	23,698	21,794	8,118	37.2
45-54 years	20,576	16,467	6,770	41.1
55-64 years	15,637	9,962	4,230	42.5
65-74 years	11,164	5,654	2,509	44.4
75-79 years	2,871	1,141	615	53.9
Male				
All ages	52,744	44,088	19,861	45.0
18-24 years	7,139	7,044	2,989	42.4
25-34 years	10,281	10,007	4,421	44.2
35-44 years	11,373	10,706	4,600	43.0
45-54 years	10,034	8,036	3,598	44.8
55-64 years	7,517	4,925	2,441	49.6
65-74 years	4,972	2,737	1,457	53.2
75-79 years	1,428	633	355	56.1
Female				
All ages	58,343	46,892	16,635	35.5
18-24 years	8,430	8,314	3,224	38.8
25-34 years	11,291	10,597	3,620	34.2
35-44 years	12,325	11,088	3,518	31.7
45-54 years	10,542	8,431	3,172	37.6
55-64 years	8,120	5,037	1,789	35.5
65-74 years	6,192	2,917	1,052	36.1
75-79 years	1,443	508	260	51.3

Table 2. Percent of dentulous adults who should see dentist at early date, by age, race, and sex: United States, 1960-62

Race and age	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All ages	40.1	1.9	45.0	2.4	35.5	1.7
18-24 years	40.5	2.8	42.4	3.5	38.8	3.5
25-34 years	39.0	2.7	44.2	2.3	34.2	3.4
35-44 years	37.2	2.0	43.0	2.5	31.7	2.8
45-54 years	41.1	2.2	44.8	3.4	37.6	1.8
55-64 years	42.5	2.4	49.6	4.6	35.5	2.9
65-74 years	44.4	3.7	53.2	3.2	36.1	5.8
75-79 years	53.9	8.4	56.1	13.5	51.3	13.1
White						
All ages	37.6	2.1	42.9	2.7	32.7	1.9
18-24 years	37.8	3.2	40.1	4.1	35.9	3.4
25-34 years	36.9	2.9	43.0	3.0	31.0	3.2
35-44 years	35.3	2.2	40.4	2.8	30.4	3.0
45-54 years	38.2	2.4	42.0	3.4	34.7	1.9
55-64 years	38.5	2.6	46.4	4.6	31.3	2.9
65-74 years	42.1	4.2	51.9	3.8	33.3	6.5
75-79 years	53.5	9.4	58.2	15.3	47.6	15.5
Negro						
All ages	61.5	3.0	65.9	4.6	57.5	2.7
18-24 years	65.5	4.7	65.9	9.4	65.1	5.7
25-34 years	60.1	5.2	65.7	7.1	56.4	7.0
35-44 years	51.8	6.4	64.0	10.5	40.2	4.9
45-54 years	61.3	6.1	63.1	7.3	59.4	6.3
55-64 years	78.8	5.6	78.5	7.0	79.2	9.9
65-74 years	*	*	*	*	*	*
75-79 years	*	*	*	*	*	*

Table 3. Percent of dentulous adults who should see dentist at early date, by family income, race, and sex: United States, 1960-62

Race and family income	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All incomes	40.1	1.9	45.0	2.4	35.5	1.7
Under $2,000	51.2	3.3	55.0	3.2	48.4	4.6
$2,000-$3,999	50.5	3.1	56.4	4.4	45.5	3.4
$4,000-$6,999	40.3	2.2	47.2	2.6	33.4	2.4
$7,000-$9,999	32.4	2.4	35.3	3.7	29.3	2.6
$10,000 and over	23.6	2.6	28.6	3.5	18.5	2.4
White						
All incomes	37.6	2.1	42.9	2.7	32.7	1.9
Under $2,000	50.6	3.4	61.4	3.3	42.6	5.4
$2,000-$3,999	48.3	3.1	52.5	4.4	44.9	3.7
$4,000-$6,999	38.5	2.5	44.8	4.0	32.2	2.6
$7,000-$9,999	31.7	2.5	34.7	3.9	28.4	2.7
$10,000 and over	22.6	2.4	27.5	2.9	17.5	2.3
Negro						
All incomes	61.5	3.0	65.9	4.6	57.5	2.7
Under $2,000	61.3	3.4	52.4	7.5	67.0	3.4
$2,000-$3,999	60.1	6.1	72.2	9.8	46.8	4.9
$4,000-$6,999	64.0	5.3	78.3	6.6	48.6	4.8
$7,000-$9,999	54.1	8.8	*	*	*	*
$10,000 and over	*	*	*	*	*	*

Table 4. Percent of dentulous adults who should see dentist at early date, by education, race, and sex: United States, 1960-62

Race and education	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All educational groups	40.1	1.9	45.0	2.4	35.5	1.7
Under 5 years	56.8	4.6	55.1	3.8	58.7	6.9
5-8 years	51.8	2.6	55.8	3.4	47.7	3.6
9-12 years	40.9	2.5	49.1	3.5	34.4	2.1
13 years and over	20.8	2.5	23.1	2.7	18.3	2.7
White						
All educational groups	37.6	2.1	42.9	2.7	32.7	1.9
Under 5 years	63.0	5.3	66.9	6.0	59.2	6.8
5-8 years	50.3	2.8	54.4	3.6	46.0	4.1
9-12 years	38.6	2.8	46.9	3.9	32.0	2.1
13 years and over	19.8	2.4	22.4	2.8	16.9	2.5
Negro						
All educational groups	61.5	3.0	65.9	4.6	57.5	2.7
Under 5 years	57.4	7.5	50.9	8.5	67.5	10.0
5-8 years	61.0	4.9	64.7	7.1	57.4	5.3
9-12 years	63.7	3.4	72.6	6.6	56.8	3.7
13 years and over	47.8	8.5	61.2	14.3	42.2	11.1

Table 5. Percent of dentulous adults who should see dentist at early date, by marital status, race, and sex: United States, 1960-62

Race and marital status	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All marital status groups	40.1	1.9	45.0	2.4	35.5	1.7
Married	39.8	2.0	44.5	2.6	35.1	1.6
Widowed	43.8	4.3	50.9	9.5	42.3	4.5
Divorced	43.7	4.1	47.5	7.7	41.3	5.0
Separated	62.3	4.8	70.5	8.7	56.0	7.6
Never married	36.5	2.7	43.5	3.1	27.9	3.5
White						
All marital status groups	37.6	2.1	42.9	2.7	32.7	1.9
Married	37.8	2.2	43.0	2.9	32.8	1.8
Widowed	42.0	4.9	50.9	10.2	40.0	5.1
Divorced	42.6	5.8	45.1	9.3	40.9	6.7
Separated	62.7	7.1	*	*	*	*
Never married	31.8	2.7	39.8	3.0	22.3	3.6
Negro						
All marital status groups	61.5	3.0	65.9	4.6	57.5	2.7
Married	60.3	3.5	63.4	5.4	57.5	3.6
Widowed	58.6	11.1	*	*	*	*
Divorced	45.6	4.8	*	*	40.7	7.0
Separated	63.3	7.9	76.5	10.8	*	*
Never married	72.8	3.3	74.7	7.7	70.2	8.1

Table 6. Percent of dentulous adults who should see dentist at early date, by usual activity status, race, and sex: United States, 1960-62

Race and usual activity	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All activities	40.1	1.9	45.0	2.4	35.5	1.7
Working	40.2	2.2	44.6	2.3	29.9	2.5
Keeping house	38.7	1.6	...	...	38.8	1.6
Retired	54.0	5.4	54.0	5.7	*	*
Other	38.9	2.5	43.6	3.8	31.3	4.0
White						
All activities	37.6	2.1	42.9	2.7	32.7	1.9
Working	37.9	2.4	42.3	2.7	27.0	2.6
Keeping house	36.1	1.9	...	...	36.1	1.9
Retired	53.6	6.0	54.0	6.0	*	*
Other	35.1	3.1	40.6	5.1	27.3	4.2
Negro						
All activities	61.5	3.0	65.9	4.6	57.5	2.7
Working	60.7	4.5	67.4	5.8	49.3	4.0
Keeping house	62.4	3.9	...	...	62.4	3.9
Retired	57.5	23.8	*	*	*	*
Other	64.8	8.9	61.5	9.9	80.8	13.5

Table 7. Percent of employed dentulous adults who should see dentist at early date, by occupation, race, and sex: United States, 1960-62

Race and occupation	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All occupations	40.1	2.1	44.4	2.2	31.8	2.2
Professional, technical, and managerial	23.7	3.2	27.1	3.1	16.4	3.8
Farmers and farm managers	55.4	3.8	55.1	4.0	...	...
Clerical and sales workers	31.6	2.7	42.0	4.6	24.8	2.4
Craftsmen, foremen, and kindred workers	46.8	4.4	46.6	4.5	...	...
Operatives and kindred workers	51.7	2.6	56.3	3.1	40.6	3.0
Private household and service workers	50.8	4.1	56.6	5.3	47.0	4.3
Farm and other laborers (except mine)	50.4	5.4	49.6	5.5	...	...
White						
All occupations	37.6	2.3	42.1	2.6	28.5	2.2
Professional, technical, and managerial	23.3	3.2	26.7	3.1	15.5	3.9
Farmers and farm managers	56.7	4.3	56.9	4.4	...	...
Clerical and sales workers	30.8	3.0	40.2	5.0	24.6	2.5
Craftsmen, foremen, and kindred workers	45.6	4.9	45.6	4.9	...	...
Operatives and kindred workers	49.6	2.9	53.9	3.4	39.5	3.6
Private household and service workers	46.6	4.2	53.1	6.1	40.7	4.9
Farm and other laborers (except mine)	47.0	5.2	46.1	5.0	...	-
Negro						
All occupations	60.9	3.6	65.7	5.2	53.9	2.9
Professional, technical, and managerial	36.0	10.0	53.7	15.7	*	*
Farmers and farm managers	60.6	7.8	58.7	5.7	...	...
Clerical and sales workers	54.5	12.5	*	*	38.8	9.5
Craftsmen, foremen, and kindred workers	62.3	9.5	60.9	9.0	...	...
Operatives and kindred workers	69.3	4.6	76.6	6.5	*	*
Private household and service workers	63.4	6.3	70.1	10.8	61.3	5.4
Farm and other laborers (except mine)	58.4	8.4	58.2	8.9	...	...

Table 8. Percent of employed dentulous adults who should see dentist at early date, by industry, race, and sex: United States, 1960-62

Race and industry	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All industries	40.1	2.1	44.4	2.2	31.8	2.2
Agriculture, forestry, and fisheries	50.0	4.9	49.4	4.9	52.6	10.8
Mining and construction	47.5	3.6	48.6	3.6	...	...
Manufacturing	42.0	2.5	45.2	2.8	32.0	3.4
Transportation, communications, and other public utilities	43.8	4.0	47.1	4.9	...	...
Wholesale and retail trade	44.0	3.3	47.8	5.0	38.2	2.3
Finance, insurance, and real estate	29.5	5.0	35.7	6.6	21.6	6.6
Service and miscellaneous	32.7	3.1	38.0	4.3	29.2	2.9
Government	26.0	3.8	31.8	4.6	...	...
White						
All industries	37.6	2.3	42.1	2.6	28.5	2.2
Agriculture, forestry, and fisheries	52.2	4.5	52.5	4.8	49.7	12.0
Mining and construction	43.6	4.1	44.4	4.4	...	...
Manufacturing	40.1	3.0	43.0	3.5	31.6	3.5
Transportation, communications, and other public utilities	42.2	3.9	46.0	5.1	...	...
Wholesale and retail trade	41.2	3.6	44.6	5.3	36.2	3.0
Finance, insurance, and real estate	28.9	5.2	34.2	6.5	22.2	6.8
Service and miscellaneous	28.0	3.1	35.7	4.2	22.0	2.9
Government	24.6	3.6	30.7	4.3	...	...
Negro						
All industries	60.9	3.6	65.7	5.2	53.9	2.9
Agriculture, forestry, and fisheries	*	*	*	*	*	*
Mining and construction	72.6	5.1	75.5	3.3	...	...
Manufacturing	66.4	7.1	70.4	7.2	41.1	17.5
Transportation, communications, and other public utilities	58.9	17.4	57.6	19.3	...	...
Wholesale and retail trade	72.6	6.7	76.0	8.2	66.9	12.2
Finance, insurance, and real estate	56.2	37.6	*	*	*	*
Service and miscellaneous	55.0	5.6	58.1	10.4	54.1	5.2
Government	39.6	23.4	*	*	...	...

Table 9. Percent of dentulous adults who should see dentist at early date, by region, race, and sex: United States, 1960-62

Race and region	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All regions	40.1	1.9	45.0	2.4	35.5	1.7
Northeast	36.0	2.5	40.7	3.2	31.6	2.3
South	43.2	4.1	48.8	4.7	38.6	3.6
West	41.8	3.3	46.6	4.2	36.8	2.7
White						
All regions	37.6	2.1	42.9	2.7	32.7	1.9
Northeast	34.0	2.6	38.6	3.4	29.7	2.4
South	38.0	4.4	44.7	5.1	32.7	3.7
West	41.1	3.7	46.1	4.8	36.0	3.1
Negro						
All regions	61.5	3.0	65.9	4.6	57.5	2.7
Northeast	59.7	4.4	69.7	6.3	52.5	5.9
South	61.4	5.7	62.1	7.6	60.9	4.8
West	63.5	5.2	71.6	5.5	54.7	7.7

Table 10. Percent of dentulous adults who should see dentist at early date, by place description, race, and sex: United States, 1960-62

Race and place description	Both sexes		Male		Female	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
All races						
All places	40.1	1.9	45.0	2.4	35.5	1.7
SMSA-in central city	41.8	2.9	47.6	3.3	37.1	2.8
SMSA-outside central city	33.5	2.2	37.8	3.8	29.2	1.2
Urban, not SMSA	46.8	5.1	53.8	5.3	40.3	6.0
Rural, farm	47.2	3.0	50.7	4.3	43.9	3.8
Rural, nonfarm	42.0	3.0	45.9	3.4	38.4	3.8
White						
All places	37.6	2.1	42.9	2.7	32.7	1.9
SMSA-in central city	37.2	3.0	42.5	3.5	32.8	3.0
SMSA-outside central city	32.9	2.4	37.2	4.1	28.8	1.2
Urban, not SMSA	44.2	5.2	51.9	5.9	36.6	5.4
Rural, farm	48.6	3.1	53.7	5.2	41.9	3.3
Rural, nonfarm	40.3	2.9	45.1	3.7	36.0	3.8
Negro						
All places	61.5	3.0	65.9	4.6	57.5	2.7
SMSA-in central city	63.2	33.4	71.8	5.6	56.3	3.3
SMSA-outside central city	49.1	8.7	55.1	14.3	42.9	6.3
Urban, not SMSA	68.7	8.8	73.7	7.2	65.3	10.9
Rural, farm	52.1	8.3	48.6	12.7	55.0	5.6
Rural, nonfarm	63.0	4.9	62.2	11.7	64.1	4.1

APPENDIX I

STATISTICAL NOTES

The Survey Design

The first cycle of the Health Examination Survey employed a highly stratified multistage probability design in which a sample of the civilian, noninstitutional population of the conterminous United States 18-79 years of age was selected. At the first stage, a sample of 42 primary sampling units (PSU's) was drawn from among the 1,900 geographic units into which the United States was divided. Random selection was controlled within regional and size-of-urban-place strata into which the units were classified. As used here a PSU is a standard metropolitan statistical area or one to three contiguous counties. Later stages result in the random selection of clusters of typically about four persons from a neighborhood within the PSU. The total sample included some 7,700 persons in 29 different States. The detailed structure of the design and the conduct of the survey have been described in previous reports.[10,11]

Reliability

The methodological strength of the survey derives especially from the 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.

The first-stage evaluation of the survey was reported in reference 11, which dealt principally with an analysis of the faithfulness with which the sampling design was carried out. This study notes that out of the 7,700 sample persons the 6,672 who were examined—a response rate of over 86 percent—gave evidence that they were a highly representative sample of the civilian, noninstitutional population of the United States. Imputation of nonrespondents was accomplished by attributing to nonexamined persons the characteristics of comparable examined persons as described in reference 11. The specific procedure used amounted to inflating the sampling weight for each examined person in order to compensate for sample persons at that stand of the same age-sex group who were not examined.

It is impossible to be certain that a particular statistic or characteristic is the same for the examined and the nonexamined groups, although the practical effect of the small nonresponse rate is almost certainly of no substantive analytical consequence. There were 6,672 persons who came in for examination. Of these, 19 did not receive a dental examination.

Sampling and Measurement Error

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 precise the survey results may be, given that they come from a sample rather than from the measurement of all elements in the universe.

The estimation of sampling errors for a study of the type of the Health Examination Survey must take into account three factors: (1) measurement error and "pure" sampling error are confounded in the data—it is not easy to find a procedure which 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 the calculation of variances, and (3) from the survey thousands of statistics are computed, many for subclasses of the population for which there are a small number of sample cases. Estimates of sampling error obtained from the sample data are subject to sampling error.

Estimates of approximate sampling variability for selected statistics used in this report are, in general, presented in the detailed tables. These estimates have been prepared by a replication technique which 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.[12,13]

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.

Age Adjustments or Expected Values

Certain age adjustments (sometimes referred to as expected values) may refer to the application of age-specific rates for the total population and to populations of a particular domain of study, such as a geographic region. The computation is as follows:

Suppose that in a subgroup the Health Examination Survey estimates that there are N_i persons in the ith age-sex-race group ($i = 1,2, \ldots 42$, sum of $N_i = N$).

Suppose the Health Examination Survey estimates that the proportion of persons needing dental care in the United States in the ith age-sex-race group is X_i. Then the expected proportion in the subgroup is

$$\frac{1}{N} \sum_i N_i X_i$$

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 which 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 persons and lower values for older persons than are found in other regions.

In that case, an average comparison will obliterate one or both of these differentials. A similar remark may be made with respect to values computed for all races together, since relationships found in one race may not be found in another. 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 rather than a quantitative exercise. The standard error of the difference between an actual and expected value may be approximated by the standard error of the actual value.

Other age adjustments, such as the presentation in table E, may refer to the more usual application of age-specific rates for the subpopulation, or domain of study, to the total population. In either case, the analytical conclusion is, of course, the same.

Small Numbers

In some tables magnitudes are shown for cells for which the 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 except to indicate that the true quantity is small. Such numbers, if shown, have been included to convey an impression of the overall story of the table.

Tests of Significance

The test of significance for demographic variables determined whether or not the difference between the actual and expected value was greater than two times its standard error.

An estimate of the standard error of a difference $d = x - y$ of two statistics x and y is given by the formula $s_d = (\sigma_x^2 + \sigma_y^2)^{1/2}$, where σ_x^2 and σ_y^2 are variances, respectively, of x and y, or the squares of the standard errors shown in tables 2-10. For example, the percent of persons who should see a dentist is $x = 37.6$ for white adults and $y = 61.5$ for Negro (table 2), while from the same table variances are found to be $\sigma_x^2 = 4.41$ percent and $\sigma_Y^2 = 9.00$ percent. This formula yields the estimate of the standard error of the difference ($d = 23.9$ percent) as $s_d = 3.66$ percent. Thus as the observed difference is more than three times its sampling error, it can be concluded with near certainty that the percent of persons in need of dental care is higher among Negro adults than among white.

Most tests of significance cited in this report relate to the statistical significance of the difference between an actual and expected percentage—i.e., age adjustment is implied in the procedure.

Missing Values

Of the 6,653 sample persons who received a dental examination, 1,170 were edentulous and were therefore not within the scope of the analysis. Of the remaining 5,483 persons, evaluation of need for dental care was omitted for 184. Percents of various subgroups of the population needing dental care exclude these 184 persons.

Of the remaining 5,299 persons comprising the study population, 121 were persons classified as "other" nonwhite. These people were included in the "total" column for presentations by race, but were excluded from calculations of correlation constants, as were an additional 106 persons for whom the Oral Hygiene Index or the Periodontal Index, or both, were missing (80, 16, and 10 persons, respectively). The calculations for the correlation constants also excluded an additional 498 persons whose education or income was unknown.

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APPENDIX II

DEFINITION OF TERMS

Age.—The age recorded for each person is the age at last birthday. Age is recorded in single years.

Race.—Race is recorded as "White," "Negro," or "Other." "Other" includes American Indian, Chinese, Japanese, and so forth. Mexican persons are included with "White" unless definitely known to be Indian or of another nonwhite race.

Income of family or unrelated individuals.—Each member of a family is classified according to the total income of the family of which he is a member. Within the household all persons related to each other by blood, marriage, or adoption constitute a family. Unrelated individuals are classified according to their own income.

The income recorded is the total of all income received by members of the family in the 12-month period preceding the week of interview. Income from all sources is included, e.g., wages, salaries, rents from properties, pensions, help from relatives.

In calculating the (weighted) correlations for income, the following recoded scale was used:

1- Under $1,000	5-$4,000-$4,999
2-$1,000- $1,999	6-$5,000-$6,999
3-$2,000- $2,999	7-$7,000-$9,999
4-$3,000- $3,999	8-$10,000 and over

Education.—Each person is classified by education in terms of the highest grade of school completed. Only grades completed in regular schools, where persons are given a formal education, are included. A "regular" school is one which advances a person toward an elementary or high school diploma or a college, university, or professional school degree. Thus education in vocational, trade, or business schools outside the regular school system is not counted in determining the highest grade of school completed.

In calculating the (weighted) correlations pertaining to education, the scale indicated by the recoded values in table 4 was used.

Marital status.—The categories of marital status are *married, widowed, divorced, separated,* and *never married*. Persons with common-law marriages are considered married. *Separated* refers to married persons who have a legal separation, those living apart with intentions of obtaining a divorce, and other persons permanently or temporarily estranged from their spouse because of marital discord.

Usual activity status.—All persons are classified according to their usual activity status during the 12-month period prior to the week of interview. The usual activity status, in case more than one is reported, is the one at which the person spent the most time during the 12-month period.

The categories of usual activity status are *usually working, usually keeping house, retired,* and *other*. For several reasons these categories are not comparable with somewhat similarly named categories in official Federal labor force statistics. First, the responses concerning usual activity status are accepted without detailed questioning, since the objective of the question is not to estimate the numbers of persons in labor force categories but to identify crudely certain population groups which may have differing health problems. Second, the figures represent the usual activity status over the period of an entire year, whereas official labor force statistics relate to a much shorter period, usually 1 week. Finally in the definitions of specific categories which follow, certain marginal groups are classified differently to simplify procedures.

Usually working includes persons who are paid employees; self-employed in their own business, profession, or in farming; or unpaid employees in a family business or farm. Work around the house or volunteer or unpaid work, such as for a church, is not counted as working.

Usually keeping house includes women whose major activity is described as "keeping house" and who cannot be classified as "working."

Retired includes persons 45 years of age and over who consider themselves retired. In case of doubt a person 45 years of age or over is counted as retired if he or she has either voluntarily or involuntarily stopped working, is not looking for work, and is not described as "keeping house." A retired person may or may not be unable to work.

Other in this report includes men not classified as "working" or "retired" and women not classified as "working," "keeping house," or "retired." Per-

sons who are going to school are included in this group.

Employment status.—This term applies to the employment status of persons during the 2-week period prior to the week of interview. It is not intended that this term define the labor force or provide estimates of the employed or unemployed population at the time of the survey.

Persons who report that they either worked at or had a job or business at any time during the 2-week period prior to the week of interview are considered employed. This includes paid work as an employee of someone else, self-employment in business, farming, or professional practice, and unpaid work in a family business or farm. Persons on layoff from a job and those who were absent from their job or business because of temporary illness, vacation, strike, or bad weather are considered employed if they expect to work as soon as the particular event causing their absence no longer exists. Freelance workers are considered as currently employed if they have a definite arrangement with one or more employers to work for pay according to a weekly or monthly schedule either full time or part time. Excluded are such persons who have no definite employment schedule but work only when their services are needed. Also excluded are (1) persons receiving revenue from an enterprise in whose operation they do not participate, (2) persons doing housework or charity work for which they receive no pay, and (3) seasonal workers during the portion of the year they are not working. (It should be noted that these data were not collected for Philadelphia.)

Occupation.—A person's occupation may be defined as his principal job or business. For the purposes of this survey the principal job or business of a respondent is defined in one of the following ways. If the person worked during the 2-week-reference period of the interview or had a job or business, the question concerning his occupation (or what kind of work he was doing) applies to his job during that period. If the respondent held more than one job, the question is directed to the one at which he spent the most time. When equal time is spent at each job, the question refers to the one he considers most important. A person who has not begun work at a new job, is looking for work, or is on layoff from work is questioned about his last full-time civilian job. A full-time job is defined as one at which the person spent 35 hours or more per week and which lasted 2 consecutive weeks or more. A person who has a job to which he has not yet reported and has never had a previous job or business is classified as a "new worker."

Census code categories defining the occupational groups are shown below.

Occupational title	*Census code*
Professional, technical, and managerial workers	R, 000-195, 250-285
Farmers and farm managers	N, 222
Clerical and sales workers	S, Y, Z, 301-395
Craftsmen, foremen, and kindred workers	Q, 401-545
Operatives and kindred workers	T, W, 601-721
Private household and service workers	P, 801-803, 810-890
Farm and other laborers (except mine)	U, V, X, 901, 905, 960-973
Unknown (including new workers)	995 and all other codes

(U.S. Bureau of Census, 1960 Census of Population, Classified Index of Occupations and Industries, U.S. Government Printing Office, Washington, D.C., 1960.) This information was not collected for Philadelphia and Valdosta.

Industry.—The industry in which a person was reportedly working is classified by the major activity of the establishment in which he worked.

The only exceptions to the above are those few establishments classified according to the major activity of the parent organization, and they are as follows: laboratories, warehouses, repairshops, and places for storage.

The industry groupings are shown below. (Data on industries were not collected for Valdosta and Philadelphia.) The census code (the Classified Index of Occupation and Industries) and the Standard Industrial Classification (SIC) code components are also listed.

Industry title	*Census code*	*SIC code*
Agriculture, forestry, and fisheries	A, 017, 018	01, 02, 07 (excludes 0713), 08, 09
Mining and construction	C, 126-156	10-14, 15-17
Manufacturing	B, M, 206-459	19-39, 0713
Transportation, communications, and other public utilities	L, 507-579	40-49
Wholesale and retail trade	D,F,G,606-696	50, 52-59
Finance, insurance, and real estate	706-736	60-67
Service and miscellaneous	E,H,K,806-898	70,72,73,75,76, 78,82,84,86,88,89
Government	J, 906-936	91-94
Unknown (including new workers)	999	99

The industry title government differs somewhat from the usual industrial classification of government, since it is limited to the postal service and to Federal, State, and local public administrations. This category includes only uniquely governmental functions and excludes those activities which may also be carried out by private enterprise. For example, teachers in public educational facilities and nurses engaged in medical services of governmental agencies are included with the "service and miscellaneous" group.

Region.—For the purpose of classifying the population by geographic area, the United States was divided into three major regions. This division was especially made for the design of the HES sample. The regions and the States included are as follows:

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

Place description.—In this survey the urban population is classified as living "in the central city" or "outside the central city" of an SMSA. The remaining urban population is classified as "not in SMSA."

The definitions and titles of standard metropolitan statistical areas are established by the U.S. Bureau of the Budget with the advice of the Federal Committee on Standard Metropolitan Statistical Areas.

The definition of an individual standard metropolitan statistical area involves two considerations: first, a city or cities of specified population to constitute the central city and identify the county in which it is located as the central county; and, second, economic and social relationships with contiguous counties which are metropolitan in character so that the periphery of the specific metropolitan area may be determined.

Persons "in the central city" of an SMSA are therefore defined as those whose residency is in the city appearing in the stand and metropolitan statistical area title. Persons residing in an SMSA but not in the city appearing in the SMSA title are considered to reside "outside the central city."

The remaining population is allocated into rural-farm and rural-nonfarm groups. The farm population includes all persons living in rural territory on places of 10 or more acres from which sales of farm products amounted to $50 or more during the previous 12 months or on places of less than 10 acres from which sales of farm products amounted to $250 or more during the preceding 12 months. Other persons living in rural territory were classified as nonfarm. Persons were also classified as nonfarm if their household paid rent for the house but their rent did not include any land used for farming.

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