Data from the
NATIONAL HEALTH SURVEY

Series 10
Number 89

Edentulous Persons

United States - 1971

Statistics on the prevalence of edentulous persons by age, sex, race, income, education, and place of residence. Data are also presented on utilization of dental services and use of dentures by persons who have lost all their natural teeth.

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Under the legislation establishing the National Health Survey, the Public Health Service is authorized to use, insofar as possible, the services or facilities of other Federal, State, or private agencies.

In accordance with specifications established by the Health Interview Survey, the Bureau of the Census, under a contractual arrangement, participates in most aspects of survey planning, selects the sample, and collects the data.

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EDENTULOUS PERSONS

Clinton E. Burnham, *Division of Health Interview Statistics*

INTRODUCTION

There were an estimated 22.6 million edentulous persons in the United States according to the Health Interview Survey conducted in 1971. The July 1957-June 1958 survey estimate of the number of persons who were edentulous (had lost all their natural teeth) was 21.9 million.[1] Since in most instances it takes many years of dental neglect for an individual to lose all his teeth, persons with no teeth are heavily concentrated in the older age groups. For example, in 1971, 86.3 percent (19.5 million) of the edentulous population were in the age group 45 years of age and older, while in 1957-58 the comparable figure was 85.2 percent.

Virtually every American will be affected during his or her lifetime by dental decay or periodontal disease. Reports previously published in the *Vital and Health Statistics* series contain national estimates of the prevalence, severity, and effects of dental disease among U.S. adults. Based on dental examinations conducted during 1960-62, it was estimated that approximately 20 million adults had lost all their natural teeth.[2] Of the remaining adults with at least one natural tooth (approximately 90 million), about half had 18 or more decayed, missing, or filled teeth.[3] In addition, about three out of four of those with natural teeth had periodontal disease, and about one out of four had an advanced form of periodontal disease with pocket formations.[4]

The result of neglected dental caries and advanced periodontal disease is the loss of teeth. Persons using artificial dentures are considerably less efficient at chewing than persons with healthy natural teeth. For the aged, artificial dentures mean a decrease in masticatory function at a time when an efficient dental function is increasingly desirable due to changes in nutritional requirements.[5] While the ultimate dental health goal is the eradication of dental disease, an important immediate goal is the reduction of tooth loss. Tooth loss can usually be obviated by diagnosing and treating dental disease in its early stages and by utilizing the preventive measures now available.

The proportion of edentulous adults in a population will increase or decrease as significant changes occur in the dental health status of that population. As an index of dental health, the percentage of edentulous persons reflects both the prevalence of dental disease and success or failure in the delivery of dental services. If the percentage of edentulous adults in the U.S. population declines over a relatively short period of time, tooth loss obviously has been reduced, and it is reasonable to assume that the dental health of Americans has improved. On the other hand, an increased percentage of edentulous persons would indicate a worsened status of dental health.

During July 1957-June 1958 respondents to the Health Interview Survey were asked "Is there anyone in the family who has lost all of his teeth?"[1] In 1971 respondents were asked the same question, as well as additional ones relating to the possession, use, and adequacy of artificial dentures. This report contains national estimates of the prevalence of edentulous persons according to selected demographic characteristics and

compares the prevalence of edentulous persons in 1971 with the prevalence approximately 13 years earlier.

Estimates of the utilization of dental services by edentulous persons in terms of the volume of dental visits, interval since last visit, and type of service provided are presented. Finally, statistics are included which relate to the possession, use, and adequacy of artificial dentures.

SOURCE AND LIMITATIONS OF THE DATA

The information from the Health Interview Survey presented in this report is based on data collected in a continuing nationwide survey conducted by household interview. Each week a probability sample of households is interviewed by trained personnel of the U.S. Bureau of the Census to obtain information about the health and other characteristics of each member of the household in the civilian, noninstitutionalized population of the United States. During the 52 weeks in 1971 the sample was composed of approximately 42,000 households containing about 134,000 persons living at the time of the interview.

A description of the design of the survey, the methods used in estimation, and general qualifications of the survey data is presented in appendix I. Since the estimates shown in this report are based on a sample of the population, they are subject to sampling error. Therefore particular attention should be paid to the section entitled "Reliability of Estimates." Sampling errors for most of the estimates are of relatively low magnitude. However, where an estimated number or the numerator or denominator of a rate or percentage is small, the sampling error may be high. Charts of relative sampling errors and instructions for their use are shown in appendix I.

Definitions of terms used in this report are given in appendix II. Some of the terms have specialized meaning, and a familiarity with the definitions will assist the reader in interpreting the data presented.

Questions on dental health that appeared on the 1971 Health Interview Survey questionnaire are reproduced in appendix III. Questions 8, 9, and 10 relate to the utilization of dental services. Question 11a identifies the edentulous population. Persons identified as having lost all their teeth were asked questions 11b-11h, as appropriate, to determine if they had a complete set of false teeth, how often the artificial dentures were worn, and whether or not the dentures were adequate.

In 1971, 71 percent of the persons who reported no teeth were self-respondents. For the remaining 29 percent, the questionnaire was completed by a related adult member of the household. In this report persons for whom another member of the household responded are referred to as proxy respondents.

SELECTED FINDINGS

Age and Sex

In 1971 an estimated 22.6 million persons—11.2 percent of the United States population—had lost all their natural teeth. The proportion of edentulous persons increased sharply with age (table 1). Only about four out of 100 adults 25-34 years of age were edentulous, while 32 out of 100 persons aged 45 years and older had no natural teeth. Age-specific percentages for females and males are plotted in figure 1.

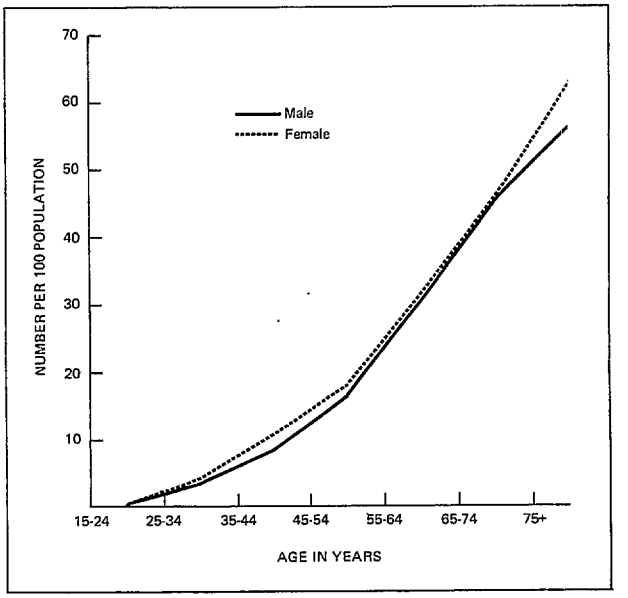

Figure 1. Number of edentulous persons per 100 population, by age and sex: United States, 1971.

Table A. Percent of edentulous persons in the population, by sex and age: United States, July 1957-June 1958 and 1971

Sex and age	July 1957-June 1958	1971
	Percent	
Both sexes		
All ages	13.0	11.2
Under 15 years	*	*
15-24 years	0.9	0.3
25-34 years	3.6	3.6
35-44 years	9.6	9.3
45-54 years	22.4	17.3
55-64 years	38.1	30.8
65-74 years	55.4	45.2
75 years and over	67.3	59.8
Male		
All ages	11.9	10.1
Under 15 years	*	*
15-24 years	0.9	0.3
25-34 years	2.6	3.2
35-44 years	8.8	8.2
45-54 years	21.9	16.5
55-64 years	35.9	30.5
65-74 years	52.8	45.0
75 years and over	62.4	56.3
Female		
All ages	14.1	12.2
Under 15 years	*	*
15-24 years	0.9	0.3
25-34 years	4.5	4.0
35-44 years	10.3	10.4
45-54 years	22.8	17.9
55-64 years	40.1	31.1
65-74 years	57.6	45.4
75 years and over	71.0	62.2

Table A shows a comparison of 1971 findings with those from the 1958 survey. Except for persons 15-24 years of age, the differences in the age-sex-specific percentages for the two sets of data are not significant in persons under age 45. At age 45 and beyond the percentage of edentulous persons decreased significantly between the two time periods. This decrease prevails for both sexes and all the age groups.

Color

The prevalence of edentulous persons was higher among whites than among blacks (table 2). The white population had a higher percentage of persons in the older age groups than did the black population, but the impact of this age distribution on the overall rate can be reduced by comparing the age-specific percentages in table 2. Figure 2 shows the proportion of edentulous persons 45 years of age and older by age, sex, and color. The age-specific percentages for females show little difference between the two groups, but the rates for black males are lower than those for their white counterparts.

In table B, which shows the percent of the population 45 years old and over who were edentulous, figures for black adults have been combined with those for adults of races other than white in the columns labeled "All other" to facilitate comparison between the 1971 estimates and those obtained in 1958. In the earlier survey whites, both male and female, had higher age-specific edentulous rates than did all other persons. The reduction in the rates that occurred for whites between the two periods did not occur for persons of all other races.

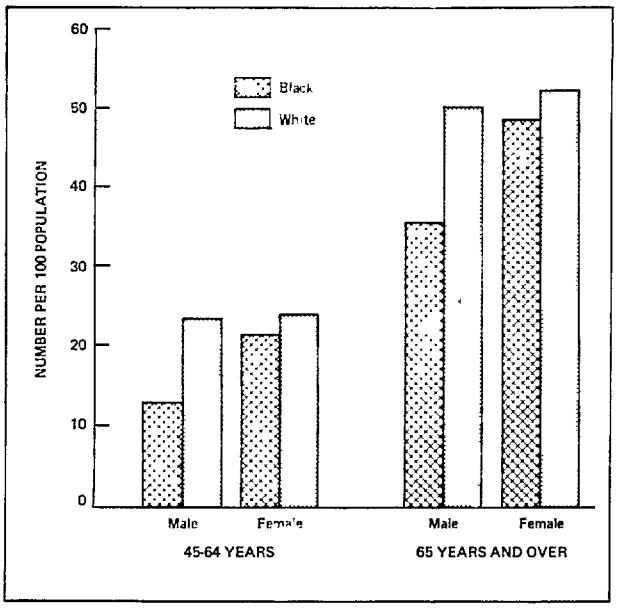

Figure 2. Number of edentulous persons per 100 population for persons aged 45 years and over, by age, race, and sex: United States, 1971.

Table B. Percent of white and all other edentulous persons 45 years and over in the population, by sex and age: United States, July 1957-June 1958 and 1971

Sex and age	White		All other[1]	
	July 1957-June 1958	1971	July 1957-June 1958	1971
	Percent			
Both sexes				
45 years and over	39.4	32.7	23.3	24.1
45-64 years	30.3	23.9	17.0	17.2
65 years and over	60.6	51.4	43.1	42.9
Male				
45 years and over	37.4	31.5	19.3	18.7
45-64 years	29.3	23.7	13.5	12.4
65 years and over	57.3	50.3	37.5	35.5
Female				
45 years and over	41.3	33.8	27.1	29.1
45-64 years	31.3	24.1	20.3	21.3
65 years and over	63.3	52.3	48.2	48.7

[1]Figures for black persons have been combined with those for persons of races other than white to facilitate comparison between the 1971 estimates and those obtained in the July 1957-June 1958 survey.

Income and Education

As family income increased, the percentage of persons who had lost all their natural teeth decreased (table 3). In addition, the proportion of edentulous persons was related to the educational attainment of the individual (table 4); in each age group over 25 the percentage remained the same or decreased as educational level increased. Table C shows the percent of edentulous persons by family income and level of education for persons aged 45-64 and 65 years of age and older. For each of the three income levels the percentage decreased as educational level increased. For each level of education the percentage decreased as the level of family income increased. In the age group 45-64, 36.9 percent of the persons with less than 9 years of education and a family income of less than $5,000 had lost all their natural teeth. In this same age group only 12.1 percent of the individuals with 12 or more years of education and family income of $10,000 or more were edentulous. Even for persons 65 and over, only three out of 10 individuals who had 12 or more years of education and a family income of $10,000 or more were edentulous.

Place of Residence and Geographic Region

Standard metropolitan statistical areas (SMSA's) had a lower proportion of edentulous persons than did other areas for all age groups beginning at age 25 (table 5).

Edentulous rates by the four major geographic regions are shown in table 6. In the age groups 45-64 and 65 and over, the North Central and South Regions had higher percentages of persons who had lost all their natural teeth than did the Northeast and West Regions.

Dental Visits—Volume, Interval, and Type of Service

Persons who were edentulous at the time of the survey made an estimated 10.7 million dental visits during 1971. The number of dental visits per person per year for this population was 0.5 (table 7). Among persons who had made at least one dental visit during the past 12 months, edentulous persons made an estimated 3.9 visits per person per year compared with 3.3 visits per person per year for other persons (table 8).

Table D compares the 1971 age-specific rates for dental visits by edentulous persons with the rates obtained in the 1958 survey. For the total of edentulous persons of all ages, both the rate for all persons and the rate for those with one or more visits in the past 12 months were higher in the 1958 survey. Although the number of dental visits for persons who had lost all

Table C. Percent of edentulous persons aged 45 years and over in the population, by family income, age, and educational level of the individual: United States, 1971

Age and educational level	Family income			
	All incomes[1]	Less than $5,000	$5,000-$9,999	$10,000 or more
	Percent			
45-64 years				
Total[2]	23.3	32.9	27.7	16.3
Less than 9 years	34.3	36.9	34.3	30.1
9-11 years	28.7	33.9	30.4	24.9
12 years or more	15.9	25.2	21.4	12.1
65 years and over				
Total[2]	50.7	56.4	46.6	38.9
Less than 9 years	58.0	60.2	56.1	50.1
9-11 years	51.1	54.9	47.0	42.4
12 years or more	37.2	46.1	33.9	29.6

[1]Includes unknown income.
[2]Includes unknown education.

Table D. Number of dental visits per person per year for all edentulous persons and for edentulous persons reporting dental visits in the past 12 months, by age: United States, July 1957-June 1958 and 1971

Age	All edentulous persons		Edentulous persons reporting dental visit in past 12 months	
	July 1957-June 1958	1971	July 1957-June 1958	1971
	Visits per person per year			
All ages	0.8	0.5	7.4	3.9
Under 25 years	*	*	*	*
25-44 years	1.5	0.7	8.4	3.7
45-64 years	0.8	0.5	7.5	3.9
65 years and over	0.5	0.3	6.7	4.0

Table E. Percent of edentulous persons reporting dental visits in the past 12 months, by age: United States, July 1957-June 1958 and 1971

Age	July 1957-June 1958	1971
	Percent	
All ages	10.7	11.9
Under 25 years	38.6	54.5
25-44 years	17.7	17.6
45-64 years	11.0	13.3
65 years and over	7.3	8.4

their natural teeth decreased between the 1958 and 1971 surveys, there was a slight increase in the percent reporting a dental visit in the past 12 months (table E).

The majority (60.5 percent) of the edentulous population had not seen a dentist within the past 5 years (table 9). About half (50.4 percent) of all persons in the United States who had not seen a dentist within 5 years were edentulous.

Denture work was the reported reason for 76.3 percent of dental visits made by edentulous persons. Most of the remaining visits involved extractions, gum treatment, and examination. Type of service statistics are estimates based on dental visits occurring in the 2-week period prior to the interview (appendix III, questions 8 and 9).

Possession, Use, and Adequacy of False Teeth

Approximately 1.8 million edentulous persons had either an incomplete set of artificial teeth (that is, upper or lower plate only) or no artificial denture at all. An additional 2.6 million individuals had a complete set of false teeth that they did not wear all the time, and two-thirds of these persons never used their false teeth (table 10). Among edentulous persons a higher percentage of males than females did not have false teeth, 7.2 and 3.5 percent respectively. The frequency with which artificial dentures were worn by persons with a complete set did not differ by sex.

While 21.5 million persons with no natural teeth indicated that they had dentures, almost 6.5 million—three out of every 10 persons who had artificial dentures—thought that their dentures needed refitting or that they needed new dentures (table 11). Nearly one out of every two edentulous persons who had a complete set of false teeth but did not wear them all the time indicated a need for new dentures or for denture refitting. This ratio dropped to about one out of four among persons who wore their dentures all the time. Self-respondents reported needing new dentures or refitting of dentures more often than did proxy respondents.

Comments

Applying life table techniques and using Health Interview Survey prevalence rates for edentulous persons, Greville[6] estimated the probability of a dentulous person of specified age being alive and edentulous at a subsequent age. He partitioned the expectation of life (in years) for specified ages between dentulous and edentulous years and concluded that the proportion of edentulous years was less in 1971 than 13 years earlier.

Moen and Poetsch[7] recently concluded that the dental health of the United States population improved significantly between 1959 and 1969. Their conclusion was based on a decline in the percentage of persons having extractions, fillings, and denture work and a concurrent increase in the percentage of persons receiving preventive dental services. This improvement in dental health is supported by Health Interview Survey data which show that the prevalence of edentulous persons 45 years of age and older decreased over a 13-year period ending in 1971. This decrease in the prevalence of persons with no natural teeth has taken place almost entirely among the white population, though it should be noted that in 1958 the percentage of edentulous persons aged 45 years old and older was substantially greater among whites than among adults of other races.

The associations observed between family income, educational attainment, and edentulous

rates are not surprising. The least expensive type of dental care is often the extraction of the affected tooth. Extraction may be the only alternative for the individual who postpones dental treatment, and in low income families dental care is likely to be a low-priority item. On the other other hand, a higher educational level might be expected to coincide with a greater awareness of the importance of preventive and restorative dental measures.

Although the data presented indicate that edentulous rates in the United States have decreased since the 1958 survey, there is evidence within the edentulous population of poor dental habits and dissatisfaction with their artificial dentures. In an older population (45 years and over) where oral structures are subject to changes associated with aging, only slightly more than one out of 10 persons reported having seen a dentist in the past 12 months, and six out of 10 had not seen a dentist in 5 years. This almost total disregard for frequent periodic dental checkups occurred despite the fact that 6.5 million individuals in the edentulous population indicated that their dentures were in need of repair. The high proportion of the edentulous population represented by persons who do not have dentures, have them but do not use them, or continue to use dentures which are in need of repair suggests the need for a complete review of all aspects of our dental care system as it relates to individuals who have lost all their natural teeth.

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LIST OF DETAILED TABLES

Table 1. Total population and number and percent of edentulous persons, by sex and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	All persons	Edentulous persons	
	Number in thousands		Percent
Both sexes			
All ages	202,360	22,643	11.2
Under 15 years	58,563	*	*
15-24 years	35,256	110	0.3
25-34 years	25,183	910	3.6
35-44 years	22,246	2,070	9.3
45-54 years	23,246	4,015	17.3
55-64 years	18,518	5,707	30.8
65-74 years	12,044	5,448	45.2
75 years and over	7,305	4,371	59.8
Male			
All ages	97,603	9,838	10.1
Under 15 years	29,834	*	*
15-24 years	16,905	54	0.3
25-34 years	12,146	389	3.2
35-44 years	10,696	874	8.2
45-54 years	11,137	1,843	16.5
55-64 years	8,695	2,654	30.5
65-74 years	5,299	2,387	45.0
75 years and over	2,892	1,628	56.3
Female			
All ages	104,757	12,805	12.2
Under 15 years	28,729	*	*
15-24 years	18,351	56	0.3
25-34 years	13,037	522	4.0
35-44 years	11,550	1,197	10.4
45-54 years	12,109	2,172	17.9
55-64 years	9,822	3,053	31.1
65-74 years	6,745	3,061	45.4
75 years and over	4,413	2,743	62.2

NOTE: For official population estimates for more general use, see U.S. Bureau of the Census reports on the civilian population of the United States in Current Population Reports, Series P-20, P-25, and P-60.

Table 2. Total population and number and percent of edentulous persons, by race, sex, and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	White			Black		
	All persons	Edentulous persons		All persons	Edentulous persons	
Both sexes	Number in thousands		Percent	Number in thousands		Percent
All ages	177,093	21,106	11.9	22,994	1,445	6.3
Under 25 years	79,698	111	0.1	12,945	*	*
25-44 years	41,884	2,822	6.7	4,892	152	3.1
45-64 years	37,737	9,030	23.9	3,698	653	17.7
65 years and over	17,774	9,144	51.4	1,460	630	43.2
Male						
All ages	85,640	9,314	10.9	10,806	490	4.5
Under 25 years	39,801	58	0.1	6,342	*	*
25-44 years	20,355	1,219	6.0	2,169	*	*
45-64 years	17,988	4,269	23.7	1,660	214	12.9
65 years and over	7,496	3,768	50.3	635	227	35.7
Female						
All ages	91,453	11,793	12.9	12,187	955	7.8
Under 25 years	39,896	53	0.1	6,602	*	*
25-44 years	21,529	1,603	7.4	2,723	109	4.0
45-64 years	19,749	4,761	24.1	2,037	439	21.6
65 years and over	10,279	5,376	52.3	825	403	48.8

NOTE: For official population estimates for more general use, see U.S. Bureau of the Census reports on the civilian population of the United States in Current Population Reports, Series P-20, P-25, and P-60.

Table 3. Number and percent of edentulous persons in the population, by family income and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Age	Family income						
	All incomes[1]	Less than $3,000	$3,000-$4,999	$5,000-$6,999	$7,000-$9,999	$10,000-$14,999	$15,000 or more
	Number in thousands						
All ages	22,643	5,073	3,843	3,235	3,609	3,405	1,860
Under 25 years	121	*	*	*	*	*	*
25-44 years	2,981	174	267	443	764	825	348
45-64 years	9,722	1,196	1,314	1,536	1,989	1,931	1,036
65 years and over	9,819	3,692	2,251	1,234	825	630	458
	Percent						
All ages	11.2	25.7	18.1	11.9	9.7	7.0	5.2
Under 25 years	0.1	*	*	*	*	*	*
25-44 years	6.3	7.9	8.0	7.6	7.7	5.8	3.7
45-64 years	23.3	33.5	32.4	28.0	27.4	20.7	11.7
65 years and over	50.7	58.5	53.2	46.2	47.3	42.0	35.2

[1]Includes unknown income.

Table 4. Number and percent of edentulous persons in the population, by educational level of the individual and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Age	Educational level of the individual				
	All levels[1]	Less than 9 years	9-11 years	12 years	13 years or more
	Number in thousands				
All ages	22,643	10,348	4,587	5,253	1,869
Under 25 years	121	*	*	53	*
25-44 years	2,981	616	914	1,195	219
45-64 years	9,722	3,783	2,264	2,648	864
65 years and over	9,819	5,943	1,372	1,358	778
	Percent				
All ages	11.2	36.9	17.6	11.1	5.9
Under 25 years	0.1	*	*	0.5	*
25-44 years	6.3	11.3	11.4	6.1	1.6
45-64 years	23.3	34.3	28.7	19.0	10.6
65 years and over	50.7	58.0	51.1	42.4	30.8

[1]Includes unknown education.

Table 5. Number and percent of edentulous persons in the population, by place of residence and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Age	Place of residence			
	All residences	SMSA	Outside SMSA	
			Nonfarm	Farm
	Number in thousands			
All ages	22,643	12,686	8,646	1,311
Under 25 years	121	70	*	*
25-44 years	2,981	1,568	1,273	140
45-64 years	9,722	5,548	3,538	635
65 years and over	9,819	5,499	3,789	531
	Percent			
All ages	11.2	9.8	13.5	15.8
Under 25 years	0.1	0.1	*	*
25-44 years	6.3	5.0	8.8	8.9
45-64 years	23.3	20.4	28.4	29.2
65 years and over	50.7	47.4	55.9	54.5

Table 6. Number and percent of edentulous persons in the population, by geographic region and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Age	Geographic region				
	United States	North-east	North Central	South	West
	Number in thousands				
All ages	22,643	5,189	7,070	7,186	3,199
Under 25 years	121	*	*	*	*
25-44 years	2,981	598	1,035	917	431
45-64 years	9,722	2,208	3,054	3,058	1,402
65 years and over	9,819	2,350	2,940	3,176	1,353
	Percent				
All ages	11.2	10.7	12.6	11.4	9.1
Under 25 years	0.1	*	*	*	*
25-44 years	6.3	5.3	8.0	6.3	5.1
45-64 years	23.3	20.7	27.0	24.0	19.8
65 years and over	50.7	47.4	53.9	53.0	46.1

Table 7. Number of dental visits and number of dental visits per person per year, by whether person was edentulous, sex, and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	All persons	Edentulous persons	Other persons	All persons	Edentulous persons	Other persons
	Number of dental visits in thousands			Number of dental visits per person per year		
Both sexes						
All ages	311,943	10,668	301,275	1.5	0.5	1.7
Under 25 years	142,826	*	142,498	1.5	*	1.5
25-44 years	80,836	1,954	78,882	1.7	0.7	1.8
45-64 years	68,016	5,101	62,915	1.6	0.5	2.0
65 years and over	20,265	3,286	16,980	1.0	0.3	1.8
Male						
All ages	132,644	4,987	127,657	1.4	0.5	1.5
Under 25 years	61,280	*	61,105	1.3	*	1.3
25-44 years	32,476	1,045	31,432	1.4	0.8	1.5
45-64 years	30,773	2,304	28,469	1.6	0.5	1.9
65 years and over	8,115	1,464	6,651	1.0	0.4	1.6
Female						
All ages	179,299	5,681	173,618	1.7	0.4	1.9
Under 25 years	81,547	*	81,393	1.7	*	1.7
25-44 years	48,359	*	47,450	2.0	*	2.1
45-64 years	37,243	2,797	34,446	1.7	0.5	2.1
65 years and over	12,150	1,822	10,329	1.1	0.3	1.9

Table 8. Number of persons reporting dental visits in past 12 months and number of dental visits per person per year for those reporting visits, by whether person was edentulous, sex, and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	All persons	Edentulous persons	Other persons	All persons	Edentulous persons	Other persons
	Number of persons in thousands			Number of dental visits per person per year		
Both sexes						
All ages	95,272	2,703	92,569	3.3	3.9	3.3
Under 25 years	46,460	66	46,394	3.1	*	3.1
25-44 years	24,821	524	24,297	3.3	3.7	3.2
45-64 years	18,905	1,294	17,612	3.6	3.9	3.6
65 years and over	5,086	820	4,266	4.0	4.0	4.0
Male						
All ages	44,396	1,262	43,134	3.0	4.0	3.0
Under 25 years	22,318	*	22,285	2.7	*	2.7
25-44 years	11,229	240	10,989	2.9	4.4	2.9
45-64 years	8,763	626	8,137	3.5	3.7	3.5
65 years and over	2,086	363	1,723	3.9	4.0	3.9
Female						
All ages	50,876	1,441	49,435	3.5	3.9	3.5
Under 25 years	24,141	*	24,109	3.4	*	3.4
25-44 years	13,593	284	13,308	3.6	3.2	3.6
45-64 years	10,142	668	9,474	3.7	4.2	3.6
65 years and over	3,000	457	2,543	4.1	4.0	4.1

Table 9. Number and percent distribution of edentulous persons and other persons by interval since last dental visit, sex, and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	Interval since last dental visit											
	Total	In the past 12 months	1-4 years	5 years or more	Never seen dentist	Unknown	Total	In the past 12 months	1-4 years	5 years or more	Never seen dentist	Unknown
	Number in thousands						Percent distribution					
EDENTULOUS PERSONS												
Both sexes												
All ages-	22,643	2,703	5,845	13,708	57	330	100.0	11.9	25.8	60.5	0.3	1.5
Under 25 years-	121	66	*	*	*	*	100.0	54.5	*	*	*	*
25-44 years----	2,981	524	1,130	1,268	*	55	100.0	17.6	37.9	42.5	*	1.8
45-64 years----	9,722	1,294	2,887	5,381	*	135	100.0	13.3	29.7	55.3	*	1.4
65 years and over----------	9,819	820	1,787	7,049	*	137	100.0	8.4	18.2	71.8	*	1.4
Male												
All ages-	9,838	1,262	2,712	5,691	*	145	100.0	12.8	27.6	57.8	*	1.5
Under 25 years-	63	*	*	*	*	*	100.0	*	*	*	*	*
25-44 years----	1,263	240	483	508	*	*	100.0	19.0	38.2	40.2	*	*
45-64 years----	4,497	626	1,409	2,381	*	65	100.0	13.9	31.3	52.9	*	1.4
65 years and over----------	4,015	363	795	2,799	*	*	100.0	9.0	19.8	69.7	*	*
Female												
All ages-	12,805	1,441	3,133	8,017	*	185	100.0	11.3	24.5	62.6	*	1.4
Under 25 years-	57	*	*	*	*	*	100.0	*	*	*	*	*
25-44 years----	1,718	284	647	760	*	*	100.0	16.5	37.7	44.2	*	*
45-64 years----	5,225	668	1,477	3,000	*	70	100.0	12.8	28.3	57.4	*	1.3
65 years and over----------	5,804	457	992	4,250	*	89	100.0	7.9	17.1	73.2	*	1.5
OTHER PERSONS												
Both sexes												
All ages-	179,717	92,569	45,806	13,474	24,871	2,997	100.0	51.5	25.5	7.5	13.8	1.6
Under 25 years-	93,698	46,394	19,591	2,353	23,804	1,556	100.0	49.5	20.9	2.5	25.4	1.7
25-44 years----	44,447	24,297	14,474	4,285	594	797	100.0	54.7	32.6	9.6	1.3	1.8
45-64 years----	32,042	17,612	9,181	4,412	322	515	100.0	55.0	28.7	13.8	1.0	1.6
65 years and over----------	9,530	4,266	2,560	2,424	151	129	100.0	44.8	26.9	25.4	1.6	1.4
Male												
All ages-	87,765	43,134	22,952	7,140	12,966	1,573	100.0	49.1	26.2	8.1	14.8	1.8
Under 25 years-	46,675	22,285	9,997	1,202	12,372	820	100.0	47.7	21.4	2.6	26.5	1.8
25-44 years----	21,579	10,989	7,346	2,459	347	437	100.0	50.9	34.0	11.4	1.6	2.0
45-64 years----	15,335	8,137	4,466	2,302	166	264	100.0	53.1	29.1	15.0	1.1	1.7
65 years and over----------	4,176	1,723	1,142	1,177	82	52	100.0	41.3	27.3	28.2	2.0	1.2
Female												
All ages-	91,952	49,435	22,854	6,334	11,905	1,424	100.0	53.8	24.9	6.9	12.9	1.5
Under 25 years-	47,023	24,109	9,594	1,151	11,432	737	100.0	51.3	20.4	2.4	24.3	1.6
25-44 years----	22,868	13,308	7,127	1,826	247	359	100.0	58.2	31.2	8.0	1.1	1.6
45-64 years----	16,707	9,474	4,715	2,110	156	251	100.0	56.7	28.2	12.6	0.9	1.5
65 years and over----------	5,354	2,543	1,418	1,247	69	77	100.0	47.5	26.5	23.3	1.3	1.4

Table 10. Number and percent distribution of edentulous persons by whether they had false teeth, completeness of false teeth, and frequency of use, according to sex and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Sex and age	Total	Completeness of false teeth					
		No false teeth	Incomplete set	Complete set; uses false teeth:			Unknown[1]
				Never	Some of the time	All of the time	
		Number of persons in thousands					
Both sexes							
All ages	22,643	1,152	686	1,716	876	18,053	159
Under 25 years	121	*	*	*	*	97	*
25-44 years	2,981	110	80	175	78	2,524	*
45-64 years	9,722	427	252	664	347	7,975	57
65 years and over	9,819	604	351	874	451	7,457	83
Male							
All ages	9,838	707	293	770	364	7,636	67
Under 25 years	63	*	*	*	*	*	*
25-44 years	1,263	62	*	81	*	1,047	*
45-64 years	4,497	288	126	322	154	3,577	*
65 years and over	4,015	347	136	366	173	2,966	*
Female							
All ages	12,805	445	394	946	512	10,417	92
Under 25 years	57	*	*	*	*	50	*
25-44 years	1,718	*	53	93	*	1,477	*
45-64 years	5,225	139	126	342	194	4,398	*
65 years and over	5,804	257	215	508	278	4,491	56
		Percent distribution					
Both sexes							
All ages	100.0	5.1	3.0	7.6	3.9	79.7	0.7
Under 25 years	100.0	*	*	*	*	80.2	*
25-44 years	100.0	3.7	2.7	5.9	2.6	84.7	*
45-64 years	100.0	4.4	2.6	6.8	3.6	82.0	0.6
65 years and over	100.0	6.2	3.6	8.9	4.6	75.9	0.8
Male							
All ages	100.0	7.2	3.0	7.8	3.7	77.6	0.7
Under 25 years	100.0	*	*	*	*	*	*
25-44 years	100.0	4.9	*	6.4	*	82.9	*
45-64 years	100.0	6.4	2.8	7.2	3.4	79.5	*
65 years and over	100.0	8.6	3.4	9.1	4.3	73.9	*
Female							
All ages	100.0	3.5	3.1	7.4	4.0	81.4	0.7
Under 25 years	100.0	*	*	*	*	87.7	*
25-44 years	100.0	*	3.1	5.4	*	86.0	*
45-64 years	100.0	2.7	2.4	6.5	3.7	84.2	*
65 years and over	100.0	4.4	3.7	8.8	4.8	77.4	1.0

[1]Includes persons for whom possession, completeness, or frequency of use was unknown.

Table 11. Number and percent distribution of edentulous persons with false teeth by whether the false teeth need refitting or replacement, according to completeness of false teeth, frequency of use, and type of respondent: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Type of respondent and adequacy of false teeth	Total[1]	Incomplete set of false teeth	Complete set; uses false teeth:		
			Never	Some of the time	All of the time
	Number of persons in thousands				
All respondents[2,3]	21,454	686	1,716	876	18,053
False teeth need refitting or replacement	6,456	323	879	417	4,810
False teeth do not need refitting or replacement	14,505	327	780	432	12,891
Self-respondents[2]	15,249	480	1,228	634	12,829
False teeth need refitting or replacement	4,933	242	651	303	3,717
False teeth do not need refitting or replacement	10,031	218	544	315	8,907
Proxy respondents[2]	6,091	201	483	238	5,127
False teeth need refitting or replacement	1,493	78	225	111	1,072
False teeth do not need refitting or replacement	4,392	107	233	116	3,909
	Percent distribution				
All respondents[2,3]	100.0	100.0	100.0	100.0	100.0
False teeth need refitting or replacement	30.1	47.1	51.2	47.6	26.6
False teeth do not need refitting or replacement	67.6	47.7	45.5	49.3	71.4
Self-respondents[2]	100.0	100.0	100.0	100.0	100.0
False teeth need refitting or replacement	32.3	50.4	53.0	47.8	29.0
False teeth do not need refitting or replacement	65.8	45.4	44.3	49.7	69.4
Proxy respondents[2]	100.0	100.0	100.0	100.0	100.0
False teeth need refitting or replacement	24.5	38.8	46.6	46.6	20.9
False teeth do not need refitting or replacement	72.1	53.2	48.2	48.7	76.2

[1] Includes unknown completeness of set and unknown frequency of use.
[2] Includes unknown if dentures need to be refitted or replaced.
[3] Includes unknown type of respondent.

Table 12. Populations used in obtaining percentages shown in this publication, by selected demographic characteristics and age: United States, 1971

[Data are based on household interviews of the civilian, noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in appendix I. Definitions of terms are given in appendix II]

Characteristic	All ages	Under 25 years	25-44 years	45-64 years	65 years and over
	Number in thousands				
Total population	202,360	93,819	47,428	41,764	19,349
Family income[1]					
Less than $3,000	19,770	7,680	2,207	3,568	6,316
$3,000-$4,999	21,196	9,560	3,347	4,060	4,228
$5,000-$6,999	27,128	13,160	5,810	5,486	2,672
$7,000-$9,999	37,267	18,357	9,907	7,257	1,746
$10,000-$14,999	48,694	23,682	14,167	9,345	1,500
$15,000 or more	35,587	15,938	9,517	8,833	1,300
Educational level of individual[2]					
Under 9 years	28,075	1,375	5,438	11,018	10,244
9-11 years	26,111	7,538	7,999	7,889	2,684
12 years	47,466	10,646	19,680	13,936	3,204
13 years or more	31,534	7,116	13,702	8,186	2,530
Place of residence					
SMSA	129,828	59,771	31,322	27,142	11,593
Outside SMSA:					
Nonfarm	64,259	30,503	14,528	12,448	6,781
Farm	8,272	3,545	1,578	2,174	975
Geographic region					
Northeast	48,376	21,426	11,329	10,657	4,963
North Central	56,124	26,352	13,018	11,299	5,455
South	62,880	29,500	14,649	12,738	5,993
West	34,981	16,541	8,432	7,070	2,938

[1] Excludes unknown income.
[2] Excludes persons under 17 years old.

NOTE: For official population estimates for more general use, see U.S. Bureau of the Census reports on the civilian population of the United States in Current Population Reports, Series P-20, P-25, and P-60.

APPENDIX I

TECHNICAL NOTES ON METHODS

Background of This Report

This report is one of a series of statistical reports prepared by the National Center for Health Statistics (NCHS). It is based on information collected in a continuing nationwide sample of households in the Health Interview Survey (HIS).

The Health Interview Survey utilizes a questionnaire which obtains information on personal and demographic characteristics, illnesses, injuries, impairments, chronic conditions, and other health topics. As data relating to each of these various broad topics are tabulated and analyzed, separate reports are issued which cover one or more of the specific topics. The present report is based on data collected in household interviews during 1971.

The population covered by the sample for the Health Interview Survey is the civilian, noninstitutionalized population of the United States living at the time of the interview. The sample does not include members of the Armed Forces or U.S. nationals living in foreign countries. It should also be noted that the estimates shown do not represent a complete measure of any given topic during the specified calendar period since data are not collected in the interview for persons who died during the reference period. For many types of statistics collected in the survey, the reference period covers the 2 weeks prior to the interview week. For such a short period, the contribution by decedents to a total inventory of conditions or services should be very small. However, the contribution by decedents during a long reference period (e.g., 1 year) might be sizable, especially for older persons.

Statistical Design of the Health Interview Survey

General plan.--The sampling plan of the survey follows a multistage probability design which permits a continuous sampling of the civilian, noninstitutionalized population of the United States. The sample is designed in such a way that the sample of households interviewed each week is representative of the target population and that weekly samples are additive over time. This feature of the design permits both continuous measurement of characteristics of samples and more detailed analysis of less common characteristics and smaller categories of health-related items. The continuous collection has administrative and operational advantages as well as technical assets since it permits fieldwork to be handled with an experienced, stable staff.

The overall sample was designed so that tabulations can be provided for each of the four major geographic regions and for urban and rural sectors of the United States.

The first stage of the sample design consists of drawing a sample of 357 primary sampling units (PSU's) from approximately 1,900 geographically defined PSU's. A PSU consists of a county, a small group of contiguous counties, or a standard metropolitan statistical area. The PSU's collectively cover the 50 States and the District of Columbia.

With no loss in general understanding, the remaining stages can be combined and treated in this discussion as an ultimate stage. Within PSU's, then, ultimate stage units called segments are defined in such a manner that each segment contains an expected six households. Three general types of segments are used.

Area segments which are defined geographically.

List segments, using 1960 census registers as the frame.

Permit segments, using updated lists of building permits issued in sample PSU's since 1960.

Census address listings were used for all areas of the country where addresses were well defined and could be used to locate housing units. In general the list frame included the larger urban areas of the United States from which about two-thirds of the HIS sample was selected.

The usual HIS sample consists of approximately 8,000 segments containing 57,000 assigned households, of which 11,000 were vacant, demolished, or occupied by persons not in the scope of the survey. The 46,000 eligible occupied households yield a probability sample of about 134,000 persons in 44,000 interviewed households in a year.

Descriptive material on data collection, field procedures, and questionnaire development in the HIS has been published[8] as well as a detailed description of the sample design[9] and a report on the estimation procedure and the method used to calculate sampling errors of estimates derived from the survey.[10]

Collection of data.—Field operations for the survey are performed by the U.S. Bureau of the Census under specifications established by the National Center for Health Statistics. In accordance with these specifications the Bureau of the Census participates in survey planning, selects the sample, and conducts the field interviewing as an agent of NCHS. The data are coded, edited, and tabulated by NCHS.

Estimating procedures.—Since the design of the HIS is a complex multistage probability sample, it is necessary to use complex procedures in the derivation of estimates. Four basic operations are involved:

1. *Inflation by the reciprocal of the probability of selection.*—The probability of selection is the product of the probabilities of selection from each step of selection in the design (PSU, segment, and household).
2. *Nonresponse adjustment.*—The estimates are inflated by a multiplication factor which has as its numerator the number of sample households in a given segment and as its denominator the number of households interviewed in that segment.
3. *First-stage ratio adjustment.*—Sampling theory indicates that the use of auxiliary information which is highly correlated with the variables being estimated improves the reliability of the estimates. To reduce the variability between PSU's within a region, the estimates are ratio adjusted to the 1960 populations within six color-residence classes.
4. *Poststratification by age-sex-color.*—The estimates are ratio adjusted within each of 60 age-sex-color cells to an independent estimate of the population of each cell for the survey period. These independent estimates are prepared by the Bureau of the Census. Both the first-stage and poststratified ratio adjustments take the form of multiplication factors applied to the weight of each elementary unit (person, household, condition, and hospitalization).

The effect of the ratio-estimating process is to make the sample more closely representative of the civilian, noninstitutionalized population by age, sex, color, and residence, which thereby reduces sampling variance.

As noted, each week's sample represents the population living during that week and characteristics of the population. Consolidation of samples over a time period, e.g., a calendar quarter, produces estimates of average characteristics of the U.S. population for the calendar quarter. Similarly, population data for a year are averages of the four quarterly figures.

For prevalence statistics, such as number of persons with speech impairments or number of persons classified by time interval since last physician visit, figures are first calculated for each calendar quarter by averaging estimates for all weeks of interviewing in the quarter. Prevalence data for a year are then obtained by averaging the four quarterly figures.

NOTE: The list of references follows the text.

For other types of statistics—namely those measuring the number of occurrences during a specified time period—such as incidence of acute conditions, number of disability days, or number of visits to a doctor or dentist, a similar computational procedure is used, but the statistics are interpreted differently. For these items, the questionnaire asks for the respondent's experience over the 2 calendar weeks prior to the week of interview. In such instances the estimated quarterly total for the statistic is 6.5 times the average 2-week estimate produced by the 13 successive samples taken during the period. The annual total is the sum of the four quarters. Thus the experience of persons *interviewed during a year*—experience which actually occurred for each person in a 2-calendar-week interval prior to week of interview—is treated as though it measured the total of such experience *during the year.* Such interpretation leads to no significant bias.

General Qualifications

Nonresponse.—Data were adjusted for nonresponse by a procedure which imputes to persons in a household which was not interviewed the characteristics of persons in households in the same segment which were interviewed. The total noninterview rate, the ratio of the total noninterviewed eligible households to the total eligible households, was 3.6 percent, including a 1.1-percent refusal rate with the remainder primarily due to the failure to find an eligible respondent at home after repeated calls.

The interview process.—The statistics presented in this report are based on replies obtained in interviews with persons in the sample households. Each person 19 years of age and over present at the time of interview was interviewed individually. For children and for adults not present in the home at the time of the interview, the information was obtained from a related household member such as a spouse or the mother of a child.

There are limitations to the accuracy of diagnostic and other information collected in household interviews. For diagnostic information, the household respondent can usually pass on to the interviewer only the information the physician has given to the family. For conditions not medically attended, diagnostic information is often no more than a description of symptoms. However, other facts, such as the number of disability days caused by the condition, can be obtained more accurately from household members than from any other source since only the persons concerned are in a position to report this information.

Rounding of numbers.—The original tabulations on which the data in this report are based show all estimates to the nearest whole unit. All consolidations were made from the original tabulations using the estimates to the nearest unit. In the final published tables, the figures are rounded to the nearest thousand, although these are not necessarily accurate to that detail. Devised statistics such as rates and percent distributions are computed after the estimates on which these are based have been rounded to the nearest thousand.

Population figures.—Some of the published tables include population figures for specified categories. Except for certain overall totals by age, sex, and color, which are adjusted to independent estimates, these figures are based on the sample of households in the HIS. These are given primarily to provide denominators for rate computation, and for this purpose are more appropriate for use with the accompanying measures of health characteristics than other population data that may be available. With the exception of the overall totals by age, sex, and color mentioned above, the population figures differ from figures (which are derived from different sources) published in reports of the Bureau of the Census. Official population estimates are presented in Bureau of the Census reports in Series P-20, P-25, and P-60.

Reliability of Estimates

Since the statistics presented in this report are based on a sample, they will differ somewhat from the figures that would have been obtained if a complete census had been taken using the same schedules, instructions, and interviewing personnel and procedures.

As in any survey, the results are also subject to reporting and processing errors and errors due to nonresponse. To the extent possible, these types of errors were kept to a minimum by

methods built into survey procedures. Although it is very difficult to measure the extent of bias in the Health Interview Survey, a number of studies have been conducted to study this problem. The results have been published in several reports. [11-15]

The standard error is primarily a measure of sampling variability, that is, the variations that might occur by chance because only a sample of the population is surveyed. As calculated for this report, the standard error also reflects part of the variation which arises in the measurement process. It does not include estimates of any biases which might be in the data. The chances are about 68 out of 100 that an estimate from the sample would differ from a complete census by less than the standard error. The chances are about 95 out of 100 that the difference would be less than twice the standard error and about 99 out of 100 that it would be less than 2½ times as large.

The relative standard error of an estimate is obtained by dividing the standard error of the estimate by the estimate itself and is expressed as a percentage of the estimate. For this report, asterisks are shown for any cell with more than a 30-percent relative standard error. Included in this appendix are charts from which the relative standard errors can be determined for estimates shown in the report. In order to derive relative errors which would be applicable to a wide variety of health statistics and which could be prepared at a moderate cost, a number of approximations were required. As a result, the charts provide an estimate of the approximate relative standard error rather than the precise error for any specific aggregate or percentage.

Three classes of statistics for the health survey are identified for purposes of estimating variances.

Narrow range.—This class consists of (1) statistics which estimate a population attribute, e.g., the number of persons in a particular income group, and (2) statistics for which the measure for a single individual during the reference period used in data collection is usually either 0 or 1 or on occasion may take on the value 2 or very rarely 3.

Medium range.—This class consists of other statistics for which the measure for a single individual during the reference period used in data collection will rarely lie outside the range 0 to 5.

Wide range.—This class consists of statistics for which the measure for a single individual during the reference period used in data collection can range from 0 to a number in excess of 5, e.g., the number of days of bed disability.

In addition to classifying variables according to whether they are narrow-, medium-, or wide-range, statistics in the survey are further defined as:

Type A. Statistics on prevalence and incidence for which the period of reference in the questionnaire is 12 months.

Type B. Incidence-type statistics for which the period of reference in the questionnaire is 2 weeks.

Type C. Statistics for which the reference period is 6 months.

Only the charts on sampling error applicable to data contained in this report are presented.

General rules for determining relative sampling errors.—The "guide" on page 24, together with the following rules, will enable the reader to determine approximate relative standard errors from the charts for estimates presented in this report.

Rule 1. *Estimates of aggregates:* Approximate relative standard errors for estimates of aggregates such as the number of persons with a given characteristic are obtained from appropriate curves on page 25. The number of persons in the total U.S. population or in an age-sex-color class of the total population is adjusted to official Bureau of the Census figures and is not subject to sampling error.

Rule 2. *Estimates of percentages in a percent distribution:* Relative standard errors

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NOTE: The list of references follows the text.

for percentages in a percent distribution of a total are obtained from appropriate curves on pages 26 and 27. For values which do not fall on one of the curves presented in the chart, visual interpolation will provide a satisfactory approximation.

Rule 3. *Estimates of rates where the numerator is a subclass of the denominator:* This rule applies for prevalence rates or where a unit of the numerator occurs, with few exceptions, only once in the year for any one unit in the denominator. For example, in computing the rate of visual impairments per 1,000 population, the numerator consisting of persons with the impairment is a subclass of the denominator, which includes all persons in the population. Such rates if converted to rates per 100 may be treated as though they were percentages and the relative standard errors obtained from the chart P4AN-M. Rates per 1,000, or on any other base, must first be converted to rates per 100; then the percentage chart will provide the relative standard error per 100.

Rule 4. *Estimates of rates where the numerator is not a subclass of the denominator:* This rule applies where a unit of the numerator often occurs more than once for any one unit in the denominator. For example, in the computation of the number of persons injured per 100 currently employed persons per year, it is possible that a person in the denominator could have sustained more than one of the injuries included in the numerator. Approximate relative standard errors for rates of this kind may be computed as follows:

(a) Where the denominator is the total U.S. population or includes all persons in one or more of the age-sex-color groups of the total population, the relative error of the rate is equivalent to the relative error of the numerator, which can be obtained directly from the appropriate chart.

(b) In other cases the relative standard error of the numerator and of the denominator can be obtained from the appropriate curve. Square each of these relative errors, add the resulting values, and extract the square root of the sum. This procedure will result in an upper bound on the standard error and often will overstate the error.

Rule 5. *Estimates of difference between two statistics (mean, rate, total, etc.):* The standard error of a difference is approximately the square root of the sum of the squares of each standard error considered separately. A formula for the standard error of a difference,

$$d = X_1 - X_2$$

is

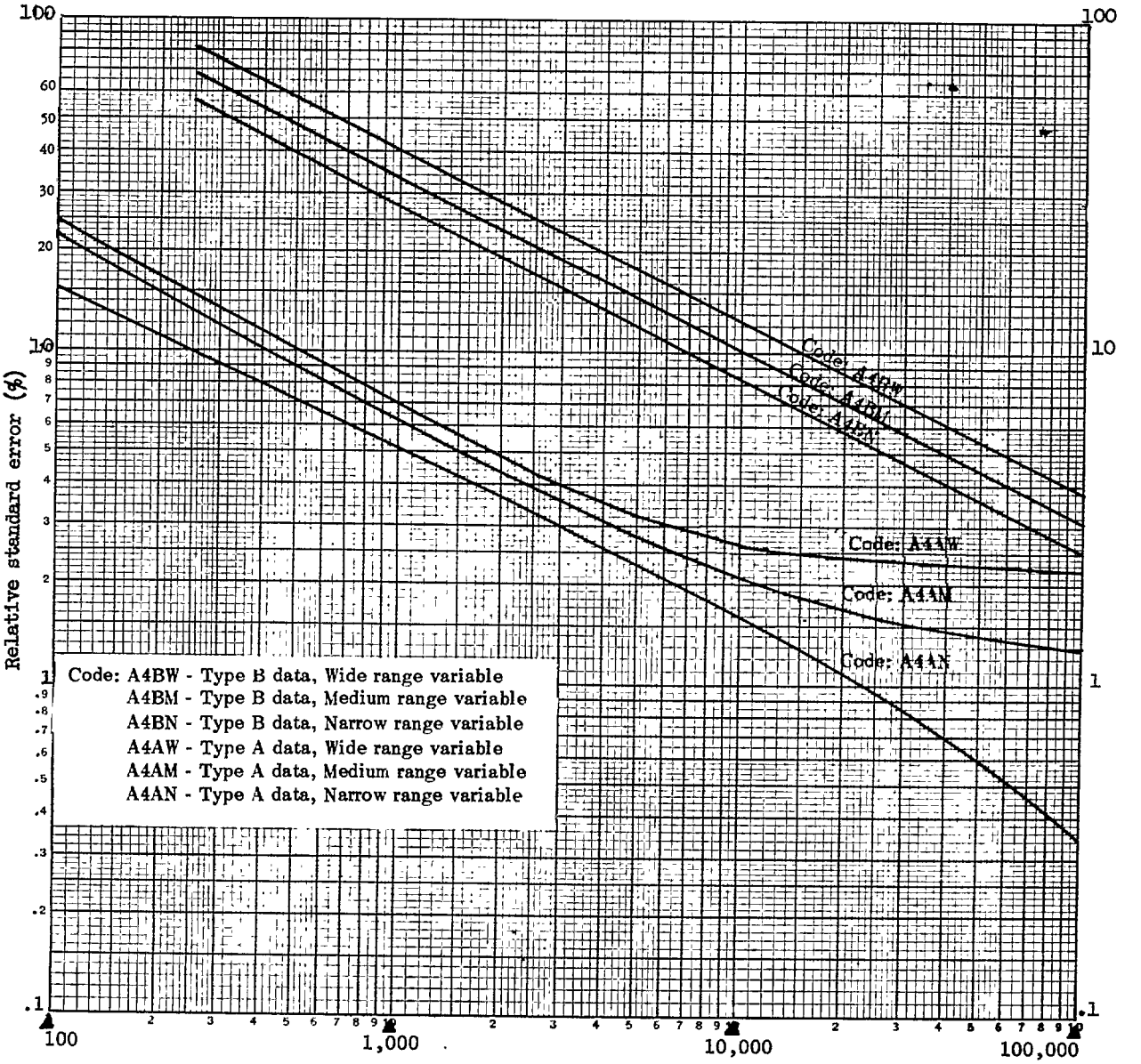
$$\sigma_d = \sqrt{(X_1 V_{x1})^2 + (X_2 V_{x2})^2}$$

where X_1 is the estimate for class 1, X_2 is the estimate for class 2, and V_{x1} and V_{x2} are the relative errors of X_1 and X_2 respectively. This formula will represent the actual standard error quite accurately for the difference between separate and uncorrelated characteristics although it is only a rough approximation in most other cases. The relative standard error of each estimate involved in such a difference can be determined by one of the four rules above, whichever is appropriate.

The code shown below identifies the appropriate curve to be used in estimating the relative standard error of the statistic described. The four components of each code describe the statistic as follows: (1) A = aggregate, P = percentage; (2) the number of calendar quarters of data collection; (3) the type of statistic as described on page 22; and (4) the range of the statistic as described on page 22.

Statistic	Use:		
	Rule	Code	On page
Number of:			
Persons in total U.S. population or total in any age-sex-color category		Not subject to sampling error	
Edentulous persons	1	A4AN	25
Persons in any other population group	1	A4AN	25
Dental visits	1	A4BM	25
Percent of edentulous persons in any population group	3	P4AN-M	26
Percentage distribution of:			
Edentulous persons	2	P4AN-M	26
Dental visits by type of service	2	P4BN-M	27
Persons by interval since last dental visit	2	P4AN-M	26
Number of dental visits:			
Per person in total U.S. population or per person in any age-sex-color group of the U.S. population	4(a)	A4BM	25
Per person in any other population group	4(b)	Numer. : A4BM	25
		Denom. : A4AN	25

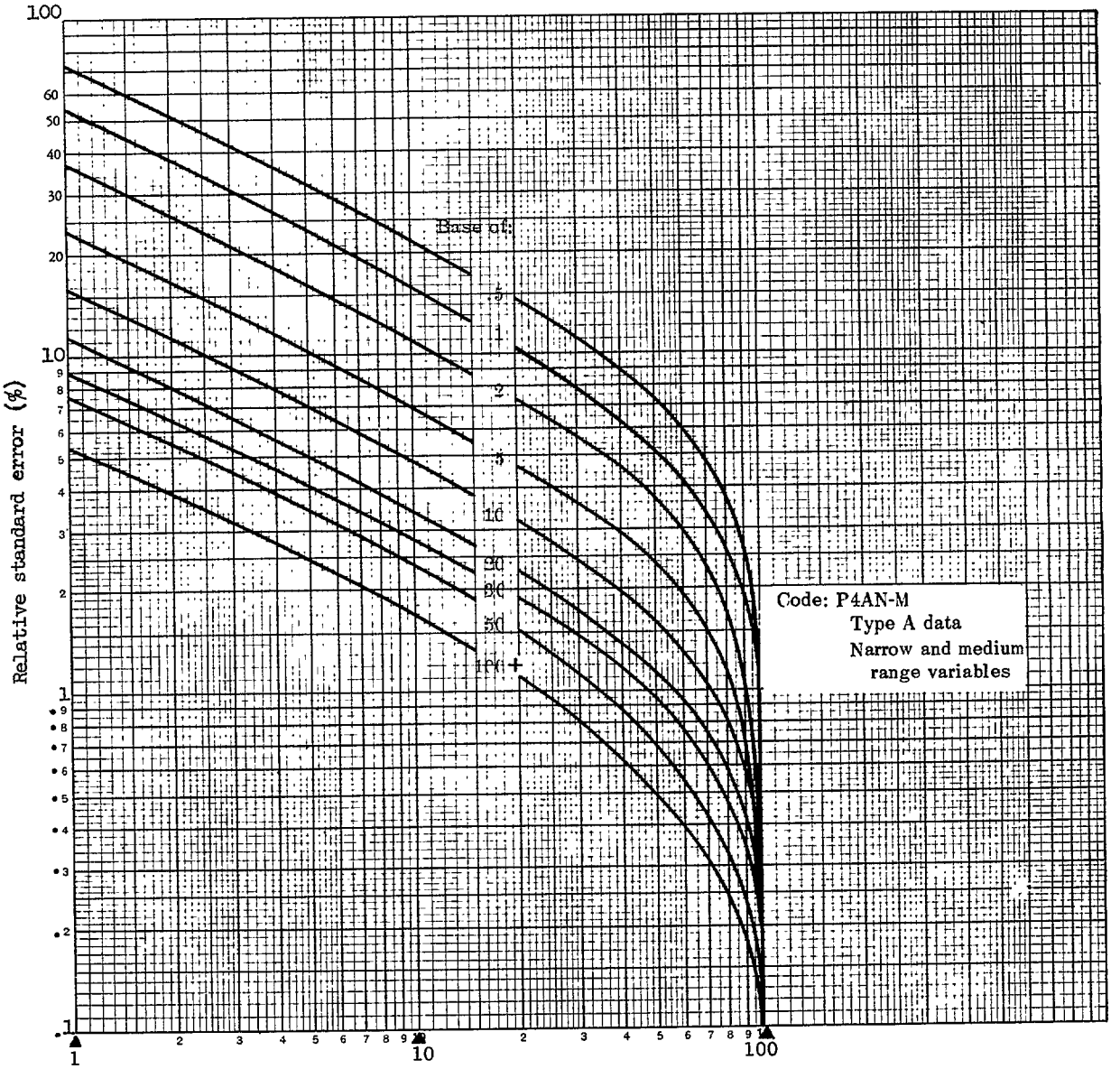
Relative standard errors for aggregates based on four quarters of data collection for data of all types and ranges



Example of use of chart: An aggregate of 2,000,000 (on scale at bottom of chart) for a Narrow range Type A statistic (code: A4AN) has a relative standard error of 3.6 percent, (read from scale at left side of chart), or a standard error of 72,000 (3.6 percent of 2,000,000). For a Wide range Type B statistic (code: A4BW), an aggregate of 6,000,000 has a relative error of 16.0 percent or a standard error of 960,000 (16 percent of 6,000,000).

Relative standard errors for percentages based on four quarters of data collection for type A data, Narrow and Medium range

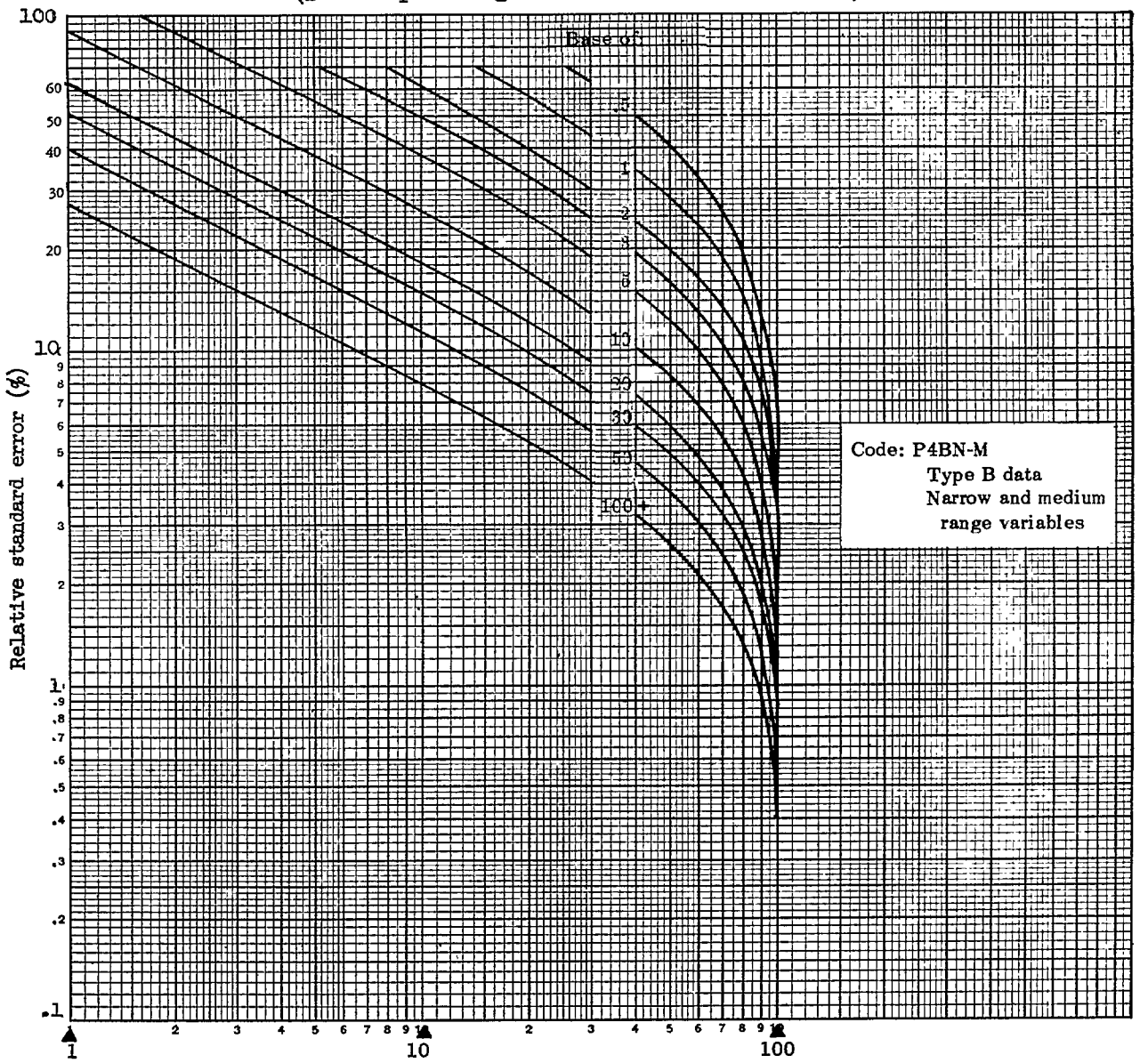
(Base of percentage shown on curves in millions)



Example of use of chart: An estimate of 20 percent (on scale at bottom of chart) based on an estimate of 10,000,000 has a relative standard error of 3.2 percent (read from the scale at the left side of the chart), the point at which the curve for a base of 10,000,000 intersects the vertical line for 20 percent. The standard error in percentage points is equal to 20 percent X 3.2 percent or 0.64 percentage points.

Relative standard errors for percentages based on four quarters of data collection for type B data, Narrow and Medium range

(Base of percentage shown on curves in millions)



Example of use of chart: An estimate of 20 percent (on scale at bottom of chart) based on an estimate of 10,000,000 has a relative standard error of 17.0 percent (read from scale at the left side of the chart), the point at which the curve for a base of 10,000,000 intersects the vertical line for 20 percent. The standard error in percentage points is equal to 20 percent X 17.0 percent or 3.4 percentage points.

APPENDIX II
DEFINITIONS OF CERTAIN TERMS USED IN THIS REPORT

Dental Terms

Edentulous persons.—Persons who have lost all their permanent teeth are classed as edentulous persons. An edentulous person may have dentures but does not have any natural teeth.

False teeth.—False teeth are artificial dentures. A complete set includes both upper and lower plates; an incomplete set has either an upper or a lower plate but not both.

Frequency of use of false teeth.—For this report the use of dentures was defined for all edentulous persons who had a complete set of false teeth according to answers to questions 11e and 11f of the questionnaire as follows:

> *Use false teeth all the time* means use of false teeth all the time, both when the user is eating and when he is not.
>
> *Use false teeth some of the time* means use of false teeth either when the user is eating or when he is not, but not both.

Dental visit.—A dental visit is defined as any visit to a dentist's office for treatment or advice, including services by a technician or hygienist acting under a dentist's supervision.

Interval since last dental visit.—The interval since the last dental visit is the length of time prior to the week of interview since a dentist or dental hygienist was last visited for treatment or advice of any type.

Type of dental service.—A dental service is a service received when a dentist or dental hygienist is visited. For purposes of this survey, dental services have been categorized into a number of broad types. If a single dental visit involves more than one type of dental service, each type of service is recorded. If a particular type of service is rendered more than once during a single visit, the type of service is nevertheless recorded only once. For example, if during a single dental visit one tooth is extracted and three teeth are filled, the types of services rendered during that visit are recorded as "extractions" and "fillings," each category being recorded only once. The categories of type of dental service are defined as follows:

Fillings include temporary fillings, permanent fillings, inlays, crowns, and similar procedures.

Extractions include any dental surgery and related activity such as removal of stitches.

Cleaning or examination includes all forms of dental prophylaxis, checkup, consultation, and X-rays.

Straightening includes orthodontic treatment and brace work and also fitting or repair of braces.

Gum treatment includes all periodontal work except prophylaxis.

Denture work includes taking impressions for false teeth, plate fitting or repair, and bridge work.

Other includes all types of dental service not listed above.

Demographic Terms

Age.—The age recorded for each person is the age at last birthday. Age is recorded in single years and grouped in a variety of distributions depending on the purpose of the table.

Color.—The population is divided into two color groups, "white" and "all other." "All other" includes black, American Indian, Chinese, Japanese, and any other race. Mexican persons are included with "white" unless definitely known to be Indian or of another race.

Income of family or of 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 (or by an unrelated individual) in the 12-month period preceding the week of interview. Income from all sources is included, e.g., wages, salaries, rents from property, pensions, and help from relatives.

Education.—The categories of education status show the years of school completed. Only years 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.

Education of individual.—Each person aged 17 years or older is classified by education in terms of the highest grade of school completed.

Geographic region.—For the purpose of classifying the population by geographic area, the States are grouped into four regions. These regions, which correspond to those used by the U.S. Bureau of the Census, are shown in figure I.

Place of residence.—The place of residence of a member of the civilian, noninstitutionalized population is classified as inside a standard metropolitan statistical area (SMSA) or outside an SMSA and either farm or nonfarm.

Standard metropolitan statistical areas.—The definitions and titles of SMSA's are established by the U.S. Office of Management and Budget with the advice of the Federal Committee on Standard Metropolitan Statistical Areas. There were 212 SMSA's defined for the 1960 decennial census.

The definition of an individual SMSA involves two considerations: first, a city or cities of specified population which constitute the central city and identify the county in which it is located as the central county; second, economic and social relationships with contiguous counties (except in New England) which are metropolitan in character so that the periphery of the specific metropolitan area may be determined. SMSA's are not limited by State boundaries. In New England SMSA's consist of towns and cities, rather than counties. The metropolitan population in this report is based on SMSA's as defined in the 1960 census and does not include any subsequent additions or changes.

Central cities.—Each SMSA must include at least one central city. The complete title of an SMSA identifies the central city or cities. If only one

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

Figure I.

central city is designated, then it must have 50,000 inhabitants or more. The area title may include, in addition to the largest city, up to two city names on the basis and in the order of the following criteria: (1) the additional city has at least 250,000 inhabitants or (2) the additional city has a population of one-third or more of that of the largest city and a minimum population of 25,000. An exception occurs where two cities have contiguous boundaries and constitute, for economic and social purposes, a single community of at least 50,000, the smaller of which must have a population of at least 15,000.

Farm and nonfarm residence.—The population residing outside SMSA's is subdivided into the farm population, which comprises all non-SMSA residents living on farms, and the nonfarm population, which comprises the remaining outside SMSA population. The farm population includes persons living on places of 10 acres or more 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 outside an SMSA were classified as nonfarm if their household paid rent for the house but their rent did not include any land used for farming.

Sales of farm products refer to the gross receipts from the sale of field crops, vegetables, fruits, nuts, livestock and livestock products (milk, wool, etc.), poultry and poultry products, and nursery and forest products produced on the place and sold at any time during the preceding 12 months.

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APPENDIX III

HEALTH INTERVIEW SURVEY QUESTIONNAIRE, 1971—DENTAL QUESTIONS

8a. During the past 2 weeks, did anyone in the family, (that is, you, your —, etc.) go to a dentist? Y *(8b and c)* N *(10)*		
b. Who was this? – Mark "Dental visit," box in person's column.	8b.	☐ Dental visit
c. During the past 2 weeks, did anyone else in the family go to a dentist? Y *(Reask 8b and c)* N		
If "Dental visit," ask: d. During the past 2 weeks, how many times did — go to a dentist?	d.	____No. of dental visits *(NP)*
For each dental visit, ask: 9a. What did — have done (the last time, the time before, etc.)? *(Mark all that apply for each visit)* b. Anything else?	9a. & b.	1 2 3 ☐ ☐ ☐ Cleaning teeth ☐ ☐ ☐ Exam. (X-ray) ☐ ☐ ☐ Fillings ☐ ☐ ☐ Extractions or other surgery ☐ ☐ ☐ Straightening (Orthodontia) ☐ ☐ ☐ Treatment for gums ☐ ☐ ☐ Denture work ☐ ☐ ☐ Other *(Describe)* _____
Do not ask for children 1 yr. old and under. 10a. During the past 12 months, (that is, since (date) a year ago,) about how many visits did — make to a dentist? (Include the — visits you already told me about.)	10a.	____Number of visits
b. ABOUT how long has it been since — LAST went to a dentist?	b.	1 ☐ 2-week dental visit 2 ☐ Past 2 weeks not reported *(Q.'s 8 and 9)* 3 ☐ 2 weeks – 6 mos. 4 ☐ Over 6 – 12 mos. 5 ☐ 1 year 6 ☐ 2 – 4 years 7 ☐ 5+ years 8 ☐ Never *(NP)*
11a. Is there anyone in the family who has lost ALL of his teeth? Y N *(12)*		
b. Who is this? Anyone else?	11b.	☐ No teeth
For each person with "No teeth," ask: c. Does — have false teeth?	c.	Y N *(NP)*
d. Does — have an upper plate, a lower plate, or both?	d.	☐ Upper ☐ Both ☐ Lower
e. Does — usually wear { the upper / the lower / both } plate(s) while eating?	e.	Y N
f. Does — usually wear { the upper / the lower / both } plate(s) when not eating?	f.	Y N
g. Does — need new false teeth?	g.	Y *(NP)* N
h. Do the ones he has need refitting?	h.	Y N

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