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# HEALTH STATISTICS <br> FROM THE U. S. .NATIONAL HEALTH SURVEY 

# LOSS OF TEETH 

## United States <br> July 1957 - June 1958

Statistics on persons who have lost all of their permanent teeth, by age, sex, residence, region, race, income, education, time interval since last dental visit, and volume of dental visits. Based on data collected in household interviews during July 1957-June 1958.
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The U. S. National Health Survey is a continuing program under which the Public Health Service makes studies todetermine the extent of illness and disability in the population of the United States and to gather related information. It is authorized by Public Law 652, 84th Congress.

## CO-OPERATION OF THE BUREAU OF THE CENSUS

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. For the Health Interview Survey the Bureau of the Census designed and selected the sample, conducted the household interviews, and processed the data in accordance with specifications established by the Public Health Service.

Public Health Service Publication No. 584-B22

## CONTENTS

Page
Selected Findings ..... 1
Source of Data ..... 1
Edentulous Persons- ..... 1
Time Interval Since Last Dental Visit and Rate of Dental Visits ..... 3
Detailed Tables ..... 5
Appendix I. Technical Notes on Methods---- ..... 18
Background of This Report ..... 18
Statistical Design of the Health Interview Survey ..... 18
General Qualifications ..... 19
Reliability of Estimates ..... 19
Appendix II, Definitions of Certain Terms Used in This Report ..... 21
Dental Care Terms ..... 21
Demographic, Social, and Economic Terms- ..... 21
Location of Residence Terms ..... 21
Appendix III. Questionnaire ..... 23

## EXPLANATION OF SYMBOLS

Data not available (three dashes)----------------
Category not applicable (three dots)------------ ...
Quantity is zero (1 dash)----------------------- -
Magnitude greater than zero but less than one-half of the unit used--------------------- 0 or 0.0

Magnitude of the sampling error precludes (*) showing separate estimates--------------------

## LOSS OF TEETH

## SELECTED FINDINGS

Loss of teeth occurs most often as the result of two of the most common diseases affecting the American people-dental decay and periodontal disease. During his lifetime, nearly every person has one or both of these ailments, and when treatment is too long delayed, tooth loss results. Accrued tooth loss in individuals leads ultimately to edentulousness-total loss of permanent teeth-and the number and distribution of edentulous persons provide an index to both the prevalence of dental disease and the extent of dental neglect in the U.S. population.

Based on health interviews conducted by the U. S. National Health Survey during July 1957June 1958, there were approximately 22 million edentulous persons in the United States- 13 percent of the population of the Nation. A person was classified as edentulous if he had lost all of his permanent teeth, regardless of whether or not he wore dentures.

Only 4 percent of persons 25-34 years of age were edentulous, but the percent was higher in each succeeding age group; reaching 67 percent for persons 75 years of age and over. In each of the age groups, the proportion edentulous was slightly higher for women than for men.

Rural areas had a somewhat higher percent of edentulous persons than did urban areas and the proportion edentulous was substantially higner in the white population than in the nonwhite population.

In general, the proportion edentulous was smaller among members of high income families than among members of low income families, and smaller for persons in families where the head of the family had at least one year of college than for persons in families where the fainily head had less education.

## SOURCE OF DATA

The information contained in this report was obtained from nationwide household interviews conducted by the U.S. National Health Survey. The survey is continuous, each week covering a random sample of the civilian noninstitutional

[^0]population of the United States. This report is based on interviews obtained during the period July 1957-June 1958, during which time interviews were conducted in approximately 36,000 households and included about 115,000 persons.

A description of the survey design, methods used in estimation, and the general qualifications of the data is presented in Appendix I. Particular attention should be given to the section entitled Reliability of Estimates. Since the figures presented are estimates based on a sample of the population, they are subject to sampling error. Although the sampling errors for most of the estimates presented are of relatively low magnitude, where an estimated number or the numerator or denominator of a percent or rate is small, the sampling error may be'high.

Definitions of terms used in the 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.

The questionnaire used during July 1957-June 1958 is reproduced in Appendix III.

## EDENTULOUS PERSONS

Based on interviews conducted during July 1957-June 1958, U. S. National Health Survey data revealed that about 22 million persons, 13 percent of the population of the Nation, were edentulous.

This finding is based on responses to the question "Is there anyone in the family who has lost all of his teeth?" Persons who had lost all of their permanent teeth were classified as edentulous in the survey regardless of whether or not they wore dentures.

The proportion edentulous increased markedly with age, as would be expected. Virtually no one under 15 and only about 1 percent of those 15-24 years of age were edentulous. The proportion edentulous increased to 22 percent for those in the 45-54 year age group and increased to 67 percent for those 75 years of age and over.

The proportion edentulous was higher for women than for men in each of the separate age groups 25 years and above (fig. 1 and table 1). For all ages combined, 14 percent of the female population and 12 percent of the nrale population were edentulous.

The proportion of persons who are edentulous was higher among rural than among urban resi-


Figure 1. Rate of edentulous persons per 100: population by sex and age.
dents, as may be seen in figure 2. When the population was divided into more detailed residence groups, a clear relationship between the proportion of edentulous persons and degree of urbanization occurred among women in each of the separate age groups. In general, the proportion was lowest among women living "Inside urbanized areas," and highest for rural-farm women. The relationship for men was not as pronounced (table 2).

Data on total number and percent of edentulous persons are presented for the four separate geographic regions of the Nation in table 3. The percent edentulous varied somewhat among the four regions. Within each of the separate age groups 25 years and over, residents of the Northeastern region had the lowest rate and those living in the North Central region had the highest rate of edentulous persons.

There were large differences between the two racial groups with respect to rates of edentulous persons. The proportion of the white population that had lost all of their permanent teeth was much higher than that for the nonwhite population. About 30 percent of white persons aged 45-64 were edentulous, as compared with only 17 percent of nonwhite persons. Corresponding figures for persons 65 years of age and over were 61 percent edentulous for the white population and 43 percent for the nonwhite population (fig. 3 and table 4).


When the population of the Nation was classified according to family income, differences in the proportion of persons who were edentulous occurred among the various income groups. The higher the family income, the smaller the pro-


portion of persons in that income group who had lost all of their permanent teeth. Among persons 65 years of age and over, for example, 62 percent of persons in families with incomes under $\$ 2,000$ were edentulous as compared with 55 percent of persons in families with incomes $\$ 7,000$ and over (fig. 4 and table 5).


Figure 5. Rate of edentulous persons per 100 population by education of family head and age.

The percent edentulous was also computed tor the different groups classified according to the educational attainment of the head of the family. As may be seen infigure 5 and table 6, the percent edentulous first increased and then dropped as the educational level of the family head increased. When family income and education of family head were cross-classified, the "low education-low income" group had the highest proportion edentulous and the "high education-high income". group had the lowest. The two remaining groups occupied middle positions (table 7).

## TIME INTERVAL SINCE LAST DENTAL VISIT AND RATE OF DENTAL VISITS

Edentulous persons and persons who had some or all of their natural teeth were classified according to the time interval since their last dental visit in tables 8 and 9 and figures 6 and 7. Any visit to a dentist for treatment or advice was considered to be a dental visit, regardless of whether the service was provided by a dentist himself or by a dental hygienist working under a dentist's supervision.

In each of the separate age groups, 25 years and over, the proportion of edentulous persons who had visited a dentist during the 1-year peri-



Figure 7. Percent of edentulous and other persons who had not visitad adentist within the past years by age.
od prior to interview was substantially below that for the remainder of the population.

The proportion of edentulous persons visiting a dentist within the year decreased with age from 18 percent for persons $25-44$ years of age to 7 percent for persons 65 years of age and over (fig. 6). The higher percent of persons with recent dental visits in the younger age groups is undoubtedly due to a comparatively larger proportion among the younger edentulous persons who only recently lost all of their teeth.

For both edentulous persons and persons who had their natural teeth, the percent who had not visited a dentist for 5 years or more increased with age. For edentulous persons the figures varied from 40 percent for persons 25-44 years of age to 69 percent for those 65 years of age and over. Corresponding figures for other persons were 13 percent and 33 percent (fig. 7).


Figure 8. Number of dental visits par person per year for edentulous and other porsons by age.

The rates of dental visits for edentulous persons also fell considerably below those for persons with natural teeth. While there was little difference in the rates for persons 25-44 years of age, the differences were considerably larger in the older age groups (fig. 8 and table 10). The decrease in rate of dental visits from 1.5 visits per person per year for those 25-44 years of age to 0.5 visits for those 65 years of age and over, is again probably related to the decrease in the proportion of persons who recently became edentulous. While dental visits for edentulous persons included such services as checkup, denture repair, gum treatment, and fittings for new dentures, they also included visits for tooth extraction and fitting of the initial set of full dentures for persons who recently lost all of their teeth. These latter services generally involve a number of dental visits. Consequently, at those ages where the proportion of persons who recently became edentulous is large, their dental visit rate would be expected to be relatively higher than in groups where persons had been edentulous for some time.

## DETAILED TABLES

Page
Table 1. Number and percent of edentulous persons by sex and age: United States, July 1957-June 1958 ..... 6
2. Number and rate per 100 population of edentulous persons by residence, sex, and age: United States, July 1957-June 1958 ..... 7
3. Number and rate per 100 population of edentulous persons by region, sex, and age: United States, July 1957-June 1958 ..... 8
4. Number and rate per 100 population of edentulous persons by race and age: United States, July 1957-June 1958- ..... 9
5. Number and rate per 100 population of edentulous persons by family income and age: United States, July 1957-June 1958 ..... 9
6. Number and rate per 100 population of edentulous persons by education of fami- ly head and age: United States, July 1957-June 1958 ..... 10
7. Number and rate per 100 population of edentulous persons by family income, ed- ucation of family head, and age: United States, July 1957-June 1958 ..... 10
8. Number of edentulous and other persons by time interval since last dental vis- it, sex, and age: United States, July 1957-June 1958- ..... 11
9. Percent distribution of edentulous and other persons by time interval since last dental visit according to sex and age: United States, July 1957-June 1958------------------------------------------------------------------------------ ..... 12
10. Number of dental visits and number of dental visits per person per year for edentulous and other persons by sex and age: United States, July 1957-June 1958 ..... 13
POPULATION
11. Population used in obtaining rates shown in this publication by residence, sex, and age: United States, July 1957-June 1958 ..... 14
12. Population used in obtaining rates shown in this publication by region, sex,  ..... 15
13. Population used in obtaining rates shown in this publication by age and demo- graphic characteristic: United States, July 1957-June 1958 ..... 16

13. Population used in obtaining rates shown in this publication by age and demo-
graphic characteristic: United States, July 1957-June 1958---
16

Table 1. Number and percent of edentulous persons by sex and age: United States, July 1957June 1958
|Data are based on household interviews during July 1957 -June 1958 Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix l. Definitions of terms. are given in Appendix II]


Table 2. Number and rate per 100 population of edentulous persons by residence, sex, and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detalled figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix !. Definitions of terms are given in Appendix 1]



Both sexes
A11 ages-------------------------
$\qquad$
$\qquad$



All ages-------------------------


Female
411 ages--------------------------


Number of edentulous persons in thousands

| 21,881 | 13,332 | 9,130 | 4,202 | 8,548 | 5,570 | 2,978 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 220 | 130 | 91 | (*) | 90 | 51 | (*) |
| 3,008 | 1,629 | 1,095 | 534 | 1,379 | 917 | 461 |
| 10,037 | 6,219 | 4,372 | 1,848 | 3,818 | 2,445 | 1,373 |
| 8,616 | 5,354 | 3,573 | 1,781 | 3,262 | 2,156 | 1,106 |
| 9,730 | 5,800 | 4,032 | 1,768 | 3,930 | 2,592 | 1,338 |
| 105 | 66 | 50 | (*) | (*) | (*) | (*) |
| 1,245 | 687 | 469 | 218 | 557 | 388 | 169 |
| 4,668 | 2,843 | 2,021 | 822 | 1,824 | 1,186 | 638 |
| 3,713 | 2,203 | 1,491 | 713 | 1,509 | 998 | 511 |
| 12,151 | 7,532 | 5,099 | 2,434 | 4,618 | 2,978 | 1,641 |
| 115 | 64 | 41 | (*) | 50 | (*) | (*) |
| 1,763 | 942 | 626 | 316 | 821 | 529 | 292 |
| 5,370 | 3,376 | 2,350 | 1,026 | 1,994 | 1,259 | 735 |
| 4,903 | 3,150 | 2,082 | 1,068 | 1,753 | 1,158 | 595 |

Rate per 100 population

|  |  |  |  |  |  |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 13.0 | 12.9 | 12.3 | 14.7 | 13.1 | 12.6 | 14.1 |  |
| 0.3 | 0.3 |  | 0.3 | $(*)$ | 0.3 | 0.2 | $(*)$ |
| 6.6 | 5.7 | 5.2 | 7.3 | 8.0 | 7.3 | 9.7 |  |
| 29.1 | 27.4 | 26.1 | 31.0 | 32.5 | 32.6 | 32.4 |  |
| 59.4 | 57.6 | 56.0 | 60.9 | 62.6 | 64.1 | 59.9 |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 11.9 | 11.8 | 11.3 | 13.1 | 12.0 | 11.8 | 12.3 |  |
|  |  |  |  |  |  |  |  |
| 0.3 | 0.3 | 0.3 | $(*)$ | $(*)$ | $(*)$ | $(*)$ |  |
| 5.7 | 5.1 | 4.7 | 6.3 | 6.6 | 6.4 | 7.2 |  |
| 27.9 | 26.4 | 25.3 | 29.6 | 30.6 | 32.1 | 28.2 |  |
| 55.9 | 54.5 | 53.1 | 57.7 | 58.1 | 61.4 | 52.6 |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 14.1 | 14.0 | 13.1 | 16.3 | 14.2 | 13.3 | 16.2 |  |
| 0.3 | 0.3 | 0.3 | $(*)$ | 0.3 | $(*)$ | $(*)$ |  |
| 7.4 | 6.3 | 5.7 | 8.3 | 9.2 | 8.2 | 12.0 |  |
| 30.3 | 28.2 | 26.8 | 32.3 | 34.5 | 33.1 | 37.2 |  |
| 62.3 | 59.9 | 58.4 | 63.2 | 67.1 | 66.6 | 68.1 |  |

Table 3. Number and rate per 100 population of edentulous persons by region, sex, and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix 1 . Definitions of terms are given in Appendix 11]


## Both sexes



## Female




Table 4. Number and rate per 100 population of edentulous persons by race and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix 1. Definitions of terms are given in Appendix 11]

| Age | Race |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | A11 races | White | Nonwhite | All races | White | Nonwhite |
| All ag | Number of edentulous persons in thousands |  |  | Rate per 100 population |  |  |
|  | 21,881 | 20,786 | 1,095 | 13.0 | 13.9 | 5.9 |
| 0-24- | 220 | 200. | (*) | 0.3 | 0.3 | (*) |
| 25-44 | 3,008 | 2,893 | 114 | 6.6 | . 7.1 | 2.4 |
| 45-64 | 10,037 | 9,508 | 529 | 29.1 | 30.3 | 17.0 |
| 65+-- | 8,616 | 8,184 | 432 | 59.4 | 60.6 | 43.1 |

Table 5. Number and rate per 100 population of edentulous persons by family income and age: United States, July 1957-June 1958
(See headnote on table 4)

|  | Family income |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Age | Total | $\begin{array}{r} \text { Under } \\ \$ 2,000 \end{array}$ | $\begin{gathered} \$ 2,000- \\ 3,999 \end{gathered}$ | $\begin{gathered} \$ 4,000- \\ 6,999 \end{gathered}$ | \$7,000+ | Unknown |
|  |  | aber of | entulous | persons i | thousand |  |
| A11 ages- | 21,881 | 6,015 | 4,968 | 6,143 | 3,037 | 1,718 |
| 0-24---------------------------------- | 220 | (*) | 43 | 83 | (*) | (*) |
| 25-44-------------------------------- | 3,008 | 332 | 570 | 1,422 | 534 | 150 |
| 45-64-- | 10,037 | 1,886 | 2,443 | 3,233 | 1,659 | 816 |
| $65+-\cdots$ | 8,616 | 3,759 | 1,911 | 1,404 | 804 | 738 |
| : . - |  |  | e per 10 | populati |  |  |
| All ages | 13.0 | 23.6 | 13.8 | 9.9 | 8.8 | 17.1 |
| 0-24---------------------------------- | 0.3 | (*) | 0.3 | 0.3 | (*) | (*) |
| 25-44--------------------------------- | 6.6 | 7.8 | 6.5 | 7.2 | 4.9 | 7.1 |
|  | 29.1 | 34.3 | 32.7 | * 30.2 | 20.8 | 29.2 |
| 65+- | 59.4 | 62.4 | 58.4 | 58.1 | 55.4 | 54.7 |

Table 6. Number and rate per 100 population of edentulous persons by education of family head and age: United States, July 1957-June 1958
[Data are based on household interviews during July l957-June 1958. Data refer to the civilian noninstitutional population of the United. States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix l. Definitions of terms are given in Appendix 11]


Table 7. Number and rate per 100 population of edentulous persons by family income, education of family head, and age: United States, July 1957-June 1958
(See headnote on table 6)

| Age | Total | Family income and education of family head |  |  |  | Income or education unknown |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Under. \$4,000 |  | \$4,000+ |  |  |
|  |  | $\begin{gathered} \text { Under } 9 \\ \text { years } \end{gathered}$ | $9+$ years | Under <br> 9 years | $9+$ years |  |
|  | Number of edentulous persons in thousands |  |  |  |  |  |
|  | 21,881 | 7,638 | 2,978 | 3,855 | 5,136 | 2,274 |
|  | ; 220 | 46 | (*) | 46 | 77 | (*) |
|  | 3,008 | 494 | 381 | 589 | 1,341 | 202 |
| 45-64-- | 10,037 | 3,048 | 1,148 | 2,279 | 2,511. | 1,052 |
| 65+- | 8,616 | 4,049 | 1,415 | 941 | 1,207 | 1,004 |
| A11 ages | Rate per 100 population |  |  |  |  |  |
|  | 13.0 | 21.9 | 12.0 | 15.6 | 7.2 | 17.4 |
| 0-24 | 0.3 | 0.3 | (*) | 0.5 | 0.2 | (*) |
| 25-44- | 6.6 | 7.8 | 5.9 | 9.6 | 5.6 | 7.4 |
| 45-64 | 29.1 | 35.3 | 29.3 | 33.0 | 22.0 | 29.3 |
| 65+--- | 59.4 | 62.3 | 58.3 | 58.6 | 56.0 | 55.1 |

Table 8. Number of edentulous and other persons by time interval since last dental visit, sex, and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix l. Definitions of terms are given in Appendix 11]


Table 9. Percent distribution of edentulous and other persons by time interval since last dental visit according to sex and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix 1 . Definitions of terms are given in Appendix 11]


Table 10. Number of dental visits and number of dental visits per person per year for edentulous and other persons by sex and age: United States, July 1957-June 1958
[Data are based on household interviews during. July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals fue to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix l. Definitions of terms are given in Appendix 11]


Table 11. Population used in obtaining rates shown in this publication by residence, sex, and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957 -June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix 1 . Definitions of terms are given in Appendix 11 ]


NOTE: For official population estimates for more general use, see Bureau of the Census reports on the civilian population of the United States, in Current Population Reports: Series P-20, P-25, P-50, P-57, and P-60.

Table 12. Population used in obtaining rates shown in this publication by region, sex, and age: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional pop'ulation of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix 1 . Definitions of terms are given in Appendix 11]

|  | Region |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Sex and age | $\begin{gathered} \text { All } \\ \text { regions } \end{gathered}$ | Northeast | North Central | South | West |
|  |  | Populatio | in thous | ands |  |
| All ages | 168,369 | 42,125 | 50,340 | 51,903 | 24,001 |
| 0-24----------------------------------------------- | 73,730 | 16,495 | 21,971 | 24,596 | 10,667 |
| 25-44 | 45,656. | 11,870 | 13,583 | 13,379 | 6,824 |
| 45-64- | 34,470 | 9,978 | 10,128 | 9,851 | 4,513 |
| 65+- | 14,512 | 3,781 | - 4,657 | 4,078 | 1,997 |
| All ages | 81,906 | 20,487 | 24,722 | 25,120 | 11,577 |
| 0-24- | 36,640 | 8,358 | 10,968 | 12,167 | 5,148 |
| 25-44 | 21,885 | 5,680 | 6,573 | 6,362 | 3,270 |
| 45-64 | 16,739 | 4,825 | 4,997 | 4,712 | 2,205 |
| 65+- | 6,641 | 1,623 | 2,184 | 1,879 | 955 |
| All ages | 86,463 | 21,637 | 25,618 | 26,783 | 12,425 |
| 0-24 | 37,089 | 8,137 | 11,004 | 12,429 | 5,519 |
|  | 23,772 | 6,190 | 7,010 | 7,016 | 3,555 |
|  | 17,731 | 5,153 | 5,131 | 5,139 | 2,308 |
| 65+-------------------------------------------1. | 7,871 | 2,157 | 2,473 | 2,198 | 1,042 |

NOTE: For official population estimates for more general use, see Bureau of the Census reports on the civilian population of the United States; in Current Population Reports: Series P-20, P-25, P-50, P-57, and P-60.

Table 13. Population used in obtaining rates shown in this publication by age and demographic characteristic: United States, July 1957-June 1958
[Data are based on household interviews during July 1957-June 1958. Data refer to the civilian noninstitutional population of the United States. Detailed figures may not add to totals due to rounding. The survey design, general qualifications, and information on the reliability of the estimates are given in Appendix l. Definitions of terms are given in Appendix II]

| Characteristic | Age |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | All ages | 0-24 | 25-44 | 45-64 | $65+$ |
|  | Population in thousands |  |  |  |  |
|  | 168,369 | 73,730 | 45,656 | 34,470 | 14,512 |
|  |  |  |  |  |  |
|  | 149,810 | 64,074 | 40,868 | 31,357 | 13,511 |
|  | 18,559 | 9,656 | 4,788 | 3,114 | 1,002 |
| Family income |  |  |  |  |  |
| Under \$2,000 | 25,459 | 9,654 | 4,282 | 5,499 | 6,024 |
| \$2,000-3,999 | 36,051 | 16,488 | 8,811 | 7,481 | 3,272 |
|  | 62,248 | 29,475 | 19,634 | 10,722 | 2,417 |
|  | 34,549 | 14,323 | 10,804 | 7,972 | 1,451 |
| Unknown- | 10,062 | 3,791 | 2,126 | 2,797 | 1,349 |
| Education of family head |  |  |  |  |  |
|  | 12,836 | 4,914 | 2,305 | 3,326 | 2,292 |
|  | 50,497 | 19,738 | 10,843 | 13,415 | 6,501 |
|  | 72,483 | 34,684 | 22,565 | 11,611 | 3,623 |
|  | 28,485 | 12,840 | 9,165 | 5,023 | 1,457 |
| Unknown | 4,067 | 1,554 | 778 | 1,095 | 639 |
| Family income and education of family head |  |  |  |  |  |
| Under \$ $\mathbf{4}^{\text {, 000 }}$ |  |  |  |  |  |
| Under 9 years | 34,822. | 13, 394 | 6,304 | 8,623 | 6,501 |
|  | 24,853 | 12,041 | 6,461 | 3,923 | 2,428 |
| \$4,000+ |  |  |  |  |  |
| Under 9 years | 24,633 | 10,007 | 6,122 | 6,897 | 1,607 |
| $9+$ years--- | 70,971 | 33, 360 | 24,022 | 11,434 | 2,155 |
| Unknown-------------------------------------------------1-1 | 13,090 | 4,928 | 2,747 | 3,593 | 1,821 |

NOTE: For official population estimates for more general use, see Bureau of the Census reports on the civilian population of the United States, in Current Population Reports: Series $P-20, P-25, P-50, P-57$, and $P-60$.

## APPENDIX I

## TECHNICAL NOTES ON METHODS

## Background of This Report

This report on Loss of Teeth is one of a series of statistical reports which cover separate healthrelated topics prepared by the U. S. National Health Survey. The report is based on information collected in the continuing nationwide sample Health Interview Survey, which is a main aspect of the program.

The Health Interview Survey uses a questionnaire which, in addition to personal and demographic characteristics, requests information on illnesses, injuries, chronic conditions, medical care, dental care, and hospitalization. As interview data relating to each of these various broad subject areas are tabulated and analyzed, separate reports are issued covering one or more specific topics. The present report on edentulous persons is based on the consolidated sample for 52 weeks of interviewing ending June 29, 1958.

The population covered by the sample for the Health Interview Survey is the civilian population of the United States living at the time of the household interview. Although the sample collection covers persons living as inmates of resident-type institutions, data for these persons are not included in the figures given in these reports. The sample does not include members of the Armed Forces, United States nationals living in foreign countries, and crews of vessels. It should also be noted that the estimates of dental visits shown do not represent a complete inventory of dental visits for any specified calendar period since no adjustment has been made for persons who had dental visits during the reference period and who were not living at the time of the household interview-a time lapse of two weeks.

## 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 population of the United States. The first stage of this design consists of an area sample of 372 from among approximately 1,900 geographically defined Primary Sampling Units (PSU's) into which the United States has been divided. A PSU is a county, a group of contiguous counties, or a Standard Metropolitan Statistical Area.

With no loss in general understanding, the remaining stages can be telescoped and treated in this discussion as an ultimate stage. Within PSU's, then, ultimate stage units called segments are defined, also geographically, in such a manner that each segment contains an expected six households in the sample. Each week a random sample of about 120 segments is drawn. In the approximately 700 households in those segments persons are interviewed concerning illnesses, injuries, chronic conditions, disability, and other factors related to health.

The household members interviewed each week are a representative sample of the population so that sam-
ples for successive weeks can be combined into larger samples for, say a calendar quarter, or a year. Thus the design permits both continuous measurement of characteristics of high incidence or prevalence in the population, and through the larger consolidated samples more detailed analysis of less common characteristics and smaller categories. The continuous collection has administrative and operational advantages, as well as technical assets, since it permits field work to be handled with an experienced, stable staff.

Sample size and geographic detail.-The national sample plan over a 12 -month period includes approximately 115,000 persons from 36,000 households in 6,000 segments, with representation from every State. The over-all sample was designed in such a fashion, that from the annual sample, tabulations can be provided for various geographic sections of the United States and for urban and rural sectors of the Nation.

Collection of data. - The field operations for the household survey are performed by the Bureau of the Census under specifications established by the Public Health Service. In accordance with these specifications the Bureau of the Census designs and selects the sample, conducts the field interviewing, and edits and codes the questionaires. Tabulations are prepared by the Public Health Service using the Bureau of the Census electronic computers.

Estimating methods.-Each statistic produced by the survey-for example, the number of edentulous per-sons-is the result of two stages of ratio estimation. In the first of these, the ratio factor is 1950 decennial population count to estimated population for 1950 for the U. S. National Health Survey's first-stage sample of PSU's. These factors are applied separately for more than 50 color-residence classes.

Later, ratios of sample-produced estimates of the population to official Bureau of the Census figures for current population in 76 age-sex-color classes are computed, and serve as second-stage factors for ratio estimating.

The effect of the ratio estimating process is to make the sample more closely representative of the population by age, sex, color, and residence, thus reducing sampling variance.

For prevalence statistics, such as number of edentulous persons, figures are first calculated for each calendar quarter by averaging estimates for all weeks of interviewing in that quarter. Prevalence data for a year are then obtained by averaging the four quarterly figures.

For statistics measuring the number of occurrences during a specified time period, such as number of dental visits, a similar computational procedure is used. but the statistics have a different interpretation. For one of the dental visits items, the questionnaire asks for the respondent's experience over the two calendar weeks prior to the week of interview. In such instances, the estimated quarterly total for the statistic is simply 6.5 times the average two-week estimate produced by the 13 successive samples taken during the quarter.

The annual total is the sum of the four quarters. Thus, the experience of persons interviewed during a yearexperience which actually occurred for each person in a two-calendar-week interval prior to week of inter-view-is treated in analysis as though it measured the total of such experience occurring in the year. Such interpretation leads to no significant bias. .

The interviewing and estimation procedure, as noted earlier, are designed to reproduce the experience in the reference period of the questionnairefor the population living at the time of interview.

## General Qualifications

Nonresponse. -Data were adjusted for nonresponse by a procedure which imputed to persons in a household not interviewed the characteristics of interviewed persons in the same segment. The total noninterview rate was 6 percent; 1 percent was refusal, and the remainder was accounted for by all other reasons, such as failure to find any household respondent after repeated trials.

The interview process.- The statistics presented in this report are based on replies secured in interviews of persons in the sampled households. Each person 18 years and over, available at the time of interview, was interviewed individually. Proxy respondents within the household were employed for children and for adults not available at the time of the interview, provided the respondent was closely related to the person about whom information was being obtained.

Rounding of numbers. - The original tabulations on which 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 or tenth of million. Because of sampling error, however, they are not necessarily accurate to that detail. Derived statistics such as rates and percent distributions are computed after the estimates on which they 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 over-all totals by age, sex, and color, (which are adjusted to independent estimates), these figures are based on the sample of households in the U. S. National Health Survey. They are given primarily for the purpose of providing 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. In some instances they will permit users to recombine published data into classes more suitable to their specific needs. With the exception of the over-all totals by age, sex, and color, mentioned above, the population figures may in some cases differ from corresponding figures (which are derived from different sources) published in reports of the Bureau of the Census. For population data for general use, see the official estimates presented in Bureau of the Census reports in the $\mathrm{P}-20, \mathrm{P}-25, \mathrm{P}-50, \mathrm{P}-57$, and $\mathrm{P}-60$ series.

## Reliability of Estimates

Since the estimates 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 measurement error.

The standard error is primarily a measure ot 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 lie 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 $2 \%$ times as large.

The estimates of standard errors shown in tables I and II are approximations for the 372 -area sample and may be used by the reader to determine standard errors for the statistics presented in this report.

Table I. Standard errors of estimates of aggregates


[^1]In order to derive standard 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 tables of standard errors shown in this report should be interpreted as providing an estimate of approximate standard error rather than as the precise standard error for any specific statistic.

The following guides will enable the reader to determine the sampling errors for the data contained in this report.

1. Approximate standard errors for estimates of the number of dental visits and the number of persons in a population group ${ }^{1}$ are obtained from the appropriate columns of table I .
2. Approximate standard errors for percentage distributions of dental visits or of persons in a population group ${ }^{1}$ are given in table Il.
3. A rough approximation of the standard errors for rates showing the number of dental visits per person per year for edentulous and for other persons ${ }^{2}$ are obtained by

[^2]taking the square root of the sum of the squares of the standard error of the numerator used in obtaining the rate divided by the numerator itself and the standard error of the denominator used divided by the denominator itself, and then multiplying by the rate. This computation will normally give an overestimation of the true sampling error. Example: The number of dental visits. per person per year for edentulous persons $45-64$ years of age is 0.8 visits. The numerator used in obtaining the rate is $8,400,000$ visits (table 10), and the denominator is $10,037,000$ persons (table 2). The standard error of the numerator is $1,204,000$ visits (from Appendix table 1), and the standard error of the denominator is 220,000 persons (from Appendix table l). Carrying out the computations for
$$
0.8 \times \sqrt{\left(\frac{1,204,000}{8,400,000}\right)^{2}+\left(\frac{220,000}{10,037,000}\right)^{2}}
$$
gives 0.1 as the approximate standard error for a rate of 0.8 visits.

Table II. Standard errors of estimated percentages based on number of persons in a population group or number of dental visits (body of table expressed in percentage points)

| Estimated percentage | Base of percentage (base is shown in thousands) |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Population group Dental visits | 100 2,500 | 500 12,500 | 1,000 25,000 | 2,000 50,000 | 3,000 75,000 | $\begin{array}{r} 5,000 \\ 125,000 \end{array}$ | $\begin{array}{r} 10,000 \\ 250,000 \end{array}$ | $\begin{array}{r} 20,000 \\ 500,000 \end{array}$ | $\begin{array}{r} 30,000 \\ 750,000 \end{array}$ | $\begin{array}{r} 50,000 \\ 1,250,000 \end{array}$ | 100,000 |
| 2 or 98-------- | 3.6 | 1.6 | 1.1 | 0.8 | 0.7 | 0.5 | 0.4 | 0.3 | 0.2 | 0.2 | 0.1 |
| 5 or 95--------- | 5.6 | 2.5 | 1.8 | 1.3 | 1.0 | 0.8 | 0.6 | 0.4 | 0.3 | 0.3 | 0.2 |
| 10 or 90-------- | 6.8 | 3.0 | 2.1 | 1.5 | 1.2 | 1.0 | 0.7 | 0.5 | 0.4 | 0.3 | 0.2 |
| 25 or 75-------- | 9.8 | 4.4 | 3.1 | 2.2 | 1.8 | 1.4 | 1.0 | 0.7 | 0.6 | 0.4 | 0.3 |
| 50---------------- | 12.9 | 5.8 | 4.1 | 2.9 | 2.4 | 1.8 | 1.3 | 0.9 | 0.7 | 0.6 | 0.4 |

[^3]
## APPENDIX II

## DEFINITIONS OF CERTAIN TERMS USED IN THIS REPORT

## Dental Care Terms

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

Dental visits. - Each visit to a dentist's office for treatment or advice is considered to be a dental visit. The visit may involve services provided directly by the dentist or by a dental hygienist acting under a dentist's supervision. Services provided while a person was a patient in a hospital for overnight or longer are not considered to be dental visits.

Time 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.

The interval is recorded to the nearest month for periods of a month or more but less than a year, and to the nearest year for periods of a year or more.

## Demographic, Social, and Economic 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 upon the purpose of the table.

Race. -In this report, the population has been subdivided into two groups according to race, "White" and "Nonwhite." "Nonwhite" includes Negro, American Indian, Chinese, Japanese, and so forth. Mexican persons are included with "White" unless definitely known to be Indian or other nonwhite race.

Family income. - 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 ending with the week of interview. Income from all sources is included, e.g., wages, salaries, rents from property, pensions, help from relatives, and so forth.

Education of family head. - Each member of a family is classified according to the education of the head 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 education.

The categories of educational status show 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, tradē, or
business schools outside the regular school system is not counted in determining the highest grade of school completed.

## Location of Residence Terms

Urban residence. -The definition of urban areas used in the U. S. National Health Survey is the same as that used in the 1950 Census. According to this definition, the urban population comprises all persons living in (a) places of 2.500 inhabitants or more incorporated as cities, boroughs, and villages; (b) incorporated towns of 2,500 inhabitants or more except in New England, New York, and Wisconsin, where "Towns" are simply minor civil divisions of counties; (c) the densely settled urbanfringe, including both incorporated and unincorporated areas around cities of 50,000 or more; and (d) unincorporated places of 2,500 inhabitants or more outside any urban fringe.

In this report, the urban population has been subdivided into those living "Inside urbanized areas" and those living in "Other urban places."

Inside urbanized areas.-Following the definition used in the 1950 Census, the population in urbanized areas comprises all persons living in (a) cities of 50,000 inhabitants or more in 1940 or according to a special census taken between 1940 and 1950; and (b) the densely settled urban fringe, including both incorporated and unincorporated areas, surrounding these cities.
Other urban places. - The remaining urban population not classified as living "Inside urbanized areas" is classified as living in "Other urban places."
Rural residence. - The remaining population not classified as "Urban" is classified as "Rural." In this report the rural population has been subdivided into "Rural farm" and "Rural nonfarm."

Rural farm.-All rural residents living on farms are classified as "Rural farm." In deciding whether members of a household reside on a farm or ranch. the statement of the household respondent that the house is on a farm or ranch is accepted, with the following exception. A house occupied by persons who pay cash rent for the house and yard only is not counted as a farm or ranch even though the surrounding area is farm land. This special case does not cover: (1) the living quarters of a tenant farmer who rents farm land as well as house and yard; (2) the quarters of a hired hand who receives living quarters on a farm as part of his compensation or (3) separate living quarters inside a structure which is classified as on a farm. In all these cases the living quarters are counted as on a farm.
Rural nonfarm. -The remaining rural population not classified as "Rural farm" is classified as "Rural nonfarm."

Region, -For the purposes of classirying the population by geographic area of residence, the National Health Survey uses the same grouping of states used by the Bureau of the Census and many other agencies. The four major regions are:
Region States included

Northeast Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania West

North Central Michigan, Ohio, Indiana, Illinois, Wisconsin, Minnesota, Iowa,

Missouri, North Dakota, South Dakota, Nebraska, Kansas

South
Sout
Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Lousiana, Oklahoma, Texas

Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California

## APPENDIX III

## OUESTIONNAIRE

The items below show the exact content and wording of the questionnaire used in the household survey. The actual questionnaire is designed for a household as a unit and includes additional spaces for reports on more than one person.



| MEDICAL CABE |  |
| :---: | :---: |
|  to a doctor or to to a doctor's office or cilnic? Aayone else? <br> if "Yes" <br> (b) How many thaes duriag the past 2 meent | $\qquad$ |
| (c) Were did soa talk to the doctor? <br> (d) How engy times at $\cdots$ (home, office, elinic, otc.)? (Record total number of times for anch type of place) |  |
| 19. Hate did you have dare? <br> If are then one pisit or telephone cell: <br> that did you bave dhoe an the $\left\{\begin{array}{l}\text { first } \\ \text { eecood } \\ \text { etc. }\end{array}\right\}$ wiait (or telephone ealli? |  |
| 20. if "No" to g. 18s, abk: <br> bow loag has it been aince goo lest talked to a doctort | $\qquad$ tone. or $\qquad$ ITs. $\square$ leas then ! mo. miver |
| DEATAL CABE |  |
|  It 7 (to" <br> (b) Bow may tises darlat the matat 2 meekt? |  |
| 22 Rhat did yon have dene? <br> If aore than one vieft: <br> Ghat did yoo have dane on the $\left\{\begin{array}{l}\text { ilrat } \\ \text { lecund } \\ \text { ete. }\end{array}\right\}$ visit? |  |
| If "Fon to a. 214, ask: <br> 2n. Hov lang bas it been since goo ment to ondentiat |  |
| is Is there marone fis the fanily to bas last all of tis teeth? | $\square$ Tea $\square_{\text {- mo }}$ |
| GOSPITAL CARE |  |
|  tospital ovetuifit or looger? <br> It "Ies": <br> (b) Bow many time were yoa to the boapital? |  |
|  bore or staiturian? <br> $1 f$ Tes" <br>  | Yee (tyble II) <br> ■ $\qquad$ Pb. of times |

27. Daring the past 12 months in thich gromp aid the total toons of yoor finily Iall
 anch es mages, salaries, rents Irom property, penaloss, belp Prom relativen, etc.



FOOTNOTES AND COEMENTS

6. Missing toes. foot, or leg
8. Paralysis of any kind
9. Any permanent stiffenss or deformity of the foot or leg, fingers, arm, or back
chtional health surver

1. Cannot keep house at all at present.
2. Serious trouble with seeing, even with glasses
3. Condition present since birth, such as cleft palate or club foot
4. Missing fingers, hand, or arm
kidey troubla
5. Arthritis or rheumatism 18. Prostate trouble
6. Thyroid trouble or goiter of any kind
7. Mental or nervous trouble
8. Repeated trouble with back or spine
9. Tumor or cancer
10. Chronic skin trouble
11. Hernia or rupture
12. Asthma
13. Tuberculos is
14. Chronic bronchitis
15. Rheumat ic fever
. Hardening of the arteries
16. Heart trouble
17. Stroke
18. Trouble with varicose veins
19. Stomach ulcer

Any other chronic
stomach trouble

## Check List of Lapalraente

.

Cun keep house but linited in outside activities.
4. Not limited in any of these ways.

## watiomal healyh suryey

1. Cannot take part at all in ordinary play with other children.
2. Can play with other children but piay.
3. Not limited in any of these ways.
. $\$ 4.000-\$ 4.999$
T.
. $\$ 10,000$ and

[^0]:    This report was prepared by Jane w. Bergsten. of the U. S. National Health Survey staff.

[^1]:    Bllustration of use of table 1. -The number of edentulous women in the Nation was $12,151,000$. Since this is an estimate of an aggregate and designates the number of persons in a population group, column (a) of table 1 is appropriate. Reading from this column, a statistic of $10,000,000$ has a standard error of 220,000 and a statistic of $20,000,000$ has a standard error of 300,000. Interpolating between these values, the appropriate standard error of the estimated 12.151,000 is 237,000.

[^2]:    ${ }^{1}$ The number and percentage distribution of persons in an age, sex, or color group, or the total number of persons in the population are not subject to sampling error because of adjustment to official Bureau of the Census figures.
    $\mathbf{2}^{2}$ Note that where the rate refers to a group of persons with a specific characteristic obtained from the survey (e.g., edentulous persons), rule 3 applies, even if the group is further subdivided by age, sex, or color.

[^3]:    IIlustration of use of table ll.-Of the $269,200,000$ dental visits made during July $1957-J u n e$ l958, 7 percent were made by edentulous
    
    
    
    
    
    
     mate answer which is sufficiently precise.

