

# National Medical Care Utilization and Expenditure Survey

## Dental Care Charges: United States, January-June 1980

Preliminary  
Data  
Report  
No. 1



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## Overview

Data on charges for dental visits were collected during 1980 for the National Medical Care Utilization and Expenditure Survey (NMCUES). A dental visit was any visit to a dentist, dental surgeon, oral surgeon, orthodontist, or other person for dental care. This report presents preliminary estimates based on the first 6 months of data collected from the national household sample. The estimates do not necessarily represent half of the final full year estimates because of possible changes in utilization, reporting, or data processing. The data in this report, however, provide the best recent information on charges for dental visits and estimates of total expenditures for personal dental care for the civilian noninstitutionalized population of the United States.

## Survey Background

NMCUES was designed to provide estimates of the health of the civilian noninstitutionalized population of the United States, its utilization and expenditures for various types of medical care, and health insurance coverage and amounts paid by insurers for health care. Specific data relating to the Medicare and Medicaid programs were also collected. NMCUES data were obtained from three sources:

- The national household sample.
- Four State Medicaid household samples.
- Medicare and Medicaid administrative records.

About 17,900 persons were included in the national household sample, and about 13,700 persons were included in the four State Medicaid household samples. Information for all family members was collected from a single household respondent through a set of five interviews approximately 3 months apart. Administrative records were extracted for people in interviewed households reported to be covered by Medicare or Medicaid.

Data from the national household sample complement the data collected in the National Health Interview Survey, and they update and show time trends from 1977 when data were obtained by the National Medical Care Expenditure Survey. The State household samples and administrative records provide program monitoring data on participation in the Medicaid program and utilization of covered and uncovered services by Medicare recipients.

The Health Care Financing Administration and the National Center for Health Statistics co-sponsored the survey. Data were collected by the Research Triangle Institute, National Opinion Research Center, and Systemetrics, Inc., under contract to the Department of Health and Human Services.

## Data Highlights

An estimated 158 million dental visits occurred during the first 6 months of 1980 in the United States, or 73 visits per 100 persons.

Estimated expenditures for nonorthodontic dental care were \$7.85 billion during the 6-month

period January-June 1980. This represents an average 6-month expenditure of \$36 per person.

The average charge for nonorthodontic dental visits was \$56, although half of the visits had charges under \$30.

Visits including dental examination or cleaning services comprised 45 percent of all nonorthodontic visits and 29 percent of nonorthodontic dental expenditures.

Expenditures for nonorthodontic dental care per person were about three times as high among people in families with incomes of \$35,000 or more as among people in families with incomes less than \$5,000. People in families with higher incomes had both more visits per person and higher charges per visit than did people with lower incomes.

The total course of treatment per person receiving orthodontic care averaged about \$1,400.

## Discussion

### Number of Visits

An estimated 158 million dental visits were made by the civilian noninstitutionalized population of the United States during the first 6 months of 1980. The 95-percent confidence interval for this estimate is 149-168 million visits (see the Technical Notes section for computing standard errors). The total number of visits included about 141 million visits with nonorthodontic services and about 18 million visits with orthodontic services (tables 1 and 2). Data on visits with orthodontia as the only service, or the only billed service, are analyzed separately from nonorthodontic visits. Orthodontic treatment generally lasts longer than 6 months, and data were not available on the number of visits after June 30, 1980, that might be included in an orthodontic charge.

Other surveys have shown different estimates of the number of dental visits. However, the variation among surveys is more a problem of measurement than of actual differences in utilization. The total estimate of 180 million dental visits for the first 6 months of 1980 from the National Health Interview Survey was 14 percent higher than the NMCUES total estimate. In contrast, the estimate of the number of dental visits per person from the 1977 National Medical Care Expenditure Survey was 11 percent lower than the NMCUES estimate.

To make the latter comparison, two assumptions were required, because data from the National Medical Care Expenditure Survey were based on the whole year of 1977 and data from NMCUES were based on the first 6 months of 1980. The first assumption was that approximately half of the total dental visits reported in the National Medical Care Expendi-

ture Survey occurred during the first 6 months of the year. The second was that the actual number of dental visits per person remained constant over time. Both assumptions were reasonable based on yearly data obtained through the National Health Interview Survey. Given these assumptions, the measurement differences between the National Medical Care Expenditure Survey and NMCUES become apparent. Half of the 1977 National Medical Care Expenditure Survey estimate was 65 dental visits per 100 people, compared with 73 dental visits per 100 people for the NMCUES 6-month estimate (National Center for Health Services Research, 1981).

The number of nonorthodontic dental visits per person estimated from NMCUES varied by characteristics of people or their families. People 35-54 years of age had more nonorthodontic dental visits per person than either younger or older people. White people had more dental visits per person than did black people. Adults with higher educational levels had more visits per person than adults with lower educational levels. People in families with incomes of \$35,000 or more during the prior year had 2.5 times the number of nonorthodontic dental visits per person as people in families with incomes less than \$5,000.

The number of orthodontic dental visits also varied by different characteristics of people. Almost all orthodontic visits were made by white people. People in families with incomes of \$35,000 or more made 25 percent of the orthodontic dental visits, although they comprised only 10 percent of the population. Combining orthodontic and nonorthodontic visits, people in families with incomes of \$35,000 or more had 118 visits per 100 persons, compared with 42 visits per 100 persons for those people in families with incomes less than \$5,000. About 9 out of 10 orthodontic visits were made by people 5-24 years of age; probably a greater concentration by age would have been observed if the data had been tabulated for single years of age. Inclusion of orthodontic visits with nonorthodontic visits increased the total number of visits per person for people 5-14 years of age and 15-24 years of age to about the same level as for people 25-54 years of age.

Orthodontic treatment generally requires regular visits over the course of treatment. An estimated 4.4 million people had approximately 18 million orthodontic visits made during the 6-month period, an average of 4.0 orthodontic visits per person under orthodontic treatment.

### Charges Per Visit

The average charge for a nonorthodontic dental visit was \$56 during the first 6 months of 1980 (table

Table 1

**Number of nonorthodontic dental visits, visits per 100 persons, average charges, and expenditures, by selected characteristics:  
United States, January-June 1980**

| Selected characteristic              | Population<br>in millions | Nonorthodontic dental visits |                           |                             |                      |                       |
|--------------------------------------|---------------------------|------------------------------|---------------------------|-----------------------------|----------------------|-----------------------|
|                                      |                           | Number in<br>millions        | Number per<br>100 persons | Average charge<br>per visit | Expenditures         |                       |
|                                      |                           |                              |                           |                             | Total in<br>billions | Average per<br>person |
| Total <sup>1</sup> . . . . .         | 217                       | 140.6                        | 65                        | \$56                        | \$7.85               | \$36                  |
| Age                                  |                           |                              |                           |                             |                      |                       |
| Under 5 years . . . . .              | 16                        | 3.4                          | ( <sup>2</sup> )          | 31                          | 0.11                 | ( <sup>2</sup> )      |
| 5-14 years . . . . .                 | 34                        | 20.7                         | 61                        | 38                          | 0.79                 | 23                    |
| 15-24 years . . . . .                | 40                        | 24.9                         | 62                        | 51                          | 1.27                 | 32                    |
| 25-34 years . . . . .                | 35                        | 25.7                         | 74                        | 55                          | 1.42                 | 41                    |
| 35-44 years . . . . .                | 25                        | 20.3                         | 81                        | 64                          | 1.31                 | 52                    |
| 45-54 years . . . . .                | 23                        | 18.1                         | 80                        | 72                          | 1.31                 | 58                    |
| 55-64 years . . . . .                | 21                        | 15.3                         | 73                        | 60                          | 0.92                 | 44                    |
| 65-74 years . . . . .                | 15                        | 8.7                          | 57                        | 57                          | 0.50                 | 33                    |
| 75 years and over . . . . .          | 9                         | 3.5                          | 41                        | 50                          | 0.17                 | 20                    |
| Sex                                  |                           |                              |                           |                             |                      |                       |
| Male . . . . .                       | 105                       | 63.9                         | 61                        | 59                          | 3.77                 | 36                    |
| Female . . . . .                     | 112                       | 76.7                         | 68                        | 53                          | 4.08                 | 36                    |
| Race                                 |                           |                              |                           |                             |                      |                       |
| White . . . . .                      | 183                       | 126.7                        | 69                        | 55                          | 6.97                 | 38                    |
| Black . . . . .                      | 25                        | 9.1                          | 36                        | 57                          | 0.52                 | 20                    |
| Geographic area                      |                           |                              |                           |                             |                      |                       |
| Northeast . . . . .                  | 47                        | 38.9                         | 83                        | 58                          | 2.25                 | 48                    |
| North Central . . . . .              | 58                        | 38.2                         | 66                        | 52                          | 1.99                 | 34                    |
| South . . . . .                      | 67                        | 34.8                         | 52                        | 51                          | 1.76                 | 26                    |
| West . . . . .                       | 46                        | 28.7                         | 62                        | 66                          | 1.90                 | 41                    |
| Education of individual <sup>3</sup> |                           |                              |                           |                             |                      |                       |
| Less than 9 years . . . . .          | 24                        | 8.3                          | 34                        | 61                          | 0.51                 | 21                    |
| 9-11 years . . . . .                 | 28                        | 14.3                         | 51                        | 56                          | 0.80                 | 29                    |
| 12 years . . . . .                   | 59                        | 46.0                         | 79                        | 59                          | 2.69                 | 46                    |
| 13-15 years . . . . .                | 26                        | 21.8                         | 85                        | 63                          | 1.37                 | 53                    |
| 16 years or more . . . . .           | 21                        | 20.0                         | 94                        | 61                          | 1.22                 | 58                    |
| 1979 family income                   |                           |                              |                           |                             |                      |                       |
| Less than \$5,000 . . . . .          | 21                        | 8.2                          | 39                        | 53                          | 0.43                 | 20                    |
| \$ 5,000- 9,999 . . . . .            | 29                        | 12.3                         | 42                        | 48                          | 0.59                 | 20                    |
| \$10,000-14,999 . . . . .            | 35                        | 21.2                         | 61                        | 54                          | 1.15                 | 33                    |
| \$15,000-19,999 . . . . .            | 28                        | 17.4                         | 63                        | 47                          | 0.82                 | 30                    |
| \$20,000-24,999 . . . . .            | 28                        | 21.1                         | 74                        | 49                          | 1.04                 | 37                    |
| \$25,000-34,999 . . . . .            | 29                        | 24.9                         | 86                        | 63                          | 1.58                 | 55                    |
| \$35,000 or more . . . . .           | 22                        | 21.5                         | 98                        | 64                          | 1.37                 | 62                    |
| Unknown . . . . .                    | 25                        | 13.9                         | 56                        | 61                          | 0.85                 | 34                    |

<sup>1</sup>Includes all other races not shown separately and unknown educational level.

<sup>2</sup>Most people in this age group do not have dental visits.

<sup>3</sup>For persons 17 years of age and over.

1). The charge for a visit included amounts that were paid by the family, health insurance, Medicare, Medicaid, or other sources. Some respondents reported that the visit was included in a flat fee for a service requiring a number of visits. Flat fee charges, for services other than orthodontia, were evenly distributed among all associated visits that occurred prior to July, and the visits were counted as visits with known charges. No data on charges were avail-

able for about 17 percent of the dental visits, because the service was directly provided by a public or private facility, the charge was paid directly by insurance or Medicaid, or the respondent did not otherwise know or remember the charge. Visits with known charges were used to calculate the estimates of charges with expenditures in this report. The assumption was made that visits with unknown charges had the same average charge as visits with known charges.

**Table 2**

**Number of orthodontic dental visits and average visits per 100 persons, by selected characteristics: United States, January-June 1980**

| Selected characteristic      | Population in millions | Orthodontic dental visits |                                |
|------------------------------|------------------------|---------------------------|--------------------------------|
|                              |                        | Number in millions        | Average number per 100 persons |
| Total <sup>1</sup> . . . . . | 217                    | 17.6                      | 8                              |
| <b>Age</b>                   |                        |                           |                                |
| 5-14 years . . . . .         | 34                     | 8.6                       | 25                             |
| 15-24 years . . . . .        | 40                     | 7.0                       | 17                             |
| All other . . . . .          | 143                    | 2.0                       | 1                              |
| <b>Sex</b>                   |                        |                           |                                |
| Male . . . . .               | 105                    | 6.2                       | 6                              |
| Female . . . . .             | 112                    | 11.4                      | 10                             |
| <b>Race</b>                  |                        |                           |                                |
| White . . . . .              | 183                    | 16.3                      | 9                              |
| Black . . . . .              | 25                     | 0.6                       | 2                              |
| <b>1979 family income</b>    |                        |                           |                                |
| Less than \$5,000 . . . . .  | 21                     | 0.6                       | 3                              |
| \$ 5,000- 9,999 . . . . .    | 29                     | 1.3                       | 4                              |
| \$10,000-14,999 . . . . .    | 35                     | 1.4                       | 4                              |
| \$15,000-19,999 . . . . .    | 28                     | 1.9                       | 7                              |
| \$20,000-24,999 . . . . .    | 28                     | 2.2                       | 8                              |
| \$25,000-34,999 . . . . .    | 29                     | 3.5                       | 12                             |
| \$35,000 or more . . . . .   | 22                     | 4.4                       | 20                             |
| Unknown . . . . .            | 25                     | 2.3                       | 9                              |

<sup>1</sup>Includes all other races not shown separately.

The average charge per dental visit from the National Medical Care Expenditure Survey was about the same as the NMCUES estimate, controlling for inflation. The National Medical Care Expenditure Survey estimate was \$48 in 1977, or about \$62 in 1980 terms adjusted for changes in the Consumer Price Index for personal dental services (Kasper, et al., 1980; Waldo, 1981). This included charges for orthodontic care. If the assumption is made that orthodontic treatment lasts 24 months on the average, the average charge for all visits in NMCUES would be \$59, which is within the range of sampling variability from the adjusted 1977 estimate.<sup>1</sup>

The NMCUES average charge per visit for non-orthodontic dental care was \$31 for people under 5 years of age, compared with \$72 for people 45-54 years of age (table 1). The average charge per visit was higher for people with high family incomes than for people with moderate or low family incomes—about

<sup>1</sup>Comparison cannot be made with Rossiter and Lawson (1979), because that report was based only on dental visits with a separate charge for a single visit.

\$63 for people in families with incomes of \$25,000 or more and around \$50 for people in families with incomes less than \$25,000. There were no statistically significant differences by sex, race, or education in the average charge per visit.

The average charge per visit showed greater variability by type of service than by selected characteristics of persons. Dental visits were precoded into one or more of the following categories of service:

- Only X-rays.
- Cleaning teeth.
- Examination.
- Orthodontia.
- Fillings.
- Extractions.
- Root canals.
- Crowns.
- Bridges.
- Partial dentures.
- Full dentures.
- Other.

Dental visits that included exam, cleaning, or only X-rays had an average charge of \$35. Dental visits that included services related to crowns had an average charge of \$169. The average charge of \$35 per visit with exam or cleaning services largely represented the cost of the service. These services are generally completed during one visit, and only 12 percent of these visits were reported to be part of a flat fee charge. However, the \$169 average charge per visit with crown services represented only part of the total cost of the treatment. Dental treatment involving crowns usually involves more than one visit, and 53 percent of these visits were reported to be part of a flat fee charge. If a type of treatment requires two visits, the average charge for the total treatment would be twice the average visit charge.

The average and median charges for dental visits were quite different. Nonorthodontic dental visits had an average charge of \$56, but half of the visits had charges of \$30 or less (the median charge). The difference between the average and median charges indicates that a small proportion of visits accounted for a large proportion of the charges.

In contrast to charges for nonorthodontic treatment, charges for orthodontic treatment were not allocated to individual visits. Orthodontia generally requires regular visits over the course of treatment, about 18-30 months. It was not possible to determine how long the treatment would last for the people included in the survey. About three-fourths of the orthodontic visits were reported to be part of a flat

fee, and this flat fee averaged \$1,417 per person receiving orthodontia treatment.

Data from other sources provide estimates somewhat similar to NMCUES estimates. A survey was made in September 1979 of the fees charged by dentists for various services (Bureau of Economic Research, 1981). The median charge reported by dentists was \$7 for a periodic oral exam and \$18 for an adult prophylaxis. Since both services are often involved in a single visit, the combined charge of \$25 was not too dissimilar for the median NMCUES household reported charge of \$22 for a visit with exam or cleaning. The median charge reported by dentists for a single filling of permanent teeth ranged from \$15 to \$30 depending on the number of surfaces. The median charge reported by a household for a visit in which fillings were the only service was \$30, but this included some visits where more than one tooth was filled. The median fee reported by surveyed dentists for orthodontia treatment ranged from \$1,000 to \$1,450 depending on the degree of difficulty, compared with the average orthodontia flat fee charge of \$1,417 in NMCUES.

### Total Expenditures

Total expenditures for nonorthodontic dental care during the first 6 months of 1980 were estimated

to be about \$8 billion (table 3). This estimate was based on the estimated number of dental visits and the average charge per visit for visits with a reported known charge. Visits with exam or cleaning services—those visits predominantly for preventive care—constituted 45 percent of nonorthodontic visits but only 29 percent of total expenditures for nonorthodontic dental care. Crowns were the most expensive type of service on a per visit basis, accounting for 5 percent of nonorthodontic visits but 15 percent of nonorthodontic dental expenditures.

Total national expenditures for personal dental services were estimated by the Health Care Financing Administration to be \$15.2 billion for the 12 months ending in September 1980, based upon income tax returns of dentists (Waldo, 1981). This estimate, adjusted to a 6-month period, appears lower than the NMCUES estimate. An assumption that orthodontic treatment lasted 24 months would produce a NMCUES estimate of \$1.56 billion for orthodontic dental care in the 6 months, or \$9.41 billion for all dental care. This NMCUES estimate was about one-fourth higher than the \$7.6 billion based on the Health Care Financing Administration estimate if personal dental expenditures were evenly distributed over the 12-month period. National estimates of 1977 personal dental expenditures based on household reported data in the National Medical Care Expenditure Survey were also about one-fourth higher than the Health

**Table 3**  
**Number of dental visits, charges, and expenditures, by type of visit and service: United States, January-June 1980**

| Type of visit and service                     | Number in millions | Dental visits     |                  | Total expenditures in billions |
|---|--------------------|-------------------|------------------|--------------------------------|
|   |                    | Average per visit | Median per visit |                                |
| All visits . . . . .                          | 158.2              | (1)               | (1)              | (1)                            |
| Orthodontic . . . . .                         | 17.6               | (1)               | (1)              | (1)                            |
| Nonorthodontic . . . . .                      | 140.6              | \$ 56             | \$ 30            | \$7.85                         |
| Visits with one or more services <sup>2</sup> |                    |                   |                  |                                |
| Exam or cleaning . . . . .                    | 63.5               | 35                | 24               | 2.24                           |
| Fillings . . . . .                            | 36.9               | 46                | 32               | 1.71                           |
| Extractions . . . . .                         | 10.6               | 61                | 33               | 0.64                           |
| Bridges or dentures . . . . .                 | 7.8                | 120               | 84               | 0.93                           |
| Crowns . . . . .                              | 6.9                | 169               | 125              | 1.17                           |
| Root canals . . . . .                         | 5.3                | 99                | 75               | 0.53                           |
| Other . . . . .                               | 25.7               | 66                | 35               | 1.68                           |
| Unknown . . . . .                             | 2.0                | 59                | 35               | 0.12                           |
| Visits with only one service                  |                    |                   |                  |                                |
| Exam or cleaning . . . . .                    | 51.2               | 32                | 22               | 1.66                           |
| Fillings . . . . .                            | 28.9               | 42                | 30               | 1.20                           |
| Extractions . . . . .                         | 8.6                | 54                | 28               | 0.46                           |
| Bridges or dentures . . . . .                 | 6.6                | 115               | 84               | 0.76                           |
| Crowns . . . . .                              | 5.2                | 168               | 125              | 0.87                           |
| Root canals . . . . .                         | 4.1                | 92                | 75               | 0.38                           |
| Other . . . . .                               | 17.3               | 72                | 39               | 1.23                           |

<sup>1</sup>Orthodontia charges were not allocated to a 6-month period of time.

<sup>2</sup>Since a single visit may be tabulated for several types of services, the sum of visits by type of service is greater than the total number of visits.

Care Financing Administration estimates for 1977 (National Center for Health Services Research, 1981; Waldo, 1981). Out-of-pocket dental care charges collected in the National Health Interview Survey cannot be directly compared to the NMCUES total charge estimates in this report. However, Wilder (in preparation) made a comparison between the National Medical Care Expenditure Survey and the National Health Interview Survey out-of-pocket expenses per person in 1977, and found similar estimates in both surveys.

Although an average of \$36 was spent for non-orthodontic dental care during the first 6 months of 1980, some groups of people had higher expenditures resulting from both higher number of visits per person and higher average charges per visit (table 1). People 45-54 years of age had 2.5 times the expenditures per person of people 5-14 years of age or 75 years of age and over. People in families with incomes of \$35,000 or more had 3.1 times the average expend-

itures for nonorthodontic dental care as people in families with incomes less than \$5,000 (\$62 and \$20, respectively). This difference resulted from 2.6 times the number of visits per person among people with the higher income, and 1.2 times the average charge per visit.

Other differences by characteristics of people in the average nonorthodontic expenditures per person resulted from differences in the average number of visits, since the average charges per visit were about the same. Black people had about half the dental expenditures per person as white people, but also about half the number of visits per person. The expenditures per person were higher with each higher level of education shown, with college graduates having 2.8 times the expenditures per person as people who had not attended high school. However, the average charge per visit did not vary consistently by the education of the adult population.

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## Technical Notes

### Definition of Terms

*Terms relating to dental visits*—An *orthodontic visit* is a visit where orthodontia was the only type of service received, or the only service billed if more than one service was received (the visit was part of a flat fee). All other visits were classified as *nonorthodontic visits*.

Seven *types of service* were tabulated for non-orthodontic visits based upon the precoded categories on the questionnaire. "Exam and cleaning" included visits precoded as "cleaning teeth," "examination," and "only X-rays." "Fillings," "extractions," "root canals," and "crowns" were all precoded categories. "Bridges and dentures" included the precoded categories of "bridges," "partial dentures," and "full dentures." Visits with other specified services were classified as "other," and visits with no reported services were classified as "unknown." A single visit may have been associated with multiple services and was included multiple times in the panel "visits with one or more services" on a table, but excluded from the panel "visits with only one service" on a table.

*Terms relating to charges and expenditures*—*Total expenditures* for dental visits were estimated based on the total number of visits and the average charge for visits with a reported known charge.

The *average charge per visit* is the arithmetic mean calculated from charges reported by the household respondent without consideration for the amount actually paid or the source of payment. Zero charges were assigned to visits the household reported as free from the provider in response to three separate questions. Visits associated with flat fees were included, but visits with unknown charges were excluded, in the calculation.

The *median charge per visit* was the amount at which half the visits had lower charges and half had higher charges.

A *flat fee* was a charge for a service or treatment that included more than one visit. If a hospitalization was also involved, the total flat fee was assigned to the hospitalization and a zero charge was assigned to all visits. Otherwise, the flat fee was equally distributed among all the associated visits. Visits prior to 1980 were considered in the proration of the flat fee, but visits after June 30, 1980, could not be considered.

The *average expenditures per person* were calculated by dividing the total expenditures by the number of people in the population.

*Terms relating to characteristics of people*—*Age* refers to the age of the person as of January 1, 1980. Babies born during the survey period were included in the category "under 5 years."

The *sex* of the person was recorded by the interviewer.

A person's *race* was classified as "white," "black," or "other." The "other" race category includes American Indian, Alaskan Native, Asian, Pacific Islander, and persons not identified as any race. The race of persons 17 years of age and over was reported by the household respondent; the race of children under 17 years of age was derived from the race of the wife of household head (if there was one) or the household head.

*Education of individual* shows the years of school completed for people 17 years of age and over. Only years completed in regular schools, where persons are given a formal education, were included. A "regular" school is one that 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 was not counted in determining the highest grade of school completed.

Each person was classified according to the total *1979 family income* of the family of which he or she was a member at the time of first interview. The income recorded was the total of all income received by members of the family in the 12-month period preceding the first interview, a period primarily in 1979. Income from all sources was included, e.g., wages, salaries, rents from property, pensions, and help from relatives. Within the household, all people related to each other by blood, marriage, adoption, or foster care status constituted a family. Unrelated individuals were classified according to their own income.

For the purpose of classifying the population by *geographic area*, the States were grouped into four "regions." These regions correspond to those used by the U.S. Bureau of the Census and are as follows: Northeast—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania; North Central—Michigan, Wisconsin, Ohio, Indiana, Illinois, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; South—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas; West—Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, Hawaii.

### Sample Design

The NMCUES national survey utilized two, independently drawn, national area samples provided by the Research Triangle Institute and its subcontractor, the National Opinion Research Center. Both

sample designs were stratified four-stage area probability designs and were similar in structure. The first stage consisted of primary sampling units (PSU's) which were counties, parts of counties, or groups of contiguous counties. The second stage consisted of secondary sampling units (SSU's) which were census enumeration districts or block groups. Smaller area segments constituted the third stage, and housing units (HU's) were selected in the fourth stage. Related persons in occupied HU's were interviewed as a single reporting unit (RU). Combined stage-specific sample sizes over the two designs were 135 PSU's (covering 108 separate primary areas), 809 SSU's, 809 small area segments and 7,596 HU's, containing about 7,200 RU's. About 6,600 RU's were interviewed for a response rate of 91.8 percent of eligible RU's.

NMCUES was a panel survey consisting of an initial interview during February-April 1980 and four followup interviews spaced at approximately 3-month intervals. About four-fifths of the third and fourth interviews were conducted by telephone; all of the remaining interviews were conducted in person. In most reporting units, data for all related persons were collected from a single respondent. A summary of selected information reported in previous interviews was reviewed with the family to correct errors and to allow updating the record as more information became available.

## Reliability of Estimators

The statistics presented in this report are based on a sample of the target population rather than the entire population. Thus, the estimates may differ from values that would be obtained from a complete census. The difference between a sample estimate and the population value is called the sampling error and the expected magnitude of the sampling error is measured by a statistic called the standard error. The relative standard error of an estimator is the standard error of the estimator divided by the value of the estimator based on a complete census.

Tables 4-6 present estimates of relative standard errors for figures appearing in the text tables. The chance is approximately 68 out of a 100 that the absolute difference between an estimate and the population value, relative to the estimated value, is less than the estimated relative standard error. The chance is approximately 95 out of 100 that the absolute difference relative to the estimated value is less than twice the estimated relative standard error. For example, the estimated average charge for a nonorthodontia dental visit for a person in a family with income between \$10,000 and \$14,999 was \$54, and the estimated relative standard error was .09. Thus, with 95-percent confidence, the average charge based on a complete census of the population would

Table 4

Estimated relative standard errors for table 1 for number of nonorthodontic dental visits, visits per 100 persons, average charges, and expenditures, by selected characteristics: United States, January-June 1980

| Selected characteristic           | Population       | Nonorthodontic dental visits |                        |                          |              |                    |
|-----------------------------------|------------------|------------------------------|------------------------|--------------------------|--------------|--------------------|
|                                   |                  | Number                       | Number per 100 persons | Average charge per visit | Expenditures |                    |
|                                   |                  |                              |                        |                          | Total        | Average per person |
| Total . . . . .                   | ( <sup>1</sup> ) | .03                          | .03                    | .04                      | .05          | .05                |
| Age <sup>2</sup> . . . . .        | ( <sup>1</sup> ) | .08                          | .08                    | .11                      | .14          | .14                |
| Sex . . . . .                     | ( <sup>1</sup> ) | .04                          | .04                    | .05                      | .06          | .06                |
| Race . . . . .                    | ( <sup>1</sup> ) | .07                          | .07                    | .08                      | .11          | .12                |
| Geographic area . . . . .         | .04              | .09                          | .09                    | .07                      | .11          | .12                |
| Education of individual . . . . . | .05              | .06                          | .06                    | .08                      | .10          | .11                |
| 1979 family income . . . . .      | .05              | .07                          | .06                    | .09                      | .11          | .12                |

<sup>1</sup>Estimates were post-stratified by age, sex, and race. Hence, the estimated numbers of persons by these characteristics are not subject to sampling error. However, since post-stratification for race was black/nonblack, the estimate for white people has a relative standard error of 0.03.

<sup>2</sup>For groups under 75 years of age.

**Table 5**

**Estimated relative standard errors for table 2 for number of orthodontic visits and average number per person, by selected characteristics: United States, January-June 1980**

| Selected characteristic     | Orthodontic dental visits |                                |
|-----------------------------|---------------------------|--------------------------------|
|                             | Number                    | Average number per 100 persons |
| Total . . . . .             | .09                       | .09                            |
| Age <sup>1</sup> . . . . .  | .12                       | .12                            |
| Sex . . . . .               | .12                       | .12                            |
| Race <sup>2</sup> . . . . . | .09                       | .09                            |

<sup>1</sup>Age categories except for "all other."  
<sup>2</sup>For white people only.

be between \$44 ( $\$54 - 2 \times .09 \times \$54$ ) and \$64 ( $\$54 + 2 \times .09 \times \$54$ ).

In addition to sampling errors, the results are also subject to various types of nonsampling errors such as nonresponse, misreporting by respondents, data processing mistakes, etc. In the final reports from this survey, these types of errors will be kept to a minimum by various quality control procedures, imputations procedures, outlier checks, and other methods. These procedures have not been completed for the data in this report and hence, the estimates should be used with care.

Estimates shown in the tables are rounded. Totals, averages, and percentages were calculated

using unrounded numbers and may differ slightly from those calculated from the rounded estimates.

**Table 6**

**Estimated relative standard errors for table 3 for number of dental visits, average charge per visit, and total expenditures, by type of visit and service: United States, January-June 1980**

| Type of visit and service        | Dental visits |                          |                    |
|----------------------------------|---------------|--------------------------|--------------------|
|                                  | Number        | Average charge per visit | Total expenditures |
| All visits . . . . .             | .03           | ...                      | ...                |
| Orthodontic . . . . .            | .09           | ...                      | ...                |
| Nonorthodontic . . . . .         | .03           | .04                      | .05                |
| Visits with one or more services |               |                          |                    |
| Exam or cleaning . . . . .       | .05           | .07                      | .09                |
| Fillings . . . . .               |               |                          |                    |
| Extractions . . . . .            |               |                          |                    |
| Other . . . . .                  |               |                          |                    |
| Bridges or dentures . . . . .    | .09           | .12                      | .15                |
| Crowns . . . . .                 |               |                          |                    |
| Root canals . . . . .            |               |                          |                    |
| Visits with only one service     |               |                          |                    |
| Exam or cleaning . . . . .       | .05           | .07                      | .09                |
| Fillings . . . . .               |               |                          |                    |
| Extractions . . . . .            |               |                          |                    |
| Other . . . . .                  |               |                          |                    |
| Bridges or dentures . . . . .    | .09           | .14                      | .17                |
| Crowns . . . . .                 |               |                          |                    |
| Root canals . . . . .            |               |                          |                    |

NOTE: Standard errors for medians cannot be estimated at this time.