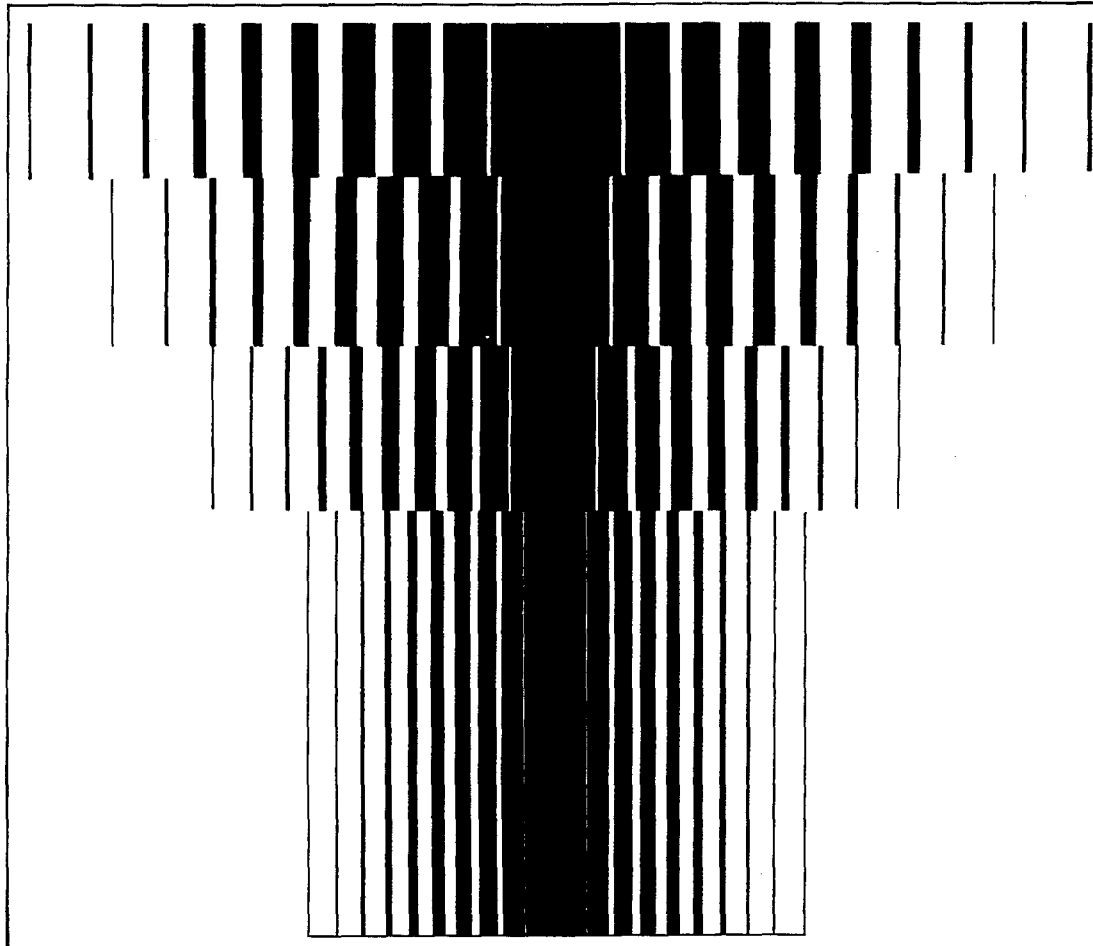# Persons Receiving
Care From Selected
Health Care Practitioners
United States, 1980

Series B, Descriptive Report No. 6

Copyright Information

Contents

Text Table

List of Figures

Symbols

---   Data not available
...   Category not applicable
-      Quantity zero
0.0 Quantity more than zero but less than 0.05
*   Test statistic is significant at 0.05 level
**   Test statistic is significant at 0.01 level

Persons Receiving Care From Selected Health Care Practitioners: United States, 1980

by Robert H. Mugge, Ph.D., National Center for Health Statistics

Executive Summary

In the household survey phase of the National Medical Care Utilization and Expenditure Survey of 1980, a survey was made of 17,123 persons who made up a representative sample of the civilian population in the United States not residing in institutions. Through repeated interviews the survey obtained information on the health conditions of these people, the health care services they received in 1980, the costs of these services, and the arrangements made for paying for the services. This report, one of a series of reports on the knowledge gained through the survey, is on the people who received services during the year from nurses, optometrists, podiatrists, psychologists, paramedics, physical therapists, social workers and counselors, laboratory technicians, radiologic technicians, other technicians, and all other practitioners; thus, this report is on people receiving services from the various types of practitioners other than physicians and dentists. In addition to excluding the military and persons living in nursing homes and other institutions, the report excludes people receiving nonphysician and nondentist services if they were only received in the same visit in which a physician or dentist was seen, if they were received in an emergency room, or if they were received while the person was an inpatient in a hospital.

More than one-third of the nation's population had one or more such visits with practitioners other than physicians and dentists in 1980, according to estimates from the National Medical Care Utilization and Expenditure Survey. Approximately 1 person out of every 8 had a visit with a nurse; about 1 person of every 11 visited an optometrist during the year; 1 of 15 visited a lab technician; 1 of 25 visited a chiropractor; 1 of 37 visited a radiologic technician; and 1 of every 50 visited a podiatrist. Psychologists, paramedics, and physical therapists were each visited by about 1 percent of the population.

People varied in their likelihood of seeing the various types of practitioners, depending on their personal characteristics, the condition of their health, and where they lived:

- In general, the practitioners were more likely to have been visited at least once during the year by

    women than by men,

    whites than by blacks or other races,

    non-Hispanics than by Hispanics,

    the old than by the young,

    those with more education than by those with less,

    those with poor health,

    those with activity limitations, and

    those living outside the South.

- There was little relationship, in general, between level of income and visiting a practitioner.

- Children, the aged, and those with low family income were most likely to have visits with nurses.

- Adults were more likely than children to visit optometrists.

- People living in the West, in the North Central Region, and in rural areas were more likely than those living elsewhere to visit chiropractors.

- The older the people were, the more likely they were to visit a podiatrist.

- Persons with more education—especially college graduates—were more likely than persons with less education to visit psychologists.

- People living in nonmetropolitan areas and people living in the West were more likely than those living elsewhere to visit paramedics.

- People reporting poor health or activity limitations were more likely than others to visit a physical therapist.

- Low income people and those living in the central cities of metropolitan areas were those most likely to visit social workers and counselors.

- Older people and people reporting fair or poor health were most likely to see technicians.

Introduction

The American people receive a significant share of their health care from practitioners other than physicians and dentists. These practitioners have important roles in the health care system of the Nation, but there is little systematic knowledge of patterns of care given or of the kinds of patients served by them. The need for such knowledge is one that the National Medical Care Utilization and Expenditure Survey (NMCUES) was designed to meet. Data in this report are about the people who visited these practitioners at least once in 1980.

The practitioners include podiatrists, psychologists, nurses, chiropractors, radiologic technicians, optometrists, social workers, laboratory technicians, medics, corpsmen, and various others. These practitioners vary widely in their specialized services, their training, their acceptance by the public, the settings in which they provide services, and in other ways. The services of some practitioners tend to be auxiliary to those of physicians, especially for practitioners such as physical therapists and radiologic, laboratory, and other technicians (Mugge, 1983). Some practitioners usually serve patients independently, as do, for example, optometrists, chiropractors, and podiatrists. Psychologists and social workers usually work alone and directly with patients, but physicians are likely to be involved in their cases. For other practitioners, such as nurses and paramedics, the situation varies.

NMCUES collected information on health problems, health care received, costs of care, and related areas throughout calendar year 1980 from a sample of the U.S. civilian noninstitutionalized population. This report is based on demographic and other information on persons in the survey, as related to whether they reported having visits during the year to nonphysician practitioners. (Visits to dentists are excluded in this report.) This report does not cover information on the visits per se.

The *medical visit* may be described as a face-to-face encounter in which a client saw a health care practitioner to obtain professional services. Visits were not counted if they took place in an emergency room or if they involved a hospital inpatient. And since the survey covered only the civilian noninstitutionalized population, visits involving military personnel or residents of nursing homes or other institutions were not included. Contacts by telephone were also not counted. However, visits in hospital outpatient departments or clinics *were* counted, as well as visits in doctors' offices, homes, clinics, laboratories, and other places.

The procedures used in the survey resulted in statistics that do not give a complete picture of services provided by nonphysician health care practitioners nor of the persons who received one or more such services during the year. If the respondent reported that a physician was seen during a visit, then the respondent was not asked whether any other type of practitioner was also seen during the visit; only if a physician was not seen was the respondent asked what types of nonphysician practitioners were seen.

Thus, the number of persons having such visits in 1980 are understated in this report, but the degree of understatement varies greatly by type of practitioner. In general, those practitioners who seldom provide their services as assistants to physicians, to hospital inpatients or nursing home residents, or in emergency rooms, will have had their clientele understated only to a small degree. It is understood that optometrists, chiropractors, podiatrists, and psychologists tend to provide their services independently of physicians and outside the hospital or institutional setting, so there should be little understating of their clients. On the other hand, it is understood that nurses, paramedics, physical therapists, and technicians frequently provide their services in hospitals or along with visits to physicians; thus a more substantial portion of their actual clients are likely to be excluded in this and other reports based on NMCUES data.

For a discussion of the sample design, imputation procedures, estimation methods, and statistical hypothesis testing, see Appendix I. For a further definition of terms, see Appendix II.

In this report, unless otherwise indicated in the text, differences between percents or totals are noted only if they are statistically significant at the .05 level. Only simple relationships of single factors to visits are reported, even though it is recognized that various relationships are confounded with one another. Thus, strong relationships are found between sex and age and the number of visits, and these relationships probably account for some of the other interrelationships that turn up in the data.

Comparisons were made between the findings of the 1980 NMCUES and some earlier surveys that also sought to measure utilization of some of these same practitioner types. Most of these surveys are not very comparable; the only survey very similar to NMCUES that has ever been done before was the National Medical Care Expenditure Survey of 1977, but comparable data are not

yet available from that survey. The earlier surveys, though different in design and content from NMCUES, did show fairly similar results to those of NMCUES in terms of the demographic characteristics of users of the respective practitioners' services, and they tend also to show growth over the years in the overall extent of use of most of these practitioners.

Survey Background

NMCUES was designed to provide estimates on utilization of and expenditures for various types of medical care, on health insurance coverage and amounts paid by insurers for health care, and on the health of the civilian noninstitutionalized population of the United States. 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.

All of the data in the present report were derived from the national household survey sample of 17,123 persons living in some 6,600 households. Information for all family members was collected from a single household respondent through five interviews approximately 3 months apart.

Data from the national household sample complement data collected in the National Health Interview Survey conducted by the National Center for Health Statistics.

The data also update earlier data and show trends since 1977, when many comparable data were obtained through the National Medical Care Expenditure Survey, which was sponsored jointly by the National Center for Health Services Research and the National Center for Health Statistics.

Understanding the data requires knowledge of the sequence of questions by which the data were obtained. All instances of health care received during the reference period were elicited through a series of probe questions on the Core Questionnaire. (See Appendix III.) Visits to *selected practitioners* were counted only when they took place during a *medical visit* or during a visit to a hospital outpatient department or clinic. For each medical visit reported, the respondent was asked whether the person saw a medical doctor on that visit. If the answer was no, then the respondent was asked, "What type of medical person did (PERSON) see?" The questionnaire had precodes to circle if the answer was chiropractor, podiatrist, optometrist, psychologist, social worker, nurse, or physical therapist; if some other type of practitioner was mentioned, then the interviewer wrote in that type. For visits to hospital clinics or outpatient departments, the respondent was asked whether a medical doctor was seen. If the answer was no, then the respondent was asked, "What type of medical person did (PERSON) see at the clinic?" Precodes were to be circled for chiropractor, podiatrist, optometrist, psychologist, social worker, nurse, physical therapist, or lab technician. If some other type of practitioner was mentioned, that type was written on the questionnaire.

Discussion

The Text Table and Figure 1 show the types of practitioners, other than physicians and dentists, who provided services without physician involvement to 1 million or more civilian noninstitutionalized persons. Each of these numbers is a sample estimate, with a standard error of the estimate as shown in Appendix I. Given these standard errors, the rank ordering of these practitioners according to the sizes of their total clientele groups can be given with a high degree of confidence, with the following exceptions: The estimated clientele groups of psychologists, paramedics, and physical therapists are so similar in size that their relative rankings cannot be confidently accorded; and the estimated clientele groups of social workers or counselors and other technicians are also too similar in size for the larger of the two to be determined with any confidence.

As noted in the Introduction, the numbers given in the Text Table are not the complete counts of persons who saw the various practitioners during 1980 because they do not count persons who were institutionalized, persons receiving emergency room service, or persons seeing one of these practitioners in the same visit in which they saw a physician. The undercounts vary widely depending on the type of practitioner. The clients of optometrists, chiropractors, podiatrists, and psychologists should

Number and percent of the population receiving services from selected medical practitioners: United States, 1980

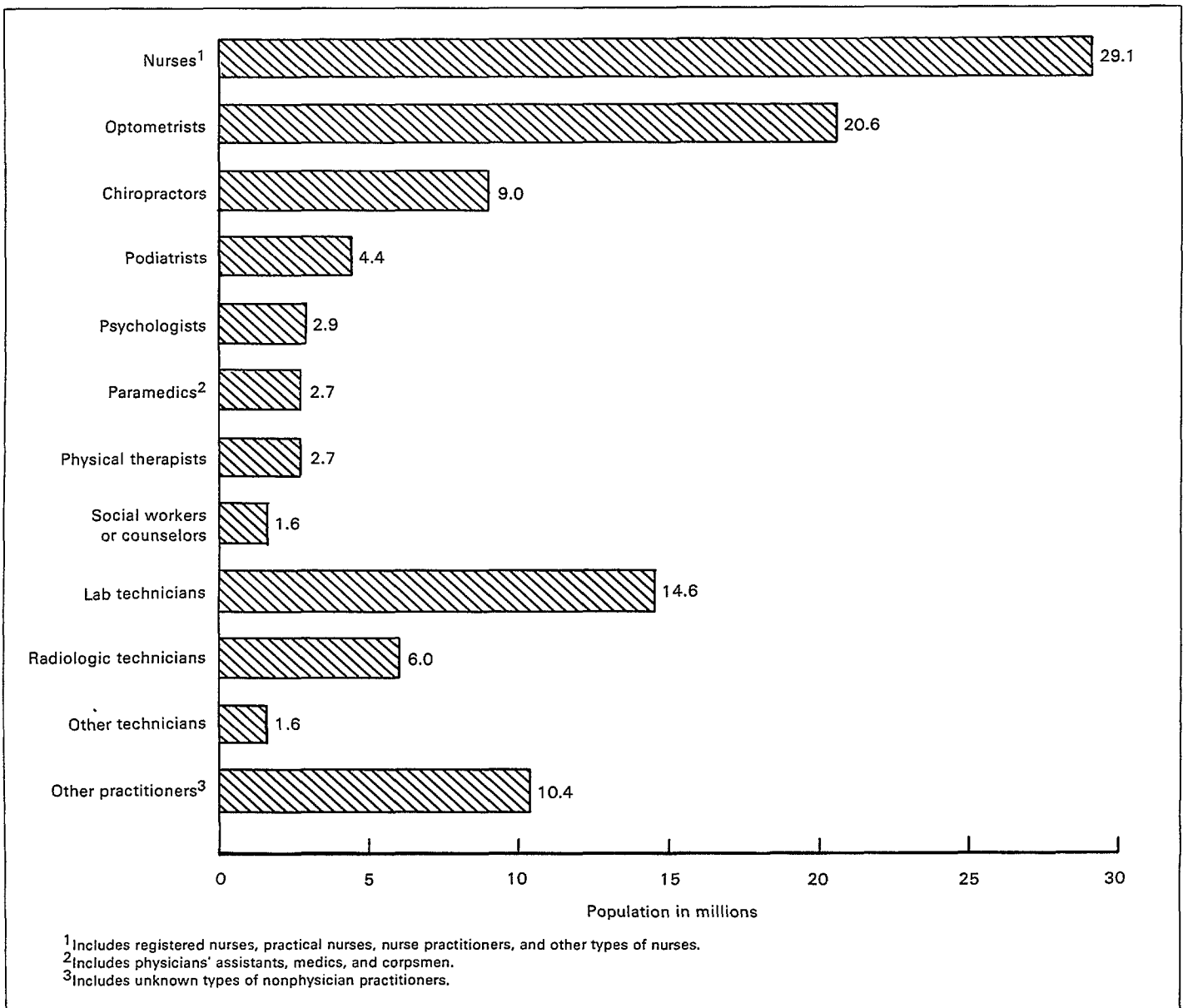| Practitioner	Population in millions	Percent of population
One or more practitioners	78.3	35.1
Nurses[1]	29.1	13.1
Optometrists	20.6	9.2
Chiropractors	9.0	4.0
Podiatrists	4.4	2.0
Psychologists	2.9	1.3
Paramedics[2]	2.7	1.2
Physical therapists	2.7	1.2
Social workers or counselors	1.6	0.7
Lab technicians	14.6	6.6
Radiologic technicians	6.0	2.7
Other technicians	1.6	0.7
Other practitioners[3]	10.4	4.7

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2] Includes physicians' assistants, medics, and corpsmen.
[3] Includes unknown types of nonphysician practitioners.

be understated only to a very small degree, but others' clients may be considerably understated.

Nurses

NMCUES yields the estimate that 29.1 million people (13.1 percent of the civilian noninstitutionalized population) received direct services from nurses in 1980. This estimate excludes services received by hospital inpatients, in emergency rooms, or in the same visit in which a physician was seen. Women were more likely than men were to have a visit with a nurse, white people more likely than black, and non-Hispanics more likely than Hispanics (Table 1 and Figures 2 and 3). Nearly one-fifth of all small children had nurse visits; for older children and young adults the rate dropped, reaching a low of only one-tenth of the adults 25–44 years of age having visits with nurses (Figure 4). From that point the utilization rate rose with age, and nearly one-fifth of the elderly had nurse visits. That widowed persons were more likely than others to have seen a nurse during the year is associated with their relatively high average age. Among those 17 years of age and over, persons who had attended college were more likely than others were to receive nurses' services. Low income persons were more likely to receive nurses' services than those with high family incomes (Table 2). The poorer one's rated health status, the more likely the person was to have used the services of a nurse, and persons with activity limitations were more likely than others to have received services. Utilization of nursing services was highest in the North Central Region and lowest in the Northeast (Figure 5). In addition, nursing services were used more in nonmetropolitan than in metropolitan areas (Figure 6).

Optometrists

Optometric services were estimated to have been received by 20.6 million individuals in 1980—9.2 percent of the population. These services were more likely to have been used by females than by males, by white persons than by black, and by non-Hispanics than by Hispanics (Table 1 and Figures 2 and 3). Utilization was higher for all the adult age groups and lower for children

Figure 1
Number of people receiving services from selected medical practitioners: United States, 1980

Practitioner	Population in millions
Nurses[1]	29.1
Optometrists	20.6
Chiropractors	9.0
Podiatrists	4.4
Psychologists	2.9
Paramedics[2]	2.7
Physical therapists	2.7
Social workers or counselors	1.6
Lab technicians	14.6
Radiologic technicians	6.0
Other technicians	1.6
Other practitioners[3]	10.4

Population in millions

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2] Includes physicians' assistants, medics, and corpsmen.
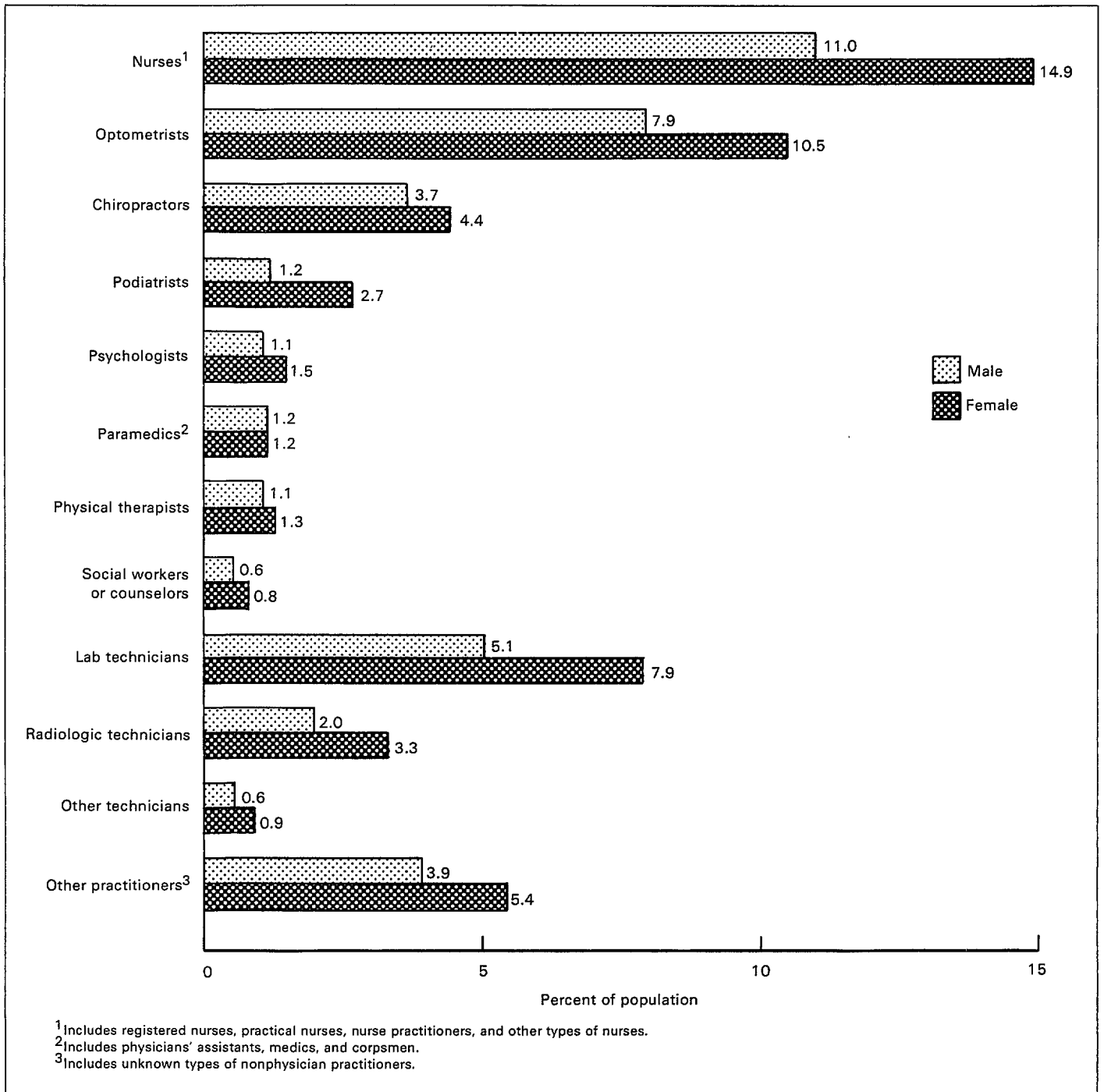[3] Includes unknown types of nonphysician practitioners.

(Figure 4). The utilization rate for college graduates was significantly higher than the rate for those with fewer than 9 years of school completed. No relationship was observable between the utilization of optometrists' services and either marital status or family income (Table 2). Use of optometry was highest in the North Central Region and lowest in the South (Figure 5). Use was also highest among people living in rural areas outside metropolitan areas and lowest in the central cities of metropolitan areas (Figure 6).

Chiropractors

NMCUES estimates indicate that 9.0 million persons (4.0 percent of the population) received chiropractic services in 1980. The likelihood of receiving such services was higher for white persons than for black and higher for non-Hispanics than for Hispanics (Table 1 and Figure 3). There was not a statistically significant difference between use rates for males and females (Figure 2). Use of chiropractors' services increased with age, except that it dropped off after 75 years of age (Figure 4). No association was found between use and education or levels of income (Tables 1 and 2). Use was lower for the *never married* than for other marital status groups, perhaps because the never married tend to be younger than the other groups. There was no significant association with health status or activity limitation. The use of chiropractors' services was much higher in the West and North Central than in the other two regions (Figure 5). Utilization was estimated to be highest in the rural areas outside standard metro-

5

Figure 2
Percent of the population receiving services from selected medical practitioners, by sex: United States, 1980
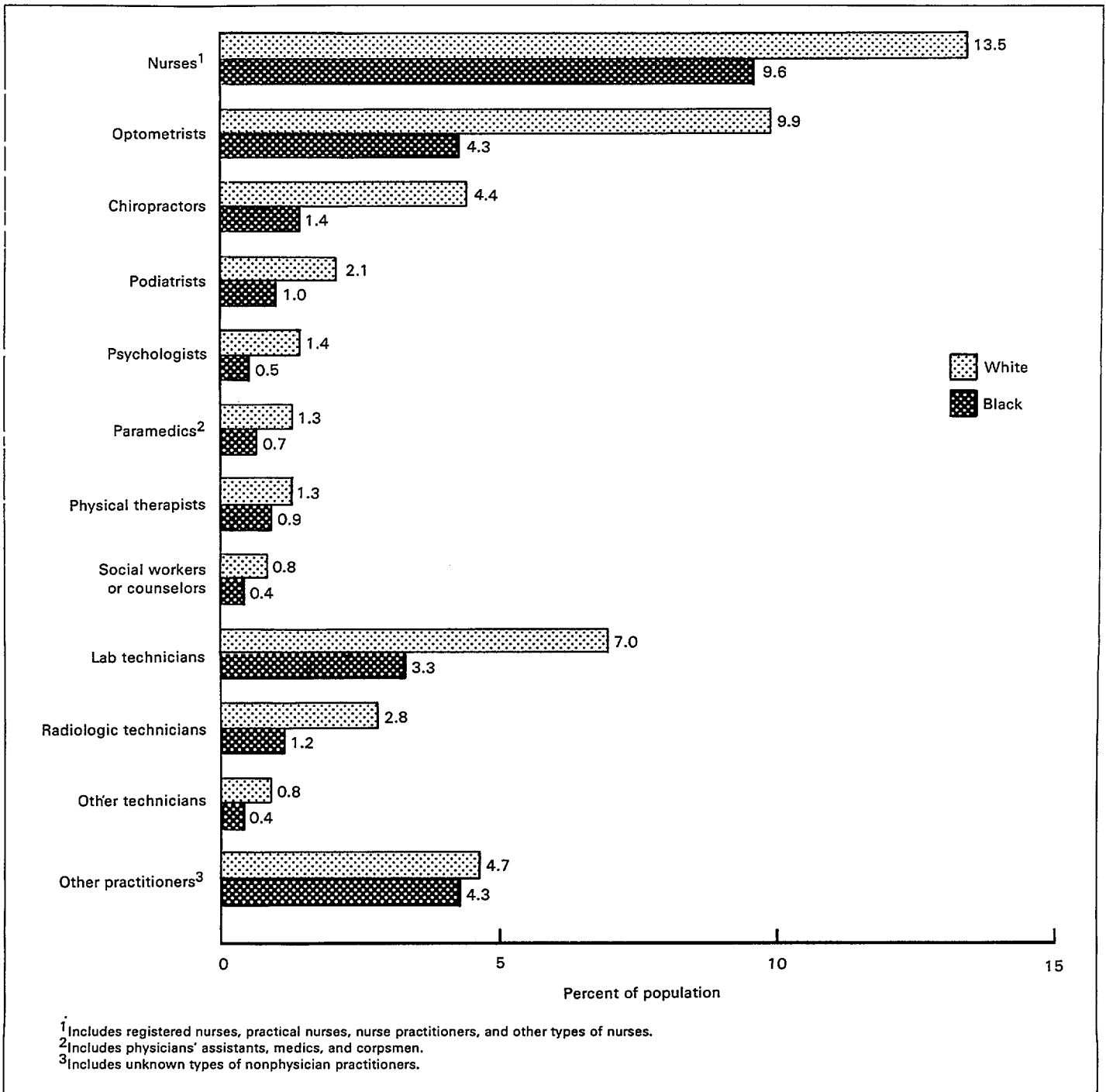

	Male	Female
Nurses[1]	11.0	14.9
Optometrists	7.9	10.5
Chiropractors	3.7	4.4
Podiatrists	1.2	2.7
Psychologists	1.1	1.5
Paramedics[2]	1.2	1.2
Physical therapists	1.1	1.3
Social workers or counselors	0.6	0.8
Lab technicians	5.1	7.9
Radiologic technicians	2.0	3.3
Other technicians	0.6	0.9
Other practitioners[3]	3.9	5.4

Percent of population

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2] Includes physicians' assistants, medics, and corpsmen.
[3] Includes unknown types of nonphysician practitioners.

politan statistical areas (SMSA's) and lowest in the central cities of SMSA's (Figure 6).

Podiatrists

The NMCUES estimate is that 4.4 million persons—2.0 percent of the total population—visited podiatrists for services at least once in 1980. Among the podiatry patients, women, white persons, and non-Hispanics predominated (Table 1 and Figures 2 and 3). The likelihood

of use rose rapidly with age, from 0.2 percent for children under 6 years of age to 10.5 percent for persons 75 years of age and over (Figure 4). Widows had very high utilization, which is consistent with the age differential finding. No consistent relationship was observed between the use of podiatry and the patient's education (Table 1). Persons in families with incomes of less than $15,000 in 1980 were more likely to see podiatrists than those in families with higher incomes. Those with poorer health status ratings had higher utilization than others, and those with an activity limitation had much higher utilization

Figure 3
Percent of the population receiving services from selected medical practitioners, by race: United States, 1980
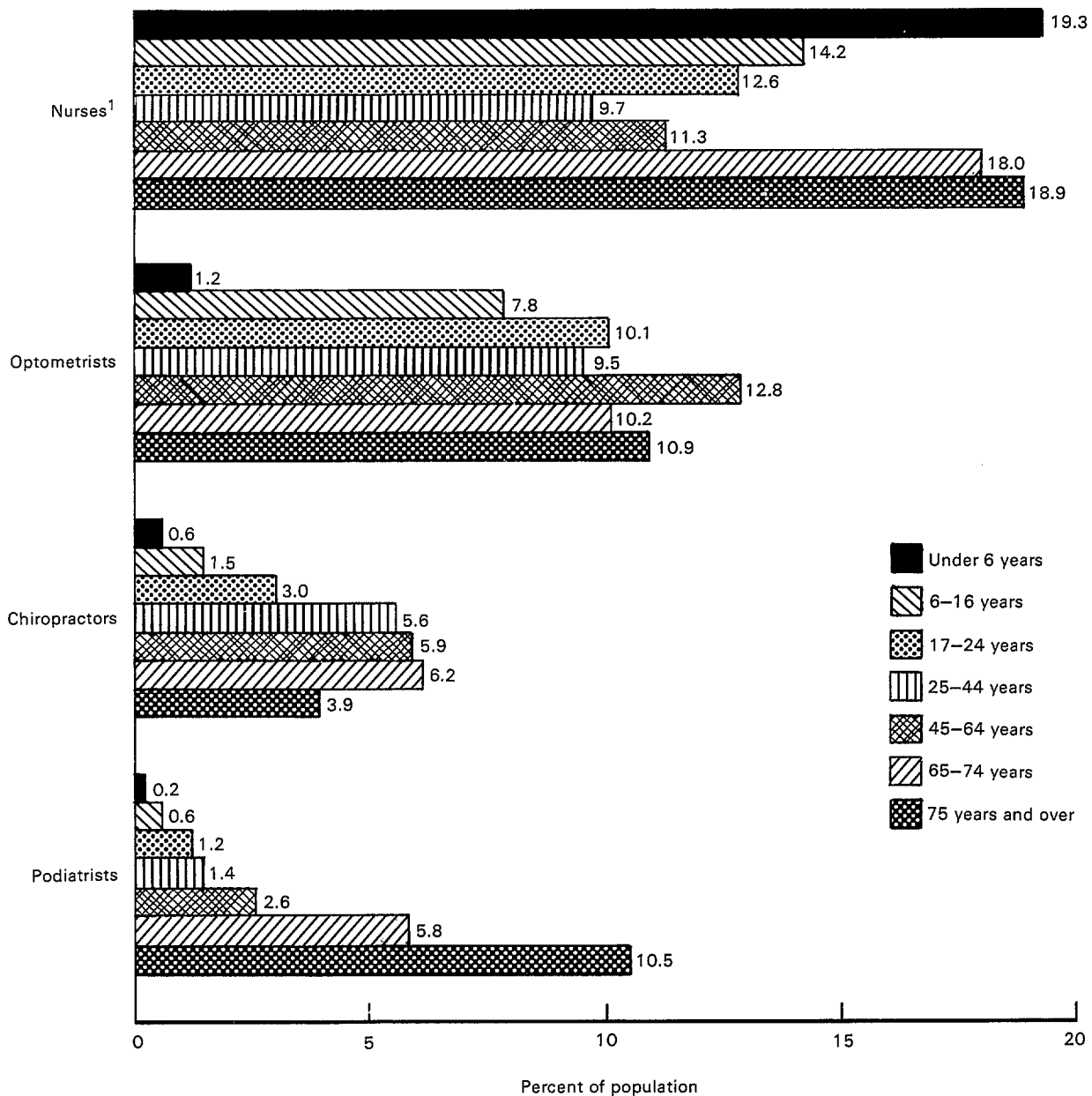

Nurses[1]
- White: 13.5
- Black: 9.6

Optometrists
- White: 9.9
- Black: 4.3

Chiropractors
- White: 4.4
- Black: 1.4

Podiatrists
- White: 2.1
- Black: 1.0

Psychologists
- White: 1.4
- Black: 0.5

Paramedics[2]
- White: 1.3
- Black: 0.7

Physical therapists
- White: 1.3
- Black: 0.9

Social workers or counselors
- White: 0.8
- Black: 0.4

Lab technicians
- White: 7.0
- Black: 3.3

Radiologic technicians
- White: 2.8
- Black: 1.2

Other technicians
- White: 0.8
- Black: 0.4

Other practitioners[3]
- White: 4.7
- Black: 4.3

White
Black

Percent of population

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2] Includes physicians' assistants, medics, and corpsmen.
[3] Includes unknown types of nonphysician practitioners.

than those without such a limitation. Use rates were highest in the Northeast and lowest in the South and West (Figure 5). Utilization was also found to be much higher in metropolitan areas than elsewhere (Figure 6).

Psychologists

An estimated 2.9 million persons—1.3 percent of the population—received services from psychologists in 1980, exclusive of hospital inpatient visits and visits that also involved medical doctors. No statistically significant differences in rates by sex were found (Table 1 and Figure 2). Utilization of psychological services was much more likely for white persons than for black and much higher for non-Hispanics than for Hispanics (Figure 3 and Table 1). Older children and younger adults had the highest utilization. Use was significantly more likely for college graduates than for persons with less education. Individuals who were separated from their spouses were more likely to use psychological services than those in other marital status categories. No consistent relationship was found

Figure 4
Percent of the population receiving services from selected medical practitioners, by age: United States, 1980

Nurses[1]
- 19.3
- 14.2
- 12.6
- 9.7
- 11.3
- 18.0
- 18.9

Optometrists
- 1.2
- 7.8
- 10.1
- 9.5
- 12.8
- 10.2
- 10.9

Chiropractors
- 0.6
- 1.5
- 3.0
- 5.6
- 5.9
- 6.2
- 3.9

Podiatrists
- 0.2
- 0.6
- 1.2
- 1.4
- 2.6
- 5.8
- 10.5

Legend:
- ■ Under 6 years
- ▨ 6–16 years
- ▦ 17–24 years
- ▥ 25–44 years
- ▩ 45–64 years
- ▧ 65–74 years
- ▦ 75 years and over

Percent of population

[1]Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.

between use of psychologists and family income, and there were no statistically significant differences in relation to health status or the presence of an activity limitation (Table 2). Utilization was highest in the suburban areas of metropolitan counties and lowest in the rural areas of nonmetropolitan counties.

Paramedics

The broad group identified here as *paramedics* were reported seen by 2.7 million persons, 1.2 percent of the total population. These persons included approximately 1.6 million who reported seeing *physicians' assistants,* about 700,000 seeing *paramedics,* 300,000 seeing *medics,* and 200,000 seeing *corpsmen.* These four categories were grouped together because of the similarity in their functions and because, considered separately, the size of the sample would have made little statistical analysis possible. *Nurse practitioner* visits were not counted here, even though their function is also similar; they were counted instead with nurses.

There was not a statistically significant difference between the sexes in use of paramedics, nor was there between white and black persons (Table 1 and Figures 2 and 3). Non-Hispanics used paramedics' services notably

Figure 5. Percent of the population receiving services from selected medical practitioners, by geographic region: United States, 1980

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
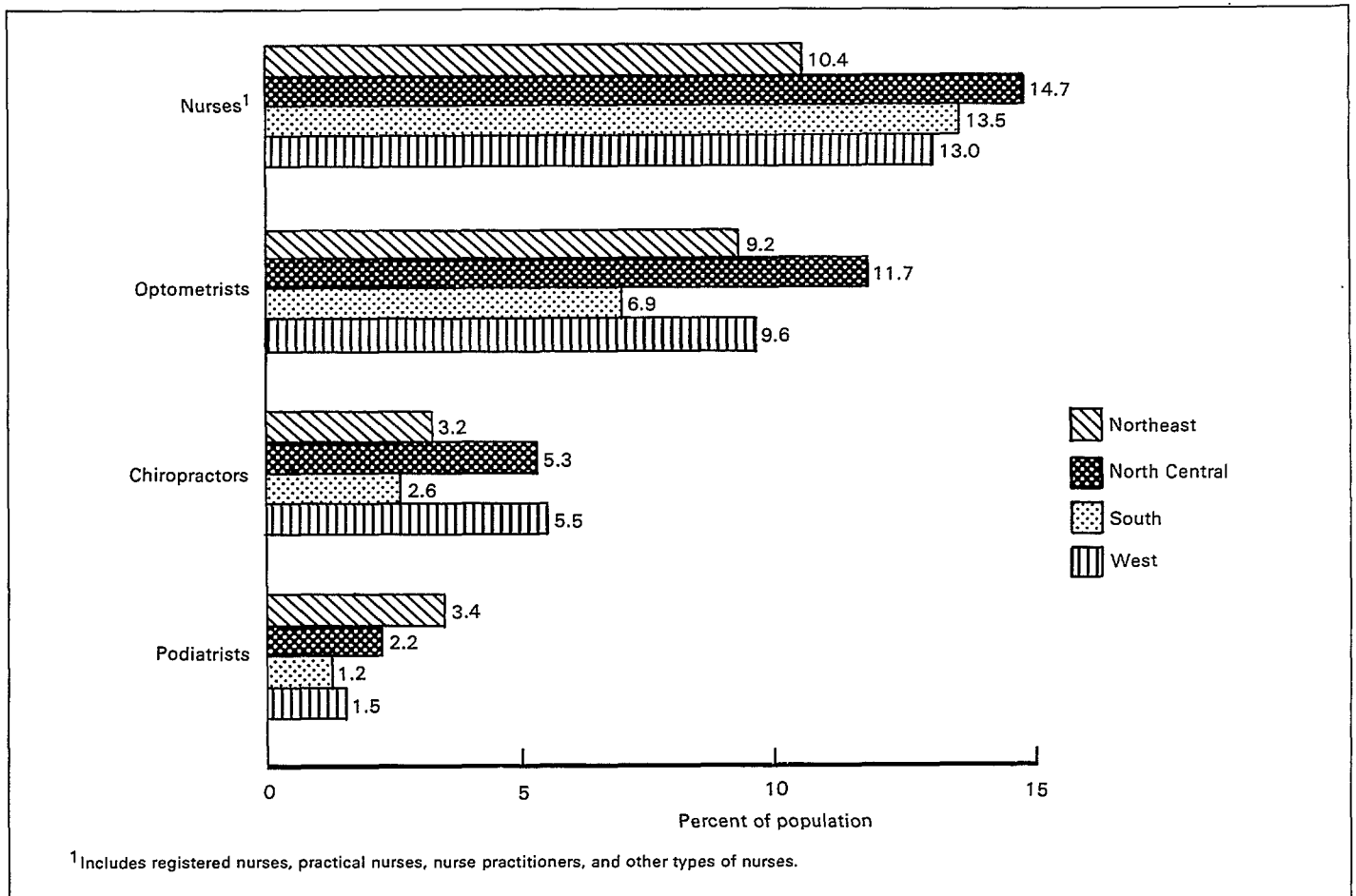
more than did Hispanics. No relationship was found between use of paramedics and age, marital status, or family income, but the use of paramedics did increase to some extent with education. Utilization did not vary by health status or the presence of an activity limitation (Table 2). Utilization was highest in the West and lowest in the Northeast; it was highest in rural areas and lowest in the central cities of metropolitan areas.

Physical Therapists

An estimated 2.7 million persons, 1.2 percent of the total population, had one or more visits with a physical therapist in 1980, excluding services provided to hospital inpatients or services given in the same visit in which a physician was seen. There were no differences in utilization in relation to sex, race, marital status, education, or family income (Tables 1 and 2 and Figures 2 and 3). However, non-Hispanics had markedly higher use rates than Hispanics; and utilization increased as age increased, up to age 75. As would be expected, use of physical therapists increased as health status declined; and use was particularly high for persons reported to have activity limitations. The use of physical therapists' services was

highest in the West and lowest in the South; it was also relatively high in metropolitan areas compared with other areas.

Social Workers and Counselors

When social workers and counselors were considered separately, the proportions of the population reporting use of their services were too small in the survey sample to permit much analysis. Since the functions of these two kinds of practitioners are similar, they were combined for purposes of this report. An estimated 1.6 million persons, 0.7 percent of the total population, received services from these practitioners.

There was no statistically significant difference in utilization of social workers and counselors between males and females or between black and white persons, but other races had a significantly lower level of use than the white race, and Hispanics a lower level than non-Hispanics (Table 1 and Figures 2 and 3). The highest utilization came in the 25–44 year age group, with rates dropping off for age groups both below and above this level. Some tendency was noted for increased use of social workers and counselors by people with more education. Among

9

Figure 6

Percent of the population receiving services from selected medical practitioners, by location of residence: United States, 1980

Nurses[1]	In central city 11.3
	Outside central city 12.5
	Urban 15.4
	Rural 15.4

Optometrists	In central city 8.1
	Outside central city 9.3
	Urban 9.7
	Rural 10.7

In SMSA { In central city / Outside central city }

Outside SMSA { Urban / Rural }

Chiropractors	2.6
	4.4
	3.9
	5.6

Podiatrists	2.5
	2.2
	1.5
	0.9

0   5   10   15   20

Percent of population

[1]Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.

NOTE: SMSA = standard metropolitan statistical area.

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marital status groups those who were divorced had the highest likelihood of using such services, and the widowed and married groups had the lowest. Use tended to decline as family income increased (Table 2). Health status and activity limitation showed no relationship to use. Use was highest in the West and lowest in the South; it was also highest in the metropolitan areas, especially their central cities, and relatively low outside metropolitan areas.

Technicians

Large numbers of people in NMCUES reported seeing technicians during 1980 without seeing a physician in the same visit: 14.6 million persons (6.6 percent of the population) saw laboratory technicians, probably in most cases to get diagnostic tests of blood, urine, or other tissue. Radiologic, or X-ray, technicians were seen by an estimated 6.0 million persons—2.7 percent of the total—for ·diagnostic services or treatment. A residual group, including 1.6 million persons, 0.7 percent of the total, saw other or unspecified types of technicians. (All of these estimates exclude the many instances in which technicians provided services to persons who were hospital in-

patients or emergency room patients, as well as to persons who received technician services in the same visits in which they saw physicians.)

Patterns of utilization were generally similar for the three types of technicians (Tables 1 and 2 and Figures 2 and 3). For all three types, utilization by females exceeded that by males, utilization by white persons exceeded that by black, and for non-Hispanics utilization was higher than for Hispanics. Use of technician services tended to increase with age, although for the lab and other technicians it dropped off for persons 75 years of age and over. Use levels increased with education but not with family income. Utilization was relatively high for those with poorer health status and for those with activity limitations. Patterns were mixed and inconclusive in relation to region and type of community of residence, except that lowest use was found in the South. The South shared with the West the lowest use rate for "other" technicians.

Other Practitioners

The "other" practitioner category was a catch-all of many different kinds of practitioners, no one of which

10

was reported by more than a small number of individuals in the survey sample. The category also includes non-physician practitioners of unknown types. It is estimated from the survey findings that a total of 10.4 million persons, 4.7 percent of the total population, received services from all these different practitioners in 1980. Included were such diverse practitioners as audiologists, faith healers, aides, contact lens fitters, dieticians, nutritionists, and pharmacists. The characteristics of people having visits to these other practitioners tend in a general way to reflect the characteristics of the total group of persons who saw nonphysician practitioners during the year (Tables 1 and 2 and Figures 2 and 3). Thus, as with the clients of all of the practitioners, utilization of the other practitioners was higher for females than for males and for non-Hispanics than for Hispanics. Utilization increased with age and was highest for widows and divorced persons and for the lowest income group. It was also higher for those with fair or poor health status or activity limitation than for others. Utilization of other practitioners differed from utilization of all practitioners in that it did not increase with education, it was highest in the Northeast, and it was about the same inside and outside standard metropolitan statistical areas.

Comparisons With Earlier Survey Findings

Except for the 1977 National Medical Care Expenditure Study (NMCES), no nationally representative, longitudinal sample survey comparable to NMCUES, of persons receiving services from nonphysician and nondentist health care practitioners, has ever been done before, according to our knowledge. Estimates comparable to those reported here are not yet available from NMCES.

A 1928–31 survey reported that 21.3 percent of the surveyed population had home or office calls involving "secondary or sectarian practitioners" during a 12-month period (Falk, Rorem, and Ring, 1933, p. 73). Similar to NMCUES and NMCES, this study involved periodic visits in the homes of a large group of respondents in order to determine the kinds of health care received and their costs (Falk, Rorem, and Ring, 1933, and Falk, Klem, and Sinai, 1933). However, this study was limited to 17 States and the District of Columbia, included only white families, and in various other ways was lacking in comparability to the 1980 survey.

Reports were found from past surveys showing some relevant data regarding services from optometrists, chiropractors, podiatrists, psychologists, and physical therapists, and these are noted below. Relevant national data from past surveys were not found regarding services from nurses, paramedics, social workers and counselors, or technicians.

Optometrists

The 1928–31 survey in selected areas (as noted above) found that 13.4 percent of the families and 4.15 percent of individuals received refractive services or glasses (Falk, Rorem, and Ring, 1933, pp. 60 and 73).

Estimates of the number and certain characteristics of persons receiving optometric services over a 12-month period in 1963–64 were obtained in the National Health Interview Survey (Hannaford, 1966). Data were based on single interviews in a representative sample of households; thus, they depended on 12-month recall on the part of respondents. It was estimated then that 16.2 million persons (8.7 percent of all persons) received such services, compared with the estimates of 20.6 million (9.2 percent) in 1980. As in 1980 findings, the earlier survey estimates showed females having higher utilization than

males, and white people having higher utilization rates than all others. The rate of use, as in 1980, was highest in the North Central Region, next highest in the West, then in the Northeast, and lowest in the South. Contrary to the 1980 survey, the one in 1963–64 showed utilization increasing consistently with income.

A 1968 survey of optometrists showed that less than 1 percent of all optometrists were employed by physicians, bearing out the observation that they tend to work independently (Koch and Phillips, 1974a, p. 47). In the same survey the rate of active optometrists per 100,000 population was highest in the West, next highest in the North Central States, then in the Northeast, and lowest in the South.

The Bureau of Health Manpower (1978) estimated in 1978 that 33 million people received optometric services. In that report, too, the highest rate of optometrists in relation to the population was reported to be in the West.

Poe (1983) reported the estimated number of visits to optometrists in 1979, by broad demographic characteristics, according to the National Health Interview Survey. Relating the estimated total optometric visits to the total population yields the estimate of 153 visits per 1,000 population for the United States in 1979, which is somewhat higher than might be expected on the basis of the NMCUES estimate that 9.2 percent of the population had optometric visits in 1980 (Table 1), with an average of 1.4 visits per patient. The differentials in visits per 1,000 population according to sex, age, race, place of residence, and region as yielded by the Poe data are very similar in magnitude and direction to the differentials in percent of persons seeing optometrists as shown in Tables 1 and 2 of this report.

The Bureau of Health Professions (1981) estimated the following utilization rates of active optometrists per 100,000 population in the four regions in 1980:

Region	Rate
Northeast	10.2
North Central	11.2
South	8.0
West	12.3

The four regions follow the same order as in the 1968 survey (Koch and Phillips, 1974a).

Chiropractors

In the National Health Interview Survey (NHIS) information was sought on persons who received services from chiropractors over a 12-month period in 1963–64 and again in 1974. Findings in the two instances when the subject was included in NHIS are not strictly comparable with one another, just as neither survey is comparable to the NMCUES of 1980. Different questions were used to obtain the information, and in 1963–64 proxy respondents were used, while in 1974 the items were asked on a self-respondent basis. In both instances NHIS depended on 12-month recall on the part of respondents, whereas NMCUES involved continual record-keeping through the year and interviews with respondents every 3 months. More complete reporting on health care utilization would thus be expected to result from NMCUES than was the case with NHIS. Recognizing that the three sets of data were derived in different ways, which may explain some of the differences in the data, it is still interesting and useful to compare findings from the three data sets on persons with reported chiropractic visits (Table 3).

The estimates show an increase in the proportion of the population visiting chiropractors, from 3.6 percent in 1974 to 4.0 percent in 1980; however, this rise could have resulted from more complete reporting in 1980 than in 1974. Thus, although a real increase could have taken place, it cannot be said that there is evidence here that the total utilization rate for chiropractic services increased from 1974 to 1980.

The National Opinion Research Council surveyed health care practices of a sample of the nation's population in 1955 and again in 1958 (Kuby, 1965, p. 8). In the 1955 survey the information was obtained only on adults, and 4.1 percent reported having received chiropractic services in the preceding year. In the 1958 survey it was reported that 3.0 percent of adults and 2.0 percent of all persons received chiropractic services. Kuby reported that she did not believe the difference represented any real decline in persons receiving chiropractic services from 1955 to 1958, but that the difference was probably from "differences in sampling procedures, sampling error, or the wording of questions" (1965, p. 14).

It may appear superficially that the sex differential changed by 1980, with more males having seen a chiropractor according to the two earlier surveys and more females according to the 1980 survey. However, none of these differences is statistically significant.

While the exact numbers differ, there is a similarity in the patterns shown in data from the three surveys in terms of utilization rates by race, age, region, and place of residence.

In a survey of chiropractors conducted in 1979 Von Kuster (1980) estimated that "6.8 million individuals used chiropractic services in 1979"—well below the survey estimates given above for 1974 and 1980. Von Kuster further estimated that 56 percent of the chiropractic patients were female and 75 percent were white. The 1980 NMCUES estimate agrees that 56 percent of the patients were female, but according to the 1980 survey estimate, 95 percent of the patients were white.

From the 1979 survey, the number of practicing chiropractors per 100,000 population was also estimated (Von Kuster, p. 108):

Region	Rate
Northeast	8.2
North Central	10.5
South	7.4
West	14.7

According to these rates, the regions are ranked in the same order as they are by the NMCUES utilization rates. Thus, as may be expected, utilization rates are correlated with the geographical distribution of chiropractors.

Podiatrists

The utilization of podiatry services was included in the 1963–64 and 1974 National Health Interview Surveys. Some related data were also obtained in a 1970 survey of podiatrists (Koch and Phillips, 1974b). Although the reported number of patients and the population reporting utilization increased from the 1963–64 to the 1974 survey, they then declined in the 1980 survey—from 5.0 million persons and 2.4 percent of the population in 1974 to 4.4 million persons and 2.0 percent in 1980 (Table 3). This fluctuation was greater than would have been expected by chance alone, but the reasons for the change are unknown. If the differences were due to variations in survey design and data collection methods, there may well have been no actual decline in patients or levels of utilization for podiatrists between 1974 and 1980 (they could even have increased), in spite of the indications in Table 3.

In terms of characteristics and locations, the three surveys provide highly similar patterns on the utilization of podiatrists. Use by females was much higher than use by males according to each survey. The white rate was much higher than the rate for all other races in the last two surveys; this difference was not significant in 1963–64. In all surveys utilization increased markedly with age. All surveys found utilization highest in the Northeast, next highest in the North Central Region, next in the West, and lowest in the South. And in all surveys, utilization was much higher in metropolitan areas than elsewhere. According to the report on the 1974 national survey of podiatrists, the numbers of active podiatrists per 100,000 population in the regions were as follows (Stant and Handler, 1978, p. 4):

Region	Rate
Northeast	5.9
North Central	3.4
South	1.7
West	3.0

13

Comparison of these regional rates with the NMCUES findings shows that the utilization rates tend to reflect the distribution of podiatrists in the general population.

Psychologists

According to unpublished manpower estimates of the American Psychological Association, visits to psychologists' offices per 1,000 population in 1976 were 83.1 in the Northeast, 67.3 in the West, 41.7 in the North Central Region, and 36.6 in the South (Haupt, 1980, p. 19). Not only do these estimates provide the same ordering of the regions as in the 1980 NMCUES, but the relative levels of rates for the four regions are also very similar. The ratio of each other region's rate to that of the Northeast according to the two sets of data is as follows:

Region	American Psychological Association	NMCUES
West.	81.0	84.2
North Central.	50.2	57.9
South	44.0	42.1

A survey made in 1978 of health service providers who were members of the American Psychological Association found indications that children, the aged, black persons, and Hispanics were underserved in psychological services (Vandenbos, Stapp, and Kilburg, 1981). This finding is consistent with the NMCUES finding that all four of these groups, except for school-age children, tend to have relatively low rates in the use of psychologists' services.

Physical Therapists

The use of physical therapists was studied in the 1974 National Health Interview Survey. The results of that survey are compared with the results of the 1980 survey in Table 3 (Howie, 1978).

For 1974 it was estimated that 3.2 million persons received physical therapy; for 1980, after a 6-year period in which the number of patients would have been expected to grow, the estimate was half a million less. The explanation for the drop in the figures is probably the fact that the 1974 survey data reported all services received from physical therapists, regardless of the setting, while in 1980 certain kinds were excluded. A large proportion of cases are expected to receive their physical therapy as inpatients in hospitals; such persons would have been counted in 1974 but not in 1980 if they received no more physical therapy after leaving the hospital. This factor very likely accounted for most of the difference between the estimates for the two years.

Despite the differences between the surveys, highly similar findings came up in terms of utilization differentials: In both surveys utilization was closely associated with age, and in both significant differences in relation to sex and race were lacking. A similar pattern in relating utilization to the regions is shown. The surveys differed, however, in that the 1980 survey showed higher utilization in metropolitan areas, whereas the 1974 survey did not.

Summary

Earlier surveys provide some data that are roughly comparable to selected data obtained through NMCUES in 1980 for persons receiving services from optometrists, chiropractors, podiatrists, psychologists, and physical therapists. Most of these earlier survey findings are similar to the findings in NMCUES. Probably the most useful for purposes of comparison with NMCUES are the data obtained on persons having visits to optometrists in the National Health Interview Survey for 1979, on persons with visits to chiropractors and podiatrists in NHIS for 1963–64 and 1974, and on persons with visits to physical therapists in NHIS for 1974. In general the findings of these earlier surveys corroborate the NMCUES data with respect to differentials on sex, race, age, region, and location of residence of persons receiving services.

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List of Detailed Tables

Table 1

Number of people and percent of the population receiving services from selected medical practitioners, by sex, race, ethnicity, age, marital status, and education: United States, 1980

Characteristic	Population in thousands	One or more practitioners	Nurses[1]	Optometrists	Chiropractors	Podiatrists	Psychologists	Paramedics[2]	Physical therapists	Social workers or counselors	Lab technicians	Radiologic technicians	Other technicians	Other practitioners[3]
		Percent												
Total................	222,876	35.1	13.1	9.2	4.0	2.0	1.3	1.2	1.2	0.7	6.6	2.7	0.7	4.7
Sex														
Male.......................	107,539	30.6	11.0	7.9	3.7	1.2	1.1	1.2	1.1	0.6	5.1	2.0	0.6	3.9
Female.....................	115,337	39.4	14.9	10.5	4.4	2.7	1.5	1.2	1.3	0.8	7.9	3.3	0.9	5.4
Race														
White......................	191,722	36.9	13.5	9.9	4.4	2.1	1.4	1.3	1.3	0.8	7.0	2.8	0.8	4.7
Black.......................	26,050	22.4	9.6	4.3	1.4	1.0	0.5	0.7	0.9	0.4	3.3	1.2	0.4	4.3
Other	5,104	34.7	12.5	10.0	2.3	0.9	-	-	1.3	0.2	4.9	4.3	0.5	5.6
Ethnicity														
Hispanic....................	15,013	23.6	8.8	5.8	2.4	1.3	0.6	0.3	0.6	0.3	3.9	1.2	0.3	3.7
Non-Hispanic................	207,863	35.9	13.4	9.5	4.1	2.0	1.3	1.3	1.3	0.7	6.7	2.8	0.8	4.8
Age														
Under 6 years	20,805	27.0	19.3	1.2	0.6	0.2	0.3	1.4	0.1	0.2	3.3	0.6	0.4	3.1
6–16 years.................	40,822	29.9	14.2	7.8	1.5	0.6	1.8	1.2	0.7	0.7	2.4	1.3	0.3	4.3
17 years and over	161,249	37.5	12.0	10.6	5.1	2.5	1.3	1.2	1.5	0.8	8.0	3.3	0.9	5.0
17–24 years	32,886	33.9	12.6	10.1	3.0	1.2	1.5	1.2	1.0	0.9	6.6	2.1	0.4	4.5
25–44 years	61,316	34.0	9.7	9.5	5.6	1.4	1.9	1.6	1.3	1.1	7.3	2.9	0.8	4.2
45–64 years	43,578	40.2	11.3	12.8	5.9	2.6	0.9	0.9	2.1	0.4	9.0	4.4	1.2	4.8
65–74 years	15,165	45.3	18.0	10.2	6.2	5.8	0.2	0.8	2.2	0.3	10.8	3.9	1.5	7.4
75 years and over	8,305	49.0	18.9	10.9	3.9	10.5	-	1.0	1.1	0.2	9.3	4.0	0.5	9.3
Marital status[4]														
Married.....................	98,684	37.5	10.9	10.4	6.0	2.1	1.2	1.3	1.6	0.6	8.6	3.4	0.9	4.8
Widowed	13,258	45.6	17.3	12.6	4.0	7.4	0.2	0.7	1.6	0.6	9.4	5.1	1.1	6.5
Separated..................	4,938	36.2	13.1	12.6	4.5	1.2	4.4	1.1	1.1	1.0	9.1	1.5	0.7	4.8
Divorced...................	9,908	39.9	13.7	11.8	5.9	3.1	1.5	0.9	1.2	2.1	7.5	3.7	1.8	6.3
Never married	33,852	33.8	12.3	10.0	2.8	1.9	1.5	1.3	1.4	1.0	5.7	2.4	0.5	4.5
Years of school completed[4]														
Less than 9 years............	24,137	34.9	12.7	9.2	4.2	3.7	0.8	0.6	1.4	0.2	7.5	2.9	0.7	5.7
9–11 years.................	28,604	34.6	10.7	10.2	4.3	2.7	1.0	0.9	1.6	0.7	7.0	3.1	0.4	5.1
12 years...................	59,792	36.9	11.0	11.2	6.2	1.9	0.9	1.4	1.3	0.8	7.7	3.2	1.0	4.4
13–15 years	26,450	39.6	14.2	10.5	5.0	2.3	1.4	1.2	2.1	1.2	8.4	3.5	0.9	5.2
16 years or more............	22,267	42.9	13.0	11.4	4.5	3.1	3.1	1.6	1.6	0.8	10.2	3.9	1.4	5.1

[1] Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2] Includes physicians' assistants, medics, and corpsmen.
[3] Includes unknown types of nonphysician practitioners.
[4] Persons 17 years of age and over.

17

Table 2
Number of people and percent of the population receiving services from selected medical practitioners, by family income in 1980, health status, activity limitation, geographic region, and location of residence: United States, 1980

Characteristic	Population in thousands	One or more practitioners	Nurses[1]	Optometrists	Chiropractors	Podiatrists	Psychologists	Paramedics[2]	Physical therapists	Social workers or counselors	Lab technicians	Radiologic technicians	Other technicians	Other practitioners[3]
							Percent							
Total................	222,876	35.1	13.1	9.2	4.0	2.0	1.3	1.2	1.2	0.7	6.6	2.7	0.7	4.7
Family income in 1980														
Less than $5,000	17,338	38.0	15.6	10.3	3.7	2.8	1.4	1.5	1.3	1.5	7.4	2.7	0.5	7.4
$5,000–$14,999.............	59,634	34.9	14.3	7.7	4.1	2.4	1.1	1.3	1.2	0.7	6.3	3.1	0.8	5.2
$15,000–$24,999	60,410	34.6	13.2	9.4	3.8	1.7	1.1	1.3	1.1	0.8	6.2	2.4	0.8	4.2
$25,000–$34,999	42,631	35.0	11.6	10.4	4.3	1.6	1.4	1.1	1.2	0.6	6.6	2.5	0.5	3.9
$35,000 or more.............	42,864	35.0	11.6	9.7	4.1	1.7	1.6	1.1	1.5	0.4	7.0	2.5	0.9	4.4
Health status														
Excellent	110,597	31.7	12.1	8.6	3.5	1.4	1.1	1.2	0.7	0.5	4.9	2.1	0.5	3.8
Good.......................	81,873	36.5	13.2	9.9	4.5	2.1	1.3	1.3	1.4	0.9	6.9	2.8	0.8	5.0
Fair.......................	20,790	43.9	15.8	10.0	5.0	3.8	2.0	1.1	1.9	0.8	12.2	4.1	1.2	7.1
Poor	8,015	47.8	17.1	10.5	5.1	3.9	2.0	1.9	4.8	1.3	12.0	6.5	1.2	8.0
Activity limitation														
Limited.....................	20,906	47.0	17.2	9.7	5.1	4.7	1.7	0.9	4.5	1.2	11.5	3.8	1.1	8.1
Not limited.................	201,970	33.9	12.6	9.2	3.9	1.7	1.2	1.3	0.9	0.7	6.0	2.6	0.7	4.3
Geographic region														
Northeast...................	46,902	34.8	10.4	9.2	3.2	3.4	1.9	0.4	1.3	0.8	7.6	3.0	0.8	5.6
North Central...............	59,265	39.4	14.7	11.7	5.3	2.2	1.1	1.3	1.4	0.6	7.0	3.0	1.1	4.9
South	69,500	29.8	13.5	6.9	2.6	1.2	0.8	1.2	0.9	0.5	4.3	2.0	0.5	3.4
West.......................	47,209	37.9	13.0	9.6	5.5	1.5	1.6	1.9	1.5	1.1	8.3	3.0	0.5	5.3
Location of residence														
In SMSA[4]..................	154,076	34.1	12.0	8.8	3.7	2.3	1.4	1.0	1.4	0.8	6.8	2.3	0.8	4.7
In central city.............	64,927	31.0	11.3	8.1	2.6	2.5	1.0	0.9	1.4	1.1	5.2	2.0	0.8	4.5
Outside central city.........	89,149	36.3	12.5	9.3	4.4	2.2	1.7	1.1	1.5	0.6	7.9	2.6	0.9	4.8
Outside SMSA[4]	68,800	37.4	15.4	10.2	4.9	1.2	1.0	1.7	0.7	0.4	6.1	3.4	0.5	4.6
Urban	31,009	37.3	15.4	9.7	3.9	1.5	1.2	1.4	1.0	0.4	6.0	4.1	0.6	5.2
Rural.....................	37,792	37.6	15.4	10.7	5.6	0.9	0.8	2.0	0.6	0.4	6.1	2.9	0.3	4.2

[1]Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2]Includes physicians' assistants, medics, and corpsmen.
[3]Includes unknown types of nonphysician practitioners.
[4]SMSA = standard metropolitan statistical area.

Table 3
Number of people and percent of the population receiving services from chiropractors, podiatrists, and physical therapists, as estimated in the National Health Interview Survey (NHIS) and in the National Medical Care Utilization and Expenditure Survey (NMCUES), by selected characteristics: United States, 1963–64, 1974, and 1980

Characteristic	Chiropractors			Podiatrists			Physical therapists	
	NHIS		NMCUES, 1980	NHIS		NMCUES, 1980	NHIS, 1974	NMCUES, 1980
	1963–64	1974		1963–64	1974			
	Number in thousands							
People receiving services..................	4,250	7,527	8,985	3,060	4,978	4,393	3,242	[1]2,745
	Percent							
Total..................................	2.3	3.6	4.0	1.6	2.4	2.0	1.6	1.2
Sex								
Male...	2.4	3.8	3.7	1.1	1.6	1.2	1.6	1.1
Female.......................................	2.2	3.5	4.4	2.2	3.1	2.7	1.5	1.3
Race								
White..	2.6	4.0	4.4	1.8	2.5	2.1	1.6	1.3
All other....................................	0.3	1.0	1.5	0.7	1.7	1.0	1.4	1.0
Age								
Under 6 years	0.4	0.7	0.6	0.4	1.2	0.2	0.4	0.1
6–16 years	0.6	1.2	1.5	0.6	0.9	0.6	0.7	0.7
17–24 years	1.7	3.3	3.0	0.9	1.1	1.2	1.3	1.0
25–44 years	3.4	4.8	5.6	1.3	1.6	1.4	2.0	1.3
45–64 years	4.2	6.2	5.9	3.2	4.1	2.6	2.3	2.1
65 years and over	2.9	3.9	5.4	4.5	7.0	7.4	2.2	1.8
Geographic region								
Northeast....................................	1.8	3.3	3.2	2.7	3.9	3.4	1.4	1.3
North Central................................	3.0	4.2	5.3	1.7	2.6	2.2	1.7	1.4
South..	1.8	2.5	2.6	0.9	1.3	1.2	1.3	0.9
West...	2.7	5.0	5.5	1.4	2.0	1.5	1.9	1.5
Location of residence								
In SMSA[2]...................................	1.9	3.0	3.7	2.0	2.8	2.3	1.6	1.4
In central city..............................	- - -	2.4	2.6	- - -	3.1	2.5	1.6	1.4
Outside central city........................	- - -	3.4	4.4	- - -	2.5	2.2	1.5	1.5
Outside SMSA[2]..............................	- - -	5.1	4.9	- - -	1.5	1.2	1.5	0.7
Nonfarm.....................................	2.7	4.9	- - -	1.0	1.6	- - -	1.6	- - -
Farm..	4.3	6.6	- - -	0.6	0.8	- - -	1.1	- - -
Urban.......................................	- - -	- - -	3.9	- - -	- - -	1.5	- - -	1.0
Rural.......................................	- - -	- - -	5.6	- - -	- - -	0.9	- - -	0.6

[1] Excludes persons who received physical therapy only as hospital inpatients.
[2] SMSA = standard metropolitan statistical area.

Appendixes

List of Appendix Tables

Appendix I. Technical Notes on Methods

Survey Background

The National Medical Care Utilization and Expenditure Survey was a panel survey designed to collect data about the U.S. civilian noninstitutionalized population in 1980. During the course of the survey, information was obtained on health, access to and use of medical services, associated charges and sources of payment, and health insurance coverage. The survey was co-sponsored by the National Center for Health Statistics and the Health Care Financing Administration. Data collection was provided under contract by the Research Triangle Institute and its subcontractors, National Opinion Research Center and SysteMetrics, Inc.

The basic survey plan for NMCUES drew heavily on two surveys, the National Health Interview Survey, conducted by the National Center for Health Statistics, and the National Medical Care Expenditure Survey (NMCES), co-sponsored by the National Center for Health Services Research and the National Center for Health Statistics.

NHIS is a continuing, multipurpose, cross-sectional survey first conducted in 1957. The main purpose of NHIS is to collect information on illness, disability, and the use of medical care. Although some information on medical expenditures and insurance payments has been collected in NHIS, the cross-sectional nature of the survey design is not well suited for providing annual data on expenditures and payments.

NMCES was a panel survey in which a sample of households was interviewed six times over an 18-month period in 1977 and 1978. NMCES was specifically designed to provide comprehensive data on how health services were used and paid for in the United States in 1977.

NMCUES is similar to NMCES in survey design and questionnaire wording, so that analysis of some of the change during the 3 years between 1977 and 1980 is possible. Both NMCUES and NMCES used question wording that was similar to NHIS in areas common to the three surveys. Together they provide extensive information on illness, disability, use of medical care, costs of medical care, sources of payment for medical care, and health insurance coverage at two points in time.

Sample Design of NMCUES

The NMCUES sample of housing units and group quarters, hereafter jointly referred to as dwelling units, is a concatenation of two independently selected national samples, one provided by the Research Triangle Institute and the other by the National Opinion Research Center. The sample designs used by these two organizations are similar with respect to principal design features; both can be characterized as stratified, four-stage area probability designs. The principal differences between the two designs are the type of stratification variables and the specific definitions of sampling units at each stage. The salient design features of the two sample surveys are summarized in the following sections.

The target population for NMCUES consisted of all persons who were members of the U.S. civilian noninstitutionalized population at any time between January 1, 1980 and December 31, 1980. All persons living in a sample dwelling unit at the time of the first interview contact became part of the national sample. Unmarried students 17–22 years of age who lived away from home were included in the sample when a parent or guardian was included in the sample. In addition, persons who died or were institutionalized between January 1 and the date of first interview were included in the sample if they were related to persons living in the sampled dwelling units. All of these persons were considered "key" persons, and data were collected for them for the full 12 months of 1980 or for the proportion of time they were part of the U.S. civilian noninstitutionalized population. In addition, babies born to key persons were considered key persons, and data were collected for them from the time of birth. Relatives from outside the original population (that is, institutionalized, in the Armed Forces, or outside the United States between January 1 and the first interview) who moved in with key persons after the first interview were also considered key persons, and data were collected for them from the time they joined the key person. Relatives who moved in with key persons after the first interview but were part of the civilian noninstitutionalized population on January 1, 1980, were classified as "nonkey" persons. Data were collected for nonkey persons for the time that they lived with a key person but, because they had a chance of selection in the initial sample, their data are not used for general person-level analysis. However, data for nonkey persons are used in family analysis because they do contribute to the family's utilization of and expenditures for health care during the time they are part of the family.

Persons included in the sample were grouped into "reporting units" for data collection purposes. Reporting

units were defined as all persons related to each other by blood, marriage, adoption, or foster care status and living in the same dwelling unit. The combined NMCUES sample consisted of 7,244 eligible reporting units, of which 6,599 agreed to participate in the survey. In total, data were obtained on 17,123 key persons. The Research Triangle Institute sample yielded 8,326 key persons and the National Opinion Research Center sample 8,797.

Research Triangle Institute Sample Design

A primary sampling unit (PSU) is defined as a county, a group of contiguous counties, or parts of counties with a combined minimum 1970 population size of 20,000. A total of 1,686 disjoint PSU's exhaust the land area of the 50 states and Washington, D.C. The PSU's are classified as one of two types. The 16 largest standard metropolitan statistical areas (SMSA's) are designated as self-representing PSU's, and the remaining 1,670 PSU's in the primary sampling frame are designated as non-self-representing PSU's.

PSU's are grouped into strata whose members tend to be relatively alike within strata and relatively unlike between strata. PSU's derived from the 16 largest SMSA's had sufficient population in 1970 to be treated as primary strata. The 1,659 non-self-representing PSU's from the continental United States were stratified into 42 primary strata with approximately equal populations. Each of these primary strata had a 1970 population of about 3⅓ million. One supplementary primary stratum of 11 PSU's, with a 1970 population of about 1 million, was added to the Research Triangle Institute primary frame to include Alaska and Hawaii.

The total first stage sample for Research Triangle Institute consisted of 59 PSU's, of which 16 were self-representing PSU's. The non-self-representing PSU's were obtained by selecting one PSU from each of the 43 non-self-representing primary strata. These PSU's were selected with probability proportional to 1970 population size.

In each of the 59 sample PSU's the entire PSU was divided into smaller disjoint area units called secondary sampling units (SSU's). Each SSU consisted of one or more 1970 Census-defined enumeration districts or block groups. Within each PSU the SSU's were ordered and then partitioned to form secondary strata of approximately equal size. Two secondary strata were formed in the non-self-representing PSU drawn from Alaska and Hawaii, and four secondary strata were formed in each of the remaining 42 non-self-representing PSU's. Thus, the non-self-representing PSU's were partitioned into a total of 170 secondary strata. In a similar manner the 16 self-representing PSU's were partitioned into 144 secondary strata.

In the second stage of selection one SSU was selected from each of the 144 secondary strata covering the self-representing PSU's, and two SSU's were selected from each of the remaining secondary strata. All second-stage sampling was with replacement and with probability proportional to the SSU's total noninstitutionalized population. The total number of sample SSU's was $2 \times 170 + 144 = 484$.

For the third stage of selection each SSU was first divided into smaller disjoint geographic areas, and one area within the SSU was selected with probability proportional to the total number of housing units in 1970. Next, one or more disjoint segments of at least 60 housing units were formed in the selected area. One segment was selected from each SSU with probability proportional to the segment housing unit count. In response to the sponsoring agencies' request that the expected household-sample size be reduced, a systematic sample of one-sixth of the segments was deleted from the sample. Thus, the total third-stage sample was reduced to 404 segments.

For the fourth stage of selection all of the dwelling units within the segment were listed, and a systematic sample of dwelling units was selected. The procedures used to determine the sampling rate for segments guaranteed that all dwelling units had an approximately equal overall probability of selection. All of the reporting units within the selected dwelling units were included in the sample.

National Opinion Research Center Sample Design

The land area of the 50 States and Washington, D.C., was also divided into disjoint PSU's for the National Opinion Research Center sample design. A PSU consisted of SMSA's, parts of SMSA's, counties, parts of counties, or independent cities. Grouping of counties into a single PSU occurred when individual counties had a 1970 population of less than 10,000.

The PSU's were classified into two groups according to metropolitan status—SMSA or not SMSA. These two groups were individually ordered and then partitioned into zones with a 1970 census population size of approximately 1 million.

A single PSU was selected within each zone with a probability proportional to its 1970 population. It should be noted that this procedure allowed a PSU to be selected more than one time. For instance, an SMSA primary sampling unit with a population of 3 million could be selected at least twice and possibly as many as 4 times. The full general-purpose sample contained 204 PSU's. These 204 PSU's were systematically allocated for four subsamples of 51 PSU's. The final set of 76 sample PSU's was chosen by randomly selecting two complete subsamples of 51 PSU's; one subsample was included in its entirety, and 25 of the PSU's in the other subsample were selected systematically for inclusion in NMCUES.

For the second stage each of the PSU's selected in the first stage was partitioned into a disjoint set of SSU's defined by block groups, enumeration districts, or a combination of the two types of Census units. Within each

sample PSU the SSU's were ordered and then partitioned into 18 zones such that each zone contained approximately the same number of households. One SSU had the opportunity to be selected more than once, as was the case in the PSU selection. If a PSU had been hit more than once in the first stage, the second-stage selection process was repeated as many times as there were first-stage hits. The 405 SSU's were identified by selecting 5 SSU's from each of the 51 PSU's in the subsample that was included in its entirety, and 6 SSU's from each of the 25 PSU's in the group for which only one-half of the PSU's were included.

The SSU's selected in the second stage were then subdivided into area segments with a minimum size of 100 housing units each. One segment was then selected with probability proportional to the estimated number of housing units.

The fourth stage sample selection of housing units for the National Opinion Research Center was essentially the same as that used by the Research Triangle Institute.

Collection of Data

Field operations for NMCUES were performed by the Research Triangle Institute and the National Opinion Research Center under specifications established by the sponsoring agencies. Persons in the sample dwelling units were interviewed at approximately 3-month intervals beginning in February 1980 and ending in March 1981. The Core Questionnaire was administered during each of the five rounds of interviews to collect data on health, health care, health care charges, sources of payment, and health insurance coverage. A summary of responses was used to update information reported in previous rounds. Supplements to the Core Questionnaire were used during the first, third, and fifth rounds of interviews to collect data that were not expected to change during the year or that were needed only once. Approximately 80 percent of the third and fourth rounds of interviews were conducted by telephone; all remaining interviews were conducted in person. The respondent for the interview was required to be a household member 17 years of age or older. A proxy respondent not residing in the household was permitted only if all eligible household members were unable to respond because of health, language, or mental condition.

Imputation

Nonresponse in panel surveys such as NMCUES occurs when sample individuals refuse to participate in the survey (total nonresponse), when initially participating individuals drop out of the survey (attrition nonresponse), or when data for specific items on the questionnaire are not collected (item nonresponse). In general, response rates for NMCUES were excellent: approximately 90 percent of the sample reporting units agreed to participate in

the survey, and approximately 94 percent of the individuals in the participating reporting units supplied complete annual information. Even though the overall response rates are quite high for NMCUES, the estimates of means and proportions may be biased if nonrespondents have different health care experiences than respondents, or if there is a substantial response rate differential across subgroups of the target population. Furthermore, totals will tend to be underestimated unless allowance is made for the loss of data due to nonresponse.

Two methods commonly used to compensate for survey nonresponse are data imputation and the adjustment of sampling weights. For NMCUES, imputation was used to compensate for attrition and item nonresponse, and weight adjustment was used to compensate for total nonresponse. The calculation of the weight adjustment factors are discussed in the section on sampling weights.

A specialized form of the sequential hot-deck imputation method was used for attrition imputation. First, each sample person with incomplete annual data (hereafter referred to as a "recipient") was linked to a sample person with similar demographic and socioeconomic characteristics who had complete annual data (hereafter referred to as a "donor"). Second, the time periods for which the recipient had missing data were divided into two categories: imputed eligible days and imputed ineligible days. The imputed eligible days were those days for which the donor was eligible (that is, in scope) and the imputed ineligible days were those days for which the donor was ineligible (that is, out of scope). For the recipient's imputed eligible days, the donor's medical care experiences (such as medical provider visits, dental visits, or hospital stays) were imputed into the recipient's record. Finally, the results of the attrition imputation were used to make the final determination of a person's respondent status. If more than two-thirds of the person's total eligible days (both reported and imputed) were imputed, then the person was considered to be a total nonrespondent, and all data for the person were removed from the analytic data file.

The data collection methodology and field quality control procedures for NMCUES were designed so that the data would be as accurate and complete as possible subject to budget considerations. However, individuals cannot report data that are unknown to them, or they may choose not to report the data even if known. This latter situation is especially true for data relating to expenditures, income, and other sensitive topics. Because of the size and complexity of the NMCUES data base it was not feasible, from the standpoint of cost, to replace all missing data for all data items. The 12-month data files, for example, contain approximately 1,400 data items per person. With this in mind, the NMCUES approach was to designate a subset of the total items on the data base for imputation of the missing data. Thus, for 5 percent of the NMCUES data items the responses were edited and missing data imputed by a combination of logic and hot-deck procedures to produce revised variables for use

23

in analysis. Items for which imputations were made cover the following data areas:

- Visit charges.
- Source of payment codes and amounts.
- Annual disability days.
- Health insurance premium amount.
- Length of hospital stay.
- Total weeks worked in 1980.
- Average hours worked per week.
- Educational level.
- Hispanic ethnicity.
- Income.
- Age and birthdate.
- Race.
- Sex.
- Health insurance coverage.
- Visit dates.

These items were selected as the most important variables for statistical analyses.

Weighting and Estimation

For the analysis of NMCUES data, sample weights are required to reflect the complex sample design and to adjust for the potential biasing effects of systematic non-sampling errors related to total nonresponse and sampling frame undercoverage. Data imputation procedures, discussed in the preceding section, were used to compensate for attrition and item nonresponse.

Development of weights reflecting the sample design of NMCUES was the first step in the computation of person-level analytical weights. The basic sample-design weight for a dwelling unit is the product of four weight components that correspond to the four stages of sample selection. Each of the four weight components is either the inverse of the probability of selection at the stage when sampling was without replacement, or it is the inverse of the expected number of selections when sampling was with replacement and multiple selection of the sample unit was possible.

As previously discussed, the NMCUES sample is composed of two independently selected samples. Each sample, together with its basic sampling weights, yields independent unbiased estimates of population parameters. Because the two NMCUES samples were of approximately equal size, a simple average of the two independent estimators was used for the combined sample estimator. This is equivalent to defining an adjusted basic weight by dividing each basic sample weight by 2. Hereafter only the combined sample and the adjusted basic weights are considered.

The total nonresponse-undercoverage adjustment factor is computed at the reporting unit (RU) level. Because every RU within a dwelling unit is included in the sample,

the adjusted basic weight assigned to an RU is simply the adjusted basic weight for the dwelling unit in which the RU is located. As noted above, an RU was classified as responding if the RU initially agreed to participate in NMCUES and as nonresponding otherwise.

Initially 96 RU weight adjustment cells were formed by cross-classifying the following RU variables: race of RU head (white or all other), type of RU head (female, male, or husband-wife), age of RU head (four levels), and size of RU (four levels). These cells were then collapsed to 63 cells so that each cell contained at least 20 responding RU's.

The formula for computing the total nonresponse-undercoverage adjustment factor for RU's in cell C was

$$A_1(C) = \frac{\text{CPS}(C)}{\sum_{k \in C} \phi(k) W_1(k)}$$

where CPS(C) = March 1980 Current Population Survey estimate of the number of RU's in cell C

$$\phi(k) = \begin{cases} 1 & \text{if } k\text{th RU was classified as responding} \\ 0 & \text{otherwise} \end{cases}$$

$W_1(k)$ = the adjusted basic weight for the kth RU

The nonresponse-undercoverage adjusted weight for the kth RU, denoted by $W_2(k)$, was then computed as the product of the adjusted basic weight for kth RU and the nonresponse-undercoverage adjustment factor for the cell containing the RU.

The poststratification adjustment factor is computed at the person level. As each person within an RU is included in the sample, the nonresponse-undercoverage adjusted weight for a sample person is the nonresponse-undercoverage adjusted weight for the RU in which the person resides. Each person was classified as responding or nonresponding as discussed in the section on attrition imputation.

Initially, 60 poststrata were formed by cross-classifying the following three variables: age (15 levels), race (black or all other), and sex (male or female). One poststratum (black males over 75 years of age) had fewer than 20 respondents, so it was combined with an adjacent poststratum (black males 65–74 years of age), resulting in 59 poststrata.

Estimates based on the 1980 census of the U.S. civilian noninstitutionalized population by age, race, and sex for February 1, May 1, August 1, and November 1, 1980, were obtained from the U.S. Bureau of the Census. The mean of the mid-quarter population estimates for each of the poststrata was computed and used as the 1980 average target population in calculating the poststrata adjustment factors. Similarly, survey based estimates of the average poststrata population were developed using the nonresponse-undercoverage adjusted weights. First, a

survey based estimate of the target population of post-stratum p at mid-quarter q was computed as follows:

$$S(p,q) = \sum_{j \in p} \delta(q,j) W_2(j)$$

where

$$\delta(q,j) = \begin{cases} 1 & \text{if survey respondent } j \text{ was in scope at mid-quarter } q \\ 0 & \text{otherwise} \end{cases}$$

$W_2(j)$ = nonresponse-undercoverage adjusted weight of respondent j.

The survey based estimate of the 1980 average population for poststratum p was computed as the mean of the 4 mid-quarter estimates, or

$$S(p) = \frac{1}{4} \times \sum_{q=1}^{4} S(p,q)$$

The poststratification adjustment factor for the pth poststratum was then computed as

$$A_2(p) = \frac{C(p)}{S(p)}$$

where $C(p)$ = mean 1980 population for poststratum p based on U.S. Bureau of Census data. The poststratified weight for the jth respondent, denoted by $W_3(j)$, was then computed as the product of the nonresponse-undercoverage adjusted weight for the jth respondent and poststratification adjustment factor for the poststrata containing the respondent.

For many analyses estimates of the average 1980 population are required. Since some respondents were eligible for only a portion of the year, the aggregation of the W_3 weights for all respondents is an estimate of the total number of persons who were in the civilian noninstitutionalized population of the United States in 1980 and is an overestimate of the average 1980 population size. Therefore an adjustment factor was calculated for each respondent to reflect the proportion of time during 1980 the respondent was eligible to report NMCUES data. This adjustment factor for respondent j is

$$A_3(j) = \frac{E(j)}{366}$$

where $E(j)$ = number of days during 1980 respondent j was in scope.

Estimators

Weighted linear estimators are used for estimating population and population subdomain aggregates. Suppose, for example, an estimate of the parameter "total

doctor visit charges for persons 65 years and over" is desired.

The estimator of this parameter, denoted by $\hat{\theta}$, is given by

$$\hat{\theta} = \sum_{j \in A} W_3(j) X_j$$

where A is the collection of all NMCUES respondents 65 years and over and X_j is the total doctor visit charges reported by the jth respondent during the eligible period.

Ratio estimators are used for estimating population and population subdomain parameters such as means, proportions, and rates. As will be illustrated in the following examples, care must be taken in determining the appropriate weights to be used in the denominator of the ratio estimator.

Example 1—The NMCUES estimator for the proportion of doctor visits attributable to persons 65 years of age and over is given by

$$\hat{\theta} = \frac{\sum_{j \in A} W_3(j) Y_j}{\sum_{\text{All } j} W_3(j) Y_j}$$

where Y_j is the number of doctor visits reported by the jth respondent.

Example 2—The NMCUES estimator for mean annual doctor visit charges for persons 65 years of age and over is given by

$$\hat{\theta} = \frac{\sum_{j \in A} W_3(j) X_j}{\sum_{j \in A} W_3(j) A_3(j)}$$

where X_j is the total doctor visit charges reported by the jth respondent during his or her eligible period, and $A_3(j)$ is in the time adjustment factor for the jth respondent. The time adjustment factor is used in this situation to adjust for the fact that the jth respondent contributed doctor visit charges to the numerator only during the period of eligibility.

Reliability of Estimates

The estimates presented in this report are based on a sample of the target population rather than on the entire population. Thus the values of the estimates may be different from values that would be obtained from a complete census. The difference between a sample estimate and the population value is referred to as the sampling error, and the expected magnitude of the sampling error is measured by a statistic called the standard error. Estimated standard errors for the estimates presented in

Table 1 are shown in Table I, and estimated standard errors for estimates presented in Table 2 are shown in Table II.

The SESUDAAN (Shah, 1981) standard error estimation software package was used to produce the estimates of standard errors. SESUDAAN is a Taylor Series procedure, developed and released by the Research Triangle Institute. It runs within the Statistical Analysis System (SAS Institute, Inc., 1982).

It should also be noted that in addition to sampling error, the estimates presented in this report are subject to nonsampling errors such as biased interviewing and reporting, undercoverage, and nonresponse. The standard error does not provide an estimate of these types of errors. However, as discussed in preceding sections, every effort was made to minimize these errors.

Suppose that $\hat{\theta}$ is an unbiased estimator for the parameter θ, and $S_{\hat{\theta}}$ is a consistent estimator for the standard error of $\hat{\theta}$. Under appropriate central limit theorem assumptions regarding $\hat{\theta}$, the statistic $Z = (\hat{\theta} - \theta)/S_{\hat{\theta}}$ has an approximate standard normal distribution for large samples. Thus, an approximate $(1 - \alpha) \times 100$ percent confidence interval for θ is given by

$$(\hat{\theta} + z_{\alpha/2} S_{\hat{\theta}}, \ \hat{\theta} + z_{1-\alpha/2} S_{\hat{\theta}})$$

where $z_{\alpha/2}$ and $z_{1-\alpha/2}$ are the appropriate values from a standard normal table.

As an example, Table 1 shows the estimate that 10.1 percent of all persons in the civilian noninstitutionalized population of the United States 17–24 years of age received services from optometrists during 1980. Table I shows a standard error estimate of .74 percentage points for this particular estimate. Since 68 percent of the area under the normal curve is within 1 standard error of the midpoint, 95 percent of the area within 2 standard errors, and 99 percent of the area within 2.5 standard errors, we infer the following: Chances are 68 out of 100 that the true value is $10.1 \pm .74$ or between 9.36 and 10.84 percent; chances are 95 out of 100 that the true value is $10.1 \pm 2(.74)$, or between 8.62 and 11.58 percent; and chances are 99 out of 100 that the true value is $10.1 \pm 2.5(.74)$, or between 8.25 and 11.95 percent.

Confidence intervals for the difference of two parameters can be constructed in a similar manner. Suppose θ_1 and θ_2 are the values of the parameter of interest in two mutually exclusive population subgroups. If $\hat{\theta}_1$ and $\hat{\theta}_2$ are unbiased estimators of θ_1 and θ_2 respectively, then $\hat{d} = \hat{\theta}_1 - \hat{\theta}_2$ is unbiased for $d = \theta_1 - \theta_2$ and

$$\mathrm{Var}(\hat{d}) = \mathrm{Var}(\hat{\theta}_1) + \mathrm{Var}(\hat{\theta}_2) - 2\,\mathrm{Cov}(\hat{\theta}_1, \hat{\theta}_2)$$

Unfortunately the estimation of $\mathrm{Var}(\hat{d})$ presents a problem because it is not possible for the National Center for Health Statistics to provide the reader with covariance estimates for all possible pairs of subdomains of potential interest. However, if it is reasonable to assume that

$\mathrm{Cov}(\hat{\theta}_1, \hat{\theta}_2) = 0$, the standard error of d can be estimated by

$$S_{\hat{d}} = \sqrt{S_{\hat{\theta}_1}^2 + S_{\hat{\theta}_2}^2}$$

Then, under appropriate central limit theorem assumptions regarding d, the statistic $Z_d = (\hat{d} - d)/S_{\hat{d}}$ has an approximate standard normal distribution for large samples, and the interval

$$(\hat{d} + z_{\alpha/2} S_{\hat{d}}, \ \hat{d} + z_{1-\alpha/2} S_{\hat{d}})$$

is an approximate $(1 - \alpha) \times 100$ percent confidence interval for the difference d.

By way of example, suppose we wanted to construct a 95-percent confidence interval for the difference between the percent of males receiving services from nurses (θ_1) and the percent of females receiving services from nurses (θ_2). From Table 1 we have $\hat{\theta}_1 = 11.0$ and $\hat{\theta}_2 = 14.9$ so that

$$\hat{d} = \hat{\theta}_1 - \hat{\theta}_2$$
$$= 11.0 - 14.9$$
$$= -3.9$$

Also, from Table I we have $S_{\hat{\theta}_1} = .44$ and $S_{\hat{\theta}_2} = .51$ so that

$$S_{\hat{d}} = \sqrt{S_{\hat{\theta}_1}^2 + S_{\hat{\theta}_2}^2}$$
$$= \sqrt{.1936 + .2601}$$
$$= \sqrt{.4537}$$
$$= .67$$

Then as $\alpha = .05$, it follows that $z_{\alpha/2} = -1.96$ and $z_{1-\alpha/2} = 1.96$, so that the 95-percent confidence interval for the difference of interest is $(-5.22, -2.58)$.

The reader should be aware that the assumption that $\mathrm{Cov}(\hat{\theta}_1, \hat{\theta}_2) = 0$ is frequently not true for complex sample surveys. This warning is especially germane for sample designs, such as the NMCUES design, which rely on cluster sampling at one or more stages of sample selection. If $\mathrm{Cov}(\hat{\theta}_1, \hat{\theta}_2)$ is positive, the confidence interval will tend to be too large, and hence the confidence level will be understated. More seriously, if $\mathrm{Cov}(\hat{\theta}_1, \hat{\theta}_2)$ is negative, the confidence interval will tend to be too small, and the confidence level will be overstated.

The statistics Z and Z_d can be used to test hypotheses. For example, the size α critical region for the composite hypothesis

$$H_0 : d \geq d_0$$

versus

$$H_A : d < d_0$$

Table I
Numbers of sample cases and standard errors of estimates for numbers and percents of total population receiving services from selected medical practitioners, and percents, by sex, race, ethnicity, age, marital status, and education: United States, 1980

Characteristic	Sample cases	One or more practitioners	Nurses[1]	Optom-etrists	Chiro-practors	Podia-trists	Psychol-ogists	Para-medics[2]	Physical thera-pists	Social workers or counselors	Lab tech-nicians	Radiologic tech-nicians	Other tech-nicians	Other practi-tioners[3]
		Standard errors in thousands of estimated numbers in thousands												
Total................	17,123	2,785	1,199	1,069	739	288	282	336	233	191	808	451	184	534
		Standard errors of estimated percents in percentage points												
Total................	17,123	0.77	0.41	0.36	0.28	0.12	0.12	0.15	0.10	0.09	0.32	0.19	0.08	0.21
Sex														
Male.....................	8,229	0.91	0.44	0.43	0.28	0.14	0.12	0.18	0.14	0.11	0.29	0.18	0.09	0.24
Female	8,894	0.79	0.51	0.43	0.36	0.20	0.16	0.15	0.14	0.11	0.42	0.27	0.10	0.27
Race														
White	14,777	0.78	0.44	0.38	0.32	0.14	0.14	0.15	0.10	0.10	0.33	0.20	0.08	0.22
Black.....................	1,961	1.69	1.20	0.53	0.39	0.27	0.18	0.30	0.24	0.21	0.58	0.34	0.17	0.56
Other	385	3.19	2.32	2.22	0.93	0.46	-	-	0.59	0.22	1.28	2.34	0.37	1.43
Ethnicity														
Hispanic..................	1,192	2.08	1.71	0.92	0.53	0.31	0.22	0.22	0.19	0.18	0.67	0.34	0.16	0.56
Non-Hispanic..............	15,931	0.74	0.41	0.36	0.30	0.13	0.13	0.16	0.11	0.09	0.34	0.19	0.08	0.22
Age														
Under 6 years	1,776	1.42	1.24	0.28	0.21	0.10	0.15	0.33	0.07	0.12	0.45	0.19	0.15	0.48
6–16 years.................	3,271	1.13	0.88	0.55	0.30	0.15	0.25	0.43	0.15	0.19	0.32	0.21	0.11	0.51
17 years and over	12,076	0.81	0.42	0.41	0.35	0.16	0.13	0.13	0.12	0.09	0.40	0.24	0.10	0.22
17–24 years	2,414	1.22	0.77	0.74	0.43	0.26	0.27	0.25	0.19	0.16	0.60	0.36	0.12	0.47
25–44 years	4,414	0.90	0.48	0.51	0.45	0.18	0.27	0.25	0.21	0.20	0.48	0.28	0.15	0.35
45–64 years	3,376	1.09	0.65	0.77	0.61	0.28	0.25	0.23	0.23	0.12	0.58	0.44	0.21	0.41
65–74 years	1,183	1.74	1.27	0.91	0.94	0.69	0.12	0.32	0.48	0.18	0.93	0.71	0.29	0.77
75 years and over	689	2.27	1.76	1.20	0.78	1.34	-	0.36	0.40	0.17	1.34	0.72	0.28	1.31
Marital status[4,5]														
Married.....................	7,634	0.91	0.42	0.45	0.41	0.19	0.15	0.17	0.16	0.09	0.48	0.25	0.13	0.29
Widowed	1,031	1.97	1.53	0.96	0.63	1.01	0.14	0.23	0.38	0.23	1.06	0.79	0.26	0.79
Separated...................	355	3.06	2.30	1.86	1.47	0.55	1.25	0.55	0.57	0.61	1.56	0.64	0.39	1.28
Divorced...................	675	2.06	1.32	1.17	1.27	0.65	0.45	0.34	0.44	0.61	1.04	0.68	0.48	0.97
Never married	2,332	1.05	0.81	0.79	0.37	0.28	0.27	0.29	0.23	0.23	0.56	0.42	0.17	0.47
Years of school completed[4]														
Less than 9 years............	1,885	1.56	1.09	0.71	0.51	0.53	0.27	0.25	0.28	0.11	0.81	0.49	0.20	0.58
9–11 years.................	2,151	1.37	0.70	0.68	0.52	0.34	0.23	0.22	0.29	0.21	0.69	0.35	0.15	0.52
12 years....................	4,511	1.00	0.58	0.56	0.52	0.21	0.18	0.18	0.17	0.14	0.45	0.35	0.15	0.34
13–15 years	1,938	1.31	0.82	0.89	0.57	0.38	0.30	0.24	0.35	0.28	0.75	0.42	0.24	0.54
16 years or more............	1,591	1.08	0.85	0.88	0.50	0.41	0.45	0.37	0.33	0.21	0.86	0.53	0.32	0.66

[1]Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2]Includes physicians' assistants, medics, and corpsmen.
[3]Includes unknown types of nonphysician practitioners.
[4]Persons 17 years of age and over.
[5]Excludes 49 sample persons for whom the information was not reported.

Table II
Numbers of sample cases and standard errors of estimates for numbers and percents of total population receiving services from selected medical practitioners, and percents,
by family income in 1980, health status, activity limitation, geographic region, and location of residence: United States, 1980

Characteristic	Sample cases	One or more practitioners	Nurses[1]	Optometrists	Chiropractors	Podiatrists	Psychologists	Paramedics[2]	Physical therapists	Social workers or counselors	Lab technicians	Radiologic technicians	Other technicians	Other practitioners[3]
		Standard errors in thousands of estimated numbers in thousands												
Total...............	17,123	2,785	1,199	1,069	739	288	282	336	233	191	808	451	184	534
		Standard errors of estimated percents in percentage points												
Total...............	17,123	0.77	0.41	0.36	0.28	0.12	0.12	0.15	0.10	0.09	0.32	0.19	0.08	0.21
Family income in 1980														
Less than $5,000	1,298	1.83	1.33	1.01	0.55	0.50	0.36	0.57	0.27	0.36	0.92	0.46	0.20	0.78
$5,000–$14,999............	4,604	1.24	0.71	0.50	0.40	0.27	0.20	0.25	0.16	0.16	0.50	0.33	0.13	0.38
$15,000–$24,999	4,644	1.01	0.66	0.51	0.35	0.22	0.23	0.22	0.16	0.15	0.41	0.29	0.15	0.36
$25,000–$34,999	3,289	1.25	0.67	0.64	0.55	0.23	0.33	0.25	0.18	0.19	0.60	0.31	0.15	0.42
$35,000 or more............	3,288	1.09	0.59	0.72	0.58	0.27	0.26	0.22	0.22	0.16	0.45	0.33	0.18	0.44
Health status[4]														
Excellent	8,486	0.74	0.44	0.44	0.30	0.15	0.15	0.18	0.11	0.10	0.26	0.21	0.09	0.24
Good.......................	6,259	1.09	0.56	0.52	0.35	0.18	0.14	0.19	0.18	0.14	0.41	0.24	0.13	0.33
Fair.......................	1,601	1.73	1.07	0.67	0.69	0.58	0.44	0.34	0.48	0.21	1.21	0.52	0.29	0.72
Poor	642	2.57	1.68	1.34	0.93	0.83	0.64	0.62	1.06	0.51	1.31	1.02	0.46	1.02
Activity limitation														
Limited....................	1,652	1.77	0.93	0.82	0.60	0.61	0.35	0.22	0.50	0.28	1.10	0.59	0.27	0.71
Not limited.................	15,471	0.74	0.41	0.37	0.29	0.12	0.12	0.16	0.09	0.09	0.31	0.19	0.08	0.20
Geographic region														
Northeast..................	3,631	1.51	0.82	0.73	0.41	0.38	0.35	0.14	0.21	0.18	0.63	0.27	0.17	0.33
North Central	4,592	0.99	0.71	0.72	0.62	0.21	0.25	0.22	0.16	0.19	0.63	0.46	0.21	0.42
South	5,402	1.68	0.92	0.45	0.42	0.20	0.16	0.34	0.15	0.15	0.66	0.24	0.13	0.34
West......................	3,498	1.54	0.71	1.00	0.63	0.21	0.21	0.40	0.24	0.17	0.68	0.48	0.11	0.55
Location of residence														
In SMSA[5]..................	11,775	0.94	0.43	0.47	0.34	0.15	0.14	0.18	0.12	0.10	0.39	0.21	0.10	0.23
In central city.............	4,950	1.13	0.70	0.53	0.30	0.25	0.22	0.16	0.17	0.20	0.51	0.31	0.16	0.34
Outside central city.........	6,825	1.14	0.56	0.59	0.42	0.25	0.21	0.29	0.17	0.11	0.48	0.25	0.13	0.33
Outside SMSA[5]..............	5,348	1.37	0.91	0.52	0.51	0.22	0.23	0.26	0.14	0.16	0.59	0.37	0.13	0.42
Urban	2,456	1.73	1.25	0.65	0.58	0.29	0.26	0.35	0.25	0.18	0.75	0.43	0.25	0.70
Rural.....................	2,892	1.59	1.04	0.66	0.73	0.25	0.25	0.36	0.16	0.19	0.83	0.56	0.09	0.46

[1]Includes registered nurses, practical nurses, nurse practitioners, and other types of nurses.
[2]Includes physicians' assistants, medics, and corpsmen.
[3]Includes unknown types of nonphysician practitioners.
[4]Excludes 135 sample persons for whom the information was not reported.
[5]SMSA = standard metropolitan statistical area.

is given by

$$Z_{d_0} = \frac{\hat{d} - d_0}{S_{\hat{d}}} \leq z_\alpha$$

As an example, suppose that we had an a priori reason to believe that the percent of males receiving services from optometrists (θ_1) is less than the percent of females receiving services from optometrists (θ_2). Letting $d = \theta_1 - \theta_2$, this can be restated as a formal hypothesis as

$$H_0 : d \geq 0$$

versus

$$H_A : d < 0$$

Note that what we believe to be the true state of nature is reflected by the one-sided alternative.

From Table 1 and Table I we see that

$$\hat{d} = 7.9 - 10.5 = -2.6$$

and

$$S_{\hat{d}} = \sqrt{.1849 + .1849}$$
$$= .61$$

so that $Z_{d_0} = -4.28$. Then, assuming that the level of significance had been set at $\alpha = .01$ (which implies the one-tailed critical value as $z_\alpha = -2.33$), we would reject H_0 in favor of H_A as $Z_{d_0} \leq z_\alpha$.

As discussed in connection with the construction of confidence intervals, the assumption that $\text{Cov}(\hat{\theta}_1, \hat{\theta}_2) = 0$ must be carefully evaluated. If in fact the covariance is positive, the size of the test will be smaller than α; and if the covariance is negative, the size of the test will be larger than α. The reader desiring to conduct more sophisticated analysis of the NMCUES data is advised to consult with a statistician knowledgeable in the analysis of data from complex sample surveys.

Appendix II. Definition of Terms

Age—The age of the person as of January 1, 1980. Babies born during the survey period were included in the category "under 5 years."

Core Questionnaire—The basic interview instrument used during each interview to obtain data about health, health care, charges for health care, sources of payment, and health insurance coverage.

Emergency department—A hospital facility organized to provide medical services to people needing immediate medical or surgical intervention. The emergency department is staffed 24 hours a day. People receiving care in the emergency department may be admitted into a hospital.

Emergency department visit—A face-to-face encounter between a patient (not necessarily ambulatory) and a medical person. Emergency department visits include encounters by patients transported to the emergency department by police or the emergency medical service. The visit may result in a hospital admission.

Education of individual—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.

Ethnicity—The ethnicity of people 17 years of age and over as reported by the family respondent or the ethnicity of those under 17 as derived from the ethnicity of other family members. If the head of the family was male and had a wife who was living in the household, her ethnicity was assigned to any children under 17 years of age. In all other cases, the ethnicity of the head of the family (male or female) was assigned to any children under 17 years of age. Ethnicity is classified as Hispanic, which includes Puerto Rican, Cuban, Mexican, Mexicano, Mexican American, Chicano, other Latin American, or other Spanish and non-Hispanic.

Family—A group of people living together related to each other by blood, marriage, adoption, or foster care status. An unmarried student 17–22 years of age living away from home was also considered part of the family even though his or her residence was in a different location during the school year.

Family head—At the time of the first interview, the respondent for the family was asked to designate a "family head." If no head was designated or this information was missing, a family head was imputed.

Family income in 1980—Each member of a family is classified according to the total income of the family of which he or she is a member. Because some persons changed families during the year, their family income is defined as the income of the family they were in the longest. If a family did not exist for the entire year, the family income is adjusted to an annual basis by dividing actual income by the proportion of the year the family existed. Unrelated persons are classified according to their own income. For each person, 12 categories of income were collected, including income from employment for persons 14 years of age and older and income from various government programs, pensions, alimony or child support, interest, and net rental income. Where information was missing, it was imputed. For persons who were members of more than one family, their total income was allocated to each family in proportion to the amount of time they were in that family.

Group Quarters—A structure occupied by five or more unrelated people who lived or ate together, or for whom there was neither direct access from the outside or through a common hall nor complete kitchen facilities. Only noninstitutional group quarters were included in the NMCUES sample frame.

Hospital admission—The formal acceptance by a hospital of a patient who is provided room, board, and regular nursing care in a unit of the hospital. Included as a hospital admission is a patient admitted to the hospital and discharged on the same day. Also included is a hospital stay resulting from an emergency department visit.

Hospital outpatient department—A hospital-based ambulatory care facility organized to provide nonemergency medical services. Persons receiving services do not receive inpatient nursing care. Examples of outpatient departments or clinics are Pediatric, Obstetrics and Gynecology, Eye, and Psychiatric.

Hospital outpatient department visit—A face-to-face encounter between an ambulatory patient and a medical person. The patient comes to a hospital-based ambulatory care facility to receive services and departs on the same day. If more than one department or clinic is visited on a single trip, each department or clinic visited is counted as a separate visit.

Household—Occupants of a housing unit or group quarters that was included in the sample. This could have been one person, a family of related people, a number of unrelated people, or a combination of related and unrelated people.

Housing unit—A group of rooms or a single room occupied or intended for occupancy as separate living quarters: that is, (1) the occupants did not live and eat with any other persons in the structure, and (2) there was either direct access from the outside or through a common hall, or there were complete kitchen facilities for the use of the occupants only.

Institution—A place providing room, board, and certain other services for the residents or patients. Correctional institutions, military barracks, and orphanages were always considered institutions for NMCUES. Places that provided health care were also identified as institutions if they provided either nursing or personal care services. Certain other facilities licensed, registered, or certified by a State agency or affiliated with a Federal, State, or local government agency were also defined as institutions. People residing in institutions were not included in the household samples.

Key person—A key person was (1) an occupant of a national household sample housing unit or group quarters at the time of the first interview; (2) a person related to and living with a State Medicaid household case member at the time of the first interview; (3) an unmarried student 17–22 years of age living away from home and related to a person in one of the first two groups; (4) a related person who had lived with a person in the first two groups between January 1, 1980, and the round 1 interview, but was deceased or had been institutionalized; (5) a baby born to a key person during 1980; or (6) a person who was living outside the United States, was in the Armed Forces, or was in an institution at the time of the round 1 interview but who had joined a related key person.

Limitation of activity—Four categories were developed for classifying limitation of activity:

1. Cannot perform usual activity.

2. Can perform usual activity but limited in kind or amount.

3. Can perform usual activity but limited in kind or amount of other activity.

4. Not limited.

People 6 years of age and over were classified into any of the categories; children 1–5 years of age were classified into categories 1, 2, and 4; and children under 1 year of age into categories 1 and 4.

Location of residence—Location of residence was classified according to the Office of Management and Budget designations of standard metropolitan statistical areas as found in the 1970 Decennial Census. Classifications of central cities, other areas of SMSA's, and of urban and rural areas outside SMSA's are Bureau of the Census classifications based on the 1970 census.

Marital status—Marital status for each person 17 years of age and over was as indicated by the household respondent.

NMCUES—National Medical Care Utilization and Expenditure Survey.

National household component—One component of NMCUES, consisting of multiple household interviews with an area probability sample of people in the noninstitutionalized population of the United States in 1980.

Nonkey person—A person related to a key person who joined him or her after the round 1 interview but was part of the civilian noninstitutionalized population of the United States at the date of the first interview.

OPD—Hospital outpatient department visit. OPD was used as an identifier of the space on the control card for the interviewer to record the number of hospital outpatient department visits, as an interviewer instruction to record in that space, and as a prefix to page numbers in the hospital stay section of the Core Questionnaire.

PSU #—The primary sampling unit number used to identify the first stage of the sample selection process.

Perceived health status—The family respondent's judgment of the health of the person compared with others the same age, as reported at the time of the first interview. The categories were "excellent," "good," "fair," or "poor."

Principal RU respondent—The member of the reporting unit who provided most of the information for the people in the reporting unit.

Proxy respondent—As used in this survey, a proxy respondent was a person who provided information for people in the reporting unit but who was not a member of the reporting unit. A proxy respondent was used only when no member of the reporting unit could supply the information because of physical or mental incapacity.

RU—Reporting unit.

RV—Repeat visit. This portion of the questionnaire was used if a number of visits were made by the same person to the same provider of health care for the same services and with the same charges.

Race—The race of people 17 years of age and over reported by the family respondent; the race of those under 17 derived from the race of other family members. If the head of the family was male and had a wife who was living in the household, her race was assigned to any children under 17 years of age. In all other cases, the race of the head of the family (male or female) was assigned to any children under 17 years of age. Race is classified as "white," "black," or "other." The "other" race category includes American Indian, Alaskan Native, Asian, Pacific Islander, and people not identified by race. The category "all other" includes the categories "black" and "other."

Region—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.

Reporting unit—The basic unit for reporting data in the household components of NMCUES. A reporting unit consisted of all related people residing in the same housing unit or group quarters. One person could give information for all members of the reporting unit.

REF. DATE—Reference date. The reference date was the date of the previous interview in most cases. For the first interview, however, it was January 1, 1980. For new persons, it was the date they joined the reporting unit.

Round—A round was the administrative term used to designate all interviews that occurred within a given period of time and that used the same instruments and procedures.

Segment #—A number used to identify the sample unit at a stage in the sample selection.

Sex—Recorded by the interviewer in the initial NMCUES interview.

Appendix III. Survey Instrument

For all instruments used in the National Medical Care Utilization and Expenditure Survey, see Bonham (1983).

In each of the five rounds of interviewing, the interviewer asked a series of probe questions to determine whether any member of the family had received medical services during the reference period. For the first round of interviewing, which took place in February and April 1980, the reference period was from January 1, 1980, until the time of the interview. In each subsequent round the reference period began with the data of the previous interview and ended with the current interview, except that the reference period for the fifth round ended December 31, 1980.

The first question relevant to this report among the provider probe questions was number 4: "Since (REF. DATE), did (you/anyone in the family) go to a hospital clinic or hospital outpatient department for medical care?" If the answer was yes, the respondent was asked, "Who was this?" and "Anyone else?" For each person so indicated, the respondent was asked, "Since (REF. DATE), how many times did (PERSON) visit a hospital clinic or outpatient department?" For each such visit the questions on page OPD–24 of the questionnaire were asked, including number 4: "Did (PERSON) see a medical doctor on that visit?" If the answer was no, then the respondent was asked question 4.C., "What type of medical person did (PERSON) see at (CLINIC NAME)?" and the interviewer had the following precoded types to circle: "Chiropractor, Podiatrist, Optometrist, Psychologist, Social Worker, Nurse, Physical Therapist, Lab Technician," and "Other (SPECIFY)." The "others" were subsequently given special codes.

The next relevant probe questions followed the question as to whether family members had seen a medical doctor. Question number 10 then was asked: "(Not counting the visits you already told me about), since (REF. DATE), did (you/anyone in the family) see any medical practitioners such as optometrists, foot doctors, chiropractors, or physical therapists?" If yes, respondent was asked "Who was this?" and "Anyone else?" and, for each such person, "Since (REF. DATE), how many times did (PERSON) see such a medical practitioner?" Question 11 then probed further: "(Not counting the visits you've already told me about) since (REF. DATE), did

(you/anyone in the family) receive treatment from any other medical person such as a nurse, nurse practitioner, paramedic, health aide, physician assistant, or other such medical person?" If so, respondent was asked who such persons were, and how many times they saw such medical persons. The interviewer then asked question 12, "(Not counting what you have already told me about) since (REF. DATE), did (you/anyone in the family) see a psychiatrist, a psychologist, a psychiatric social worker or any other mental health person?" and, if so, who such persons were and how many times they saw such mental health persons. The interviewer next asked provider probe question number 13, "(Not counting the visits you've told me about) since (REF. DATE), did (you/anyone in the family) go to a doctor's office, clinic, or laboratory *just* for (an) examination(s), tests, shots, X-rays, or treatments?" and, if so, who such persons were and how many times they went for such services. Then the final relevant probe question was number 14: "(Besides the visits we've talked about) since (REF. DATE), did (you/anyone in the family) go to a health clinic, company clinic, school clinic, infirmary, neighborhood health center, family planning clinic, mental health clinic, or any other medical place?" If so, respondent was asked who such persons were and how many times they went to one of these places.

For all instances in which the interviewer had elicited positive responses to any of questions 10–14, the questions on "medical provider visit" (pages MV–38 and following on the Core Questionnaire) were asked. These include questions on the date of the visit, type of place, provider's name, and location. Then was asked, "Did (PERSON) see a medical doctor on that visit?" If the answer was no, then the interviewer asked, "What type of medical person did (PERSON) see?" and had the following items to circle: "Chiropractor, Podiatrist, Optometrist, Psychologist, Social Worker, Nurse, Physical Therapist," and "Other (SPECIFY)." Special codes were subsequently given to types of medical persons entered under "Other."

The following four pages show the pages of the Core Questionnaire containing the questions that elicited information on services from nonphysician health-care practitioners.

PROVIDER PROBES

The next questions deal with visits you (and members of your family) have made to dentists, doctors and other types of medical specialists since (REF. DATE). First, we will talk about dental visits.

PERSON 1

1. Since (REF. DATE) did [you/anyone in the family, that is you, (EACH PERSON IN FAMILY)] go to a dentist?

Yes . . . . 01(A)
No. . . . . 02(2)

A. Who was this? CODE "DENTIST" IN PERSON'S COLUMN. Did anyone else go to a dentist since (REF. DATE)?	1A	Dentist 01
B. Since (REF. DATE), how many times did (PERSON) go to a dentist? RECORD IN PERSON'S COLUMN.	B	☐ Times

2. (Not counting the visits you just told me about), since (REF. DATE) did [you/anyone in the family] go to a dental surgeon, oral surgeon, orthodontist, dental assistant or any other person for dental care?

Yes . . . . 01(A)
No. . . . . 02(DV)

A. Who was this? CODE "OTHER DENTAL" IN PERSON'S COLUMN. Anyone else?	2A	Other Dental. 01
B. Since (REF. DATE), how many times did (PERSON) go to such a person for dental care? RECORD IN PERSON'S COLUMN.	B	☐ Times
DV ENTER TOTAL OF EACH PERSON'S DENTAL VISITS (Q's 1B & 2B) IN "DV" BOX ON CONTROL CARD.	DV	

3. Since (REF. DATE) did [you/anyone in the family] go to a hospital emergency room for medical care?

Yes . . . . 01(A)
No. . . . . 02(ER)

A. Who was this? CODE "EMERGENCY ROOM" IN PERSON'S COLUMN. Anyone else?	3A	Emergency Room. 01
B. Since (REF. DATE) how many times did (PERSON) receive treatment in a hospital emergency room? RECORD IN PERSON'S COLUMN.	B	☐ Times
ER ENTER TOTAL OF EACH PERSON'S EMERGENCY ROOM VISITS IN "ER" BOX ON CONTROL CARD.	ER	

4. Since (REF. DATE), did [you/anyone in the family] go to a hospital clinic or hospital outpatient department for medical care?

Yes . . . . 01(A)
No. . . . . 02(OPD)

A. Who was this? CODE "CLINIC OR OPD" IN PERSON'S COLUMN. Anyone else?	4A	Clinic or OPD 01
B. Since (REF. DATE), how many times did (PERSON) visit a hospital clinic or outpatient department? RECORD IN PERSON'S COLUMN.	B	☐ Times

IF PERSON WENT TO MORE THAN ONE CLINIC OR OUTPATIENT DEPARTMENT ON A SINGLE TRIP TO THE HOSPITAL, COUNT EACH CLINIC OR DEPARTMENT AS A DIFFERENT VISIT.

OPD ENTER TOTAL OF EACH PERSON'S CLINIC OR OPD VISITS IN "OPD" BOX ON CONTROL CARD.	OPD	

9. Since (REF. DATE), how many times did (PERSON) see a medical doctor? (Do not count doctors seen | 9 | None seen. 00
during visits to [an emergency room/hospital clinic or outpatient department/or while a patient | | Medical Doctor 01
in a hospital.]) RECORD IN PERSON'S COLUMN. | | ☐ Times

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10. (Not counting the visits you already told me about) since (REF. DATE), did [you/anyone in the
family] see any medical practitioners such as optometrists, foot doctors, chiropractors, or
physical therapists?

A. Who was this? CODE "MEDICAL PRACTITIONER" IN   Yes . . . . 01(A) | 10A | Medical Practitioner . 01
PERSON'S COLUMN. Anyone else?   No. . . . . 02(11)

B. Since (REF. DATE), how many times did (PERSON) see such | B | ☐ Times
a medical practitioner? RECORD IN PERSON'S COLUMN.

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11. (Not counting the visits you've already told me about) since (REF. DATE), did [you/anyone in the
family] receive treatment from any other medical person such as a nurse, nurse practitioner,
paramedic, health aide, physician assistant, or other such medical person?

A. Who was this? CODE "MEDICAL PERSON" IN PERSON'S   Yes . . . . 01(A) | 11A | Medical Person 01
COLUMN. Anyone else?   No. . . . . 02(12)

B. Since (REF. DATE), how many times did (PERSON) see such | B | ☐ Times
a medical person? RECORD IN PERSON'S COLUMN.

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12. (Not counting what you have already told me about) since (REF. DATE), did [you/anyone in the
family] see a psychiatrist, a psychologist, a psychiatric social worker or any other mental health
person?
A. Who was this? CODE "MENTAL HEALTH PERSON" IN   Yes . . . . 01(A) | 12A | Mental Health Person . 01
PERSON'S COLUMN. Anyone else?   No. . . . . 02(13)

B. Since (REF. DATE), how many times did (PERSON) see | B | ☐ Times
such a mental health person? RECORD IN PERSON'S COLUMN.

---

13. (Not counting the visits you've told me about) since (REF. DATE), did [you/anyone in the family]
go to a doctor's office, clinic, or laboratory just for an examination, tests, shots, X-rays,
or treatments?

A. Who was this? CODE "TESTS, SHOTS" IN PERSON'S   Yes . . . . 01(A) | 13A | Tests, Shots 01
COLUMN. Anyone else?   No. . . . . 02(14)

B. Since (REF. DATE), how many times did (PERSON) go just for | B | ☐ Times
examinations, tests, shots, X-rays, or treatments?
RECORD IN PERSON'S COLUMN.

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14. (Besides the visits we've talked about) since (REF. DATE), did [you/anyone in the family] go to a
health clinic, company clinic, school clinic, infirmary, neighborhood health center, family
planning clinic, mental health clinic or any other medical place?

A. Who was this? CODE "CLINIC, HEALTH CENTER" IN   Yes . . . . 01(A) | 14A | Clinic, Health Center. 01
PERSON'S COLUMN. Anyone else?   No. . . . . 02(MV)

B. How many times since (REF. DATE) did (PERSON) go to one | B | ☐ Times
of these places? RECORD IN PERSON'S COLUMN.

MV | ENTER TOTAL OF EACH PERSON'S VISITS (Q's. 9, 10B, 11B, 12B, 13B AND 14B) IN MV BOX ON CONTROL CARD. | MV |

HOSPITAL OUTPATIENT DEPARTMENT VISIT

VISIT A

(You told me that (PERSON) visited a hospital clinic or hospital outpatient department (NUMBER) times since (REF. DATE).)

PERSON _____ # _____

		VISIT A
1. On what date did (PERSON) [first/next] visit a hospital clinic or outpatient department?	1	_____ / _____ Month / Date
2. What is the complete name of the hospital and in what city and state is it located?	2	Name: _____ _____ / _____ City / State
3. What is the name of the clinic or department (PERSON) went to during the visit on (DATE)? Any other clinic? ENTER NAME IN FIRST AVAILABLE COL. IF DK NAME, ASK: What type of clinic is it?	3	_____ Clinic/Dept. Name or Type

FOR EACH CLINIC, ASK Q's. 4 - 21

4. Did (PERSON) see a medical doctor on that visit?	4	Yes . . . . 01(A) No. . . . . 02(C) Don't know. . . . . 94(5)
A. Is that doctor a general practitioner or a specialist?	A	General Practitioner. . . 01(5) Specialist. . . . . 02(B) Don't know. . . . . 94(5)
B. What is the doctor's specialty?	B	Cardiologist. . . . . . . 01(5) Internist . . . . 02(5) OB/GYN. . . . . 03(5) Ophthalmologist . . . . . 04(5) Orthopedist . . . . 05(5) Pediatrician. . . . . . . 06(5) Psychiatrist. . . . . . . 07(5) Other (SPECIFY) . . . . . 08(5) _____ ☐☐
C. What type of medical person did (PERSON) see at (CLINIC NAME)?	C	Chiropractor. . . . . . . 01 Podiatrist. . . . . 02 Optometrist . . . . 03 Psychologist. . . . . . . 04 Social Worker . . . . . . 05 Nurse . . . . 06 Physical Therapist. . . . 07 Lab Technician. . . . . . 08 Other (SPECIFY) . . . . . 09 _____ ☐☐

MEDICAL PROVIDER VISIT

Person Name _____ # _____

[Besides the visits we already talked about/You told me that (PERSON) had seen a medical person (NUMBER) times since (REF. DATE).]

1. On what date did (PERSON) [first/next] see a medical person?

    _____/_____
    MONTH / DATE

2. Where did (PERSON) see the medical person on (DATE), at what type of place -- was it a clinic, hospital, doctor's office, or some other place?

    IF CLINIC, ASK:
    Was it a hospital outpatient clinic, a company clinic, or some other kind of clinic?

    IF SOME OTHER PLACE, ASK:
    Where was this?

    Doctor's office or group practice.01

    Doctor's clinic. 02

    Neighborhood/Family Health Center.03

    Company clinic 04

    School clinic. 05

    Other clinic 06

    Home 07

    Laboratory 08

    Hospital outpatient clinic, hospital inpatient, emergency room. . . . . 09(INSTRUCTION BOX)

    Other (SPECIFY) 10

    _____ [|]

INSTRUCTION BOX	MAKE SURE A HOSPITAL STAY, EMERGENCY ROOM OR HOSPITAL OUTPATIENT VISIT HAS BEEN COMPLETED FOR THIS DATE. INVALIDATE THIS PAGE AND GO TO NEXT VISIT.

3. A. What is the name of the medical person (PERSON) saw on (DATE)?

    _____
    Provider's Name

    B. What is the name of the medical place (PERSON) went to on (DATE)? In what city and state is it located?

    _____
    Place Name

    _____/_____
    City / State

4. Did (PERSON) see a medical doctor on that visit?

    Yes. . . . . .01(A)
    No . . . . .02(C)
    Don't know . . . . .94(5)

    A. Is the doctor a general practitioner or a specialist?

    General practitioner . . . . . . .01(5)
    Specialist . . . . .02(B)
    Don't know . . . . .94(5)

    B. What is the doctor's specialty?

    Cardiologist. . . .01(5)   Orthopedist. . .05(5)
    Internist . . . . .02(5)   Pediatrician . .06(5)
    OB/GYN. . . . . . .03(5)   Psychiatrist . .07(5)
    Ophthalmologist . .04(5)   Other (SPECIFY).08(5)

    _____ [|]

    C. What type of medical person did (PERSON) see?

    Chiropractor. . . .01(5)   Social Worker. .05(5)
    Podiatrist. . . . .02(5)   Nurse. . . . . .06(D)
    Optometrist . . . .03(5)   Phy. Therapist .07(D)
    Psychologist. . . .04(5)   Other (SPECIFY).08(D)

    _____ [|]

    D. Does (MEDICAL PERSON) work for or with a doctor?

    Yes. 01
    No 02
    Don't know 94

37

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National Medical Care Utilization and Expenditure Survey

The National Medical Care Utilization and Expenditure Survey (NMCUES) is a unique source of detailed national estimates on the utilization of and expenditures for various types of medical care. NMCUES is designed to be directly responsive to the continuing need for statistical information on health care expenditures associated with health services utilization for the entire U.S. population.

NMCUES will produce comparable estimates over time for evaluation of the impact of legislation and programs on health status, costs, utilization, and illness-related behavior in the medical care delivery system. In addition to national estimates for the civilian noninstitutionalized population, it will also provide separate estimates for the Medicaid-eligible populations in four States.

The first cycle of NMCUES, which covers calendar year 1980, was designed and conducted as a collaborative effort between the National Center for Health Statistics, Public Health Service, and the Office of Research and Demonstrations, Health Care Financing Administration. Data were obtained from three survey components. The first was a national household survey and the second was a survey of Medicaid enrollees in four States (California, Michigan, Texas, and New York). Both of these components involved five interviews over a period of 15 months to obtain information on medical care utilization and expenditures and other health-related information. The third component was an administrative records survey that verified the eligibility status of respondents for the Medicare and Medicaid programs and supplemented the household data with claims data for the Medicare and Medicaid populations.

Data collection was accomplished by Research Triangle Institute, Research Triangle Park, N.C., and its subcontractors, the National Opinion Research Center of the University of Chicago, Ill., and SysteMetrics, Inc., Berkeley, Calif., under Contract No. 233–79–2032.

Co-Project Officers for the Survey were Robert R. Fuchsberg of the National Center for Health Statistics (NCHS) and Allen Dobson of the Health Care Financing Administration (HCFA). Robert A. Wright of NCHS and Larry Corder of HCFA also had major responsibilities. Daniel G. Horvitz of Research Triangle Institute was the Project Director primarily responsible for data collection, along with Associate Project Directors Esther Fleishman of the National Opinion Research Center, Robert H. Thornton of Research Triangle Institute, and James S. Lubalin of SysteMetrics, Inc. Barbara Moser of Research Triangle Institute was the Project Director primarily responsible for data processing.