Vital and Health Statistics

Advance Data From Vital and Health Statistics: Numbers 211–220

Series 16: Compilations of Advance Data From Vital and Health Statistics No. 22

Data in this report from health and demographic surveys present statistics by age and other variables on office visits to cardiovascular disease specialists, characteristics of persons dying from heart and cerebrovascular diseases, use of vitamin and mineral supplements, forearm mortality among children and youth, and AIDS knowledge and attitudes. Estimates are based on the civilian noninstitutionalized population of the United States. These reports were originally published in 1989.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics

Hyattsville, Maryland
May 1995
DHHS Publication No. (PHS) 95-1881

Contents

Number 211 • March 24, 1992

Advance Data

From Vital and Health Statistics of the National Center for Health Statistics

Office Visits for Diabetes Mellitus: United States, 1989

by Susan M. Schappert, M.A., Division of Health Care Statistics

During the 12-month period from March 1989 to March 1990, there were an estimated 13.2 million visits made to nonfederally employed, office-based physicians in the United States, at which the principal, or first-listed diagnosis was diabetes mellitus. An additional 8.7 million visits included diabetes mellitus as the second- or third-listed diagnosis.

This report presents national estimates pertaining to diabetes-related office visits.[1] These estimates are based upon data collected in the National Ambulatory Medical Care Survey (NAMCS), a national probability sample survey conducted by the Division of Health Care Statistics of the National Center for Health Statistics, Centers for Disease Control. Statistics are presented on patient, physician, and visit characteristics for visits with a diagnosis of diabetes mellitus.

A copy of the Patient Record, the survey instrument used by participating physicians to record information about their patients' office visits, is shown in figure 1. In item 10 of the form, physicians are requested to record a principal diagnosis (the diagnosis most closely associated with the patient's most important reason for visit) as well as any other significant current diagnoses. Up to three diagnoses are coded and classified according to the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) (1) for each visit. This report will focus primarily on the estimated 13.2 million office visits in which the patient's principal diagnosis was recorded as diabetes mellitus.

It is necessary to keep in mind that the estimates presented in this report are based on a sample, rather than on the entire universe of office visits, and, as such, they are subject to sampling variability. The technical notes found at the end of this report discuss briefly the sample design, sampling errors, and guidelines for use in evaluating the precision of NAMCS estimates. Two publications are also available that summarize general findings from the 1989 NAMCS (2,3), and additional publications on selected topics will be forthcoming.

Patient characteristics

More than half (57.5 percent) of the estimated 13.2 million office visits with a principal diagnosis of diabetes mellitus were made by females, and the overwhelming majority (86.3 percent) were made by persons aged 45 years and over (table 1). More than three-quarters (79.3 percent) of the visits were made by white persons.

The overall visit rate for visits with a principal diagnosis of diabetes mellitus was 5.4 visits per 100 persons per year; visit rates were not found to differ significantly for males and females or for white persons and black persons. (Statistical comparisons with other race groups were not possible in this survey due to the very low estimates of visits obtained for these groups.) Furthermore, visit rates by age, sex, and race were not found to differ significantly from those reported for visits with a principal diagnosis of diabetes mellitus since 1975 (4,5).

Visit rates rose with age, however, with significant increases noted for those in the 45–64 years category and the aggregated 65 years and over category. (Rates were not significantly different between those in the age groups 65–74 years and 75 years and over.) Increasing visit rates

[1]It should be noted that the 1989 NAMCS added Alaska and Hawaii to the survey population. Previous years of data excluded these states.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics
Manning Feinleib, M.D., Dr. P.H., Director

CDC
CENTERS FOR DISEASE CONTROL

Assurance of Confidentiality – All information which would permit identification of an individual, a practice, or an establishment will be held confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to other persons or used for any other purpose

Department of Health and Human Services
Centers for Disease Control
Public Health Service
National Center for Health Statistics

A

1. DATE OF VISIT Month / Day / Year

PATIENT RECORD
NATIONAL AMBULATORY MEDICAL CARE SURVEY

OMB No. 0920-0234
Expires 8-31-89
(PHS) 6105A

2. ZIP CODE

3. DATE OF BIRTH Month / Day / Year

4. SEX
1 ☐ FEMALE
2 ☐ MALE

5. COLOR OR RACE
1 ☐ WHITE
2 ☐ BLACK
3 ☐ ASIAN/PACIFIC ISLANDER
4 ☐ AMERICAN INDIAN/ ESKIMO/ALEUT

6. ETHNICITY
1 ☐ HISPANIC ORIGIN
2 ☐ NOT HISPANIC

7. EXPECTED SOURCE(S) OF PAYMENT *[Check all that apply]*
1 ☐ SELF-PAY
2 ☐ MEDICARE
3 ☐ MEDICAID
4 ☐ BLUE CROSS/ BLUE SHIELD
5 ☐ OTHER COMMERCIAL INSURANCE
6 ☐ PRE-PAID PLAN HMO/IPA/PPO
7 ☐ NO CHARGE
8 ☐ OTHER *(Specify)*

8. WAS PATIENT REFERRED FOR THIS VISIT BY ANOTHER PHYSICIAN?
1 ☐ YES 2 ☐ NO

9. PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *[In patient's own words]*
a. MOST IMPORTANT
b OTHER

10. PHYSICIAN'S DIAGNOSES
a. PRINCIPAL DIAGNOSIS/PROBLEM ASSOCIATED WITH ITEM 9a.
b. OTHER SIGNIFICANT CURRENT DIAGNOSES

11. HAVE YOU SEEN PATIENT BEFORE?
1 ☐ YES 2 ☐ NO
IF YES, FOR THE CONDITION IN ITEM 10a?
1 ☐ YES 2 ☐ NO

12. DIAGNOSTIC/SCREENING SERVICES THIS VISIT *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ PAP TEST
3 ☐ PELVIC EXAM
4 ☐ BREAST PALPATION
5 ☐ MAMMOGRAM
6 ☐ VISUAL ACUITY
7 ☐ BLOOD PRESSURE CHECK
8 ☐ URINALYSIS
9 ☐ CHEST X-RAY
10 ☐ DIGITAL RECTAL EXAM
11 ☐ PROCT/SIGMOIDOSCOPY
12 ☐ STOOL BLOOD EXAM
13 ☐ ORAL GLUCOSE TOL.
14 ☐ CHOLESTEROL MEASURE
15 ☐ HIV SEROLOGY
16 ☐ OTHER BLOOD TEST
17 ☐ OTHER *(Specify)*

13. COUNSELING/ADVICE *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ WEIGHT REDUCTION
3 ☐ CHOLESTEROL REDUCTION
4 ☐ SMOKING CESSATION
5 ☐ HIV TRANSMISSION
6 ☐ BREAST SELF-EXAM
7 ☐ OTHER

14. NON-MEDICATION THERAPY *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ PSYCHOTHERAPY
3 ☐ CORRECTIVE LENSES
4 ☐ AMBULATORY SURGERY
5 ☐ PHYSIOTHERAPY
6 ☐ OTHER *(Specify)*

15. MEDICATION THERAPY *[Record all new or continued medications ordered or provided at this visit. Use the same brand name or generic name entered on any Rx or office medical record. Include immunizing and desensitizing agents.]*

IF NONE, CHECK HERE ☐

	a. NEW MEDICATION? YES	a. NEW MEDICATION? NO	b. FOR DX IN ITEM 10a? YES	b. FOR DX IN ITEM 10a? NO
1.	1 ☐	2 ☐	1 ☐	2 ☐
2	1 ☐	2 ☐	1 ☐	2 ☐
3	1 ☐	2 ☐	1 ☐	2 ☐
4.	1 ☐	2 ☐	1 ☐	2 ☐
5	1 ☐	2 ☐	1 ☐	2 ☐

16. DISPOSITION THIS VISIT *[Check all that apply]*
1 ☐ NO FOLLOW-UP PLANNED
2 ☐ RETURN AT SPECIFIED TIME
3 ☐ RETURN IF NEEDED, P.R.N
4 ☐ TELEPHONE FOLLOW-UP PLANNED
5 ☐ REFERRED TO OTHER PHYSICIAN
6 ☐ RETURNED TO REFERRING PHYSICIAN
7 ☐ ADMIT TO HOSPITAL
8 ☐ OTHER *(Specify)* _____

17. DURATION OF THIS VISIT *[Time actually spent with physician]*
_____ Minutes

* U.S. GOVERNMENT PRINTING OFFICE:1989-226-197

Figure 1.

by age were observed for both females and males (figure 2).

Age-related increases in visits for diabetes mellitus are further evidenced in the distribution of physician diagnoses among older age groups. For all office visits made by persons aged 45–64 years and 65–74 years, diabetes mellitus was the second most frequently reported principal diagnosis, after essential hypertension, accounting for 3.1 percent of the diagnoses among those 45–64 years of age and 4.8 percent of the diagnoses among those 65–74 years of age. For visits made by persons aged 75 years and over, diabetes mellitus was the third most frequently reported principal diagnosis after essential hypertension and cataract and accounted for 4.3 percent of the diagnoses in this age group (3).

Patient characteristics of visits with a principal diagnosis of diabetes mellitus were found to differ in one major respect from those characteristics noted in the aggregate of all other visits. While the distribution of office visits by sex and by race was not found to differ significantly for each of the two groups, differences in the proportions of visits by age category were noted. Specifically, a significantly higher percent of visits with a principal diagnosis of diabetes mellitus was made by persons in each age category after

Table 1. Number, percent distribution, and rate of visits with a principal diagnosis of diabetes mellitus to ambulatory care physicians by patient's age, sex, and race: United States, 1989

Patient characteristic	Number of visits in thousands	Percent distribution	Visit rate per 100 persons[1]
All visits	13,237	100.0	5.4
Age			
Less than 25 years	*261	*2.0	*0.3
25–34 years	*504	*3.8	*1.2
35–44 years	1,050	7.9	2.9
45–54 years	1,593	12.0	6.5
55–64 years	2,948	22.3	13.8
65–74 years	4,002	30.2	22.4
75 years and over	2,878	21.7	25.3
Sex			
Female	7,617	57.5	6.1
Less than 25 years	*132	*1.0	*0.3
25–34 years	*297	*2.2	*1.4
35–44 years	*447	*3.4	*2.4
45–54 years	942	7.1	7.4
55–64 years	1,606	12.1	14.2
65–74 years	2,377	18.0	24.0
75 years and over	1,817	13.7	25.3
Male	5,619	42.5	4.8
Less than 25 years	*129	*1.0	*0.3
25–34 years	*207	*1.6	*1.0
35–44 years	604	4.6	3.4
45–54 years	652	4.9	5.4
55–64 years	1,342	10.1	13.3
65–74 years	1,625	12.3	20.5
75 years and over	1,060	8.0	25.2
Race			
White	10,497	79.3	5.1
Less than 25 years	*253	*1.9	*0.3
25–34 years	*470	*3.6	*1.3
35–44 years	716	5.4	2.3
45–54 years	1,122	8.5	5.3
55–64 years	2,296	17.3	12.2
65–74 years	3,239	24.5	20.3
75 years and over	2,401	18.1	23.2
Black	1,939	14.7	6.5
Less than 25 years	–	–	–
25–34 years	*8	*0.1	*0.2
35–44 years	*238	*1.8	*6.1
45–54 years	*310	*2.3	*12.0
55–64 years	569	4.3	26.8
65–74 years	*482	*3.6	*31.2
75 years and over	*332	*2.5	*36.6
Asian/Pacific Islander	*380	*2.9	...
American Indian or Alaskan Native	*29	*0.2	...
Unspecified	*391	*3.0	...
Geographic region			
Northeast	2,175	16.4	4.4
Midwest	3,828	28.9	6.4
South	4,425	33.4	5.3
West	2,809	21.2	4.7

[1]Number of visits per 100 persons per year. Based on U.S. Bureau of the Census estimates of the civilian noninstitutionalized population as of July 1, 1989.

the age of 44 years than was true for matching age categories for all other visits. Similarly, significantly lower proportions of visits with a principal diagnosis of diabetes mellitus were made by persons under the age of 45 years than was the case for all other visits (figure 3).

Physician characteristics

Of the estimated 13.2 million office visits with a principal diagnosis of diabetes mellitus, 44.0 percent (about 5.8 million visits) were made to general and family practice physicians. Internal medicine specialists received 28.7 percent of the visits, while ophthalmologists accounted for 6.8 percent (table 2).

Diabetes mellitus was the fourth most frequently reported principal diagnosis rendered by general and family practice physicians, accounting for 2.8 percent of all visits to this physician group. For internal medicine specialists, diabetes was second only to essential hypertension as a principal diagnosis and represented 4.8 percent of all visits to this specialty. Among ophthalmologists, diabetes was found to be the tenth most frequently rendered principal diagnosis, accounting for 2.3 percent of all ophthalmology visits.

Visit characteristics

The vast majority (92.2 percent) of office visits with a principal diagnosis of diabetes mellitus were made by patients who were making return visits to the physician for care of their condition. Only 5 percent of the visits were made by new patients (table 3).

The chronic nature of diabetes mellitus is highlighted by the fact that among all return visits for the care of old (previously treated) problems, diabetes was the third most frequently recorded principal diagnosis (table 4). (It should be noted that the ranked order presented in this and other tables in this report may not be entirely reliable since some estimates may not be statistically different from other

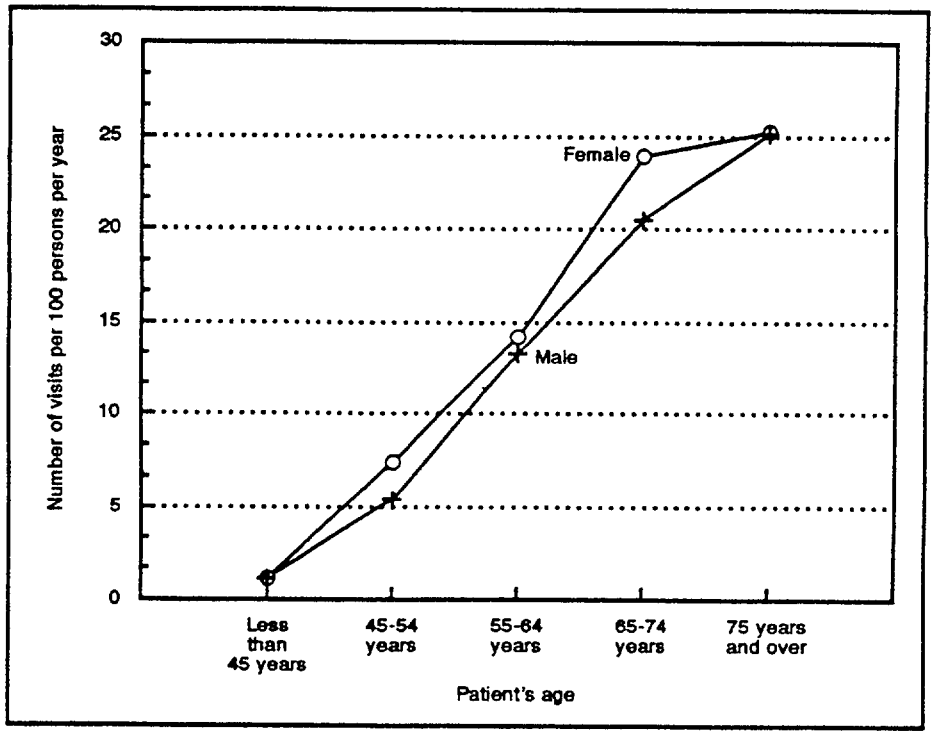


Figure 2. Annual office visit rate by patient's age and sex for visits with a principal diagnosis of diabetes mellitus: United States, 1989

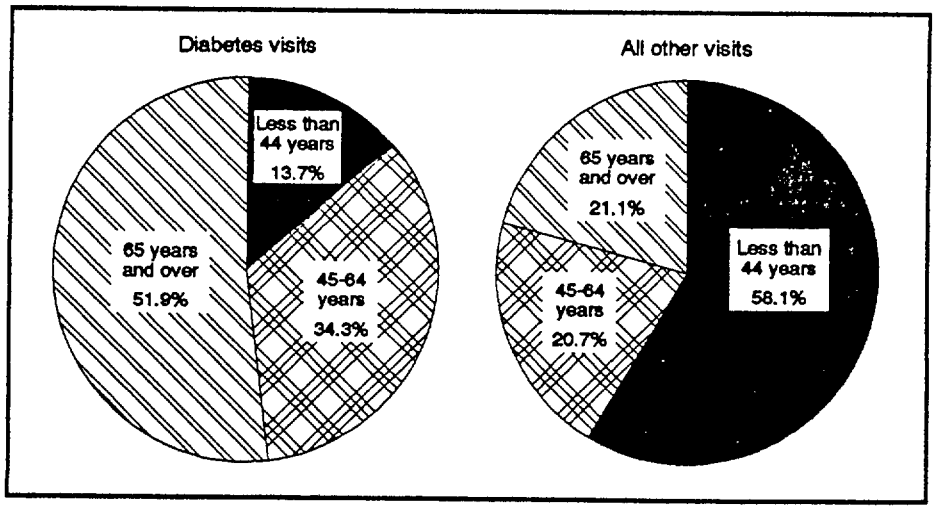


Figure 3. Percent distribution of office visits for diabetes mellitus and for all other diagnoses by patient's age: United States, 1989

near estimates due to sampling variability.)

The ratio of return visits to new problem visits was nearly 12:1, meaning that nearly 12 return visits for continuing care of this problem were recorded during the year for every visit that was recorded as a "new problem" encounter (3). New problem encounters include those made by new patients as well as those made by "old" patients for the care of new problems.

Item 7 of the Patient Record asks the physician to list the expected source of payment for the visit being recorded; more than one source may be listed by the physician. Medicare was the expected source of payment at 44.4 percent of visits, followed by self-pay (33.5 percent), commercial insurance (21.2 percent), and HMO/prepaid plan (13.9 percent) (table 5).

Item 9a of the Patient Record asks the physician to record the patient's most important complaint, symptom, or other reason for this visit using the patient's (or patient surrogate's) own words. These responses have been classified and coded using *A Reason for Visit Classification for Ambulatory Care* (RVC) (6). This classification is divided into the eight modules, or groups of reasons, shown in table 6. The disease module accounted for the highest percentage of visits with a first-listed diagnosis of diabetes mellitus (40.6 percent); this was followed by the diagnostic, screening, and preventive module (23.6 percent); the symptom module (17.3 percent); and the treatment module (12.8 percent).

Among visits with a principal diagnosis of diabetes mellitus, patients most often expressed their reason for visit as, simply, diabetes mellitus (38.5 percent of visits); next was glucose level determination (13.8 percent of visits); and general medical examination (7.8 percent of visits). Reasons for visit are shown in table 7.

Of all office visits in 1989, diabetes mellitus was the seventh most frequently reported principal diagnosis, and the fourth most frequently reported morbidity-related principal diagnosis after essential hypertension, otitis media, and acute upper respiratory infections (table 8). (Morbidity-related diagnoses are defined here as those that are classifiable to disease or injury, in contrast to nonillness or noninjury-related visits. Examples of visits with diagnoses that are not morbidity-related would include visits for routine pregnancy examination, general medical examination, etc.)

The majority of visits (68.2 percent) with a principal diagnosis of diabetes mellitus had a second diagnosis listed on the Patient Record, and 25.2 percent included a third diagnosis. Concomitant diagnoses are shown in table 9. Essential hypertension was the most frequently reported second- or

Table 2. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by physician specialty: United States, 1989

Physician specialty	Number of visits in thousands	Percent distribution
All visits	13,237	100.0
General and family practice	5,818	44.0
Internal medicine	3,797	28.7
Ophthalmology	898	6.8
General surgery	*417	*3.2
Cardiovascular disease	*137	*1.0
Other specialties	2,170	16.4

Table 3. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by referral status and prior-visit status: United States, 1989

Visit characteristic	Number of visits in thousands	Percent distribution
All visits	13,237	100.0
Referral status		
Patient was referred by another physician	*453	*3.4
Patient was not referred by another physician	12,784	96.6
Prior-visit status		
New patient	658	5.0
Old patient	12,578	95.1
New problem	*379	*2.9
Old problem	12,199	92.2

Table 4. Number and percent distribution of office visits for the 10 most frequent principal diagnoses for return visits for the care of old problems: United States, 1989

Rank	Principal diagnosis and ICD-9-CM code*		Number of visits in thousands	Percent distribution
	All return visits		422,207	100.0
1	Essential hypertension	401	24,267	5.7
2	Normal pregnancy	V22	20,201	4.8
3	**Diabetes mellitus**	250	12,199	2.9
4	Suppurative and unspecified otitis media	382	10,726	2.5
5	Health supervision of infant or child	V20	10,059	2.4
6	General medical examination	V70	9,558	2.3
7	Allergic rhinitis	477	9,455	2.2
8	Neurotic disorders	300	7,143	1.7
9	Other postsurgical states	V45	6,517	1.5
10	Asthma	493	5,338	1.3

*Based on the *International Classification of Diseases, 9th Revision, Clinical Modification* ICD-9-CM

Table 5. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by expected source of payment: United States, 1989

Expected source of payment[1]	Number of visits in thousands	Percent distribution
All visits	13,237	100.0
Self pay	4,438	33.5
Medicare	5,871	44.4
Medicaid	1,184	8.9
Commercial insurance	2,802	21.2
Blue Cross/Blue Shield	851	6.4
HMO Prepaid plan	1,842	13.9
No charge	*178	*1.3
Other	*351	*2.7
Unknown	*162	*1.2

[1]Data may exceed total number of visits because more than one category may be reported per visit.

third-listed diagnosis, showing up at about 3.5 million visits, or 26.5 percent of all visits with a principal diagnosis of diabetes mellitus.

About 72.2 percent of visits with a principal diagnosis of diabetes mellitus included a blood pressure check (table 10). This is significantly higher than the 34.2 percent of all other office visits (that is, those visits which did not list diabetes mellitus as a principal diagnosis) that included a blood pressure check in 1989.

Other frequently performed diagnostic services included "other" blood test (54.8 percent), urinalysis (17.4 percent), cholesterol measure (9.8 percent), and visual acuity examination (8.0 percent). All of these, with the exception of the visual acuity examination, were performed at a significantly higher rate at visits with a principal diagnosis of diabetes mellitus than at all other visits. The number of diagnostic services performed per visit is displayed in table 11.

Therapeutic services ordered or provided by the physician are shown in table 12. Weight reduction was the most frequently reported type of counseling/advice either ordered or provided (32.7 percent of visits). In contrast, only 5.8 percent of visits with a principal diagnosis other than diabetes mellitus included counseling or advice on weight reduction. Similarly, 9.9 percent of visits with a principal diagnosis of diabetes mellitus included counseling advice ordered or provided for reduction of cholesterol, compared with about 3 percent of all other visits.

More than three-quarters of visits with a principal diagnosis of diabetes mellitus (77.9 percent) included a new or continuing medication ordered or provided by the physician, a significantly higher percentage than the corresponding 59.8 percent of all other visits. As used in the NAMCS, the term "drug" is interchangeable with the term "medication" and includes prescription as well as nonprescription preparations. The term "drug mention" refers to each mention of medication on the Patient Record. Because doctors can record

Table 6. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by patient's principal reason for visit: United States, 1989

Principal reason for visit and RVC code [1]		Number of visits in thousands	Percent distribution
All visits		13,237	100.0
Symptom module	S001–S999	2,287	17.3
Disease module	D001–D999	5,376	40.6
Diagnostic, screening, and preventive module	X100–X599	3,122	23.6
Treatment module	T100–T899	1,692	12.8
Injuries and adverse effects module	J001–J999	*11	*0.1
Test results module	R100–R700	*343	*2.6
Administrative module	A100–A140	*40	*0.3
Other [2]	U990–U999	*366	*2.8

[1]Based on "A Reason for Visit Classification for Ambulatory Care" (RVC). *Vital and Health Statistics*, Series 2, No. 78, Feb. 1979.
[2]Includes problems and complaints not elsewhere classified, entries of "none," blanks, and illegible entries.

Table 7. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by the most frequent principal reasons for visit: United States, 1989

Principal reason for visit and RVC code [1]		Number of visits in thousands	Percent distribution
All visits		13,237	100.0
Diabetes mellitus	D205	5,092	38.5
Glucose level determination	X310	1,833	13.8
General medical examination	X100	1,034	7.8
Vision dysfunctions; tiredness, exhaustion; vertigo, dizziness	S305,S015,S225	670	5.1
Symptoms of fluid abnormalities; foot and toe symptoms; skin lesion, back symptoms; general weakness	S035,S935,S865,S905,S020	597	4.5

[1]Based on "A Reason for Visit Classification for Ambulatory Care" (RVC), *Vital and Health Statistics*, Series 2, No. 78, Feb. 1979.

Table 8. Number, percent, and cumulative percent of office visits by the 10 principal diagnoses most frequently rendered by physicians: United States, 1989

Rank	Principal diagnosis and ICD–9–CM code [1]		Number of visits in thousands	Percent distribution	Cumulative percent
	All visits		692,702	100.0	
1	Essential hypertension	401	27,708	4.0	4.0
2	Normal pregnancy	V22	23,578	3.4	7.4
3	General medical examination	V70	20,166	2.9	10.3
4	Suppurative and unspecified otitis media	382	20,033	2.9	13.2
5	Acute upper respiratory infections	465	15,765	2.3	15.5
6	Health supervision of infant or child	V20	15,669	2.3	17.8
7	**Diabetes mellitus**	250	13,237	1.9	19.7
8	Allergic rhinitis	477	11,631	1.7	21.4
9	Bronchitis, not specified as acute or chronic	490	11,160	1.6	23.0
10	Acute pharyngitis	462	10,958	1.6	24.6

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification*, ICD–9–CM.

Table 9. Number and percent distribution of office visits by diagnoses most frequently associated with a principal diagnosis of diabetes mellitus: United States, 1989

Second- or third- listed diagnosis and ICD–9–CM code [1]		Number of visits in thousands	Percent distribution
All visits		13,237	100.0
Essential hypertension	401	3,510	26.5
Other retinal disorders	362	808	6.1
Other forms of chronic ischemic heart disease	414	*501	*3.7
Disorders of lipoid metabolism	272	*480	*3.6
Obesity and other hyperalimentation	278	*278	*3.4

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification*, ICD–9–CM

more than one drug per visit, the total number of drug mentions will generally be higher than the number of visits. The term "drug visit" refers to any visit in which at least one drug is ordered or provided by the physician.

There were about 10.3 million drug visits among the 13.2 million visits with a principal diagnosis of diabetes mellitus (78.0 percent). The number of drugs ordered or provided per visit is listed in table 13. Approximately 30.3 percent of visits included three or more medications, compared with just 10.9 percent of all visits with a principal diagnosis other than diabetes mellitus.

In all, there were approximately 23.8 million drug mentions, or 2.3 drugs ordered or provided per drug visit. Table 14 presents data on the number and percent of diabetes-related drug mentions for the most frequently used generic substances. Table 15 displays drug mentions according to therapeutic classification, based on the *National Drug Code Directory* (7).

The mean duration of physician-patient contact for visits with a principal diagnosis of diabetes mellitus was 17.3 minutes (with a standard error of .73 minutes) and does not include visits in which no face-to-face contact with the physician occurred. Physician-patient contact only includes the time spent in actual face-to-face contact between physician and patient. Data on duration of visits with a principal diagnosis of diabetes mellitus are shown in table 16.

The great majority (89.2 percent) of visits with a principal diagnosis of diabetes mellitus resulted in a scheduled return visit. Data on disposition of visit are also shown in Table 16.

Visits with a second or third diagnosis of diabetes mellitus

In addition to the 13.2 million office visits with a first-listed diagnosis of diabetes mellitus, approximately 8.7 million office visits were made during 1989 at which a second or third diagnosis was listed as diabetes

mellitus, yielding a total of about 22 million diabetes-related diagnoses overall. Visits in which the second or third diagnosis was diabetes mellitus were not found to differ significantly from visits in which the principal diagnosis was diabetes mellitus in terms of the age, sex, or race distribution of patients.

In 18.7 percent of the visits in which diabetes was the second- or third-listed diagnosis, the principal diagnosis was listed as essential hypertension (1.6 million visits). Table 17 displays the major ICD–9–CM coding classes associated with principal diagnoses for visits in which the second- or third-listed diagnosis was diabetes mellitus.

Table 18 presents data on the diagnoses reported most frequently in conjunction with all of the approximately 22 million diagnoses of diabetes mellitus, whether first-, second-, or third-listed on the Patient Record. Essential hypertension was reported most often in addition to a diagnosis of diabetes mellitus, at 6.3 million visits, or 28.7 percent of all such visits. Other common diagnoses reported in conjunction with diabetes mellitus included other forms of chronic ischemic heart disease, other retinal disorders, obesity and hyperalimentation, disorders of lipoid metabolism, and other and unspecified arthropathies.

References

1. Public Health Service and Health Care Financing Administration. International Classification of Diseases, 9th Revision, clinical modification. Washington: Public Health Service. 1980.
2. DeLozier JE, Gagnon RO. 1989 Summary: National Ambulatory Medical Care Survey. Advance data from vital and health statistics; no 203. Hyattsville, Maryland: National Center for Health Statistics. 1991.
3. Schappert SM. National Ambulatory Medical Care Survey: 1989 Summary. National Center for Health Statistics. Vital Health Stat 13(110). 1992.
4. Nelson C, McLemore T. The National Ambulatory Medical Care Survey, United States,

Table 10. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by selected diagnostic services: United States, 1989

Selected diagnostic services[2]	Diabetes visits[1]		All other visits	
	Number of visits in thousands	Percent distribution	Number of visits in thousands	Percent distribution
All visits	13,237	100.0	679,465	100.0
None	914	6.9	264,920	39.0
Visual acuity	1,058	8.0	44,134	6.5
Blood pressure check	9,552	72.2	232,347	34.2
Urinalysis	2,300	17.4	85,416	12.6
Oral glucose tolerance[3]	562	4.2	2,494	0.4
Cholesterol measure[3]	1,302	9.8	23,526	3.5
Other blood test	7,253	54 8	80,957	11.9

[1]Visits with a principal diagnosis of diabetes mellitus.
[2]Total may exceed total number of visits because more than one category may be reported per visit.
[3]Category is new in the 1989 NAMCS

Table 11. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by number of diagnostic services ordered or provided per visit: United States, 1989

Number of diagnositc services ordered or provided per visit	Diabetes visits[1]		All other visits	
	Number of visits in thousands	Percent distribution	Number of visits in thousands	Percent distribution
All visits	13,237	100.0	679,465	100.0
None	914	6.9	264,920	39.0
One	3,307	25.0	215,664	31.7
Two	5,703	43.1	105,062	15.5
Three	1,906	14.4	42,633	6.3
Four or more	1,407	10 6	51,186	7.5

[1]Visits with a principal diagnosis of diabetes mellitus.

Table 12. Number and percent distribution of office visits by selected therapeutic services: United States, 1989

Selected therapeutic services	Diabetes visits[1]		All other visits	
	Number of visits in thousands	Percent distribution	Number of visits in thousands	Percent distribution
All visits	13,237	100.0	679,465	100.0
Counseling/advice ordered or provided[2,3]				
None	5,856	44 2	429,936	63.3
Weight reduction	4,324	32 7	39,529	5.8
Cholesterol reduction	1,313	9.9	20,220	3.0
Smoking cessation	*409	*3.1	14,700	2.2
HIV transmission	*24	*0.2	1,020	0.2
Breast self-exam	*237	*1.8	15,542	2.3
Other counseling/advice	3,989	30.1	189,283	27.9

[1]Visits with a principal diagnosis of diabetes mellitus.
[2]Category is new in the 1989 NAMCS
[3]Total may exceed total number of visits because more than one category may be reported per visit.

Table 13. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by number of medications ordered or provided by physician: United States, 1989

Number of new or continued medications ordered or provided by the physician	Diabetes visits[1]		All other visits	
	Number of visits in thousands	Percent distribution	Number of visits in thousands	Percent distribution
All visits	13,237	100.0	679,465	100.0
None	2,931	22.1	272,982	40.2
One	3,897	29 4	226,180	33.3
Two	2,411	18 2	106,309	15.6
Three–five	3,998	30 3	73,994	10.9

[1]Visits with a principal diagnosis of diabetes mellitus.

Table 14. Number and percent distribution of drug mentions for the five most frequently used generic substances for visits with a principal diagnosis of diabetes mellitus: United States, 1989

Generic substance	*Number of mentions in thousands*	*Percent distribution*
Total drug mentions for visits with a principal diagnosis of diabetes mellitus	23,768	100.0
Insulin	4,223	17.8
Glyburide	2,345	9.9
Hydrochlorothiazide	1,137	4.8
Furosemide	989	4.2
Glipizide	*833	*3.5

[1]Frequency of mention combines single-ingredient agents with mentions of the agent as an ingredient in a combination drug.

Table 15. Number and percent distribution of drug mentions by therapeutic classification for visits with a principal diagnosis of diabetes mellitus: United States, 1989

Therapeutic classification[1]	*Number of mentions in thousands*	*Percent distribution*
Total drug mentions for visits with a principal diagnosis of diabetes mellitus	23,768	100.0
Hormones and agents affecting hormonal mechanisms	9,375	39.4
Cardiovascular-renal	7,334	30.9
Pain relief	1,508	6.3
Metabolic and nutrient	1,102	4.6
Psychopharmacologic	*893	*3.2
Gastrointestinal	*766	*3.2
Antimicrobial	*596	*2.5
Other[2]	1,225	5.2
Unclassified/miscellaneous	968	4.1

[1]Therapeutic class is based on the standard drug classification used in the *National Drug Code Directory, 1982 Edition.*
[2]Includes the following classifications: anesthetic, hematologic, radiopharmaceuticals/contrast media, immunologic agents, skin-mucous membrane, neurologic, ophthalmic, otologic, and respiratory tract drugs.

Table 16. Number and percent distribution of office visits with a principal diagnosis of diabetes mellitus by duration and disposition of visit: United States, 1989

Visit characteristic	*Number of visits in thousands*	*Percent distribution*
All visits	13,237	100.0
Duration of visit		
Zero minutes[1]	*212	*1.6
1–5 minutes	854	6.5
6–10 minutes	3,079	23.3
11–15 minutes	4,503	34.0
16–30 minutes	3,801	28.7
More than 30 minutes	787	5.9
Disposition of visit[2]		
No followup planned	*298	*2.2
Return at specified time	11,809	89.2
Return if needed	1,045	7.9
Telephone followup planned	*445	*3.4
Referred to other physician	*254	*1.9
Returned to referring physician	*179	*1.4
Admit to hospital	*103	*0.8
Other	*127	*1.0

[1]Visits of zero minutes duration are those in which there was no face-to-face contact between the patient and the physician.
[2]Total may exceed total number of visits because more than one category may be reported per visit.

1975–81 and 1985 trends. National Center for Health Statistics. Vital Health Stat 13(93). 1988.
5. Ezzati T. Office visits for diabetes mellitus, National Ambulatory Medical Care Survey: United States, 1977. Advance data from vital and health statistics; no 57. Hyattsville, Maryland: National Center for Health Statistics. 1980.
6. Schneider D, Appleton L, McLemore T. A reason for visit classification for ambulatory care. National Center for Health Statistics. Vital Health Stat 2(78). 1979.
7. Food and Drug Administration. National drug code directory. Washington: Public Health Service. 1982.

Table 17. Number and percent distribution of office visits with a second- or third-listed diagnosis of diabetes mellitus by selected diagnostic classes: United States, 1989

Principal diagnosis (major ICD–9–CM coding class [1])	*Number of visits in thousands*	*Percent distribution*
All second- and third-listed diagnoses of diabetes mellitus	8,718	100.0
Diseases of circulatory system . 390–459	3,174	36.4
Diseases of respiratory system . 460–519	1,184	13.6
Diseases of musculoskeletal system and connective tissue. 710–739	919	10.5
Symptoms, signs, and ill-defined conditions 780–799	*489	*5.6

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM).

Table 18. Number and percent distribution of office visits by diagnoses most frequently associated with a first-, second-, or third-listed diagnosis of diabetes mellitus: United States, 1989

Concomitant diagnosis and ICD–9–CM code [1]	*Number of visits in thousands*	*Percent distribution*
All visits with a first-, second-, or third-listed diagnosis of diabetes mellitus	21,955	100.0
Essential hypertension 401	6,303	28.7
Other forms of chronic ischemic heart disease . . . 414	975	4.4
Other retinal disorders 362	926	4.2
Obesity and other hyperalimentation. 278	746	3.4
Disorders of lipoid metabolism 272	642	2.9
Other and unspecified arthropathies. 716	611	2.8

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification*,ICD–9–CM.

Technical notes

Source of data and sample design

The information presented in this report is based on data collected by means of the National Ambulatory Medical Care Survey (NAMCS) from March 20, 1989–March 18, 1990. The target universe of NAMCS includes office visits made in the United States by ambulatory patients to nonfederally employed physicians who are principally engaged in office practice, but not in the specialties of anesthesiology, pathology, or radiology. Telephone contacts and nonoffice visits are excluded.

A multistage probability sample design is used in NAMCS, involving samples of primary units (PSU's), physician practices within PSU's, and patient visits within physician practices. For 1989, a sample of 2,535 nonfederal, office-based physicians was selected from master files maintained by the American Medical Association and American Osteopathic Association. The physician response rate for the 1989 NAMCS was 74 percent. Sample physicians were asked to complete Patient Records (see figure 1) for a systematic random sample of office visits occurring during a randomly assigned 1-week reporting period. Responding physicians completed 38,384 patient records.

Characteristics of the physician's practice, such as primary specialty and type of practice, were obtained from the physicians during an induction interview. The U.S. Bureau of the Census, Housing Surveys Branch, was responsible for the survey's data collection. Processing operations and medical coding were performed by the National Center for Health Statistics, Hospital Discharge and Ambulatory Care Survey Section, Research Triangle Park, North Carolina.

Sampling errors

The standard error is primarily a measure of the sampling variability that occurs by chance when only a sample, rather than an entire universe, is surveyed. The relative standard error of an estimate is obtained by dividing the standard error by the estimate itself; the result is then expressed as a percent of the estimate. Approximate relative standard errors of selected aggregate statistics are shown in tables I–II, and the standard errors for estimated percent of visits are shown in table III.

Adjustments for nonresponse

Estimates from NAMCS data were adjusted to account for sample physicians who were in scope but did not participate in the study. This adjustment was calculated to minimize the impact of response on final estimates by imputing to nonresponding physicians data from visits to similar physicians. For this purpose, physicians were judged similar if they had the same specialty designation and practiced in the same PSU.

Test of significance and rounding

In this report, the determination of statistical significance is based on the t-test. The Bonferroni inequality was used to establish the critical value for statistically significant differences (0.05 level of confidence). Terms relating to differences such as "greater than" or "less than" indicate that the difference is statistically significant. In the tables, estimates of office visits have been rounded to the nearest thousand. Consequently,

Table I. Relative standard errors for estimated number of office visits: National Ambulatory Medical Care Survey, 1989

Estimated number of office visits (in thousands)	*Relative standard error (in percent)*
200	49.4
400	35.0
547	30.0
600	28.7
800	24.9
1,000	22.4
2,000	16.1
5,000	10.6
10,000	8.0
13,000	7.3
20,000	6.4
50,000	5.1
100,000	4.6
600,000	4.1

Example of use of table: An aggregate estimate of 10 million visits has a relative standard error of 8.0 percent or a standard error of 800,000 visits (8.0 percent of 10 million).

Table II. Relative standard errors for estimated number of drug mentions: National Ambulatory Medical Care Survey, 1989

Estimated number of drug mentions (in thousands)	*Relative standard error (in percent)*
200	63.4
400	45.0
500	40.3
600	36.9
800	32.0
912	30.0
1,000	28.7
2,000	20.6
5,000	13.6
10,000	10.3
20,000	8.1
50,000	6.5
100,000	5.8
600,000	5.2

Example of use of table: An aggregate estimate of 10 million drug mentions has a relative standard error of 10.3 percent or a standard error of 1.03 million mentions (10.3 percent of 10 million).

Table III. Standard errors for percents of estimated numbers of office visits: National Ambulatory Medical Care Survey, 1989

Base of percer (visits in thousands)	*Estimated percent*					
	1 or 99	*5 or 95*	*10 or 90*	*20 or 80*	*30 or 70*	*50*
	Standard error in percentage points					
200	4.9	10.7	14.8	19.7	22.6	24.6
500	3.1	6.8	9.3	12.5	14.3	15.6
1,000	2.2	4.8	6.6	8.8	10.1	11.0
2,000	1.6	3.4	4.7	6.2	7.1	7.8
5,000	1.0	2.2	3.0	3.9	4.5	4.9
10,000	0.7	1.5	2.1	2.8	3.2	3.5
13,000	0.6	1.3	1.8	2.4	2.8	3.1
20,000	0.5	1.1	1.5	2.0	2.3	2.5
50,000	0.3	0.7	0.9	1.3	1.4	1.6
100,000	0.2	0.5	0.7	0.9	1.0	1.1
600,000	0.1	0.2	0.3	0.4	0.4	0.5

Example of use of table: An estimate of 30 percent based on an aggregate estimate of 13 million visits has a standard error of 2.8 percent or a relative standard error of 9.3 percent (2.8 percent divided by 30 percent).

estimates will not always add to totals. Rates and percents were calculated from original unrounded figures and do not necessarily agree with percents calculated from rounded data.

Definition of terms

Ambulatory patient—An ambulatory patient is an individual seeking personal health services who is not currently admitted to any health care institution on the premises.

Physician—A physician is a duly licensed doctor of medicine (M.D.) or doctor of osteopathy (D.O.) who is currently in office-based practice and who spends some time caring for ambulatory patients. Excluded from the NAMCS are physicians who are hospital based; who specialize in anesthesiology, pathology, or radiology; who are federally employed; who treat only institutionalized patients; or who are employed full time by an institution and who spend no time seeing ambulatory patients.

Office—Offices are the premises physicians identify as locations for their ambulatory practice; these customarily include consultation, examination, or treatment spaces the patients associate with the particular physician.

Visit—A visit is a direct personal exchange between an ambulatory patient and a physician or a staff member working under the physician's supervision, for the purpose of seeking care and rendering personal health services.

Drug mention—A drug mention is the physician's entry of a pharmaceutical agent—by any route of administration—for prevention, diagnoses, or treatment. Generic as well as brand-name drugs are included, as are nonprescription and prescription drugs. Along with all new drugs, the physician also records continued medications if the patient was specifically instructed during the visit to continue the medication.

Drug visit—A drug visit is a visit in which medication was prescribed or provided by the physician.

Symbols

- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision

*U.S. Government Printing Office: 1992 — 312-093/40022

Suggested citation

Schappert SM. Office visits for diabetes mellitus: United States, 1989. Advance data from vital and health statistics; no. 211. Hyattsville, Maryland: National Center for Health Statistics. 1992.

Number 212 • March 24, 1992

Advance Data

From Vital and Health Statistics of the National Center for Health Statistics

Prevalence of Major Digestive Disorders and Bowel Symptoms, 1989

by Felicia B. LeClere, Ph.D., Abigail J. Moss, Division of Health Interview Statistics, James E. Everhart, M.D., M.P.H., and Harold P. Roth, M.D., National Institute of Diabetes and Digestive and Kidney Diseases

Introduction

Digestive diseases have a substantial impact on health and health services in the United States. In 1988, about 3.3 million people were hospitalized for digestive diseases and over 5.3 million digestive system procedures were performed on hospitalized patients (1). In 1989, there were an estimated 26.7 million first-listed visits for digestive diseases to office-based physicians (2).

Despite the frequency of digestive diseases, there are no special population-based registries for nonmalignant digestive diseases in the United States nor are noninfectious digestive diseases reported to State health departments. The surveys of the National Center for Health Statistics (NCHS) provide timely data on the impact and trends in chronic digestive diseases. The National Health Interview Survey (NHIS) is particularly useful for several reasons. First, questions regarding digestive conditions have been asked annually for more than 30 years, which allows for an analysis of long-term trends. Second, less common conditions and small subpopulations can also be examined by combining multiple years. Data are routinely gathered on common conditions, such as constipation and hemorrhoids, that may not require frequent medical attention and therefore are not adequately covered by surveys of medical care utilization. Finally, NHIS is the only continuing source of information regarding disability and activity restriction due to digestive diseases.

The ongoing NHIS is limited in its ability to provide accurate information on specific diseases. The survey utilizes a chronic condition checklist and relies on respondents' reports for all family members. The National Institute of Diabetes and Digestive and Kidney Diseases collaborated with NCHS to develop a special questionnaire aimed at collecting more complete and accurate information on digestive disorders. Renewed interest in the epidemiology of these diseases also prompted the development of this questionnaire (3–11). The NHIS questionnaire on digestive disorders was administered in 1989, along with two other surveys that provide information relevant to the identification of digestive conditions—the National Ambulatory Medical Care Survey and the third National Health and Nutrition Examination Survey.

The data collection method for the 1989 NHIS digestive disorders questionnaire, which is described in more detail later, improves the accuracy of the reporting of chronic digestive conditions. It may also allow for improved case selection for analytic study of these diseases. More complex analyses of the data from the digestive disorders questionnaire are possible, and further exploration of the data is encouraged.

Data and methods

This report is based on data from the 1989 National Health Interview Survey, which is a continuous cross-sectional survey of the resident household population of the United States. Every year since 1957, basic demographic and health information

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics
Manning Feinleib, M.D., Dr. P.H., Director

CDC
CENTERS FOR DISEASE CONTROL

has been collected from a nationally representative sample of household members in face-to-face interviews using a standard questionnaire. Additional health topics are added to the basic questionnaire. In 1989 a special questionnaire on digestive disorders was administered to one randomly selected member of each sample family in an interview household who was 18 years of age and over. Approximately 42,000 individuals were interviewed.

The NHIS digestive disorders (NHIS–DD) questionnaire consists of three sections. In the first section, respondents were asked about specific digestive conditions: gallbladder trouble, ulcers, diverticulitis, hemorrhoids, and colon conditions. Functional colon conditions include diagnostic synonyms such as irritable bowel syndrome, functional bowel, spastic colon, and irritable colon. Information on the timing of onset, medical diagnosis, and treatment of these specific disorders was also obtained. In the second section of the questionnaire, data were collected on the location and severity of abdominal pain and the diagnosis of associated conditions. The purpose of this section was to examine the prevalence of the symptoms of irritable bowel syndrome and other diseases of the lower digestive tract. The final section contains information on normative bowel habits and identifies episodes of common bowel complaints such as diarrhea and constipation. Data derived from the first and third sections of this survey are presented in this report. A facsimile of the digestive disorders questionnaire is provided in "Current Estimates From the National Health Interview Survey: United States, 1989" (12).

The "Technical notes" section that appears at the end of this report contains more information on the survey design, sampling procedure, and the NHIS questionnaire document. Methods for constructing approximate standard errors and tests of significance for estimates and percents presented in this report also appear in these notes. The prevalence estimates of the major digestive disorders from the NHIS–DD are compared with those routinely generated from the basic NHIS questionnaire. The reasons why these estimates may differ are also discussed. Unless otherwise noted, the comparisons made within the text are significant at the .05 level.

Tables 1 through 5 contain data on the number and percent of persons with selected major chronic digestive disorders. These figures are reported for those with the condition in the last 12 months and those who have ever had the condition by age, sex, race, Hispanic origin, and poverty status. In table 6 the prevalence of chronic bowel complaints, such as diarrhea and constipation, and the use of medical care are presented. For the purposes of this report, those persons who report having constipation or diarrhea most or all of the time are classified as having a chronic bowel complaint.

Results

Prevalence and onset

Of the major digestive disorders reported in the NHIS–DD, hemorrhoids were the most commonly reported in the last 12 months and for those ever reporting digestive conditions. In the case of hemorrhoids, the question of whether the respondent ever had the condition is worded slightly differently from that for other conditions. Respondents were asked if a doctor ever diagnosed hemorrhoids, whereas for other conditions respondents were asked if they ever had the condition with no mention of its medical diagnosis. About 23 million adults had hemorrhoids (12.8 percent of the noninstitutionalized population) in the last year, and 36 million (20.3 percent) reported ever having had hemorrhoids. Functional colon conditions and ulcers were also fairly prevalent. About 7 million people had functional colon conditions (3.7 percent of the population), and about 6 million people (3.5 percent) had ulcers in the 12-month period preceding the interview date. An estimated 19 million people (10.5 percent) reported ever having had ulcers, and over 10 million (5.9 percent) reported ever having had functional colon conditions.

Gallstones and gallbladder trouble and diverticulitis affect fewer people, although about 3 million people had each of these conditions in the last 12 months. About 14 million reported ever having had gallstones or gallbladder trouble, and about 5 million reported ever having had diverticulitis. In the 12 months before the interview date, about 5.3 million people had chronic constipation (about 3.0 percent of the adult noninstitutionalized population) and about 2.1 million adults had chronic diarrhea (1.2 percent).

Among those who reported having had a condition in the last 12 months, there are two major subgroups—those for whom the condition is ongoing and those for whom the condition was first identified in the last 12 months. An estimated 1 million gallstones or gallbladder cases were first diagnosed in the last 12 months. This represents about 39 percent of those conditions reported in that time period. About 20 percent of those reporting ulcers, or an estimated 1.3 million, were first diagnosed in the previous year. An estimated 1.3 million persons developed functional colon conditions in the last 12 months (18.6 percent of persons with functional colon conditions during that time period). In the same period, 17.9 percent of those persons with diverticulitis (an estimated 476,000 persons) were first diagnosed with the condition.

Two of the conditions reported in the NHIS–DD represent composites of numerous related conditions. The ulcer group consists of gastric (stomach) ulcer and duodenal ulcers. Ulcers of either site may more generally be referred to as peptic ulcers. Respondents could also report other (excluding skin) ulcers without further specification. For those reporting ever having ulcers, the most common diagnosis was a duodenal ulcer (32.4 percent of the cases),

followed by peptic (27.0 percent), gastric (19.2 percent), stomach (12.1 percent), and other or not told (9.3 percent).

The conditions grouped together under the rubric "functional colon conditions" tend to be synonyms rather than distinctly diagnosed conditions. Among those persons with functional colon conditions in the last 12 months, the most frequently reported diagnosis was spastic colon (39.2 percent), followed by irritable bowel syndrome (30.6 percent), irritable colon (14.8 percent), other (14.0 percent), and functional bowel (1.4 percent). The pattern of diagnosis is similar among those who report ever having the condition.

Sociodemographic differences

As with most chronic conditions, increasing age is highly related to the lifetime prevalence of chronic digestive conditions. The age gradient is especially steep for gallbladder trouble, ulcers, and diverticulitis. Among men, the percent who ever had gallstones or gallbladder trouble nearly doubles from 6.2 percent of noninstitutionalized adults aged 45–64 to 12.0 percent for those 65 and over. Ulcers exhibit a similar pattern for men. About 14 percent of men aged 45–64 report ever having ulcers. That figure increases to 20.4 percent for men 65 and over. Diverticulitis is also much more prevalent among elderly men and women. Nearly 10 percent of the population 65 and over ever had diverticulitis compared with 2.8 percent of the population of all ages. Among women, 4.8 percent of those 45–64 report ever having diverticulitis. This figure increases to 11.3 percent for those aged 65 and over.

In general, women are much more likely than men to report ever having had digestive disorders and bowel complaints, with the exception of ulcers. See figure 1 for an illustration of differences by age and sex. These data support the clinical impression and other survey data that women have these conditions more often than men (13–16). For nearly all of the digestive disorders and bowel complaints on which data were collected, the percent of adult women affected is nearly twice that of men. About 11 percent of women 18 years of age and over ever had gallstones or gallbladder trouble in contrast to 4.0 percent of men. Over 8 percent of women reported ever having had functional colon conditions, whereas only 3.4 percent of men reported having had these conditions. A little over 1 percent of men reported being constipated most or all the time in the last 12 months in contrast to nearly 5 percent of women.

Current digestive conditions are especially characteristic of elderly women and, in fact, may be understated, because elderly women—especially those who are functionally dependent—are more likely to be institutionalized (17). Of the noninstitutionalized female population 65 years of age and over, 3.6 percent had gallstones or gallbladder trouble, 5.7 percent had diverticulitis, 5.9 percent had functional colon condition, 15.2 percent had hemorrhoids, and 6.4 percent were chronically constipated in the last 12 months. These percents are all significantly higher than males in the same age groups and some are significantly higher than younger women.

The prevalence of chronic digestive disorders is not consistently related to race, ethnicity, or poverty. In general, however, smaller proportions of black persons and Hispanics reported digestive disorders; although within many of the age categories, the estimates for black persons are not statistically reliable. Several explanations have been offered for why black persons, in particular, report fewer chronic conditions (18). First, the black and Hispanic populations are younger and, therefore, less likely to have chronic conditions. Among the statistically reliable comparisons that can be made for all age groups, however, a smaller proportion of black persons are affected by these digestive conditions. Second, a medical diagnosis is often necessary to identify these conditions and given that black persons have fewer physician contacts than white persons, these conditions may remain undiagnosed (18).

One consistent difference is the higher prevalence of chronic constipation among black persons, Hispanics, and the poor. Among black persons, 4.3 percent of the adult population were chronically constipated in the last 12 months compared with 2.8 percent of white persons. Among Hispanics, 4.7 percent were constipated compared with 2.9 percent of non-Hispanics; and among the poor, 5.4 percent compared with 3.5 percent of the nonpoor. The poor were also more likely to have had chronic diarrhea (1.9 percent of the poor compared with 1.1 percent of the nonpoor).

Medical diagnosis

In general, most digestive disorders are medically diagnosed and some form of diagnostic test is performed when applicable. Over 95 percent of persons who reported ever having gallbladder trouble, ulcers, or diverticulitis were medically diagnosed. Of those conditions, gallstones or gallbladder trouble was most likely to have been identified by a diagnostic test (88.3 percent of persons who ever had condition). Approximately three-fourths of those who reported ulcers and diverticulitis also had diagnostic tests performed. Persons who ever had functional colon conditions are slightly less likely to have had them medically diagnosed (88 percent). Hemorrhoids are medically attended in fewer cases. Of those who ever report having hemorrhoids, only 21 percent ever had hemorrhoid surgery.

Medical diagnosis and testing vary slightly by age, race, ethnicity, poverty status, and sex. The notable comparisons, although not statistically significant, are in the use of diagnostic tests that may reflect differences in the adequacy of health care coverage (19). Slightly less than 70 percent of black persons who ever had an ulcer had an upper GI series,

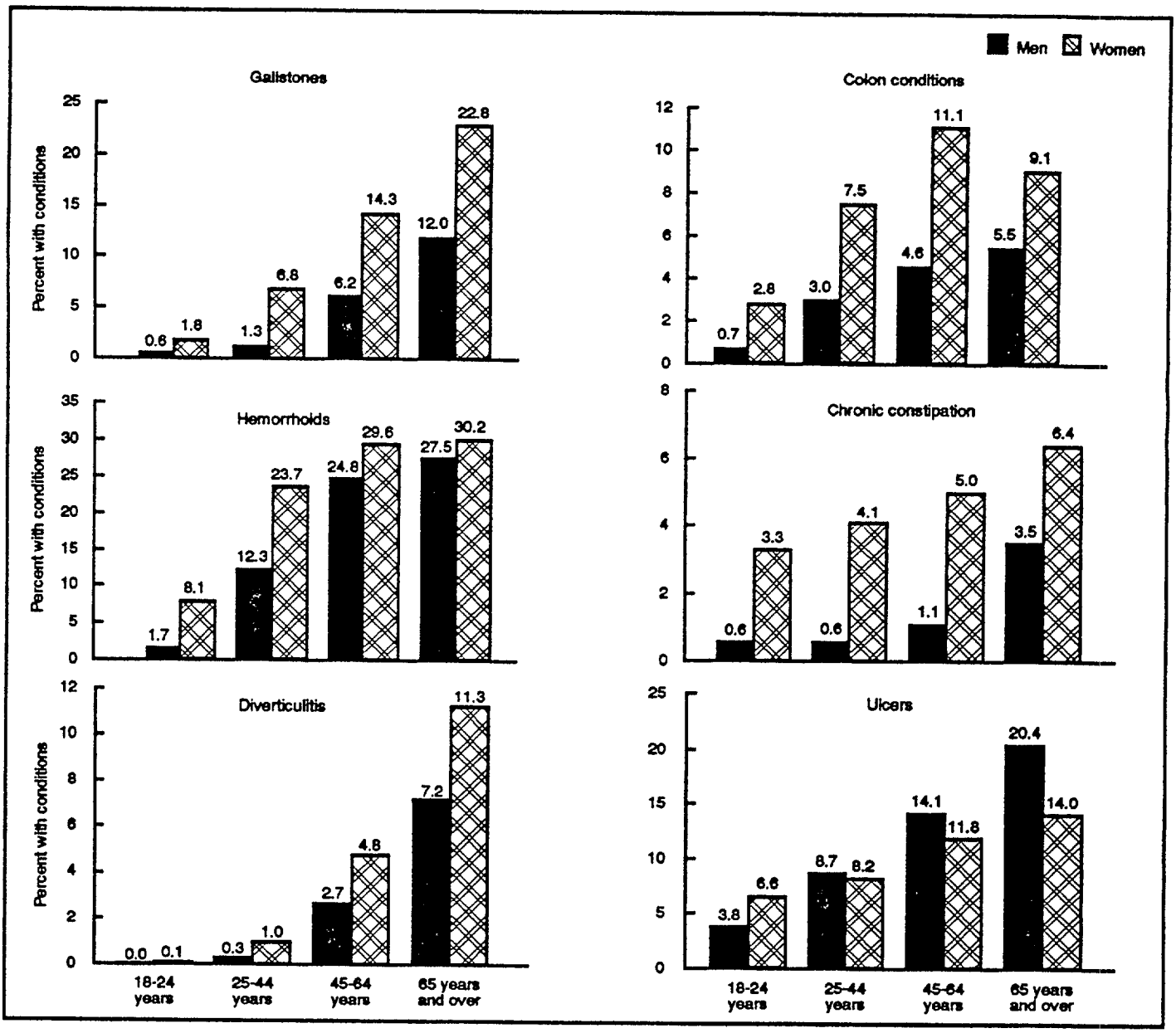


Figure 1. Percent of persons 18 years of age and over who ever had selected digestive disorders by age and sex: United States, 1989

upper endoscopy, or upper gastroscopy performed as compared with 73 percent of white persons. For Hispanics with ulcers, 66.4 percent had these procedures compared with 73 percent of non-Hispanics. The comparison is similar and significant for the poor and nonpoor. Finally, although women are much more likely to report ever having hemorrhoids (24.2 percent of women compared with 15.9 percent of men), they are significantly less likely to have had hemorrhoid surgery. Of women who ever had hemorrhoids, 16.7 percent had surgery in contrast to 28.6 percent of men.

There is variation in the use of over-the-counter remedies for constipation by sociodemographic groups, which parallels the prevalence of chronic constipation. Over 14 percent of women 65 years of age and over used stool softeners or laxatives in the 30 days prior to the interview. This compares with about 9 percent of men in the same age group. Elderly black persons (19.6 percent) also were more likely to have used laxatives recently than elderly white persons (11.4 percent). The high rates of laxative use among the general population (an estimated 10 million persons used these remedies in the last 30 days) reported in this study may also be a reflection of the way in which the question was worded. Respondents were asked about a range of products, including standard laxatives and also bulk and fiber laxatives. Although they were specifically asked about whether the products were used to improve bowel function, respondents may also be using these remedies for other reasons. Laxative use is also congruent with occasional constipation as well as chronic constipation. An estimated 31 million persons reported being constipated some, most, or all of the time in the last 12 months.

Comments

Digestive disorders and gastrointestinal and bowel complaints are often difficult to identify and diagnose (20,21). The NHIS–DD questionnaire provides an integrated data source to identify not only the specific conditions noted by the respondent but also the sources and nature of abdominal pain as well as a detailed description of bowel function. The abdominal pain and bowel function portions of the questionnaire, which measure symptoms, have proven effective in other small-scale surveys in identifying and discriminating among a variety of gastrointestinal disorders (22). The information contained in these two portions of the NHIS–DD will be useful for both future scientific analysis and for the improvement of the identification and treatment of digestive disorders (22).

In addition, further analysis can be done on how digestive conditions affect general health. The NHIS–DD is linked to the basic NHIS, which includes information on self-assessed health status, limitation of activity, reduced activity days, and medical care utilization. Other sociodemographic characteristics of the sample individuals and their families are also available. In addition the NHIS–DD can be linked to other special health topic questionnaires in 1989, a list of which appears in the technical notes.

A public use data file based on the 1989 digestive disorders supplement is available. Information regarding the purchase of the public use tape and documentation may be obtained by writing to the Systems and Programming Branch, Division of Health Interview Statistics, 6525 Belcrest Road, Hyattsville, MD 20782.

References

1. Graves EJ. National Hospital Discharge Survey: Annual Summary, 1988. National Center for Health Statistics. Vital Health Stat 13(106).
2. DeLozier JE, Gagnon RO. 1989 Summary: National Ambulatory Medical Care Survey. Advance data from vital and health statistics; no 203. Hyattsville, Maryland: National Center for Health Statistics. 1991.
3. Maurer KR, Everhart JE, Ezzati TM, Johannes RS, Knowler WC, Larson DL, Sanders R, Shawker TH, Roth HP. Prevalence of gallstone disease in Hispanic populations in the United States. Gastroenterology 96:487–92. 1989.
4. Sichieri R, Everhart JE, Roth HP. Low incidence of hospitalization with gallbladder disease among blacks in the United States. Am J Epidemiol 131:826–35.
5. Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation: an epidemiological study. Gastroenterology 98:380–6. 1990.
6. Everhart JE, Go VLW, Johannes RS, FitzSimmons SC, Roth HP, White LR. A longitudinal survey of self-reported bowel habits in the United States. Dig Dis Sci 34:1153–62. 1990.
7. Sandler RS, Jordon MC, Shelton BJ. Demographic and dietary determinants of constipation in the U.S. population. Am J Public Health 80:185–9. 1990.
8. Everhart JE, Renault PF. Irritable bowel syndrome in office practice in the United States. Gastroenterology 100:998–1005. 1991.
9. Talley NJ, Phillips SF, Twomey BB, Zinsmeister AR, Melton LJ. Relationship among personality and symptoms in nonulcer dyspepsia and the irritable bowel syndrome. Gastroenterology 99:327–33. 1990.
10. Sonnenberg A. Changes in physician visits for gastric and duodenal ulcer in the United States during 1958–84 as shown by National Disease and Therapeutic Index (NDTI). Dig Dis Sci 32:1–7. 1987.
11. Kurta JH, Coroby ED. Current peptic ulcer trends. An epidemiological profile. J Clin Gastroenterol 10:259–68. 1988.
12. Adams PF, Benson V. Current estimates from the National Health Interview Survey, 1989. National Center for Health Statistics. Vital Health Stat 10(176). 1990.
13. Gee MI, Grace MG, Wensel RH, Sherbaniuk RW, Thompson AB. Nutritional status of gastroenterology outpatients: comparison of inflammatory bowel disease with functional disorders. J Am Diet Assoc 85(12):1591–9. 1985.
14. Johanson JF, Sonnenberg A, Koch TR. Clinical epidemiology of chronic constipation. J Clin Gastroenterol 11(5):525–36. 1989.
15. Prior A, Wilson K, Whorwell PJ, Faragher EB. Irritable bowel syndrome in the gynecological clinic: survey of 798 new referrals. Dig Dis Sci 1820–4. 1989.
16. Sandler, RS. Epidemiology of irritable bowel syndrome in the United States. Gastroenterology 99(2):409–15. 1990.
17. Hing E, Bloom B. Long-term care for the functionally dependent elderly. National Center for Health Statistics. Vital Health Stat 13(104). 1990.
18. Ries, P. Health of black and white Americans, 1985–87. National Center for Health Statistics. Vital Health Stat 10(171). 1989.
19. Ries, P. Characteristics of persons with and without health care coverage: United States, 1989. Advance data from vital and health statistics; no 201. Hyattsville, Maryland: National Center for Health Statistics. 1991.
20. Thompson WG, Heaton KW. Functional bowel disorders in apparently healthy people. Gastroenterology 79:283–8. 1980.
21. Manning AP, Thompson WG, Heaton KW, Morris AF. Towards positive diagnosis of the irritable bowel. Br Med J 2:653–4. 1978.
22. Talley MJ, Phillips SF, Melton LJ, Wiltgen C, Zinsmeister AR. A patient questionnaire to identify bowel disease. Ann Intern Med 111:671–4. 1989.

Table 1. Number and percent of persons 18 years of age and over with gallstones, gallbladder trouble, medically diagnosed conditions, and diagnostic procedures performed, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Gallstones or gallbladder trouble in last 12 months	Ever had gallstones or gallbladder trouble	Condition was medically diagnosed	Diagnostic procedures performed[2]	Gallstones or gallbladder trouble in last 12 months	Ever had gallstones or gallbladder trouble	Condition was medically diagnosed	Diagnostic procedures performed
	Number of persons in thousands					Percent of persons 18 years and over		Percent of persons who ever had condition	
Age									
18 years and over	179,529	2,691	13,702	13,411	12,095	1.5	7.6	97.9	88.3
18–24 years	25,400	*162	303	272	213	0.6	1.2	89.8	70.3
25–44 years	78,796	*798	3,257	3,156	2,825	1.0	4.1	96.9	86.7
45–64 years	46,114	*872	4,790	4,701	4,406	1.9	10.4	98.1	92.0
65 years and over	29,219	*859	5,352	5,282	4,651	2.9	18.3	98.7	86.9
Sex and age									
Male, 18 years and over	85,257	*757	3,399	3,303	2,962	0.9	4.0	97.2	87.1
18–24 years	12,396	*57	70	*43	*35	*0.5	0.6	*61.4	*0.0
25–44 years	38,648	*445	516	481	401	0.4	1.3	93.2	77.7
45–64 years	22,070	*311	1,358	1,341	1,226	1.4	6.2	98.7	90.3
65 years and over	12,143	*244	1,455	1,437	1,300	2.0	12.0	98.8	89.3
Female									
Female, 18 years and over	94,272	*1,934	10,303	10,108	9,134	2.1	10.9	98.1	88.7
18–24 years	13,005	*105	234	229	179	0.8	1.8	97.9	76.5
25–44 years	40,147	*652	2,741	2,674	2,424	1.6	6.8	97.6	88.4
45–64 years	24,042	*561	3,431	3,360	3,180	2.3	14.3	97.9	92.7
65 years and over	17,076	*615	3,896	3,845	3,350	3.6	22.8	98.7	86.0
Race and age									
White, 18 years and over	154,178	*2,435	12,571	12,295	11,128	1.6	8.2	97.8	88.5
18–24 years	20,956	*146	255	224	165	0.7	1.2	87.8	64.7
25–44 years	66,637	*675	2,845	2,746	2,469	1.0	4.3	96.5	86.8
45–64 years	40,139	*791	4,391	4,310	4,071	2.0	10.9	98.2	92.7
65 years and over	26,445	*823	5,080	5,015	4,424	3.1	19.2	98.7	87.1
Black, 18 years and over	19,932	*208	917	908	780	1.0	4.6	99.0	85.1
18–24 years	3,562	*16	*48	*48	*48	*0.4	*1.3	*100.0	*0.0
25–44 years	9,204	*100	341	338	294	1.1	3.7	99.1	86.2
45–64 years	4,712	*63	294	291	244	*1.3	6.2	99.0	83.0
65 years and over	2,454	*29	234	230	194	*1.2	9.5	98.3	82.9
Hispanic origin									
Hispanic	13,029	321	869	850	714	2.5	6.7	97.8	82.2
Non-Hispanic	166,500	2,370	12,833	12,560	11,381	1.4	7.7	97.9	88.7
Poverty status									
Below poverty threshold	16,225	354	1,543	1,512	1,322	2.2	9.5	98.0	85.7
At or above poverty threshold	149,290	2,116	10,845	10,618	9,651	1.4	7.3	97.9	89.0

[1] Includes persons of all races and unknown poverty status

[2] Diagnostic tests include x-ray, sonogram or ultrasound and upper G I series.

NOTE: Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Table 2. Number and percent of persons 18 years of age and over with ulcers, medically diagnosed conditions, and diagnostic procedures performed, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Ulcers in last 12 months	Ever had ulcers	Condition was medically diagnosed	Diagnostic procedures performed[2]	Ulcers in last 12 months	Ever had ulcers	Condition was medically diagnosed	Diagnostic procedures performed
	Number of persons in thousands					Percent of persons 18 years and over		Percent of persons who ever had condition	
Age									
18 years and over	179,529	6,295	18,849	18,102	13,660	3.5	10.5	96.0	72.5
18–24 years	25,400	700	1,336	1,177	557	2.8	5.3	88.1	41.7
25–44 years	78,796	2,391	6,689	6,327	4,480	3.0	8.5	94.6	67.0
45–64 years	46,114	1,861	5,959	5,837	4,863	4.0	12.9	98.0	81.6
65 years and over	29,219	1,343	4,864	4,761	3,760	4.6	16.6	97.9	77.3
Sex and age									
Male, 18 years and over	85,257	2,754	9,442	8,969	6,800	3.2	11.1	95.0	72.0
18–24 years	12,396	266	476	374	144	2.1	3.8	78.6	30.3
25–44 years	38,648	1,120	3,378	3,147	2,236	2.9	8.7	93.2	66.2
45–64 years	22,070	796	3,111	3,038	2,492	3.6	14.1	97.7	80.1
65 years and over	12,143	572	2,477	2,410	1,928	4.7	20.4	97.3	77.8
Female, 18 years and over	94,272	3,541	9,407	9,133	6,860	3.8	10.0	97.1	72.9
18–24 years	13,005	434	861	803	413	3.3	6.6	93.3	48.0
25–44 years	40,147	1,271	3,311	3,180	2,245	3.2	8.2	96.0	67.8
45–64 years	24,044	1,064	2,848	2,770	2,371	4.4	11.8	97.3	83.3
65 years and over	17,076	771	2,387	2,351	1,831	4.5	14.0	98.5	76.7
Race and age									
White, 18 years and over	154,178	5,376	16,735	16,106	12,217	3.5	10.9	96.2	73.0
18–24 years	20,956	630	1,198	102	512	3.0	5.7	8.5	42.7
25–44 years	66,637	1,996	5,795	5,493	3,844	3.0	8.7	94.8	66.3
45–64 years	40,139	1,556	5,226	5,135	4,352	3.9	13.0	98.3	83.3
65 years and over	26,445	1,194	4,516	4,416	3,508	4.5	17.1	97.8	77.7
Black, 18 years and over	19,932	763	1,766	1,682	1,230	3.8	8.9	95.2	69.6
18–24 years	3,562	*42	106	87	*36	*1.2	3.0	82.1	*34.0
25–44 years	9,204	322	720	686	542	3.5	7.8	95.3	75.3
45–64 years	4,712	252	604	576	409	5.3	12.8	95.4	67.7
65 years and over	2,454	147	336	333	244	6.0	13.7	99.1	72.6
Hispanic origin									
Hispanic	13,029	397	909	854	604	3.0	7.0	93.9	66.4
Non-Hispanic	166,500	5,897	17,940	17,249	13,056	3.5	10.8	96.1	72.8
Poverty status									
Below poverty threshold	16,225	922	1,910	1,781	1,257	5.7	11.8	93.2	65.8
At or above poverty threshold	149,290	4,769	15,296	14,714	11,174	3.2	10.2	96.2	73.1

[1]Includes persons of all races and those of unknown poverty status.
[2]Diagnostic tests include upper G.I. series or upper endoscopy or gastroscopy.

NOTE. Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Table 3. Number and percent of persons 18 years of age and over with diverticulitis, medically diagnosed conditions, and diagnostic procedures performed, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Diverticulitis in last 12 months	Ever had diverticulitis	Condition was medically diagnosed	Diagnostic procedures performed[2]	Diverticulitis in last 12 months	Ever had diverticulitis	Condition was medically diagnosed	Diagnostic procedures performed
Age	Number of persons in thousands					Percent of persons 18 years and over		Percent of persons who ever had condition	
18 years and over	179,529	2,662	5,093	4,898	3,791	1.5	2.8	96.2	74.4
18–24 years	25,400	*2	*17	*17	*2	*0.0	*0.1	*100.0	*11.8
25–44 years	78,796	259	520	446	311	0.3	0.7	85.8	59.8
45–64 years	46,114	966	1,750	1,698	1,375	2.1	3.8	97.0	78.6
65 years and over	29,219	1,435	2,808	2,738	2,103	4.9	9.6	97.5	74.9
Sex and age									
Male, 18 years and over	85,257	828	1,615	1,569	1,199	1.0	1.9	97.2	74.2
18–24 years	12,396	*0	*5	*5	*0	*0.0	*0.0	*100.0	*0.0
25–44 years	38,648	74	134	110	93	0.2	0.3	82.1	69.4
45–64 years	22,070	295	598	578	442	1.3	2.7	96.7	73.9
65 years and over	12,143	459	878	876	664	3.8	7.2	99.8	75.6
Female, 18 years and over	94,272	1,834	3,479	3,329	2,592	1.9	3.7	95.7	74.5
18–24 years	13,005	*2	*12	*12	*2	*0.0	*0.1	*100.0	*16.7
25–44 years	40,147	185	385	336	218	0.5	1.0	87.3	56.6
45–64 years	24,044	671	1,152	1,120	933	2.8	4.8	97.2	81.0
65 years and over	17,076	976	1,930	1,862	1,439	5.7	11.3	96.5	74.6
Race and age									
White, 18 years and over	154,178	2,570	4,927	4,734	3,671	1.7	3.2	96.1	74.5
18–24 years	20,956	*2	*17	*17	*2	*0.0	*0.1	*100.0	*11.8
25–44 years	66,637	249	486	412	280	0.4	0.7	84.8	57.6
45–64 years	40,139	913	1,680	1,631	1,329	2.3	4.2	97.1	79.1
65 years and over	26,445	1,406	2,744	2,674	2,060	5.3	10.4	97.4	75.1
Black, 18 years and over	19,932	69	140	138	94	0.3	0.7	98.6	67.1
18–24 years	3,562	*0	*0	*0	*0	*0.0	*0.0	*0.0	*0.0
25–44 years	9,204	*2	*25	*25	*23	*0.0	*0.3	*100.0	*92.0
45–64 years	4,712	*39	*55	*53	*32	*0.8	*1.2	*96.4	*58.2
65 years and over	2,454	*29	*60	*60	*39	*1.2	*2.4	*100.0	*65.0
Hispanic origin									
Hispanic	13,029	*56	111	96	*65	*0.4	0.9	86.5	*58.6
Non-Hispanic	166,500	2,606	4,982	4,802	3,726	1.6	3.0	96.4	74.8
Poverty status									
Below poverty threshold	16,225	135	310	284	223	0.8	1.9	91.6	71.9
At or above poverty threshold	149,290	2,292	4,266	4,115	3,173	1.5	2.9	96.5	74.4

[1] Includes persons of all races and those of unknown poverty status.
[2] Diagnostic tests include barium enema and overnight hospitalization

NOTE Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Table 4. Number and percent of persons 18 years of age and over with functional colon conditions and medically diagnosed conditions, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Colon conditions in last 12 months[2]	Ever had colon conditions	Condition was medically diagnosed	Colon conditions in last 12 months	Ever had colon conditions	Condition was medically diagnosed
	Number of persons in thousands				Percent of persons 18 years and over		Percent of persons who ever had condition
Age							
18 years and over	179,529	6,719	10,532	9,271	3.7	5.9	88.0
18–24 years	25,400	348	457	406	1.4	1.8	88.8
25–44 years	78,796	2,641	4,164	3,638	3.4	5.3	87.4
45–64 years	46,114	2,408	3,686	3,244	5.2	8.0	88.0
65 years and over	29,219	1,322	2,225	1,983	4.5	7.6	89.1
Sex and age							
Male, 18 years and over	85,257	1,688	2,934	2,568	2.0	3.4	87.5
18–24 years	12,396	*62	88	*60	*0.5	0.7	*68.2
25–44 years	38,648	684	1,160	1,020	1.8	3.0	87.9
45–64 years	22,070	620	1,013	899	2.8	4.6	88.7
65 years and over	12,143	321	672	589	2.6	5.5	87.6
Female, 18 years and over	94,272	5,031	7,598	6,704	5.3	8.1	88.2
18–24 years	13,005	286	369	346	2.2	2.8	93 8
25–44 years	40,147	1,957	3,004	2,619	4.9	7.5	87 2
45–64 years	24,044	1,788	2,672	2,345	7.4	11.1	87.8
65 years and over	17,076	1,001	1,553	1,395	5.9	9.1	89 8
Race and age							
White, 18 years and over	154,178	6,411	10,070	8,881	4.2	6.5	88.2
18–24 years	20,956	338	444	397	1.6	2.1	89.4
25–44 years	66,637	2,452	3,898	3,420	3.7	5.8	87.7
45–64 years	40,139	2,330	3,544	3,118	5.8	8.8	88.0
65 years and over	26,445	1,290	2,184	1,947	4.9	8.3	89.1
Black, 18 years and over	19,932	240	355	318	1.2	1.8	89.6
18–24 years	3,562	*10	*13	*9	*0.3	*0.4	*69.2
25–44 years	9,204	143	194	176	1.6	2.1	90.7
45–64 years	4,712	*64	116	105	*1.4	2.5	90.5
65 years and over	2,454	*23	*32	*27	*0.9	*1.3	*84 4
Hispanic origin							
Hispanic	13,029	260	350	304	2 0	2.7	86.9
Non-Hispanic	166,500	6,459	10,182	8,967	3.9	6.1	88.1
Poverty status							
Below poverty threshold	16,225	488	616	556	3.0	3.8	90.3
At or above poverty threshold	149,290	5,869	9,339	8,198	3.9	6.3	87.8

[1] Includes persons of all races and those of unknown poverty status.
[2] Includes spastic colon, functional bowel, irritable colon, and irritable bowel syndrome.

NOTE. Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Table 5. Number and percent of persons 18 years of age and over with hemorrhoids and medically diagnosed conditions, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Hemorrhoids in last 12 months	Doctor ever diagnosed hemorrhoids	Ever had hemorrhoid surgery	Hemorrhoids in last 12 months	Doctor ever diagnosed hemorrhoids	Ever had hemorrhoid surgery
Age	Number of persons in thousands				Percent of persons 18 years and over		Percent of persons who ever had hemorrhoids
18 years and over	179,529	23,016	36,373	7,688	12.8	20.3	21.1
18–24 years	25,400	1,481	1,262	73	5.8	5.0	5.8
25–44 years	78,796	10,291	14,034	1,382	13.1	17.8	9.8
45–64 years	46,114	7,143	12,578	3,059	15.5	27.3	24.3
65 years and over	29,219	4,101	8,498	3,175	14.0	29.1	37.4
Sex and age							
Male, 18 years and over	85,257	9,173	13,528	3,872	10.8	15.9	28.6
18–24 years	12,396	429	213	*32	3.5	1.7	*15.0
25–44 years	36,648	3,981	4,506	748	10.9	12.3	16.6
45–64 years	22,070	3,250	5,466	1,650	14.7	24.8	30.2
65 years and over	12,143	1,512	3,343	1,442	12.5	27.5	43.1
Female, 18 years and over	94,272	13,843	22,844	3,816	14.7	24.2	16.7
18–24 years	13,005	1,052	1,049	*40	8.1	8.1	*3.8
25–44 years	40,148	6,310	9,528	633	15.7	23.7	6.6
45–64 years	24,044	3,892	7,112	1,409	16.2	29.6	19.8
65 years and over	17,076	2,589	5,155	1,733	15.2	30.2	33.6
Race and age							
White, 18 years and over	154,178	20,955	33,184	7,122	13.6	21.5	21.5
18–24 years	20,956	1,244	1,053	*55	5.9	5.0	*5.2
25–44 years	66,637	9,250	12,526	1,200	13.9	18.8	9.6
45–64 years	40,139	6,611	11,529	2,820	16.5	28.7	24.5
65 years and over	26,445	3,895	8,076	3,047	14.7	30.5	37.7
Black, 18 years and over	19,932	1,682	2,740	470	8.4	13.7	17.2
18–24 years	3,562	199	195	*8	5.6	5.5	*4.1
25–44 years	9,204	854	1,255	147	9.3	13.6	11.7
45–64 years	4,712	448	922	201	9.5	19.6	21.8
65 years and over	2,454	180	367	114	7.3	15.0	31.1
Hispanic origin							
Hispanic	13,029	1,132	1,598	240	8.7	12.3	15.0
Non-Hispanic	166,500	21,883	34,774	7,448	13.1	20.9	21.4
Poverty status							
Below poverty threshold	16,225	2,024	2,834	512	12.5	17.5	18.1
At or above poverty threshold	149,290	19,686	31,138	6,483	13.2	20.9	20.8

[1] Includes persons of all races and those of unknown poverty status

NOTE: Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Table 6. Number of persons 18 years of age and over reporting bowel complaints and selected treatments, by selected sociodemographic characteristics: United States, 1989

Characteristic	All persons 18 years and over[1]	Chronic constipation in last 12 months[2]	Used stool softner or laxative in last 30 days	Chronic diarrhea in last 12 months[2]	Saw a doctor for diarrhea in last 12 months	Chronic constipation in last 12 months	Used stool softner or laxative in last 30 days	Chronic diarrhea in last 12 months	Saw a doctor for diarrhea in last 12 months
Age	Number of persons in thousands					Percent of persons 18 years and over			
18 years and over	179,349	5,374	10,107	2,131	3,789	3.0	5.6	1.2	2.1
18–24 years	25,400	504	670	233	302	2.0	2.6	0.9	1.2
25–44 years	78,754	1,887	3,074	837	1,374	2.4	3.9	1.1	1.7
45–64 years	46,053	1,431	2,852	634	1,176	3.1	6.2	1.4	2.6
65 years and over	29,142	1,552	3,510	428	936	5.3	12.0	1.5	3.2
Sex and age									
Male, 18 years and over	85,146	999	2,232	584	1,142	1.2	2.6	0.7	1.3
18–24 years	12,396	80	136	*49	87	0.6	1.1	*0.4	0.7
25–44 years	38,617	251	513	211	405	0.6	1.3	0.5	1.0
45–64 years	22,043	239	539	201	367	1.1	2.4	0.9	1.7
65 years and over	12,091	428	1,044	123	283	3.5	8.6	1.0	2.3
Female, 18 years and over	94,203	4,376	7,875	1,547	2,646	4.6	8.4	1.6	2.8
18–24 years	13,005	424	534	183	216	3.3	4.1	1.4	1.7
25–44 years	40,136	1,636	2,561	626	969	4.1	6.4	1.6	2.4
45–64 years	24,010	1,192	2,313	433	809	5.0	9.6	1.8	3.4
65 years and over	17,502	1,124	2,466	304	653	6.4	14.1	1.7	3.7
Race and age									
White, 18 years and over	154,012	4,378	8,272	1,922	3,453	2.8	5.4	1.2	2.2
18–24 years	20,956	387	558	187	259	1.8	2.7	0.9	1.2
25–44 years	66,602	1,454	2,414	748	1,193	2.2	3.6	1.1	1.8
45–64 years	40,085	1,170	2,298	572	1,106	2.9	5.7	1.4	2.8
65 years and over	26,369	1,367	3,002	415	895	5.2	11.4	1.6	3.4
Black, 18 years and over	19,918	854	1,698	150	244	4.3	8.5	0.8	1.2
18–24 years	3,562	109	105	*46	*35	3.1	2.9	*1.3	*1.0
25–44 years	9,197	367	607	*51	130	4.0	6.6	*0.6	*1.4
45–64 years	4,705	206	504	*44	*46	4.4	10.7	*0.9	*1.0
65 years and over	2,454	172	482	*10	*33	7.0	19.6	*0.4	*1.3
Hispanic origin									
Hispanic	13,021	610	774	109	207	4.7	5.9	0.8	1.6
Non-hispanic	166,328	4,764	9,332	2,022	3,582	2.9	5.6	1.2	2.2
Poverty status									
Below poverty threshold	16,211	868	1,262	316	397	5.4	7.8	1.9	2.4
At or above poverty threshold	149,172	3,908	7,830	1,653	3,160	2.6	5.2	1.1	2.1

[1] Includes persons of all races and those of unknown poverty status; excludes those who refused to answer bowel habits portion of the questionnaire and those persons with colostomies.
[2] Chronic constipation and diarrhea are defined as those persons with constipation or diarrhea most or all of the time in the last 12 months.

NOTE: Estimates of less than 68,000 and percents based on these estimates have 30 percent or more relative standard error; see technical notes for description of the calculation of standard errors.

Technical notes

Source and description of data

The estimates presented in this report are based on data from the 1989 National Health Interview Survey (NHIS), an ongoing survey of households in the United States conducted by the National Center for Health Statistics. Each week, a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers obtain information about the health and other characteristics of the households included in the NHIS sample.

NHIS consists of two parts: (a) a basic health questionnaire that remains the same each year and (b) special topics questionnaires that vary from year to year and usually are asked of just one person in each family. In 1989, the special topics included health care coverage, adult immunization, severe and persistent mental illness, dental health, diabetes, orofacial pain, digestive disorders, and acquired immunodeficiency syndrome (AIDS) knowledge and attitudes.

The total interviewed sample for 1989 for the basic health questionnaire consisted of 45,711 households containing 116,929 persons. The noninterview rate was 5.1 percent. NHIS digestive disorders (NHIS–DD) interviews were completed for 42,392 persons 18 years of age and over, or 90.7 percent of those NHIS–DD sample persons identified from the basic health questionnaire (approximately 46,756 members of families were identified). The overall response rate for the NHIS–DD was 86.1 percent (the product of the response rates for the basic and digestive disorders questionnaires).

Sampling errors

Because estimates shown in this report are based on a sample of the population rather than on the entire population, they are subject to sampling error. When an estimate or the numerator or denominator of a percent is small, the sampling error may be relatively high. In addition, the complex sample design of NHIS has the effect of making sampling errors larger than they would be had a simple random sample of equal size been used. Estimates and figures based on estimates that do not meet the reliability criteria of 30 percent relative standard error are marked on the tables.

Approximate standard errors of the estimated numbers (x) in the tables (except for age, sex, and race for all persons when the standard error is assumed to be 0.0) may be calculated using the formula

$$SE(x) = \sqrt{.000021(x)^2 + 6{,}100(x)}$$

For example, it is estimated that 2,691,000 persons had gallstones or gallbladder trouble in the last 12 months (table 1). Using this formula, the standard error for the estimated number is

$$SE(2{,}691{,}000) = \sqrt{.000021(2{,}691{,}000)^2 + 6{,}100(2{,}691{,}000)} = 128{,}714$$

Approximate standard errors of the estimated percents in the tables may be calculated using the formula

$$SE(p) = \sqrt{\frac{6{,}100(p)\,(100-p)}{y}}$$

where p is the percent of persons and y is the base population from which the percent is calculated.

For example, it is estimated that 10.5 percent of the population has ever had ulcers (table 2). Using this formula, the standard error for the estimated percent is

$$SE(10.5) = \sqrt{\frac{6{,}100(10.5)\,(100-10.5)}{179{,}529{,}000}} = .18$$

If x_1 and x_2 are two estimates, then the approximate standard error of the difference $(x_1 - x_2)$ can be computed as follows:

$$SE(x_1 - x_2) = \sqrt{SE(x_1)^2 + SE(x_2)^2 - 2r\,SE(x_1)\,SE(x_2)}$$

where $SE(x_1)$ and $SE(x_2)$ are computed using the appropriate formulas previously presented in this section and r is the correlation coefficient between x_1 and x_2. Assuming $r = 0.0$ will result in an accurate standard error if the two estimates are actually uncorrelated. If they are correlated, the standard error of the difference will be underestimated or overestimated. These calculations can also be performed for differences in percents using the appropriate standard error formulas for percents.

In this report, differences are considered statistically significant at the 5-percent level if the difference between two estimates was at least twice as large as its standard error. Further information on how the standard error parameters are constructed is available in "Current Estimates From the National Health Interview Survey: United States, 1989" (12).

Comparison to basic NHIS estimates

Prevalence estimates of digestive disorders routinely reported from the basic portion of NHIS are likely to differ from those presented in this report. Two survey design differences between the basic NHIS and the NHIS–DD may affect the comparability of the estimates. First, the questions from the basic NHIS may be answered by one respondent for all members of the family when other members are not present. Approximately one-third of the responses for adults on the basic NHIS are by proxy respondents. However, the questions on the NHIS–DD are answered only by the sample individual. This difference in reporting may be especially problematic for the less serious and more personally sensitive conditions such as hemorrhoids, chronic constipation, and diarrhea as the household respondent in the basic NHIS may not know about these conditions.

The manner in which the conditions are identified also differs between the basic NHIS and the

NHIS–DD. In the basic NHIS, the prevalence of chronic conditions is estimated by dividing the entire sample into six representative subsamples. Respondents within each subsample are administered one of six condition checklists, only one of which contains chronic digestive conditions, and are asked if any family member has each condition. In the NHIS–DD supplement, all respondents were asked specific questions about major digestive disorders and a series of followup questions on each reported condition.

Other reasons why the prevalence estimates may differ between the 1989 basic NHIS and the NHIS–DD include differences in nonresponse rates and the specificity of terminology related to the condition. In addition, the NHIS–DD asked respondents whether they had the particular condition in the past 12 months and whether they had ever had the condition. The basic NHIS queries the respondent about the last 12 months only. For conditions that are ongoing, the two-part question may improve reporting on the presence of the condition in the last 12 months. Finally, those with an identified digestive condition in the NHIS–DD were asked if the doctor made the diagnosis and if appropriate medical care had been given or diagnostic tests performed. These questions help assure that the respondent had an appropriate evaluation, although they cannot assure that the diagnosis was correct or the respondent remembered or was told the appropriate diagnosis.

The reported prevalence of digestive disorders in the basic questionnaire of the NHIS are significantly lower than those estimated from the NHIS–DD. These comparative estimates are presented in table I. In the case of ulcers and functional colon conditions, part of the difference is definitional. In the NHIS–DD respondents are given a structured set of definitions for identifying their condition immediately following the query about the condition. In the basic NHIS, once the condition of "ulcer" or "spastic colon" is identified, the respondents supply information through followup questions. The information is then later used to classify the condition according to specific diagnosis categories.

The lower estimates for hemorrhoids and constipation in the basic NHIS are to be expected given that neither is likely to be medically diagnosed or attended. As a result, proxy respondents are less likely to know about the occurrence of the two conditions among family members. In addition, respondents to the basic NHIS are asked about hemorrhoids in a condition list that includes cardiovascular diseases, whereas the NHIS–DD groups them with digestive conditions. The grouping in the basic NHIS may lower the response rate because respondents do not identify hemorrhoids with heart disease or hypertension.

Table I. Estimated number of persons 18 years of age and over with major digestive disorders by survey instrument: United States, 1989

Digestive condition in the last 12 months	*Estimated from basic NHIS in thousands*	*Estimated from NHIS–DD in thousands*
Gallstones or gallbladder trouble	1,818	2,691
Ulcers[1]	4,095	6,295
Diverticulitis	1,983	2,662
Functional colon conditions[2]	1,328	6,719
Hemorrhoids	11,446	23,016
Constipation[3]	4,006	5,374

[1]Ulcer defined in the basic National Health Interview Statistics (NHIS) as gastric, duodenal, peptic, gastrojejunal, and ulcer of the esophagus (ICD 531–4, and 530.2). Ulcer defined in the NHIS digestive disorders (NHIS–DD) as gastric, duodenal, peptic, stomach, and other excluding skin.
[2]Functional colon conditions in the basic NHIS are defined as irritable bowel enterospasm, irritable bowel syndrome, mucous colitis, and spastic colon. Functional colon conditions defined in the NHIS–DD as irritable bowel syndrome, irritable colon, spastic colon, functional bowel, and other similar conditions.
[3]Constipation is defined as "frequent" constipation in the basic NHIS and as constipation most or all of the time in the NHIS–DD

Symbols

- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standards of reliability or precision
#	Figure suppressed to comply with confidentiality

Number 213 • April 30, 1992

Advance Data

From Vital and Health Statistics of the National Center for Health Statistics

National Ambulatory Medical Care Survey: 1990 Summary

by Susan M. Schappert, M.A., Division of Health Care Statistics

During the 12-month period from January 1990 through December 1990, an estimated 704.6 million visits were made to nonfederally employed, office-based physicians in the United States, or about 2.9 visits per person. This rate is not statistically different from office visit rates observed since 1975 (1,2).

This report presents data highlights from the 1990 National Ambulatory Medical Care Survey (NAMCS), a national probability sample survey conducted by the Division of Health Care Statistics of the National Center for Health Statistics, Centers for Disease Control. The data summarized here should be considered provisional because final editing may result in minor changes in the estimates. Statistics are presented on patient, physician, and visit characteristics.

Because the estimates presented in this report are based on a sample rather than on the entire universe of office visits, they are subject to sampling variability. The technical notes found at the end of this report give a brief overview of the sample design used in the 1990 NAMCS, an explanation of sampling errors, and guidelines for judging the precision of the estimates.

The Patient Record is used by physicians participating in the NAMCS to record information about their patients' office visits. This form is reproduced in figure 1 and is intended to serve as a reference for readers as they review the survey findings presented in this document.

The physician sample for the NAMCS was selected with the cooperation of the American Medical Association and the American Osteopathic Association. Their contribution to this effort is gratefully acknowledged.

Data highlights

Patient characteristics

Office visits by patient's age, sex, and race are shown in table 1. Females made about 60.6 percent of all office visits during 1990, and accounted for a higher percentage of visits than males in all age categories except the youngest (under 15 years). Females also had significantly higher visit rates than males did in each age category with the exception of the youngest group (under 15 years) and the two oldest groups (65–74 years and 75 years and over).

Visit rates tended to increase with age after the age of 24. Persons aged 65–74 years and 75 years and over had the highest visit rates of all age categories; rates for these two groups did not differ significantly from each other. The pattern, however, was found to be slightly different for males and females. Among males, rates increased with each age group after the age of 44, with males aged 75 years and over having the highest rate of 5.4 visits per person.

Females, despite a general trend toward increasing visit rates with age after the age of 24, showed no statistical difference in the rates for females aged 25–44 years compared with those aged 45–64 years. or in the rates for females aged 65–74 years compared with those aged 75 years and over.

White persons made approximately 84.8 percent of all

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics
Manning Feinleib, M.D., Dr. P.H., Director

CDC
CENTERS FOR DISEASE CONTROL

Assurance of Confidentiality—All information which would permit identification of an individual, a practice, or an establishment will be held confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to other persons or used for any other purpose.

Department of Health and Human Services
Centers for Disease Control
Public Health Service
National Center for Health Statistics

A

1. DATE OF VISIT Month / Day / Year

PATIENT RECORD
NATIONAL AMBULATORY MEDICAL CARE SURVEY

OMB No. 0920-0234
Expires 8-31-89
(PHS) 6105A

2. ZIP CODE

3. DATE OF BIRTH Month / Day / Year

4. SEX
1 ☐ FEMALE
2 ☐ MALE

5. COLOR OR RACE
1 ☐ WHITE
2 ☐ BLACK
3 ☐ ASIAN/PACIFIC ISLANDER
4 ☐ AMERICAN INDIAN/ ESKIMO/ALEUT

6. ETHNICITY
1 ☐ HISPANIC ORIGIN
2 ☐ NOT HISPANIC

7. EXPECTED SOURCE(S) OF PAYMENT *[Check all that apply]*
1 ☐ SELF-PAY
2 ☐ MEDICARE
3 ☐ MEDICAID
4 ☐ BLUE CROSS/ BLUE SHIELD
5 ☐ OTHER COMMERCIAL INSURANCE
6 ☐ PRE-PAID PLAN HMO/IPA/PPO
7 ☐ NO CHARGE
8 ☐ OTHER *[Specify]*

8. WAS PATIENT REFERRED FOR THIS VISIT BY ANOTHER PHYSICIAN?
1 ☐ YES 2 ☐ NO

9. PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *[In patient's own words]*
a MOST IMPORTANT
b OTHER

10. PHYSICIAN'S DIAGNOSES
a. PRINCIPAL DIAGNOSIS/PROBLEM ASSOCIATED WITH ITEM 9a.
b OTHER SIGNIFICANT CURRENT DIAGNOSES

11. HAVE YOU SEEN PATIENT BEFORE?
1 ☐ YES 2 ☐ NO
IF YES, FOR THE CONDITION IN ITEM 10a?
1 ☐ YES 2 ☐ NO

12. DIAGNOSTIC/SCREENING SERVICES THIS VISIT *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ PAP TEST
3 ☐ PELVIC EXAM
4 ☐ BREAST PALPATION
5 ☐ MAMMOGRAM
6 ☐ VISUAL ACUITY
7 ☐ BLOOD PRESSURE CHECK
8 ☐ URINALYSIS
9 ☐ CHEST X-RAY
10 ☐ DIGITAL RECTAL EXAM
11 ☐ PROCT/SIGMOIDOSCOPY
12 ☐ STOOL BLOOD EXAM
13 ☐ ORAL GLUCOSE TOL
14 ☐ CHOLESTEROL MEASURE
15 ☐ HIV SEROLOGY
16 ☐ OTHER BLOOD TEST
17 ☐ OTHER *[Specify]*

13. COUNSELING/ADVICE *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ WEIGHT REDUCTION
3 ☐ CHOLESTEROL REDUCTION
4 ☐ SMOKING CESSATION
5 ☐ HIV TRANSMISSION
6 ☐ BREAST SELF-EXAM
7 ☐ OTHER

14. NON-MEDICATION THERAPY *[Check all ordered or provided]*
1 ☐ NONE
2 ☐ PSYCHOTHERAPY
3 ☐ CORRECTIVE LENSES
4 ☐ AMBULATORY SURGERY
5 ☐ PHYSIOTHERAPY
6 ☐ OTHER *[Specify]*

15. MEDICATION THERAPY *[Record all new or continued medications ordered or provided at this visit. Use the same brand name or generic name entered on any Rx or office medical record. Include immunizing and desensitizing agents.]*

IF NONE, CHECK HERE ☐

	a. NEW MEDICATION? YES	a. NEW MEDICATION? NO	b. FOR DX IN ITEM 10a? YES	b. FOR DX IN ITEM 10a? NO
1	☐	☐	☐	☐
2	☐	☐	☐	☐
3	☐	☐	☐	☐
4	☐	☐	☐	☐
5	☐	☐	☐	☐

16. DISPOSITION THIS VISIT *[Check all that apply]*
1 ☐ NO FOLLOW-UP PLANNED
2 ☐ RETURN AT SPECIFIED TIME
3 ☐ RETURN IF NEEDED, P.R.N.
4 ☐ TELEPHONE FOLLOW-UP PLANNED
5 ☐ REFERRED TO OTHER PHYSICIAN
6 ☐ RETURNED TO REFERRING PHYSICIAN
7 ☐ ADMIT TO HOSPITAL
8 ☐ OTHER *[Specify]*

17. DURATION OF THIS VISIT *[Time actually spent with physician]*
Minutes

Figure 1. Patient record

office visits during 1990, with black persons and Asian/Pacific Islanders accounting for about 8.8 percent and 3.0 percent, respectively. These percentages were not statistically different from those reported in 1989. While visit rates were found to be significantly higher for white persons than for black persons overall, these differences were noted only among the younger age groups (less than 15 years, 15–24 years, and 25–44 years). No significant differences were found between the white population and the black population in the 45–64 years, 65–74 years, and 75 years and over age groups. Visit rates by age, sex, and race were not statistically different from rates observed in the 1989 NAMCS.

Physician characteristics

Table 2 shows the distribution of office visits according to physician specialty for the 13 most visited specialties. The largest share of visits (29.8 percent) was made to physicians specializing in general and family practice (GFP); this percentage is not significantly different from the percentage of GFP visits in 1989. Provisional data concerning other physician specialties for 1990 indicates slight increases in the proportion of visits made to internists, psychiatrists, and ophthalmologists compared with 1989 figures, as well as slight decreases in the proportion of visits made to pediatricians, dermatologists, and general surgeons. However, 1990 visit rates to each of the 13 specialties

Table 1. Number, percent distribution, and annual rate of office visits by patient's age, sex, race, and geographic region: United States, 1990

Patient characteristic	Number of visits in thousands	Percent distribution	Number of visits per person per year[1]
All patients	704,604	100.0	2.9
Age			
Under 15 years	138,427	19.6	2.5
15–24 years	68,918	9.8	2.0
25–44 years	194,195	27.6	2.4
45–64 years	149,786	21.3	3.2
65–74 years	86,422	12.3	4.8
75 years and over	66,856	9.5	5.7
Sex and age			
Female	427,151	60.6	3.4
Under 15 years	65,229	9.3	2.4
15–24 years	45,165	6.4	2.6
25–44 years	132,163	18.8	3.2
45–64 years	89,697	12.7	3.7
65–74 years	51,529	7.3	5.1
75 years and over	43,349	6.2	5.9
Male	277,452	39.4	2.3
Under 15 years	73,198	10.4	2.6
15–24 years	23,753	3.4	1.4
25–44 years	62,012	8.8	1.6
45–64 years	60,089	8.5	2.7
65–74 years	34,893	5.0	4.3
75 years and over	23,507	3.3	5.4
Race and age			
White	597,306	84.8	2.9
Under 15 years	115,421	16.4	2.6
15–24 years	56,297	8.0	2.0
25–44 years	163,020	23.1	2.4
45–64 years	126,970	18.0	3.1
65–74 years	76,045	10.8	4.7
75 years and over	59,552	8.5	5.6
Black	62,317	8.8	2.1
Under 15 years	12,401	1.8	1.5
15–24 years	7,063	1.0	1.4
25–44 years	18,350	2.6	1.9
45–64 years	13,664	1.9	2.9
65–74 years	6,264	0.9	4.0
75 years and over	4,575	0.6	4.9
All other races			
Asian or Pacific Islander	21,312	3.0	---
American Indian or Alaskan Native	2,382	0.3	---
Unspecified	21,287	3.0	---
Geographic region			
Northeast	127,805	18.1	2.6
Midwest	180,276	25.6	3.0
South	235,303	33.4	2.8
West	161,220	22.9	3.1

[1]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized population of the United States as of July 1, 1990.

were not found to differ significantly from 1989 visit rates (3).

Visit characteristics

Referral status and prior-visit status

Only 5.5 percent of office visits in 1990 were made as the result of a referral from another physician. The overwhelming majority of office visits (83.8 percent) were made by patients who had seen the physician on a previous occasion, and more than half (61.2 percent) of all visits were made by persons who were returning to the physician for care of a previously treated problem (table 3). Only 16.2 percent of visits were made by new patients. These percentages are not significantly different from those reported in 1989.

Expected source of payment

Expected sources of payment were most often commercial insurance (36.1 percent of visits) and "self-pay" (30.4 percent of visits) (figure 2). (The self-pay category includes the patient's contribution towards "co-payments" and "deductibles.") The percentage of visits at which commercial insurance was expected as a source of payment was up slightly from the 1989 level, while the percentage of self-pay visits showed a slight decrease. Medicare was an expected payment source at 19.8 percent of visits overall, up slightly from the 1989 level, but was an expected source of payment at 80.0 percent of visits by persons aged 65 years and over. "HMO/pre-paid plan" was mentioned at 14.5 percent of visits, not significantly different from the 1989 level. It should be noted that physicians were asked to check all of the applicable payment categories for this survey item, with the result that multiple payment sources could be coded for each visit.

Reason for visit

Item 9 of the Patient Record asks the physician to record the patient's (or patient surrogate's) "complaint(s), symptom(s), or other reason(s) for this visit in the patient's own words." Up to three reasons for visit are classified and coded from the survey according to *A Reason for Visit Classification for Ambulatory Care"* (RVC) (4). The principal reason for visit is the problem, complaint, or reason listed in item 9a.

The RVC is divided into the eight modules or groups of reasons displayed in table 4. More than half of all visits were made for reasons classified as symptoms (56.8 percent). Respiratory symptoms accounted for 11.3 percent of all visits while musculoskeletal symptoms accounted for 10.3 percent.

The twenty most frequently mentioned principal reasons for visit, representing 39.5 percent of all visits, are shown in table 5. General medical examination was the most

Table 2. Number, percent distribution, and annual rate of office visits by physician specialty and professional identity: United States, 1990

Physician specialty	Number of visits in thousands	Percent distribution	Number of visits per 100 persons per year[1]
All visits	704,604	100.0	286.3
General and family practice	209,788	29.8	85.2
Internal medicine	96,622	13.7	39.3
Pediatrics	81,148	11.5	33.0
Obstetrics and gynecology	61,243	8.7	[2]48.3
Ophthalmology	43,842	6.2	17.8
Orthopedic surgery	32,917	4.7	13.4
Dermatology	24,009	3.4	9.8
General surgery	22,402	3.2	9.1
Psychiatry	20,963	3.0	8.5
Otolaryngology	17,959	2.5	7.3
Cardiovascular disease	11,240	1.6	4.6
Urological surgery	9,546	1.4	3.9
Neurology	6,228	0.9	2.5
All other specialties	66,696	9.5	27.1
Professional identity			
Doctor of osteopathy	39,287	5.6	16.0
Doctor of medicine	665,317	94.4	270.3

[1]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized population of the United States as of July 1, 1990.
[2]Based on the female population only.

Table 3. Number and percent distribution of office visits by referral status and prior-visit status: United States, 1990

Visit characteristic	Number of visits in thousands	Percent distribution
All visits	704,604	100.0
Referral status		
Referred by another physician	38,806	5.5
Not referred by another physician	665,797	94.5
Prior visit status		
New patient	113,962	16.2
Old patient	590,641	83.8
New problem	159,635	22.5
Old problem	431,006	61.2

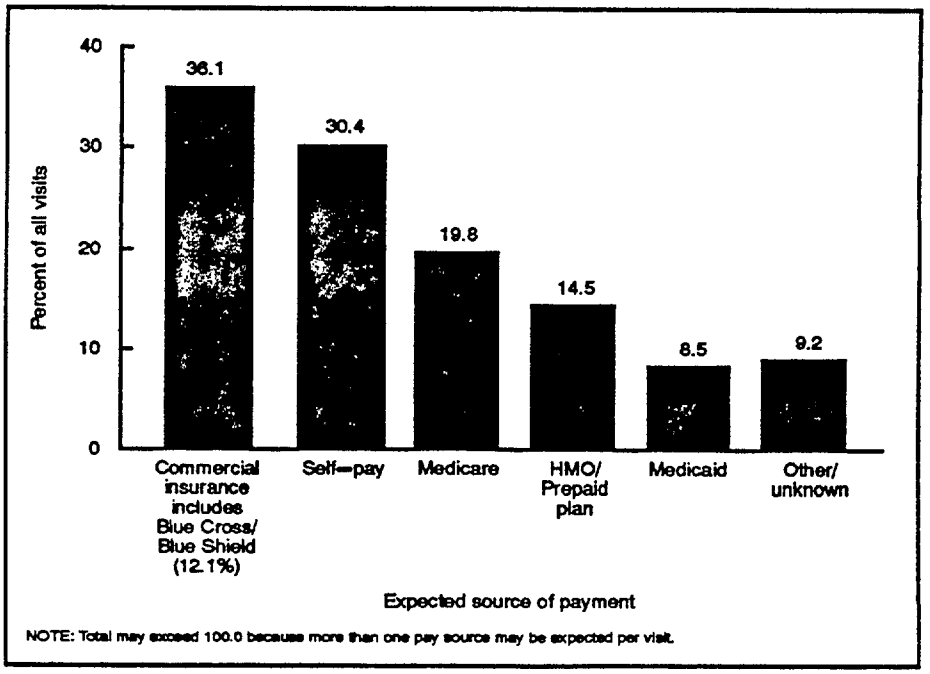


Figure 2. Office visits by expected source of payment: United States, 1990

frequently mentioned reason for visit overall (4.3 percent of the total), while cough was the most frequently mentioned reason having to do with illness or injury (3.7 percent). The top twenty reasons for 1990 were also listed as the twenty most frequently mentioned reasons for 1989, although in slightly different order.

Diagnostic and screening services

Table 6 displays statistics on diagnostic or screening services ordered or provided by the physician during the office visit. All diagnostic and screening categories included on the 1990 survey were also found on the 1989 survey. However, this list is changed periodically to reflect the changing needs of data users, recommendations of advisors, and anticipated future health data needs. The most frequently mentioned diagnostic service was blood pressure check, recorded at 38.5 percent of visits. This percentage was significantly higher than the 34.5 percent of visits with a check of blood pressure in 1989. Also, blood pressure checks were ordered or provided at a higher percentage of female visits (42.9 percent) than male visits (31.8 percent) in 1990, as was also the case in 1989.

Other frequently mentioned diagnostic or screening services included "other" blood test (13.3 percent of visits), urinalysis (12.8 percent), and pelvic exam (performed at 12.0 percent of female office visits). With the exception of blood pressure check, none of the diagnostic or screening categories showed significant changes from 1989 levels.

Principal diagnosis

Item 10 of the Patient Record asks the physician to record the principal diagnosis or problem associated with the patient's most important reason for the current visit as well as any other significant current diagnoses. Up to three diagnoses are coded and classified according to the *International*

Table 4. Number and percent distribution of office visits by patient's principal reason for visit: United States, 1990

Principal reason for visit and RVC code[1]		Number of visits in thousands	Percent distribution
All visits		704,604	100.0
Symptom module	S001–S999	400,323	56.8
General symptoms	S001–S099	48,395	6.9
Symptoms referable to psychological/mental disorders	S100–S199	19,831	2.8
Symptoms referable to the nervous system (excluding sense organs)	S200–S259	20,537	2.9
Symptoms referable to the cardiovascular/lymphatic system	S260–S299	4,351	0.6
Symptoms referable to the eyes and ears	S300–S399	51,327	7.3
Symptoms referable to the respiratory system	S400–S499	79,665	11.3
Symptoms referable to the digestive system	S500–S639	31,887	4.5
Symptoms referable to the genitourinary system	S640–S829	30,714	4.4
Symptoms referable to the skin, hair, and nails	S830–S899	40,928	5.8
Symptoms referable to the musculoskeletal system	S900–S999	72,687	10.3
Disease module	D001–D999	66,121	9.4
Diagnostic/screening, and preventive module	X100–X599	110,059	15.6
Treatment module	T100–T899	69,045	9.8
Injuries and adverse effects module	J001–J999	22,426	3.2
Test results module	R100–R700	9,021	1.3
Administrative module	A100–A140	8,341	1.2
Other[2]	U990–U999	19,267	2.7

[1]Based on "*A Reason for Visit Classification for Ambulatory Care*" (RVC), *Vital Health Stat* 2(78) 1979.
[2]Includes problems and complaints not elsewhere classified, entries of "none", blanks, and illegible entries.

Table 5. Number and percent distribution of office visits by the 20 principal reasons for visit most frequently mentioned by patients: United States, 1990

Rank	Reason for visit and RVC code[1]		Number of visits in thousands	Percent of all visits	Percent of female visits	Percent of male visits
	All visits		704,604	100.0	100.0	100.0
1	General medical examination	X100	30,341	4.3	4.8	3.6
2	Cough	S440	25,740	3.7	3.2	4.3
3	Routine prenatal examination	X205	25,296	3.6	5.9	...
4	Symptoms referable to throat	S455	18,866	2.7	2.5	2.9
5	Postoperative visit	T205	17,523	2.5	2.6	2.4
6	Earache or ear infection	S355	14,633	2.1	1.8	2.5
7	Well baby examination	X105	14,534	2.1	1.6	2.8
8	Back symptoms	S905	12,497	1.8	1.6	2.0
9	Stomach pain, cramps, and spasms	S545	12,054	1.7	1.8	1.5
10	Skin rash	S860	11,562	1.6	1.4	1.9
11	Fever	S010	11,500	1.6	1.3	2.1
12	Vision dysfunctions	S305	11,397	1.6	1.6	1.7
13	Hypertension	D510	10,391	1.5	1.5	1.4
14	Headache, pain in head	S210	10,203	1.4	1.6	1.2
15	Knee symptoms	S925	9,755	1.4	1.2	1.7
16	Chest pain and related symptoms (not referable to body system)	S050	9,684	1.4	1.2	1.6
17	Head cold, upper respiratory infection (coryza)	S445	8,557	1.2	1.2	1.3
18	Nasal congestion	S400	8,546	1.2	1.1	1.4
19	Blood pressure test	X320	7,922	1.1	1.1	1.1
20	Neck symptoms	S900	7,006	1.0	1.0	1.0
	All other reasons		426,597	60.5	60.0	61.6

[1]Based on "*A Reason for Visit Classification for Ambulatory Care*" (RVC), *Vital Health Stat* 2(78) 1979.

Classification of Diseases, 9th Revision, Clinical Modification (ICD–9–CM) (5).

Table 7 displays office visits by principal diagnosis using the major disease categories specified by the ICD-9-CM. The supplementary classification, used for diagnoses that are not classifiable to injury or illness (for example, general medical examination, routine prenatal examination, and health supervision of an infant or child), accounted for 14.8 percent of all office visits. Diseases of the respiratory system (14.2 percent) and diseases of the nervous system and sense organs (11.4 percent) were also prominent on the list.

Table 8 displays the 20 most frequently reported principal diagnoses for 1990, categorized at the three-digit coding level of the ICD-9-CM, and accounting for 36.2 percent of all office visits made during the year. Of these 20, 19 also appeared on the list of the 20 most frequent diagnoses for 1989.

The most common diagnosis rendered by physicians at office visits in 1990 was essential hypertension, occurring at 3.9 percent of all visits. Essential hypertension has been the most frequently reported morbidity-related diagnosis in every survey year since the NAMCS began in 1973. (Morbidity-related diagnoses are those classifiable to illness or injury. Nonmorbidity related diagnoses include routine prenatal examination, health supervision of an infant or child, and general medical examination, among others.)

Therapeutic services

Table 9 presents data summarized from items 13, 14, and 15 of the Patient Record which pertain to therapeutic services ordered or provided by the physician at the office visit.

Medication therapy was the most commonly mentioned therapeutic service, reported at 60.3 percent of office visits in 1990. Physicians were instructed to record all new or continued medications ordered or provided at the visit, including prescription and nonprescription preparations, and immunizing and desensitizing agents. As used in the NAMCS, the term "drug" is interchangeable with the term "medication," and the term "prescribing" is used broadly to mean ordering or providing any medication, whether prescription or over-the-counter. Additional drug data are presented in tables 10, 11, and 12, and are discussed in the next section.

Counseling/advice (defined to include formal and informal counseling, advice, and patient education) was offered at about 37.2 percent of office visits, and weight reduction was the most frequently specified category

Table 6. Number and percent distribution of office visits by selected diagnostic service and sex: United States, 1990

Diagnostic and screening services[1]	Number of visits in thousands	Percent of all visits	Percent of female visits	Percent of male visits
All visits	704,604	100.0	100.0	100.0
None	254,305	36.1	32.5	41.6
Pap test	33,898	4.8	7.9	0.0
Pelvic exam	51,422	7.3	12.0	. . .
Breast palpation	39,509	5.6	9.2	0.0
Mammogram	11,773	1.7	2.8	. . .
Visual acuity	45,291	6.4	6.2	6.8
Blood pressure	271,390	38.5	42.9	31.8
Urinalysis	89,904	12.8	15.2	9.0
Chest x-ray	20,293	2.9	2.7	3.2
Digital rectal examination	25,823	3.7	3.9	3.4
Proctoscopy or sigmoidoscopy	3,057	0.4	0.4	0.5
Stool blood exam	17,480	2.5	2.6	2.3
Oral glucose tolerance	3,421	0.5	0.6	0.3
Cholesterol measure	26,155	3.7	3.8	3.5
HIV serology	1,280	0.2	0.2	0.2
Other blood test	94,009	13.3	13.7	12.9
Other	176,390	25.0	24.6	25.6

[1]Total may exceed total number of visits because more than one service may be reported per visit.

Table 7. Number and percent distribution of office visits by principal diagnosis: United States, 1990

Principal diagnosis and ICD–9–CM code[1]	Number of visits in thousands	Percent distribution
All visits	704,604	100.0
Infectious and parasitic diseases .001–139	27,075	3.8
Neoplasms .140–239	21,941	3.1
Endocrine, nutritional and metabolic diseases and immunity disorders .240–279	29,456	4.2
Mental disorders .290–319	29,929	4.2
Diseases of the nervous system and sense organs .320–389	80,128	11.4
Diseases of the circulatory system .390–459	55,989	7.9
Diseases of the respiratory system .460–519	100,294	14.2
Diseases of the digestive system .520–579	26,154	3.7
Diseases of the genitourinary system .580–629	41,067	5.8
Diseases of the skin and subcutaneous tissue .680–709	36,836	5.2
Diseases of the musculoskeletal system and connective tissue .710–739	47,101	6.7
Symptoms, signs, and ill-defined conditions .780–799	27,221	3.9
Injury and poisoning .800–999	51,134	7.3
Supplementary classification .V01–V82	104,418	14.8
All other diagnoses[2]	10,722	1.5
Unknown/blank[3]	15,139	2.1

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM).
[2]Includes diseases of the blood and blood-forming organs (280–289); complications of pregnancy, childbirth, and the puerperium (630–676); congenital anomalies (740–759); and certain conditions originating in the perinatal period (760–799).
[3]Includes blank diagnoses, uncodable diagnoses, and illegible diagnoses.

(6.3 percent of visits). More common counseling topics, such as medical, social, and family counseling, were included in the "other" category (28.2 percent of visits). More detailed data on counseling and advice have been collected in the 1991 NAMCS.

Approximately 19.7 percent of visits included a mention of nonmedication therapy ordered or provided by the physician, with the most commonly listed category being psychotherapy (3.8 percent of visits). Ambulatory surgery was ordered or provided at about 2.0 percent of visits, not significantly different from the 1989 level. More detailed data on ambulatory surgery, collected in the 1991 NAMCS, will be forthcoming later this year.

Medication therapy

As noted above, 60.3 percent or about 424.6 million office visits included a new or continuing medication ordered or provided by the physician during 1990. Visits with one or more drug mentions are termed "drug visits" in the NAMCS. As many as five medications, or drug mentions, could be coded per drug visit, resulting in a total of 759.4 million drug mentions during 1990. This yields an average of about 1.1 drug mentions per office visit, or 1.8 drug mentions per drug visit.

Table 10 displays data on number of drug visits and drug mentions by physician specialty. Cardiovascular disease specialists and internists had the highest percentage of drug visits, at 78.5 percent and 74.5 percent, respectively.

Drug mentions are displayed by therapeutic class in table 11. This classification is based on the therapeutic categories used in the National Drug Code Directory (6). It should be noted that some drugs have more than one therapeutic application. In cases of this type, each drug was assigned to the category for which it is most frequently prescribed. Antimicrobial drugs accounted for 16.5 percent of all drug mentions, while cardiovascular-renal drugs (14.4 percent), respiratory tract drugs (11.4 percent), and pain relief drugs (10.2 percent) were also frequently mentioned.

Table 12 shows the 20 most frequently used generic substances for 1990. In this table, drug products containing more than one ingredient (combination products) are included in the data for each ingredient. For example, acetaminophen with codeine is included in both the count for acetaminophen and the count for codeine. Amoxicillin was the generic ingredient most frequently used in drugs ordered or provided by the physician at office visits in 1990, occurring in 4.9 percent of drug mentions.

Fifteen of the 20 most used generic ingredients for 1990 were also on the list of the top 20 for 1989. Albuterol and pseudoephedrine, new on the list for 1990, showed substantial gains of roughly 2.5 million mentions and 3.4 million mentions, respectively, over 1989 levels.

The NAMCS drug data base permits classification by a wide range of variables, including specific product name, generic class, entry form

Table 8. Number and percent distribution of office visits by the 20 principal diagnoses most frequently rendered by physicians: United States, 1990

Rank	Principal diagnosis and ICD–9–CM code[1]	Number of visits in thousands	Percent of all visits	Percent of female visits	Percent of male visits
	All visits	704,604	100.0	100.0	100.0
1	Essential hypertension .401	27,310	3.9	3.9	3.8
2	Normal pregnancy .V22	23,561	3.3	5.5	...
3	Suppurative and unspecified otitis media .382	21,043	3.0	2.3	4.0
4	General medical examination .V70	20,555	2.9	2.9	3.0
5	Acute upper respiratory infections of multiple or unspecified sites .465	18,676	2.7	2.4	3.0
6	Health supervision of infant or child .V20	15,676	2.2	1.7	3.0
7	Diabetes mellitus .250	15,303	2.2	1.9	2.6
8	Allergic rhinitis .477	12,123	1.7	1.7	1.8
9	Bronchitis, not specified as acute or chronic .490	12,098	1.7	1.6	1.9
10	Acute pharyngitis .462	11,536	1.6	1.6	1.8
11	Chronic sinusitis .473	11,141	1.6	1.6	1.5
12	Neurotic disorders .300	9,531	1.4	1.5	1.1
13	Diseases of sebaceous glands .706	8,346	1.2	1.1	1.3
14	Disorders of refraction and accommodation .367	7,288	1.0	1.0	1.0
15	Cataract .366	7,282	1.0	1.2	0.8
16	Glaucoma .365	7,234	1.0	1.1	1.0
17	Asthma .493	7,137	1.0	1.1	0.9
18	Sprains and strains of other and unspecified parts of back .847	6,951	1.0	0.9	1.1
19	Other forms of chronic ischemic heart disease .414	6,429	0.9	0.5	1.5
20	Osteoarthrosis and allied disorders .715	6,358	0.9	1.0	0.8

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification*, ICD–9–CM.

Table 9. Number and percent distribution of office visits by selected therapeutic services ordered or provided by the physician: United States, 1990

Therapeutic services[1]	Number of visits in thousands	Percent distribution
All visits	704,604	100.0
Medication therapy[2]		
Drug visits[3]	424,587	60.3
Number of medications ordered or provided by the physician		
None	280,017	39.7
1	230,716	32.7
2	110,865	15.7
3–5	83,007	11.8
Counseling and advice[1]		
None	442,833	62.8
Weight reduction	44,378	6.3
Cholesterol reduction	22,566	3.2
Breast self-exam	16,174	2.3
Smoking cessation	14,937	2.1
HIV transmission	1,740	0.2
Other	198,607	28.2
Other nonmedication therapy[1]		
None	566,077	80.3
Psychotherapy	26,922	3.8
Physiotherapy	16,572	2.4
Ambulatory surgery	14,203	2.0
Corrective lenses	9,580	1.4
Other	75,338	10.7

[1]Total may exceed total number of visits because more than one category may be reported per visit.
[2]Medications include prescription drugs, over-the-counter preparations, immunizing agents, desensitizing agents, etc.
[3]Drug visits are visits at which one or more medication is ordered or supplied by the physician.

chosen by the physician (that is, brand name, generic name, or the desired therapeutic effect), prescription status (that is, whether the product is prescription or nonprescription), federally controlled substance status, composition status (that is, single or multiple ingredient product), and therapeutic category. A report describing the method and instruments used to collect and process drug information for the NAMCS is available (7).

Disposition of visit

Nearly two-thirds (66.0 percent) of all office visits included a scheduled follow-up visit or telephone call, while another 22.6 percent included instructions to return if needed. Only about 1.0 percent of visits resulted in a hospital admission. Table 13 displays data on office visit disposition.

Duration of visit

Table 14 presents data on the duration of office visits. Duration of visit refers to the amount of time spent in face-to-face contact between the physician and the patient. This time is estimated and recorded by the physician and does not include time spent waiting to see the physician, time spent receiving care from someone other than the physician without the presence of the physician, or time spent by the physician in reviewing patient records and/or test results. In cases where the patient received care from a member of the physician's staff but did not actually see the physician during the visit, duration was recorded as "zero" minutes.

About 69.3 percent of office visits had a duration of 15 minutes or less in 1990. The mean duration time for all visits was 16.7 minutes, significantly higher than the 15.9 minutes reported for 1989.

Additional reports which utilize 1990 NAMCS data are forthcoming in the Advance Data From Vital and Health Statistics series. In addition, survey data will be available on computer tape from the National

Table 10. Number and percent distribution of drug visits and drug mentions by physician specialty: United States, 1990

Physician specialty	Number of drug visits[1] in thousands	Percent distribution	Number of drug mentions in thousands	Percent distribution	Percent drug visits[2]
All drug visits	424,587	100.0	759,406	100.0	60.3
General and family practice	144,052	33.9	251,960	33.2	68.7
Internal medicine	71,967	17.0	149,370	19.7	74.5
Pediatrics	54,250	12.8	76,370	10.1	66.9
Obstetrics and gynecology	26,814	6.3	35,687	4.7	43.8
Ophthalmology	19,193	4.5	30,808	4.1	43.8
Orthopedic surgery	8,586	2.0	11,035	1.5	26.1
Dermatology	15,364	3.6	29,572	3.9	64.0
General surgery	6,961	1.6	12,597	1.7	31.1
Psychiatry	10,756	2.5	18,516	2.4	51.3
Otolaryngology	8,017	1.9	12,341	1.6	44.6
Cardiovascular disease	8,827	2.1	25,153	3.3	78.5
Urological surgery	3,854	0.9	5,145	0.7	40.4
Neurology	4,127	1.0	7,586	1.0	66.3
All other specialties	41,819	9.8	93,265	12.3	62.7

[1]Drug visits are visits at which one or more drugs are ordered or supplied by the physician.
[2]Number of drug visits divided by number of office visits multiplied by 100.

Table 11. Number and percent distribution of drug mentions by therapeutic classification: United States, 1990

Therapeutic classification[1]	Number of drug mentions in thousands	Percent distribution
All drug mentions	759,406	100.0
Antimicrobial	125,275	16.5
Cardiovascular-renal	109,171	14.4
Respiratory tract	86,562	11.4
Pain relief	77,355	10.2
Hormones and related agents	67,544	8.9
Dermatologic	43,558	5.7
Psychopharmacological	46,188	6.1
Metabolic and nutrient	29,238	3.9
Gastrointestinal	31,139	4.1
Ophthalmic	30,375	4.0
Immunologic	19,337	2.5
Neurologic	14,111	1.9
Hematologic	9,914	1.3
Other and unclassified	69,639	9.2

[1]Therapeutic class based on the standard drug classification used in the National Drug Code Directory, 1982 Edition.

Table 12. Number and percent distribution of drug mentions for the 20 most frequently used generic substances: United States, 1990

Rank	Generic substance	Number of drug mentions in thousands[1]	Percent distribution
	All drug mentions	759,406	100.0
1	Amoxicillin	37,011	4.9
2	Acetaminophen	23,416	3.1
3	Erythromycin	19,474	2.6
4	Hydrochlorothiazide	15,011	2.0
5	Codeine	14,435	1.9
6	Phenylephrine	12,297	1.6
7	Ibuprofen	11,964	1.6
8	Phenylpropanolamine	11,489	1.5
9	Aspirin	10,823	1.4
10	Albuterol	10,505	1.4
11	Pseudoephedrine	10,474	1.4
12	Naproxen	10,354	1.4
13	Furosemide	9,570	1.3
14	Chlorpheniramine	9,197	1.2
15	Alcohol	9,015	1.2
16	Digoxin	8,924	1.2
17	Cefaclor	8,910	1.2
18	Guaifenesin	8,890	1.2
19	Trimethoprim	8,649	1.1
20	Sulfamethoxazole	8,282	1.1

[1]Frequency of mention combines single-ingredient agents with mentions of the agent as an ingredient in a combination drug

Technical Information Service at a nominal cost beginning about April 1992. Questions regarding this report, future reports, or the NAMCS may be directed to the Ambulatory Care Statistics Branch by calling (301) 436–7132.

References

1. Nelson C, McLemore T. The National Ambulatory Medical Care Survey. United States, 1975–81 and 1985 trends. National Center for Health Statistics. Vital Health Stat 13(93). 1988.

2. DeLozier JE, Gagnon, RO. 1989 Summary: National Ambulatory Medical Care Survey. Advance data from vital and health statistics; no. 203. Hyattsville, Maryland: National Center for Health Statistics. 1991.

3. Schappert SM. National Ambulatory Medical Care Survey: 1989 Summary. National Center for Health Statistics. Vital and Health Stat 13(110). 1992.

4. Schneider D, Appleton L, McLemore T. A reason for visit classification for ambulatory care. National Center for Health Statistics. Vital and Health Stat 2(78). 1979.

5. Public Health Service and Health Care Financing Administration. International Classification of Diseases, 9th Revision, clinical modification. Washington: Public Health Service. 1980.

6. Food and Drug Administration. National Drug Code Directory, 1982 Edition. Washington: Public Health Service, 1982.

7. Koch H, Campbell W. The collection and processing of drug information. National Ambulatory Medical Care Survey, 1980. National Center for Health Statistics. Vital Health Stat 2(90). 1982.

Table 13. Number and percent distribution of office visits by disposition of visit: United States, 1990

Disposition[1]	*Number of visits in thousands*	*Percent distribution*
All visits	704,604	100.0
No followup planned	68,310	9.7
Return at specified time	437,530	62.1
Return if needed	159,101	22.6
Telephone followup planned	27,207	3.9
Referred to other physician	22,939	3.3
Returned to referring physician	7,210	1.0
Admit to hospital	6,802	1.0
Other	11,513	1.6

[1]Total may exceed total number of visits because more than one disposition may be reported per visit.

Table 14. Number and percent distribution of office visits by duration of visit: United States, 1990

Duration	*Number of visits in thousands*	*Percent distribution*
All visits	704,604	100.0
0 minutes[1]	8,262	1.2
1–5 minutes	63,383	9.0
6–10 minutes	199,086	28.3
11–15 minutes	217,608	30.9
16–30 minutes	167,690	23.8
31 minutes and over	48,575	6.9

[1]Visits of zero minutes duration are those in which there was no face-to-face contact between the patient and the physician.

Symbols

--- Data not available

. . . Category not applicable

- Quantity zero

0.0 Quantity more than zero but less than 0.05

Z Quantity more than zero but less than 500 where numbers are rounded to thousands

* Figure does not meet standard of reliability or precision

Technical notes

Source of data and sample design

The information presented in this report is based on data collected by means of the National Ambulatory Medical Care Survey (NAMCS) from January 1990 through December 1990. The target universe of NAMCS includes office visits made in the United States by ambulatory patients to nonfederally employed physicians who are principally engaged in office practice, but not in the specialties of anesthesiology, pathology, or radiology. Telephone contacts and nonoffice visits are excluded.

A multistage probability sample design is used in NAMCS, involving samples of primary sampling units (PSU's), physician practices within PSU's, and patient visits within physician practices. For 1990, a sample of 3,063 nonfederal, office-based physicians was selected from master files maintained by the American Medical Association and American Osteopathic Association. The physician response rate for the 1990 NAMCS was 74 percent. Sample physicians were asked to complete Patient Records (see figure 1) for a systematic random sample of office visits occurring during a randomly assigned 1-week reporting period. Responding physicians completed 43,469 patient records.

Characteristics of the physician's practice, such as primary specialty and type of practice, were obtained from the physicians during an induction interview. The U.S. Bureau of the Census, Housing Surveys Branch, was responsible for the survey's data collection. Processing operations and medical coding were performed by the National Center for Health Statistics, Hospital Discharge and Ambulatory Care Survey Section, Research Triangle Park, North Carolina.

Sampling errors

The standard error is primarily a measure of the sampling variability that occurs by chance when only a sample, rather than an entire universe, is surveyed. The relative standard error of an estimate is obtained by dividing the standard error by the estimate itself; the result is then expressed as a percent of the estimate. Table I shows provisional relative standard errors for estimated numbers of office visits in 1990, and table II presents provisional relative standard errors for estimated numbers of drug mentions. Provisional standard errors for estimated percents of visits are shown in table III.

Alternatively, relative standard errors for aggregate estimates may be calculated using the following general formula, where x is the aggregate of interest in thousands, and A and B are the appropriate coefficients from table IV.

$$\mathrm{RSE}(x) = \sqrt{A + \frac{B}{X}} \cdot 100.0$$

Similarly, relative standard errors for percents may be calculated using the following general formula, where p is the percent of interest and x is the denominator of the percent in thousands, using the appropriate coefficient from table IV.

$$\mathrm{RSE}\ (p) = \sqrt{\frac{B \cdot (1-p)}{p \cdot x}} \cdot 100.0$$

Table I. Provisional relative standard errors for estimated number of office visits: National Ambulatory Medical Care Survey, 1990

Estimated number of office visits in thousands	Relative standard error in percent
200	49.4
400	35.0
547	30.0
600	28.7
800	24.9
1,000	22.4
2,000	16.1
5,000	10.6
10,000	8.0
13,000	7.3
20,000	6.4
50,000	5.1
100,000	4.6
600,000	4.1

Example of use of table: An aggregate estimate of 10 million visits has a relative standard error of 8.0 percent or a standard error of 800,000 visits (8.0 percent of 10 million).

Table II. Provisional relative standard errors for estimated number of drug mentions: National Ambulatory Medical Care Survey, 1990

Estimated number of drug mentions in thousands	Relative standard error in percent
200	63.4
400	45.0
500	40.3
600	36.9
800	32.0
912	30.0
1,000	28.7
2,000	20.6
5,000	13.6
10,000	10.3
20,000	8.1
50,000	6.5
100,000	5.8
600,000	5.2

Example of use of table: An aggregate estimate of 10 million drug mentions has a relative standard error of 10.3 percent or a standard error of 1.03 million visits (10.3 percent of 10 million).

Table III. Provisional standard errors for percents of estimated numbers of office visits: National Ambulatory Medical Care Survey, 1990

Base of percent visits in thousands	Estimated percent					
	1 or 99	5 or 95	10 or 90	20 or 80	30 or 70	50
	Standard error in percentage points					
200	4.9	10.7	14.8	19.7	22.6	24.6
500	3.1	6.8	9.3	12.5	14.3	15.6
1,000	2.2	4.8	6.6	8.8	10.1	11.0
2,000	1.6	3.4	4.7	6.2	7.1	7.8
5,000	1.0	2.2	3.0	3.9	4.5	4.9
10,000	0.7	1.5	2.1	2.8	3.2	3.5
13,000	0.6	1.3	1.8	2.4	2.8	3.1
20,000	0.5	1.1	1.5	2.0	2.3	2.5
50,000	0.3	0.7	0.9	1.3	1.4	1.6
100,000	0.2	0.5	0.7	0.9	1.0	1.1
600,000	0.1	0.2	0.3	0.4	0.4	0.5

Example of use of table: An estimate of 30 percent based on an aggregate estimate of 13 million visits has a standard error of 2.8 percent or a relative standard error of 9.3 percent (2.8 percent divided by 30 percent).

Table IV. Provisional coefficients appropriate for determining relative standard errors by type of estimate and physician groups: National Ambulatory Medical Care Survey, 1990

Type of estimate and physician group	Coefficient A	Coefficient B
Visits		
Overall totals	0.00161075	48.44516000
Doctors of osteopathy, general surgery, orthopedic surgery, cardiovascular disease, psychiatry, urological surgery, dermatology, neurology, ophthalmology, otolaryngology	0.01798498	8.66482249
Pediatrics, obstetrics, and gynecology	0.01283754	24.17002721
Internal medicine, all other specialties	0.01498303	36.73205078
General and family practice	0.00573033	30.48694805
Drug mentions		
Overall totals	0.00258400	79.97392437
Doctors of osteopathy, general surgery, orthopedic surgery, cardiovascular disease, psychiatry, urological surgery, dermatology, neurology, ophthalmology, otolaryngology	0.03278417	9.67984575
Pediatrics, obstetrics, and gynecology	0.02355989	22.74292891
Internal medicine, all other specialties	0.02100443	61.17468803
General and family practice	0.00717830	53.42315388

Adjustments for nonresponse

Estimates from NAMCS data were adjusted to account for sample physicians who were in scope but did not participate in the study. This adjustment was calculated to minimize the impact of response on final estimates by imputing to nonresponding physicians data from visits to similar physicians. For this purpose, physicians were judged similar if they had the same specialty designation and practiced in the same PSU.

Test of significance and rounding

In this report, the determination of statistical inference is based on the t-test. The Bonferroni inequality was used to establish the critical value for statistically significant differences (0.05 level of confidence). Terms relating to differences such as "greater than" or "less than" indicate that the difference is statistically significant. A lack of comment regarding the difference between any two estimates does not mean that the difference was tested and found to be not significant.

In the tables, estimates of office visits have been rounded to the nearest thousand. Consequently, estimates will not always add to totals. Rates and percents were calculated from original unrounded figures and do not necessarily agree with percents calculated from rounded data.

Definition of terms

Ambulatory patient—An ambulatory patient is an individual seeking personal health services who is not currently admitted to any health care institution on the premises.

Physician—A physician is a duly licensed doctor of medicine (M.D.) or doctor of osteopathy (D.O.) who is currently in office-based practice and who spends some time caring for ambulatory patients. Excluded from the NAMCS are physicians who are hospital based; who specialize in anesthesiology, pathology, or radiology; who are federally employed; who treat only institutionalized patients; or who are employed full time by an institution and spend no time seeing ambulatory patients.

Office—Offices are the premises physicians identify as locations for their ambulatory practice. These customarily include consultation, examination, or treatment spaces that the patients associate with the particular physician.

Visit—A visit is a direct personal exchange between an ambulatory patient and a physician (or a staff member working under the physician's supervision) for the purpose of seeking care and rendering personal health services.

Drug mention—A drug mention is the physician's entry of a pharmaceutical agent—by any route of administration—for prevention, diagnosis, or treatment. Generic as well as brand-name drugs are included, as are nonprescription and prescription drugs. Along with all new drugs, the physician also records continued medications if the patient was specifically instructed during the visit to continue the medication.

Drug visit—A drug visit is a visit in which medication was prescribed or provided by the physician.

Suggested citation

Schappert SM. National Ambulatory Medical Care Survey: 1990 Summary. Advance data from vital and health statistics; no 213. Hyattsville, Maryland: National Center for Health Statistics. 1992.

Number 214 • September 8, 1992

Advance Data

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Office Visits for Otitis Media: United States, 1975–90

by Susan M. Schappert, M.A.,
Division of Health Care Statistics

During 1990, there were an estimated 24.5 million visits made to office-based physicians in the United States at which the principal diagnosis was otitis media, nearly one visit for every 10 persons. These visits accounted for 3.5 percent of all office visits and represented the second most frequent illness diagnosis. For children under age 15, otitis media represented the most frequent diagnosis in physician office practices. Since 1975, the first year these data were collected, the number of otitis media visits has increased almost 150 percent (figure 1), and the annual visit rate has more than doubled.

This report presents national estimates pertaining to office visits with a diagnosis of otitis media between 1975 and 1990. These estimates are based upon data collected in the National Ambulatory Medical Care Survey (NAMCS), a national probability sample survey conducted by the Division of Health Care Statistics of the National Center for Health Statistics, Centers for Disease Control. Statistics on patient, physician, and visit characteristics for visits with a diagnosis of otitis media are presented and compared for four years: 1975, 1980, 1985, and 1990.

A copy of the 1990 Patient Record, the survey instrument used by participating physicians to record information about their patients' office visits, is displayed in figure 2. Although some changes have been made in this form over the years, the basic format has remained the same, and it is hoped that this will provide a useful reference point for readers.

In item 10 of the Patient Record, physicians were asked to record a principal diagnosis (the diagnosis most closely associated with the patient's most important reason for visit) as well as any other significant current diagnoses. Up to three diagnoses were coded and classified for each visit. For the 1975 survey year, diagnoses were coded according to the *Eighth Revision International Classification of Diseases, adapted for use in the United States* (ICDA–8) (1). For survey years 1980, 1985, and 1990, diagnoses were coded according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM) (2). This report will focus primarily on office visits in which the patient's principal

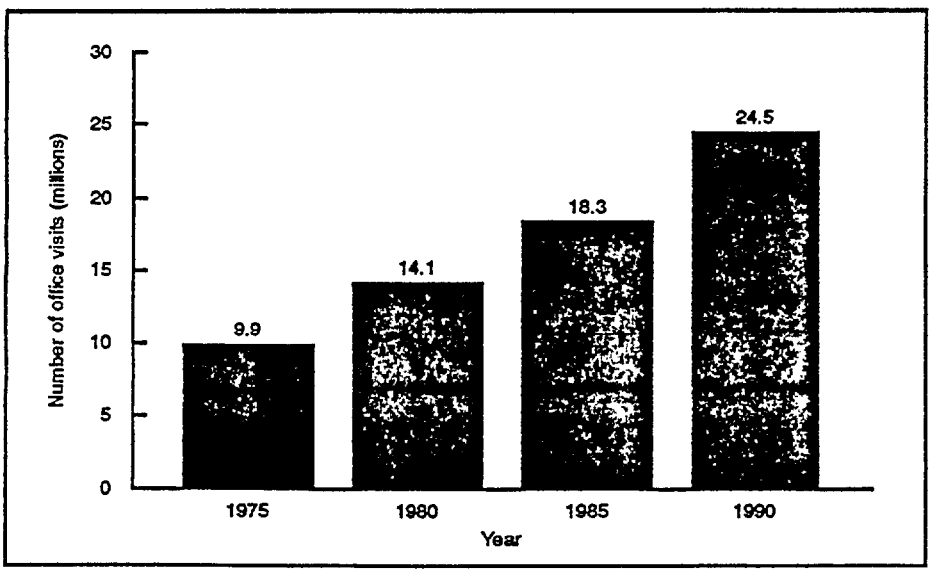
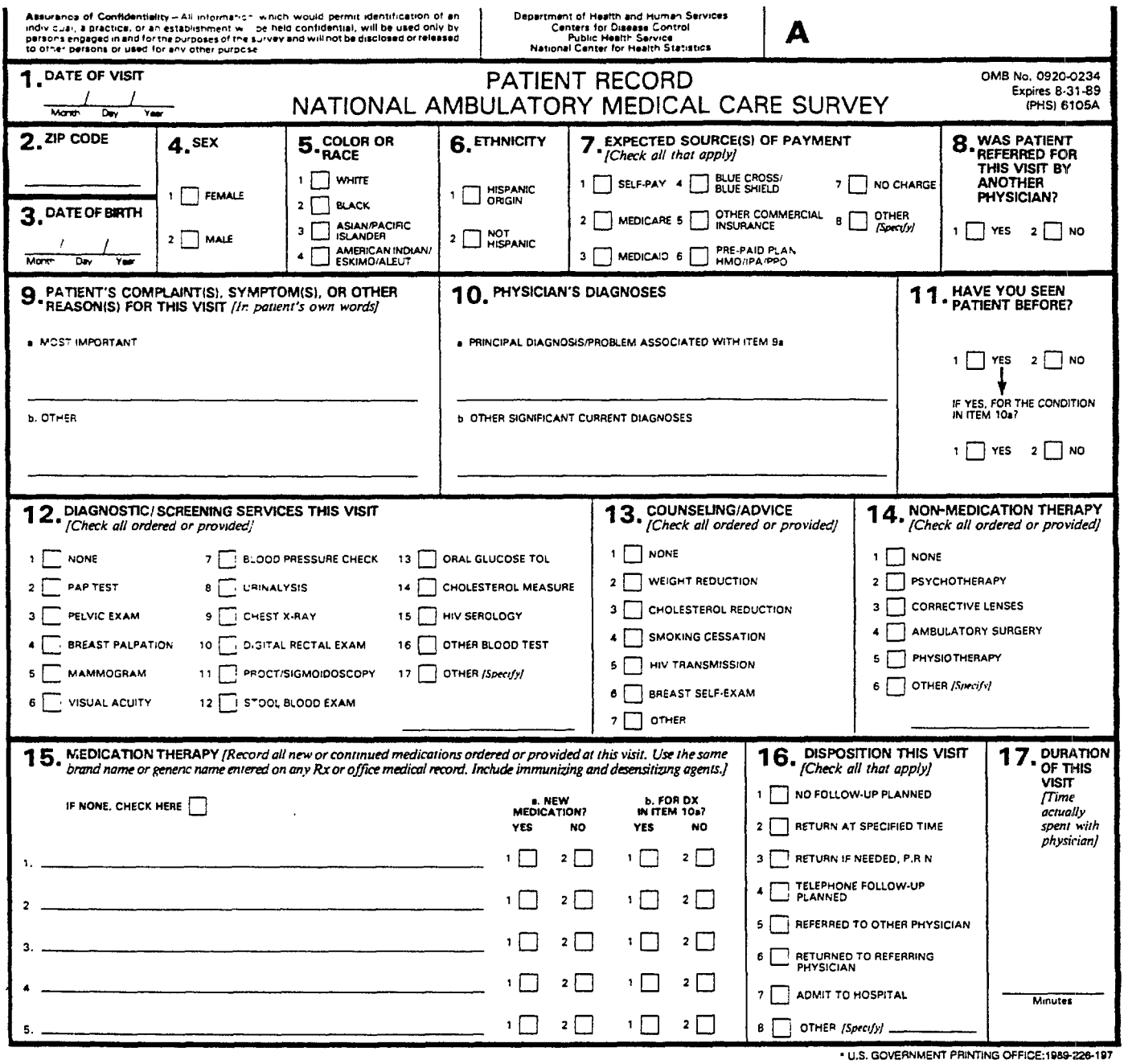


Figure 1. Office visits with a principal diagnosis of otitis media: United States, 1975–90

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL



Assurance of Confidentiality – All information which would permit identification of an individual, a practice, or an establishment will be held confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to other persons or used for any other purpose.

Department of Health and Human Services
Centers for Disease Control
Public Health Service
National Center for Health Statistics

A

PATIENT RECORD
NATIONAL AMBULATORY MEDICAL CARE SURVEY

OMB No. 0920-0234
Expires 8-31-89
(PHS) 6105A

1. DATE OF VISIT — Month / Day / Year

2. ZIP CODE

3. DATE OF BIRTH — Month / Day / Year

4. SEX
1 FEMALE
2 MALE

5. COLOR OR RACE
1 WHITE
2 BLACK
3 ASIAN/PACIFIC ISLANDER
4 AMERICAN INDIAN/ ESKIMO/ALEUT

6. ETHNICITY
1 HISPANIC ORIGIN
2 NOT HISPANIC

7. EXPECTED SOURCE(S) OF PAYMENT *[Check all that apply]*
1 SELF-PAY
2 MEDICARE
3 MEDICAID
4 BLUE CROSS/ BLUE SHIELD
5 OTHER COMMERCIAL INSURANCE
6 PRE-PAID PLAN HMO/IPA/PPO
7 NO CHARGE
8 OTHER *(Specify)*

8. WAS PATIENT REFERRED FOR THIS VISIT BY ANOTHER PHYSICIAN?
1 YES 2 NO

9. PATIENT'S COMPLAINT(S), SYMPTOM(S), OR OTHER REASON(S) FOR THIS VISIT *[In patient's own words]*
a. MOST IMPORTANT
b. OTHER

10. PHYSICIAN'S DIAGNOSES
a. PRINCIPAL DIAGNOSIS/PROBLEM ASSOCIATED WITH ITEM 9a
b. OTHER SIGNIFICANT CURRENT DIAGNOSES

11. HAVE YOU SEEN PATIENT BEFORE?
1 YES 2 NO
IF YES, FOR THE CONDITION IN ITEM 10a?
1 YES 2 NO

12. DIAGNOSTIC/SCREENING SERVICES THIS VISIT *[Check all ordered or provided]*
1 NONE
2 PAP TEST
3 PELVIC EXAM
4 BREAST PALPATION
5 MAMMOGRAM
6 VISUAL ACUITY
7 BLOOD PRESSURE CHECK
8 URINALYSIS
9 CHEST X-RAY
10 DIGITAL RECTAL EXAM
11 PROCT/SIGMOIDOSCOPY
12 STOOL BLOOD EXAM
13 ORAL GLUCOSE TOL
14 CHOLESTEROL MEASURE
15 HIV SEROLOGY
16 OTHER BLOOD TEST
17 OTHER *(Specify)*

13. COUNSELING/ADVICE *[Check all ordered or provided]*
1 NONE
2 WEIGHT REDUCTION
3 CHOLESTEROL REDUCTION
4 SMOKING CESSATION
5 HIV TRANSMISSION
6 BREAST SELF-EXAM
7 OTHER

14. NON-MEDICATION THERAPY *[Check all ordered or provided]*
1 NONE
2 PSYCHOTHERAPY
3 CORRECTIVE LENSES
4 AMBULATORY SURGERY
5 PHYSIOTHERAPY
6 OTHER *(Specify)*

15. MEDICATION THERAPY *[Record all new or continued medications ordered or provided at this visit. Use the same brand name or generic name entered on any Rx or office medical record. Include immunizing and desensitizing agents.]*
IF NONE, CHECK HERE

	a. NEW MEDICATION? YES	a. NEW MEDICATION? NO	b. FOR DX IN ITEM 10a? YES	b. FOR DX IN ITEM 10a? NO
1.	1	2	1	2
2.	1	2	1	2
3.	1	2	1	2
4.	1	2	1	2
5.	1	2	1	2

16. DISPOSITION THIS VISIT *[Check all that apply]*
1 NO FOLLOW-UP PLANNED
2 RETURN AT SPECIFIED TIME
3 RETURN IF NEEDED, P.R.N.
4 TELEPHONE FOLLOW-UP PLANNED
5 REFERRED TO OTHER PHYSICIAN
6 RETURNED TO REFERRING PHYSICIAN
7 ADMIT TO HOSPITAL
8 OTHER *(Specify)*

17. DURATION OF THIS VISIT *[Time actually spent with physician]*
Minutes

* U.S. GOVERNMENT PRINTING OFFICE:1989-226-197

Figure 2. Patient Record

diagnosis was recorded as otitis media.[1]

It is necessary to keep in mind that the estimates presented in this report are based on samples, and, as such, they are subject to sampling variability. The technical notes found at the end of this report discuss briefly the sample design, sampling errors, and guidelines for use in evaluating the precision of NAMCS estimates.

[1]In order to compare diagnostic data from 1975 through 1990, it was necessary to ensure the comparability of codes used to classify diagnoses of otitis media during this time. For the purposes of this report, otitis media has been defined to include nonsuppurative otitis media (ICD–9–CM codes 381.0–381.4) as well as suppurative and unspecified otitis media (ICD–9–CM codes 382.0–382.9). These codes were compared with ICDA–8 codes 381.0–381.9 (otitis media without mention of mastoiditis). ICDA–8 codes for 382.0–382.3 (otitis media with mention of mastoiditis) were also considered for inclusion in the analysis. However, mastoiditis is classified as a separate condition in the ICD–9–CM, which could have lessened the comparability of these specific codes over the years. Despite this consideration, it was discovered that, for 1975, there were no NAMCS visits coded with a diagnosis in the range of 382, rendering this a nonissue and limiting data comparisions to the codes mentioned above.

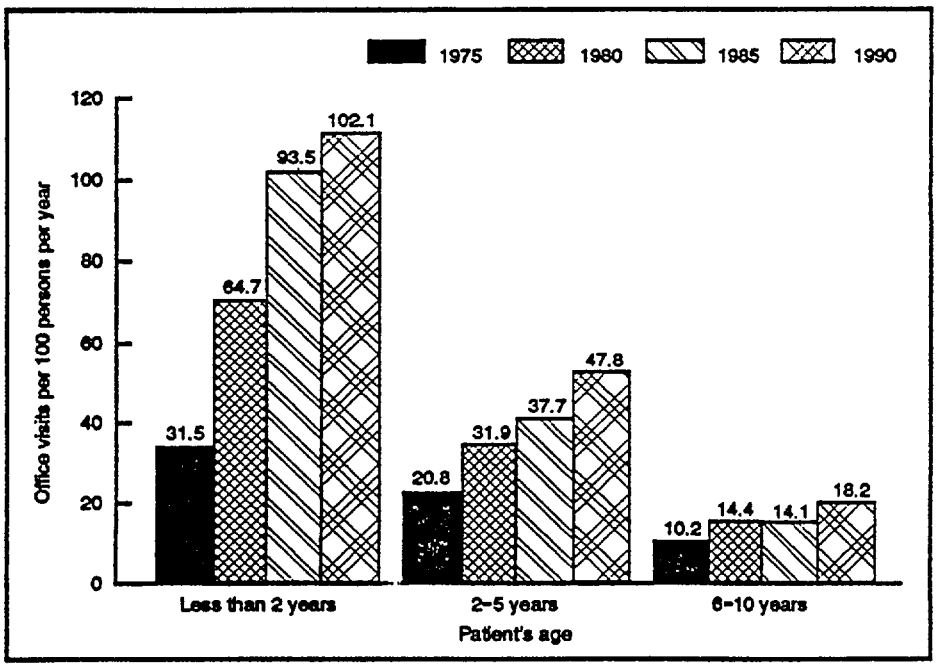


Figure 3. Annual visit rates for visits with a principal diagnosis of otitis media by patient's age: United States, 1975–90

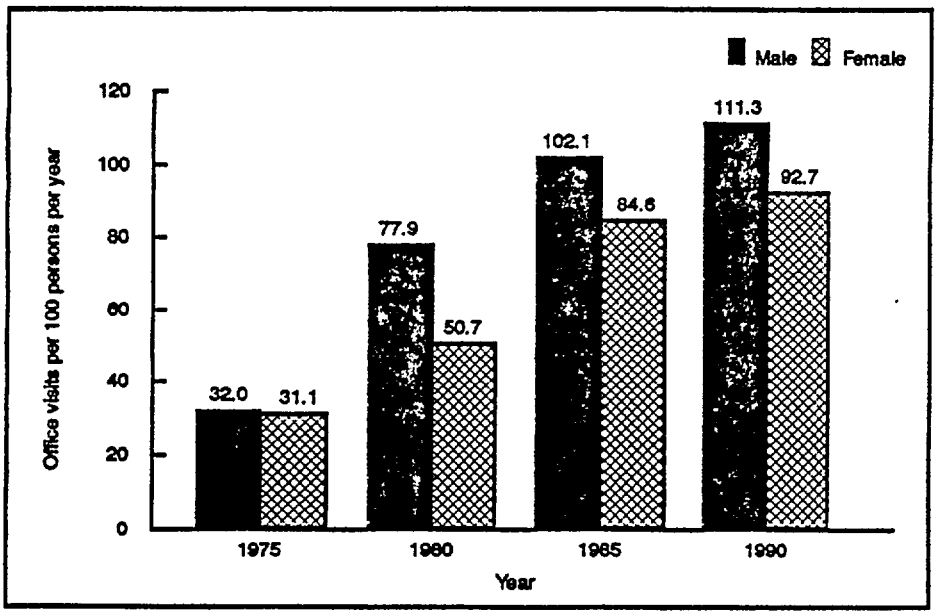


Figure 4. Annual otitis media visit rate for patients aged less than 2 years by sex: United States, 1975–90

Patient characteristics

Tables 1, 2, and 3 show visits with a principal diagnosis of otitis media by patient's age, sex, race, and geographic region between 1975 and 1990. Major findings are summarized below.

Patient's age

During 1975–90 the majority of visits for otitis media were made by children. In 1975, 70.6 percent of otitis media visits were made by persons under the age of 15. By 1990, that percentage had increased to 80.5 percent.

Examining this age group (under 15 years) more closely, visit rates were found to be highest among children under the age of 2 years for three of the four survey years presented here. (In 1975 visit rates for children aged less than 2 years and for those aged 2–5 years were higher than visit rates for other age groups but were not statistically different from each other.) Furthermore, the visit rate for children under the age of 2 years jumped from 31.5 visits per 100 children in 1975 to 102.1 visits per 100 children in 1990, an increase of 224.1 percent (figure 3).

Increasing visit rates were also noted in the groups 2–5 years of age and 6–10 years of age. Among children aged 2–5 years, the visit rate rose from 20.8 visits per 100 children in 1975 to 47.8 visits in 1990, up 129.8 percent. Among those 6–10 years of age, the increase was 78.4 percent, from 10.2 visits per 100 children in 1975 to 18.2 visits per 100 children in 1990.

Although the visit rate for children aged 11–14 years was 3.3 visits per 100 in 1975 and 8 visits per 100 in 1990, this difference was not found to be statistically significant. No significant increase was noted between 1975 and 1990 in the visit rate for persons in the age groups 15–24 years, 25–44 years, 45–64 years, and 65 years and over.

Visit rates by age and sex

For each of the years presented here, the likelihood of a physician visit for otitis media is about the same for males and females. In 1990, for example, males accounted for 52.5 percent of the visits and females 47.5 percent, a difference that is not statistically significant. Annual visit rates are not statistically different for males and females, being 10.7 visits per 100 males and 9.3 per 100 females in 1990.

Within age groups, the increases in visit rates for males and females from 1975 to 1990 are similar. The visit rate for males under the age of 2 years increased dramatically from 32 visits per 100 male children in 1975 to 111.3 visits per 100 male children in 1990, an increase of 247.8 percent. The increase was only slightly less for females, with a visit rate climbing from 31.1 visits per 100 female children in 1975 to 92.7 visits per 100

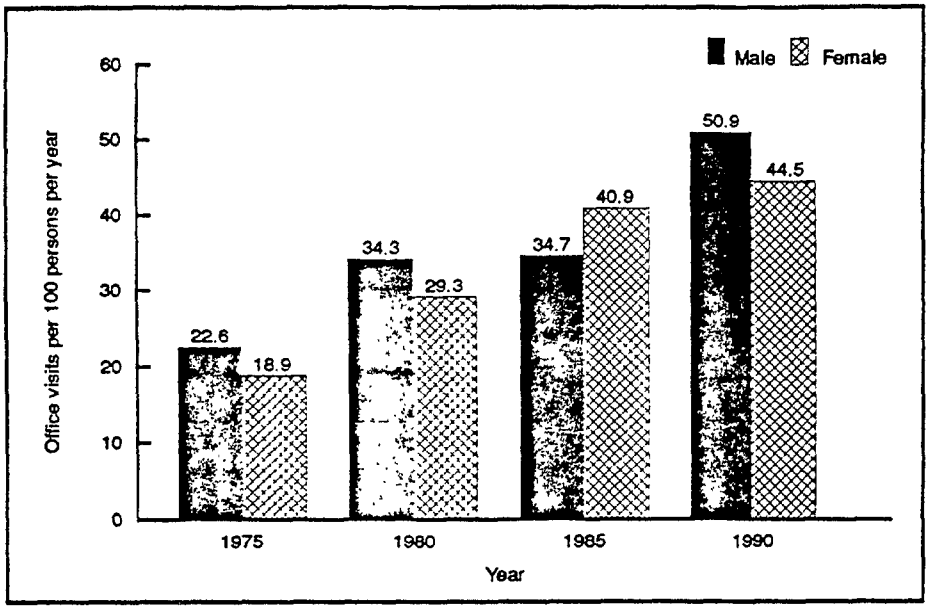


Figure 5. Annual otitis media visit rates for patients aged 2–5 years by sex: United States, 1975–90

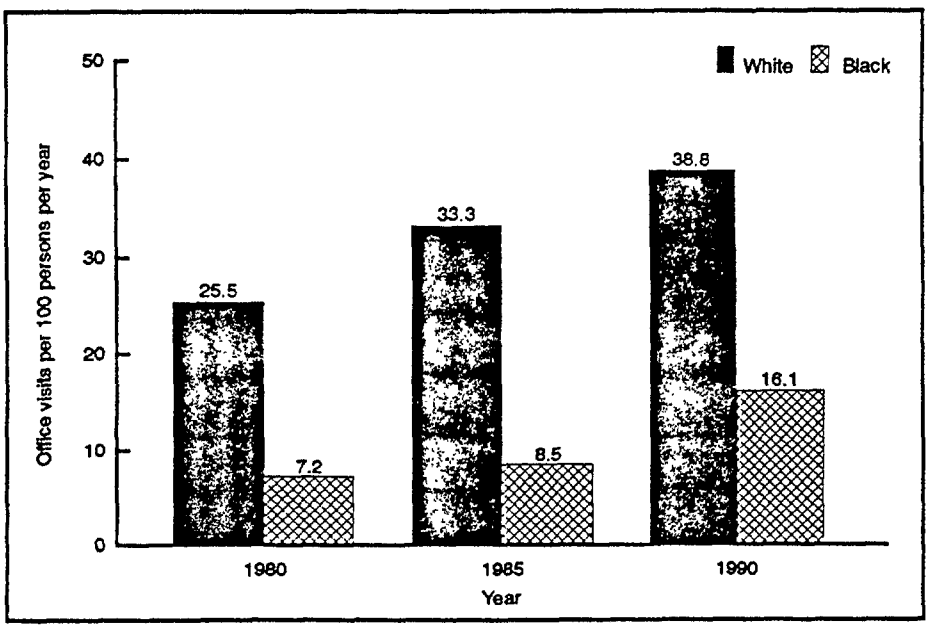


Figure 6. Annual otitis media visit rates for patients aged less than 15 years according to race: United States, 1980–90

in 1990, or a difference of 198.1 percent (figure 4).

Significant increases were also noted among males and females aged 2–5 years between 1975 and 1990, with the male visit rate rising from 22.6 visits to 50.9 visits per 100 males, and the rate for females climbing from 18.9 visits to 44.5 visits per 100 females (figure 5). Visit rates for males and females in the age groups 6–10 years and 15 years and over did not appear to increase significantly during this time period. Estimates for the age group 11–14 years could not be compared, due to unreliably small estimates in earlier years.

Visit rates by race

Visit rates for a principal diagnosis of otitis media were significantly higher for white persons under the age of 15 years than for black persons in the same age group for 1980, 1985, and 1990. The small number of visits for otitis media made by black persons in 1975, and by black persons aged 15 years and over in 1980, 1985, and 1990 made calculation and comparison of these rates statistically unreliable. Rates for race categories other than white and black persons were statistically unreliable due to small sample size for all data years and did not permit comparisons.

White persons under the age of 15 years made about 25.5 visits per 100 in 1980, compared with 7.2 visits per 100 black persons aged less than 15 years in 1980. By 1990 corresponding visit rates were 38.8 and 16.1, respectively, with both groups showing an increase over the time period, although the increase was greater among white persons than among black persons (figure 6).

Visit rates by geographic region

Visit rates for four geographic regions of the United States (Northeast, Midwest, South, and West) were not found to differ significantly from each other either in 1975 or in 1990, although substantial increases were noted in each of these four regions over the 1975–90 time period. The pattern of change varied by region (figure 7).

The overall otitis media visit rate for the northeast region jumped from 3.9 visits per 100 persons in 1975 to 9.2 visits per 100 persons in 1980, making the northeastern visit rate for 1980 substantially higher than the three other regional rates. The northeastern visit rates for 1985 and 1990 did not change significantly from the 1980 level.

In the midwestern region a significant increase in the otitis media visit rate was seen between 1980 and 1985, when the rate rose from 5.0 visits per 100 persons to 8.2 visits per 100. Significantly higher visit rates were found in the southern region in 1990 compared with 1985 and in the western region in 1985 compared with 1975.

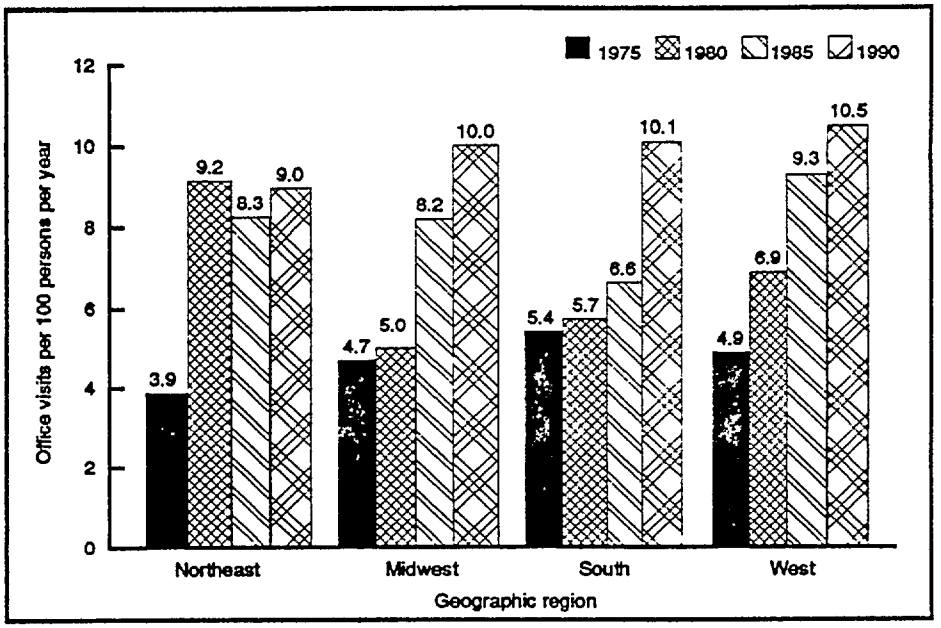


Figure 7. Annual otitis media visit rates by geographic region: United States, 1975–90

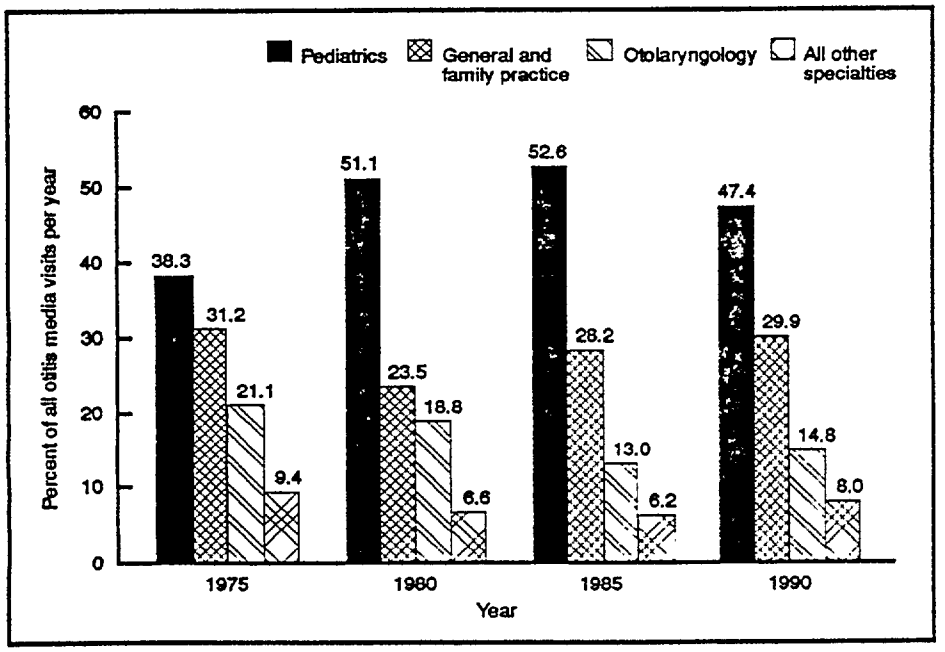


Figure 8. Percent of otitis media visits by physician specialty: United States, 1975–90

Physician characteristics

Table 4 presents data on visits with a principal diagnosis of otitis media by physician specialty. Major findings are summarized below.

Physician specialty

In 1975 the majority of visits with a principal diagnosis of otitis media were made to pediatricians (38.3 percent), general and family practitioners (31.2 percent), and otolaryngologists (21.1 percent). By 1990 the distribution of visits by physician specialty had not changed significantly. Pediatricians received 47.4 percent of the total in 1990, followed by general and family practitioners with 29.9 percent and otolaryngologists with 14.8 percent of the total number of visits with a principal diagnosis of otitis media (figure 8).

Visit rates to selected specialties

The visit rate for a principal diagnosis of otitis media increased significantly for pediatricians and general and family practice physicians between 1975 and 1990 (figure 9). The visit rate to pediatricians increased from 1.8 visits per 100 persons in 1975 to 4.7 visits per 100 in 1990. About 1.5 visits per 100 persons were made to general and family practice physicians in 1975, compared with 3.0 visits per 100 persons in 1990. The rate of visits with a first-listed diagnosis of otitis media did not differ significantly for otolaryngologists between 1975 and 1990.

An examination of visit rates by age to pediatricians and general and family practitioners shows that the largest increase in visits for otitis media occurred among visits to pediatricians by patients aged less than 2 years (figure 10). Substantial increases in the visit rate to these specialties were also noted for visits made by patients aged 2–5 years (figure 11). These findings parallel the changes described earlier in overall visit rates by age.

Visit characteristics

Reason for visit

Item 9 of the Patient Record asks the physician to record the patient's most important complaint, symptom, or other reason for this visit using the patient's (or patient surrogate's) own words. Before 1977 these responses were classified according to The National Ambulatory Medical Care Survey, symptom classification (SC) (3). From 1977 to the present, reasons for visit have been classified and coded according to "A Reason for Visit Classification for Ambulatory Care" (RVC) (4). The 10 most frequently mentioned principal reasons for visits with a first-listed diagnosis of otitis media in 1990 are

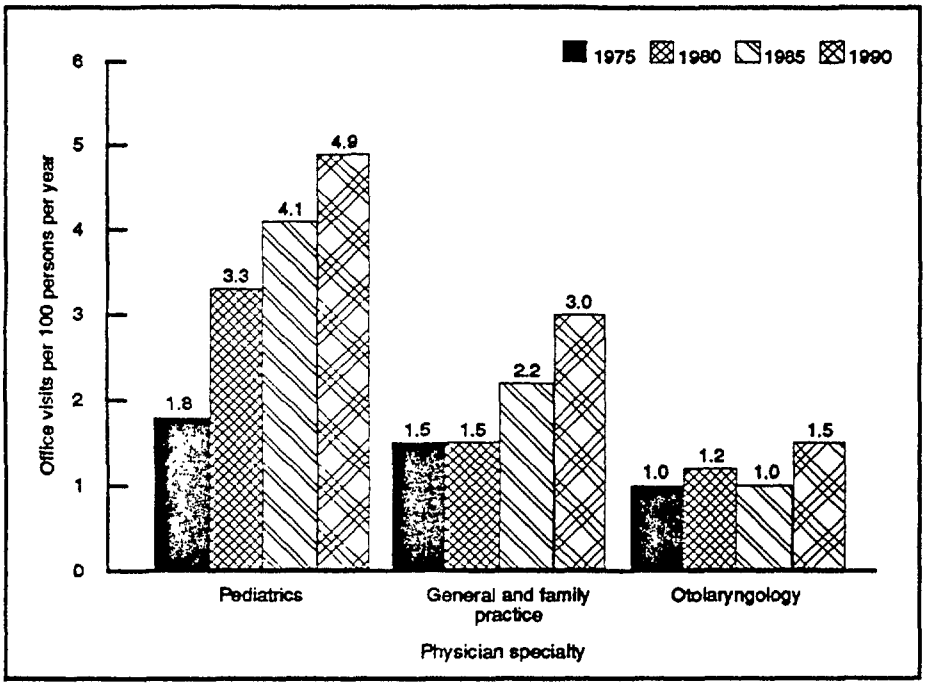


Figure 9. Annual otitis media visit rates for selected physician specialties: United States, 1975–90

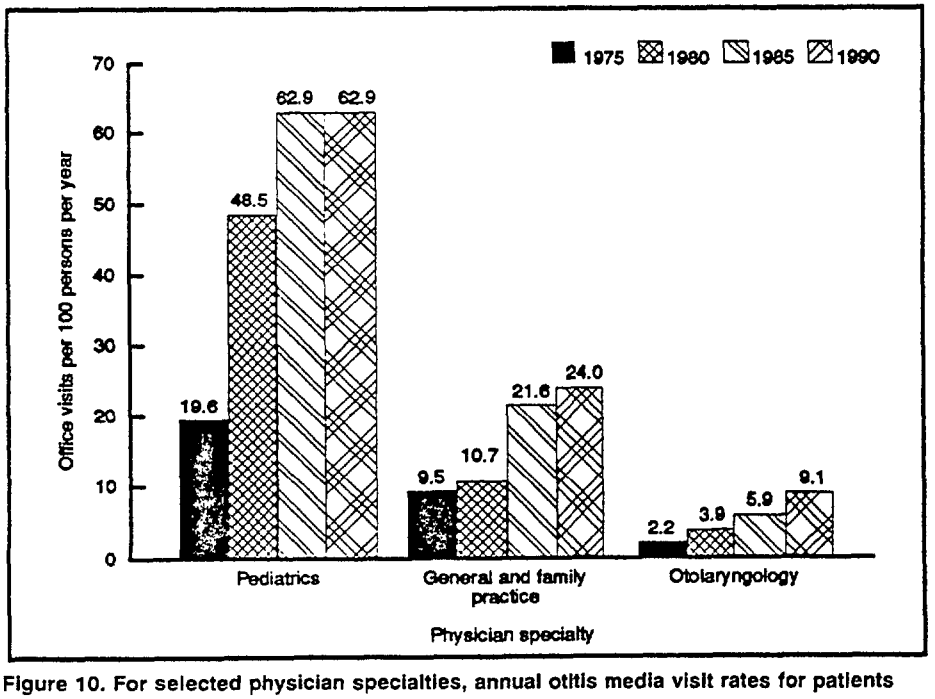


Figure 10. For selected physician specialties, annual otitis media visit rates for patients aged less than 2 years: United States, 1975–90

displayed in table 5. They have not changed substantially since 1975.

Prior-visit status

During 1990 about 57.0 percent of otitis media visits were made by "old" patients (patients who had seen the physician on a prior occasion) who were returning for care of an "old" problem (a problem that had been treated previously by the physician), 28.2 percent were made by patients returning to the physician for care of a new problem, and 14.8 percent were made by new patients. These percentages were not statistically different from those reported in 1975. No significant changes were noted in prior-visit status by age category between 1975 and 1990.

Diagnosis and treatment

The format used on the Patient Record to record diagnostic and therapeutic services ordered or provided by the physician at the office visit has undergone considerable revision since 1975, making categorical comparisons difficult for the years in question here. For 1990 about 74.1 percent of visits with a principal diagnosis of otitis media indicated that none of the diagnostic services listed were ordered or provided by the physician. In addition, 22.2 percent of visits included a mention of counseling and/or advice, and 5.8 percent included nonmedication therapy ordered or provided to the patient.

Despite the difficulties mentioned above in comparing diagnostic and treatment categories, one treatment category has remained fairly constant on the Patient Record and shows that the majority of otitis media visits made during 1975–90 included a mention of medication ordered or provided by the physician. As used in the NAMCS, the term "medication" is interchangeable with the term "drug" and refers to all new or continuing medication ordered or provided by the physician at the visit, including prescription and nonprescription preparations. In 1975, medications were ordered or provided at 78.5 percent of the visits with a principal diagnosis of otitis media; the corresponding percentage was 84.1 percent for 1990. This difference was not found to be statistically significant.

More specific data on drugs ordered or prescribed by the physician at the visit began to be collected on the 1980 NAMCS survey. For 1980, 1985, and 1990, amoxicillin was the most frequently mentioned medication (generic or brand name product) ordered or prescribed at visits with a principal diagnosis of otitis media. A list of the 10 most

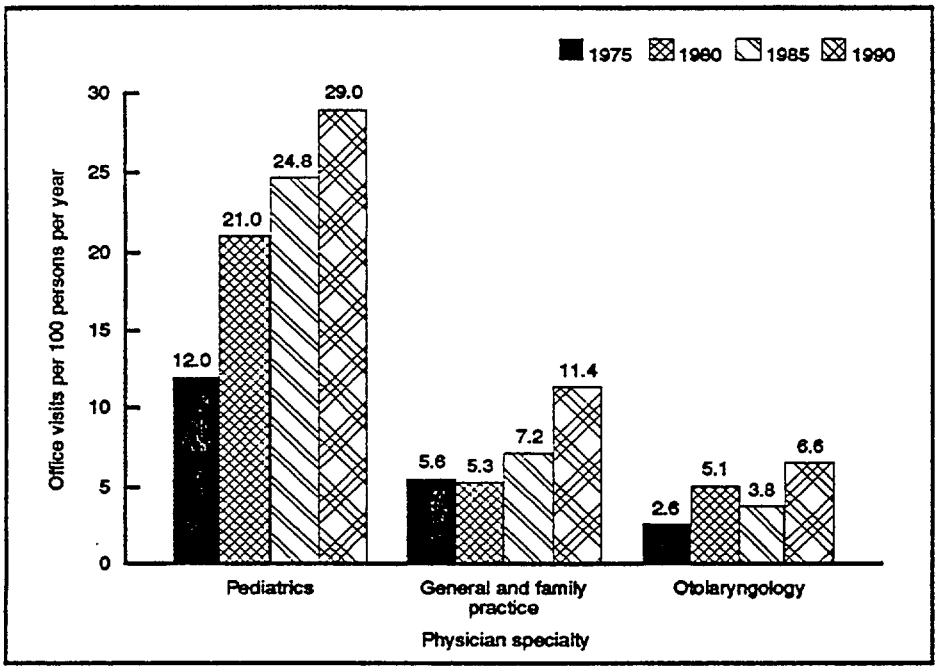


Figure 11. For selected physician specialties, annual otitis media visit rates for patients aged 2–5 years: United States, 1975–90

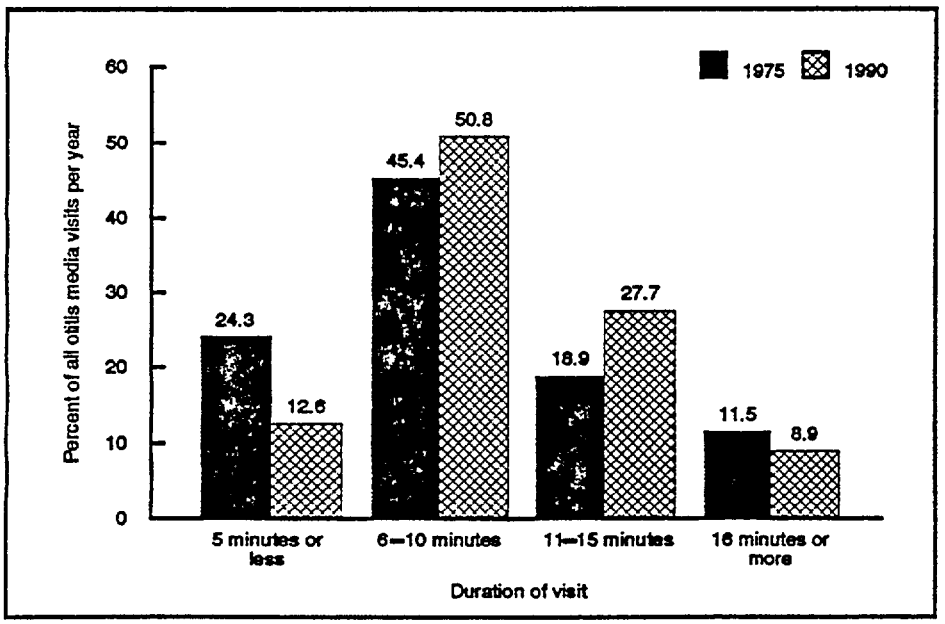


Figure 12. Percent of otitis media visits by duration of visit: United States, 1975 and 1990

frequently utilized medications for 1990 is shown in table 6.

Duration of visit

More than half (about 63 percent) of all visits with a principal diagnosis of otitis media lasted 10 minutes or less in 1975 and 1990. However, a higher percentage of visits in 1975 lasted 5 minutes or less (24.3 percent) compared with 1990 (12.6 percent). At the same time more visits in 1990 lasted 11–15 minutes (27.7 percent) compared with 1975 (18.8 percent). Data on duration of visit are displayed in figure 12.

Visit duration for the two youngest age groups appeared to increase between 1975 and 1990. Whereas more than one-third (34.9 percent) of visits made by patients under the age of 2 years lasted less than 5 minutes in 1975, the same was true for only 11.3 percent of patients in this age group in 1990. Similarly, for visits made by those 2–5 years of age, about one-quarter (25.6 percent) lasted 5 minutes or less in 1975 compared with just 12.7 percent in 1990.

There appeared to be a substantially higher percentage of visits of short duration among younger patients (66.6 percent of visits by patients aged 0–24 years lasted 10 minutes or less in 1990), compared with older patients (38.4 percent of visits made by patients aged 25 years and over lasted 10 minutes or less in 1990).

Disposition of visit

More than half of all otitis media visits resulted in a scheduled return visit in 1975 (58.7 percent), not significantly different than the 65.1 percent found in 1990. The percent of otitis media visits resulting in a scheduled return visit did not appear to differ by age in 1975. However, in 1990, persons in the two youngest age groups (less than 2 years and 2–5 years) were found to be more likely to have a return visit scheduled than were those in the aggregated 15 years and over age group. Data on disposition of visit are displayed in table 7.

Otitis media as a principal diagnosis

In 1975, otitis media was the fifth most frequently mentioned morbidity-related principal diagnosis, and the eighth most common principal diagnosis overall.[2] (It should be kept in mind that the rank orderings presented within this report may not be entirely reliable, as some estimates may not differ statistically

[2]Morbidity-related diagnoses are those classifiable to illness or injury (ICD–9–CM codes 001–999). Diagnoses other than those related to illness or injury are classified by the ICD–9–CM supplementary classification codes V01–V82, and include general medical examinations, routine prenatal examinations, health supervision of an infant or child, etc.

from other near estimates due to sampling variability.) By 1990 it was the second most frequently mentioned principal diagnosis overall, after essential hypertension (table 8).

Furthermore, among visits made by males in 1990, otitis media was the most frequently reported principal diagnosis, recorded at approximately 4.6 percent of these visits, a significantly higher proportion than for visits by females. Among females, this diagnosis was listed at about 2.7 percent of visits. It was the second most frequent morbidity-related principal diagnosis after essential hypertension among females and the fourth most frequent of all reported diagnoses among females.

Ranked diagnoses by age group

For 1975 and 1990 otitis media was the most frequently reported morbidity-related principal diagnosis among visits made by children under the age of 2 years. However, the percentage of visits for otitis media made by children in this age group increased from 7.3 percent of all visits made by children under age 2 in 1975 to 17.4 percent of all visits in this age category in 1990.

A similar pattern was seen among children aged 2–5 years, with visits for otitis media, the most frequently reported principal diagnosis in this age group in 1975 and 1990, jumping from 10.4 percent of the total in 1975 to 18.1 percent in 1990.

Among children aged 6–10 years, otitis media was the most frequently mentioned morbidity-related principal diagnosis for 1975 and 1990, representing 6.9 percent and 10.5 percent, respectively, of visits made by this age group.

Although it ranked 6th as a morbidity-related principal diagnosis among those 11–14 years of age in 1975 (2.6 percent of visits), otitis media was the most frequently reported morbidity-related principal diagnosis among this age group in 1990, accounting for 5.2 percent of all visits made by children aged 11–14 years.

In comparison, for visits made by persons aged 15 years and over, otitis media was listed as the principal diagnosis at only 0.6 percent of visits in 1975, making it the 20th most frequently mentioned morbidity-related principal diagnosis. For 1990 it was listed at 0.8 percent of visits in the age category 15 years and over, making it the 21st most frequent morbidity-related principal diagnosis, and the 24th most frequent of all principal diagnoses for this age group (figure 13).

Ranked diagnoses by physician specialty

In 1975 about 1.3 percent of office visits to general and family practitioners resulted in a principal diagnosis of otitis media, making otitis media the 13th most frequently listed morbidity-related principal diagnosis among office visits to general and family practice physicians during that year. By 1990, however, 3.5 percent of all visits to this specialty listed otitis media as the principal diagnosis, making it the 3rd most frequently mentioned morbidity-related principal diagnosis among visits to general and family practice physicians.

Among visits to pediatricians, otitis media was the most frequently reported morbidity-related principal diagnosis for 1975 and 1990, but the percentage of visits with this diagnosis increased from 8.1 percent of the total number of visits to pediatricians in 1975 to 14.3 percent in 1990.

Otitis media was also the most frequently rendered principal diagnosis at office visits to otolaryngologists for 1975 and 1990, and the proportion of visits with this diagnosis increased from 12.8 percent of all visits to this specialty in 1975 to 20.2 percent in 1990 (figure 14).

Concomitant diagnoses

About 18.2 percent of visits with a principal diagnosis of otitis media in 1975 also listed a second diagnosis; for 1990, about 31.6 percent of visits did so. Diseases of the respiratory system were mentioned at 66.3 percent of visits listing a second diagnosis in 1975 and at 59.2 percent of visits listing a second diagnosis in 1990.

Otitis media as a second- or third-listed diagnosis

In addition to the 9.9 million office visits with a principal diagnosis of otitis media in 1975, an additional 2.9 million visits were made at which the second- or third-listed diagnosis was otitis media, for a total of about 12.8 million visits related to otitis media, or 2.3 percent of all visits made during that year. In 1990 otitis media was listed as the second or third diagnosis at an additional 5.9 million visits, for a total of about 30.3 million otitis media-related office visits, or approximately 4.3 percent of

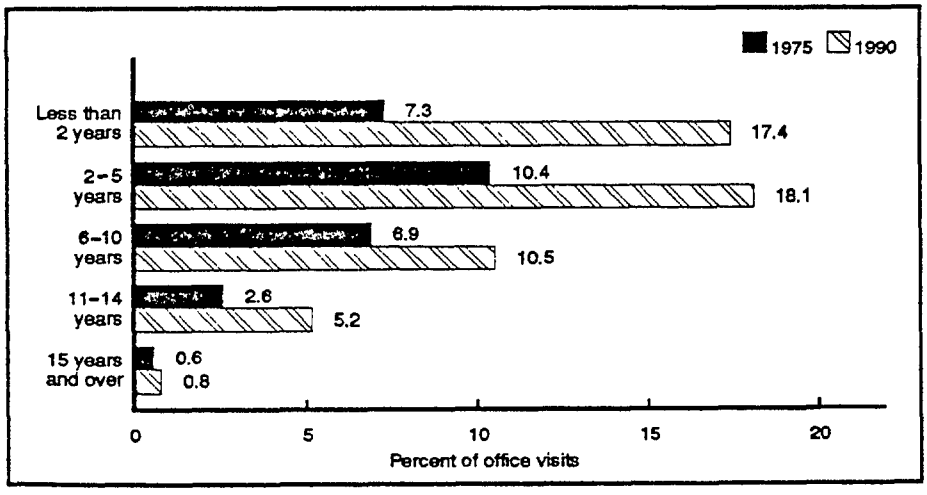


Figure 13. Percent of office visits with a principal diagnosis of otitis media by patient's age: United States, 1975 and 1990

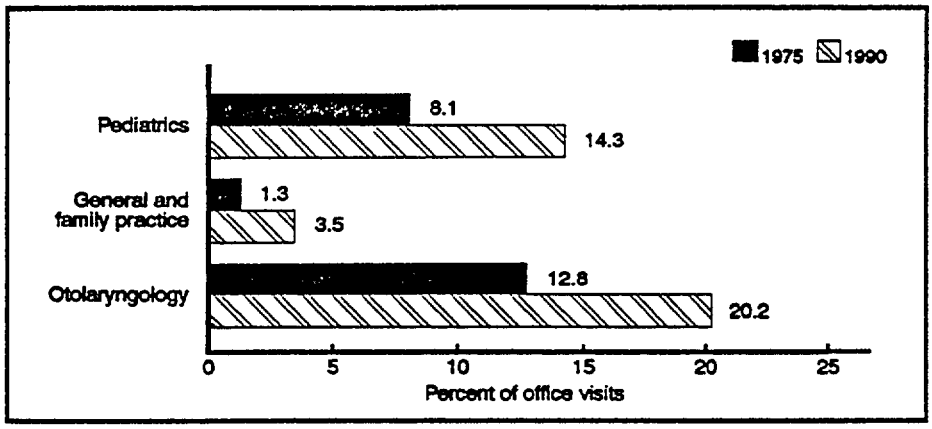


Figure 14. Percent of office visits with a principal diagnosis of otitis media for selected specialties: United States, 1975 and 1990

all visits made during this 12- month period. First-listed diagnoses for visits with a second- or third-listed diagnosis of otitis media were most frequently diseases of the respiratory system for 1975 and 1990.

Summary and discussion

Data from the National Ambulatory Medical Care Survey show a steady increase in the number and rate of physician office visits for otitis media over the period from 1975 to 1990. The annual visit rate during this period more than doubled, and for children under age 15, increased 175 percent. Though the increase is greatest for males under age 2, there are substantial increases for males and females under age 15. Reasons for this dramatic increase are not readily apparent. Data from the National Health Interview Survey (NHIS), however, suggest that the increased visit rate may reflect an increase in the incidence of ear infections. According to NHIS data, the incidence of acute ear infections among the U.S. population increased by about 40 percent between 1982 and 1990, from 6.1 to 8.6 conditions per 100 persons per year. This compares with an increase of about 52 percent in the physician office visit rate for otitis media, from 1980 to 1990. (Because of gaps in data collection, it is not possible to compare precisely concurrent time periods.) The under 15 age group, which accounts for about 80 percent of otitis media physician office visits, experienced a 60 percent increase in office visit rate from 1980 to 1990. This parallels data from the NHIS that show a 60 percent increase in the incidence of acute ear infections among the under 17 age group from 1982 to 1990 (5,6). The reporting of an acute ear infection in the NHIS does not necessarily equate to an incidence of otitis media, but the parallel increases in ear infection incidence and otitis media physician visits are mutually supportive and likely to be related.

References

1. National Center for Health Statistics. Eighth Revision International Classification of Diseases, adapted for use in the United States. Washington: Public Health Service. 1967.

2. Public Health Service and Health Care Financing Administration. International Classification of Diseases, 9th Revision, clinical modification. Washington: Public Health Service. 1980.

3. Meads S, McLemore T. The National Ambulatory Medical Care Survey: Symptom classification. National Center for Health Statistics. Vital and Health Stat 2(63). 1974.

4. Schneider D, Appleton L, McLemore T. A reason for visit classification for ambulatory care. National Center for Health Statistics. Vital and Health Stat 2(78). 1979.

5. National Center for Health Statistics. Current estimates from the National Health Interview Survey, United States, 1982. National Center for Health Statistics. Vital Health Stat 10(150). 1985.

6. Adams PF, Benson V. Current estimates from the National Health Interview Survey. National Center for Health Statistics. Vital Health Stat 10(181). 1991.

Table 1. Number, percent distribution, and annual rate of office visits with a principal diagnosis of otitis media by patient's age and sex: United States: 1975–90

Sex and age	*1975*	*1980*	*1985*	*1990*
		Number of visits in thousands		
Both sexes				
All ages	9,899	14,138	18,341	24,458
Under 15 years	6,991	11,160	15,014	19,680
0–1 year	1,860	4,280	6,819	8,146
2–5 years	2,796	3,926	5,337	7,145
6–10 years	1,787	2,383	2,295	3,297
11–14 years	548	571	562	1,092
15 years and over	2,907	2,979	3,328	4,777
15–24 years	805	1,051	1,036	927
25–44 years	1,027	1,052	1,154	2,056
45–64 years	698	525	638	1,239
65 years and over	*377	*351	500	555
Female				
All ages	5,201	6,489	9,483	11,731
Under 15 years	3,292	4,884	7,381	8,928
0–1 year	909	1,625	3,041	3,634
2–5 years	1,228	1,774	2,797	3,238
6–10 years	872	1,226	1,176	1,477
11–14 years	*283	*259	367	579
15 years and over	1,910	1,605	2,102	2,804
15–24 years	*496	510	628	565
25–44 years	697	629	728	1,297
45–64 years	*453	*257	423	643
65 years and over	*264	*209	323	*299
Male				
All ages	4,697	7,650	8,858	12,728
Under 15 years	3,698	6,276	7,633	10,753
0–1 year	951	2,655	3,779	4,512
2–5 years	1,569	2,152	2,540	3,907
6–10 years	914	1,157	1,119	1,820
11–14 years	*264	*312	*195	*514
15 years and over	1,000	1,374	1,225	1,975
15–24 years	*310	541	408	*362
25–44 years	*331	423	425	759
45–64 years	*245	*269	*215	597
65 years and over	*114	*141	*177	*257
Both sexes		Percent distribution		
All ages	100.0	100.0	100.0	100.0
Under 15 years	70.6	78.9	81.9	80.5
0–1 year	18.8	30.3	37.2	33.3
2–5 years	28.2	27.8	29.1	29.2
6–10 years	18.1	16.9	12.5	13.5
11–14 years	5.5	4.0	3.1	4.5
15 years and over	29.4	21.1	18.1	19.5
15–24 years	8 1	7.4	5.6	3.8
25–44 years	10.4	7.4	6.3	8.4
45–64 years	7.1	3.7	3.5	5.1
65 years and over	*3.8	2.5	2.7	2.3
Female				
All ages	52.5	45.9	51.7	48.0
Under 15 years	33.3	34.5	40.2	36.5
0–1 year	9.2	11.5	16.6	14.9
2–5 years	12.4	12.5	15.2	13.2
6–10 years	8.8	8.7	6.4	6.0
11–14 years	*2.9	*1.8	2.0	2.4
15 years and over	19.3	11 4	11.5	11.5
15–24 years	5.0	3.6	3.4	2.3
25–44 years	7.0	4.4	4.0	5.3
45–64 years	*4.6	*1.8	2.3	2.6
65 years and over	*2.7	*1 5	1.8	1.2

Table 1. Number, percent distribution, and annual rate of office visits with a principal diagnosis of otitis media by patient's age and sex: United States: 1975–90—Con.

Sex and age	*1975*	*1980*	*1985*	*1990*
Male		Percent distribution		
All ages	47.5	54.1	48.3	52.0
Under 15 years	37.4	44.4	41.6	44.0
0–1 year	9.6	18.8	20.6	18.4
2–5 years	15.9	15.2	13.8	16.0
6–10 years	9.2	8.2	6.1	7.4
11–14 years	*2.7	*2.2	*1.1	2.1
15 years and over	10.1	9.7	6.7	8.1
15–24 years	*3.1	3.8	2.2	1.5
25–44 years	*3.3	3.0	2.3	3.1
45–64 years	*2.5	*1.9	*1.2	2.4
65 years and over	*1.2	*1.0	*1.0	1.1
Both sexes		Number of visits per 100 persons per year[1]		
All ages	4.8	6.5	7.9	9.9
Under 15 years	13.1	22.5	29.1	36.0
0–1 year	31.5	64.7	93.5	102.1
2–5 years	20.8	31.9	37.7	47.8
6–10 years	10.2	14.4	14.1	18.2
11–14 years	3.3	4.0	4.1	8.0
15 years and over	1.9	1.8	1.8	2.5
15–24 years	2.1	2.6	2.7	2.7
25–44 years	2.0	1.7	1.6	2.6
45–64 years	1.6	1.2	1.4	2.7
65 years and over	*1.8	*1.5	1.9	1.9
Female				
All ages	4.8	5.8	7.9	9.3
Under 15 years	12.6	20.1	29.3	33.4
0–1 year	31.1	50.7	84.6	92.7
2–5 years	18.9	29.3	40.9	44.5
6–10 years	10.1	15.3	14.7	16.6
11–14 years	*3.5	*3.7	5.4	8.8
15 years and over	2.3	1.8	2.2	2.8
15–24 years	*2.5	2.5	3.2	3.2
25–44 years	2.6	2.0	2.0	3.2
45–64 years	*2.0	*1.1	1.8	2.7
65 years and over	*2.1	*1.5	2.0	*1.7
Male				
All ages	4.7	7.3	7.9	10.7
Under 15 years	13.6	24.8	28.9	38.4
0–1 year	32.0	77.9	102.1	111.3
2–5 years	22.6	34.3	34.7	50.9
6–10 years	10.3	13.6	13.5	19.7
11–14 years	*3.2	*4.4	*2.7	7.3
15 years and over	1.4	1.7	1.4	2.2
15–24 years	*1.6	2.8	2.2	2.1
25–44 years	*1.3	1.4	1.2	1.9
45–64 years	*1.2	*1.3	*1.0	2.7
65 years and over	*1.3	*1.4	*1.6	*2.1

[1]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized U.S. population as of July 1 for each survey year. Survey years 1975–1985 did not include Alaska and Hawaii, and population estimates for these years have been modified accordingly.

Table 2. Number, percent distribution, and annual rate of office visits with a principal diagnosis of otitis media for patients aged less than 15 years according to race: United States, 1975–90

Race and age	*1975*	*1980*	*1985*	*1990*[1]
		Number of visits in thousands		
Total	6,991	11,160	15,014	19,006
White	6,641	10,430	14,047	17,127
Black	*237	544	671	1,373
Other	*113	*186	*297	*507
		Percent distribution		
Total	100.0	100.0	100.0	100.0
White	95.0	93.5	93.6	90.1
Black	*3.4	4.9	4.5	7.2
Other	*1.6	*1.7	*2.0	*2.7
		Number of visits per 100 persons per year[2]		
Total	13.1	22.5	29.1	34.7
White	14.9	25.5	33.3	38.8
Black	*3.0	7.2	8.5	16.1
Other	*18.7	*16.9	*20.6	*24.9

[1]The 1990 NAMCS included an "unspecified" category in the race item. A total of 675,000 visits in 1990 having a race category of "unspecified" have been omitted from this table. Data years 1975–1985 imputed a race category where necessary.
[2]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized population of the United States as of July 1 for each survey year. Survey years 1975–1985 do not include Alaska and Hawaii, and population estimates for these years have been modified accordingly.

Table 3. Number, percent distribution, and annual rate of office visits with a principal diagnosis of otitis media by geographic region: United States, 1975–90

Geographic region	*1975*	*1980*	*1985*	*1990*
		Number of visits in thousands		
All visits	9,899	14,138	18,341	24,458
Northeast	1,934	4,460	4,134	4,491
Midwest	2,600	2,904	4,797	6,001
South	3,592	4,044	5,290	8,466
West	1,773	2,731	4,120	5,501
		Percent distribution		
All visits	100.0	100.0	100.0	100.0
Northeast	19.5	31.5	22.5	18.4
Midwest	26.3	20.5	26.2	24.5
South	36.3	28.6	28.8	34.6
West	17.9	19.3	22.5	22.5
		Number of visits per 100 persons per year[1]		
All visits	4.8	6.5	7.9	9.9
Northeast	3.9	9.2	8.3	9.0
Midwest	4.7	5.0	8.2	10.0
South	5.4	5.7	6.6	10.1
West	4.9	6.9	9.3	10.5

[1]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized population of the United States as of July 1 for each survey year. Survey years 1975–85 did not include Alaska and Hawaii, and population estimates for these years have been modified accordingly.

Table 4. Number, percent distribution, and annual rate of office visits with a principal diagnosis of otitis media by physician specialty: United States, 1975–90

Physician specialty	*1975*	*1980*	*1985*	*1990*
		Number of visits in thousands		
All visits with a principal diagnosis of otitis media	9,899	14,138	18,341	24,458
Pediatrics	3,795	7,225	9,641	11,581
General and family practice	3,087	3,320	5,165	7,301
Otolaryngology	2,088	2,654	2,393	3,620
All other specialties	929	939	1,142	1,956
		Percent distribution		
All visits with a principal diagnosis of otitis media	100.0	100.0	100.0	100.0
Pediatrics	38.3	51.1	52.6	47.4
General and family practice	31.2	23.5	28.2	29.9
Otolaryngology	21.1	18.8	13.0	14.8
All other specialties	9.4	6.6	6.2	8.0
		Number of visits per 100 persons per year[1]		
All visits with a principal diagnosis of otitis media	4.8	6.5	7.9	9.9
Pediatrics	1.8	3.3	4.2	4.7
General and family practice	1.5	1.5	2.2	3.0
Otolaryngology	1.0	1.2	1.0	1.5
All other specialties	0.4	0.4	0.5	0.8

[1]Based on U.S. Bureau of the Census estimates of the civilian, noninstitutionalized U.S. population as of July 1 for each survey year. Survey years 1975–85 did not include Alaska and Hawaii, and population estimates for these years have been modified accordingly.

Table 5. Number and percent distribution of office visits with a principal diagnosis of otitis media by patient's principal reason for visit: United States, 1990

Reason for visit[1]	*Number of visits in thousands*	*Percent distribution*
All visits with a principal diagnosis of otitis media	24,458	100.0
Earache or ear infection .S355	9,005	36.8
Other symptoms referable to ears, not elsewhere classified .S365	3,161	12.9
Fever .S010	2,151	8.6
Otitis media .D450	1,350	5.4
Cough .S440	1,279	5.1
Discharge from ear .S350	828	3.3
Head cold, upper respiratory infection (coryza) .S445	788	3.2
Hearing dysfunctions .S345	781	3.2
Nasal congestion .S400	767	3.1
Plugged feeling in ear .S360	624	2.5
All other reasons	3,724	15.9

[1]Based on "A Reason for Visit Classification for Ambulatory Care" (RVC), Vital Health Stat 12)78 1979.

Table 6. Number and percent distribution of office visits with a principal diagnosis of otitis media by the 10 most frequently used generic substances: United States, 1990

Generic substance[1]	*Number of drug mentions in thousands*	*Percent distribution*
All drug mentions for visits with a principal diagnosis of otitis media	29,006	100.0
Amoxicillin	9,845	33.9
Cefaclor	3,496	12.1
Trimethoprim	1,754	6.0
Sulfamethoxazole	1,754	6.0
Pentoxifylline	1,624	5.6
Phenylephrine	1,524	5.3
Erythromycin	1,498	5.2
Phenylpropanolamine	1,292	4.5
Sulfisoxazole	1,036	3.6
Hydrocortisone	1,012	3.5

[1]Frequency of mention combines single-ingredient agents with mentions of the agent in a combination drug.

Table 7. Number and percent distribution of office visits with a principal diagnosis of otitis media by disposition of visit according to patient's age: United States, 1975 and 1990

Disposition of visit[1]	*Number of visits in thousands*	*Patient's age*		
		0–5 years	*6–14 years*	*15 years and over*
1975		Percent distribution		
All visits	9,899	100.0	100.0	100.0
Return visit scheduled	5,813	60.2	56.4	58.3
Return if needed	2,478	24.7	21.8	28.2
No follow-up	1,204	11.6	*16.1	*9.8
Other[2]	670	*7.2	*7.4	*5.7
1990				
All visits	24,458	100.0	100.0	100.0
Return visit scheduled	15,918	73.2	56.9	46.6
Return if needed	5,405	17.4	24.3	35.2
No follow-up	2,227	6.9	12.1	13.4
Other[2]	1,893	7.2	*8.3	*9.1

[1]Total may exceed total number of visits because more than one disposition is possible per visit.
[2]Includes telephone followup, return to referring physician, admit to hospital, and "other".

Table 8. Number and percent distribution of office visits by the 10 most frequently mentioned principal diagnoses: United States, 1975 and 1990

Principal diagnosis and code	*Number of visits in thousands*	*Percent distribution*
1975[1]		
All visits	567,600	100.0
Medical or special examination Y00	40,863	7.2
Medical or surgical aftercare. Y10	26,782	4.7
Essential benign hypertension 401	22,824	4.0
Prenatal care Y06	20,851	3.7
Acute respiratory infection, site unspecified 465	14,607	2.6
Neuroses 300	13,641	2.4
Chronic ischemic heart disease. 412	12,513	2.2
Otitis media 381	9,899	1.7
Diabetes mellitus. 250	9,671	1.7
Other eczema and dermatitis 692	9,667	1.7
1990[2]		
All visits	704,604	100.0
Essential hypertension 401	27,310	3.9
Otitis media[3]	24,458	3.5
Normal pregnancy. V22	23,561	3.3
General medical examination V70	21,043	3.0
Acute upper respiratory infections 465	20,555	2.9
Health supervision of infant or child V20	18,676	2.7
Diabetes mellitus. 250	15,303	2.2
Allergic rhinitis 477	12,123	1.7
Bronchitis, not specified as acute or chronic. 490	12,098	1.7
Acute pharyngitis. 462	11,536	1.6

[1]Diagnostic codes based on the *Eighth Revision International Classification of Diseases*, adapted for use in the United States (ICDA–8).
[2]Diagnostic codes based on the *International Classification of Diseases, 9th Revision, Clinical Modification*, (ICD–9–CM).
[3]Defined here to include ICD–9–CM codes 381.0–381.4 (nonsuppurative otitis media) and 382.0–382.9 (suppurative and unspecified otitis media).

Technical notes

Source of data and sample design

The information presented in this report is based on data collected by means of the National Ambulatory Medical Care Survey (NAMCS) from January 1990 through December 1990. The target universe of NAMCS includes office visits made in the United States by ambulatory patients to nonfederally employed physicians who are principally engaged in office practice, but not in the specialties of anesthesiology, pathology, or radiology. Telephone contacts and nonoffice visits are excluded.

A multistage probability sample design is used in NAMCS, involving samples of primary sampling units (PSU's), physician practices within PSU's, and patient visits within physician practices. For 1990, a sample of 3,063 nonfederal, office-based physicians was selected from master files maintained by the American Medical Association and American Osteopathic Association. The physician response rate for the 1990 NAMCS was 74 percent. Sample physicians were asked to complete Patient Records (see figure 2) for a systematic random sample of office visits occurring during a randomly assigned 1-week reporting period. Responding physicians completed 43,469 patient records.

Characteristics of the physician's practice, such as primary specialty and type of practice, were obtained from the physicians during an induction interview. The U.S. Bureau of the Census, Housing Surveys Branch, was responsible for the survey's data collection. Processing operations and medical coding were performed by the National Center for Health Statistics, Hospital Discharge and Ambulatory Care Survey Section, Research Triangle Park, North Carolina.

Previous NAMCS surveys employed a statistical design that is similar to that used for the 1990 NAMCS. Additional information pertaining to technical aspects of the other data years included in this report (1975, 1980, and 1985) is available upon request.

Sampling errors

The standard error is primarily a measure of the sampling variability that occurs by chance when only a sample, rather than an entire universe, is surveyed. The relative standard error of an estimate is obtained by dividing the standard error by the estimate itself; the result is then expressed as a percent of the estimate. Table I shows relative standard errors for estimated numbers of office visits in 1990, and table II presents relative standard errors for estimated numbers of drug mentions. Standard errors for estimated percents of visits are shown in table III.

Alternatively, relative standard errors for aggregate estimates may be calculated using the following general formula, where x is the aggregate of interest in thousands, and A and B are the appropriate coefficients from table IV.

$$\mathrm{RSE}(x) = \sqrt{A + \frac{B}{X}} \cdot 100.0$$

Table I. Relative standard errors for estimated number of office visits: National Ambulatory Medical Care Survey, 1990

Estimated number of office visits in thousands	*Relative standard error in percent*
200	48.2
400	34.2
522	30.0
600	28.0
800	24.3
1,000	21.8
2,000	15.6
5,000	10.3
10,000	7.7
15,000	6.1
20,000	6.7
50,000	4.8
100,000	4.3
500,000	3.8

Example of use of table: An aggregate estimate of 10 million visits has a relative standard error of 7.7 percent or a standard error of 770,000 visits (7.7 percent of 10 million).

Table II. Relative standard errors for estimated number of drug mentions: National Ambulatory Medical Care Survey, 1990

Estimated number of drug mentions in thousands	*Relative standard error in percent*
200	58.5
400	41.5
500	37.2
600	34.0
778	30.0
800	29.6
1,000	26.6
2,000	19.1
5,000	12.7
10,000	9.7
20,000	7.7
50,000	6.3
100,000	5.7
500,000	5.2

Example of use of table: An aggregate estimate of 10 million drug mentions has a relative standard error of 9.7 percent or a standard error of 970,000 visits (9.7 percent of 10 million).

Similarly, relative standard errors for percents may be calculated using the following general formula, where p is the percent of interest and x is the denominator of the percent in thousands, using the appropriate coefficient from table IV.

$$\mathrm{RSE}(p) = \sqrt{\frac{B\,(1-p)}{p\,x}} \cdot 100.0$$

Adjustments for nonresponse

Estimates from NAMCS data were adjusted to account for sample physicians who were in scope but did not participate in the study. This adjustment was calculated to minimize the impact of response on final estimates by imputing to nonresponding physicians data from visits to similar physicians. For this purpose, physicians were judged similar if they had the same specialty designation and practiced in the same PSU.

Test of significance and rounding

In this report the determination of statistical inference is based on the

Table III. Standard errors for percents of estimated numbers of office visits: National Ambulatory Medical Care Survey, 1990

Base of percent (visits in thousands)	Estimated percent					
	1 or 99	5 or 95	10 or 90	20 or 80	30 or 70	50
	Standard error in percentage points					
200	4.8	10.5	14.4	19.2	22.0	24.0
500	3.0	6.6	9.1	12.2	13.9	15.2
1,000	2.1	4.7	6.5	8.6	9.9	10.8
2,000	1.5	3.3	4.6	6.1	7.0	7.6
5,000	1.0	2.1	2.9	3.8	4.4	4.8
10,000	0.7	1.5	2.0	2.7	3.1	3.4
13,000	0.6	1.3	1.8	2.4	2.7	3.0
20,000	0.5	1.1	1.4	1.9	2.2	2.4
50,000	0.3	0.7	0.9	1.2	1.4	1.5
100,000	0.2	0.5	0.6	0.9	1.0	1.1
600,000	0.1	0.2	0.3	0.4	0.4	0.5

Example of use of table: An estimate of 30 percent based on an aggregate estimate of 13 million visits has a standard error of 2.7 percent or a relative standard error of 9.1 percent (2.7 percent divided by 30 percent).

Table IV. Coefficients appropriate for determining relative standard errors by type of estimate and physician groups: National Ambulatory Medical Care Survey, 1990

Type of estimate and physician group	Coefficient	
	A	B
Visits		
Overall totals	0.00138387	46.19541416
Doctors of osteopathy, general surgery, cardiovascular disease, psychiatry, urological surgery, dermatology, neurology, pediatrics, ophthalmology, otolaryngology, obstetrics and gynecology	0.01684812	8.03232318
Orthopedic surgery	0.02504087	15.06497239
"All other" specialties group	0.01820068	33.70580231
General and family practice, internal medicine	0.00669347	30.86108039
Drug mentions		
Overall totals	0.00259409	67.9417652
Doctors of osteopathy, orthopedic surgery, cardiovascular disease, psychiatry, urological surgery, dermatology, pediatrics, ophthalmology, otolaryngology, obstetrics and gynecology	0.02306475	11.46572351
General surgery, neurology	0.07521297	5.08446943
General and family practice, internal medicine	0.00856244	52.12780308
"All other" specialties group	0.03885901	58.83244791

t-test. The Bonferroni inequality was used to establish the critical value for statistically significant differences (0.05 level of confidence). Terms relating to differences such as "greater than" or "less than" indicate that the difference is statistically significant. A lack of comment regarding the difference between any two estimates does not mean that the difference was tested and found to be not significant.

In the tables estimates of office visits have been rounded to the nearest thousand. Consequently, estimates will not always add to totals. Rates and percents were calculated from original unrounded figures and do not necessarily agree with percents calculated from rounded data.

Population figures and rate computation

Population figures used in computing annual visit rates in this report are based on July 1, 1990, estimates of the civilian, noninstitutionalized population of the United States. For survey years 1975–85, data were collected only for the conterminous United States, and the original population estimates for these years were modified to exclude Alaska and Hawaii. For this reason the 1975–85 estimates are not considered to be official and are used solely to provide denominators for rate computation. Because of a recent revision in the modification technique, 1975–85 population estimates used in this report may differ slightly from those found in earlier NAMCS reports.

Definition of terms

Ambulatory patient—An ambulatory patient is an individual seeking personal health services who is not currently admitted to any health care institution on the premises.

Physician—A physician is a duly licensed doctor of medicine (M.D.) or doctor of osteopathy (D.O.) who is currently in office-based practice and who spends some time caring for ambulatory patients. Excluded from the NAMCS are physicians who are hospital based; who specialize in anesthesiology, pathology, or radiology; who are federally employed; who treat only institutionalized patients; or who are employed full time by an institution and spend no time seeing ambulatory patients.

Office—Offices are the premises physicians identify as locations for their ambulatory practice. These customarily include consultation,

examination, or treatment spaces that patients associate with the particular physician.

Visit—A visit is a direct personal exchange between an ambulatory patient and a physician (or a staff member working under the physician's supervision), for the purpose of seeking care and rendering personal health services.

Drug mention—A drug mention is the physician's entry of a pharmaceutical agent —by any route of administration— for prevention, diagnosis, or treatment. Generic as well as brand-name drugs are included, as are nonprescription and prescription drugs. Along with all new drugs, the physician also records continued medications if the patient was specifically instructed during the visit to continue the medication.

Drug Visit—A drug visit is a visit in which medication was prescribed or provided by the physician.

Number 215 • August 18, 1992

Advance Data

From the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Health Insurance and Utilization of Medical Care for Chronically Ill Children With Special Needs

Health of Our Nation's Children, United States, 1988

by Lu Ann Aday, Ph.D., Professor of Behavioral Sciences, The University of Texas School of Public Health

Introduction

This is one of a series of reports, subtitled *Health of Our Nation's Children*, based on data from the National Health Interview Survey on Child Health (NHIS-CH), and conducted in 1988 by the National Center for Health Statistics. Included in this series are reports on child care arrangements; developmental, learning, and emotional problems; exposure to environmental cigarette smoke; and health insurance coverage.

Through NHIS-CH, data were collected on a nationally representative sample of children 17 years of age and under. The questionnaire addressed a broad range of health-related topics. A brief description of the sample design and data collection procedures are summarized in the Technical notes. A detailed description of the study procedures and survey questionnaire can be found in the 1988 edition of the annual report "Current Estimates From the National Health Interview Survey" (1). The National Institute of Child Health and Human Development and the Maternal and Child Health Bureau jointly sponsored the survey.

The analyses reported here focus on the insurance coverage and health care utilization of chronically ill children with special needs, based on those who had one or more of the chronic conditions included in the NHIS-CH condition record; who were unable to perform age-appropriate roles; or who experienced pain, discomfort, or being upset often or all of the time due to the condition.

In recent years the characterization of "special populations" of children or those with "special needs" or "special health care needs" has been applied quite broadly to encompass those who may have serious physical, cognitive, developmental, learning, or emotional problems or disabilities; those who are socially or socioeconomically disadvantaged; and those who may be otherwise particularly "vulnerable" populations of children (2–7).

Characterizations of the elderly with special needs have tended to focus on those with chronic illness who experience serious limitations in activities of daily living (personal care tasks such as bathing or eating) or instrumental activities of daily living (home management tasks such as shopping or managing money) (8–10). No uniform definitions or estimates of functionally impaired children are available at the national level. Using the same data set on which these analyses are based, Newacheck and his colleagues have published estimates of the number and prevalence of chronic conditions among children, and how estimates of the magnitude of impact may vary, depending on the criteria of severity or functional impairment employed (11,12).

The National Center for Health Statistics, other agencies within the Department of Health and Human Services, and the Census Bureau are planning an array of surveys to monitor the impact of the Americans with Disabilities Act (ADA) and other disability-related programs. These studies will provide valuable information on the characteristics of chronically ill and disabled children and nonelderly as well as elderly adults.

The National Child Health Assessment Planning Project (NCHAPP), Albert Einstein College

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics
Manning Feinleib, M.D., Dr. P.H., Director

CDC
CENTERS FOR DISEASE CONTROL

of Medicine, is developing a state-of-the-art definition and protocol for identifying children with "special health care needs," which will be used in connection with these and related data gathering efforts. The 1993–94 National Health Interview Survey (NHIS) on Disability will collect a subset of the required information on a national sample of children.

The analyses reported here focus on a subgroup of children with special needs—those with selected chronic illnesses who experienced major limitations in their usual activities and/or serious pain and discomfort due to these conditions. Their insurance coverage, utilization of physician and hospital services, and prescribed medicines are examined by age, sex, race, ethnicity, family structure, income, and place of residence. The results pinpoint chronically ill children with special needs who may have the least access to routine medical care.

Data and methods

These analyses focus on children who were identified to have had one or more of a number of childhood conditions in the NHIS-CH condition record. Respondents were asked whether the child had ever had the condition; if so, whether they had it in the last 12 months; and for selected conditions, among those who had experienced it in the last year, whether it had lasted at least 3 months in the child's lifetime or if the interviewer judged it to be an obviously permanent condition. For conditions that met these criteria, the respondent was asked to answer a series of questions about whether the child had to miss any school, stay in bed, or otherwise limit usual activities, as well as how much pain, discomfort, or bother the child may have experienced during the past 12 months due to the condition. The respondent was also asked the number of nights, if any, the child had been hospitalized, the number of times a medical doctor or assistant was seen or talked to about the child's condition, and if the child had used prescribed medicines for the condition during the past 12 months.

Chronically ill children were identified, based primarily on the information provided in the NHIS-CH condition record. The conditions included frequent or repeated ear infections, digestive allergies, frequent diarrhea or bowel trouble, diabetes, sickle cell anemia, anemia, asthma, hay fever or respiratory allergies, epilepsy or seizures, frequent or severe headaches, arthritis or other joint problems, other musculoskeletal impairments, cerebral palsy, heart disease, and other conditions requiring surgery or lasting more than 3 months. This generally includes the list of chronic conditions identified by Newacheck and Taylor, except for eczema or any kind of skin allergy, deafness and hearing loss, blindness and vision impairment, and speech defects, which were excluded because questions regarding condition-specific activity limitation were not asked for these conditions (1,11). Further, these analyses were limited to conditions the child had experienced in the past 12 months *and* (for selected conditions) deemed to be relatively permanent, based on whether the child was reported to have had them at least 3 months or that the interviewer assessed to be obviously permanent. Newacheck and Taylor also included conditions in their national prevalence estimates that a panel of physician judges deemed to *ordinarily* have a duration of more than 3 months (11).

Chronically ill children with special needs were those who had one or more of the designated conditions, who were unable to engage in usual childhood activities (such as playing with other children or participating in games or sports), or experienced pain, discomfort, or being upset often or all of the time, based on questions asked in the conditions record. In addition, based on questions asked in the main questionnaire, children with one or more of the chronic conditions (listed earlier) were considered to have special needs, including those who reported that due to illness they were unable to perform or were limited in the kind or amount of their major activity (defined as playing for children under 5 years of age and going to school for those aged 5 to 17 years).

Results

Overall prevalence—The highest prevalence (and the percent and number) of children with chronic illness included in the 1988 NHIS-CH conditions record included hay fever or respiratory allergies (9.2 percent or 5.8 million), frequent or repeated ear infections (9.0 percent or 5.7 million), or asthma (4.2 percent or 2.7 million) (table 1). Conditions experienced by 2–3 percent of children (or 1.3 to 1.8 million) included frequent or severe headaches (2.8 percent), digestive allergies (2.5 percent), frequent diarrhea or bowel trouble (2.0 percent), or other conditions (2.3 percent). Conditions that occurred in less than 2 percent of children (or less than 1 million) were heart disease (1.5 percent); musculoskeletal impairments (1.0 percent), not including arthritis or other joint problems (0.5 percent); anemia (1.1 percent); epilepsy or seizures (0.7 percent); cerebral palsy (0.2 percent); diabetes (0.1 percent); and sickle cell anemia (0.1 percent).

Around 9.6 million (or 15.2 percent) children under 18 years of age with these conditions were estimated to have special needs—defined as those for whom the condition caused problems, such as missing school, staying in bed or otherwise limiting their usual activities, or experiencing pain or discomfort often or all of the time in the last year. The chronic conditions for which more than half of the children experienced these problems were cerebral palsy (90.9 percent), frequent or severe headaches (76.3 percent), epilepsy or seizures (65.5 percent), asthma (65.3 percent), frequent or repeated ear infections (63.5 percent), arthritis or other joint problems (62.1 percent), and other

musculoskeletal impairments (59.0 percent).

Subgroup prevalence—The prevalence of chronically ill children with special needs was higher for males (15.8 percent) than for females (14.5 percent) (table 2). The rates were also higher among nonminority than among minority children: 16 percent for white children compared with 12.4 percent for black children and 15.6 percent for non-Hispanic children compared with 12.1 percent for Hispanic children. The prevalence rates for children who lived neither with both biological parents nor their biological mother (10.8 percent), as well as for children who had neither private insurance nor Medicaid coverage (13.1 percent), were lower than the rates for their counterparts. As has been reported in studies conducted on this and other NHIS data sets, the lower prevalence reported for these groups, as well as minorities, may be due to underreporting and differential nonresponse for children in these categories (14–16).

Insurance coverage—About three-fourths of the children had private insurance coverage (76.2 percent), 11 percent had Medicaid coverage, and 12.8 percent had neither private insurance nor Medicaid coverage (table 3). Black and Hispanic chronically ill children with special needs were much less likely to have private insurance and more likely to have Medicaid coverage than were white chronically ill children. Hispanic children (23.4 percent) were almost twice as likely as non-Hispanic children (12.0 percent) to have neither private nor public insurance coverage. Children in families with incomes of less than $25,000 were much less likely to have private insurance coverage and substantially more likely to be uninsured (22.6 percent) compared with children from families with annual family incomes of $25,000 or more (5.5 percent). Children who lived in central cities were also less likely to have private insurance (67.5 percent) and more likely to be uninsured (15.8 percent) than were children who lived in more suburban areas—84.1 percent and 10.1 percent, respectively. Those who lived outside of metropolitan areas were also less likely to have private coverage (71.1 percent) and more likely to be uninsured (14.6 percent).

Physician utilization—More than 8 of every 10 (83.8 percent) chronically ill children with special needs had contact with a physician during the year (table 4). Those who did averaged about eight (7.9) visits. Children under 5 years of age (93.7 percent) were more likely to have seen a physician than were children 5 to 17 years of age (80.0 percent). Those who did not live with a biological mother *or* a biological mother and father were less likely to have seen a doctor (75.0 percent). Though not statistically significant, the proportion of uninsured children who had seen a physician (76.8 percent) tended to be lower than the proportion for those with private insurance (84.3 percent).

Among children who saw a physician, the mean number of visits was lower for children 5–17 years of age (7.3) compared with children under 5 years of age (9.1), for black (4.9) children compared with white (8.4) children, and for children who lived with their biological mother only (6.2) compared with children who lived with both parents (8.7). Mean visits were also lower for children in families earning less than $25,000 (6.9) compared with families earning $25,000 or more (8.9), as well as for children living in the central cities of metropolitan areas (7.0) compared with children living in more suburban areas (8.3).

Hospital utilization—Around 9 percent of the children had been hospitalized at least once during the year (table 5). Children under 5 years of age (12.3 percent) were more likely to have been hospitalized than were children aged 5–17 years (7.3 percent). Though the differences were not statistically significant, there was a tendency for minority and low-income children, who averaged fewer visits to a physician in the past year, to be more likely hospitalized.

Use of medicine—Nearly 80 percent of the children had taken prescribed medicine for their condition during the past year (table 5). The percents taking medications were higher for younger children (89.5 percent) compared with older children (74.6 percent), for white children (80.1 percent) compared with black children (73.7 percent), and for children who lived with a biological mother and father (81.7 percent) or a biological mother (75.8 percent) compared with children who did not live with a biological mother and father or a biological mother (70.9 percent).

Summary

In summary, a substantial proportion of Hispanic and low-income chronically ill children with special needs have neither private insurance nor Medicaid coverage. Those who averaged the fewest doctor visits during the past year for their condition (such as black or low-income children) also tended to be more likely to be hospitalized. Children who did not live with a biological mother or biological mother and father were least likely to have been to a physician or to be taking prescribed medications for their condition. These analyses pinpoint chronically ill children with special needs who are likely to have the least access to routine medical care. Further research is warranted to estimate the probable impact of the differential nonresponse and underreporting by minority and low-income respondents on these estimates.

References

1. Adams PF, Hardy AM. Current estimates from the National Health Interview Survey, 1988. National Center for Health Statistics. Vital Health Stat 10(173). 1989.
2. Aday LA. Health and health care of vulnerable populations. San Francisco, California: Jossey-Bass. In press.

3. Division of Special Populations Program Development. Program overview. Rockville, Maryland: U.S. Department of Health and Human Services, Bureau of Health Care Delivery and Assistance. 1990.

4. Institute of Medicine. Research on children and adolescents with mental, behavioral, and developmental disorders: Mobilizing a national initiative. Washington: National Academy Press. 1989.

5. Palfrey JS, Singer JD, Walker DK, Butler JA. Early identification of children's special needs: A study in five metropolitan communities. J of Pediatrics 111(5):651–659. 1987.

6. Shelton TL, Jeppson ES, Johnson BH. Family-centered care for children with special health care needs (2nd ed.). Washington: Association for the Care of Children's Health. 1989.

7. Stein REK, ed. Caring for children with chronic illness: Issues and strategies. New York: Springer. 1989.

8. Institute of Medicine. Disability in America: Toward a national agenda for prevention. Washington: National Academy Press. 1991.

9. Leon J, Lair T. Functional status of the noninstitutionalized elderly: Estimates of ADL and IADL difficulties. National Medical Expenditure Survey Research Findings 4. Agency for Health Care Policy and Research. Washington: U.S. Government Printing Office. 1990.

10. Thompson-Hoffman S, Storck IF, eds. Disability in the United States: A portrait from national data. New York: Springer. 1991.

11. Newacheck PW, Taylor WR. Childhood chronic illness: Prevalence, severity, and impact. Amer J Pub Health 82(3):364–371. 1992.

12. Newacheck PW, McManus MA, Fox HB. Prevalence and impact of chronic illness among adolescents. Amer J Disease of Children 145(12):1367–1373. 1991.

13. Andersen RM, Mullner RM, Cornelius LJ. Black-white differences in health status: Methods or substance? Milbank Mem Fund Q 65 (supp 1): 72–99. 1987.

14. Ries PW. Health of black and white Americans, 1985–87. National Center for Health Statistics. Vital Health Stat 10(171). 1990.

15. Zill N, Schoenborn CA. Developmental, learning, and emotional problems: Health of our Nation's children, United States, 1988. Advance data from vital and health statistics; no 190. Hyattsville, Maryland: National Center for Health Statistics. 1990.

16. Hidiroglou MA, Fuller WA, Hickman RD. SUPER CARP. Ames: Survey Section, Statistical Laboratory, Iowa State University. 1980.

Table 1. Number and percent of chronically ill children and those with special needs by condition: United States, 1988.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in the Technical notes]

Condition	*Children with condition*		*Children with condition who have special needs*	
	Number in thousands	*Percent*	*Number in thousands*	*Percent*
Frequent or repeated ear infections	5,735	9.0 (0.2)	3,580	63.5 (1.4)
Digestive allergies	1,593	2.5 (0.1)	512	32.3 (2.9)
Frequent diarrhea or bowel trouble	1,282	2.0 (0.1)	630	50.4 (3.5)
Diabetes	64	0.1 (0.02)	32	50.6 (13.2)
Sickle cell anemia	74	0.1 (0.02)	12	17.2 (8.1)
Anemia	703	1.1 (0.1)	179	25.5 (5.1)
Asthma	2,700	4.2 (0.2)	1,739	65.3 (2.1)
Hay fever or respiratory allergies	5,830	9.2 (0.3)	2,300	40.4 (1.4)
Epilepsy or seizures	422	0.7 (0.09)	269	65.5 (6.2)
Frequent or severe headaches	1,796	2.8 (0.2)	1,280	76.3 (2.2)
Arthritis or other joint problems	290	0.5 (0.06)	178	62.1 (6.3)
Other musculoskeletal impairments	630	1.0 (0.09)	358	59.0 (5.2)
Cerebral palsy	112	0.2 (0.04)	100	90.9 (6.0)
Heart disease	958	1.5 (0.1)	298	32.2 (3.7)
Other conditions	1,455	2.3 (0.1)	812	57.9 (2.8)

NOTE: Numbers in parentheses are the standard errors of the estimates. These estimates are based on those children included in the NHIS-CH condition record; for further details, see the text.

Table 2. Number and percent of chronically ill children with special needs by age, sex, race, Hispanic origin, family structure, family income, place of residence, and insurance coverage: United States, 1988.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in the Technical notes]

Characteristic	*Number of children in thousands*	*Percent of children*
All children[1]	9,636	15.2 (0.3)
Age		
Under 5 years	2,868	15.6 (0.6)
5–17 years	6,768	15.0 (0.4)
Sex		
Male	5,126	15.8 (0.5)
Female	4,510	14.5 (0.4)
Race		
White	8,199	16.0 (0.4)
Black	1,213	12.4 (0.8)
Hispanic Origin		
Hispanic	877	12.1 (1.2)
Non-Hispanic	8,587	15.6 (0.4)
Family structure		
Biological mother and father	5,838	15.0 (0.4)
Biological mother only	3,107	17.1 (0.7)
All other	692	10.8 (0.9)
Family income		
Less than $25,000	3,773	15.3 (0.6)
$25,000 or more	5,121	16.1 (0.4)
Place of residence		
MSA		
Central city	2,745	14.5 (0.7)
Not central city	4,468	15.2 (0.5)
Not MSA	2,423	15.9 (0.7)
Insurance coverage		
Private insurance	6,969	15.7 (0.4)
Medicaid	1,006	16.5 (1.3)
Neither	1,175	13.1 (0.9)

[1] Numbers for respective groups may not sum to total due to missing values.

NOTE: Numbers in parentheses are the standard errors of the estimates.

Table 3. Percent distribution of type of insurance coverage for chronically ill children with special needs, according to age, sex, race, Hispanic origin, family structure, family income, place of residence, and insurance coverage: United States, 1988.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in the Technical notes]

Characteristic	Number of children in thousands	Total	Insurance coverage		
			Private insurance	Medicaid	Neither
			Percent distribution		
All children[1]	9,150	100.0	76.2 (1.3)	11.0 (1.0)	12.8 (0.9)
Age					
Under 5 years	2,713	100.0	75.3 (1.9)	11.9 (1.5)	12.8 (1.6)
5–17 years	6,437	100.0	76.5 (1.5)	10.6 (1.2)	12.9 (1.0)
Sex					
Male	4,895	100.0	75.2 (1.6)	11.3 (1.3)	13.5 (1.3)
Female	4,254	100.0	77.3 (1.5)	10.7 (1.1)	12.1 (1.2)
Race					
White	7,818	100.0	80.2 (1.2)	7.8 (0.8)	12.1 (0.9)
Black	1,114	100.0	51.5 (4.5)	34.1 (4.4)	14.4 (2.2)
Hispanic origin					
Hispanic	784	100.0	53.5 (5.0)	23.2 (3.7)	23.4 (3.1)
Non-Hispanic	8,198	100.0	78.2 (1.2)	9.8 (0.9)	12.0 (0.9)
Family Structure					
Biological mother and father	5,677	100.0	86.1 (1.3)	3.2 (0.7)	10.6 (1.0)
Biological mother only	2,834	100.0	58.9 (2.3)	24.9 (1.9)	16.2 (1.9)
All other	638	100.0	64.5 (4.5)	18.2 (3.8)	17.4 (3.5)
Family Income					
Less than $25,000	3,414	100.0	52.7 (2.2)	24.7 (2.0)	22.6 (1.8)
$25,000 or more	5,003	100.0	93.2 (0.9)	1.4 (0.5)	5.5 (0.7)
Place of Residence					
MSA					
Central city	2,557	100.0	67.5 (2.3)	16.7 (2.0)	15.8 (1.6)
Not central city	4,287	100.0	84.1 (1.8)	5.8 (1.2)	10.1 (1.2)
Not MSA	2,306	100.0	71.1 (2.0)	14.3 (1.8)	14.6 (1.8)

[1]Numbers for respective groups may not sum to total due to missing values.

NOTE: Numbers in parentheses are the standard errors of the estimates. Also, the total number of cases in this table is less than the total number of children with special needs due to missing values on insurance coverage.

Table 4. Physician utilization for condition of chronically ill children with special needs, according to age, sex, race, Hispanic origin, family structure, family income, place of residence, and insurance coverage: United States, 1988.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in the Technical notes]

Characteristic	Physician utilization	
	Children with 1 contact or more for condition in past year	Contacts per child per year for those with 1 contact or more
	Percent	Mean number
All children	83.8 (0.9)	7.9 (0.5)
Age		
Under 5 years	93.7 (1.4)	9.1 (0.6)
5–17 years	80.0 (1.2)	7.3 (0.7)
Sex		
Male	83.1 (1.3)	8.3 (0.9)
Female	84.5 (1.2)	7.3 (0.5)
Race		
White	84.1 (1.0)	8.4 (0.6)
Black	84.5 (1.9)	4.9 (0.6)
Hispanic origin		
Hispanic	81.2 (3.1)	6.5 (0.7)
Non-Hispanic	84.0 (1.0)	8.0 (0.6)
Family structure		
Biological mother and father	86.3 (1.0)	8.7 (0.8)
Biological mother only	81.1 (1.8)	6.2 (0.4)
All other	75.0 (3.4)	7.6 (1.0)
Family income		
Less than $25,000	83.3 (1.6)	6.9 (0.5)
$25,000 or more	84.7 (1.1)	8.9 (0.8)
Place of residence		
MSA		
Central city	85.1 (1.6)	7.0 (0.6)
Not central city	84.6 (1.4)	8.3 (0.7)
Not MSA	80.8 (2.1)	8.0 (1.5)
Insurance coverage		
Private insurance	84.3 (1.0)	8.0 (0.5)
Medicaid	85.5 (2.5)	6.9 (0.8)
Neither	76.8 (3.8)	8.2 (2.5)

NOTE: Numbers in parentheses are the standard errors of the estimates.

Table 5. Percent of hospital utilization and use of medicine for condition of chronically ill children with special needs, according to age, sex, race, Hispanic origin, family structure, family income, place of residence, and insurance coverage: United States, 1988.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in the Technical notes]

Characteristic	Hospital utilization	Use of medicine
	Children with 1 night or more for condition in past year	Children using medicine for condition in past year
	Percent	
All children	8.8 (0.7)	79.0 (1.0)
Age		
Under 5 years	12.3 (1.2)	89.5 (1.1)
5–17 years	7.3 (0.9)	74.6 (1.3)
Sex		
Male	9.6 (1.2)	79.3 (1.4)
Female	7.9 (0.8)	78.7 (1.4)
Race		
White	8.5 (0.8)	80.1 (1.0)
Black	11.1 (1.9)	73.7 (3.1)
Hispanic origin		
Hispanic	11.5 (4.2)	75.6 (3.5)
Non-Hispanic	8.5 (0.7)	79.3 (1.0)
Family structure		
Biological mother and father	8.2 (0.9)	81.7 (1.2)
Biological mother only	9.8 (1.1)	75.8 (2.0)
All other	9.0 (2.1)	70.9 (3.5)
Family income		
Less than $25,000	10.6 (1.5)	78.3 (1.6)
$25,000 or more	7.4 (0.8)	79.5 (1.2)
Place of residence		
MSA		
Central city	8.7 (1.1)	77.6 (1.8)
Not central city	8.3 (1.0)	80.6 (1.4)
Not MSA	9.8 (1.5)	77.7 (2.1)
Insurance coverage		
Private insurance	8.0 (0.8)	79.6 (1.1)
Medicaid	13.5 (3.2)	75.7 (3.0)
Neither	5.4 (1.2)	77.6 (2.7)

NOTE: Numbers in parentheses are the standard errors of the estimates.

Technical notes

The estimates presented in this report are based on data from the National Health Interview Survey (NHIS), an ongoing survey of households in the United States, conducted by the National Center for Health Statistics. Each week, a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers obtain information about the health and other characteristics of each member of the households included in the NHIS sample.

NHIS consists of two parts: (a) a basic health questionnaire that remains the same each year and is completed for each household member, and (b) special topics questionnaires that vary from year to year and usually are asked of just one person in each family. In 1988 the special topics included acquired immunodeficiency syndrome (AIDS) knowledge and attitudes, medical device implants, occupational health, alcohol, and child health. These data sets can be linked to provide additional sources for analysis.

The total sample interviewed for 1988 for the basic health questionnaire consisted of 47,485 households containing 122,310 individuals. The total response rate was 95 percent. For the National Health Interview Survey on Child Health (NHIS-CH), one sample child 17 years of age and under was selected from each family with children in that age range. Information about the sample child was collected by face-to-face interview with the adult member who knew most about the sample child's health, who in most cases was the child's mother. Interviews were completed for 17,110 children 17 years of age and under, 95 percent of those identified as eligible on the basis of the basic health questionnaire. The overall response rate for NHIS-CH was 91 percent, the product of the response rates for the basic and the child health questionnaires.

Because the estimates presented in this report are based on a sample of the population, they are subject to sampling error. Standard errors are provided for each of the percents and means in this report to indicate the probable sampling errors of these estimates. The standard errors for this report were calculated using SUPER CARP, a software package designed to produce standard errors for estimates based on complex, multistage sample designs (16).

Persons for whom valid responses were not available for certain items were excluded from the analyses. Those variables for which estimates may be affected due to missing observations are noted in the text.

All differences discussed in this report are statistically significant at the 0.05 level unless otherwise noted. The *t*-test, with a critical value determined by the number of response categories for an individual variable, was used to test for all pairwise comparisons discussed.

Suggested citation

Aday LuAnn. Health insurance and utilization of medical care for chronically ill children with special needs. Advance data from vital and health statistics; no. 215. Hyattsville, Maryland: National Center for Health Statistics. 1992.

Number 216 • August 21, 1992

Advance Data

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

AIDS Knowledge and Attitudes for January-March 1991

Provisional Data from the National Health Interview Survey

by Ann M. Hardy, Dr. P.H., Division of Health Interview Statistics

Highlights

In general, levels of knowledge about acquired immunodeficiency syndrome (AIDS), especially about the major modes of transmission, were fairly high in the first quarter of 1991 and patterns of knowledge levels by sociodemographic factors were similar to those seen in past years. Several changes between the last quarter of 1990 and the first quarter of 1991 were noted including:

- An increase of 10 percentage points in the proportion who felt they knew a lot about AIDS.
- An increase of 3–6 percentage points in the percent of adults stating that various forms of casual contact were very unlikely or definitely not possible ways to transmit human immunodeficiency virus (HIV).
- An increase from 68 to 77 percent in the proportion who believe blood is routinely tested for HIV.
- A slight increase in the proportion who reported HIV antibody testing, excluding blood donation (from 11 to 14 percent).

Some new questions were added to the 1991 AIDS Knowledge and Attitudes Survey. Noteworthy findings include:

- Most of those who have never been tested for HIV apart from blood donation stated this was because they were not at risk of acquiring HIV infection.
- Half of all adults had heard of azidothymidine (AZT). Of those, most knew it could delay symptoms and that it was not a cure for AIDS. However, many were unsure about other aspects of AZT treatment.
- While 76 percent of adults believed condoms were at least somewhat effective in preventing sexual transmission of HIV, only 17 percent of persons knew that natural membrane condoms and latex condoms were not equal in preventing transmission of HIV and only 26 percent knew that oil-based lubricants could damage condoms. For both items, about two-thirds of adults indicated that they did not know the answer.

Introduction

The National Center for Health Statistics has included questions about HIV and AIDS as part of the National Health Interview Survey (NHIS) since 1987. The purpose of these questions is to provide population-based data on adults' knowledge about AIDS and transmission of HIV and on their experience with HIV antibody testing. Such information is used to help plan and monitor various educational and prevention programs. The questionnaire used in 1991 is the fourth version of this survey. Although new questions have been introduced in each version to meet changing data needs, many questions have been used repeatedly to allow for examination of trends. NCHS has routinely published results from this

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL

survey in *Advance Data From Vital and Health Statistics* (1–7). In addition, public use data tapes of the 1987–90 surveys are currently available and more detailed exploration of the data is encouraged.

The NHIS AIDS questionnaires have been developed by the National Center for Health Statistics and an Interagency Task Force created by the Public Health Service Data Policy Committee. The Task Force includes representatives from other centers within the Centers for Disease Control and from the Office of the Assistant Secretary for Health, the National AIDS Program Office, the National Institutes of Health, the Alcohol, Drug Abuse and Mental Health Administration, the Food and Drug Administration, the Office of Population Affairs, the Indian Health Service, the Agency for Health Care Policy and Research, and the Health Resources and Services Administration.

Data and methods

This report presents provisional data for the first quarter of 1991 for most items included in the NHIS AIDS questionnaire. Details about the sample design and the estimation procedure can be found in the technical notes at the end of this report. Table 1 shows percent distributions by response categories for the entire adult population as well various subgroups defined by age, sex, race and ethnicity, and education. In most cases, the actual questions asked are reproduced verbatim in the tables along with the response categories. Refusals and other nonresponse categories (generally less than 1 percent of total responses) are excluded from the denominator in the calculation of estimates, but responses of "don't know" are included. The NHIS AIDS survey uses the phrase "the AIDS virus" rather than "HIV" because it is felt to be more widely recognized; however, in this report the two terms are used synonymously.

When interpreting trend data, revisions in the questionnaire, whether in actual wording or in context and location of questions, must be considered. There were several important changes and additions to the 1991 questionnaire. First, the series of knowledge items that contain selected statements about HIV and AIDS (question 5 in the 1991 survey) had five possible responses in earlier versions of the questionnaire: definitely true, probably true, probably false, definitely false, and don't know. In 1991 the distinction between definitely and probably was eliminated, leaving true, false, and don't know as the only possible response choices.

Before 1991, in the section on HIV antibody testing, an initial question assessing whether persons had heard of the blood test to detect the AIDS virus infection was asked; those who were not aware of the test were skipped past the remainder of this section. In 1991 this lead-in was eliminated because of concern about people attempting to end the survey prematurely. Persons who truly were not familiar with HIV antibody testing would still have the option of responding "don't know" to questions in this section.

Several new items were added to the 1991 survey including the perceived likelihood of becoming infected by receiving care from an infected health care worker or by donating blood. Reasons why persons have not been tested for HIV were assessed. Items were added to assess respondents' knowledge about the HIV antibody test, about AZT, and about the proper use of condoms. Finally, a distinction between having a co-worker with HIV or AIDS and having other friends or relatives with the disease was made in 1991.

Selected findings

Sources of information—In 1991 the NHIS again asked about seeing or hearing public service announcements (PSA's) about AIDS. Seventy-nine percent of adults reported seeing a PSA on television; this is similar to the figure obtained in 1989 (the last time this question was asked). Forty-two percent of adults reported hearing an AIDS PSA on the radio, similar to the 45 percent reported in 1989.

In terms of more general sources of information, 85 percent of adults reported receiving information about AIDS from at least one source in the month before interview. Television programs were the most common; 72 percent of persons reported these as a source of AIDS information. Newspapers and magazines were reported by 43 and 39 percent, respectively. About one-third of adults reported radio programs as a source of information.

Two items about information received by children aged 10–17 years showed little change from 1990. About two-thirds of parents reported they had ever discussed AIDS with their children and 74 percent reported that their children received instruction at school about AIDS. As in the past, women were much more likely to have discussed AIDS with their children than men.

General knowledge about AIDS—An increase was noted from 1990 to 1991 in the percentage of adults who said they knew a lot about AIDS (from 19 to 29 percent). The proportions who said they knew some, little, or none decreased slightly.

The proportion of persons who reported having heard the AIDS virus called "HIV" increased slightly from 79 percent in the last quarter of 1990 to 83 percent in the first quarter of 1991. Awareness of this term remained lower among older persons, those with less than 12 years of education, and Hispanic adults.

In 1991 the possible responses to the series of knowledge statements changed from definitely true, probably true, probably false, definitely false, and don't know to true, false, and don't know. Because of this, the proportion with the correct response increased for all these questions in the first quarter of 1991 compared with the last quarter of 1990. However, for many of the

questions the proportion who responded "don't know" also increased.

Over 90 percent of adults knew that anyone with the AIDS virus could transmit it through sexual intercourse, that an infected pregnant woman could give it to her baby, and that there is no cure for AIDS at present. Even among those with less than 12 years of education, over 80 percent responded correctly to these questions.

Many adults were also aware that HIV decreases the body's natural protection against diseases (85 percent correct), that AIDS is an infectious disease caused by a virus (81 percent), that persons with HIV infection can look and feel well and healthy (80 percent), and that there is no vaccine available for AIDS or HIV (80 percent). The responses to these questions showed more variation by sociodemographic characteristics, particularly age and education, than did those to the questions on the major modes of HIV transmission. Older adults (those 50 years of age and over) and adults with less than 12 years of education were less likely to respond correctly than younger and more educated persons. In all groups, persons were more likely to respond "don't know" to the statements rather than to give the incorrect true-false response.

For other questions knowledge levels were lower. Seventy-seven percent of adults knew that a person could be infected with the AIDS virus and not have the disease AIDS. About two-thirds of adults were aware that there are drugs available that can lengthen the life of an infected person. Just over half of adults (56 percent) knew that AIDS can damage the brain and that early treatment of HIV infection can reduce symptoms in an infected person. Again, older and less educated persons showed less understanding of these facts about AIDS.

Misperceptions about transmission of AIDS and HIV—As in previous NHIS AIDS surveys, the 1991 survey assessed people's perception of the likelihood of transmission of HIV by various forms of casual and nonintimate contact. Possible response categories ranged from very likely to definitely not possible. Slight increases (of 3–6 percentage points) in the proportion who felt that transmission of HIV through most of these modes was either very unlikely or definitely not possible were noted in the first quarter of 1991 compared with the last quarter of 1990. However, misperceptions about transmission still persisted. About one quarter of all respondents erroneously believed sharing eating utensils with an infected person, eating in a restaurant where the cook was infected, being coughed or sneezed on by an infected person, or mosquitoes or other insects had at least some likelihood of transmission. As in the past, persons with more education, younger adults, and white adults were more likely to perceive these modes as unlikely to transmit HIV.

In 1990 the first instance of HIV transmission from an infected health care worker to several patients was reported (8). Followup studies of patients of other HIV infected health care workers conducted both before and after the report of these cases have not demonstrated any other instances where transmission to patients has occurred and the CDC estimates that this type of event is very rare (9). In 1991 a question was added to this section of the NHIS asking persons to assess the likelihood of getting HIV by being cared for by an infected nurse, doctor, dentist, or other health care worker. Over half (55 percent) of adults rated this as very or somewhat likely to transmit HIV. Only 6 percent of persons felt this would definitely not result in transmission, and 17 percent felt it would be very unlikely. There were slight differences among demographic subgroups in perceived likelihood of transmission for this type of contact.

Blood donation and blood screening—Forty-three percent of adults reported having ever donated blood; 19 percent had donated since March 1985 when routine screening of donated blood for HIV began and 7 percent had donated in the past year. Sixty-two percent of adults knew that a person could not get HIV while giving or donating blood for use by others, 29 percent felt they could, and 10 percent of adults did not know. Seventy-seven percent of adults in the first quarter of 1991 believed that blood donations are routinely tested for the AIDS virus. This is an increase from 68 percent reported in the last quarter of 1990. However, the proportion who did not know the answer to this question more than doubled between 1990 and 1991 from 7 to 16 percent. These changes may be due in part to the elimination in 1991 of the question that first asked if persons were aware of the blood test to detect HIV infection before proceeding to other questions related to HIV testing. Of those who donated blood since 1985 and who were also aware that blood donations are screened for HIV, only 4 percent reportedly donated blood at least in part to be tested for HIV.

HIV antibody testing— Counting testing done for all reasons, including blood donation, 29 percent of adults in the United States have been tested for antibodies to HIV. The percent of adults tested for HIV apart from blood donation increased slightly from 11 percent at the end of 1990 to 14 percent in the first quarter of 1991. The remainder of this report discussing past experience with HIV testing is limited to testing apart from blood donation.

The 1991 NHIS attempted to determine why adults had not been tested for HIV. The most common response, given by 84 percent of those never tested (excluding donation), was that they did not consider themselves to be at risk for AIDS. Very few respondents (less than 2 percent) chose recognized barriers to testing such as fear of discrimination, not knowing where to go for testing, and not trusting the medical community to keep results confidential as reasons they had not been tested. The remainder listed another unspecified reason

(6 percent) or said they did not know why they had not been tested (9 percent).

For those who had been tested, the reported reasons for HIV antibody testing were similar in the first quarter of 1991 to those reported in 1990. Twenty-nine percent of those tested did so just to find out if they were infected. Another 7 percent were referred by their doctor, the health department, or their sex partner for testing. Fourteen percent had been tested because of a hospitalization or surgical procedure, 10 percent to apply for life insurance, and 7 percent for military induction or service. While immigration was only mentioned by 5 percent of all adults tested, it was mentioned by 26 percent of Hispanic persons tested.

As in 1990, most of those in the first quarter of 1991 who reported testing were tested at their doctor or HMO or at a hospital, emergency room, or an outpatient clinic (58 percent of those tested). These were the most commonly mentioned sites among all the various population subgroups examined. Seven percent each were tested at a community health clinic or a military induction or service site.

As in the past, about three-quarters of those tested got their results. Of those who did not receive results only 10 percent said they did not want them, 21 percent said they could not get them, and 53 percent said there was another reason they had not gotten their results. At least some in this latter category may have been persons whose results were not yet available and who will ultimately get their results. Also unchanged from 1990 is the way in which people reported getting their results: 62 percent received their results in person, 17 percent over the telephone, and 14 percent in the mail. In the first quarter of 1991, almost all adults tested said they felt their results were accurate (98 percent) and that their results were handled properly in terms of confidentiality (95 percent).

The proportion who indicated that they plan to be tested in the next year was 8 percent, similar to figures reported earlier. The figure was highest among black adults, 20 percent. Of those who plan to be tested, 65 percent said it would be because they wanted to know the results, 25 percent said it would be part of a blood donation, 7 percent each indicated it would be to apply for a job, to join the military, or to apply for a marriage license.

A new question was added in 1991 to determine more about people's understanding of the HIV antibody test. Seventy percent of adults recognized that after one is infected with HIV, there is a period of time before the blood test shows the infection; 26 percent responded "don't know" to this statement. While the proportion with the incorrect response was similar across sociodemographic groups, the percent who responded "don't know" was higher among older adults, Hispanic persons, and those with less education.

Awareness about AZT—The 1991 NHIS AIDS survey also assessed whether persons had heard of the drug AZT, the first antiviral drug approved for the treatment of HIV infection. Those who had heard of AZT were also asked a series of specific questions about AZT. In the first quarter of 1991, 50 percent of adults had heard of AZT. Familiarity with AZT increased sharply with years of education from 23 percent who had heard of AZT among those with less than 12 years of education to 68 percent for those with more than 12 years. Black adults were somewhat less aware of the drug than white persons (40 percent compared with 53 percent); Hispanic persons were less aware than either of these two groups (28 percent).

Among persons who had heard of AZT, 87 percent knew that AZT does not cure persons with AIDS and 80 percent knew that AZT can delay or slow down symptoms of HIV infection. The other knowledge items about AZT elicited fewer correct responses. Fifty-seven percent of adults knew that AZT has side effects and 33 percent were aware that the drug could only be used at certain times during the illness. Few persons actually gave the incorrect response to these two items; many (38 and 56 percent, respectively) responded "don't know." Almost half (49 percent) of persons were aware that there are other drugs to treat AIDS-related illnesses; again a large proportion (36 percent) said they did not know the correct answer to this question. This pattern of a high proportion being unsure of the correct answer to these three items was seen in all sociodemographic groups examined and few differences in the proportion with correct responses were noted.

Perceptions about condoms—In 1991 respondents were again asked to rate the efficacy of condoms as a means of preventing the sexual transmission of HIV. A slight increase in the proportion who rated condoms as very effective was noted between the last quarter of 1990 and the first quarter of 1991 (from 25 to 28 percent). The proportion who rated them as somewhat effective dropped slightly (from 53 to 48 percent) and the proportion who did not know how effective they were increased slightly (from 15 to 18 percent).

The 1991 survey contained two new questions to measure knowledge about the proper use of condoms. While three-quarters of adults in the first quarter of 1991 believed condoms to be at least somewhat effective in preventing the spread of HIV, far fewer were able to answer the specific questions about use correctly. Only 17 percent of adults correctly answered "false" to the statement that latex condoms and natural membrane condoms are equally good at preventing HIV transmission; 19 percent thought this statement was true. Most (62 percent) reported that they did not know the correct response. Younger persons were much more likely to give the correct response

than adults 50 years of age and over: correct responses also increased by years of education. White adults and males were slightly more likely to respond correctly than black or Hispanic adults or females. However, in all groups, the largest proportion of respondents did not know which response to choose. A similar pattern was noted for the second knowledge question about condoms. Twenty-six percent of adults knew that oil-based lubricants can cause latex condoms to break, 6 percent thought this statement was false and 66 percent did not know. Again, correct responses were noted more frequently among younger persons than those 50 years of age and over, among males than females, and among those with more than 12 years of education compared with those with less than 12 years.

Risk of HIV infection— Eighty-one percent of adults in the first quarter of 1991 felt they had no chance of having HIV infection; only 1 percent rated their chances of this as high or medium. Similarly, 74 percent of adults said they had no chance of getting HIV infection in the future. Twenty-two percent felt their chances were low and only 2 percent felt they were at high or medium risk for getting HIV. Only 3 percent of adults reported being in any of the behavior categories associated with an increased risk of HIV infection. These figures varied little by sociodemographic characteristics and are similar to figures reported previously.

Knowledge of someone with AIDS—In the past, the NHIS AIDS survey has assessed if adults had personally known someone with HIV infection or AIDS. In 1991 the distinction was made between having a co-worker with HIV and knowing others (friends or relatives) with the infection. Four percent of adults reported having had a co-worker with HIV or AIDS. This figure increased by years of education from 1 percent of those with less than 12 years to 7 percent for those with more than 12 years. Nine percent of persons reported having a friend or relative with the disease. This also increased with years of education.

References

1. Dawson DA, Thornberry OT. AIDS knowledge and attitudes for December 1987: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics; no 153. Hyattsville, Maryland: National Center for Health Statistics. 1988.
2. Hardy AM, Dawson DA. AIDS knowledge and attitudes for December 1988: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics; no 175. Hyattsville, Maryland: National Center for Health Statistics. 1989.
3. Hardy AM. AIDS knowledge and attitudes for October–December 1989: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics; no 186. Hyattsville, Maryland: National Center for Health Statistics. 1990.
4. Dawson DA. AIDS knowledge and attitudes for January–March 1990: Provisional data from the NationalHealth Interview Survey. Advance data from vital and health statistics; no 193. Hyattsville, Maryland: National Center for Health Statistics. 1990.
5. Fitti JE, Cynamon M. AIDS knowledge and attitudes for April-June 1990: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics: no 195. Hyattsville, Maryland: National Center for Health Statistics. 1990.
6. Adams PF, Hardy AM. AIDS knowledge and attitudes for July–September 1990: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics; no 198. Hyattsville, Maryland: National Center for Health Statistics. 1991.
7. Hardy AM. AIDS knowledge and attitudes for October–December 1990: Provisional data from the National Health Interview Survey. Advance data from vital and health statistics; no 204 . Hyattsville, Maryland: National Center for Health Statistics. 1991.
8. Centers for Disease Control. Update: Transmission of HIV infection during invasive dental procedures—Florida. MMWR 1991; 40:377–81.
9. Centers for Disease Control. Update: Investigations of patients who have been treated by HIV-infected health care workers. MMWR 1992; 41:344–6.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age			Sex		Race or ethnicity			Education		
		18–29 years	30–49 years	50 years and over	Male	Female	Non-Hispanic White	Non-Hispanic Black	Hispanic	Less than 12 years	12 years	More than 12 years
	Percent distribution											
Total	100	100	100	100	100	100	100	100	100	100	100	100
1. How much would you say you know about AIDS?												
A lot	29	33	34	20	29	29	29	26	28	14	25	40
Some	44	49	48	37	43	46	46	36	38	32	48	48
A little	20	16	15	27	21	18	18	24	24	33	22	11
Nothing	7	2	3	16	7	7	6	14	10	22	5	2
Don't know	0	–	0	0	0	0	0	–	–	–	0	0
2. In the past month have you—												
2a. Seen any Public Service Announcements about AIDS on television?												
Yes	79	80	80	76	80	78	80	81	70	70	82	81
No	19	18	18	20	18	19	18	17	28	27	16	17
Don't know	2	1	2	4	2	3	3	2	2	3	3	2
2b. Heard any Public Service Announcements about AIDS on the radio?												
Yes	42	52	46	31	48	37	42	49	45	31	44	47
No	54	45	51	65	48	59	55	49	52	65	53	50
Don't know	3	3	3	4	3	4	4	3	3	4	4	3
2c. Seen any Public Service Posters in airports about AIDS?												
Yes	10	12	10	7	12	8	9	11	12	6	8	13
No	89	86	88	91	86	91	89	88	84	92	91	85
Don't know	2	2	1	2	2	2	2	1	4	2	1	2
3. In the past month, have you received information about AIDS from any of these sources?[1]												
Television programs	72	73	73	71	73	71	72	75	70	69	74	72
Radio programs	32	38	35	24	38	27	31	38	36	24	32	36
Magazine articles	39	41	41	34	37	40	40	34	33	22	38	47
Newspaper articles	43	38	46	45	45	42	45	37	39	29	43	51
Street signs/billboards	16	23	17	9	19	13	15	20	16	9	14	21
Store displays/store distributed brochures	7	10	8	4	8	6	6	10	10	5	7	8
Bus/streetcar/subway displays	7	11	6	4	8	6	5	13	10	5	5	9
Health department brochures	14	19	15	8	13	15	13	18	18	10	13	16
Workplace distributed brochures	10	11	14	6	11	10	10	15	9	3	10	15
School distributed brochures	8	14	8	2	6	9	7	10	10	5	7	10
Church distributed brochures	4	4	4	3	4	4	3	7	4	3	4	4
Community organization	4	4	4	3	4	3	3	6	3	2	3	5
Friend/acquaintance	7	11	8	4	7	7	6	10	9	6	7	8
AIDS hotline	1	1	1	1	1	1	1	2	1	1	1	1
Other	3	3	3	2	2	3	3	3	3	2	2	4
Don't know	1	1	1	1	1	1	1	1	2	2	1	0
Received no AIDS information in past month	15	14	13	18	15	16	15	14	17	22	15	12
4. Have you heard the AIDS virus called by the name HIV?												
Yes	83	88	88	73	82	83	85	81	66	60	84	92
No	15	11	11	23	16	15	14	15	31	35	14	7
Don't know	2	1	1	4	2	2	2	4	3	5	2	1
5a. AIDS can reduce the body's natural protection against disease.												
True	85	87	91	77	86	84	88	72	78	66	86	95
False	4	4	3	5	3	5	3	9	3	6	5	2
Don't know	11	9	5	19	10	11	8	19	19	28	10	3
5b. AIDS can damage the brain.												
True	56	47	58	61	57	56	55	60	64	58	57	55
False	16	25	17	8	17	16	17	12	13	8	15	21
Don't know	28	28	24	31	27	28	28	28	23	34	28	24
5c. AIDS is an infectious disease caused by a virus.												
True	81	88	86	69	83	79	81	79	81	67	80	88
False	6	4	6	6	5	6	6	6	3	5	6	5
Don't know	14	8	8	24	12	15	13	15	16	27	13	7
5d. A person can be infected with the AIDS virus and not have the disease AIDS.												
True	77	78	84	68	77	77	80	68	64	57	78	86
False	7	9	6	6	7	7	6	10	9	8	7	5
Don't know	16	12	10	26	16	16	14	22	27	35	14	8
5e. ANY person with the AIDS virus can pass it on to someone else through sexual intercourse.												
True	95	96	97	92	95	95	95	94	96	91	96	96
False	1	2	1	1	2	1	1	2	1	1	1	2
Don't know	4	2	2	7	4	4	3	4	3	8	3	2

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age			Sex		Race or ethnicity			Education		
		18–29 years	30–49 years	50 years and over	Male	Female	Non-Hispanic White	Non-Hispanic Black	Hispanic	Less than 12 years	12 years	More than 12 years
	Percent distribution[1]											
5f. A pregnant women who has the AIDS virus can give it to her baby.												
True	94	96	97	91	93	95	95	92	94	88	95	97
False	1	0	1	1	1	0	0	1	1	1	1	0
Don't know	5	4	3	9	6	4	5	7	5	11	4	3
5g. A person who has the AIDS virus can look and feel well and healthy.												
True	80	84	86	69	80	79	82	74	63	60	79	90
False	7	6	6	9	7	8	6	9	11	11	9	4
Don't know	13	10	8	22	13	14	11	17	27	29	13	6
5h. There are drugs available which can lengthen the life of a person infected with the AIDS virus.												
True	67	63	72	63	67	66	70	56	53	51	65	77
False	9	12	9	7	10	9	8	17	14	10	11	7
Don't know	24	24	19	30	23	25	22	27	33	39	25	16
5i. Early treatment of the AIDS virus infection can reduce symptoms in an infected person.												
True	56	55	61	50	57	55	58	50	47	40	54	65
False	11	14	12	8	11	11	11	14	10	10	12	11
Don't know	33	31	27	41	32	34	32	36	43	50	34	24
5j. There is a vaccine available to the public that protects a person from getting the AIDS virus.												
True	4	4	3	4	4	3	3	7	6	7	3	3
False	80	83	87	68	81	78	82	69	69	60	81	88
Don't know	17	13	10	28	15	19	15	24	25	33	16	9
5k. There is no cure for AIDS at present.												
True	92	93	95	88	92	92	94	87	86	81	93	97
False	2	2	2	3	3	2	2	4	3	4	2	2
Don't know	6	5	3	10	5	6	4	10	11	15	4	2
6. How likely do you think it is that a person will get AIDS or the AIDS virus infection from—												
6a. Working near someone with the AIDS virus?												
Very likely	2	1	2	3	2	2	1	4	3	3	2	1
Somewhat likely	5	4	5	6	5	5	5	6	5	6	5	4
Somewhat unlikely	7	6	7	6	6	7	6	7	11	8	7	5
Very unlikely	41	40	43	41	43	40	43	40	32	37	41	44
Definitely not possible	40	45	42	33	39	40	41	34	41	30	40	44
Don't know	6	3	3	11	5	6	5	10	8	15	4	2
6b. Eating in a restaurant where the cook has the AIDS virus?												
Very likely	6	4	5	7	5	6	5	9	7	9	6	4
Somewhat likely	16	14	16	17	16	16	16	19	12	17	18	13
Somewhat unlikely	13	16	13	11	13	12	13	11	14	11	13	14
Very unlikely	35	37	37	30	36	34	36	31	30	27	33	41
Definitely not possible	21	23	23	17	21	22	21	16	24	15	21	24
Don't know	10	5	6	18	9	10	9	14	12	22	9	5
6c. Sharing plates, forks, or glasses with someone who has the AIDS virus?												
Very likely	10	7	10	11	10	10	9	14	11	13	12	7
Somewhat likely	18	16	18	20	19	17	18	19	17	20	19	17
Somewhat unlikely	12	14	13	11	13	12	13	11	11	10	13	13
Very unlikely	31	32	32	28	31	31	32	28	26	25	29	35
Definitely not possible	20	27	21	15	20	21	20	17	24	14	20	24
Don't know	9	5	6	15	8	9	8	11	11	18	8	5
6d. Using public toilets?												
Very likely	6	5	5	7	5	6	4	10	8	11	6	3
Somewhat likely	10	9	9	13	10	11	10	12	12	14	12	7
Somewhat unlikely	11	12	11	10	11	11	11	10	12	9	12	11
Very unlikely	36	36	38	33	37	35	37	33	30	29	34	41
Definitely not possible	29	34	32	22	30	29	30	23	26	20	29	34
Don't know	8	5	5	15	7	9	8	11	13	18	8	4

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age: 18–29 years	Age: 30–49 years	Age: 50 years and over	Sex: Male	Sex: Female	Race or ethnicity: Non-Hispanic White	Race or ethnicity: Non-Hispanic Black	Race or ethnicity: Hispanic	Education: Less than 12 years	Education: 12 years	Education: More than 12 years
	Percent distribution[1]											
6e. Sharing needles for drug use with someone who has the AIDS virus?												
Very likely	96	98	97	92	95	96	96	91	96	90	96	98
Somewhat likely	1	1	1	2	1	1	1	4	1	2	1	1
Somewhat unlikely	0	0	0	0	0	0	0	0	0	0	0	0
Very unlikely	0	0	0	0	0	0	0	1	0	1	0	0
Definitely not possible	0	0	0	0	0	0	0	0	0	0	0	0
Don't know	2	1	1	6	2	2	2	4	2	7	2	1
6f. Being coughed or sneezed on by someone who has the AIDS virus?												
Very likely	9	6	8	12	8	9	8	13	10	14	10	5
Somewhat likely	18	14	18	21	18	18	18	16	19	20	19	17
Somewhat unlikely	13	14	14	11	14	12	13	11	13	10	13	15
Very unlikely	32	37	33	27	33	31	33	30	28	24	30	38
Definitely not possible	18	23	19	12	17	18	18	17	17	12	18	20
Don't know	11	6	8	18	10	11	10	13	13	20	10	6
6g. Attending school with a child who has the AIDS virus?												
Very likely	2	0	2	2	2	1	1	3	2	3	2	1
Somewhat likely	4	2	4	5	4	4	4	5	5	5	5	3
Somewhat unlikely	7	7	7	7	7	7	7	9	7	6	8	7
Very unlikely	41	40	42	41	42	40	43	38	32	35	41	45
Definitely not possible	40	48	42	31	39	41	40	35	46	33	40	43
Don't know	6	3	3	13	6	6	6	10	8	17	5	2
6h. Mosquitoes or other insects?												
Very likely	9	10	9	10	10	9	8	15	12	13	10	6
Somewhat likely	17	18	17	16	18	16	16	23	18	18	18	16
Somewhat unlikely	8	10	8	6	8	8	8	6	8	7	8	9
Very unlikely	25	24	27	24	26	24	27	19	20	18	24	30
Definitely not possible	21	22	23	18	21	21	22	17	18	13	20	25
Don't know	20	17	16	27	17	22	19	21	24	31	20	14
6i. Being cared for by a nurse, doctor, dentist, or other health care worker who has the AIDS virus?												
Very likely	22	17	21	29	22	23	21	28	24	29	26	16
Somewhat likely	33	31	35	33	33	33	35	28	28	26	34	36
Somewhat unlikely	13	16	14	9	13	12	14	9	8	7	12	17
Very unlikely	17	20	19	13	18	17	18	13	15	13	14	22
Definitely not possible	6	9	6	3	6	6	5	9	11	7	6	6
Don't know	8	6	6	13	8	8	7	14	14	18	7	4
7. Can a person get AIDS or the AIDS virus infection while giving or donating blood for use by others?												
Yes	29	31	28	28	31	26	25	45	36	36	31	23
No	62	61	66	57	60	63	66	40	48	42	61	72
Don't know	10	8	7	15	9	10	9	14	16	22	9	5
10. Have you ever discussed AIDS with any of your children aged 10–17?[2]												
Yes	66	45	68	56	54	76	68	66	56	53	64	73
No	34	55	32	44	45	24	31	34	44	47	36	27
Don't know	0	–	0	–	–	0	0	–	–	–	0	–
11. Have any or all of your children aged 10–17 had instruction at school about AIDS?[2]												
Yes	74	51	75	78	72	76	73	80	77	68	74	76
No	9	12	9	6	7	10	10	4	7	8	9	9
Don't know	17	36	16	15	21	14	17	16	16	23	17	15
12. Have you ever given or donated blood?												
Yes	43	35	47	44	54	33	46	37	29	29	40	52
No	57	65	53	55	46	67	54	63	71	71	59	48
Don't know	0	0	0	0	0	0	0	0	0	0	0	0
13a. Have you donated blood since March 1985?												
Yes	19	26	23	9	22	16	20	15	16	7	17	26
No	81	74	77	91	77	84	80	85	84	92	83	73
Don't know	1	0	0	1	1	0	1	0	0	0	0	1
13b Have you donated blood in the past 12 months?												
Yes	7	9	8	3	8	6	7	4	6	3	6	10
No	93	90	91	96	91	94	92	95	94	97	94	90
Don't know	1	1	0	1	1	0	1	0	0	0	1	1

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age: 18–29 years	Age: 30–49 years	Age: 50 years and over	Sex: Male	Sex: Female	Race or ethnicity: Non-Hispanic White	Race or ethnicity: Non-Hispanic Black	Race or ethnicity: Hispanic	Education: Less than 12 years	Education: 12 years	Education: More than 12 years
							Percent distribution[1]					
14. How many times in the past 12 months have you donated blood?												
Once	3	5	4	1	4	3	4	2	3	2	3	5
Twice	2	2	2	1	2	1	2	1	2	1	1	3
Three times or more	2	2	2	1	2	1	2	1	1	0	1	2
Don't know	0	–	–	0	–	0	–	0	–	0	–	–
Did not donate blood in past 12 months	93	91	92	97	92	94	93	96	94	97	94	90
15. To the best of your knowledge, are blood donations routinely tested for the AIDS virus infection?												
Yes	77	80	82	68	76	77	80	66	64	60	77	85
No	7	6	7	9	8	7	6	10	12	10	8	5
Don't know	16	14	11	24	16	16	14	24	25	30	15	10
16. Was one of your reasons for donating blood because you wanted to be tested for the AIDS virus infection?[4]												
Yes	4	7	2	1	5	2	3	11	6	6	3	3
No	92	88	94	97	91	95	93	83	92	88	93	93
Don't know	0	0	–	–	0	–	0	–	–	–	0	–
17a. Except for blood donations since 1985, have you had your blood tested for the AIDS virus infection?												
Yes	14	20	16	6	15	12	12	22	20	11	13	16
No	81	76	79	86	79	83	82	73	75	82	81	80
Don't know	6	4	5	9	6	5	6	5	4	7	6	5
17b. Why haven't you been tested?[1,5]												
Don't consider myself at risk of AIDS	84	76	85	88	83	85	86	76	77	79	83	87
Don't believe anything can be done if I am positive	0	0	1	0	0	0	0	0	1	0	0	0
Don't like needles	1	2	1	0	1	1	1	3	1	1	1	1
Afraid of losing job, insurance, housing, friends, family if people knew I was positive	0	0	0	0	0	0	0	0	–	0	–	0
Don't trust medical clinics/hospitals to keep test results confidential	0	0	0	0	0	0	0	1	1	0	0	0
Already know whether I have the AIDS virus infection	0	0	0	0	0	0	0	0	–	1	0	0
Don't know where to go for a test	1	2	1	0	1	1	0	2	2	1	1	0
Other	6	8	6	6	6	7	6	8	8	6	6	7
Don't know	9	14	8	6	10	8	7	13	14	14	9	6
18. How many times have you had your blood tested for the AIDS virus infection, not including blood donations?												
Once	9	12	11	4	9	9	8	13	15	8	8	10
Twice	2	4	2	1	3	2	2	5	3	1	2	3
Three times or more	2	3	2	1	2	1	2	3	2	1	2	2
Don't know	0	0	0	1	0	0	0	1	0	1	0	0
Never had test[6]	87	80	84	95	85	88	89	78	80	89	88	85
19. How many times in the past 12 months have you had your blood tested for the AIDS virus infection, not including blood donations?												
None	7	10	9	2	8	6	6	9	11	5	6	8
Once	6	8	6	3	6	5	5	10	7	5	5	6
Twice	1	1	1	0	1	1	1	2	2	1	1	1
Three times or more	0	1	0	0	0	0	0	1	0	0	0	0
Don't know	0	0	0	0	0	0	0	0	–	0	0	0
Never had test[6]	87	80	84	94	85	88	89	78	80	89	88	85
20. Did you have any of the AIDS blood tests:[1,7]												
For hospitalization or a surgical procedure?	14	11	14	19	10	17	13	16	16	18	16	10
To apply for health insurance?	3	1	4	4	4	3	4	2	1	2	3	4
To apply for life insurance?	10	7	11	12	12	8	12	3	9	5	4	16
For employment?	6	8	5	4	8	4	5	10	6	6	7	6
To apply for a marriage license?	5	6	6	1	6	4	6	2	1	4	5	6
For military induction or military service?	7	11	5	2	11	2	8	6	3	1	9	8
For immigration?	5	5	5	5	5	5	1	4	26	15	2	3
Just to find out if you were infected?	29	31	27	27	30	27	26	41	25	26	30	28
Because of referral by the doctor?	5	7	4	5	3	8	6	6	5	7	7	4
Because of referral by the Health Department?	1	1	0	0	1	1	0	3	1	1	1	0
Because of referral by your sex partner?	1	1	1	0	1	0	1	1	1	1	1	1
Other	21	19	22	20	15	27	22	18	21	23	20	21
Don't know	1	0	1	1	1	1	1	–	0	1	1	0

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age: 18–29 years	Age: 30–49 years	Age: 50 years and over	Sex: Male	Sex: Female	Race or ethnicity: Non-Hispanic White	Race or ethnicity: Non-Hispanic Black	Race or ethnicity: Hispanic	Education: Less than 12 years	Education: 12 years	Education: More than 12 years
	Percent distribution[1]											
21. When was your last AIDS blood test for the AIDS virus infection not including blood donation?[7]												
'991	7	8	6	8	7	7	7	11	2	8	5	8
'990	40	39	39	42	37	43	38	44	37	37	40	39
'989	20	22	20	13	19	20	21	17	22	15	22	20
'988	12	13	12	11	13	11	12	9	15	16	11	12
'987	6	6	7	4	7	6	6	6	9	5	5	8
'986	3	3	4	1	4	2	3	2	2	3	2	4
'985	1	1	2	1	1	1	2	1	0	0	2	1
Don't know	7	6	6	11	8	5	7	6	11	11	7	5
22. Did you have your last AIDS blood test:[1,7]												
For hospitalization or a surgical procedure?	13	11	13	18	9	17	12	17	12	16	16	9
To apply for health insurance?	3	1	5	4	4	3	4	3	2	2	4	3
To apply for life insurance?	10	8	12	12	13	8	13	3	9	5	4	17
For employment?	6	8	5	4	8	4	5	10	6	5	7	6
To apply for a marriage license?	4	4	5	1	5	4	5	2	1	4	4	5
For military induction or military service?	7	10	5	2	11	2	7	5	4	2	8	7
For immigration?	4	4	4	5	5	4	1	3	23	14	1	3
Just to find out if you were infected?	28	30	27	27	29	27	26	40	24	24	31	26
Because of referral by the doctor?	5	7	4	4	3	7	5	6	4	7	7	3
Because of referral by the Health Department?	1	1	–	0	0	1	0	3	–	0	1	–
Because of referral by your sex partner?	1	1	0	0	1	0	1	1	0	0	1	1
Other	22	22	22	24	17	28	24	19	21	25	23	21
Don't know	0	0	1	0	0	1	1	0	0	1	1	0
23. Not including a blood donation, where was your last blood test for the AIDS virus done?[7]												
AIDS clinic/counseling/testing site	1	0	1	1	1	1	1	0	2	–	0	2
Community health clinic	7	9	6	4	7	8	6	11	6	7	9	6
Clinic run by employer	2	3	2	1	3	1	3	0	2	–	2	3
Doctor/HMO	31	29	31	38	30	32	31	30	38	38	27	31
Hospital/emergency room/outpatient clinic	27	25	27	30	21	34	26	32	25	34	32	21
STD clinic	1	1	0	–	1	0	0	0	3	2	0	0
Family planning clinic	0	1	0	–	0	1	0	0	2	1	0	0
Prenatal clinic	1	1	1	–	–	1	1	1	1	–	1	1
Tuberculosis clinic	–	–	–	–	–	–	–	–	–	–	–	–
Public clinic	3	4	2	0	3	2	2	5	3	4	3	2
Other clinic	2	3	2	3	3	2	3	2	3	1	2	3
Drug treatment facility	0	0	0	–	0	0	0	–	–	1	–	0
Military induction/service site	7	10	5	4	11	2	7	4	4	2	9	7
Immigration site	1	1	0	–	1	0	0	0	2	1	0	0
Other	15	12	19	13	17	13	17	13	9	6	11	21
Don't know	0	–	0	0	0	–	0	–	–	0	0	–
25. Did you get the results of your last test?[7]												
Yes	80	82	80	71	79	80	78	81	87	80	81	78
No	20	17	19	28	21	19	21	19	13	18	18	22
Don't know	1	0	1	1	0	1	1	1	–	2	0	0
26. Was this because you didn't want the results or was it because you were unable to get the results?[8]												
Didn't want	10	9	12	6	8	12	9	14	14	9	12	9
Unable to get	21	32	17	14	27	14	22	15	34	27	23	18
Both	2	1	1	5	1	3	1	6	–	7	–	2
Other	53	47	58	53	50	57	56	38	52	40	46	62
Don't know	13	9	12	22	14	12	12	26	–	18	18	8
28. Were the results given in person, by telephone, by mail, or in some other way?[9]												
In person	62	63	59	67	58	65	58	64	81	77	62	56
By telephone	17	15	18	18	15	18	19	14	4	15	16	18
By mail	14	16	15	9	19	9	14	18	13	6	16	16
Other	7	7	8	5	7	7	9	5	2	2	6	10
Don't know	–	–	–	–	–	–	–	–	–	–	–	–
29. Do you believe the results of your last test were accurate?[9]												
Yes	98	98	98	96	98	98	98	97	99	98	98	98
No	0	0	0	2	0	1	0	–	1	2	0	–
Don't know	2	2	1	3	2	1	1	3	0	1	2	2
30. Do you feel that the confidentiality of the results of your last test for the AIDS virus infection was handled properly?[9]												
Yes	95	96	94	98	95	95	95	98	94	96	94	96
No	2	2	2	1	2	2	2	2	3	2	3	2
Don't know	2	1	4	1	3	2	3	–	2	2	2	2

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age			Sex		Race or ethnicity			Education		
		18–29 years	30–49 years	50 years and over	Male	Female	Non-Hispanic White	Non-Hispanic Black	Hispanic	Less than 12 years	12 years	More than 12 years
	Percent distribution[1]											
31. Do you expect to have a blood test for the AIDS virus infection in the next 12 months?												
Yes	8	15	8	4	9	7	6	20	11	8	8	8
No	85	76	86	90	83	86	89	66	78	83	85	86
Don't know	7	9	6	7	7	7	5	14	11	10	7	6
32. Tell me if each of these statements explain why you expect to have the blood test in the next 12 months.[10]												
Because it will be part of a blood donation	25	24	25	27	26	23	31	10	30	19	23	29
Because it will be part of hospitalization or surgery you expect to have	6	6	7	6	5	8	6	7	6	10	7	4
Because you expect to apply for life or health insurance	7	9	6	4	8	6	7	7	11	8	7	7
Because you expect to apply for a job	7	9	6	3	8	6	7	6	8	7	9	5
Because you expect to join the military	4	6	3	–	5	2	2	5	7	7	2	3
Because you expect to apply for a marriage license	7	12	4	0	8	7	8	4	14	6	9	6
Because you want to know the results	65	76	55	58	65	64	55	80	75	86	66	54
Because it will be a required part of some other activity that includes automatic AIDS testing	21	16	24	27	22	19	22	18	21	15	23	22
33. Where will you go to have a blood test for the AIDS virus infection?[10]												
AIDS clinic/counseling/testing site	2	3	1	1	3	1	2	2	–	–	2	3
Community health clinic	10	13	9	6	10	11	6	16	14	14	12	7
Clinic run by employer	3	1	5	–	3	1	2	1	5	–	3	4
Doctor/HMO	39	36	39	48	36	42	41	39	29	44	37	39
Hospital/emergency room/outpatient clinic	18	17	16	23	17	18	15	21	22	19	18	17
STD clinic	0	0	1	–	1	0	0	–	–	–	0	1
Family planning clinic	0	1	0	–	0	1	0	0	2	0	0	0
Prenatal clinic	–	–	–	–	–	–	–	–	–	–	–	–
Tuberculosis clinic	0	1	–	–	1	–	–	1	–	–	1	–
Public clinic	3	4	3	0	1	4	2	4	5	6	3	1
Other clinic	3	2	3	4	3	3	3	1	4	4	2	3
Drug treatment facility	–	–	–	–	–	–	–	–	–	–	–	–
Military induction/service site	4	5	4	1	5	2	5	2	1	2	3	5
Immigration site	–	–	–	–	–	–	–	–	–	–	–	–
Other	0	0	1	–	0	0	0	–	2	–	1	0
Don't know	5	7	5	1	6	4	5	7	4	5	5	5
34. Tell me whether you think the following statements about the blood test for the AIDS virus infection are true or false or if you do not know whether they are true or false.												
34a. Sometimes the results of a blood test for the AIDS virus infection can be wrong.												
True	72	70	76	68	73	71	74	67	56	57	72	79
False	7	9	8	4	7	7	6	8	10	6	7	7
Don't know	22	21	17	28	20	22	20	25	34	36	21	15
34b. After a person becomes infected with the AIDS virus, there can be a period of time before the test shows the infection.												
True	70	75	74	61	70	70	72	69	56	54	70	78
False	4	4	4	3	4	3	3	4	4	3	4	4
Don't know	26	20	22	36	26	26	25	27	40	43	26	18
37. Have you ever heard of a drug called AZT, also known as Zidovudine or Retrovir?												
Yes	50	48	58	42	51	49	53	40	28	23	45	68
No	47	49	39	54	46	47	43	56	67	72	51	30
Don't know	3	3	3	4	3	4	3	4	5	4	4	3
38. Tell me whether you think the following statements about AZT are true or false or if you don't know whether they are true or false.[11]												
38a. AZT can delay or slow down the symptoms of AIDS virus infection.												
True	80	82	82	74	79	81	80	75	81	69	76	84
False	2	1	2	2	2	1	2	2	3	2	2	2
Don't know	18	16	16	23	19	18	18	23	16	29	22	15
38b. AZT cures people with AIDS.												
True	1	1	1	2	2	1	1	2	3	2	2	1
False	87	90	90	81	87	88	88	83	86	79	85	90
Don't know	11	9	9	17	12	11	11	15	11	19	13	9

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age			Sex		Race or ethnicity			Education		
		18–29 years	30–49 years	50 years and over	Male	Female	Non-Hispanic White	Non-Hispanic Black	Hispanic	Less than 12 years	12 years	More than 12 years
	Percent distribution[1]											
38c. AZT has no known side effects.												
True	5	6	5	5	5	5	5	8	3	7	6	4
False	57	61	61	49	57	58	58	50	59	45	48	65
Don't know	38	33	35	46	38	37	37	42	38	47	45	31
38d. AZT is appropriate for a person with the AIDS virus infection only at certain times during the illness.												
True	33	38	36	24	33	34	32	38	40	33	27	37
False	11	12	11	10	12	10	11	10	16	6	13	11
Don't know	56	50	52	66	55	56	57	51	44	60	60	53
38e. There are other drugs available to treat AIDS-related illnesses.												
True	49	46	54	42	52	47	51	41	41	36	43	55
False	15	18	14	13	14	15	14	19	26	16	16	14
Don't know	36	36	31	44	34	38	36	40	33	49	41	31
39. Did you have a blood transfusion at any time between 1977 and 1985?												
Yes	5	2	5	7	4	5	5	5	1	6	5	4
No	94	97	94	92	94	94	94	95	98	93	94	95
Don't know	1	1	1	1	1	1	1	1	0	1	1	1
40. Do you have frequent blood transfusions because of Sickle Cell or Chronic Anemia?												
Yes	0	0	0	0	0	0	0	1	–	0	0	0
No	100	100	100	100	100	100	100	99	100	100	100	100
Don't know	0	0	0	0	0	0	0	0	–	0	0	0
41. How effective do you think the use of a condom is to prevent getting the AIDS virus through sexual activity?												
Very effective	28	35	31	19	32	24	28	28	23	19	25	35
Somewhat effective	48	50	51	43	47	49	50	39	42	37	51	51
Not at all effective	4	3	4	4	3	4	3	5	5	6	4	3
Don't know how effective	18	11	13	29	16	20	16	26	25	33	19	10
Don't know method	2	1	1	5	2	3	2	2	5	5	2	1
42. Tell me whether you think the following statements are true or false or whether you don't know whether they are true or false.												
42a. Latex condoms and natural membrane condoms are equally good at preventing transmission of the AIDS virus.												
True	19	28	20	11	23	15	18	22	21	15	21	18
False	17	22	20	9	19	15	18	13	12	8	13	25
Don't know	62	49	59	76	57	67	62	63	63	72	64	56
Don't know method	2	1	1	5	2	3	2	2	5	5	2	1
42b. Oil-based lubricants can cause latex condoms to break.												
True	26	37	30	14	31	22	27	28	20	17	24	33
False	6	8	5	4	7	5	5	7	6	4	6	6
Don't know	66	54	63	77	61	70	66	63	69	74	69	59
Don't know method	2	1	1	5	2	3	2	2	5	5	2	1
43. What are your chances of having the AIDS virus?												
High	0	0	0	0	0	0	0	1	1	0	0	0
Medium	1	1	1	1	1	1	1	2	1	1	1	1
Low	16	22	17	9	17	14	16	18	10	9	14	20
None	81	74	80	88	79	83	82	75	85	86	82	78
Don't know	2	2	1	3	2	2	1	5	3	4	2	1
44. What are your chances of getting the AIDS virus?												
High	0	1	0	–	0	0	0	1	0	1	0	0
Medium	2	3	2	1	2	2	2	3	2	1	2	2
Low	22	29	24	13	24	20	22	22	17	12	19	28
None	74	65	72	83	71	76	74	70	77	81	76	68
Don't know	2	2	2	3	2	2	2	4	3	5	2	1
N/A—High chance of already having the AIDS virus	0	0	0	0	0	0	0	1	1	0	0	0
45. Have you ever had a coworker who had AIDS or the AIDS virus?												
Yes	4	4	6	3	4	5	4	4	6	1	3	7
No	87	87	86	89	87	88	88	84	83	89	90	84
Never worked, never had a coworker	1	1	0	1	0	1	1	1	2	2	1	0
Don't know	7	7	8	7	9	6	7	10	9	7	6	8
46. Have you ever had a friend or relative who had AIDS or the AIDS virus?												
Yes	9	9	12	6	8	10	9	10	9	5	8	12
No	87	88	85	90	88	87	88	84	85	90	88	85
Don't know	4	3	3	4	4	3	3	6	5	5	4	3

See footnotes at end of table.

Table 1. Provisional estimates of the percent of persons 18 years of age and over with selected AIDS knowledge and attitudes from the 1991 National Health Interview Survey, by selected characteristics: United States, January–March 1991—Con.

[Data are based on household interviews of the civilian noninstitutionalized population. The survey design, general qualifications, and information on the reliability of the estimates are given in technical notes]

AIDS knowledge or attitude	Total	Age			Sex		Race or ethnicity			Education		
		18–29 years	30–49 years	50 years and over	Male	Female	Non-Hispanic White	Non-Hispanic Black	Hispanic	Less than 12 years	12 years	More than 12 years
47. Are any of these statements true for you?												
a. You have hemophilia and have received clotting factor concentrates since 1977.												
b. You are a man who has had sex with another man at some time since 1977, even 1 time.												
c. You have taken illegal drugs by needle at any time since 1977.												
d. Since 1977, you are or have been the sex partner of any person who would answer yes to any of the items above (a-c)												
e. You had sex for money or drugs at any time since 1977												
	Percent distribution[1]											
Yes to at least 1 statement	3	5	4	1	4	2	3	3	4	2	3	3
No to all statements	97	95	96	99	96	98	97	97	96	97	97	96
Don't know	0	0	0	0	0	0	0	0	0	0	0	0

[1] Multiple responses may sum to more than 100.
[2] Based on persons answering yes to question 8, "Do you have any children aged 10 through 17?"
[3] Based on persons answering no or don't know to questions 12, 13a, or 13b.
[4] Based on persons answering yes to questions 13a and 15.
[5] Based on persons answering no to question 17a.
[6] Based on persons answering no or don't know to question 17a.
[7] Based on persons answering yes to question 17a.
[8] Based on persons answering no or don't know to question 25.
[9] Persons answering yes to question 25.
[10] Based on persons answering yes to question 31.
[11] Based on persons answering yes to question 37.

Technical notes

The National Health Interview Survey (NHIS) is a continuous, cross-sectional household interview survey. Each week, a probability sample of the civilian noninstitutionalized population residing in the United States is interviewed by personnel of the U.S. Bureau of the Census to obtain information on the health and other characteristics of each member of the household. Information on special health topics is collected for all or a sample of household members. The 1991 National Health Interview Survey of AIDS Knowledge and Attitudes is asked of one randomly chosen adult 18 years of age or over in each family. The estimates in this report are based on completed interviews with 9,983 individuals, about 87 percent of eligible respondents.

Table I contains the estimated population size of each of the demographic subgroups included in table 1 to allow readers to derive provisional estimates of the number of people in the United States with a given characteristic, for example, the number of women who have had their blood tested for HIV. The population estimates in table I are based on 1989 data from the NHIS inflated to national population controls by age, race, and sex. The population controls are based on the 1980 census carried forward to 1989. These estimates, therefore, may differ from 1990 census results brought forward to the survey date. Population controls incorporating census results will be used for survey estimation beginning later in the decade.

Table II shows approximate standard errors for most of the estimates presented in table 1. These standard error estimates were derived by applying a design effect of 1.3 to the standard errors that would have been obtained with a simple random sample design. The reader is cautioned about comparing estimates when the denominator is small (for example, when looking only at those persons who did not receive the results of their HIV antibody test). The estimates in table 1 and the standard errors in table II are provisional. They may differ slightly from estimates made using the final 1991 data file because they were calculated using a simplified weighting procedure that does not adjust for all the factors used in weighting the final data file. A final data file covering the entire 1991 data collection period will be available at the end of 1992.

Table I. Sample sizes for January–March 1991 National Health Interview Survey of AIDS Knowledge and Attitudes and estimated adult population 18 years of age and over, by selected characteristics: United States, 1991

Characteristics	Sample size	Estimated population in thousands
All adults	9,983	180,271
Age		
18–29 years	2,300	46,282
30–49 years	4,101	71,831
50 years and over	3,582	61,157
Sex		
Male	4,183	85,632
Female	5,800	94,638
Race and ethnicity		
Non-Hispanic white	7,746	139,440
Non-Hispanic black	1,255	19,585
Hispanic	644	14,118
Education		
Less than 12 years	1,736	36,782
12 years	2,069	72,418
More than 12 years	1,461	70,036

[1] Estimates below the cutoff points have an RSE of more than 30 percent and are considered to be statistically unreliable.

Table II. Standard errors, expressed in percentage points, of estimated percents from the 1991 National Health Interview Survey of AIDS Knowledge and Attitudes, by selected characteristics: United States, January–March 1991

		Age			Sex		Race and ethnicity			Education		
Estimated percent	Total	18–29 years	30–49 years	50 years and over	Male	Female	White	Black	Hispanic	Less than 12 years	12 years	More than 12 years
5 or 95	0.3	0.6	0.4	0.5	0.4	0.4	0.3	0.8	1.1	0.6	0.5	0.4
10 or 90	0.4	0.8	0.6	0.6	0.6	0.5	0.4	1.1	1.5	0.8	0.6	0.6
15 or 85	0.5	1.0	0.7	0.8	0.7	0.6	0.5	1.3	1.8	1.0	0.8	0.7
20 or 80	0.5	1.1	0.8	0.9	0.8	0.7	0.6	1.5	2.0	1.1	0.8	0.8
25 or 75	0.6	1.2	0.9	0.9	0.9	0.7	0.6	1.6	2.2	1.2	0.9	0.9
30 or 70	0.6	1.2	0.9	1.0	0.9	0.8	0.7	1.7	2.3	1.3	1.0	0.9
35 or 65	0.6	1.3	1.0	1.0	0.9	0.8	0.7	1.7	2.4	1.3	1.0	1.0
40 or 60	0.6	1.3	1.0	1.1	1.0	0.8	0.7	1.8	2.5	1.4	1.0	1.0
45 or 55	0.6	1.3	1.0	1.1	1.0	0.8	0.7	1.8	2.5	1.4	1.1	1.0
50	0.6	1.3	1.0	1.1	1.0	0.8	0.7	1.8	2.5	1.4	1.1	1.0

Number 217 • September 16, 1992

Advance Data

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Assistive Technology Devices and Home Accessibility Features: Prevalence, Payment, Need, and Trends

by Mitchell P. LaPlante, Ph.D., University of California, San Francisco, Gerry E. Hendershot, Ph.D., and Abigail J. Moss, Division of Health Interview Statistics

In 1990, more than 13.1 million Americans, about 5.3 percent of the population, were using assistive technology devices to accommodate physical impairments. In 1990, 7.1 million persons, nearly 3 percent of all Americans, lived in homes that were specially adapted to accommodate impairments. About half of the persons with assistive technology devices, and more than three-fourths of those with home accessibility features, purchased them themselves or with the help of their families without contributions from third-party payers. More than 2.5 million Americans said they need assistive technology devices that they do not have, mostly because they cannot afford them. Between 1980 and 1990, the number of persons using anatomical or mobility assistive technology devices increased at a more rapid rate than did the general population.

These findings are from the 1990 National Health Interview Survey on Assistive Devices (NHIS-AD), which was cosponsored by the National Center for Health Statistics (NCHS) and the National Institute for Disability and Rehabilitation Research (NIDRR). NCHS is one of the Centers for Disease Control in the Public Health Service, Department of Health and Human Services. NIDRR is an agency in the Office of Special Education and Rehabilitation Services, Department of Education. NCHS and NIDRR jointly planned the Survey, and the Bureau of the Census conducted the field work.

Background

"Assistive technology" consists of devices and other solutions that assist people with deficits in physical, mental, or emotional functioning. Assistive technology devices are items frequently used by people with functional deficits as alternative ways of performing actions, tasks, and activities.

Hundreds of assistive technology devices are available. Mobility aids, such as wheelchairs and walkers, orthotics, and prostheses, are more visible and familiar types of assistive technology devices. Some other devices include microcomputers, powered mobility devices, myoelectrically powered prostheses, augmentative communication devices, optical pointers, headsticks, mouthsticks, and alphabet boards. Some assistive devices, such as myoelectrically powered prostheses and infrared hearing systems, are technically sophisticated. However, many devices are "low-tech," such as walkers and canes.

Assistive technology also includes ways of controlling these devices. Software may control ordinary hardware systems in ways that facilitate their use by persons with functional deficits, like text-to-speech conversion software that runs on ordinary computers. Some assistive technology involves extending the range of users. For example, signs with words can be made more legible to everyone, not just persons with vision impairments, by avoiding ambiguity and providing better contrast between letters and background.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL

Another way to help people with deficits in physical, mental, and emotional functioning is to build or modify the environment to be more accessible. Accessibility often involves accommodating assistive technology in the design or reconfiguration of features of buildings and environments so they are more useable by people with functional deficits. Accessible design includes reducing barriers in transportation systems, buildings and homes, and recreational and public areas to make them more convenient for people with functional deficits. Some facilitating design features are ramps and approaches, specially configured door openers and locks, wheelchair-lifting devices, and elevating devices.

Assistive technology devices and accessible design are interdependent. A person who uses a wheelchair cannot get into buildings accessible only by stairs. A shopping mall directory may be out of view or meaningless to a person with functional deficits. Barrier-free universal design is increasingly encouraged to allow all persons, disabled or not, to move freely, independently, and safely in their surroundings. Assistive technology devices and accessible environmental design features help people regain function, assist them in performing activities and roles, and can often prevent further disability or reduce the level of disability.

Recent public policies emphasize the societal desirability of access to assistive technology and accessible environmental design. The Americans with Disabilities Act (ADA), enacted on July 26, 1990, and now being implemented, requires employers, public officials, and businesses to make accommodations for people with functional deficits, if such accommodations do not cause undue economic hardship (1). Such accommodations include special training, flexible work schedules, personal assistants, accessible design, and assistive technology devices.

Public Law 100–407, the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (the "Tech Act"), authorizes Federal funds to States that plan and develop consumer-responsive statewide programs of technology-related assistance for individuals with functional deficits or disabilities. This goal can be achieved by providing assistive technology devices and services, by developing an information dissemination system, by establishing or enhancing training and technical assistance, and by designing public awareness projects. Important factors determining the use of technology are benefits and costs of acquiring and using technology. An underlying assumption is that many people who could use technology do not have access to it. The Tech Act recognizes the need for concerted planning to increase access to technology for people with functional deficits.

These recent developments in public policy emphasize the significant contribution of assistive technology for people with disabilities, and the need for national statistics on the use of that technology. In response to that need, NIDRR and NCHS cosponsored a survey on assistive technology devices and homes with accessibility features as part of the National Health Interview Survey of 1990. This is the first report of the results of that survey. The survey focused on assistive technology devices and did not attempt to cover all aspects of assistive technology. For the first time, an NCHS survey included questions about accessibility features in homes. Even people who are not disabled and who live in homes with accessibility features are benefitted because relatives, friends, and others who are disabled can live with them or visit them. Also, these homes will be more practical for their owners, should they develop a functional deficit.

This report provides national estimates of the number of people using assistive technology devices or living in homes with accessibility features in 1990, the types of devices and features used, the sources of payment for this technology, and the number of persons who need but do not have assistive technology devices. Estimates are presented for the total noninsitutionalized population of all ages, and for broad age groups. Statistics on the number of people using assistive technology devices at all ages were last obtained by the NHIS in 1980. This report updates these statistics collected earlier and shows trends over time for comparable items.

Concepts and measures

The Assistive Devices interview began with this preamble: "The next questions are about the use of devices to help people with physical disabilities or impairments." The interviewer then asked, "Does anyone in the family NOW use a brace of any kind? Who is this? Does anyone else now use a brace?" Similar sets of questions were asked about specific devices for mobility, hearing, vision, and speech. The last question in each set (such as mobility) asked if anyone used any other device for that purpose, and a final question asked if anyone used any other special equipment designed for persons with disabilities or impairments. Every device used by any person in the family was recorded.

Any device or equipment reported in response to these questions is considered an "assistive technology device" (except that implanted devices, such as pacemakers, were excluded when mentioned). Some of the devices are "high technology," such as computers, and some are "low technology," such as canes and walking sticks. Other terms sometimes used to refer to assistive technology are "assistive devices," "adaptive technology," "tools and equipment," "aids and appliances," and "special aids." "Assistive technology" is now the most widely used term and is preferred by disability-related organizations. The operational definition of assistive technology used here is consistent with the definition given by DeWitt: "In general, assistive technology includes devices that enhance the ability of an individual with a disability to engage

in major life activities, actions, and tasks" (2).

Although the intention of the Assistive Devices interview was to identify assistive technology used by persons with impairments that are permanent or long lasting, some of the devices may have been used only temporarily during recovery from an injury or acute illness. This would have occurred most often with devices such as crutches, canes, walkers, and wheelchairs, and not at all with some other devices, such as artificial limbs. The number of persons who have acute conditions for which they use devices is unknown, but is assumed to be small compared with the number of people with long-lasting impairments who use devices. Nevertheless, numbers shown in this report probably overestimate slightly the number of chronically ill or impaired persons using any device and of people using some specific devices, such as crutches.

The interviewer also said to the respondent, "Please tell me if this home is equipped with any special features designed for disabled persons," and handed the respondent a printed card listing ramps; extra-wide doors or passages; elevators or stairlifts (not counting public elevators); hand rails or grab bars (other than normal hand rails or stairs); raised toilets; levers, push bars, or special knobs on doors; lowered counters; slip-resistant floors; and other special features designed for disabled persons. The presence of any of these features in the home is considered a "home accessibility feature."

The statistics on home accessibility features refer to persons living in homes with these features, not to those homes. Persons living in homes with accessibility features do not necessarily have an impairment, and, in fact, a majority are reported not to be limited in their activity by an impairment or chronic illness. Even if none of the residents has an impairment, they still benefit from the accessibility features: They are better able to accommodate visitors with impairments, and they are prepared should injury or illness cause an impairment to themselves.

The terms "impairment," "disability," and "handicap" are often used loosely and interchangeably. Where greater precision is needed they must be differentiated and defined. The International Classification of Impairments, Disabilities, and Handicaps (ICIDH) (3) differentiates the terms and defines them as follows: "impairment" is "any loss or abnormality of psychological, physiological, or anatomical structure or function"; "disability" is a restriction in the ability to perform "essential components of everyday living," such as personal hygiene or moving about; "handicap" is a limitation on "the fulfillment of a role that is normal for that individual." A "handicap" is a consequence of a disability, and a "disability" is a consequence of an impairment; however, impairments do not necessarily lead to disabilities, nor do disabilities necessarily lead to handicaps. Furthermore, handicaps and disabilities are not necessarily permanent.

Persons using assistive technology may be assumed to have an impairment, that is, some loss or abnormality of structure or function at the level of organ systems, but it is not known if they have a disability or a handicap. The use of assistive technology devices or home accessibility features may enable them to perform essential functions of everyday living, thus preventing a disability; or it may enable them to perform their normal roles, preventing a handicap. This report describes persons with impairments who use assistive technology devices or home accessibility features to prevent or alleviate disabilities and handicaps.

The prevalence of assistive technology devices and home accessibility features

The estimated numbers of persons in the U.S. civilian noninstitutionalized population who use assistive technology devices are shown in table 1. Altogether, more than 13 million Americans use assistive technology devices. More people use assistive technology devices to compensate for mobility impairments than for any other general type of impairment: 6.4 million use some kind of mobility technology, and 4.4 million use a cane or walking stick, the single most-used assistive technology devices. Other prevalent assistive technologies are hearing aids (3.8 million), walkers (1.7 million), wheelchairs (1.4 million), and back braces (1.2 million).

About 7.1 million people live in homes that have special equipment for persons with impairments. The most common home adaptation is hand rails (3.4 million), followed by ramps (2.1 million), extra-wide doors (1.7 million), and raised toilets (1.3 million).

Age patterns

The percent distribution of persons who use assistive technology devices by age, according to the type of technology used is shown in table 2. Among persons who use any assistive technology devices, the majority (52 percent) are over 65 years of age, reflecting the higher prevalence of impairments in that population. However, for some specific assistive technologies, a significant proportion of users are under age 25 years: foot braces (38 percent), artificial arms or hands (35 percent), adapted typewriters or computers (25 percent), and leg braces (24 percent).

The percent of persons who use assistive technology devices by type of technology used, according to age, is shown in table 3. This emphasizes some of the age differences noted in table 2. For example, in table 3 the proportion of users of devices that use anatomical technology declines significantly and regularly with increasing age, from 62 percent among users under 25 years of age to only 7 percent among users 75 years and over. Mobility and hearing technologies show the opposite trend:

The proportions increase regularly with age, from lows of 23 percent (mobility) and 15 percent (hearing) among persons under 25 years to highs of 67 percent (mobility) and 40 percent (hearing) among persons 75 years and over.

These age-related patterns are also shown for the specific assistive technologies listed, although there are some reversals. For example, the proportion of users who use crutches goes down with age, not up as in the general mobility category. This may reflect the temporary use of crutches by younger persons recovering from injuries to the legs or feet, which are more common among younger people than older people.

Prevalence rates in the general population

The prevalence of assistive devices is described in another way in table 4. Whereas tables 1–3 include only persons who use some kind of assistive technology device or home adaptation, table 4 includes all persons, whether or not they use assistive technology devices, and shows the users as a percent of the total population, according to age. Overall, 5.3 percent of the civilian noninstitutionalized population uses some kind of assistive technology devices or home adaptation. That percent increases with age, from about 1 percent among persons under 25 years of age to nearly 35 percent among persons 75 years of age and over.

Source of payment

Where an assistive technology device or accessibility was used in a sample household, respondents were asked to identify every source of payment for each device or feature from a printed list of sources. The listed sources were: no payment, gift, self or family, private health insurance, Medicare, Medicaid, rehabilitation program, employer, school system, Veterans' Administration program, other private source, and other public source. More than one source of payment could be identified for each technology or feature.

Percent distributions of persons with assistive technology devices or home accessibility features by the sources of payment, according to age, are shown in table 5. About 8 percent of these persons indicated "no payment" or "gift" when asked the source of payment for assistive devices; for about one-third of people with accessibility features in the home, no one paid for those features. Neither of these groups is included in the percent distribution in table 5. The "out-of-pocket" category includes persons who gave only "self or family" as the source of payment. The "third party" category includes persons who named only other sources of payment, including some not on the printed list, and unknown sources of payment. The "combination" category includes persons who named both "self or family" and other sources of payment.

Nearly half (48 percent) the people with assistive technology devices said they or their families paid for them with no assistance from third parties. More than three-fourths of persons with home accessibility features said they were paid for entirely by themselves or by their family. Third-party sources made complete or partial payment for more than half of users' assistive technology devices (52 percent), and for about one-fourth of users' home adaptation (23 percent). The percent of assistive technology devices paid for solely out-of-pocket increased with age, but the percent of home accessibility features paid for solely out-of-pocket did not change with age.

Unmet need

Near the end of the Assistive Devices interview, respondents were asked, "Does anyone in the family NEED any special equipment that they DON'T HAVE?" If so, they were asked who that family member was, what equipment they needed, and why they did not have it. Persons identified by respondents in answers to these questions are considered to have an unmet need for assistive technology devices. (Home accessibility features were not included in these questions.) It should be noted that "unmet need" and the "met need" it implies are defined in terms of the perceptions of a household respondent. A health professional might reach a different conclusion in individual cases.

The percent distributions of persons reported to have an unmet need for assistive technology devices by the reason that they do not have it, according to age, are shown in table 6. More than 2.5 million persons, or about 1 percent of the population, have an unmet need for assistive technology devices. About 1.2 million persons of working age (25–64 years) have an unmet need for assistive technology devices.

Overall and in every age group shown, the reason most often given for not having a needed assistive technology device is financial—people could not afford to buy it. Overall, three-fifths said they could not afford the needed assistive technology devices, with the figure being highest (70 percent) in the population aged 25–44 years.

Poverty and assistive technology devices

People whose family incomes are below the poverty line are somewhat more likely to use assistive technology devices than those whose incomes are above the poverty line (5.6 percent and 5.0 percent, respectively). More than half of poor people with assistive technology devices had the help of a third-party payer in obtaining devices, compared to about one-third of nonpoor users. Poor people were about twice as likely as nonpoor people to say they needed a device they did not have (1.9 percent and 1.0 percent, respectively).

Trends in prevalence of assistive technology devices

The 1980 National Health Interview Survey collected data on some assistive technology devices in a

manner comparable with that used in 1990. For those technologies, the prevalence in 1990 and 1980 and the percent change over the decade are shown in table 7. Also shown are the age-adjusted estimates of prevalence for 1990, using the 1980 population as the standard, and the percent differences between those estimates and the 1980 estimates. The age-adjusted 1990 estimates can be considered the numbers expected if the age composition of the population had not changed between 1980 and 1990.

The total population increased by about 13 percent between 1980 and 1990, but use of the selected assistive technology devices increased more rapidly. Use of anatomical braces more than doubled, and use of walkers and wheelchairs nearly doubled. The numbers of users of canes and artificial limbs also increased more rapidly than the general population. Only the use of crutches, many of which, as previously noted, are used only temporarily during recovery from injuries, increased at about the same rate as the population.

Because the population aged between 1980 and 1990, and because older people are more likely than younger people to use assistive technology devices, some of the increase in the prevalence of devices can be attributed to the aging of the population. However, comparing the 1980 prevalence estimates with the 1990 age-adjusted estimates controls statistically for the aging of the population and reveals the change in prevalence net of aging. The last column of table 7 shows the percent difference between the 1980 estimates and the 1990 age-adjusted estimates. For each type of device, the age-adjusted percent difference is less than the unadjusted percent difference, indicating that the aging of the population did indeed account for a significant part of the overall increase in use of devices. However, with the exception of artificial limbs and crutches, the age-adjusted differences are greater than the 13 percent growth in population, indicating that, even allowing for the aging of the population, use of assistive technology devices grew more rapidly than the population during the decade.

Discussion

The data presented here show that finances are a barrier to acquiring assistive technology. For noninstitutionalized persons, assistive technology devices and accessibility features in homes are often paid for by individuals and families out-of-pocket rather than with contributions from other parties. Reliance on payment by individuals and their families reduces access to assistive technology for persons in poverty. Although the rate of people using assistive technology devices is slightly higher among persons in poverty than among those not in poverty, poor people express more need for these devices. Persons in poverty are twice as likely as persons not in poverty to have an unmet need for assistive technology devices mainly because they cannot afford to buy them. Medicaid, Medicare, Veterans' Administration, and other public programs help people in poverty and those over 65 to acquire assistive technology devices, but a third or more are purchased by poor individuals and their families without contributions from other parties. These programs seldom pay for accessibility features in homes, which are most often paid for by individuals and families. The survey did not ask about unmet needs for home accessibility features.

Despite financial problems in acquiring assistive technology devices, use of devices has increased dramatically over the past decade. The number of users of wheelchairs and walkers almost doubled from 1980 to 1990, and the number of users of leg, foot, and other braces has more than doubled. These increases may be due to improved coverage by public programs, reduced costs of technology, and improved design, which has made devices lighter, safer, stronger, easier to use, and more attractive. The aging of the population has contributed to the increased number of mobility devices, but orthoses tend to be used more by the younger population.

Nevertheless, considerable unmet demand for assistive technology remains: Some 2.5 million persons in 1990 stated they needed technology devices they did not have. Some of them need an enhanced version of a device they already have, and others need a device they do not have at all. The main reason given for this unmet need is inability to pay for it out-of-pocket and it is not covered by health insurance or programs in which they are enrolled.

References

1. West J, ed. The Americans with Disabilities Act: from policy to practice. New York: Milbank Memorial Fund. 1991.
2. DeWitt JC. The role of technology in removing barriers. In: West J, ed. The Americans with Disabilities Act: from policy to practice. New York: Milbank Memorial Fund. 1991.
3. World Health Organization. The international classification of impairments, disabilities, and handicaps. Geneva: World Health Organization. 1980.
4. Adams PF, Benson V. Current estimates from the National Health Interview Survey. National Center for Health Statistics. Vital Health Statistics 10(181). 1991.

Table 1. Number of persons using assistive technology devices or living in homes with accessibility features, by type of device or feature and age of person: United States, 1990

Assistive technology device and home accessibility feature	*All ages*	*24 years and under*	*25–44 years*	*45–64 years*	*65–74 years*	*75 years and over*
Assistive technology device			Number in thousands			
Any assistive technology device	13,128	1,048	2,228	3,022	2,756	4,073
Anatomical technology devices:						
Any anatomical technology device	3,732	646	1,367	1,052	388	277
Leg brace	862	208	288	208	97	61
Foot brace	186	71	44	*30	*29	*12
Arm brace	210	*28	87	62	*20	*13
Hand brace	208	*28	93	63	*22	*4
Neck brace	299	*27	118	109	*27	*18
Back brace	1,173	68	420	460	128	98
Other brace	849	241	369	146	46	48
Artificial leg or foot	184	*8	*28	64	47	*38
Artificial arm or hand	*34	*12	*4	*8	*7	*2
Mobility technology devices:						
Any mobility technology device	6,403	240	609	1,385	1,435	2,735
Crutch	671	87	173	210	137	64
Cane or walking stick	4,400	*31	319	1,011	1,032	2,007
Walker	1,687	*34	72	276	350	957
Wheelchair	1,411	139	168	304	324	476
Scooter	64	*6	*11	*18	*18	*11
Other mobility technology	254	*18	*28	66	57	85
Hearing technology devices:						
Any hearing technology device	3,987	152	257	818	1,142	1,618
Hearing aid	3,782	148	228	743	1,102	1,562
TDD/TTY	173	*22	*23	56	*24	*48
Special alarm	76	*7	*17	*24	*5	*23
Other hearing technology	564	*24	56	136	142	205
Vision technology devices:						
Any vision technology device	261	*12	67	*39	*32	111
White cane	109	*2	43	*17	*14	*32
Other vision technology	177	*10	*34	*24	*26	82
Speech technology devices:						
Any speech technology device	*34	*8	*2	*4	*8	*11
Other types of technology devices:						
Any other type of technology device	1,331	156	277	333	296	269
Adapted typewriter or computer	48	*12	*24	*8	*0	*4
Adapted automobile	211	*19	71	60	51	*11
Other technology device	1,138	140	196	289	257	257
Home accessibility feature						
Any type of home accessibility feature	7,102	1,395	1,272	1,484	1,284	1,667
Ramps	2,109	578	457	486	321	267
Extra-wide doors	1,651	397	333	410	249	263
Elevator or stair lift	409	66	*28	45	97	173
Hand rails	3,396	425	420	686	778	1,086
Raised toilet	1,324	125	133	285	276	505
Adapted door locks	410	57	*29	90	86	148
Lowered counters	242	52	47	59	*22	62
Slip-resistant floors	212	*40	41	79	*25	*27
Other home accessibility feature	1,595	313	313	345	293	330

NOTES: Numbers do not add to totals because categories are not mutually exclusive; that is, a single person in the total may be counted in more than one type of device category. A TTD/TTY is a typewriter-like device for the deaf that communicates over telephone lines using text.

Table 2. Percent distribution of persons using assistive technology devices or living in homes with accessibility features by age of person, according to type of device or feature: United States, 1990

Assistive technology device or home accessibility feature	*All ages*	*24 years and under*	*25–44 years*	*45–64 years*	*65–74 years*	*75 years and over*
Assistive technology device			Percent distribution			
Any assistive technology device	100.0	8.0	17.0	23.0	21.0	31.0
Anatomical technology devices:						
Any anatomical technology device	100.0	17.3	36.6	28.2	10.4	7.4
Leg brace	100.0	24.2	33.4	24.2	11.2	7.0
Foot brace	100.0	38.4	23.8	16.1	15.6	*6.5
Arm brace	100.0	13.4	41.4	29.4	9.5	*6.2
Hand brace	100.0	13.4	44.6	30.0	10.6	*1.9
Neck brace	100.0	9.0	39.6	36.5	9.0	*6.0
Back brace	100.0	5.8	35.8	39.2	10.9	8.3
Other brace	100.0	28.4	43.5	17.1	5.4	5.7
Artificial leg or foot	100.0	*4.3	15.2	34.6	25.5	20.6
Artificial arm or hand	100.0	*35.3	*11.8	*23.5	*20.6	*5.9
Mobility technology devices:						
Any mobility technology device	100.0	3.7	9.5	21.6	22.4	42.7
Crutch	100.0	13.0	25.8	31.3	20.4	9.6
Cane or walking stick	100.0	0.7	7.2	23.0	23.5	45.6
Walker	100.0	2.0	4.3	16.3	20.7	56.7
Wheelchair	100.0	9.9	11.9	21.5	22.9	33.8
Scooter	100.0	*9.4	*17.3	28.3	28.3	*17.3
Other mobility technology	100.0	*7.1	11.0	26.0	22.3	33.5
Hearing technology devices:						
Any hearing technology device	100.0	3.8	6.4	20.5	28.6	40.6
Hearing aid	100.0	3.9	6.0	19.6	29.1	41.3
TDD/TTY	100.0	12.7	13.3	32.1	13.8	27.5
Special alarm	100.0	*9.2	22.3	31.5	*6.6	30.2
Other hearing technology	100.0	4.3	10.0	24.2	25.2	36.4
Vision technology devices:						
Any vision technology device	100.0	*4.6	25.8	15.0	12.3	42.4
White cane	100.0	*1.8	39.9	15.6	*12.9	29.4
Other vision technology	100.0	*5.6	19.2	13.5	14.7	46.3
Speech technology devices:						
Any speech technology device	100.0	*23.5	*5.9	*11.8	*23.5	*32.4
Other types of technology devices:						
Any other type of technology device	100.0	11.7	20.8	25.0	22.2	20.2
Adapted typewriter or computer	100.0	*25.0	50.0	*16.7	*0.0	*8.3
Adapted automobile	100.0	9.0	33.6	28.3	24.3	*5.2
Other technoloigy device	100.0	12.3	17.2	25.4	22.6	22.6
Home accessibility feature						
Any type of home accessibility feature	100.0	19.6	17.9	20.9	18.1	23.5
Ramps	100.0	27.4	21.7	23.1	15.2	12.6
Extra-wide doors	100.0	24.0	20.2	24.8	15.1	15.9
Elevator or stair lift	100.0	16.0	6.9	11.0	23.8	42.2
Hand rails	100.0	12.5	12.4	20.2	22.9	32.0
Raised toilet	100.0	9.5	10.1	21.5	20.8	38.1
Adapted door locks	100.0	13.9	7.0	22.0	21.0	36.1
Lowered counters	100.0	21.4	19.3	24.4	9.1	25.7
Slip-resistant floors	100.0	18.9	19.4	37.2	11.8	12.7
Other home accessibility feature	100.0	19.6	19.6	21.7	18.4	20.7

NOTES: Sums may not equal totals due to rounding. A TTD/TTY is a typewriter-like device for the deaf that communicates over telephone lines using text.

Table 3. Percent of persons using assistive technology devices, by type of technology device and age of person, and percent of persons living in homes with accessibility features, by type of accessibility feature, according to age: United States, 1990

Assistive technology device and home accessibility feature	*All ages*	*24 years and under*	*25–44 years*	*45–64 years*	*65–74 years*	*75 years and over*
Assistive technology device			Percent			
Anatomical technology devices:						
Any anatomical technology device	28.4	61.7	61.4	34.8	14.1	6.8
Leg brace	6.6	19.9	12.9	6.9	3.5	1.5
Foot brace	1.4	6.8	2.0	1.0	1.1	*0.3
Arm brace	1.6	2.7	3.9	2.0	0.7	*0.3
Hand brace	1.6	2.7	4.2	2.1	0.8	*0.1
Neck brace	2.3	2.6	5.3	3.6	1.0	*0.4
Back brace	8.9	6.5	18.8	15.2	4.6	2.4
Other brace	6.5	23.0	16.6	4.8	1.7	1.2
Artificial leg or foot	1.4	*0.8	1.3	2.1	1.7	0.9
Artificial arm or hand	0.3	1.1	*0.2	*0.3	*0.3	*0.0
Mobility technology devices:						
Any mobility technology device	48.8	22.9	27.3	45.8	52.1	67.2
Crutch	5.1	8.3	7.8	6.9	5.0	1.6
Cane or walking stick	33.5	3.0	14.3	33.5	37.4	49.3
Walker	12.9	3.2	3.2	9.1	12.7	23.5
Wheelchair	10.8	13.3	7.6	10.0	11.8	11.7
Scooter	0.5	*0.6	*0.5	*0.6	*0.7	*0.3
Other mobility technology	1.9	*1.7	1.3	2.2	2.1	2.1
Hearing technology devices:						
Any hearing technology device	30.4	14.5	11.5	27.1	41.4	39.7
Hearing aid	28.8	14.1	10.2	24.6	40.0	38.3
TDD/TTY	1.3	2.1	1.0	1.8	0.9	1.2
Special alarm	0.6	*0.7	*0.8	0.8	*0.2	0.6
Other hearing technology	4.3	2.3	2.5	4.5	5.1	5.0
Vision technology devices:						
Any vision technology device	2.0	*1.1	3.0	1.3	1.2	2.7
White cane	0.8	*0.2	1.9	*0.6	*0.5	0.8
Other vision technology	1.3	*1.0	1.5	0.8	0.9	2.0
Speech technology devices:						
Any speech technology device	0.3	*0.8	*0.1	*0.1	*0.3	*0.3
Other types of technology devices:						
Any other type of technology device	10.1	14.9	12.4	11.0	10.7	6.6
Adapted typewriter or computer	0.4	*1.1	1.1	*0.3	*0.0	*0.1
Adapted automobile	1.6	*1.8	3.2	2.0	1.9	*0.3
Other technololgy device	8.7	13.4	8.8	9.5	9.3	6.3
Home accessibility feature						
Ramps	29.7	41.4	36.0	32.8	25.0	16.0
Extra-wide doors	23.2	28.5	26.2	27.6	19.4	15.8
Elevator or stair lift	5.8	4.7	2.2	3.0	7.6	10.4
Hand rails	47.8	30.5	33.0	46.2	60.6	65.2
Raised toilet	18.6	9.0	10.5	19.2	21.5	30.3
Adapted door locks	5.8	4.1	2.3	6.1	6.7	8.9
Lowered counters	3.4	3.7	3.7	4.0	1.7	3.7
Slip-resistant floors	3.0	2.9	3.2	5.3	1.9	1.6
Other home accessibility feature	22.5	22.4	24.6	23.3	22.8	19.8

NOTE: A TTD/TTY is a typewriter-like device for the deaf that communicates over telephone lines using text.

Table 4. Percent of persons who use assistive technology devices or live in homes with accessibility features, by age of person and by technology or accessibility feature: United States, 1990

Assistive technology device or home accessibility feature	*All ages*	*24 years and under*	*25–44 years*	*45–64 years*	*65–74 years*	*75 years and over*
			Percent of total population			
Any assistive technology device	5.3	*1.2	2.8	6.5	15.2	34.9
Any anatomical technology device	1.5	*0.7	1.7	2.3	2.1	2.4
Any mobility technology device	2.6	*0.3	*0.8	3.0	7.9	23.4
Any hearing technology device	1.6	*0.2	*0.3	1.8	6.3	13.8
Any vision technology device	*0.1	*0.0	*0.1	*0.1	*0.2	0.9
Any speech technology device	*0.0	*0.0	*0.0	*0.0	*0.0	*0.1
Any other type of technology device	0.5	*0.2	*0.3	0.7	1.6	2.3
Any type of home accessibility feature	2.9	*1.6	1.6	3.2	7.1	14.3

Table 5. Number of persons with assistive technology devices or home accessibility features and percent distribution by source of payment, according to age of person: United States, 1990

Source of payment	All ages	24 years and under	25–44 years	45–64 years	65–74 years	75 years and over
Assistive technology devices			Number in thousands			
Persons with assistive technology device	13,128	1,048	2,228	3,022	2,756	4,073
			Percent distribution			
All sources of payment[1]	100.0	100.0	100.0	100.0	100.0	100.0
Out-of-pocket	48.2	34.0	37.5	45.5	52.5	56.0
Third party[2]	34.0	45.0	49.2	37.1	28.7	24.8
Combination of out-of-pocket and third party	17.9	21.0	13.3	17.4	18.7	19.2
Home accessibility features			Number in thousands			
Persons with home accessibility features	7,102	1,395	1,272	1,484	1,284	1,667
			Percent distribution			
All sources of payment[1]	100.0	100.0	100.0	100.0	100.0	100.0
Out-of-pocket	77.5	76.1	77.9	74.6	81.6	78.1
Third party[2]	15.2	17.9	15.4	16.1	11.7	15.0
Combination of out-of-pocket and third party	7.3	6.0	6.7	9.3	6.8	6.9

[1]Excludes persons whose device or feature was not paid for.
[2]Includes persons who did not know the source of payment.
NOTE: Sums may not equal totals due to rounding.

Table 6. Number of persons who need assistive technology devices they do not have and percent distribution by reason for not having them, according to age of person: United States, 1990

Reason for not having assistive technology devices	All ages	24 years and under	25–44 years	45–64 years	65–74 years	75 years and over
			Number in thousands			
Persons with unmmet need for assistive technology devices[1]	2,508	178	448	760	567	556
			Percent distribution			
All reasons[1]	100.0	100.0	100.0	100.0	100.0	100.0
Cannot afford	61.1	59.7	69.6	63.2	61.6	51.6
All other reasons[1]	38.9	40.3	30.4	36.8	38.4	48.4

[1]Includes persons for whom the reason is unknown.

Table 7. Number of persons in the population, number of persons using selected assistive technology devices and percent change from 1980 to 1990, and age-adjusted number using assistive technology devices and percent difference between 1980 and 1990: United States, 1980 and 1990

Assistive technology device	1980	1990	Change from 1980 to 1990	1990	Difference between 1980 and age-adjusted 1990
	Number in thousands		Percent	Age-adjusted number in thousands[1]	Percent
All persons	217,923	246,099	12.9	246,099	12.9
Leg or foot brace	472	1,048	121.9	924	95.8
Brace other than leg or foot	1,000	2,740	174.1	2,436	143.6
Artificial limb	177	218	23.2	189	6.8
Crutch	588	671	14.2	590	0.3
Cane or walking stick	2,878	4,400	52.9	3,626	26.0
Walker	866	1,687	94.8	1,363	57.4
Wheelchair	720	1,411	96.1	1,185	64.6

[1]Age-adjusted by the direct method, using the 1980 population as standard, and age groups under 45 years, 45–64 years, 65–74 years, and 75 years and over.

Symbols	
- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision

Technical notes

The statistics in this report are based on information collected by the National Health Interview Survey, a data system of the National Center for Health Statistics (NCHS). The information was collected by personal interview in the homes of a nationally representative sample of nonmilitary persons living in households.

The interviewers were recruited, trained, and supervised by the Bureau of the Census under terms of an interagency agreement with NCHS. The interview data were keyed and edited by NCHS.

In the 1990 NHIS, interviews were conducted in 46,476 households, or 95 percent of the eligible households. Nearly 120,000 persons lived in the households in which interviews were conducted. Of these persons, 6,310 were reported to use assistive technology devices, and 3,239 were reported to have home accessibility features. The sample cases were weighted to make the estimates of national statistics shown in this report. The weight for each case adjusted for several factors, including the nonresponse of some eligible households.

Although extensive quality control measures are used at each stage of the NHIS, both sampling and nonsampling errors are present in the estimates. Sampling errors arise because the information comes from a sample of the population, not from the whole population. Estimates based on a sample often differ from statistics based on a complete enumeration. That difference, the "sampling error," can be measured by a statistic called the "standard error." Standard errors were estimated using the following formula:

$$SE(x) = \sqrt{\frac{1783x\,(100-x)}{y}}$$

where x is the estimated percent, y is the base (denominator) of the percent, and $SE(x)$ is the standard error of the percent. This formula was derived by estimating the standard errors of a set of selected statistics using Taylor linearization (a precise technique), then mathematically fitting a curve to the relationship between the estimates and their standard errors. The formula described the curve. Estimates of statistics that have a standard error that is 30 percent or more of the estimate itself are considered unreliable and are marked with an asterisk.

Sampling error also affects comparisons of estimates: If estimates have large sampling errors, a difference between them may have arisen by chance. Statements about differences among estimates have been tested (using a two-tailed t-test) and found to have been unlikely to have occurred by chance (probability less than 0.05).

Nonsampling errors can arise from a variety of sources, and are difficult to measure. In most surveys, the most serious source of nonsampling error is inaccurate information given by the respondent, who may misunderstand the question, not remember the correct answer, or willfully give a false answer. Other sources of nonresponse error are mistakes in asking questions or recording answers, and mistakes in coding and keying interview data.

For more information on sampling design, field procedures, data processing, estimation procedures, and variance estimation, see *Current Estimates from the National Health Interview Survey, 1990*, which also includes reproductions of the Assistive Devices questionnaire and other questionnaires used in 1990 (4).

Suggested citation

LaPlante MP, Hendershot GE, Moss AJ. Assistive technology devices and home accessibility features: prevalence, payment, need, and trends. Advance data from vital and health statistics; no 217. Hyattsville, Maryland: National Center for Health Statistics. 1992.

National Center for Health Statistics

Director
Manning Feinleib, M.D., Dr. P.H.

Acting Deputy Director
Jack R. Anderson

Number 218 • September 16, 1992

Advance Data

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Serious Mental Illness and Disability in the Adult Household Population: United States, 1989

by Peggy R. Barker, M.P.H., Division of Health Interview Statistics, Ronald W. Manderscheid, Ph.D., National Institute of Mental Health, Gerry E. Hendershot, Ph.D., Susan S. Jack, M.S., Charlotte A. Schoenborn, M.P.H., Division of Health Interview Statistics, and Ingrid Goldstrom, M.Sc., National Institute of Mental Health

Introduction

Significance of the problem

Estimates of the prevalence of serious mental illness (SMI) and information on persons with SMI in the United States are critical to the development of policy for this population in a broad range of areas, such as planning and development of necessary mental health, health, and social services, including housing; development of disability policy (for example, Supplemental Security Income and/or Social Security Disability Insurance eligibility); and training, recruitment, and placement of psychiatric and other mental health staff. However, such data have not been readily available because of the difficulty of defining the population, the lack of relevant operational measures, and the lack of appropriate survey mechanisms outside of treatment settings. This report is designed to address this deficit for the civilian noninstitutionalized population of the United States.

Deinstitutionalization of mentally ill persons and demographic trends in the United States, that is, the aging into adulthood of "baby boomers" and the overall graying of America, have resulted in an increase in the absolute number of SMI persons generally and in those living in the community. Currently, the National Institute of Mental Health (NIMH) estimates that there are between 4 and 5 million SMI persons in the adult population of the United States, including both institutional and community residential settings (1). Thus, some sense of urgency exists to improve knowledge about this large, disabled population.

Definition of the population

Historically, the definition of SMI was based principally upon psychiatric diagnosis. Over the years this definition has evolved to a more refined notion, including psychiatric disabilities. It has become increasingly recognized that the SMI population is a heterogeneous group with different diagnoses, levels of disability, and duration of disability, and therefore, different service needs (2). At present, a more precise definition is being developed by NIMH to encompass this diversity.

Because of the complexity of the interface among psychiatric diagnosis, type and level of disability, and duration of the disability, SMI has been defined for the present survey as any psychiatric disorder present during the past year that seriously interfered with one or more aspects of a person's daily life. In this context, specific measures of disability and their duration represent variable characteristics of persons in the population rather than defining criteria. This approach represents a more flexible application of the diagnosis, disability, and duration criteria employed in the past (3–5).

Previous estimates

The most recent survey prior to the present, the 1978 Social Security Administration Survey of Disability and Work, estimated that 1.1 million persons in households were "seriously disabled mentally ill" (6). The definition of the population was based on persons 20–64 years of age who were limited in the kind or amount of work or housework they could do and who had been disabled or were expected to be so for a

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL

period of at least 12 months, mainly because of mental illness or nervous or emotional problems.

The estimate of 1.1 million persons was known to be an undercount of the population in the community because data were not collected on functional limitations beyond the work domain, or on limitations of a shorter duration than 1 year, that is, people with recent or episodic disabilities. Elderly persons, the fastest growing segment of the population in the United States were not included and no data were collected on the use of mental health services or participation in programs by persons with psychiatric disabilities.

Present survey

In 1989, NIMH collaborated with the National Center for Health Statistics (NCHS) on a special supplement to the National Health Interview Survey (NHIS). The purpose was to update previous estimates using a more flexible operational definition of the number of SMI persons in the household population of the United States, and to examine the use of mental health services and disability program participation of this population.

Highlights

Based on respondent-reported information collected in the NHIS, in 1989 there were approximately 3.3 million adults 18 years of age or older in the civilian noninstitutionalized population of the United States who had a serious mental illness in the past 12 months, a rate of 18.2 adults per 1,000 persons. Approximately 2.6 million, or 78.8 percent of these adults, have one or more specific limitations in work, school, personal care, social functioning, concentrating, or coping with day-to-day stress attributed to SMI.

Approximately 1.4 million adults between the ages of 18 and 69 were currently unable to work (829,000) or limited in work (529,000) because of their SMI, and over 82 percent of these adults have had this work limitation for a year or longer.

Among the 390,000 adults 70 years of age and over with SMI, about 85 percent had current limitations in one or more of the specific activities described above because of SMI, and approximately 80 percent of these adults had been limited by SMI for a year or longer.

About 703,000 adults with SMI in the household population receive a disability payment through a Government program because of their mental disorder. By race, 76 percent of these adults are white persons and 22 percent are black persons. Almost 43 percent of black adults with SMI receive a Government disability payment compared with about 21 percent of white adults with SMI.

Data and methods

Design

The NHIS is a continuous cross-sectional nationwide survey of the resident household population of the United States. Every year since 1957, basic demographic and health information has been collected from a nationally representative sample of households in face-to-face interviews conducted by staff of the U.S. Bureau of the Census. Certain types of noninstitutional group quarters, such as small group homes and halfway houses, are included and residents interviewed when these places fall into the sampling frame. The term "household" is used to denote all residential places in the NHIS sample. Information is collected on each member of the family (or families) residing in the household, by proxy if the person is not at home at the time of the interview or is not competent to self-respond. For the NHIS-Mental Health, the same respondent or respondents present for the basic interview were asked questions on mental health about all family members.

Respondents

In 1989, information was collected on about 113,000 persons for the NHIS-Mental Health. This represented a response rate of 97 percent of respondents for which information was collected on the basic questionnaire and about 92 percent of the total NHIS sample. Nonresponse for the basic NHIS was about 5 percent.

In the entire 1989 NHIS sample, over 58 percent of all adults responded for themselves, and about 68 percent of adults reported to have SMI responded for themselves. As might be expected, self-response was lower among those persons most seriously disabled by SMI. Of those reported to be unable to carry out one or more activities for a year or longer, 52 percent responded for themselves compared with 77 percent of those for whom no specific current limitations were reported.

Validity of the data

Clearly, the quality of these data is dependent on the person with SMI or a family member's awareness of and willingness to report both the condition and the resulting disability. Because there is still some stigma attached to mental illness and because this survey was not designed to "diagnose" mental disorders, these data are likely to underestimate the true prevalence. In this survey, both diagnosed and undiagnosed conditions were reported; but among those persons with a current limitation due to the mental disorder, about 95 percent reported that a health professional had diagnosed the disorder. Among all persons reported to have SMI, over 92 percent reported that the disorder had been diagnosed.

Methods

The three main concepts in the NIMH definition of "serious mental illness," diagnosis, disability, and duration of disability (3–5) were operationalized in the survey in the manner described below.

Information about a mental or emotional disorder diagnosis was determined using a checklist of specific severe mental disorders and

RT 69 3–4

Section Q — MENTAL HEALTH

PERSON 1

Enter person number(s) of respondent(s).

5–6
7–8

Person number(s) of respondent(s)

These questions are about mental and emotional disorders.

1a. DURING THE PAST 12 MONTHS, did anyone in the family have —

If "Yes," ask 1b and c.

b. Who is this?

Mark box in appropriate person's column.

c. DURING THE PAST 12 MONTHS, did anyone else have —

A. Schizophrenia (skit-suh-free'-nee-uh)?	☐ Yes	☐ No	A.	1 ☐ Schizophrenia — 9
B. Paranoid or delusional disorder, other than schizophrenia?	☐ Yes	☐ No	B.	1 ☐ Paranoid disorder — 10
C. Manic episodes or manic depression, also called bipolar disorder?	☐ Yes *(Specify)*	☐ No	C.	1 ☐ Manic episodes — 11 1 ☐ Manic depression — 12
D. Major depression? *Read if necessary:* **A depressed mood and loss of interest in almost all activities FOR AT LEAST TWO WEEKS.**	☐ Yes	☐ No	D.	1 ☐ Major depression — 13
E. Anti-social personality, obsessive-compulsive personality, or any other SEVERE personality disorder?	☐ Yes	☐ No	E.	1 ☐ Personality disorder — 14
F. Alzheimer's (altz' hī-merz) **disease or another type of senile disorder?**	☐ Yes	☐ No	F.	1 ☐ Senility — 15
G. Alcohol abuse disorder?	☐ Yes	☐ No	G.	1 ☐ Alcohol abuse — 16
H. Drug abuse disorder?	☐ Yes	☐ No	H.	1 ☐ Drug abuse — 17
I. Does anyone in the family NOW have mental retardation?	☐ Yes	☐ No	I.	1 ☐ Mental retardation — 18

2a. DURING THE PAST 12 MONTHS, did anyone in the family have any OTHER mental or emotional disorders? Include ONLY those disorders which SERIOUSLY interfere with a person's ability to work or attend school, or to manage their day-to-day activities. ☐ Yes ☐ No *(Check Item 1)*

b. Who is this? Anyone else? *Mark box in appropriate person's column.* — 2b. 1 ☐ Other — 19

Ask for each person with "Other" in 2b:

c. What would you call the disorder — — has? — c. — 20–22

CHECK ITEM 1 — *Refer to 1A—F and 2b/c.* — CK 1 — 1 ☐ One or more entries in 1A–F or 2b/c *(Check Item 2)* — 23; 8 ☐ All others *(NP or Section P)*

CHECK ITEM 2 — *Enter disorder(s) from 1A—F and 2c. DO NOT RECORD G, H, OR I.* — CK 2 — *(Check Item 3)*

Notes

Figure 1. Mental disorder checklist

an additional question about the presence of "any other mental or emotional disorder" that seriously interfered with a person's ability to work or attend school or to manage their day-to-day activities. The reference period for these questions was during the past 12 months. The mental disorder checklist appears in figure 1.

Questions were subsequently asked about if and when the reported disorder was diagnosed by a health professional, if and when a mental health or other health professional was last seen for the disorder, the type of mental health professional last seen, and the use of prescription medication for the disorder.

Alcohol abuse disorder, drug abuse disorder, and mental retardation were asked on the checklist but no followup questions were asked about these conditions. Persons reporting only one or more of these disorders are excluded from the data in this report because they are not included in the NIMH definition of "serious mental illness." These conditions were asked on the checklist in order to avoid having them reported as "other" mental or emotional disorders, which would have required coding before deleting them from this analysis.

Among those with SMI, disability was measured through a series of questions about current limitations in activities and functions and a series of questions about the receipt of Government disability payments. The limitation questions asked whether the person was entirely prevented from working or limited in work, and, for persons 18–24 years old and not in the labor force, in attending school or college; whether they appropriately and adequately took care of personal care needs (eating, dressing, bathing, and going to the toilet) and specific instrumental activities of daily living (managing money, doing everyday household chores, shopping, and getting around outside the home); and the degree of difficulty with certain aspects of social and cognitive functioning. The time reference for the disability questions was "now," that is, the present time. Each of these questions was phrased to refer only to limitations due to the reported mental disorder. Obviously, to the extent that persons have multiple health problems and cannot parcel out disability resulting from each, this was a difficult question to answer. Similar questions have been used previously by NIMH as part of surveys of SMI in treatment settings (7) as well as in household surveys (8).

The duration of disability concept was measured simply by asking how long any identified limitation due to the mental disorder had been present.

The "Technical notes" section that appears at the end of this report contains more information on the survey design, sampling procedure, and NHIS questionnaire documents. Methods for constructing approximate standard errors and tests of significance for estimates and percents presented in this report also appear in these notes. Unless otherwise noted, the comparisons made within the text are significant at the .05 level.

This report presents estimates of the 12-month prevalence, demographic and socioeconomic characteristics, current disability, service utilization, and disability program participation of the adult SMI household population of the United States. A facsimile of the mental health questions is provided in "Current Estimates From the National Health Interview Survey, 1989" (9).

Results

Prevalence and demographic characteristics

The 1989 12-month prevalence estimate of SMI in the U.S. adult household population is 18.2 per 1,000 persons. About 79 percent of these persons had one or more current limitations attributed to their mental disorder but these estimates varied greatly between subgroups of the population (table 1). The rate of SMI was generally higher in the oldest age group than in any other. More females than males were reported to have SMI (20.6 compared with 15.5 per 1,000 persons).

Neither the prevalence of SMI nor the proportion of persons with resulting current disability is significantly different for black and white persons. The prevalence rate among "other" races is about one-half that of black or white persons.

Both the prevalence of SMI and resulting disability are clearly related to poverty status. SMI was over 2 1/2 times as likely among adults in poverty than among those not in poverty, and proportionally more poor than nonpoor adults with SMI had resulting disability.

Lower educational attainment is strongly related to prevalence and disability from SMI. Among adults with less than 12 years of education, the rate of SMI is almost twice that among those with more than 12 years; and the percent with disability among the least educated group is 86.5 percent compared with 70.7 percent of the highest educated group.

Respondent-assessed health status

Data on assessed health status are acquired in the basic NHIS by asking respondents to assess their own health and that of family members living in the same household as excellent, very good, good, fair, or poor. Respondent-assessed health status has been shown to be highly correlated with more objective measures of health status and to predict mortality (10, 11).

Table 1 shows a strong negative correlation between reported health status and prevalence rate of SMI, and the same pattern holds for the proportions of persons reporting current limitations. Among adults with "poor" health status, the rate of SMI was 118.3 per 1,000 persons, or more than six times the rate for the total adult population; and almost

Table 1. Number and percent distribution of the adult household population, adults with serious mental illness and rate per thousand, adults currently limited by serious mental illness and percent limited, by selected characteristics: United States, 1989

Characteristic	Adult household population		All adults with serious mental illness			Adults currently limited by serious mental illness		
	Number in thousands	Percent distribution	Number in thousands	Percent distribution	Rate per thousand	Number in thousands	Percent distribution	Percent
Total[1]	179,529	100.0	3,264	100.0	18.2	2,571	100.0	78.8
Age[1]								
18–24 years	25,401	14.2	361	11.1	14.2	291	11.3	80.6
25–34 years	42,814	23.9	707	21.7	16.5	501	19.5	70.8
35–44 years	35,982	20.0	744	22.8	20.7	600	23.3	80.6
45–64 years	46,114	25.7	919	28.2	19.9	749	29.1	81.5
65–69 years	9,903	5.5	142	4.4	14.3	99	3.9	70.0
70–74 years	7,925	4.4	102	3.1	12.9	82	3.2	79.8
75 years and over	11,391	6.3	288	8.8	25.3	249	9.7	86.6
Sex[1]								
Male	85,257	47.5	1,320	40.4	15.5	1,105	43.0	83.7
Female	94,272	52.5	1,944	59.6	20.6	1,466	57.0	75.4
Race[1]								
White	153,763	85.6	2,812	86.1	18.3	2,194	85.3	78.0
Black	19,932	11.1	393	12.0	19.7	325	12.7	82.8
Other	5,834	3.2	59	1.8	10.1	52	2.0	87.1
Poverty status[2]								
Below poverty threshold	15,464	9.5	609	21.0	39.4	525	23.1	86.3
At or above poverty threshold	147,070	90.5	2,284	79.0	15.5	1,750	76.9	76.7
Education[2]								
Less than 12 years	39,809	22.4	1,083	33.8	27.2	937	37.3	86.5
12 years	68,563	38.6	1,120	34.9	16.3	866	34.5	77.4
More than 12 years	69,369	39.0	1,002	31.3	14.4	708	28.2	70.7
Respondent-assessed health status[2]								
Excellent	62,277	34.8	337	10.3	5.4	192	7.5	56.9
Very Good	50,941	28.5	620	19.1	12.2	414	16.1	66.7
Good	43,769	24.5	812	24.9	18.6	617	24.1	75.9
Fair	15,565	8.7	755	23.2	48.5	648	25.3	85.9
Poor	6,207	3.5	734	22.5	118.3	695	27.1	94.7

[1]Includes persons with unknown poverty status, education, and/or self-assessed health status.
[2]Percent denominators exclude persons with this characteristic unknown.

95 percent of those adults have a current limitation resulting from the SMI.

Work and other limitations

An estimated 47.2 percent of persons 18–69 years of age with SMI, or 1.4 million persons, were reported to be unable to work (28.9 percent) or limited in work (18.4 percent) because of their mental disorder (table 2). By race, more black persons with SMI (43.4 percent) were unable to work because of their mental disorder than white persons with SMI (26.8 percent).

Among SMI persons who are unable to work, 94.1 percent reported additional limitations, and among those limited in work, 91.3 percent reported additional limitations (table 3). Not surprisingly, persons with SMI who are unable to work or limited in work are more likely to have one or more of the other specific limitations shown in table 3 than their peers who do not report work limitations. However, more than one-half (58 percent) of persons 18–69 years of age with SMI who reported no current work limitation, and about the same proportion of those who reported not working for other reasons or for whom work limitation was unknown, reported other limitations. For these two groups of persons, "coping with day-to-day stress" was the most frequently reported limitation, (52.6 and 54.3 percent), although between 21 and 32 percent were reported to have difficulty making and keeping friendships ("social functioning") and "concentrating long enough to complete tasks."

Reporting of each type of limitation is higher for persons with SMI who are unable to work than for those who are limited in work, but the differences in difficulty "coping with day-to-day stress" and "concentrating long enough to complete tasks" are not statistically significant.

Considering the range of limitations asked about in this survey, persons with SMI who are unable to

Table 2. Number and percent distribution of adults 18–69 years of age with serious mental illness by current work limitation status according to race: United States, 1989

Work limitation status[1]	Total[2]	White	Black	Total[2]	White	Black
	Number in thousands			Percent distribution		
Total	2,874	2,471	345	100.0	100.0	100.0
Total with work limitation due to serious mental illness	1,358	1,116	215	47.2	45.2	62.1
Unable to work	829	663	150	28.9	26.8	43.4
Limited in work	529	454	65	18.4	18.4	18.7
No current work limitation	1,032	934	79	35.9	37.8	23.0
Does not work for other reasons or work limitation status unknown	485	420	51	16.9	17.0	14.8

[1]Approximately 1 percent (11,000) of those shown in "unable to work" or "limited in work" were persons aged 18–24 who were not in the labor force and who were reported as being "unable" or "limited" in school attendance.
[2]Includes "other" race.

Table 3. Number of adults 18–69 years of age with serious mental illness by current work limitation status and percent reporting other limitations, and number and percent of adults 70 years of age and over with serious mental illness reporting limitations: United States, 1989

Age and work limitation status[1]	SMI[2] population	Any other limitation	Personal care activities of daily living[3,4]	Instrumental activities of daily living[5]	Social functioning[6]	Coping with day-to-day stress	Concentrating long enough to complete tasks
	Number in thousands	Percent					
Total 18–69 years of age	2,874	74.6	2.7	22.9	46.3	67.7	46.5
Unable to work	829	94.1	7.7	48.8	70.4	86.5	72.9
Limited in work	529	91.3	2.6	30.2	61.2	80.1	67.2
No current work limitation	1,032	58.0	– – –	4.6	26.8	52.6	21.4
Does not work for other reasons or work limitation status unknown	485	58.7	– – –	9.8	30.7	54.3	32.0
Total 70 years of age and over	390	84.8	24.3	62.3	59.8	70.8	69.8

[1]Approximately 1 percent (11,000 persons) of those shown in "unable" or "limited" in work were persons age 18–24 who were not in the labor force and who were reported as being "unable" or "limited" in school attendance.
[2]SMI is seriously mentally ill.
[3]Includes eating, dressing, bathing, and going to the toilet.
[4]Questions about personal care limitations were not asked of adults 18–64 years of age with no work or school limitations resulting from the serious mental illness.
[5]Includes managing money, doing everyday household chores, shopping, and getting around outside the home.
[6]Includes forming and keeping friendships.

Table 4. Number and percent distribution of adults with serious mental illness by selected services, according to limitation status, and percent currently limited by serious mental illness: United States, 1989

Selected services	Total		Currently limited		
	Number	Percent distribution	Number	Percent distribution	Percent
Receipt of Government disability payment[1]					
Yes	703	23.2	685	27.8	97.5
No	2,324	76.8	1,782	72.2	76.7
Use of prescription medication for the mental disorder in the past year[2]					
Yes	1,891	68.2	1,573	67.9	83.2
No	881	31.8	744	32.1	84.5
Last visit to a mental health professional[1]					
Less than one month	1,035	33.6	895	35.6	86.6
One month to less than one year	836	27.2	663	26.4	79.3
One year or more	509	16.5	436	17.4	85.7
Never[3]	700	22.7	520	20.7	74.2

[1]Percent denominators exclude adults with this characteristic unknown.
[2]Percent denominators include only adults who have ever seen a doctor for the disorder, and exclude adults with this characteristic unknown.
[3]Among the 700,000 adults who reported never seeing a mental health professional, 447,000, or 63.8 percent, did report seeing another doctor or health professional for the mental disorder and 83.5 percent of these adults reported limitations.

work are the most likely to be disabled in other activities by their mental disorder, even more so than persons with SMI who are 70 years of age and over (94.1 percent compared with 84.8 percent reporting other limitations). However, persons 70 years of age and over with SMI were much more likely than younger persons to be limited in personal care and instrumental activities of daily living. More than three times as many persons 70 years of age and over were reported to be unable to take care of their personal care needs because of the mental disorder than SMI persons 18–69 years of age who were unable to work.

Receipt of disability payments

About 703,000, or 23.2 percent of adults with SMI in households currently receive disability payments through a Government program because of their mental disorder. (table 4). About 98 percent of these persons had current limitations due to the disorder. The discrepant two percent is due to proxy respondents who reported "don't know" to the limitation questions.

Respondents were asked whether this payment was through Social Security Disability Insurance (SSDI), through Supplemental Security Income (SSI), through the Veterans' Administration (VA), or through some other program. The Social Security Administration (SSA) administers several programs that provide cash payments or other benefits to persons who are, by SSA standards, disabled. Persons with adequate work histories usually receive monthly cash payments as social security benefits (SSDI), and persons with minimal resources and insufficient work history usually receive a monthly payment under the SSI program. VA disability payments are provided for service-incurred disability. As shown in table 5, most respondents with a disability payment reported SSDI (46.0 percent) or SSI (43.5 percent) as the source.

Data in table 6 indicate that adults with SMI who are 35–64 years of age, male, black, in poverty, have

Table 5. Number and percent of recipients of disability payment for mental illness, by source of payment: United States, 1989

Source	Number in thousands	Percent[1]
Social Security Disability Insurance	323	46.0
Supplemental Security Income	306	43.5
Veterans' Administration	86	12.3
Other	53	7.5

[1]Percents add to more than 100 because of multiple sources of payment.

Table 6. Number and percent of adults with serious mental illness who received Government disability payment for the mental disorder, by selected characteristics: United States, 1989

Characteristics	Number in thousands	Percent[1]
Total[2]	703	23.2
Age		
18–24 years	*38	*11.0
25–34 years	123	19.1
35–44 years	198	28.3
45–64 years	298	35.1
65 years and over	46	9.4
Sex		
Male	402	33.3
Female	301	16.6
Race		
White	537	20.5
Black	156	43.8
Other	*10	*22.7
Poverty status[3]		
Below poverty threshold	195	33.6
At or above poverty threshold	405	19.2
Education[3]		
Less than 12 years	317	30.9
12 years	212	20.8
More than 12 years	142	15.3
Respondent-assessed health status[3]		
Excellent	*34	*11.9
Very good	93	16.1
Good	140	18.3
Fair	193	27.3
Poor	241	35.1
Use of prescription medication in the past year for the mental illness[3]		
Yes	549	29.7
No	143	16.4
Last saw mental health professional for the mental disorder[3]		
Less than one month	385	38.7
One month to less than one year	188	23.2
One year or more	92	18.9
Never	*25	*3.6

[1]All percent denominators exclude persons with unknown receipt of disability payment (237,000, or 7.3 percent of adults with serious mental illness.
[2]Percent denominator for total includes persons with unknown poverty status, education, health status, time since last saw a mental health professional, and use of prescription medication.
[3]Percent denominator excludes persons with this characteristic unknown.

NOTES: Estimates of less than 41,000 and percents based on these estimates have 30 percent or more relative standard error (RSE); see Technical notes for description of the calculation of standard errors. Estimates with 30 percent or more RSE are indicated with an asterisk.

less than a high school education, have poor overall health status, used prescription medication in the past year for their mental disorder, or have recently (past month) seen a mental health professional, are disproportionately likely to receive Government disability payments. The most striking finding in this table is that almost 44 percent of black adults with SMI receive disability payments compared with about 21 percent of white adults with SMI. Overall, 22.1 percent of adults with SMI receiving disability payments for the disorder were black persons, although black adults are not significantly overrepresented among SMI in general or in the proportion of the SMI population with current limitations.

Comparing the source of disability payments by race, table 7 shows that black adults with SMI are more than twice as likely to report receiving SSI for their mental disorder than white adults with SMI. The higher proportions of black adults receiving SSDI and VA disability payments are significant at the .10 level.

These findings related to SSDI and SSI benefits are consistent with those from a recent report by the General Accounting Office (GAO) (12). In April 1992, the GAO issued findings from a study of racial differences in disability decisions for SSDI and SSI benefits. This report analyzed the circumstances surrounding the lower allowance rate for black applicants compared with white applicants for disability benefits. One of the findings was that while black applicants are less likely to be awarded benefits than white applicants, in the general population a higher proportion of black adults were receiving benefits than white adults. The report attributed this higher rate in the population to the fact that black adults apply at a higher rate than white adults, and it goes on to speculate that this may be due in part to poorer economic circumstances among black persons. Additional work is in progress to identify factors that might account for these racial differences.

As noted in table 2, a higher proportion of black adults with SMI in this survey are unable to work because of their disorder than white adults with SMI. Black adults are more likely than white adults (both in the general population and among adults with SMI) to be in poverty, to have less than a high school education, and to have fair or poor self-assessed health. Since all of these factors are related to receipt of disability payments, it is not surprising that black persons with SMI are more likely to receive disability payments because of their mental disorder.

Prescription drug use

Prescription drug use was highly prevalent in the population reporting SMI; about 68 percent of the adult SMI population who saw a doctor or other health professional for the mental disorder used prescription medication for the disorder during the past 12 months (table 8). Taking prescription medication was not related to limitation status. The lowest use of prescription medication for the disorder during the past year was among the youngest and oldest age groups (table 8). The proportion using prescription medication generally increased with age through the age group 65–69 years and decreased thereafter. Persons with SMI in "poor" health, those who received Government disability payments, and those who recently saw a mental health professional were most likely to have used medication.

The various types of prescription drugs used by persons with SMI during the past 12 months for the mental disorders reported are shown in table 9. Actual drug names were obtained from respondents and then coded by major class of drugs. Antidepressants were used by almost 41 percent of the 1.9 million persons using prescription medication in the past year, and were the most commonly reported type of drug used. This is not surprising, since "major depression" was reported for approximately 45 percent of persons reported to have SMI. Antianxiety and antipsychotic drugs were used by 26.3 and 25.2 percent of persons, respectively. Various other drugs, not considered to be drugs for mental health problems, were used for the mental disorders by about 18 percent of those who used prescription drugs. Table 10 shows that almost one-half of all persons with SMI using prescription medication for the disorder during the past year used more than one drug.

Visits to mental health professionals

About 77 percent of the SMI population in households (2.4 million persons) have seen a mental health professional for the mental disorder reported (table 4). Among the 700,000 persons with SMI who have never seen a mental health professional, most (about 64 percent) had seen a doctor or other health professional for the disorder. In table 11, characteristics of the SMI population who have seen a mental health professional for the reported mental disorder(s) are displayed. In the oldest age group, only 37 percent of persons with SMI had seen a mental health professional for the reported disorder but about 90 percent of this age group had seen another type of doctor or health professional for their disorder.

Table 7. Percent of adults with serious mental illness receiving disability payment for their mental disorder, by race and source of payment: United States, 1989

Source	White	Black
	Percent	
Social Security Disability Insurance	10.0	16.7
Supplemental Sercurity Income	6.9	20.0
Veterans' Administration	2.4	7.0
Other	1.6	2.7

Table 8. Number and percent of adults with serious mental illness who used prescription medication during the past year for the mental disorder, by selected characteristics: United States, 1989

Characteristic	Number in thousands	Percent[1]
Total[2]	1,890	68.2
Age		
18–24 years	168	55.7
25–34 years	347	61.8
35–44 years	463	69.2
45–64 years	638	78.8
65–69 years	100	82.1
70–74 years	62	75.0
75 years and over	112	50.0
Sex		
Male	732	67.4
Female	1,158	68.8
Race		
White	1634	68.2
Black	231	70.3
Other	*25	*55.4
Poverty status[3]		
Below poverty threshold	373	70.1
At or above poverty threshold	1313	68.4
Education[3]		
Less than 12 years	658	69.4
12 years	646	69.9
More than 12 years	563	66.1
Respondent-assessed health status[3]		
Excellent	162	61.4
Very good	357	67.7
Good	448	66.4
Fair	420	64.8
Poor	502	77.0
Receipt of Government disability payment[3]		
Yes	549	79.4
No	1303	64.1
Last saw mental health professional for the mental disorder[3]		
Less than one month	849	85.0
One month to less than one year	598	74.2
One year or more	201	40.2
Never	220	52.5

[1]All percent denominators exclude persons who have not seen any health professional for the disorder (246,000, or 7.5 percent of adults with serious mental illness and exclude persons with unknown "use of prescription medication for the disorder" (247,000, or 7.6 percent of adults with serious mental illness).

[2]Percent denominator for total includes persons with unknown poverty status, education, health status, disability pay, and time since last saw a mental health professional.

[3]Percent denominator excludes persons with this characteristic unknown.

NOTES: Estimates of less than 41,000 and percents based on these estimates have 30 percent or more relative standard error (RSE); see Technical notes for description of the calculation of standard errors. Estimates with an RSE of 30 percent or more are indicated with an asterisk.

Table 9. Number and percent of adults with serious mental illness who took prescription drugs in the past year for mental disorder, by type of drug: United States, 1989

Type of drug	Number in thousands	Percent
Antidepressant	769	40.6
Antianxiety	497	26.3
Antipsychotic	477	25.2
Antimanic	233	12.3
Other psychotropic drug	65	3.4
Other drug	337	17.8
Unknown drug name	46	2.4

Table 10. Number and percent distribution of adults with serious mental illness who took prescription drugs in the past year for the mental disorder, by number of drugs reported: United States, 1989

Number of drugs	Number in thousands	Percent distribution
Total	1,890	100.0
Number of drugs		
One	875	46.3
Two	478	25.3
Three	251	13.3
Four	85	4.5
Five or more	68	3.6
Unknown	135	7.1

Persons 35–64 years of age were more likely than any other age group to have seen a mental health professional.

Persons who used prescription medication for their mental disorder during the past year and persons who received disability payments for the disorder were more likely to have seen a mental health professional than others with SMI.

Summary and conclusions

The major significance of the current report is that it provides estimates and characteristics for that portion of the civilian SMI population living in households. Survey results show that approximately 3.3 million adult Americans have mental disorders that seriously interfere with one or more aspects of daily life and that about 2.6 million of these persons are currently limited in one or more functional areas. These results suggest that the household component of the SMI population is comprised of between 2.6 and 3.3 million adults, depending upon the criteria employed for inclusion. Undoubtedly, both of these numbers are conservative because of the likelihood of underreporting in the survey.

Placed in the context of the entire adult population, these findings suggest that the SMI population can be conservatively estimated to include 4 to 5 million adult Americans, or 2.1 to 2.6 percent of the adult population. In addition to the household population, it is estimated that 200,000 SMI persons are homeless on any given day (13). An additional 1 million to 1.1 million are residents of nursing homes (14), approximately 50,000 to 60,000 are patients of mental hospitals, and approximately 50,000 are inmates of State prisons (15).

A major remaining need is to collect similar data on all SMI persons, whether their residence is a household, an institutional or noninstitutional group quarter, or some other setting, including streets and shelters. In order to formulate more effective national policy to address the needs of these disabled Americans, a need exists to examine the longitudinal relationship between course of disorder and functioning as they relate to service and program participation.

References

1. Unpublished estimate. Statistical Research Branch, National Institute of Mental Health (NIMH). 1992.
2. Goldsmith H, Gattozzi A, Taube C. Defining and counting the chronically mentally ill. Hosp Community Psychiatry 32:21–7. 1981.
3. Goldman H, Manderscheid R. Chronic mental disorder in the United States. Mental Health, United States, 1987. National Institute of Mental Health. 87–1518:1–11. 1987.
4. Ashbaugh J, Manderscheid R. A method for estimating the chronic mentally ill populations in state and local areas. Hosp Community Psychiatry 36(4). 1985.
5. Goldman H, Rosenberg J, Manderscheid R. Defining the target population for vocational

Table 11. Number and percent of adults with serious mental illness who have ever seen a mental health professional, by selected characteristics: United States, 1989

Characteristic	Number in thousands	Percent[1]
Total[2]	2,380	77.3
Age		
18–24 years	276	80.3
25–34 years	503	75.8
35–44 years	630	87.6
45–64 years	719	82.5
65–69 years	89	68.5
70–74 years	70	69.5
75 and over	93	37.0
Sex		
Male	959	77.9
Female	1,421	76.8
Race		
White	2,042	76.8
Black	292	80.3
Other	46	79.7
Poverty status[3]		
Below poverty threshold	470	79.1
At or above poverty threshold	1633	76.1
Education[3]		
Less than 12 years	766	74.9
12 years	804	76.4
More than 12 years	762	80.3
Respondent-assessed health status[3]		
Excellent	244	82.6
Very good	464	78.7
Good	606	78.2
Fair	533	74.4
Poor	530	75.8
Use of prescription medication for the mental disorder[4]		
Yes	1648	88.2
No	657	76.7
Receipt of Government disability payment[3]		
Yes	665	96.4
No	1628	71.3

[1] All percent denominators exclude persons with unknown time since last saw a mental health professional (184,000, or 5.6 percent of total adults with serious mental illness).

[2] Percent denominator for total includes persons with unknown poverty status, education, health status, prescription drug use, and/or disability pay.

[3] Percent denominator excludes persons with this characteristic unknown.

[4] Percent denominator includes only persons who have ever seen a doctor or other health professional and excludes persons with this characteristic unknown.

rehabilitation. In: Ciardiello J, Bell M, eds. Vocational rehabilitation of persons with prolonged psychiatric disorders. Baltimore and London: Johns Hopkins University Press. 19–23. 1988.

6. Ashbaugh J, Leaf P, Manderscheid R, Eaton W. Estimates of the size and selected characteristics of the adult chronically mentally ill population living in U.S. households. Research in Community Ment Health J 3:3–24. 1983.
7. Mulkern V, et al. Community support program client followup study, executive summary. Study funded by the National Institute of Mental Health, Division of Biometry and Applied Sciences. Prepared by Human Services Research Institute, Cambridge, MA:5–32. 1986.
8. Leon J, Lair T. Functional status of the noninstitutionalized elderly: estimates of ADL and IADL difficulties. Research findings from the National Medical Expenditure Survey, Agency for Health Care Policy Research, Department of Health and Human Services, 90–3462. 1990.
9. Adams PF, Benson V. Current estimates from the National Health Interview Survey, 1989. National Center for Health Statistics. Vital and Health Stat 10(176). 1990.
10. Idler EL, Angel RJ. Self-rated health and mortality in the NHANES-I Epidemiologic Followup Study. Am J Public Health 80(4):446–52. 1990.
11. Idler EL, Kasl SV, Lemke JH. Self-evaluated health and mortality among the elderly in New Haven, Conecticut, and Iowa and Washington counties, Iowa, 1982–86. Am J Epidemiol 131(1):91–103. 1990.
12. U.S. General Accounting Office. Human Resources Division. Racial differences in disability decisions warrants further investigation. Washington: U.S. General Accounting Office. April 1992.
13. Manderscheid R, Rosenstein M. Homeless persons with mental illness and alcohol or other drug abuse: current research, policy, and prospects. Current opinion in Psychiatry 5:273–8. 1992.
14. Strahan G. Prevalence of selected mental disorders in nursing and related care homes. National Institute of Mental Health, Mental Health 90–1708:chapter 6. 1990.
15. Unpublished estimate. Statistical Research Branch, National Institute of Mental Health. 1992.
16. National Center for Health Statistics. The National Health Interview Survey design, 1973–84, and procedures, 1975–83. National Center for Health Statistics. Vital Health Stat 1(18). 1985.
17. Massey JT, Moore TF, Parsons VL, Tadros W. Design and estimation for the National Health Interview Survey, 1985–94. National Center for Health Statistics. Vital Health Stat 2(110). 1989.
18. Moss AJ, Parsons VL. Current estimates from the National Health Interview Survey, United States, 1985. National Center for Health Statistics. Vital Health Stat 10(160). 1986.

Symbols

---	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision

Technical notes

Source and description of data

The estimates presented in this report are based on data from the 1989 National Health Interview Survey (NHIS), an ongoing survey of households in the United States conducted by the National Center for Health Statistics (NCHS). Each week, a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers obtain information about the health and other characteristics of the households included in the NHIS sample.

NHIS consists of two parts: (a) a basic health and demographic questionnaire that remains the same each year and is completed for every household member and (b) special topics questionnaires that vary from year to year, some of which may be completed only for selected persons in each family. In 1989, the special topics included health care coverage, adult immunization, mental health, dental health, diabetes, orofacial pain, digestive disorders, and knowledge and attitudes about acquired immunodeficiency syndrome (AIDS).

The total interviewed sample for 1989 for the basic health and demographic questionnaire consisted of 45,711 households containing 116,929 persons. The noninterview rate was 5.1 percent. NHIS Mental Health (NHIS-MH) interviews were completed for 113,231 persons, or 96.8 percent of those interviewed on the basic questionnaire. The overall response rate for the NHIS-MH was 91.9 percent (the product of the response rates for the basic and mental health questionnaires).

Sampling errors

Because estimates shown in this report are based on a sample of the population rather than on the entire population, they are subject to sampling error. When an estimate or the numerator or denominator of a percent is small, the sampling error may be relatively high. In addition, the complex sample design of NHIS has the effect of making sampling errors larger than they would be had a simple random sample of equal size been used. Estimates and figures based on estimates that do not meet the reliability criteria of 30 percent relative standard error are marked on the tables.

Approximate standard errors of the estimated numbers (x) in the tables (except for age, sex, and race for all persons when the standard error is assumed to be 0.0) may be calculated using the formula

$$SE(x) = \sqrt{.0000307(x)^2 + 3640(x)}$$

For example, it is estimated that 3,264,000 adults had a SMI in the last 12 months (table 1). Using this formula, the standard error for the estimated number is

$$SE(3{,}264{,}000) =$$

$$\sqrt{.0000307(3{,}264{,}000)^2 + 3640(3{,}264{,}000)}$$

$$= 110{,}490$$

Approximate standard errors of the estimated percents in the tables may be calculated using the formula

$$SE(p) = \frac{\sqrt{3640(p)(100-p)}}{y}$$

where p is the percent of persons and y is the base population from which the percent is calculated.

For example, it is estimated that 78.8 percent of adults with SMI have one or more specific limitations resulting from the SMI (table 1). Using this formula, the standard error for the estimated percent is

$$SE(78.8) = \frac{\sqrt{3640(78.8)(100-78.8)}}{3{,}264{,}000}$$

$$= 1.86$$

If x_1 and x_2 are two estimates, then the approximate standard error of the difference $(x_1 - x_2)$ can be computed as follows:

$$SE(x_1)^2 + SE(x_2)^2 - 2r\,SE(x_1)SE(x_2)$$

where $SE(x_1)$ and $SE(x_2)$ are computed using the appropriate formulas previously presented in this section and r is the correlation coefficient between x_1 and x_2. Assuming $r = 0.0$ will result in an accurate standard error if the two estimates are actually uncorrelated. If they are correlated, the standard error of the difference will be underestimated or overestimated. These calculations can also be performed for differences in percents using the appropriate standard error formulas for percents.

In this report, unless otherwise noted, a difference was considered statistically significant at the 5-percent level if the difference $(x_1 - x_2)$ was at least twice as large as its standard error. Further information on how the standard error parameters are constructed is available in "Current Estimates From the National Health Interview Survey: 1989" (9).

Related documentation

More detailed discussion of the sample design, estimating procedures, procedures for estimating standard errors, nonsampling errors, and definitions of other sociodemographic terms used in this report have been published in *Vital and Health Statistics*, Series 1, no 18; Series 2, no 110; Series 10, nos 160 (16–18) and 176 (9).

A public use data file based on the 1989 Mental Health Survey questionnaire was released in April 1991. Information regarding the purchase of the public use data tape may be obtained by writing the National Center for Health Statistics, Division of Health Interview Statistics, 6525 Belcrest Road, Hyattsville, Maryland, 20782.

Suggested citation

Barker PR, Manderscheid RW, Hendershot GE, et al. Serious mental illness and disability in the adult household population: United States, 1989. Advance data from vital and health statistics; no 218. Hyattsville, Maryland: National Center for Health Statistics. 1992.

Number 219 • November 20, 1992

Advance Data

nchs

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Trends in Childhood Use of Dental Care Products Containing Fluoride: United States, 1983–89

by Diane K. Wagener and Parivash Nourjah, Office of Analysis and Epidemiology, National Center for Health Statistics, and Alice M. Horowitz, Epidemiology and Oral Disease Prevention Program, National Institute of Dental Research, National Institutes of Health

Introduction

The correlation between the concentration of fluoride in community drinking water and prevalence of dental caries (tooth decay) observed in the early 1940's resulted in a public health effort to encourage communities to add fluoride to their water supply as a means of preventing dental caries. Essentially all water contains at least trace amounts of fluoride. Thus, community water fluoridation is the adjustment of the amount of fluoride that occurs naturally in a community's water supply to the optimal level for preventing tooth decay. In the United States, the optimal level of fluoride ranges from 0.7 to 1.2 parts per million (ppm). In 1945, 1.7 percent of the American population was served by optimally or greater than optimally naturally fluoridated drinking water (1). A 1989 survey indicated that 54 percent of the American public and 61 percent of the population on central water systems are now being served by optimally fluoridated drinking water (2). Neither the percent of the population served by fluoridated drinking water nor the percent of the population on community water systems that received fluoridated water has changed since 1985 (2).

In addition to optimally fluoridated drinking water, other sources of fluoride for public use have been developed and marketed. These include dietary fluoride supplements, fluoride toothpaste, fluoride mouthrinse, and professionally applied fluorides. Dietary fluoride supplements are designed for children—infants through teen years—and are used in communities in which the drinking water is fluoride deficient. Dietary fluoride supplements by prescription, fluoride-containing toothpastes sold over the counter, and professionally applied fluorides have been available for over three decades. More recently, mouthrinses containing fluoride have been marketed and sold over the counter.

Early school-based fluoride programs consisted of operator-applied fluoride regimens. Later, other kinds of fluoride administration were developed and used in schools. Today, school-based, fluoride rinse and/or tablet programs have been implemented in most States. Fluoride mouthrinsing is the fluoride regimen most frequently used, followed by fluoride tablet programs. Professionally applied fluoride treatments are offered in only a few school systems.

The widespread availability of community water fluoridation and use of fluoride products in the United States have contributed to a dramatic reduction of dental caries among school-age children in recent years (figure 1). For example, among 9 year olds, the prevalence of dental caries has declined from 71 percent during 1971–74 to 34 percent during 1985–86 (3). There are some groups of children that are at higher risk than others of developing dental caries (4). These groups are mainly black and live in the Northeast and Pacific regions.

The decline in dental caries has occurred at the same time that there has been an increase in the prevalence of dental fluorosis. Dental

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL

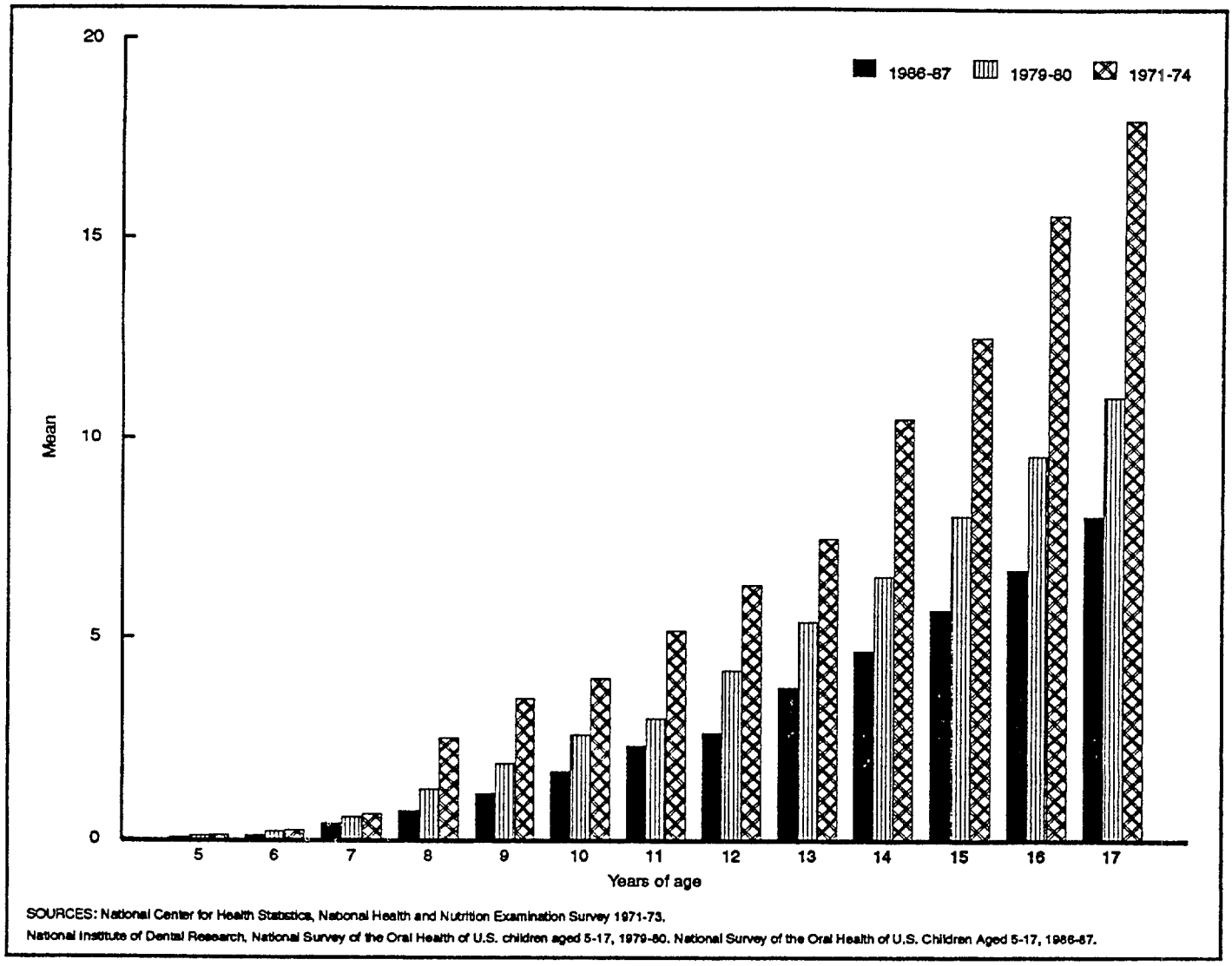


Figure 1. Age-specific mean decayed, missing, or filled permanent tooth surfaces from three national surveys: United States, 1971–87

fluorosis is a hypomineralization of enamel of the teeth that may range in appearance from a few white flecks or spots to discrete or confluent pitting and brown staining. Dental fluorosis occurs when children below the age of 6 years ingest more than the recommended amounts of fluoride. In the early 1940's, Dean estimated that only 10 percent of the children who were born and reared in communities with optimally fluoridated water (0.7 to 1.2 ppm) would demonstrate some signs of mild forms of fluorosis (5,6). Recent surveys, however, indicate that the prevalence of mild and moderate forms of fluorosis is about 22 percent (7). This degree of fluorosis is considered mild, which does not call for public health concern, although it may be important cosmetically to individuals.

To monitor the use of fluoride products, this report describes the trend in the use of selected fluoride-containing dental products and dietary fluoride supplements among infants, children, and youth younger than 18 years of age during the period 1983–89.

Data and methods

The National Health Interview Survey (NHIS) is conducted by the National Center for Health Statistics, Centers for Disease Control. It is composed of two parts: (a) a general health characteristic questionnaire that remains the same each year and is completed for each household member; and (b) a special topic questionnaire that varies from year to year and is conducted on all or a sample of the interviewed individuals. Special topics on oral health were administered in 1983, 1986, and 1989. The questions contained in these surveys were developed in collaboration with the National Institute of Dental Research, National Institutes of Health, and other Federal agencies. The information on dental care was collected on all individuals in the selected households. When possible, information was obtained from all adults in the household. Information on children and members of the family who were not at home at the time of the interview was obtained from the responsible individual of the household. These supplements

Table 1. Number of interviews, by age and selected demographic characteristics for children 0–17 years of age: United States, 1983, 1986, and 1989

Characteristic	Under 2 years			2–4 years			5–17 years		
	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	3,284	1,996	3,785	5,095	3,004	5,590	21,405	12,393	22,982
Race									
Black	483	420	665	771	581	1,005	3,063	2,574	4,196
White	2,703	1,508	2,997	4,187	2,326	4,361	17,737	9,443	17,958
Hispanic									
Hispanic	383	240	518	562	341	693	2,290	1,195	2,634
Non-Hispanic	2,902	1,756	3,267	4,533	2,663	4,897	19,115	11,198	20,348
Poverty status									
At or above poverty threshold	2,490	1,366	2,710	3,817	2,121	4,099	16,340	9,080	17,354
Below poverty threshold	491	463	759	839	650	1,069	2,783	2,304	3,813
Education of head of household									
Some college	1,253	922	1,826	1,874	1,452	2,720	7,472	5,580	10,995
High school or less	1,987	1,065	1,929	3,174	1,538	2,838	13,736	6,737	11,838
Region									
Northeast	641	401	682	973	543	961	4,355	2,433	4,082
Midwest	854	450	927	1,362	757	1,431	5,669	3,182	5,847
South	1,082	731	1,295	1,718	1,069	1,889	7,213	4,413	7,882
West	708	414	881	1,042	635	1,309	4,168	2,365	5,171

NOTE: See the appendix for the definition of variables.

contained questions on home use of fluoride products (including toothpaste and mouthrinse), dietary fluoride supplements (in the form of drops or tablets, with and without vitamins), and participation in school-based fluoride mouthrinse programs. Information about the latter fluoride regimen was collected only in the 1986 and 1989 surveys. Information on dental visits also was assessed for individuals 2 years of age and older. The numbers of individuals from whom an interview was obtained each year by age and some selected variables are displayed in table 1. The corresponding estimated numbers that the sample represents nationally are displayed in table 2.

The present analyses are restricted to information obtained on

Table 2. Estimated population size in thousands, by age and selected demographic characteristics for children 0–17 years of age: United States, 1983, 1986, and 1989

Characteristic	Under 2 years			2–4 years			5–17 years		
	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	7,109	7,314	7,674	10,743	10,861	11,094	44,761	44,957	45,235
Race									
Black	1,120	1,170	1,179	1,737	1,565	1,702	6,652	6,914	7,077
White	5,780	5,881	6,188	8,710	8,911	8,922	36,826	36,584	36,440
Hispanic									
Hispanic	813	932	1,095	1,173	1,306	1,484	4,722	4,551	5,364
Non-Hispanic	6,296	6,382	6,579	9,569	9,555	9,610	40,039	40,406	39,871
Poverty status									
At or above poverty threshold	5,371	5,199	5,604	8,028	8,006	8,289	34,077	34,050	34,702
Below poverty threshold	1,066	1,528	1,456	1,782	2,054	2,007	5,855	7,435	7,126
Education of head of household									
Some college	2,678	3,514	3,789	3,927	5,476	5,483	15,579	20,984	22,041
High school or less	4,319	3,765	3,821	6,715	5,331	5,555	28,746	23,701	22,927
Region									
Northeast	1,376	1,477	1,381	2,027	1,939	1,904	9,021	8,927	8,047
Midwest	1,799	1,596	1,779	2,788	2,643	2,745	11,715	11,312	11,260
South	2,355	2,684	2,691	3,673	3,899	3,873	15,218	15,826	15,852
West	1,578	1,557	1,823	2,255	2,380	2,572	8,807	8,892	10,076

NOTE: See the appendix for the definition of variables.

children younger than 18 years of age. Three age groups were defined as follows: younger than 2 years (infants and toddlers), 2–4 years (preschool children), and 5–17 years (school children). Information regarding dental health care was not collected for infants and toddlers younger than 2 years of age, and information about the use of fluoride mouthrinse in school-based programs was collected on 2–16 year olds but data are reported only on school children 5–16.

In all surveys, the use of fluoride-containing products is based on self-report. The method of collecting information on fluoride-containing toothpaste changed between 1983 and 1986. In 1983 the respondents were asked if the toothpaste contained fluoride. No validation of the respondent's knowledge or perception was obtained. In contrast, in 1986, the brand name of toothpaste was collected. The name of the toothpaste was then compared with brands that were approved either by the Food and Drug Administration or the American Dental Association as containing fluoride. (Brand names are confidential information and are not available on the computer tapes.) The dental care supplement in 1986 also asked questions regarding respondent's perception about the presence of fluoride in their drinking water and knowledge of the purpose of fluoridation of the community water supply. Therefore, data from this year were analyzed to examine the association of the use of fluoride-containing dental products, with the knowledge of the purpose of community water fluoridation, and whether they thought their water supply was fluoridated.

In this report, terms such as "no difference" or "similar" mean there is not a statistical significant difference. Whereas terms like "greater," "more likely," "more frequently," "less likely," or "less frequently" implies a statistical significant difference.

Findings

Figure 2 shows the reported use of each of the four fluoride-containing dental products by age in 1986. The year 1986 was chosen because this was the only year that all four sources of fluoride were considered, and it was also the mid-year in the period evaluated in this report. In this figure, 17 year olds were excluded in order to have comparable age groups across the different panels. Panel 1 shows a decline in reported use of dietary fluoride supplements by children as they age. However, participation in school mouthrinsing programs shows a different pattern, noticeably increasing between children in the age groups 5–7 and 8–10 and decreasing thereafter (panel 2). As shown in panel 3, the use of fluoride mouthrinse at home is not a common practice among infants and toddlers (1.2 percent). The practice increases to 1 out of 11 children 2–4 years of age and then doubles to about 1 out of 5 children by age 5; thereafter, the percentage is unchanged. The fourth panel shows that more than 90 percent of children 2 years of age and older use a fluoride toothpaste. Among infants and toddlers, this proportion was 30 percent.

In the following, the changes in these patterns of usage over the period 1983–89 are discussed separately for infants and toddlers (under 2 years of age), preschool children (ages 2–4 years), and school-age children (ages 5–17 years).

Infants and toddlers

Table 3 shows that among children under 2 years of age, the

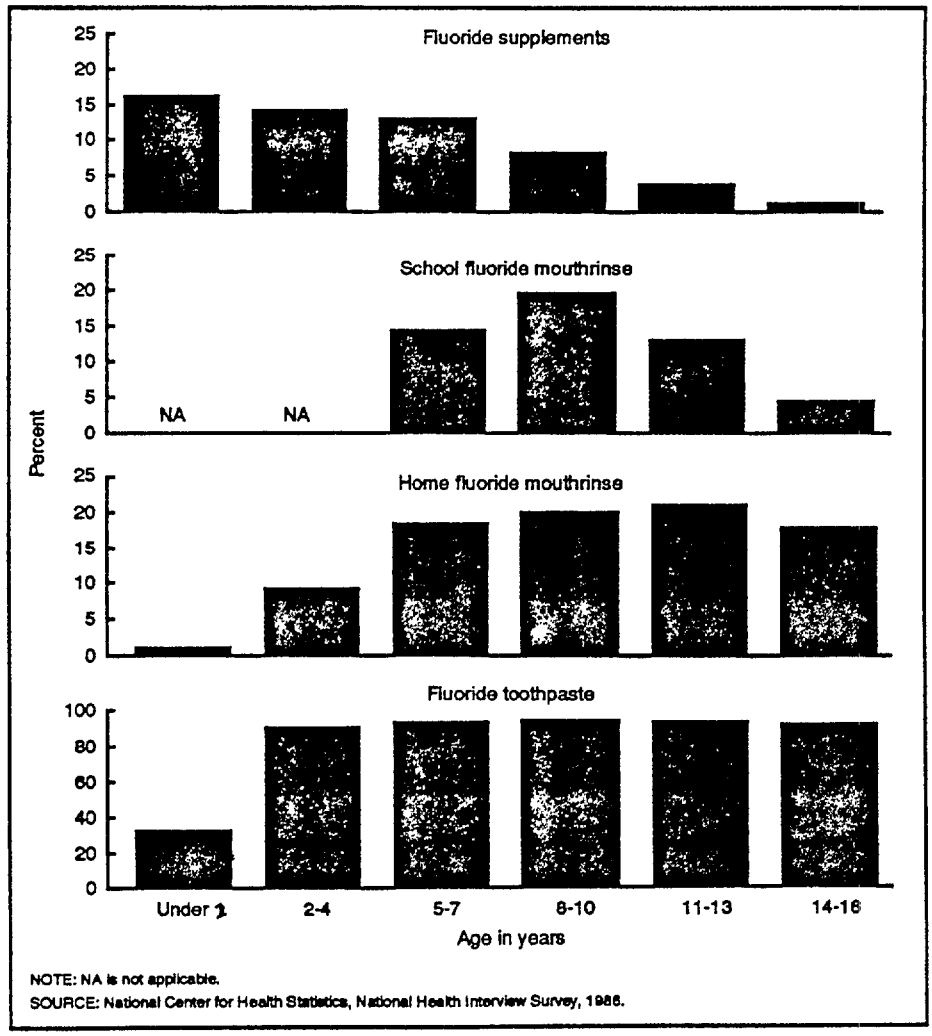


Figure 2. Percent of children using dental care products containing fluoride by age, fluoride supplements, school fluoride programs, fluoride mouthrinse, and toothpaste: United States, 1971–87

consumption of fluoride supplements had not changed significantly since 1983. It was reported that about 14 percent of these children took fluoride supplements in 1983, whereas 15 percent took fluoride supplements in 1989. In each year the use of fluoride supplements was greater among white children than black children; among non-Hispanic children than Hispanic children; among children not living in poverty than living in poverty; and among children living in households headed by persons with some college education than children in households headed by persons with lower educational attainment. In addition, more children living in the West and Northeast regions were reportedly taking fluoride supplements than in the Midwest and South. The largest increases in fluoride supplement usage occurred among children in the West, among black children, and among Hispanic children. The statistically-significant difference between Hispanic and non-Hispanic percentages disappeared between 1983 and 1989 due to the increased usage among Hispanic children.

The use of toothpaste containing fluoride by infants and toddlers did not change much between 1983 and 1986 (31 and 33 percent, respectively). However, there was an increase but not statistically significant in use reported by blacks, Hispanics, and children living in poverty.

Figure 3 indicates that the use of fluoride supplements is less among infants and toddlers of adults who reported their drinking water was fluoridated (32 percent versus 11 percent). Figure 4 shows that infants and toddlers were more likely to be receiving fluoride supplements if the responding adults knew the purpose of fluoridation. The use of toothpaste containing fluoride was also more frequent if the informant knew the purpose of community water fluoridation. However, neither the use of fluoride toothpaste nor mouthrinse was related to perception of drinking water fluoride status.

Table 3. Percent of infants and toddlers under 2 years of age using selected fluoride-containing dental care products at home, by selected sociodemographic characteristics: United States, 1983, 1986, and 1989

[Standard errors are given in parentheses]

Characteristics	*Fluoride supplement*			*Mouthrinse*			*Toothpaste*		
	1983	*1986*	*1989*	*1983*	*1986*	*1989*	*1983*	*1986*	*1989*
Total	14.0	16.3	15.1	0.6	1.2	1.2	31.0	33.4	---
	(0.7)	(1.3)	(0.7)	(0.1)	(0.3)	(0.2)	(0.9)	(0.1)	
Race									
Black	3.9	2.3	6.5	0.3	1.7	2.8	26.1	33.2	---
	(1.0)	(0.9)	(1.2)	(0.3)	(0.8)	(0.7)	(2.1)	(2.5)	
White	16.1	19.4	16.6	0.7	1.1	0.9	32.1	33.4	---
	(0.8)	(1.6)	(0.8)	(0.2)	(0.3)	(0.2)	(1.0)	(1.3)	
Hispanic									
Hispanic	7.9	9.6	12.9	1.0	0.7	1.4	25.6	34.1	---
	(1.4)	(2.1)	(1.7)	(0.5)	(0.6)	(0.6)	(2.3)	(2.9)	
Non-Hispanic	14.8	17.3	15.5	0.5	1.3	1.1	31.7	33.3	---
	(0.8)	(1.4)	(0.8)	(0.1)	(0.3)	(0.2)	(1.0)	(1.4)	
Poverty status									
At or above poverty threshold	16.8	19.9	18.2	0.6	1.2	1.1	32.3	34.4	---
	(0.9)	(1.6)	(0.9)	(0.2)	(0.3)	(0.3)	(1.0)	(1.4)	
Below poverty threshold	5.0	7.9	6.4	0.2	1.2	1.3	26.3	32.4	---
	(1.1)	(1.7)	(1.1)	(0.2)	(0.5)	(0.5)	(2.2)	(2.7)	
Education of head of household									
Some college	19.5	21.5	19.8	0.5	1.0	0.9	32.5	35.6	---
	(1.2)	(1.9)	(1.2)	(0.2)	(0.3)	(0.2)	(1.3)	(1.5)	
High school or less	10.9	11.6	10.8	0.6	1.5	1.5	30.2	31.4	---
	(0.8)	(1.3)	(0.8)	(0.2)	(0.4)	(0.4)	(1.2)	(1.5)	
Region									
Northeast	22.8	23.9	20.6	0.5	1.9	2.5	29.3	36.0	---
	(1.9)	(2.3)	(1.7)	(0.3)	(0.8)	(0.7)	(2.0)	(2.5)	
Midwest	9.1	9.8	7.9	0.2	0.7	0.8	30.2	28.0	---
	(1.3)	(1.8)	(0.9)	(0.2)	(0.4)	(0.4)	(1.7)	(2.2)	
South	8.8	11.0	10.4	0.7	1.3	1.3	32.4	34.7	---
	(1.0)	(1.5)	(1.0)	(0.3)	(0.4)	(0.4)	(1.6)	(2.2)	
West	19.8	24.9	25.1	0.8	1.1	0.4	31.2	34.2	---
	(1.8)	(4.7)	(2.0)	(0.4)	(0.6)	(0.2)	(2.2)	(2.0)	

NOTES: See the appendix for the definition of variables.
Unknown is included in total.

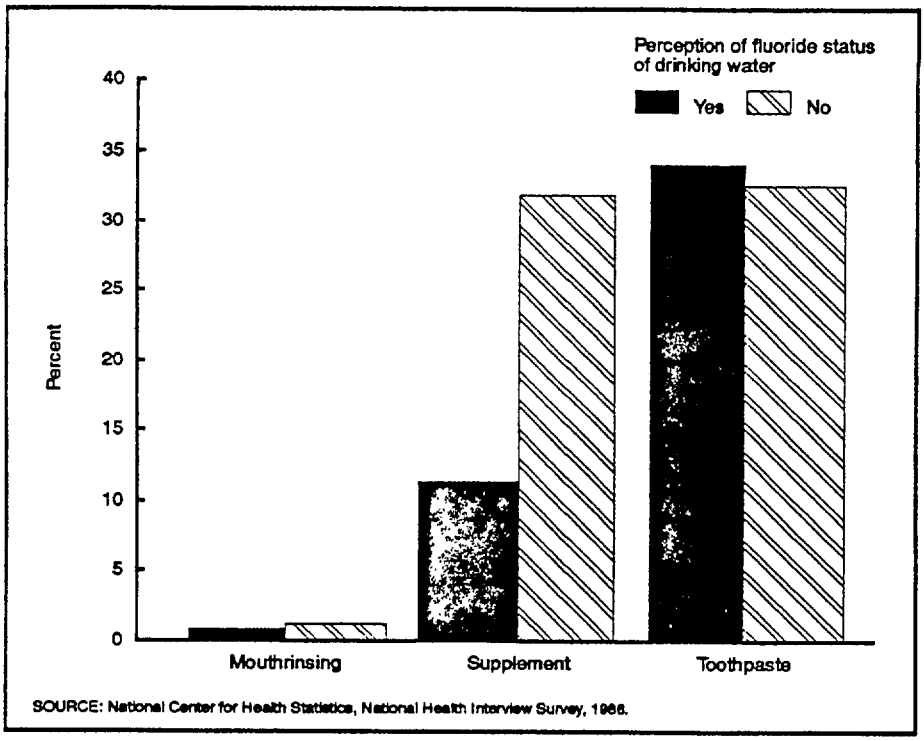


Figure 3. Percent of infants and toddlers under 2 years of age using dental care products containing fluoride by respondent's perception of fluoride status of drinking water: United States, 1986

Pre-school age children

Table 4 shows the fluoride-containing dental product usage patterns for children 2–4 years of age. The use of dietary fluoride supplements has increased 3.7 percent between 1983 and 1989. The pattern of use is similar to that of children under 2 years of age. That is, children who are white, non-Hispanic, living above the poverty threshold, and living in homes with a college educated head of household were more likely to use fluoride supplements. Further, children living in the Northeast and West were more likely to have reported usage. The differences between sociodemographically defined subgroups remained about the same between the 1983–89 period because there was almost an equal increase in use in all subgroups.

In 1983 more black children than white and more children living in the South than any other region were reported to use a fluoride-containing mouthrinse. This practice appears to be more common in recent years but the degree of change is not similar across subgroups. There is a disproportional increase in the use of fluoride mouthrinse among black children, children living in poverty, and children whose head of household had no college education. In recent years, when comparing the Northeast region with other regions, a different pattern was observed between subgroups. In 1983 children in the Northeast reported the lowest use of fluoride mouthrinse among all regions. In 1989 the Northeast ranked the second highest with respect to this practice. Also in 1989, the gap between black and white pre-school children with respect to their use of fluoride mouthrinse widened. The difference was 4 percent in 1983 compared with 8 percent in 1989.

Figure 5 indicates that the children in households in which the respondent thought that their drinking water was fluoridated reported to use dietary fluoride supplements less frequently than those in households in which the respondent thought that their drinking water was not fluoridated. Children's use of fluoride toothpaste or fluoride mouthrinse did not appear to be related to the respondent's perceived presence or absence of fluoride in the drinking water.

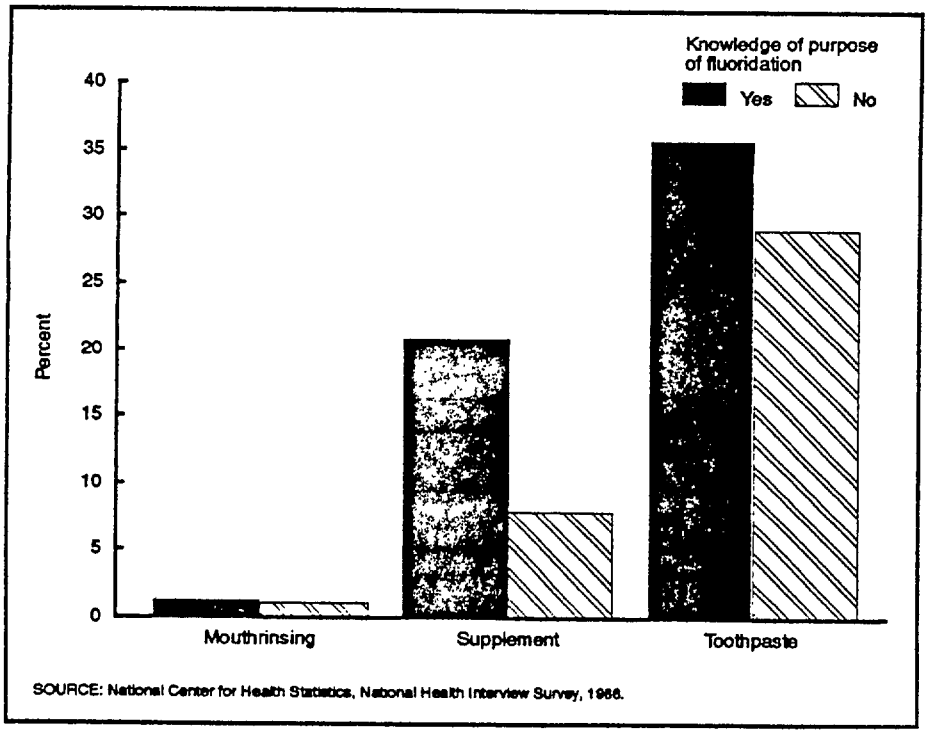


Figure 4. Percent of infants and toddlers under 2 years of age using dental care products containing fluoride by respondent's knowledge of the purpose of fluoridation: United States, 1986

Table 4. Percent of pre-school-age children (2–4 years of age) using selected fluoride-containing dental care products, by selected sociodemographic characteristics: United States, 1983, 1986, and 1989

[Standard errors are given in parentheses]

Characteristic	Fluoride supplement			Mouthrinse			Toothpaste		
	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	12.7 (0.6)	14.4 (1.3)	16.4 (0.6)	7.9 (0.4)	9.4 (0.7)	9.2 (0.5)	91.9 (0.5)	91.2 (0.6)	---
Race									
Black	3.9 (0.9)	4.4 (1.1)	8.6 (1.1)	11.6 (1.2)	13.4 (2.1)	16.3 (1.5)	89.2 (1.4)	89.8 (1.6)	---
White	15.0 (0.7)	16.3 (1.6)	17.9 (0.7)	7.4 (0.5)	8.8 (0.7)	8.0 (0.5)	92.4 (0.5)	91.7 (0.7)	---
Hispanic									
Hispanic	8.1 (1.4)	9.8 (2.1)	11.1 (1.5)	6.5 (1.1)	6.9 (1.8)	9.6 (1.2)	87.0 (1.6)	94.3 (1.4)	---
Non-Hispanic	13.3 (0.7)	15.1 (1.4)	17.2 (0.7)	8.1 (0.5)	9.7 (0.7)	9.2 (0.5)	92.5 (0.5)	90.7 (0.7)	---
Poverty status									
At or above poverty threshold	14.8 (0.8)	16.8 (1.5)	18.9 (0.7)	8.4 (0.5)	9.6 (0.7)	9.2 (0.5)	93.7 (0.5)	92.7 (0.7)	---
Below poverty threshold	5.8 (0.9)	8.1 (1.6)	8.3 (1.0)	6.5 (1.0)	9.4 (1.5)	10.5 (1.4)	87.3 (1.4)	89.4 (1.4)	---
Education of head of household									
Some college	18.8 (1.1)	18.9 (1.8)	21.3 (0.9)	8.0 (0.7)	9.5 (0.9)	8.2 (0.6)	93.8 (0.6)	91.1 (0.9)	---
High school or less	9.2 (0.7)	9.9 (1.2)	11.7 (0.8)	8.0 (0.5)	9.3 (0.9)	10.3 (0.7)	91.2 (0.6)	91.8 (0.8)	---
Region									
Northeast	23.5 (1.7)	25.0 (2.8)	27.8 (1.8)	5.8 (0.8)	10 2 (1.6)	10.1 (1.2)	91.6 (1.1)	92.7 (1.2)	---
Midwest	7.9 (1.2)	8.3 (1.6)	10.1 (1.2)	8.4 (0.8)	9.0 (1.0)	7.2 (0.8)	91.8 (0.9)	90.3 (1.3)	---
South	7.2 (0.9)	8.0 (1.3)	10.8 (0.9)	9.8 (0.8)	10.3 (1.3)	12.2 (0.9)	92.7 (0.8)	91.5 (1.0)	---
West	17.9 (1.5)	23.1 (4.6)	23.1 (1.4)	6.1 (0.9)	7.7 (1.4)	6.3 (0.8)	91.0 (1.0)	90.3 (1.5)	---

NOTES: See the appendix for the definition of variables.
Unknown is included in total.

Figure 6 shows that when the informant knew that fluoride provided protection against dental caries, the pre-school children were more likely to be using dietary fluoride supplements than their counterparts. A similar tendency is observed regarding the use of fluoride toothpaste or mouthrinse. However, the difference in usage of mouthrinse between these two groups of children is not statistically significant.

School-age children

Table 5 shows information on usage among school-age children. Participation in school-based fluoride mouthrinse programs did not change significantly between 1986 and 1989. During this period, about 1 out of 10 children reported participation in a school-based fluoride mouthrinse program. There were, however, substantial changes among some subpopulations. In 1986 more children living in poverty or in households with less educated responsible adults reported participation in these programs. By 1989, the gap had widened. Also by 1989, significantly more black children participated in school mouthrinsing activities than white children. In the earlier year, the highest participation rates were noted in the West and Northeast. By 1989, the participation rates in the South surpassed those of the Northeast, which actually decreased.

Dietary fluoride supplements was the fluoride regimen least used by school-age children. The slight change in the percent of children using supplements is primarily due to an increase in reported consumption since 1986. The only subpopulations to steadily increase the usage over the entire period were school-age children who were black, poor, or from the Northeast or the West. The remaining subpopulations primarily increased their usage after 1986 such that white, nonpoor, non-Hispanic, or children living in homes with college educated heads of household were

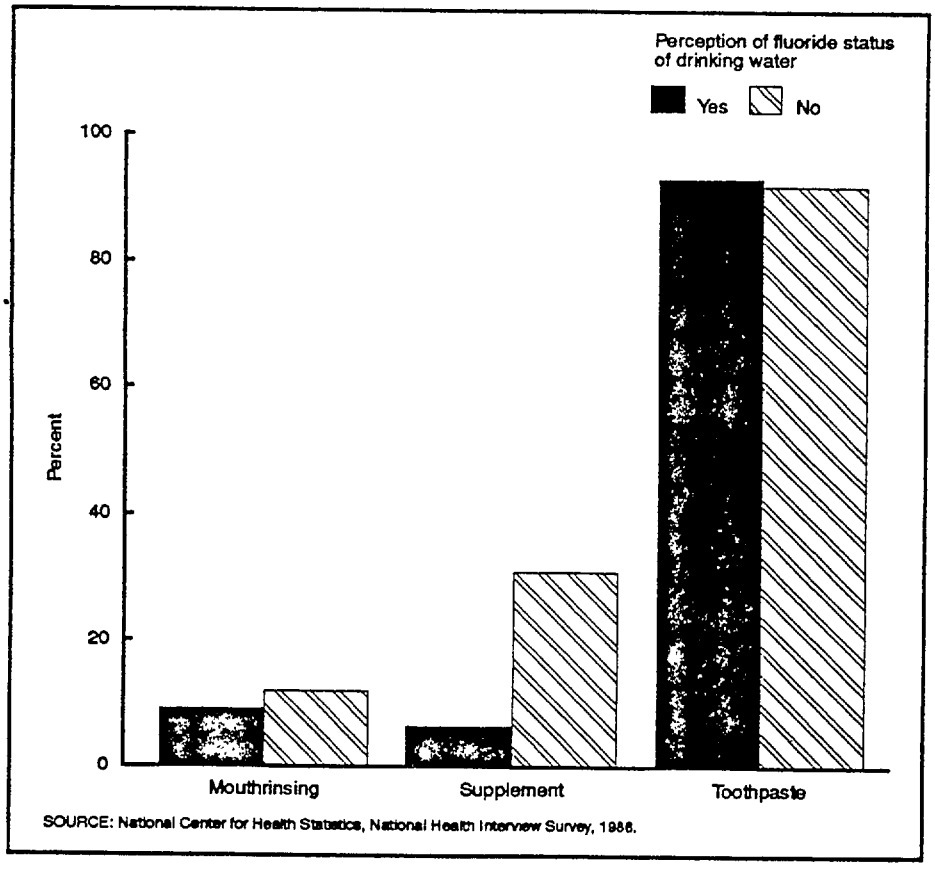


Figure 5. Percent of children 2–4 years of age using dental care products containing fluoride by respondent's perception of fluoride status of drinking water: United States, 1986

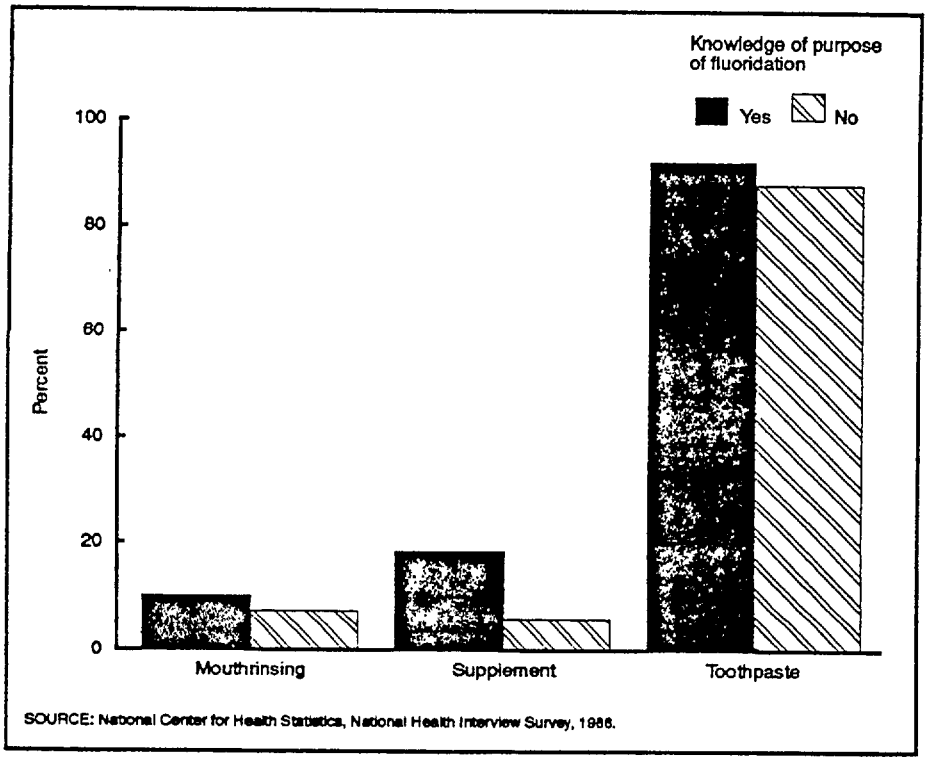


Figure 6. Percent of children 2–4 years of age using dental care products containing fluoride by respondent's knowledge of the purpose of water fluoridation: United States, 1986

more likely to use dietary fluoride supplements.

Approximately 20 percent of school-age children use fluoride-containing mouthrinse and this has increased, especially since 1986. In 1983 the use of fluoride mouthrinse was more often reported among non-Hispanic and among non-poor children. There was also more use by children living in the South than any other region. However, due to a disproportional increase in this activity throughout the decade, a different pattern was observed in 1989. Black children increased their usage more than white children, resulting in a widening of the 1 percentage point difference observed in 1983 to 8 percent in 1989. Both Hispanic and poor children reported an increase in mouthrinsing in recent years. Consequently, in 1989 there is not much difference between poor and non-poor and between Hispanic and non-Hispanic school-age children.

Figure 7 illustrates the use of fluoride dental products among school-age children in relation to the responding adult's perception of fluoride status of their drinking water. Use of fluoride toothpaste is unrelated to perception of drinking water status. However, use of fluoride mouthrinse is slightly, but nonsignificantly, more frequent among children whose responding adult thought that their drinking water was not fluoridated. Participation in school-based fluoride mouthrinse programs and use of fluoride supplements were more likely to occur when adults thought that the drinking water was not fluoridated. As shown in figure 8, children were more likely to use fluoride-containing dental care products at home if the informant knew the purpose of community water fluoridation. Participation in school-based fluoride mouthrinse programs, however, was not significantly different.

School-age children, therefore, had four potential sources of fluoride from dental-care product usage—school programs, home dietary fluoride supplements, home

Table 5. Percent of school-age children (5–17 years of age) using selected fluoride-containing dental products, by selected sociodemographic characteristics: United States, 1983, 1986, and 1989.

[Standard errors are given in parentheses]

Characteristic	School programs			Fluoride supplement			Mouthrinse			Toothpaste		
	1983	1986	1989	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	---	12.8	13.9	6.0	6.2	8.1	16.7	19.2	25.2	95.1	93.7	---
		(0.8)	(0.6)	(0.3)	(0.6)	(0.3)	(0.4)	(0.6)	(0.5)	(0.3)	(0.4)	
Race												
Black	---	14.4	19.1	2.6	3.3	4.6	17.4	19.3	32.2	92.5	92.7	---
		(1.4)	(1.4)	(0.5)	(0.6)	(0.5)	(1.1)	(1.3)	(1.3)	(1.0)	(0.8)	
White	---	12.5	13.0	6.7	6.9	8.8	16.8	19.3	24.0	95.9	93.9	---
		(0.9)	(0.6)	(0.3)	(0.8)	(0.4)	(0.4)	(0.6)	(0.5)	(0.2)	(0.4)	
Hispanic												
Hispanic	---	11.5	12.8	3.8	5.2	7.2	11.4	16.1	23.0	92.1	95.1	---
		(1.3)	(1.1)	(0.6)	(1.0)	(0.8)	(1.0)	(1.5)	(1.2)	(0.9)	(0.8)	
Non-Hispanic	---	13.0	14.1	6.3	6.3	8.2	17.3	19.5	25.5	95.5	93.5	---
		(0.8)	(0.6)	(0.3)	(0.6)	(0.3)	(0.4)	(0.6)	(0.5)	(0.3)	(0.4)	
Poverty status												
At or above poverty threshold	---	12.0	12.3	6.9	6.8	8.9	17.5	20.3	26.3	96.5	94.8	---
		(0.7)	(0.5)	(0.3)	(0.8)	(0.4)	(0.4)	(0.6)	(0.5)	(0.2)	(0.3)	
Below poverty threshold	---	16.6	20.6	3.3	4.3	5.3	14.1	15.0	24.0	92.4	92.3	---
		(1.5)	(1.5)	(0.6)	(0.7)	(0.6)	(1.2)	(1.3)	(1.2)	(0.8)	(1.0)	
Education of head of household												
Some college	---	11.3	11.0	8.3	8.4	10.2	17.6	19.2	24.6	96.4	94.5	---
		(0.7)	(0.6)	(0.5)	(1.0)	(0.5)	(0.6)	(0.8)	(0.6)	(0.3)	(0.5)	
High school or less	---	14.3	16.9	4.9	4.3	6.2	16.3	19.3	26.0	94.8	93.6	---
		(1.1)	(0.8)	(0.3)	(0.5)	(0.4)	(0.5)	(0.7)	(0.7)	(0.4)	(0.5)	
Region												
Northeast	---	13.8	10.3	9.7	10.4	11.9	14.5	21.4	23.5	95.1	93.8	---
		(2.1)	(0.8)	(0.7)	(1.2)	(0.8)	(0.8)	(1.5)	(1.1)	(0.5)	(0.8)	
Midwest	---	10.7	12.0	3.1	2.9	5.9	16.6	20.1	24.5	95.9	93.3	---
		(1.3)	(1.1)	(0.4)	(0.5)	(0.7)	(0.7)	(0.9)	(0.9)	(0.4)	(0.8)	
South	---	12.2	16.0	5.1	4.1	5.8	19.0	19.6	30.0	94.7	93.8	---
		(1.4)	(1.2)	(0.4)	(0.5)	(0.4)	(0 8)	(0.9)	(0.9)	(0.5)	(0.5)	
West	---	15.8	15.7	7.8	10.0	11.2	14.8	15.0	19.7	94.8	93.8	---
		(1.6)	(1.1)	(0.7)	(2.7)	(0.7)	(0.8)	(1.2)	(0.9)	(0.6)	(0.8)	

NOTES: See the appendix for the definition of variables.
Unknown is included in total.
Children 17 years of age are excluded in analyses of school mouthrinsing programs.

mouthrinse, and toothpaste. The use of fluoride toothpaste was approximately 95 percent of the children. Therefore, many of the children received fluoride from more than one product. The percent of children using at least three fluoridated dental-care products was 4.0 percent among families for which the responding adult thought that the drinking water was fluoridated and 8.9 percent among families for which the responsible adult thought that the drinking water was not fluoridated.

Dental health care

As table 6 shows, during 1983–89, pre-school-age children who did not visit a dentist in the previous year were less likely to use dietary fluoride supplements than children who visited a dentist the previous year. Fluoride supplements can be obtained only when prescribed by a health provider such as a physician or dentist, and in some States by a pharmacist or physician assistant. In 1983 the number of dental visits was related to the use of dietary fluoride supplements. That is, the more frequent the visits the greater the use of dietary fluoride supplements. In recent years, however, this association has disappeared.

In 1983 there was a relation between fluoride supplement use and the interval since the last dental visit. That is, the shorter the interval since the last visit the higher the percent of reported use of fluoride supplements. Although the same pattern exists in recent years, the difference in supplement intake between the children with a 6-month interval or 6 months to 1-year interval disappeared.

Between 1983 and 1989, mouthrinsing with fluoride was related to having a dental visit during the past year, the number of dental visits, and the interval since the last dental visit. This pattern did not change over time. Brushing with fluoride toothpaste was more

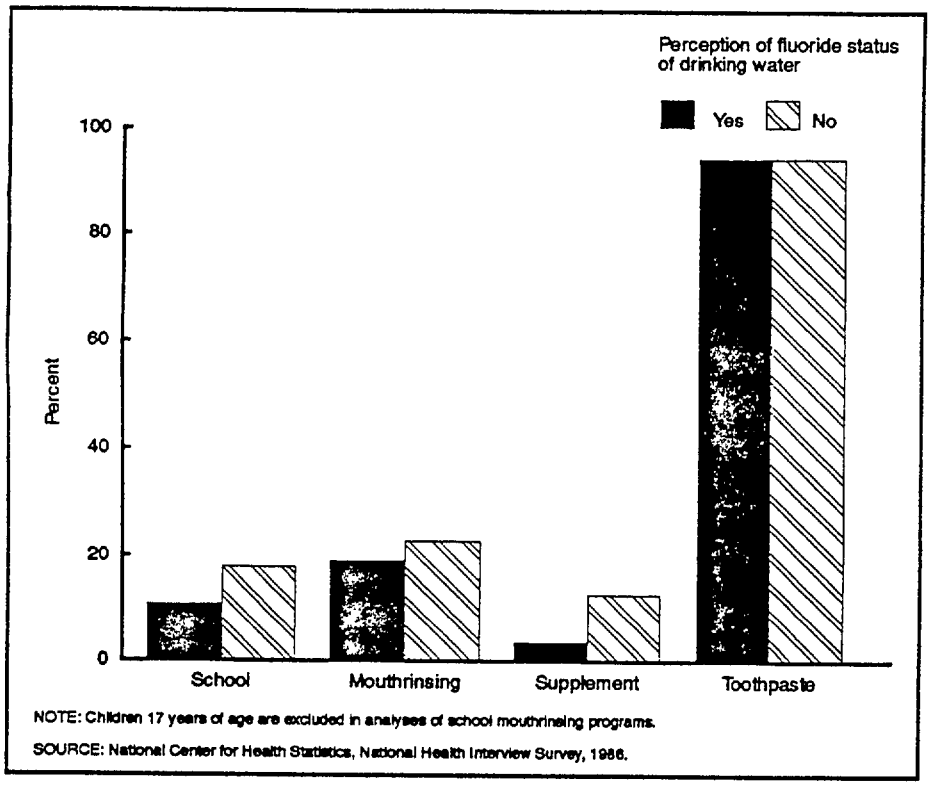


Figure 7. Percent of school children using dental care products containing fluoride by respondent's perception of fluoride status of drinking water: United States, 1986

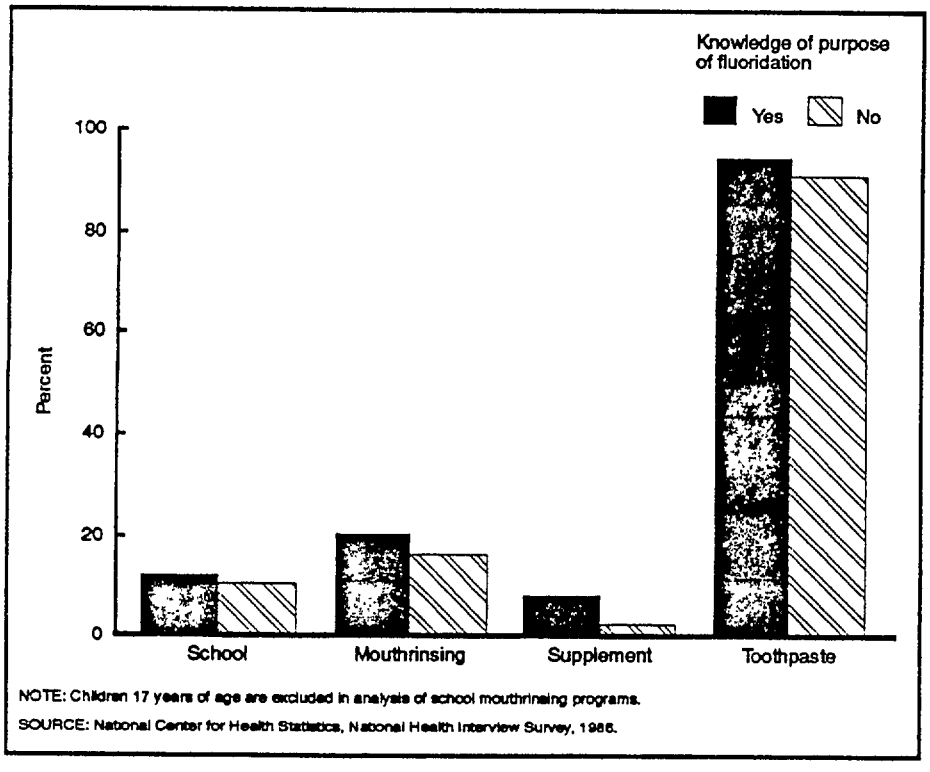


Figure 8. Percent of school children 5–17 years of age using dental care products containing fluoride by respondent's knowledge of the purpose of water fluoridation: United States, 1986

frequently reported among children who had a dental visit during the previous year. However, the number of dental visits and the interval since the last visit did not appear to be related to the use of a fluoride toothpaste.

As table 7 shows, in 1986 among school-age children, the participation in school-based fluoride mouthrinse programs did not appear to be related to dental health care utilization. However in 1989, due to increased participation in school-based fluoride mouthrinse programs among those with no dental visit or with few dental visits, an inverse relationship between dental health care and participation in fluoride mouthrinsing school program was observed. This observation is due to the increase in the number of lower income participants in these programs. Concomitantly, lower income groups are less likely to report dental visits.

During this period, school-age children who had any dental visits reported taking fluoride supplements more frequently than those who did not have any dental visits. In these children, those with two visits per year were more likely to use dietary supplements than those with one visit or with three or more visits. The length of interval since the previous visit appeared to be related to the use of fluoride supplements. That is, the shorter the interval the more frequently this activity was reported.

Similarly, mouthrinsing with a fluoride-containing solution at home was related to dental visits. Children who had no visits or who had fewer visits were less likely to rinse with fluoride. The relation of the length of interval since the last visit and rinsing with fluoride was more pronounced in 1983. In recent years, the apparent relationship between this activity with length of interval was diminished among those who reported a year or longer interval since their last dental visit.

There was no statistically different likelihood of participating in school-based fluoride programs

Table 6. Percent of pre-school-age children (2 to 4 years of age) using selected fluoride-containing dental care products, by dental care variables: United States, 1983, 1986, and 1989

[Standard errors are given in parentheses]

Dental care variables	Fluoride supplement			Mouthrinse			Toothpaste		
	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	12.7 (0.6)	14.4 (1.3)	16.4 (0.6)	7.9 (0.4)	9.4 (0.7)	9.2 (0.5)	91.9 (0.5)	91.2 (0.6)	---
Had a dental visit in past year									
Yes	17.6 (1.1)	20.1 (1.9)	22.3 (1.2)	13.4 (1.0)	15.0 (1.3)	14.4 (1.0)	95.8 (0.6)	94.0 (0.8)	---
No	10.9 (0.6)	11.9 (1.3)	14.2 (0.7)	5.8 (0.4)	7.1 (0.7)	7.3 (0.5)	90.7 (0.6)	91.8 (0.7)	---
Number of visits in past year									
0	10.9 (0.7)	11.9 (1.3)	14.2 (0.7)	5.8 (0.4)	7.1 (0.8)	7.3 (0.5)	90.7 (0.6)	91.8 (0.7)	---
1	15.2 (1.3)	18.8 (2.3)	21.5 (1.4)	10.9 (1.1)	13.1 (1.6)	11.5 (1.2)	95.8 (0.8)	95.4 (0.9)	---
2	21.4 (2.4)	23.8 (3.5)	24.4 (2.3)	15.2 (1.9)	17.3 (2.7)	18.6 (2.0)	95.2 (1.3)	90.2 (2.1)	---
3 or more	22.4 (3.4)	18.9 (3.8)	21.8 (4.1)	23.9 (3.7)	22.6 (3.7)	23.3 (4.0)	97.6 (1.2)	95.2 (2.4)	---
Interval since last dental visit									
Less than 6 months	19.2 (1.4)	19.2 (2.1)	22.3 (1.4)	14.3 (1.2)	14.5 (1.6)	14.7 (1.2)	96.0 (0.7)	94.6 (1.0)	---
6 to 11 months	14.1 (1.9)	20.7 (2.8)	22.2 (2.0)	11.4 (1.7)	15.8 (2.2)	14.0 (1.7)	95.5 (1.3)	94.3 (1.4)	---
1 year to 2 years	7.8 (2.4)	12.0 (3.7)	14.6 (2.9)	10.7 (2.6)	8.0 (3.6)	15.3 (2.9)	93.6 (2.1)	93.8 (3.8)	---
Never	10.6 (0.7)	11.8 (1.2)	14.2 (0.7)	5.7 (0.5)	7.1 (0.8)	6.9 (0.5)	91.2 (0.6)	91.8 (0.7)	---

NOTE: Unknown is included in total.

between children who did or did not have dental sealants.

Discussion

The U.S. Public Health Service recently reviewed the public health risks and benefits of fluorides in drinking water and other sources (7). The report concluded the need for "continued use of fluoride to prevent dental caries and continued support for optimal fluoridation of drinking water." It also recommended, however, that "in accordance with prudent health practice of using the appropriate amount to achieve a desired effect, ... health professionals and the public should avoid excessive and inappropriate fluoride exposure" (7). Since the 1940's, when the inverse association between fluoride intake and dental caries was noted, many different sources of fluoride have become available. Therefore, it is important to characterize the distribution of total exposure in individuals. Although the data described in this report cannot comprehensively address the issue of total exposure, reported use of fluoride containing products is an important source of information regarding fluoride exposure. Among 2-year-old children, more than one-half of the estimated fluoride exposure in communities with fluoride deficient drinking water and one-third in communities with optimally fluoridated drinking water are thought to be due to dietary fluoride supplements, fluoride dentifrice, or both (7).

The practice of giving children daily dietary fluoride supplements was developed for use in areas where optimally fluoridated drinking water is not available. The current recommendations for prescribing dietary fluoride supplements depends on the age of the child and the concentration of fluoride in the drinking water (8).

In 1990 the U.S. Public Health Service published *Healthy People 2000* (9). One of the objectives contained in this document is to increase to at least 75 percent the proportion of people served by community water systems providing optimal levels of fluoride. Another objective is to increase the use of dietary fluoride supplements to at least 85 percent of those children not receiving optimally fluoridated drinking water. The areas currently less likely to be served by fluoridated community water systems include rural areas throughout the United States and the West. In the West in 1989, only 23 percent of the population had access to fluoridated public water supplies, whereas 78 percent in the Midwest, 63 percent in the South, and 50 percent in the Northeast had access to fluoridated public water supplies (calculated based on data derived from CDC Fluoridation Census 1989-Summary (2)).

Table 7. Percentage of school-age children (5 to 17 years of age) using selected fluoride-containing dental products, by selected dental health care variables: United States, 1983, 1986, and 1989

[Standard errors are given in parentheses]

Dental care variables	School programs			Fluoride supplement			Mouthrinse			Toothpaste		
	1983	1986	1989	1983	1986	1989	1983	1986	1989	1983	1986	1989
Total	---	12.8 (0.8)	13.9 (0.6)	6.0 (0.6)	6.2 (0.6)	8.1 (0.3)	16.7 (0.4)	19.2 (0.6)	25.2 (0.5)	95.1 (0.3)	93.7 (0.4)	---
Had a dental visit in past year												
Yes	---	13.1 (0.8)	13.6 (0.6)	7.4 (0.3)	7.4 (0.8)	9.6 (0.4)	18.8 (0.5)	21.8 (0.7)	27.6 (0.6)	96.7 (0.2)	94.8 (0.4)	---
No	---	12.5 (1.1)	16.3 (1.0)	3.3 (0.3)	3.4 (0.4)	5.1 (0.4)	12.5 (0.6)	13.3 (0.8)	22.2 (0.8)	93.2 (0.5)	93.9 (0.5)	---
Number of visits in past year												
0	---	12.5 (1.1)	16.3 (1.0)	3.3 (0.3)	3.4 (0.4)	5.1 (0.4)	12.5 (0.6)	13.3 (0.8)	22.2 (0.8)	93.2 (0.5)	93.9 (0.5)	---
1	---	13.1 (1.0)	14.8 (0.7)	6.5 (0.4)	7.0 (0.8)	8.5 (0.5)	16.2 (0.7)	19.0 (0.9)	26.4 (0.8)	96.1 (0.4)	94.8 (0.5)	---
2	---	13.0 (1.0)	13.4 (0.8)	9.4 (0.6)	9.3 (1.2)	11.2 (0.6)	18.7 (0.8)	22.7 (1.0)	25.7 (0.8)	96.9 (0.3)	94.4 (0.7)	---
3 or more	---	13.3 (1.3)	11.8 (0.8)	6.6 (0.5)	5.6 (0.7)	9.4 (0.6)	22.5 (0.8)	25.6 (1.1)	33.0 (1.0)	97.2 (0.4)	95.4 (0.6)	---
Interval since last dental visit												
Less than 6 months	---	13.8 (0.9)	12.7 (0.6)	8.1 (0.4)	7.7 (0.8)	10.6 (0.5)	20.1 (0.6)	22.9 (0.8)	28.0 (0.6)	96.8 (0.3)	94.6 (0.5)	---
6 to 11 months	---	12.0 (1.0)	15.5 (0.8)	5.9 (0.5)	6.5 (1.0)	8.3 (0.6)	16.4 (0.8)	19.9 (1.0)	27.5 (0.9)	96.2 (0.4)	95.2 (0.6)	---
1 year to 2 years	---	13.4 (1.5)	15.6 (1.2)	3.2 (0.5)	2.8 (0.6)	5.2 (0.6)	14.8 (1.0)	16.5 (1.4)	26.1 (1.4)	95.6 (0.6)	94.5 (0.9)	---
2 years to 5 years	---	12.0 (1.6)	18.2 (1 6)	3.4 (0.6)	2.9 (0.7)	4.4 (0.6)	13.4 (1.2)	12.7 (1.3)	22.9 (1.4)	95.5 (0.7)	93.9 (0.9)	---
5 years or more	---	9.1 (2.3)	18.9 (2.9)	0.6 (0.4)	(1.4) (0.9)	3.6 (1.1)	10.2 (1.7)	10.3 (2.1)	24.7 (2.6)	92.8 (2.5)	92.8 (1.9)	---
Never	---	13.1 (1.8)	14.9 (1.5)	4.1 (0.6)	5.0 (0.9)	5.7 (0.7)	9.8 (0.8)	11.6 (1.3)	16.7 (1.5)	90.7 (1.1)	93.6 (0.9)	---
Had dental sealants												
Yes	---	13.5 (1.5)	13.5 (0.9)	---	10.6 (1.9)	13.1 (0.9)	---	24.8 (1.9)	29.1 (1.2)	---	95.4 (0.9)	---
No	---	12.9 (0.8)	14.5 (0.6)	---	5.9 (0.6)	7.6 (0.3)	---	18.8 (0.6)	25.4 (0.5)	---	94.2 (0.3)	---

NOTES: Unknown is included in total.
Children 17 years of age are excluded in analyses of school mouthrinsing programs.

Children living in the West, which has the lowest percent of the population served by fluoridated water systems, were the most likely to receive fluoride supplements or participate in school-based fluoride mouthrinse programs. As many as one in four children may receive these in all age groups. However, in the Northeast, which has a higher percent of the population receiving fluoridated water, the percent of children receiving other types of fluoride also was about one in four, except in school-age children for whom there were fewer children served by school-based programs than in the West. In the Midwest, which had the highest percent of the population receiving fluoridated community drinking water, the reported use of dietary fluoride supplements was the lowest of all the regions. It is not possible to determine from the interview data whether the children also had access to optimally fluoridated drinking water. Hence, the appropriate use of dietary fluoride supplements is suggestive only.

During the interview, the adult informant was asked whether they thought that their drinking water was fluoridated. These data likely include a great deal of false positive and false negative information. However, this question and the question on the informant's knowledge of the purpose of water fluoridation tend to reflect the informant's understanding of the public health importance of fluoride. In both instances, the children who use flouride supplements are more likely to live in households where responding adults either thought that their water was not fluoridated or who understood the purpose of community water fluoridation. In all age groups, the percent of children receiving supplements from these adults was about triple the percent of the remainder of the children.

Knowledge is correlated with education of the head of the household, poverty status, and utilization of dental health care. As would be expected, children of higher educated parents, living in above poverty level homes, and receiving regular dental care are more likely to

receive dietary fluoride supplements in some form. A multivariate analysis is required to determine whether parents are willing to continue providing supplements if they have appropriate knowledge of the purpose of the supplement or knowledge of why their children may be lacking the optimal amount of fluoride otherwise.

The greater increase in the use of fluorides, either dietary fluoride supplements or school-based fluoride rinse programs, occurred among minority groups—either black or Hispanic. In all age groups over these 6 years, the percent of children receiving dietary fluoride supplements increased to more than 150 percent of the level in 1983. Children participating in school-based rinse programs also increased slightly. There also were notable increases, almost doubling, among school-age minority groups in the use of fluoride mouthrinse.

One issue that should be addressed by public health officials is the use of toothpaste among infants and toddlers and children below 5 years of age. These data indicate that almost one in three of these children are brushing with a fluoride toothpaste. Given the propensity of young children to swallow toothpaste, the impact of this practice in light of other possible sources of fluoride in the water, food, and possibly through fluoride supplements should be studied (10).

These data indicate that among children there has been an increase in use of fluoride products, in addition to fluoride toothpaste. Use of fluoride toothpaste is almost ubiquitous. However, increases occurred in all age groups for all other forms of fluoride, including dietary fluoride supplements and fluoride mouthrinse at home and in school-based programs. The increases during the 6 years covered by these surveys have been moderate or slight. Whether all of these increases are in accordance with prudent health practices or whether some children might be receiving more than optimal exposure to fluoride should be studied.

References

1. Centers for Disease Control. Fluoridation Census 1985. Atlanta: Centers for Disease Control. 1988.
2. Centers for Disease Control. Fluoridation Census 1989, Summary. Atlanta: Centers for Disease Control. 1991.
3. National Center for Health Statistics. Prevention profile. Health, United States, 1991. Hyattsville, Maryland: Public Health Service. 1992.
4. National Institute of Dental Research. Oral health of United States children, the National Survey of Dental Caries in U.S. School Children: 1986–87. National and regional findings. NIH Publication no 89–2247. 1989.
5. Dean HT. Chronic endemic fluorosis (mottled enamel). J Am Dent Assoc 107:1269–72. 1936.
6. Dean HT, Elvove E. Further studies on the minimal threshold of chronic endemic dental fluorosis. Public Health Rep 52:1249–64. 1937.
7. Committee to Coordinate Environmental Health and Related Programs. Review of fluoride risks and benefits. Washington: Public Health Service. 1990.
8. American Dental Association. Accepted dental therapeutics. Chicago, Illinois: Council on dental therapeutics. Am Dent Assoc. 1984.
9. U.S. Department of Health and Human Services. Healthy people 2000: National health promotion and disease prevention objectives. Washington: Public Health Service. 1991.
10. Horowitz HS. Appropriate uses of fluoride: Considerations for the 1990 summary. J Pub Health Dent 51:60–63. 1991.
11. National Center for Health Statistics. The National Health Interview Survey design, 1978–84, and procedures, 1975–83. National Center for Health Statistics. Vital Health Stat 1(18). 1985.
12. Massey JT, Moore TF, Parsons VL, Tadros W. Design and estimation for the National Health Interview Survey, 1985–94. National Center for Health Statistics. Vital Health Stat 2(110). 1989.
13. Survey Data Analysis (SUDAAN). Manual. Research Triangle Institute.
14. U.S. Bureau of the Census. Poverty in the United States, 1990. Current population reports; series P-20, no 175. Washington: U.S. Department of Commerce. 1991.

Symbols	
- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision

Technical notes

Source of data and sample design

This report is based on data from the National Health Interview Survey (NHIS), an ongoing survey of households in the United States conducted by the National Center for Health Statistics. It has been conducted continuously since 1957. Each week, a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers obtain information about the health and other characteristics of the households included in the NHIS sample.

NHIS consists of two parts: (a) a basic health questionnaire that remains the same each year and is completed for each household member and (b) special topics questionnaires that vary from year to year and usually are asked of selected persons in each family. The estimates presented in this report are based on special oral health questions included in the 1983, 1986, and 1989 surveys.

In 1983 the interviewed sample consisted of 41,000 households containing 106,000 individuals. The total nonresponse rate was 3.3 percent; 2 percent was due to respondent refusal, and the remainder was primarily due to failure to locate an eligible respondent at home after repeated calls. In 1986 the number of households interviewed was 23,838 containing 62,502 individuals. The total nonresponse rate was 3.5 percent; 2.3 percent was due primarily to failure to locate an eligible respondent at home after repeated calls. In 1989 the number of households interviewed was 45,711 households containing 116,929 individuals. The total nonresponse rate was 5.1 percent; 3.0 percent was the result of respondent refusal, and the remainder was primarily the result of failure to locate an eligible respondent at home after repeated calls.

Special attention should be given when comparing statistics between survey years because the design of the sample of the NHIS changes following each decennial census. For example, the sampling design in the 1983 NHIS is different from the sampling design used in 1986 and 1989 NHIS. The basic sampling design for 1986 and 1989 is similar, however, due to budgetary constraints, only 50 percent of the original sample was collected in 1986. Therefore, the standard errors of the estimates of 1986 are generally larger than the other years. The information on survey design and the method used in estimation and other NHIS specifications are published elsewhere (11,12).

Because the estimates presented in this report are based on a sample of the population, they are subject to sampling errors. Standard errors of most estimates have been included in the tables in parentheses. The standard errors for this report were calculated using SUDAAN, a SAS-based software package designed to produce standard errors for estimates based on complex multistage sample designs (13).

Definition of terms

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

Education—The categories of educational status refer to years of school completed. Only years completed in regular schools in which persons are given a formal education are 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 is not counted in determining the highest grade of school completed.

Race—The population is divided into three racial groups: "white," "black," and "all other." "All other" includes Aleut, Eskimo, or American Indian; Asian or Pacific Islander; and any other races. Although the data base identifies these three groups, the sample size for "others" is too small to analyze them separately. Characterization of race is based on the respondent's description of his or her racial background.

Hispanic or non-Hispanic—A respondent was classified as Hispanic origin if he or she was self-identified as Puerto Rican, Cuban, Mexican-Mexican, Mexican-American, Chicano, Other Latino American, or Other Spanish. Non-Hispanic are all other individuals.

Poverty index—The poverty index is based on U.S. Bureau of the Census poverty threshold matrix. This matrix lists poverty threshold levels by age of the head of the household, family size, and the number of children. Detailed information on the derivation of poverty threshold is published elsewhere (14).

Geographic region—The classification of regions in the National Health Interview Survey corresponds to those used by the U.S. Bureau of the Census. The States are grouped into four regions as follow:

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

Suggested citation

Wagener DK, Nourjah P, and Horowitz A. Trends in childhood use of dental care products containing fluoride: United States, 1983–89. Advance data from vital and health statistics; no 219. Hyattsville, Maryland: National Center for Health Statistics. 1992.

National Center for Health Statistics

Director
Manning Feinleib, M.D., Dr. P.H.

Acting Deputy Director
Jack R. Anderson

Number 220 • November 12, 1992

Advance Data

From Vital and Health Statistics of the CENTERS FOR DISEASE CONTROL/National Center for Health Statistics

Expected Principal Source of Payment for Hospital Discharges: United States, 1990

by Edmund J. Graves, Division of Health Care Statistics

Introduction

In the United States during 1990, non-Federal short-stay hospitals discharged an estimated 30.8 million inpatients, excluding newborn infants. Of these 30.8 million, 11.9 million indicated private insurance as their expected principal source of payment; 15.2 million cited Medicare, Medicaid, or other public programs; and 2.7 million were in the "self-pay, no charge, or other" category.

Estimates in this report are based on the National Hospital Discharge Survey (NHDS), which has been conducted annually by the National Center for Health Statistics (NCHS) since 1965. For the 1990 NHDS, researchers abstracted data from the medical records of approximately 266,000 patients discharged from 474 short-stay hospitals. This survey reflects a redesign that took place in 1988. A brief description of this new design, data collection procedures, and the estimation process can be found in the section entitled "Technical notes." A detailed description of the original and new designs of the NHDS have been published by the NCHS (1).

Definitions of terms used in this report are also provided in the Technical notes. It should be noted that "source of payment" refers to the expected principal source of payment. The terms "patient," "inpatient," and "discharge" are used here synonymously, and that these terms do not refer to individual persons. An individual may have more than one hospitalization during a year and thus count as more than one patient, inpatient, or discharge.

From 1968 through 1970, information on hospital charges and sources of payment was collected from a subsample of the NHDS (2). No information on charges or sources of payment was collected in the NHDS from 1971 through 1976. Beginning in 1977, data on patients' expected principal sources of payment and other expected sources of payment were collected from the face sheets of medical records in the NHDS sample.

Estimates in this report are based on what patients indicated as the expected principal source of payment. Data on expected source of payment from the NHDS for 1977, 1979, and 1985 (3–5), as well as summary data for 1982–1990 (6–14), have been published. Statistics in these reports, as well as in this one, reflect only the patients' principal source of payment.

The 1977 report presented estimates of source of payment by age and sex of patients along with estimates for major diagnostic and

Acknowledgments

This report was prepared in the Division of Health Statistics. Jean Kozak, of the Hospital Care Statistics Branch, provided technical assistance in developing the style and content. Maria Owens, also of the Hospital Care Statistics Branch, assisted in testing the reliability of the statistical statements. Dorothy Graham, of the Technical Services Branch, verified the data. Charles Adams and Malcolm Graham, also of the Technical Services Branch, advised on the computer programming aspects. This report was edited by Margaret Avery and typeset by Jacqueline M. Davis of the Publications Branch.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Center for Health Statistics

CDC
CENTERS FOR DISEASE CONTROL

surgical categories. The 1979 and 1985 reports updated these basic estimates and provided analysis by additional characteristics of patients and hospitals. This report includes estimates by source of payment; sex, age, and race of patients; and geographic region of hospital. Selected diagnostic and procedure categories are also shown by source of payment. The survey form used to collect these data is reproduced in another NCHS publication (14).

According to the NHDS, approximately 6 percent of discharges from short-stay hospitals in 1990 indicated self-pay as their source of payment. On the other hand, data from the National Health Interview Survey (NHIS) for 1989 indicated that 14 percent of the population had no coverage (15). This implies that the number of the hospitalized uninsured was proportionally smaller than that of the hospitalized insured. However, some individuals who reported no health insurance at admission may have found on being hospitalized that they were covered under a public program.

In 1990, the percent of hospital discharges covered by private insurance was 38.7 percent. This was much lower than the 76.1 percent of the population estimated by the 1989 NHIS (15) to have private insurance coverage. This difference could be attributed to several factors: Persons with private insurance tend to be younger and healthier than persons under public programs and are therefore hospitalized less frequently; public programs are often billed first for hospital charges; and individuals citing private coverage may be using it as a secondary source of payment.

In some cases the expected source of payment recorded on the face sheet of the medical record may not have been the actual source of payment. For example, a patient admitted to a hospital following an automobile accident may have cited Blue Cross as the expected source of payment when, in fact, an automobile insurance company ultimately made restitution. Also, because of the manner in which this variable was collected, it was not possible to determine the charge for the hospital stay or the proportions of the hospital stay and medical services covered by the principal source of payment indicated.

Highlights

- In 1990, approximately 39 percent of hospitalized patients expected private insurance to pay for their hospital stay, compared with 53 percent in 1979.
- In 1990 approximately 49 percent of hospitalized patients expected public programs to pay for their hospital stay, compared with 40 percent in 1979.
- The average length of stay for patients expecting private insurance to pay for their hospital stay was 4.9 days compared with 7.8 days for public programs.
- The average age of patients expecting private insurance to pay for their hospital stay was 35.3 years. For those expecting public programs to pay for their hospitalization, it was 68.6 years.
- White patients were more likely than black patients to report private insurance and Medicare as sources of payment. Black patients were more likely than white patients to be in the Medicaid and self-pay categories.
- About 65 percent of patients hospitalized for benign neoplasms expected private insurance to pay for their hospitalization; for malignant neoplasms, it was 35 percent.
- The diagnostic categories with high proportions of discharges covered by Medicare (congestive heart failure, hyperplasia of prostate, and cerebrovascular disease) reflected the greater age of Medicare patients.
- Medicaid was the payment source for 12 percent of all patients, but for 28 percent of women hospitalized for childbirth.
- Although only 6 percent of all patients were in the self-pay category, that category accounted for 22 percent of patients with lacerations and open wounds.
- Of all patients with a hysterectomy performed, approximately 71 percent expected private insurance to pay for their hospitalization.
- Other government payments, including Workers' Compensation, accounted for 4 percent of surgeries, and for 22 percent of excision or destruction of an intervertebral disc.
- Medicare was the source of payment for more than half of all endoscopies of the small intestine, colonoscopies and sigmoidoscopies, and cystoscopies, excluding those with biopsies.

Trends

Three payment categories are shown in table 1: private insurance; public programs; and other types of payment (self-pay, no charge, and other). Private insurance includes Blue Cross, health maintenance organizations (HMO's), and other commercial insurance. Public programs include Medicare, Medicaid, Workers' Compensation, and other government programs.

The number of patients expecting to pay their hospital bills through private insurance declined from 19.3 million (52 percent) in 1979 to 11.9 million (39 percent) in 1990. In 1979, 14.7 million hospitalized patients (40 percent) expected to pay their hospital bills through a public program, compared with 15.2 million (49 percent) in 1990. The number of patients in the self-pay, no charge, and other category was approximately 2.7 million, both in 1979 (7 percent of all discharges) and in 1990 (9 percent of all discharges).

The number and proportion of hospital days expected to be paid for by private insurance also declined. In 1979, private insurance covered 113.3 million hospital days (43 percent of all days of care), compared with only 58.5 million (30 percent) in 1990. Public programs were the expected source of payment for 135.5 million

Table 1. Number of patients discharged from short-stay hospitals, days of care, average length of stay, and average age of patient, by expected principal source of payment: United States, selected years 1979–90

[Discharges from non-Federal hospitals. Excludes newborn infants]

Expected principal source of payment	Year	Number of discharges in thousands	Days of care in thousands	Average length of stay in days	Average age of patient
All sources of payment	1979	36,747	264,173	7.2	43.7
	1985	35,056	226,217	6.5	46.7
	[1]1990	30,788	197,422	6.4	47.9
Private insurance	1979	19,289	113,329	5.9	34.4
	1985	15,726	83,031	5.3	35.9
	1990	11,926	58,531	4.9	35.3
Public programs	1979	14,713	135,453	9.2	58.5
	1985	16,231	126,920	8.2	60.2
	1990	15,213	118,563	7.8	68.6
Self-pay, other sources of payments, and no charge	1979	2,744	15,392	5.7	29.9
	1985	3,098	16,265	5.3	30.7
	1990	2,657	14,675	5.5	31.2

[1]Includes data for patients whose expected principal source of payment was not stated.

days of care in 1979, which was 51 percent of all inpatient days. In 1990, the number of days of care in the public category had decreased to 118.6 million, but the category accounted for 60 percent of the total days. The number of days of care in the self-pay, no charge, and other category was 15.4 million (6 percent) in 1979, and 14.7 million (7 percent) in 1990.

Patients with public programs as their source of payment had consistently longer average lengths of stay than patients with private insurance, although average lengths of stay decreased for both groups from 1979 to 1990. In 1990, the average length of stay for public patients was 7.8 days, compared with 4.9 days for private patients. This is primarily because of Medicare, which was designed to help the elderly defray the cost of medical care (older people tend to have more chronic ailments and longer hospital stays than younger people). In 1990, the average age of those expecting public programs to pay for their hospital stay was 68.6 years, compared with an average age of 35.3 years for those with private insurance as their payment source. The relationship of age and coverage underlies many of the findings in this report.

Patients in the self-pay, no charge, and other category had similar average lengths of stay in 1979 (5.7 days) and in 1990 (5.5 days). The average age of these patients was 29.9 years in 1979 and 31.2 years in 1990.

Patient characteristics

The number and percent distribution of patients discharged from short-stay hospitals by expected source of payment, according to age and sex, are shown in table 2. Private insurance was the expected source of payment for at least 50 percent of discharges in all age groups except for those 65 years of age and over. Approximately 90 percent of discharges 65 years of age and over reported Medicare as their principal expected source of payment. Medicaid and self-pay categories accounted for larger proportions of discharges under 45 years of age than for those 45 years of age and over. Females were more likely to have Medicaid as a source of payment (14 percent) than were males (8 percent).

Expected sources of payment differed for white and black patients, as shown in table 3. Approximately 41 percent of white patients expected private insurance to pay for their hospital stay, compared with 29 percent of black patients. Medicare was an expected source of payment for 38 percent of the white patients, but for only 24 percent of the black patients. In contrast, 8 percent of white patients and 27 percent of black patients indicated Medicaid as an expected source of payment, and the self-pay category accounted for 5 percent of white patients and for almost 9 percent of black patients.

The percent of inpatients with private insurance as an expected source of payment ranged from 42 percent in the West to 36 percent in the Northeast. The percent of inpatients expecting the Medicare program to pay for their hospitalization ranged from 36 percent in the West to 30 percent in the Midwest.

Utilization by diagnosis

Table 4 provides the number and percent distribution of discharges by expected source of payment, according to selected diagnostic categories. Although 39 percent of all discharges expected private insurance to pay for their hospital stay, private insurance was the expected source of payment for 65 percent of discharges with benign neoplasms and neoplasms of uncertain behavior and unspecified nature, 54 percent of females with deliveries, 52 percent of discharges with an intervertebral disc disorder, 50 percent of discharges with noninfectious enteritis and colitis, and 49 percent of discharges with cholelithiasis.

Thirty-five percent of hospital discharges expected Medicare to pay for their hospital stay. The diagnostic categories with high proportions of discharges covered by Medicare reflect the older age of Medicare discharges. For example, Medicare was the expected source of payment for 78 percent of discharges with congestive heart failure, 72 percent of discharges with cerebrovascular disease, and 71 percent of discharges with hyperplasia of prostate.

Of particular interest is the contrast in sources of payment for types of neoplasms. The incidence of malignant neoplasms increases with age. As a result, among patients with a malignant neoplasm, 50 percent expected Medicare to be their source of payment, and 35 percent expected private insurance to pay for their

Table 2. Number and percent distribution of patients discharged from short-stay hospitals by expected principal source of payment, according to sex and age: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants]

Sex and age	All expected principal sources of payment	Private insurance	Medicare	Medicaid	Other government payments	Self-pay	Other payments and no charge	Payment source not stated
Both sexes				Number in thousands				
All ages	30,788	11,926	10,625	3,582	1,006	1,788	869	992
Under 15 years	2,412	1,240	41	684	91	194	92	70
15–44 years	11,799	6,410	407	2,269	605	1,129	481	497
45–64 years	6,244	3,801	838	497	264	382	215	248
65 years and over	10,333	475	9,339	133	46	83	81	176
Male								
All ages	12,280	4,470	4,718	967	550	814	359	403
Under 15 years	1,362	709	23	381	51	103	57	39
15–44 years	3,330	1,657	211	358	309	480	157	158
45–64 years	3,115	1,863	490	171	164	193	110	125
65 years and over	4,472	241	3,993	57	26	39	36	81
Female								
All ages	18,508	7,456	5,907	2,616	457	974	510	589
Under 15 years	1,049	531	18	303	40	91	35	31
15–44 years	8,469	4,753	196	1,911	296	650	325	339
45–64 years	3,129	1,939	347	326	100	189	105	123
65 years and over	5,861	234	5,346	76	20	45	46	95
Both sexes				Percent distribution				
All ages	100.0	38.7	34.5	11.6	3.3	5.8	2.8	3.2
Under 15 years	100.0	51.4	1.7	28.4	3.8	8.0	3.8	2.9
15–44 years	100.0	54.3	3.5	19.2	5.1	9.6	4.1	4.2
45–64 years	100.0	60.9	13.4	8.0	4.2	6.1	3.4	4.0
65 years and over	100.0	4.6	90.4	1.3	0.4	0.8	0.8	1.7
Male								
All ages	100.0	36.4	38.4	7.9	4.5	6.6	2.9	3.3
Under 15 years	100.0	52.1	1.7	27.9	3.7	7.5	4.2	2.9
15–44 years	100.0	49.8	6.3	10.8	9.3	14.4	4.7	4.8
45–64 years	100.0	59.8	15.7	5.5	5.3	6.2	3.5	4.0
65 years and over	100.0	5.4	89.3	1.3	0.6	0.9	0.8	1.8
Female								
All ages	100.0	40.3	31.9	14.1	2.5	5.3	2.8	3.2
Under 15 years	100.0	50.6	1.7	28.9	3.8	8.7	3.4	3.0
15–44 years	100.0	56.1	2.3	22.6	3.5	7.7	3.8	4.0
45–64 years	100.0	62.0	11.1	10.4	3.2	6.0	3.3	3.9
65 years and over	100.0	4.0	91.2	1.3	0.3	0.8	0.8	1.6

hospital stay. On the other hand, 65 percent of discharges with a benign neoplasm listed private insurance as their expected source of payment, and only 17 percent used Medicare.

Approximately 12 percent of all discharges expected Medicaid to cover their hospital stay. However, Medicaid was the source of payment for 28 percent of women hospitalized for deliveries. Twenty-two percent of patients diagnosed with asthma, 19 percent with some form of psychosis, and 16 percent with an acute respiratory infection listed Medicaid as their expected source of payment.

Other government programs, including Workers' Compensation, were the expected source of payment for 3 percent of all discharges, whereas these programs paid for 22 percent of discharges with intervertebral disc disorders, 10 percent of those with lacerations and open wounds, and 6 percent of those with fractures.

Although only 6 percent of all discharges were in the self-pay category, this was a frequent source of payment for lacerations and open wounds (22 percent).

Utilization by procedures

The number and percent distribution of procedures by expected source of payment, according to age and sex, are provided in table 5. Procedures in this report reflect only those procedures performed on an inpatient basis. Many procedures are performed in a hospital outpatient department or in other ambulatory care settings. Forty-one percent of all procedures were performed on inpatients who expected to pay for their hospital stay through private insurance. Private insurance was the expected source of payment for 37 percent of procedures for males and 44 percent of procedures for females. For discharges 45–64 years of age, private insurance was the expected source of payment for 63 percent of procedures.

One-third of all procedures performed were for discharges who expected Medicare to pay for their hospital stay. Medicare was the expected payment source for

Table 3. Number and percent distribution of patients discharged from short-stay hospitals by expected principal source of payment, according to race and geographic region: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants]

Race and region	All expected principal sources of payment	Private insurance	Medicare	Medicaid	Other government payments	Self-pay	Other payments and no charge	Payment source not stated
				Number in thousands				
All patients	30,788	11,926	10,625	3,582	1,006	1,788	869	992
Race								
White	21,376	8,722	8,135	1,730	650	1,067	533	538
Black	3,611	1,027	869	979	140	320	143	131
All other	958	402	168	222	32	84	38	13
Not stated	4,843	1,774	1,452	651	184	317	154	310
Geographic region								
Northeast	6,895	2,481	2,367	853	156	402	253	383
Midwest	7,620	3,104	2,756	779	209	390	207	176
South	11,173	4,222	3,972	1,286	401	744	224	325
West	5,100	2,119	1,530	665	241	252	184	108
				Percent distribution				
All patients	100.0	38.7	34.5	11.6	3.3	5.8	2.8	3.2
Race								
White	100.0	40.8	38.1	8.1	3.0	5.0	2.5	2.5
Black	100.0	28.5	24.1	27.1	3.9	8.9	4.0	3.6
All other	100.0	41.9	17.5	23.1	3.4	8.7	4.0	1.3
Not stated	100.0	36.6	30.0	13.4	3.8	6.6	3.2	6.4
Geographic region								
Northeast	100.0	36.0	34.3	12.4	2.3	5.8	3.7	5.6
Midwest	100.0	40.7	36.2	10.2	2.7	5.1	2.7	2.3
South	100.0	37.8	35.5	11.5	3.6	6.7	2.0	2.9
West	100.0	41.6	30.0	13.0	4.7	5.0	3.6	2.1

41 percent of procedures on males, compared with 29 percent of procedures on females. As expected, 89 percent of procedures performed on discharges 65 years of age and over had Medicare as the expected principal source of payment.

Medicaid was the expected source of payment for 11 percent of all procedures performed. Approximately 26 percent of the procedures performed on discharges under 15 years of age, and 22 percent of procedures for females between the ages of 15 and 44, had Medicaid as the principal expected source of payment. Approximately 5 percent of all procedures were in the self-pay category, but this category accounted for 14 percent of the procedures performed on males 15–44 years of age.

The number and percent distribution of surgical procedures by expected source of payment, according to selected surgical categories, are shown in table 6. Forty-six percent of all surgical procedures were performed on discharges listing private insurance as the expected source of payment. Among specific surgeries, private insurance was the expected source of payment for 71 percent of hysterectomies, 70 percent of oophorectomies and salpingo-oophorectomies, and 63 percent of appendectomies. More than half of several obstetrical and musculoskeletal surgeries also had private insurance as the expected source of payment.

Twenty-nine percent of all surgical procedures were performed on discharges using Medicare as the expected source of payment. Medicare was the expected source of payment for particularly large proportions of discharges with procedures on the heart or prostate. For example, 74 percent of surgical operations for insertion, replacement, removal, or revision of pacemaker leads or devices and 73 percent of prostatectomies were performed on discharges with Medicare as their expected source of payment. Again, these findings are consistent with the fact that older persons are generally covered under the Medicare program.

Ten percent of all surgical procedures were performed on discharges using Medicaid as the expected source of payment, but Medicaid discharges had larger proportions of several obstetric and gynecological procedures. These patients had 32 percent of the surgical operations for bilateral destruction or occlusion of fallopian tubes, 27 percent of artificial ruptures of membranes, 26 percent of repairs of obstetric laceration, and 25 percent of cesarean sections.

Other government payments, including Workers' Compensation, accounted for 4 percent of all surgeries, 23 percent of excision or destruction of an intervertebral disc, and 22 percent of spinal fusion. The self-pay category comprised 5 percent of all surgeries; 12 percent of appendectomies; 9 percent of debridement of wounds, infections, and burns; and 9 percent of open reduction of fractures with internal fixation.

Table 7 shows the number and percent distribution of nonsurgical procedures for selected procedure

Table 4. Number and percent distribution of patients discharged from short-stay hospitals by expected principal source of payment, according to selected diagnostic categories: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code number inclusions are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

First-listed diagnosis and ICD–9–CM code	All expected principal sources of payment	Private insurance	Medicare	Medicaid	Other government payments	Self-pay	Other payments and no charge	Payment source not stated
				Number in thousands				
All conditions[1]	30,788	11,926	10,625	3,582	1,006	1,788	869	992
Females with deliveries .V27	4,025	2,182	36	1,112	121	272	132	170
Heart disease .391–392.0,393–398,402, 404,410–416,420–429	3,556	932	2,172	129	51	111	67	94
Acute myocardial infarction .410	675	195	389	21	*8	24	14	22
Coronary atherosclerosis .414.0	410	163	193	10	*8	14	10	11
Other ischemic heart disease .411–413,414.1–414.9	870	255	502	35	12	27	16	24
Cardiac dysrhythmias .427	483	130	298	14	*7	16	10	9
Congestive heart failure .428.0	701	77	549	27	9	15	*8	15
Malignant neoplasms .140–208,230–234	1,571	542	780	83	34	48	35	49
Malignant neoplasm of large intestine and rectum .153–154,197.5	175	50	103	*6	*	*5	*	*6
Malignant neoplasm of trachea, bronchus and lung .162,197.0,197.3	231	77	119	12	*5	*8	*	*7
Malignant neoplasm of breast .174–175,198.81	164	69	72	*7	*	*	*	*7
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature .210–229,235–239	393	254	69	21	*6	16	15	14
Pneumonia .480–486	1,052	281	546	128	12	46	16	23
Fractures .800–829	1,017	300	427	58	65	94	37	36
Cerebrovascular disease .430–438	812	134	585	28	10	25	12	18
Psychosis .290–299	812	256	282	152	21	55	25	21
Cholelithiasis .574	506	247	151	40	10	24	17	17
Acute respiratory infections .460–466	487	174	176	79	13	26	9	10
Arthropathias and related disorders .710–719	479	166	229	24	22	9	12	18
Asthma .493	476	182	115	103	11	32	19	14
Intervertebral disc disorders .722	425	220	62	10	95	13	15	11
Diabetes mellitus .250	420	135	174	49	9	25	10	19
Noninfectious enteritis and colitis .555–556,558	347	172	75	51	9	22	9	9
Diseases of the central nervous system .320–336,340–349	342	125	114	44	12	23	10	14
Hyperplasia of prostate .600	259	58	185	*	*	*	*	*7
Lacerations and open wounds .870–904	240	83	20	23	23	53	13	25
				Percent distribution				
All conditions	100.0	38.7	34.5	11.6	3.3	5.8	2.8	3.2
Females with deliveries .V27	100.0	54.2	0.9	27.6	3.0	6.7	3.3	4.2
Heart disease .391–392.0,393–398,402,404, 410–416,420–429	100.0	26.2	61.1	3.6	1.4	3.1	1.9	2.6
Acute myocardial infarction .410	100.0	28.9	57.7	3.1	*1.2	3.6	2.1	3.3
Coronary atherosclerosis .414.0	100.0	39.9	47.0	2.5	*1.9	3.5	2.5	2.7
Other ischemic heart disease .411–413,414.1–414.9	100.0	29.3	57.6	4.0	1.4	3.0	1.8	2.8
Cardiac dysrhythmias .427	100.0	26.9	61.6	2.9	*1.4	3.2	2.1	1.9
Congestive heart failure .428.0	100.0	11.0	78.4	3.9	1.2	2.2	*1.1	2.2
Malignant neoplasms .140–208,230–234	100.0	34.5	49.6	5.3	2.2	3.1	2.2	3.1
Malignant neoplasm of large intestine and rectum .153–154,197.5	100.0	28.6	58.7	*3.3	*	*2.5	*	*3.7
Malignant neoplasm of trachea, bronchus, and lung .162,197.0,197.3	100.0	33.3	51.2	5.3	*2.2	*3.4	*	*3.2
Malignant neoplasm of breast .174–175,198.81	100.0	42.2	43.8	*4.0	*	*	*	*3.2
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature .210–229,235–239	100.0	64.5	17.4	5.2	*1.6	4.0	3.7	3.6
Pneumonia .480–486	100.0	26.8	51.9	12.2	1.1	4.3	1.5	2.2
Fractures .800–829	100.0	29.5	42.0	5.7	6.4	9.3	3.6	3.6
Cerebrovascular disease .430–438	100.0	16.5	72.0	3.4	1.3	3.0	1.5	2.2
Psychosis .290–299	100.0	31.6	34.7	18.7	2.6	6.7	3.1	2.5
Cholelithiasis .574	100.0	48.9	29.8	7.9	1.9	4.8	3.3	3.4
Acute respiratory infections .460–466	100.0	35.8	36.1	16.2	2.7	5.4	1.8	2.0
Arthropathias and related disorders .710–719	100.0	34.6	47.8	4.9	4.6	1.9	2.6	3.7
Asthma .493	100.0	38.3	24.1	21.5	2.2	6.8	4.0	3.0
Intervertebral disc disorders .722	100.0	51.7	14.6	2.4	22.3	3.0	3.5	2.5
Diabetes mellitus .250	100.0	32.0	41.4	11.7	2.2	6.0	2.3	4.4
Noninfectious enteritis and colitis .555–556,558	100.0	49.6	21.6	14.7	2.6	6.3	2.7	2.5
Diseases of the central nervous system .320–336,340–349	100.0	36.6	33.3	12.8	3.5	6.7	3.0	4.1
Hyperplasia of prostate .600	100.0	22.2	71.2	*	*	*	*	*2.8
Lacerations and open wounds .870–904	100.0	34.4	8.3	9.6	9.6	22.1	5.5	10.4

[1] Includes data for diagnostic conditions not shown in table.

categories, according to expected source of payment. Thirty-five percent of the nonsurgical procedures, compared with 46 percent of surgical procedures, were performed on discharges with private insurance as the expected source of payment. Discharges with private insurance had 57 percent of fetal EKGs and fetal monitoring, 47 percent of contrast myelograms, 43 percent of manually assisted deliveries, and 41 percent of arteriographies and angiocardiographies.

Thirty-nine percent of all nonsurgical procedures, compared with 29 percent of all surgical procedures, were performed on discharges with Medicare as the expected source of payment. Sixty percent of colonoscopies and sigmoidoscopies (excluding those with biopsy), 56 percent of cystoscopies (excluding those with biopsy), 56 percent of electrographic

Table 5. Number and percent distribution of all-listed procedures for patients discharged from short-stay hospitals by expected principal source of payment, according to sex and age: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants]

Sex and age	All expected principal sources of payment	Private insurance	Medicare	Medicaid	Other government payments	Self-pay	Other payments and no charge	Payment source not stated
Both sexes				Number in thousands				
All ages	40,506	16,717	13,471	4,381	1,437	2,104	1,158	1,237
Under 15 years	1,960	1,033	31	517	87	162	81	49
15–44 years	16,186	9,198	442	3,035	858	1,350	668	635
45–64 years	9,052	5,709	1,120	653	423	499	312	337
65 years and over	13,308	778	11,878	176	70	93	97	217
Male								
All ages	15,916	5,853	6,456	989	770	909	461	477
Under 15 years	1,144	612	17	290	53	94	51	27
15–44 years	3,840	1,969	194	376	412	517	192	178
45–64 years	4,605	2,859	652	239	264	249	171	171
65 years and over	6,326	412	5,593	84	41	49	47	101
Female								
All ages	24,590	10,864	7,015	3,392	667	1,195	697	760
Under 15 years	816	421	14	227	34	68	30	22
15–44 years	12,346	7,228	248	2,659	445	833	476	456
45–64 years	4,447	2,850	468	414	159	250	140	166
65 years and over	6,982	365	6,285	93	28	44	50	116
Both sexes				Percent distribution				
All ages	100.0	41.3	33.3	10.8	3.5	5.2	2.9	3.1
Under 15 years	100.0	52.7	1.6	26.4	4.5	8.3	4.1	2.5
15–44 years	100.0	56.8	2.7	18.8	5.3	8.3	4.1	3.9
45–64 years	100.0	63.1	12.4	7.2	4.7	5.5	3.4	3.7
65 years and over	100.0	5.8	89.3	1.3	0.5	0.7	0.7	1.6
Male								
All ages	100.0	36.8	40.6	6.2	4.8	5.7	2.9	3.0
Under 15 years	100.0	53.5	1.5	25.3	4.7	8.2	4.4	2.4
15–44 years	100.0	51.3	5.1	9.8	10.7	13.5	5.0	4.6
45–64 years	100.0	62.1	14.2	5.2	5.7	5.4	3.7	3.7
65 years and over	100.0	6.5	88.4	1.3	0.6	0.8	0.7	1.6
Female								
All ages	100.0	44.2	28.5	13.8	2.7	4.9	2.8	3.1
Under 15 years	100.0	51.6	1.7	27.8	4.2	8.3	3.7	2.7
15–44 years	100.0	58.5	2.0	21.5	3.6	6.7	3.9	3.7
45–64 years	100.0	64.1	10.5	9.3	3.6	5.6	3.2	3.7
65 years and over	100.0	5.2	90.0	1.3	0.4	0.6	0.7	1.7

monitoring, and 54 percent of circulatory monitoring, radioisotope scans, and endoscopies of the small intestine (excluding those with biopsy) were performed on discharges with Medicare as the expected source of payment.

Medicaid discharges made up 12 percent of all nonsurgical procedures, and, as was the case for surgical procedures, Medicaid was the expected source of payment for large proportions of obstetrical procedures. Thirty-three percent of manually assisted deliveries and 27 percent of fetal EKGs and fetal monitoring were performed on Medicaid discharges. In addition, Medicaid discharges had 22 percent of spinal taps.

Other government payments, including Workers' Compensation, were the expected source of payment for 3 percent of all nonsurgical procedures and accounted for 21 percent of contrast myelograms. The self-pay category accounted for 5 percent of all nonsurgical procedures and for 9 percent of spinal taps.

References

1. Haupt BJ, Kozak LJ. Estimates from two survey designs: National Hospital Discharge Survey. National Center for Health Statistics. Vital Health Stat 13(111). 1992.
2. Moien M. Patient charges in short-stay hospitals, United States, 1968–70. National Center for Health Statistics. Vital Health Stat 13(15). 1974.
3. Pokras R, Gardocki G. Expected principal source of payment for hospital discharges: United States, 1977. Advance data from vital and health statistics; no 62. Hyattsville, Maryland: National Center for Health Statistics. 1977.
4. Graves EJ, Pokras R. Expected principal source of payment for hospital discharges: United States, 1979. Advance data from vital and health statistics; no 75. Hyattsville, Maryland: National Center for Health Statistics. 1979.
5. Graves EJ. Expected principal source of payment for hospital discharges: United States, 1985. Advance data from vital and health statistics; no 144. Hyattsville, Maryland: National Center for Health Statistics. 1985.
6. Graves EJ. Utilization of short-stay hospitals, United States: 1982 annual summary. National Center for Health Statistics. Vital Health Stat 13(78). 1984.

Table 6. Number and percent distribution of all-listed surgical procedures for patients discharged from short-stay hospitals by expected principal source of payment, according to selected surgical categories: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code number inclusions are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Procedure category and ICD–9–CM code	All expected principal sources of payment	Private insurance	Medicare	Medicaid	Other government payments	Self-pay	Other payments and no charge	Payment source not stated
	Number in thousands							
All surgical procedures[1]	23,051	10,541	6,679	2,334	896	1,166	686	748
Episiotomy with or without forceps or vacuum extraction .72.1,72.21,72.31,72.71,73.6	1,717	1,023	11	383	49	118	51	82
Cardiac catheterization .37.21–37.23	995	411	426	37	18	36	32	35
Cesarean section .74.0–74.2.74.4,74.99	945	569	*8	234	27	45	28	34
Repair of current obstetric laceration .75.5–75.6	795	433	9	207	27	57	33	29
Artificial rupture of membranes .73.0	691	389	9	183	21	43	31	15
Hysterectomy .68.3–68.7	591	422	61	37	11	19	22	18
Cholecystectomy .51.2	522	263	151	40	11	23	18	16
Puncture of vessel .38.9	515	145	241	67	16	22	12	12
Oophorectomy and salpingo-oophorectomy .65.3–65.6	476	333	59	28	*6	21	15	14
Bilateral destruction or occlusion of fallopian tubes .66.2–66.3	419	224	*5	132	15	17	11	14
Coronary artery bypass graft .36.1	392	155	203	9	*8	*5	*	9
Open reduction of fracture with internal fixation .79.3	391	128	150	20	30	34	14	14
Prostatectomy .60.2–60.6	364	74	266	*5	*	*	*	9
Debridement of wound, infection, or burn .86.22,86.28	332	99	136	24	21	30	9	13
Lysis of peritoneal adhesions .54.5	323	183	87	24	*	10	11	*6
Excision or destruction of intervertebral disc .80.5	305	163	38	*8	69	*8	11	*8
Operations on muscles, tendons, and bursa .82–83.1,83.3–83.9	291	146	58	20	29	19	11	*8
Removal of coronary artery obstruction .36.0	285	127	119	*6	*7	9	9	*8
Appendectomy, excluding incidental .47.0	274	173	18	23	*8	32	11	9
Insertion, replacement, removal, and revision of pacemaker leads or device .37.7–37.8	259	44	191	*6	*	*5	*	*5
Partial excision of bone .76.2–76.3,77.6–77.8	193	94	41	12	23	*7	*8	*7
Spinal fusion .81.0	130	64	18	*7	29	*5	*	*
	Percent distribution							
All surgical procedures[1]	100.0	45.7	29.0	10.1	3.9	5.1	3.0	3.2
Episiotomy with or without forceps or vacuum extraction .72.1,72.21,72.31,72.71,73.6	100.0	59.6	0.6	22.3	2.9	6.9	3.0	4.8
Cardiac catheterization .37.21–37.23	100.0	41.3	42.8	3.7	1.8	3.7	3.2	3.5
Cesarean section .74.0–74.2,74.4,74.99	100.0	60.2	*0.8	24.8	2.9	4.8	3.0	3.6
Repair of current obstetric laceration .75.5–75.6	100.0	54.5	1.1	26.1	3.4	7.1	4.2	3.7
Artificial rupture of membranes .73.0	100.0	56.3	1.3	26.5	3.0	6.2	4.5	2.2
Hysterectomy .68.3–68.7	100.0	71.4	10.4	6.3	1.8	3.3	3.7	3.1
Cholecystectomy .51.2	100.0	50.5	28.9	7.7	2.1	4.4	3.4	3.1
Puncture of vessel .38.9	100.0	28.2	46.8	13.0	3.1	4.2	2.3	2.4
Oophorectomy and salpingo-oophorectomy .65.3–65.6	100.0	69.9	12.4	5.9	*1.2	4.5	3.2	3.0
Bilateral destruction or occlusion of fallopian tubes .66.2–66.3	100.0	53.5	*1.1	31.6	3.7	4.0	2.7	3.4
Coronary artery bypass graft .36.1	100.0	39.5	51.7	2.3	*1.9	*1.3	*	2.2
Open reduction of fracture with internal fixation .79.3	100.0	32.9	38.3	5.2	7.8	8.8	3.5	3.5
Prostatectomy .60.2–60.6	100.0	20.4	73.1	*1.5	*	*	*	2.4
Debridement of wound, infection, or burn .86.22,86.28	100.0	29.9	40.9	7.1	6.3	9.1	2.7	4.0
Lysis of peritoneal adhesions .54.5	100.0	56.6	27.0	7.3	*	3.0	3.3	*1.8
Excision or destruction of intervertebral disc .80.5	100.0	53.4	12.4	*2.6	22.6	*2.6	3.7	*2.7
Operations on muscles, tendons, and bursa .82–83.1,83.3–83.9	100.0	50.2	20.0	6.9	9.8	6.7	3.7	*2.8
Removal of coronary artery obstruction .36.0	100.0	44.6	41.6	*2.2	*2.3	3.1	3.3	*2.8
Appendectomy, excluding incidental .47.0	100.0	63.2	6.6	8.2	*2.9	11.6	4.1	3.4
Insertion, replacement, removal, and revision of pacemaker leads or device .37.7–37.8	100.0	17.1	73.8	*2.3	*	*1.9	*	*2.1
Partial excision of bone .76.2–76.3,77.6–77.8	100.0	48.8	21.5	6.3	11.9	*3.7	*4.3	*3.5
Spinal fusion .81.0	100.0	49.2	14.2	*5.3	22.2	*3.7	*	*

[1] Includes data for surgical conditions not shown in table.

7. Graves EJ. Utilization of short-stay hospitals, United States: 1983 annual summary. National Center for Health Statistics. Vital Health Stat 13(83). 1985.
8. Graves EJ. Utilization of short-stay hospitals, United States: 1984 annual summary. National Center for Health Statistics. Vital Health Stat 13(84). 1986.
9. Graves EJ. Utilization of short-stay hospitals, United States: 1985 annual summary. National Center for Health Statistics. Vital Health Stat 13(91). 1987.
10. Graves EJ. Utilization of short-stay hospitals, United States: 1986 annual summary. National Center for Health Statistics. Vital Health Stat 13(96). 1988.
11. Graves EJ. National Hospital Discharge Survey: annual summary, 1987. National Center for Health Statistics. Vital Health Stat 13(99). 1989.
12. Graves EJ. National Hospital Discharge Survey: annual summary, 1988. National Center for Health Statistics. Vital Health Stat 13(106). 1991.
13. Graves EJ, Kozak LJ. National Hospital Discharge Survey: annual summary, 1989. National Center for Health Statistics. Vital Health Stat 13(109). 1992.
14. Graves EJ. National Hospital Discharge Survey: annual summary, 1990. National Center for Health Statistics. Vital Health Stat 13(112). 1992.

Table 7. Number and percent distribution of all-listed nonsurgical procedures for patients discharged from short-stay hospitals by expected principal source of payment, according to selected nonsurgical categories: United States, 1990

[Discharges from non-Federal hospitals. Excludes newborn infants. Diagnostic groupings and code number inclusions are based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM)]

Procedure category and ICD–9–CM code	*All expected principal sources of payment*	*Private insurance*	*Medicare*	*Medicaid*	*Other government payments*	*Self-pay*	*Other payments and no charge*	*Payment source not stated*
				Number in thousands				
All nonsurgical procedures[1]	17,455	6,176	6,792	2,047	541	938	472	489
Arteriography and angiocardiography using contrast material .88.4–88.5	1,735	709	745	65	33	67	62	55
Fetal EKG (scalp) and fetal monitoring, not otherwise specified .75.32,75.34	1,377	780	13	371	53	80	45	36
Diagnostic ultrasound .88.7	1,608	494	722	196	38	88	39	31
Computerized axial tomography (CAT) .87.03,87.41,87.71,88.01,88.38	1,506	422	722	111	54	109	49	39
Respiratory therapy .93.9	1,164	286	571	158	34	67	19	29
Endoscopy of small intestine (excludes that with biopsy) .45.11–45.13	549	157	294	41	10	22	10	15
Manually assisted delivery .73.5	754	321	13	251	27	57	33	53
Circulatory monitoring .89.6	724	178	392	74	21	42	9	*7
Radioisotope scan .92.0–92.1	603	160	324	52	15	29	11	11
Cystoscopy (excludes that with biopsy) .57.31–57.32	485	144	273	21	*6	12	9	20
Spinal tap .03.31	396	148	81	89	15	35	16	12
Colonoscopy and sigmoidoscopy (excludes that with biopsy) .45.23–45.24	393	109	237	19	*5	*6	*8	9
Electrographic monitoring .89.54	629	171	349	44	19	31	*6	9
Contrast myelogram .87.21	213	100	45	*6	44	*7	*7	*5
				Percent distribution				
All nonsurgical procedures[1]	100.0	35.4	38.9	11.7	3.1	5.4	2.7	2.8
Arteriography and angiocardiography using contrast material .88.4–88.5	100.0	40.8	42.9	3.7	1.9	3.8	3.5	3.2
Fetal EKG (scalp) and fetal monitoring, not otherwise specified .75.32,75.34	100.0	56.6	0.9	26.9	3.8	5.8	3.3	2.6
Diagnostic ultrasound .88.7	100.0	30.7	44.9	12.2	2.4	5.5	2.4	2.0
Computerized axial tomography (CAT) .87.03,87.41,87.71,88.01,88.38	100.0	28.0	48.0	7.4	3.6	7.3	3.2	2.6
Respiratory therapy .93.9	100.0	24.6	49.1	13.5	2.9	5.8	1.6	2.5
Endoscopy of small intestine (excludes that with biopsy) .45.11–45.13	100.0	28.6	53.6	7.5	1.8	4.0	1.8	2.8
Manually assisted delivery .73.5	100.0	42.6	1.7	33.3	3.6	7.5	4.4	7.0
Circulatory monitoring .89.6	100.0	24.6	54.1	10.3	2.9	5.8	1.3	*1.0
Radioisotope scan .92.0–92.1	100.0	26.6	53.8	8.6	2.4	4.8	1.9	1.9
Cystoscopy (excludes that with biopsy) .57.31–57.32	100.0	29.7	56.3	4.3	*1.3	2.5	1.8	4.1
Spinal tap .03.31	100.0	37.3	20.5	22.4	3.8	8.9	4.0	3.1
Colonoscopy and sigmoidoscopy (excludes that with biopsy) .45.23–45.24	100.0	27.6	60.2	4.9	*1.2	*1.6	*2.0	2.4
Electrographic monitoring .89.54	100.0	27.1	55.6	7.0	3.1	4.9	*0.9	1.4
Contrast myelogram .87.21	100.0	46.9	21.0	*2.9	20.5	*3.1	*3.4	*2.2

[1] Includes data for nonsurgical conditions not shown in table.

15. Ries P. Characteristics of persons with and without health care coverage: United States, 1989. Advance data from vital and health statistics; no 201. Hyattsville, Maryland: National Center for Health Statistics. 1991.
16. SMG Marketing Group, Inc. Hospital Market Data Base. Chicago, Illinois: Healthcare Information Specialists. 1989.
17. Shah BV. SESUDAAN: Standard errors program for computing of standardized rates from sample survey data. Research Triangle Park, North Carolina: Research Triangle Institute. 1981.

Symbols	
- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision
#	Figure suppressed to comply with confidentiality requirements

Technical notes

Survey methodology

Sources of data

The National Hospital Discharge Survey (NHDS) covers discharges from noninstitutional hospitals, exclusive of Federal, military, and Veterans' Administration hospitals, located in the 50 States and the District of Columbia. Only short-stay hospitals (hospitals where the average length of stay for all patients is less than 30 days) and those whose specialty is general (medical or surgical) or children's general are included in the survey. These hospitals must also have at least six beds staffed for patient use.

Beginning with 1988, the NHDS sampling frame has comprised hospitals that were listed in the April 1987 SMG Hospital Market Tape (16), met the above criteria, and began accepting patients by August 1987. For 1990, the sample consisted of 542 hospitals, of which 23 were found to be out of scope (ineligible) because they had gone out of business or failed to meet the criteria for the NHDS universe. Of the 519 in-scope (eligible) hospitals, 474 responded to the survey.

Sample design and data collection

The National Center for Health Statistics (NCHS) has conducted the NHDS continuously since 1965. The original sample was selected in 1964 from a frame of short-stay hospitals listed in the National Master Facility Inventory. That sample was updated periodically with samples of hospitals that opened later. Sample hospitals were selected with probabilities ranging from certainty for the largest hospitals to 1 in 40 for the smallest hospitals. Within each sample hospital, a systematic random sample of discharges was selected.

Beginning in 1988 the NHDS sample has included with certainty all hospitals with 1,000 beds or more, or 40,000 discharges or more, annually. The remaining sample of hospitals was based on a stratified three-stage design. The first stage consisted of a selection of 112 primary sampling units (PSU's) that composed a probability subsample of PSU's to be used in the 1985–94 National Health Interview Survey (NHIS). The second stage comprised a selection of noncertainty hospitals from the sample PSU's. At the third stage, a sample of discharges was selected by a systematic random-sampling technique. A detailed description of the original and new designs has been published (1).

Two data collection procedures were used for the survey. One was a manual system of sample selection and data abstraction. The other, an automated method used for approximately 34 percent of the respondent hospitals in 1990, involved the purchase of data tapes from abstracting services, State data systems, and hospitals.

In the manual system, the sample selection and the transcription of information from hospital records to abstract forms were performed at the hospitals. The completed forms, along with sample selection control sheets, were forwarded to NCHS for coding, editing, and weighting. A few of these hospitals submitted their data via computer printout or tape. Of the hospitals using the manual system in 1990, about two-thirds had the work performed by their own medical records staff. In the remaining hospitals using the manual system, personnel of the U.S. Bureau of the Census did the work on behalf of NCHS.

For the automated system, NCHS purchased tapes containing machine-readable medical record data from abstracting services. Records were systematically sampled by NCHS. The medical abstract form and the abstract data tapes contained items relating to the patient's personal characteristics, including birth date, sex, race, and marital status but not name and address; administrative information, including admission and discharge dates, discharge status, and medical record number; diagnoses; and surgical and nonsurgical operations and procedures. Beginning in 1977 data pertaining to patient ZIP Code, expected source of payment, and dates of surgery were also collected. (The medical record number and patient ZIP Code are confidential and, therefore, not available to the public.)

Presentation of estimates

The relative standard error (RSE) of the estimate and the number of sample records on which that estimate was based (referred to as "the sample size") were used to identify estimates with relatively low reliability. Because of the complex sample design of the NHDS, the following guidelines were used in presenting the NHDS estimates:

- If the relative standard error of an estimate was larger than 30 percent, or the sample size was less than 30, the estimate is not shown. In this case, only an asterisk (*) appears in the tables.
- If the sample size was less than 60, the value of the estimate could not be assumed to be reliable. In this case, the estimate is preceded by an asterisk (*) in the tables.

Sampling errors and rounding of numbers

The standard error is primarily a measure of sampling variability that occurs by chance because only a sample rather than the entire universe is surveyed. The relative standard error of the estimate is obtained by dividing the standard error by the estimate itself and is expressed as a percent of the estimate. The resulting value is multiplied by 100, so the relative standard error is expressed as a percent of the estimate.

Estimates of sampling variability were calculated with SESUDAAN software, which computes standard errors by using a first-order Taylor approximation of the deviation of estimates from their expected values. A description of the software and the approach it uses has been published (17).

The constants for relative standard error curves for the NHDS estimates are presented in table I. The relative standard error [RSE (X)] of an estimate X may be estimated from the formula

$$\mathrm{RSE}(X) = \sqrt{a + b/X}$$

where X, a, and b are as defined in table I.

The most conservative standard error should be used when a statistic involves more than one variable. For example, the number of discharges for females 15–44 years of age expecting to pay for their own hospitalization was 650,000. Using the formula

$$\mathrm{RSE}(X) = \sqrt{a + b/X \cdot 100}$$

the relative standard error in percent was 4.16 for females, 4.34 for inpatients 15–44 years of age, and 7.81 for self-pay inpatients. The relative standard error in percent for the self-pay variable should be used since it is the most conservative of the three variables.

Estimates have been rounded to the nearest thousand. For this reason, figures within tables do not always add to the totals. Rates and average lengths of stay were calculated from original, unrounded figures and do not necessarily agree precisely with rates or average lengths of stay calculated from rounded data.

Tests of significance

In this report, statistical inference is based on the two-sided t-test with a critical value of 1.96 (0.05 level of significance). Terms such as "higher" and "less" indicate that differences are statistically significant. Terms such as "similar" or "no difference" mean that no statistically significant differences exist between the estimates being compared. A lack of comment on the difference between any two estimates does not mean that the difference was tested and found not to be significant.

Table I. Estimated parameters for relative standard error equations for National Hospital Discharge Survey statistics by characteristics: United States, 1990

Characteristic	Number of discharges or first-listed diagnoses		Number of days of care		Number of procedures	
	a	b	a	b	a	b
Total	0.00213	228.834	0.00358	452.582	0.00547	92.597
Sex						
Male	0.00152	313.079	0.00293	292.127	0.00410	89.724
Female	0.00125	311.632	0.00213	701.564	0.00337	83.021
Age						
Under 15 years	0.01597	47.116	0.00224	140.764	0.03171	44.124
15–44 years	0.00142	299.762	0.00301	460.089	0.00302	139.070
45–64 years	0.00157	234.543	0.00920	432.971	0.00491	68.024
65 years and over	0.00161	263.223	0.00251	762.854	0.00436	47.886
Region						
Northeast	0.00274	56.268	0.00368	146.195	0.00588	108.765
Midwest	0.00487	183.531	0.00605	970.001	0.00886	107.681
South	0.00375	343.892	0.00540	929.232	0.00781	50.919
West	0.00564	318.914	0.01036	830.740	0.01235	144.582
Expected principal source of payment						
Private insurance	0.00141	356.276	0.00258	1,253.398	0.00370	152.998
Medicare	0.00233	147.208	0.00335	105.814	0.00502	93.208
Medicaid	0.00542	225.144	0.00918	269.323	0.01281	125.784
Workers' Compensation	0.00881	52.626	0.02194	159.965	0.02224	27.461
Other government payments	0.04049	72.916	0.04643	240.704	0.05825	61.826
Self-pay	0.00571	255.679	0.01277	677.732	0.01598	75.975
Other payments and no charge	0.02316	146.212	0.03494	244.069	0.03750	88.504
Not stated	0.04000	171.864	0.05910	363.932	0.06397	134.637
Race						
White	0.00212	298.564	0.00329	599.597	0.00426	80.500
Black	0.00537	264.999	0.00838	291.219	0.01044	52.381
All other	0.02899	119.661	0.04485	150.121	0.04866	59.007
Not stated	0.02252	226.201	0.02914	634.529	0.00357	44.250

NOTE. The relative standard error (RSE) for an estimate (X) can be determined from the equation $\mathrm{RSE}(X) = \sqrt{a + b/X}$.

Definition of terms

Terms relating to sources of payment

Private insurance—Health insurance provided by nongovernment sources, such as insurance companies, private industry, and philanthropic organizations.

Medicare (Title XVIII)—A nationwide health program providing health insurance protection, regardless of income, to people 65 years of age and over, people eligible for Social Security disability payments for more than two years, and people with end-stage renal disease.

Medicaid—A joint Federal-State welfare program available in virtually all States that provides benefits for low-income persons. Each State has its own criteria for qualification as "low income."

Other government payments—Government payments other than those through the Medicare or Medicaid programs, such as Workers' Compensation (a program designed to enable employees injured on the job to receive financial compensation regardless of fault), payments made under the Title V Program, and the Civilian Health and Medical Program for the Uniformed Services (CHAMPUS, which provides coverage for civilian medical care for family members of active-duty uniformed service personnel and for retired uniformed service personnel and their families).

Self-pay—A form of hospital payment in which the major share of the total cost is paid by the patient or the patient's spouse, family, or next of kin.

No charge—A situation where medical services are provided free of charge by the hospital. This category includes hospital-sponsored welfare, donated staff services, and hospital-sponsored special research.

Other payments—All other nonprofit sources of payment such as church welfare, the United Way (United Appeal), or the Shriners Crippled Children Services.

Terms relating to hospitalization

Hospitals—All hospitals with an average length of stay for all patients of less than 30 days; hospitals whose specialty is general (medical or surgical) or children's general are eligible for inclusion in the NHDS, with the exception of Federal hospitals, hospital units of institutions, and hospitals with fewer than 6 beds staffed for patients' use.

Patient—A person formally admitted to the inpatient service of a short-stay hospital for observation, care, diagnosis, or treatment. The terms "patient," "inpatient," and "discharge" are used here synonymously.

Newborn infant—A patient admitted by birth to a hospital.

Discharge—The formal release of a patient by a hospital; that is, the termination of a period of hospitalization by death or by disposition to place of residence, nursing home, or another hospital. The terms "discharge," "patient," and "inpatient" are used here synonymously.

Days of care—The number of patient days accumulated at time of discharge. A stay of less than 1 day (patient admission and discharge on the same day) is counted as 1 day in the summation of total days of care. For patients admitted and discharged on different days, the number of days of care is computed by counting all days from (and including) the date of admission to (but not including) the date of discharge.

Average length of stay—The number of days of care accumulated by patients during the year divided by the number of these patients.

Terms relating to diagnoses

Diagnosis—A disease or injury (or factor that influences health status and contact with health services that is not itself a current illness or injury) listed on the medical record of a patient.

Principal diagnosis—The condition established after study to be chiefly responsible for occasioning the admission of the patient to the hospital for care.

First-listed diagnosis—The coded diagnosis identified as the principal diagnosis or that listed first on the face sheet or discharge summary of the medical record if the principal diagnosis cannot be identified. The number of first-listed diagnoses is equal to the number of discharges.

Terms relating to procedures

Procedure—A surgical or nonsurgical operation, diagnostic procedure, or special treatment reported on the medical record of a patient. The following ICD–9–CM procedure codes are not used in the NHDS:

87.09, 87.11–87.12, 87.16–87.17, 87.22–87.29, 87.39, 87.43–87.49, 87.85, 87.89, 87.92, 87.95, 87.99, 88.09, 88.16, 88.19, 88.21–88.29, 88.31, 88.33, 88.35, 88.37, 88.39, 89.01–89.09, 89.11–89.13, 89.15–89.16, 89.26, 89.29, 89.31, 89.33–89.39, 89.7–89.8, 90.01–90.99, 91.01–91.99, 93.01–93.09, 93.11–93.19, 93.21–93.25, 93.27–93.28, 93.31–93.39, 93.61–93.67, 93.71–93.78, 93.81–93.89, 94.01–94.19, 94.21–94.23, 94.29, 94.31–94.39, 94.41–94.49, 94.51–94.59, 95.01–95.03, 95.05–95.09, 95.14–95.15, 95.31–95.36, 95.41–95.48, 96.11–96.19, 96.26–96.28, 96.34–96.39, 96.41–96.48, 96.51–96.59, 96.6, 97.01–97.04, 97.14–97.16, 97.21–97.29, 97.31–97.39, 97.41–97.49, 97.51–97.59, 97.61–97.69, 97.72–97.79, 97.81–97.87, 97.89, 99.12–99.14, 99.16–99.18, 99.26–99.29, 99.31–99.39, 99.41–99.48, 99.51–99.59.

All-listed procedures—Includes up to four procedures listed on the face sheet of the medical record.

Surgical operations—All procedures except those listed under "nonsurgical procedures."

Nonsurgical procedures—Procedures generally not considered to be surgery. These include diagnostic endoscopy and radiography, radiotherapy and related therapies, physical medicine, and rehabilitation. The following ICD–9–CM codes identify nonsurgical procedures:

01.18–01.19, 03.31, 03.39, 04.19, 05.19, 06.19, 07.19, 08.19, 09.19, 09.41–09.49, 10.29, 11.29, 12.29, 14.29, 15.09, 16.21, 16.29, 18.01, 18.11, 18.19, 20.31, 20.39, 21.00–21.02, 21.21, 21.29, 22.19, 24.19, 25.09, 26.19, 27.29, 28.19, 29.11, 29.19, 31.41–31.42, 31.48–31.49, 33.21–33.23, 33.29, 34.21–34.22, 34.28–34.29, 37.26–37.27, 37.29, 38.29, 39.95, 40.19, 41.38–41.39, 42.22–42.23, 42.29, 44.11–44.13, 44.19, 45.11–45.13, 45.19, 50.19, 51.10–51.11, 51.19, 52.19, 54.21, 54.29, 55.21–55.22, 55.29, 56.31, 56.35, 56.39, 57.31–57.32, 57.39, 57.94–57.95, 58.21–58.22, 58.29, 59.29, 60.18–60.19, 61.19, 69.92, 70.21–70.22, 70.29, 71.19, 73.4, 73.51–73.59, 73.91–73.92, 75.31–75.32, 75.34–75.35, 75.94, 76.19, 78.80–78.89, 80.20–80.29, 81.98, 83.29, 84.41–84.43, 84.45–84.47, 85.19, 86.19, 86.92, 87–99.

Demographic terms

Age—Patient's age at birthday.

Race—Patients are classified into three groups: white, black, and all other (with "all other" including all categories other than white or black).

Geographic region—Hospital's location; one of four regions of the United States as defined by the U.S. Bureau of the Census.

Region	*States included*
Northeast	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut,

	New York, New Jersey, and Pennsylvania
Midwest	Michigan, Ohio, Illinois, Indiana, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
South	Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
West	Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Hawaii, and Alaska

*U.S. Government Printing Office: 1995 — 386-952/20015

Vital and Health Statistics series descriptions

SERIES 1. **Programs and Collection Procedures**—These reports describe the data collection programs of the National Center for Health Statistics. They include descriptions of the methods used to collect and process the data, definitions, and other material necessary for understanding the data.

SERIES 2. **Data Evaluation and Methods Research**—These reports are studies of new statistical methods and include analytical techniques, objective evaluations of reliability of collected data, and contributions to statistical theory. These studies also include experimental tests of new survey methods and comparisons of U.S. methodology with those of other countries.

SERIES 3. **Analytical and Epidemiological Studies**—These reports present analytical or interpretive studies based on vital and health statistics. These reports carry the analyses further than the expository types of reports in the other series.

SERIES 4. **Documents and Committee Reports**—These are final reports of major committees concerned with vital and health statistics and documents such as recommended model vital registration laws and revised birth and death certificates.

SERIES 5. **International Vital and Health Statistics Reports**—These reports are analytical or descriptive reports that compare U.S. vital and health statistics with those of other countries or present other international data of relevance to the health statistics system of the United States.

SERIES 6. **Cognition and Survey Measurement**—These reports are from the National Laboratory for Collaborative Research in Cognition and Survey Measurement. They use methods of cognitive science to design, evaluate, and test survey instruments.

SERIES 10. **Data From the National Health Interview Survey**—These reports contain statistics on illness; unintentional injuries; disability; use of hospital, medical, and other health services; and a wide range of special current health topics covering many aspects of health behaviors, health status, and health care utilization. They are based on data collected in a continuing national household interview survey.

SERIES 11. **Data From the National Health Examination Survey, the National Health and Nutrition Examination Surveys, and the Hispanic Health and Nutrition Examination Survey**—Data from direct examination, testing, and measurement on representative samples of the civilian noninstitutionalized population provide the basis for (1) medically defined total prevalence of specific diseases or conditions in the United States and the distributions of the population with respect to physical, physiological, and psychological characteristics, and (2) analyses of trends and relationships among various measurements and between survey periods.

SERIES 12. **Data From the Institutionalized Population Surveys**—Discontinued in 1975. Reports from these surveys are included in Series 13.

SERIES 13. **Data From the National Health Care Survey**—These reports contain statistics on health resources and the public's use of health care resources including ambulatory, hospital, and long-term care services based on data collected directly from health care providers and provider records.

SERIES 14. **Data on Health Resources: Manpower and Facilities**—Discontinued in 1990. Reports on the numbers, geographic distribution, and characteristics of health resources are now included in Series 13.

SERIES 15. **Data From Special Surveys**—These reports contain statistics on health and health-related topics collected in special surveys that are not part of the continuing data systems of the National Center for Health Statistics.

SERIES 16. **Compilations of Advance Data From Vital and Health Statistics**—Advance Data Reports provide early release of information from the National Center for Health Statistics' health and demographic surveys. They are compiled in the order in which they are published. Some of these releases may be followed by detailed reports in Series 10–13.

SERIES 20. **Data on Mortality**—These reports contain statistics on mortality that are not included in regular, annual, or monthly reports. Special analyses by cause of death, age, other demographic variables, and geographic and trend analyses are included.

SERIES 21. **Data on Natality, Marriage, and Divorce**—These reports contain statistics on natality, marriage, and divorce that are not included in regular, annual, or monthly reports. Special analyses by health and demographic variables and geographic and trend analyses are included.

SERIES 22. **Data From the National Mortality and Natality Surveys**—Discontinued in 1975. Reports from these sample surveys, based on vital records, are now published in Series 20 or 21.

SERIES 23. **Data From the National Survey of Family Growth**—These reports contain statistics on factors that affect birth rates, including contraception, infertility, cohabitation, marriage, divorce, and remarriage; adoption; use of medical care for family planning and infertility; and related maternal and infant health topics. These statistics are based on national surveys of childbearing age.

SERIES 24. **Compilations of Data on Natality, Mortality, Marriage, Divorce, and Induced Terminations of Pregnancy**—These include advance reports of births, deaths, marriages, and divorces based on final data from the National Vital Statistics System that were published as supplements to the *Monthly Vital Statistics Report* (MVSR). These reports provide highlights and summaries of detailed data subsequently published in *Vital Statistics of the United States*. Other supplements to the MVSR published here provide selected findings based on final data from the National Vital Statistics System and may be followed by detailed reports in Series 20 or 21.

For answers to questions about this report or for a list of reports published in these series, contact:

Data Dissemination Branch
National Center for Health Statistics
Centers for Disease Control and Prevention
Public Health Service
6525 Belcrest Road, Room 1064
Hyattsville, MD 20782

(301) 436–8500
E-mail: nchsquery@nch10a.em.cdc.gov
Internet: http://www.cdc.gov/nchswww/nchshome.htm

DEPARTMENT OF
HEALTH AND HUMAN SERVICES

Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics
6525 Belcrest Road
Hyattsville, Maryland 20782

DHHS Publication No. (PHS) 95-1881, Series 16, No. 22
5-1117 (5/95)