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Advance Data

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# Drug Utilization in Office Practice

## National Ambulatory Medical Care Survey, 1990

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In 1990 an estimated 704 million office visits were made to office-based physicians in the United States. About 60 percent of the visits were classified as a "drug visit," a visit during which one drug or more was prescribed or provided to the patient. This resulted in office-based physicians prescribing or providing an estimated 759 million medications to their patients in 1990.

This report describes the drug utilization for 1 year according to data collected in the 1990 National Ambulatory Medical Care Survey (NAMCS). NAMCS, a year-long sample survey of the nation's nonfederal, office-based physicians is conducted by the Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Care Statistics. A summary of general findings from the 1990 NAMCS (1) and reports on drug utilization in office practice, 1985 (2) and 1980 (3) have been published.

The term utilization is defined as the prescribing or providing of a new or continued drug by a doctor of medicine or osteopathy in the course of an office visit. It is not an indication of the patient's compliance with the doctor's instructions. Drug utilization in this report will be described in three ways: 1) by frequency of drug use, namely, a drug visit; the proportion of visits during which medications were prescribed or provided, 2) by the intensity of drug use; the proportion of visits during which one, two, and three or more drugs were prescribed or provided, and 3) by the drug utilization rate; the average number of medications per visit. The terms "drug" and "medication" are used interchangeably and are broadly defined to include any pharmaceutical agent the doctor prescribes or provides to the patient during a visit.

Data presented in this report are based on entries in item 15 on the NAMCS Patient Record Form (figure 1) that asks the responding physician to report the names of up to five specific drugs that were prescribed or provided in the course of the office visit (drugs prescribed through telephone contact are excluded). Physicians were asked to report nonprescription and prescription drugs, to distinguish between new and continued medications, and to indicate whether the drug was intended for the principal diagnosis associated with the visit (item 10a).

### Data highlights

Table 1 describes some key dimensions of the drug data base.

*New or continued status*—About half ( 51 percent) of the drugs prescribed or provided were described as continued medications.

*Entry status*—Seventy-one percent of the drugs prescribed or provided were specific brand or trade names.

*Prescription status*—A great majority (84 percent) of office-based drug therapy utilized prescription drugs.

*Composition status*—Seventy-five percent of the drugs were single ingredient medications.

*Control status*—Uncontrolled drugs represented 87 percent of the medications used in office-based drug therapy. Controlled drugs were distributed among the schedules as shown in table 1. Only 6 percent of the medications prescribed or provided by the office-based practitioner were classified as controlled substances.

The data in tables 2 and 3 show rank listings of the 50 drugs most frequently prescribed or provided by the office-based practitioner. Table 2 uses the entry names, that is, the trade or generic names entered on

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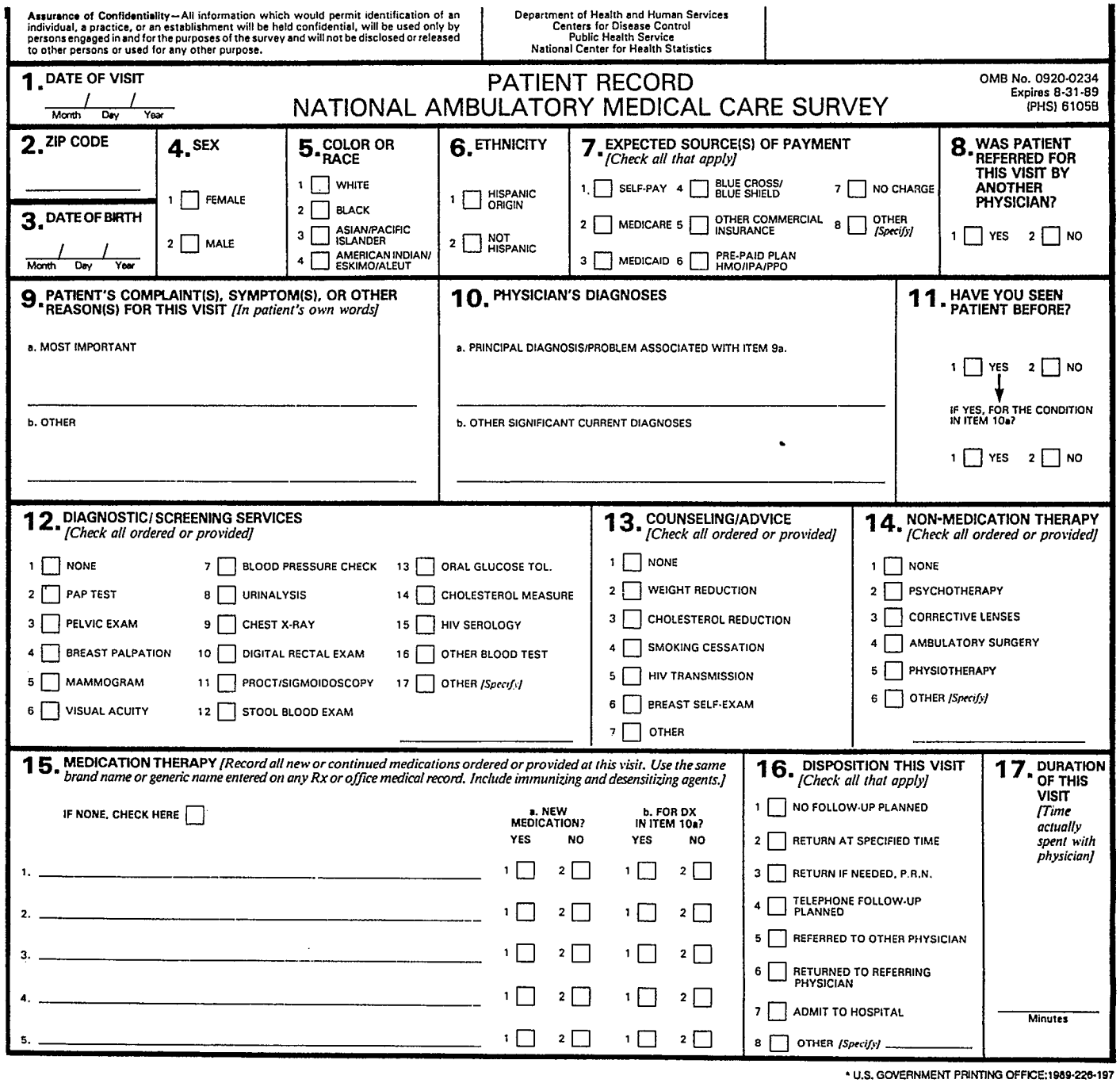
CENTERS FOR DISEASE CONTROL AND PREVENTION



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

1. DATE OF VISIT — Month / Day / Year

PATIENT RECORD
NATIONAL AMBULATORY MEDICAL CARE SURVEY

OMB No. 0920-0234
Expires 8-31-89
(PHS) 61058

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 [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. Patient Record Form**

the patient's prescription or medical record. The top three entry names, amoxicillin, amoxil, and ceclor, are antibiotics. In table 3 the data are presented by the generic ingredients of the drugs and provide a more complete perspective of drug utilization in the doctor's office. The most frequently used generic substance was amoxicillin (5 percent), an antibiotic. Seven other antibiotics are in the top 50 list including erythromycin and cefaclor. Other drugs frequently prescribed or provided by office-based physicians are the decongestants, phenylephrine, pseudoephedrine, and phenylpropanolamine, the broncodilators, albuterol and theophylline, and those drugs used in treating diseases of the circulatory system, hydrochlorothiazide, digoxin, furosemide, triamterene, nitroglycerin, diltiazem, and aspirin.

In table 4 the estimated 759 million drug mentions are classified by their chief therapeutic effect. Antimicrobial agents, cardiovascular-renal drugs, respiratory drugs, and drugs used for relief of pain account for 53 percent of all drug mentions.

The remaining tables describe the relationship between drug utilization and other key variables in office care: the characteristics of the attending physician (table 5), the patient's age and sex (table 6), race and ethnicity (table 7), and the principal diagnoses (table 8).

**Table 1. Number and percent distribution of drug mentions by selected dimensions: United States, 1990**

| Drug dimension | Drug mentions in thousands | Percent distribution |
|---|---|---|
| All mentions | 759,406 | 100.00 |
| New or continued status | | |
| New medication | 327,748 | 43.16 |
| Continued medication | 384,009 | 50.57 |
| Undetermined | 47,649 | 6.27 |
| Entry status[1] | | |
| Generic name | 131,893 | 17.37 |
| Trade name | 543,357 | 71.55 |
| Undetermined | 84,156 | 11.08 |
| Prescription status | | |
| Prescription drug | 637,300 | 83.92 |
| Nonprescription drug | 68,452 | 9.01 |
| Undetermined | 53,654 | 7.07 |
| Composition status | | |
| Single ingredient drug | 573,498 | 75.52 |
| Combination drug | 134,907 | 17.76 |
| Undetermined | 51,000 | 6.72 |
| Federal control status | | |
| Controlled drug | 49,613 | 6.53 |
| Schedule II drug | 4,159 | 0.55 |
| Schedule III drug | 13,153 | 1.73 |
| Schedule IV drug | 23,630 | 3.11 |
| Schedule V drug | 8,670 | 1.14 |
| Noncontrolled drug | 658,729 | 86.74 |
| Undetermined | 51,064 | 6.72 |

[1]The trade or generic name used by the physician on the prescription or other medical records.

## Physician

Ninety-four percent of the patient visits were to physicians who in the 1990 NAMCS sample identified themselves as doctors of medicine (table 5). However a slightly higher percent of visits to doctors of osteopathy (68 percent) were classified as a drug visit than those visits to doctors of medicine (60 percent). Doctors of osteopathy administered more single and multiple medications to patients than did doctors of medicine. The drug utilization rate for doctors of osteopathy was 1.3 medications per visit and 1.1 for doctors of medicine.

The physicians most likely to prescribe or provide medications were those specializing in cardiovascular disease, internal medicine, general and family practice, pediatrics, and neurology. Fifty-seven percent of the patient visits were to these five specialties and they accounted for 67 percent of all drug mentions.

The intensity in administering medication was greatest for the cardiovascular disease specialists. Seventy-eight percent of the visits to physicians specializing in cardiovascular disease were drug visits and 42 percent of the visits resulted in three or more medications prescribed or provided. Office-based orthopedic surgeons and general surgeons were the least likely to provide medications to their patients and about 18 percent of their visits resulted in administering a single medication.

The drug utilization rate ranged from 2.2 medications per visit for the cardiovascular disease specialists to 0.3 medications per visit for orthopedic surgeons. The drug utilization rate for the internal medicine specialty and "all other specialties" was about 1.4 medications per visit, followed by 1.2 medications per visit for dermatologists, neurologists, and general and family practitioners. By contrast, obstetricians and gynecologists, general surgeons, and urological surgeons have drug utilization rates of about 0.5 medications per visit, lower than the average rate for all physicians.

## Patient

Patients 65 years of age and over represented 22 percent of the office visits and accounted for 28 percent of the drug mentions. Table 6 shows that the percent of drug visits and the administering of multiple medications when analyzed by patients' age are greatest for older patients. Older patients were most likely to receive multiple drug therapy while younger patients were most likely to receive only one medication. A higher percent of visits by patients 75 years of age and over (23 percent) were prescribed or provided three or more medications than their younger counterparts. By contrast, patients under 15 years of age were administered more single drug therapies (41 percent) than their older counterparts. The drug utilization rate for patients 65 years of age and over, about 1.4 medications per visit, was significantly higher than the drug utilization rate for younger patients, 1.2 and 1.0 medications per visit.

Table 6 also shows that more office visits were made by female patients (61 percent) and more drug mentions were prescribed or provided to female patients (61 percent). There was also a higher percent of drug visits by females 65 years of age and over (about 67 percent) than by males of the same age (61 percent). The drug utilization rate for female and male patients was about 1.1 medications per visit.

When the data were analyzed by the patient's race (table 7), white patients have a higher percent of visits (85 percent) and drug mentions (84 percent) than black and "other race" patients. However, black patients have a higher percent of drug visits (68 percent) than did white or "other race" patients (60 percent). Sixteen percent of the visits by black

**Table 2. The 50 drugs most frequently utilized in office practice by entry name, number and percent of mentions, rank, and therapeutic use: United States, 1990**

| Rank | Entry name of drug and principal generic substance[1] | Number of mentions in thousands | Percent | Therapeutic use |
|---|---|---|---|---|
| | All drugs | 759,406 | 100.00 | All therapeutic uses |
| 1 | Amoxicillin | 17,891 | 2.36 | Antibiotic |
| 2 | Amoxil (amoxicillin) | 13,448 | 1.77 | Antibiotic |
| 3 | Ceclor (cefaclor) | 8,910 | 1.17 | Antibiotic |
| 4 | Lasix (furosemide) | 8,868 | 1.17 | Diuretic, antihypertensive |
| 5 | Prednisone | 7,830 | 1.03 | Steroid replacement therapy, anti-inflammatory agent |
| 6 | Naprosyn (naproxen) | 7,585 | 1.00 | Nonsteroidal anti-inflammatory agent |
| 7 | Seldane (terfenadine) | 7,251 | 0.95 | Antihistaminic |
| 8 | Motrin (ibuprofen) | 6,988 | 0.92 | Nonsteroidal anti-inflammatory agent |
| 9 | Zantac (ranitidine) | 6,501 | 0.86 | Duodenal or gastric ulcer |
| 10 | Premarin (estrogens) | 6,327 | 0.83 | Estrogen replacement therapy |
| 11 | Lanoxin (digoxin) | 6,275 | 0.83 | Cardiotonic/digitalis |
| 12 | Vasotec (enalapril) | 5,991 | 0.79 | Antihypertensive |
| 13 | Aspirin or A.S.A. | 5,896 | 0.78 | Analgesic, anti-inflammatory, antipyretic |
| 14 | Proventil (albuterol) | 5,614 | 0.74 | Bronchodilator |
| 15 | Dyazide (triamterene, hydrochlorothiazide) | 5,584 | 0.74 | Diuretic, antihypertensive |
| 16 | Diphtheria tetanus toxoids pertussis | 5,176 | 0.68 | Immunization |
| 17 | Voltaren (diclofenac sodium) | 5,160 | 0.68 | Nonsteroidal anti-inflammatory agent |
| 18 | Tylenol (acetaminophen) | 5,144 | 0.68 | Analgesic |
| 19 | Synthroid (levothyroxine) | 5,137 | 0.68 | Thyroid hormone therapy |
| 20 | Xanax (alprazolam) | 5,089 | 0.67 | Anxiety disorders |
| 21 | Cardizem (ditiazem) | 4,979 | 0.66 | Cardiotonic/calcium channel blocking agent |
| 22 | Capoten (captopril) | 4,785 | 0.63 | Antihypertensive |
| 23 | Prozac (fluoxetine) | 4,785 | 0.63 | Antidepressant |
| 24 | Calan (verapamil) | 4,755 | 0.63 | Cardiotonic/calcium channel blocking agent |
| 25 | Ventolin (albuterol) | 4,666 | 0.61 | Bronchodilator |
| 26 | Theo-dur (theophylline) | 4,600 | 0.61 | Bronchodilator |
| 27 | Polimoyelitis vaccine | 4,551 | 0.60 | Immunization |
| 28 | Tavist (clemastine) | 4,405 | 0.58 | Antihistaminic |
| 29 | Keflex (cephalexin) | 4,265 | 0.56 | Antibiotic |
| 30 | Tenormin (atenolol) | 4,231 | 0.56 | Antihypertensive, angina pectoris |
| 31 | Vancenase (beclomethasone dipropinate) | 4,106 | 0.54 | Intranasal steroid |
| 32 | Inderal (propranolol) | 3,970 | 0.52 | Hypertension, angina pectoris, arrhythmia, migraine |
| 33 | Timoptic (timolol) | 3,877 | 0.51 | Glaucoma |
| 34 | Cipro (ciprofloxacin) | 3,823 | 0.50 | Antibiotic |
| 35 | Augmentin (amoxicillin, potassium clavulanate) | 3,783 | 0.50 | Antibiotic |
| 36 | Entex (phenylpropanolamine, phenylephrine, guaifenesin) | 3,757 | 0.49 | Cough preparation |
| 37 | Tylenol No. 3 (acetaminophen, codeine) | 3,729 | 0.49 | Analgesic |
| 38 | Procardia (nifedipine) | 3,698 | 0.49 | Cardiotonic/calcium channel blocking agent |
| 39 | Darvocet-N (propoxyphene, acetaminophen) | 3,653 | 0.48 | Analgesic |
| 40 | Duricef (cefadroxil) | 3,573 | 0.47 | Antibiotic |
| 41 | Micronase (glyburide) | 3,434 | 0.45 | Hypoglycemic |
| 42 | Tetracycline | 3,383 | 0.45 | Antibiotic |
| 43 | Ampicillin | 3,310 | 0.44 | Antibiotic |
| 44 | Erythromycin | 3,260 | 0.43 | Antibiotic |
| 45 | Coumadin (warfarin) | 3,183 | 0.42 | Anticoagulant |
| 46 | E.E.S. (erythromycin) | 3,172 | 0.42 | Antibiotic |
| 47 | Valium (diazepam) | 3,168 | 0.42 | Anxiety disorders |
| 48 | Benadryl (diphenhydramine) | 3,150 | 0.41 | Antihistaminic |
| 49 | Ortho-novum (norethindrone, estradiol or mestranol) | 3,041 | 0.40 | Oral contraceptive |
| 50 | Tagamet (cimetidine) | 3,014 | 0.40 | Duodenal or gastric ulcer |

[1]The trade or generic name used by the physician on the prescription or other medical records. The use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services. Because of its nonspecific nature, the entry "Allergy relief or shots," with 4,184,000 mentions, is omitted.

patients compared with 11 percent of white and "other race" patients were prescribed or provided three or more medications during a visit. The drug utilization rate was higher for black patients, 1.3 medications per visit, compared with 1.1 medications per visit for white and "other race" patients. Three percent of the visits and 2 percent of the drugs mentioned were by patients whose race was "unspecified." Under the assumption that these "unspecified" race visits and drug mentions are distributed proportionately among white, black, and "other race" patients, the previously mentioned differences in visits, drug visits , drug mentions, and drug utilization rates do not change. However if this assumption is incorrect, and these "unspecified" race visits and drug mentions were all from black patients there is no

**Table 3. The 50 most frequently utilized generic substances in office practice by number and percent of mentions, rank, and therapeutic use: United States, 1990**

| Rank | Generic substance | Number of mentions in thousands[1] | Percent | Therapeutic use |
|---|---|---|---|---|
| | All drugs | 759,406 | 100.0 | All therapeutic uses |
| 1 | Amoxicillin | 37,011 | 4.87 | Antibiotic |
| 2 | Acetaminophen | 23,416 | 3.08 | Analgesic, antipyretic |
| 3 | Erythromycin | 19,474 | 2.56 | Antibiotic |
| 4 | Hydrochlorothiazide | 15,011 | 1.98 | Diuretic, antihypertensive |
| 5 | Codeine | 14,435 | 1.90 | Analgesic, antitussive |
| 6 | Phenylephrine | 12,297 | 1.62 | Decongestant, vasoconstrictor |
| 7 | Ibuprofen | 11,964 | 1.58 | Nonsteroidal anti-inflammatory agent |
| 8 | Phenylpropanolamine | 11,489 | 1.51 | Decongestant, anorexiant |
| 9 | Aspirin | 10,823 | 1.43 | Analgesic, antipyretic, anti-inflammatory |
| 10 | Albuterol | 10,505 | 1.38 | Bronchodilator |
| 11 | Pseudoephedrine | 10,474 | 1.38 | Decongestant |
| 12 | Naproxen | 10,354 | 1.36 | Nonsteroidal anti-inflammatory agent |
| 13 | Furosemide | 9,570 | 1.26 | Diuretic, antihypertensive |
| 14 | Chlorpheniramine | 9,197 | 1.21 | Antihistaminic |
| 15 | Digoxin | 8,924 | 1.18 | Cardiotonic/calcium channel blocking agent |
| 16 | Cefaclor | 8,910 | 1.17 | Antibiotic |
| 17 | Guaifenesin | 8,890 | 1.17 | Expectorant |
| 18 | Trimethorpim | 8,649 | 1.14 | Antibiotic |
| 19 | Sulfamethoxazole | 8,282 | 1.09 | Antibiotic |
| 20 | Prednisone | 8,035 | 1.06 | Steroid replacement therapy, anti-inflammatory agent |
| 21 | Triamterene | 7,974 | 1.05 | Diuretic, antihypertensive |
| 22 | Estradiol | 7,965 | 1.05 | Estrogen replacement therapy, oral contraceptive |
| 23 | Theophylline | 7,634 | 1.01 | Bronchodilator |
| 24 | Hydrocortisone | 7,405 | 0.98 | Steroidal anti-inflammatory agent |
| 25 | Terfenadine | 7,251 | 0.95 | Antihistaminic |
| 26 | Beclomethasone | 7,092 | 0.93 | Steroidal anti-inflammatory agent |
| 27 | Neomycin | 6,915 | 0.91 | Antibiotic |
| 28 | Insulin | 6,913 | 0.91 | Hypoglycemic |
| 29 | Cephalexin | 6,737 | 0.89 | Antibiotic |
| 30 | Estrogens | 6,645 | 0.88 | Estrogen replacement therapy, oral contraceptive |
| 31 | Verapamil | 6,616 | 0.87 | Cardiotonic/calcium channel blocking agent |
| 32 | Ranitidine | 6,501 | 0.86 | Duodenal or gastric ulcer |
| 33 | Penicillin | 6,406 | 0.84 | Antibiotic |
| 34 | Enalapril | 6,386 | 0.84 | Antihypertensive |
| 35 | Dextromethorphan | 6,106 | 0.80 | Antitussive |
| 36 | Polymixin B | 5,966 | 0.79 | Antibiotic |
| 37 | Glyburide | 5,687 | 0.75 | Hypoglycemic |
| 38 | Captopril | 5,665 | 0.75 | Antihypertensive |
| 39 | Dexamethasone | 5,655 | 0.74 | Steroidal anti-inflammatory agent |
| 40 | Nitroglycerin | 5,642 | 0.74 | Vasodilator |
| 41 | Nifedipine | 5,544 | 0.73 | Cardiotonic/calcium channel blocking agent |
| 42 | Triamcinolone | 5,518 | 0.73 | Steroidal anti-inflammatory agent |
| 43 | Levothyroxine | 5,510 | 0.73 | Thyroid hormone therapy |
| 44 | Diclofenac sodium | 5,160 | 0.68 | Nonsteroidal anti-inflammatory agent |
| 45 | Prednisolone | 5,130 | 0.68 | Steroidal anti-inflammatory agent |
| 46 | Alprazolam | 5,089 | 0.67 | Antianxiety agent |
| 47 | Promethazine | 5,060 | 0.67 | Antihistaminic |
| 48 | Diltiazem | 4,979 | 0.66 | Cardiotonic/calcium channel blocking agent |
| 49 | Fluoxetine Hydrochloride | 4,785 | 0.63 | Antidepressant |
| 50 | Atenolol | 4,780 | 0.63 | Cardiotonic/Beta-adrenergic blocking agent, antihypertensive |

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

difference between the drug utilization rates by race.

Non-Hispanic patients accounted for about 88 percent of the visits to office-based physicians and 89 percent of the drug mentions. There was a slight difference in the intensity in administering medications by the patients' ethnicity. Office visits by Hispanic patients were more often administered a single medication and visits by non-Hispanic patients were more often administered three or more medications. Seven percent of the visits and 6 percent of the drug mentions were by patients of "unspecified" ethnicity. Again the assumption is that these "unspecified" ethnicity visits and drug mentions are distributed proportionately among Hispanic and non-Hispanic patients. Under this assumption the drug utilization rate for Hispanics would not significantly

differ from the drug utilization rate for non-Hispanic patients. However if this assumption is incorrect and these "unspecified" ethnicity visits and drug mentions are all from Hispanic patients, the drug utilization rate for Hispanic patients becomes significantly lower than the drug utilization rate for non-Hispanic patients.

## Diagnoses

In table 8 patient visits and drug mentions are displayed according to the International Classification of Diseases (ICD) and with selected related principal diagnoses. Medications were most likely administered during visits in which the patient's diagnosis was from the major ICD categories of diseases of the respiratory system, diseases of the circulatory system, or diseases of the nervous system and sense organs. In 33 percent of the visits, the patient's diagnosis was from one of these three major ICD categories and these visits accounted for almost half of the drugs mentioned. An estimated 100 million visits to doctors' offices were those in which the patient's diagnosis was categorized under diseases of the respiratory system and 86 percent of these visits were classified as a drug visit. Drugs were administered during 79 percent of the visits in which the patient's diagnosis was categorized under diseases of the circulatory system.

The intensity in administering medication was high during those visits in which patients were specifically diagnosed with asthma. Ninety-one percent of these visits were drug visits and in almost half (48 percent) of these visits, three or more medications were prescribed or provided. Three or more drugs were also administered during those visits where patients were diagnosed with ischemic heart disease (45 percent). The drug utilization rate for visits in which patients were diagnosed with asthma or ischemic heart disease were 2.5 and 2.3 medications per visit. A high percent of drug visits was also noted when patients were diagnosed with otitis media or acute upper respiratory infection (86 percent). For those visits, in which patients were diagnosed with otitis media, 60 percent were administered a single medication. Single medications were also administered in 52 percent of the visits in which patients were diagnosed as obese.

Medications were least likely administered during visits where the patient's diagnosis was normal pregnancy. Only a third of these visits were drug visits and most (25 percent) were administered a single medication.

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### 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 |

**Table 4. Number and percent distribution of drug mentions by therapeutic catagories: United States, 1990**

| Therapeutic classifications[1] | Number of mentions in thousands | Percent distribution |
|---|---|---|
| All drugs | 759,406 | 100.00 |
| Anesthetic drugs | 3,636 | 0.48 |
| Local anesthetics | 2,434 | 0.32 |
| Antidotes | 209 | 0.03 |
| Antimicrobial agents | 125,594 | 16.54 |
| Penicillins | 43,699 | 5.75 |
| Cephalosporins | 23,821 | 3.14 |
| Erythromycins and lincosamides | 22,357 | 2.94 |
| Tetracyclines | 10,311 | 1.36 |
| Aminoglycosides | 1,412 | 0.19 |
| Sulfonamides and trimethoprim | 9,395 | 1.24 |
| Urinary tract antiseptics | 6,485 | 0.85 |
| Antifungal agents for systemic mycoses | 2,239 | 0.29 |
| Antiviral agents | 2,311 | 0.30 |
| Hematologic agents | 9,914 | 1.31 |
| Agents used to treat deficiency anemias | 6,465 | 0.85 |
| Anticoagulants or thrombolytics | 3,356 | 0.44 |
| Cardiovascular-renal drugs | 111,125 | 14.63 |
| Cardiac glycosides | 1,514 | 0.20 |
| Antiarrhythmic agents | 8,998 | 1.18 |
| Antianginal agents | 9,063 | 1.19 |
| Agents used in peripheral or cerebral vascular disorders | 18,921 | 2.49 |
| Agents used to treat shock | 4,784 | 0.63 |
| Diuretics | 39,383 | 5.19 |
| Coronary vasodilators | 27,829 | 3.66 |
| Psychopharmacologic drugs | 46,402 | 6.11 |
| Antianxiety agents | 5,465 | 0.72 |
| Antipsychotic drugs | 14,826 | 1.95 |
| Antidepressants | 5,620 | 0.74 |
| CNS stimulants, anorexiants | 17,364 | 2.29 |
| Radiopharmaceuticals/contrast media | 5,922 | 0.78 |
| Diagnostics, nonradioactive, and radiopaque | 5,922 | 0.78 |
| Gastrointestinal agents | 31,272 | 4.12 |
| Agents used in disorders of upper GI tract | 16,220 | 2.14 |
| Antidiarrheal agents | 2,919 | 0.38 |
| Laxatives | 3,378 | 0.44 |
| Metabolic and nutrient agents | 29,448 | 3.88 |
| Agents used to treat hyperlipidemia | 5,286 | 0.70 |
| Vitamins, minerals | 14,935 | 1.97 |
| Replenishers and regulators of water and electrolytes | 8,601 | 1.13 |
| Hormones and agents affecting hormonal mechanisms | 67,549 | 8.89 |
| Adrenal corticosteroids | 19,703 | 2.59 |
| Estrogen and progestins | 12,341 | 1.63 |
| Blood glucose regulators | 16,322 | 2.15 |
| Agents used to treat thyroid disease | 7,308 | 0.96 |
| Contraceptive agents | 9,619 | 1.27 |
| Immunologic agents | 19,337 | 2.55 |
| Vaccines and antiserums | 19,268 | 2.54 |
| Skin/mucous membrane | 43,777 | 5.76 |
| Dermatologics | 41,188 | 5.42 |
| Neurologic drugs | 14,140 | 1.86 |
| Drugs used in extrapyramidal movement disorders | 1,630 | 0.21 |
| Drugs used to treat skeletal muscle hyperactivity | 7,905 | 1.04 |
| Anticonvulsants | 4,474 | 0.59 |
| Oncolytics | 5,776 | 0.76 |
| Antineoplastics | 4,832 | 0.64 |
| Ophthalmic Drugs | 30,704 | 4.04 |
| Agents used to treat glaucoma | 10,267 | 1.35 |
| Ocular anti-infective and anti-inflammatory agents | 14,992 | 1.97 |
| Otologic drugs | 4,734 | 0.62 |
| Topical otic preparations | 1,640 | 0.22 |
| Drugs used in vertigo, motion sickness, and vomiting | 3,095 | 0.41 |
| Drugs used for relief of pain | 77,444 | 10.20 |
| Drugs used to treat migraine and other headaches | 36,693 | 4.83 |
| Drugs used in gout | 37,560 | 4.95 |
| Drugs used in central pain syndromes | 2,521 | 0.33 |
| Antiparasitic agents | 1,842 | 0.24 |
| Respiratory tract drugs | 87,491 | 11.52 |
| Bronchodilators, antiasthmatics | 24,587 | 3.24 |
| Nasal decongestants | 22,423 | 2.95 |
| Antitussive, expectorants, mucolytics | 18,750 | 2.47 |
| Antihistamines | 21,627 | 2.85 |
| Unclassified/miscellaneous | 43,089 | 5.67 |

[1]Therapeutic classifications are based on the standard drug classifications used in the National Drug Code Directory, 1985 Edition (4).

**Table 5. Number and percent of office visits and drug mentions, percent of office visits during which one or multiple drugs were used by physician identity and specialty: United States, 1990**

| Physician identity and specialty | Office visits | | | Drug visits[1] | | | Drug mentions | | Drug utilization rate |
|---|---|---|---|---|---|---|---|---|---|
| | Number in thousands | Percent distribution | Drug visits[1] | One drug used | Two drugs used | Three drugs or more used | Number in thousands | Percent distribution | |
| All physicians | 704,604 | 100.00 | 60.26 | 32.74 | 15.73 | 11.78 | 759,406 | 100.00 | 1.08 |
| Physician identity | | | | | | | | | |
| Doctor of medicine | 665,317 | 94.42 | 59.78 | 32.60 | 15.56 | 11.61 | 710,092 | 93.51 | 1.07 |
| Doctor of osteopathy | 39,287 | 5.58 | 68.45 | 35.11 | 18.71 | 14.63 | 49,314 | 6.49 | 1.26 |
| Specialty | | | | | | | | | |
| General and family practice | 209,788 | 29.77 | 68.67 | 36.42 | 20.16 | 12.08 | 251,960 | 33.18 | 1.20 |
| Internal medicine | 96,622 | 13.71 | 74.48 | 33.70 | 19.82 | 20.97 | 149,370 | 19.67 | 1.55 |
| Pediatrics | 81,148 | 11.52 | 66.85 | 45.90 | 15.82 | 5.13 | 76,370 | 10.06 | 0.94 |
| Obstetrics and gynecology | 61,243 | 8.69 | 43.78 | 32.30 | 8.89 | 2.59 | 35,687 | 4.70 | 0.58 |
| Ophthalmology | 43,842 | 6.22 | 43.78 | 26.56 | 10.83 | 6.40 | 30,808 | 4.06 | 0.70 |
| Orthopedic surgery | 32,917 | 4.67 | 26.08 | 20.37 | 4.19 | 1.52 | 11,035 | 1.45 | 0.34 |
| General surgery | 22,402 | 3.18 | 31.07 | 18.38 | 5.40 | 7.30 | 12,597 | 1.66 | 0.56 |
| Dermatology | 24,009 | 3.41 | 63.99 | 29.48 | 17.96 | 16.55 | 29,572 | 3.89 | 1.23 |
| Psychiatry | 20,963 | 2.98 | 51.31 | 26.88 | 16.22 | 8.21 | 18,516 | 2.44 | 0.88 |
| Otolaryngology | 17,959 | 2.55 | 44.64 | 27.95 | 11.23 | 5.46 | 12,341 | 1.63 | 0.69 |
| Urological surgery | 9,546 | 1.35 | 40.37 | 30.23 | 7.70 | 2.44 | 5,145 | 0.68 | 0.54 |
| Cardiovascular disease | 11,240 | 1.60 | 78.53 | 19.47 | 17.45 | 41.60 | 25,153 | 3.31 | 2.24 |
| Neurology | 6,228 | 0.88 | 66.27 | 33.16 | 18.49 | 14.62 | 7,586 | 1.00 | 1.22 |
| All other specialties | 66,696 | 9.47 | 62.70 | 26.05 | 15.33 | 21.33 | 93,265 | 12.28 | 1.40 |

[1]Drug visits are percent distributions of all visits.

**Table 6. Number and percent of office visits and drug mentions, percent of office visits during which one or multiple drugs were used by age and sex of patient: United States, 1990**

| Age and sex | Office visits | | | Drug visits[1] | | | Drug mentions | | Drug utilization rate |
|---|---|---|---|---|---|---|---|---|---|
| | Number in thousands | Percent distribution | Drug visits[1] | One drug used | Two drugs used | Three drugs or more used | Number in thousands | Percent distribution | |
| All patients | 704,604 | 100.00 | 60.26 | 32.74 | 15.73 | 11.78 | 759,406 | 100.00 | 1.08 |
| Age | | | | | | | | | |
| Under 15 years | 138,427 | 19.65 | 61.95 | 40.56 | 16.05 | 5.35 | 124,995 | 16.46 | 0.90 |
| 15–24 years | 68,918 | 9.78 | 57.46 | 35.45 | 14.59 | 7.42 | 61,974 | 8.16 | 0.90 |
| 25–44 years | 194,195 | 27.56 | 54.72 | 31.99 | 14.44 | 8.29 | 174,964 | 23.04 | 0.90 |
| 45–64 years | 149,786 | 21.26 | 62.08 | 30.31 | 16.75 | 15.01 | 180,623 | 23.78 | 1.21 |
| 65–74 years | 86,422 | 12.27 | 64.71 | 28.56 | 16.66 | 19.49 | 118,867 | 15.65 | 1.38 |
| 75 years and over | 66,856 | 9.49 | 65.88 | 26.82 | 16.54 | 22.51 | 97,982 | 12.90 | 1.47 |
| Sex | | | | | | | | | |
| Female | 427,151 | 60.62 | 60.78 | 32.93 | 15.87 | 11.97 | 465,574 | 61.31 | 1.09 |
| Male | 277,452 | 39.38 | 59.46 | 32.46 | 15.52 | 11.48 | 293,831 | 38.69 | 1.06 |
| Sex and age | | | | | | | | | |
| Female: | | | | | | | | | |
| Under 15 years | 65,229 | 9.26 | 62.86 | 41.76 | 16.04 | 5.05 | 59,165 | 7.79 | 0.91 |
| 15–24 years | 45,165 | 6.41 | 57.09 | 36.01 | 14.45 | 6.64 | 39,248 | 5.17 | 0.87 |
| 25–44 years | 132,183 | 18.76 | 54.47 | 32.53 | 13.69 | 8.25 | 117,749 | 15.51 | 0.89 |
| 45–64 years | 89,697 | 12.73 | 63.24 | 30.79 | 17.37 | 15.08 | 109,908 | 14.47 | 1.23 |
| 65–74 years | 51,529 | 7.31 | 66.79 | 28.76 | 18.17 | 19.87 | 73,075 | 9.62 | 1.42 |
| 75 years and over | 43,349 | 6.15 | 68.45 | 27.05 | 17.91 | 23.48 | 66,429 | 8.75 | 1.53 |
| Male: | | | | | | | | | |
| Under 15 years | 73,198 | 10.39 | 61.15 | 39.48 | 16.07 | 5.62 | 65,830 | 8.67 | 0.90 |
| 15–24 years | 23,753 | 3.37 | 58.15 | 34.38 | 14.86 | 8.91 | 22,726 | 2.99 | 0.96 |
| 25–44 years | 62,012 | 8.80 | 55.25 | 30.85 | 16.02 | 8.38 | 57,215 | 7.53 | 0.92 |
| 45–64 years | 60,089 | 8.53 | 60.34 | 29.59 | 15.84 | 14.91 | 70,715 | 9.31 | 1.18 |
| 65–74 years | 34,893 | 4.95 | 61.63 | 28.28 | 14.43 | 18.93 | 45,792 | 6.03 | 1.31 |
| 75 years and over | 23,507 | 3.34 | 61.14 | 26.40 | 14.02 | 20.73 | 31,553 | 4.15 | 1.34 |

[1]Drug visits are percent distributions of all visits.

**Table 7. Number and percent of office visits and drug mentions, percent of office visits during which one or multiple drugs were used by race and ethnicity of patient: United States, 1990**

| Race and ethnicity | Office visits | | | Drug visits[1] | | | Drug mentions | | Drug utilization rate |
|---|---|---|---|---|---|---|---|---|---|
| | Number in thousands | Percent distribution | Drug visits[1] | One drug used | Two drugs used | Three drugs or more used | Number in thousands | Percent distribution | |
| All patients | 704,604 | 100.00 | 60.26 | 32.74 | 15.73 | 11.78 | 759,406 | 100.00 | 1.08 |
| Race | | | | | | | | | |
| White | 597,306 | 84.77 | 59.88 | 32.86 | 15.47 | 11.56 | 637,424 | 83.94 | 1.07 |
| Black | 62,317 | 8.84 | 67.91 | 33.18 | 18.83 | 15.90 | 80,536 | 10.61 | 1.29 |
| Other | 23,694 | 3.36 | 60.46 | 32.89 | 16.55 | 11.03 | 24,715 | 3.25 | 1.04 |
| Unspecified[1] | 21,287 | 3.02 | 48.21 | 28.04 | 13.33 | 6.84 | 16,731 | 2.20 | 0.79 |
| Ethnicity | | | | | | | | | |
| Hispanic | 35,456 | 5.03 | 62.31 | 36.21 | 16.13 | 9.97 | 37,042 | 4.88 | 1.04 |
| Non-Hispanic | 619,747 | 87.96 | 60.71 | 32.69 | 15.79 | 12.23 | 679,551 | 89.48 | 1.10 |
| Unspecified[2] | 49,401 | 7.01 | 53.07 | 30.91 | 14.75 | 7.41 | 42,813 | 5.64 | 0.87 |

[1]Drug visits are percent distributions of all visits.
[2]Asian or Pacific Islander, and American Indian or Alaskan Native.

**Table 8. Number and percent of office visits and drug mentions, percent of office visits during which one or multiple drugs were used by physician diagnoses and ICD–9–CM codes: United States, 1990**

| Physician diagnoses and ICD–9–CM code[1] | Office visits | | | Drug visits[2] | | | Drug mentions[3] | | Drug utilization rate |
|---|---|---|---|---|---|---|---|---|---|
| | Number in thousands | Percent distribution | Drug visits[2] | One drug used | Two drugs used | Three drugs or more used | Number in thousands | Percent distribution | |
| All diagnoses | 704,604 | 100.00 | 60.26 | 32.74 | 15.73 | 11.78 | 759,406 | 100.00 | 1.08 |
| Infectious and parasitic diseases 001–139 | 27,075 | 3.84 | 66.83 | 46.32 | 14.32 | 6.19 | 26,208 | 3.45 | 0.97 |
| Neoplasms 140–239 | 21,941 | 3.11 | 37.72 | 17.13 | 9.25 | 11.35 | 17,350 | 2.28 | 0.79 |
| Endocrine, nutritional and metabolic diseases, and immunity disorders 240–289 | 29,456 | 4.18 | 70.28 | 32.92 | 17.61 | 19.74 | 43,509 | 5.73 | 1.48 |
| Diseases of the endocrine glands 240–259 | 19,289 | 2.74 | 74.22 | 30.89 | 18.33 | 25.00 | 32,520 | 4.28 | 1.69 |
| Obesity 278 | 3,840 | 0.55 | 60.87 | 51.98 | 5.77 | 3.13 | 2,926 | 0.39 | 0.76 |
| Diseases of blood and blood-forming organs 280–289 | 3,552 | 0.50 | 73.96 | 40.87 | 20.56 | 12.52 | 4,591 | 0.60 | 1.29 |
| Mental disorders 290–319 | 29,929 | 4.25 | 58.79 | 33.12 | 16.02 | 9.65 | 30,276 | 3.99 | 1.01 |
| Nonpsychotic disorders 300–316 | 22,612 | 3.21 | 51.31 | 30.48 | 12.98 | 7.85 | 19,566 | 2.58 | 0.87 |
| Diseases of nervous system and sense organs 320–389 | 80,128 | 11.37 | 61.68 | 38.03 | 15.84 | 7.81 | 77,481 | 10.20 | 0.97 |
| Diseases of the central nervous system 320–349 | 4,799 | 0.68 | 77.43 | 35.18 | 23.68 | 18.56 | 7,292 | 0.96 | 1.52 |
| Eye disorders 360–379 | 38,603 | 5.48 | 48.28 | 29.04 | 11.77 | 7.47 | 30,388 | 4.00 | 0.79 |
| Otitis media 382 | 21,043 | 2.99 | 86.48 | 59.92 | 20.82 | 5.74 | 25,185 | 3.32 | 1.20 |
| Diseases of circulatory system 390–459 | 55,989 | 7.95 | 79.21 | 29.96 | 19.71 | 29.54 | 103,561 | 13.64 | 1.85 |
| Essential hypertension 401 | 27,310 | 3.88 | 83.96 | 36.46 | 23.36 | 24.14 | 47,309 | 6.23 | 1.73 |
| Ischemic heart disease 410–414 | 9,210 | 1.31 | 80.11 | 16.94 | 18.17 | 45.00 | 21,525 | 2.83 | 2.34 |
| Diseases of respiratory system 460–519 | 100,294 | 14.23 | 86.35 | 40.01 | 26.58 | 19.77 | 165,963 | 21.85 | 1.65 |
| Acute upper respiratory infection 465 | 18,676 | 2.65 | 85.80 | 43.45 | 31.31 | 11.04 | 27,143 | 3.57 | 1.45 |
| Asthma 493 | 7,137 | 1.01 | 91.41 | 20.42 | 22.20 | 48.79 | 18,077 | 2.38 | 2.53 |
| Diseases of digestive system 520–579 | 26,154 | 3.71 | 61.49 | 33.40 | 17.14 | 10.95 | 28,576 | 3.76 | 1.09 |
| Diseases of genitourinary system 580–629 | 41,067 | 5.83 | 56.34 | 37.39 | 13.05 | 5.90 | 34,490 | 4.54 | 0.84 |
| Male genitourinary system 600–608 | 4,479 | 0.64 | 50.38 | 33.68 | 11.06 | 5.64 | 3,370 | 0.44 | 0.75 |
| Female genitourinary system 614–629 | 20,377 | 2.89 | 57.48 | 37.66 | 14.87 | 4.94 | 16,992 | 2.24 | 0.83 |
| Diseases of skin and subcutaneous tissue 680–709 | 36,836 | 5.23 | 69.73 | 35.90 | 20.32 | 13.56 | 45,596 | 6.00 | 1.24 |
| Disease of musculoskeletal system 710–739 | 47,101 | 6.68 | 64.68 | 36.53 | 15.48 | 12.68 | 53,395 | 7.03 | 1.13 |
| Arthopathies 710–716 | 12,784 | 1.81 | 78.53 | 37.87 | 18.49 | 22.17 | 19,883 | 2.62 | 1.56 |
| Symptoms, signs, and ill-defined conditions 780–799 | 27,221 | 3.86 | 52.86 | 29.59 | 13.54 | 9.74 | 25,469 | 3.35 | 0.94 |
| Injury and poisoning 800–999 | 51,134 | 7.26 | 43.38 | 28.65 | 9.54 | 5.20 | 33,656 | 4.43 | 0.66 |
| Normal pregnancy V022 | 23,561 | 3.34 | 32.86 | 24.73 | 6.87 | 1.26 | 9,973 | 1.31 | 0.42 |
| Health supervision of infant or child V020 | 15,676 | 2.22 | 48.22 | 25.04 | 16.95 | 6.22 | 12,382 | 1.63 | 0.79 |
| Other or undetermined[4] | 87,454 | 12.41 | 33.91 | 21.72 | 7.33 | 4.84 | 46,928 | 6.18 | 0.54 |

[1]Based on the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD–9–CM) (5).
[2]Drug visits are percent distributions of all visits.
[3]Includes all drug mentions whether or not associated with a principal diagnosis.
[4]Includes complications of pregnancy, childbirth and the puerperium (630–676); congenital anomalies (740–759); certain conditions originating in the perinatal period (760–767); supplementary classifications (V001–V082, excluding V020 and V022); and blanks, noncodable, and illegible diagnoses.

# 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–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, or physicians who are principally engaged in teaching, research, or administration. Telephone contacts, nonoffice visits, and visits made to hospital emergency or outpatient departments are also excluded.

A multistage probability sample design is used in NAMCS, involving primary sampling units (PSU's), physician practices within PSU's, and patient visits within physician practices. The PSU's are counties, groups of counties, county equivalents (such as parishes or independent cities), or towns and townships (for some PSU's in New England). For 1990 a sample of 3,063 non-Federal, office-based physicians were selected from master files maintained by the American Medical Association and the American Osteopathic Association. The physician response rate for the 1990 NAMCS was 74 percent. Sample physicians were asked to complete Patient Records (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 and were asked to report up to 5 drugs utilized.

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.

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

| Estimated number of drug mentions in thousands | All | Specialty group | | | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| | Relative standard error in percent | | | | |
| 100 | 82.6 | 72.8 | 35.5 | 79.2 | 37.1 |
| 171 | 63.2 | 56.0 | 32.4 | 61.9 | 30.0 |
| 200 | 58.5 | 51.9 | 31.7 | 57.7 | 28.4 |
| 300 | 47.9 | 42.7 | 30.4 | 48.5 | 24.8 |
| 338 | 45.1 | 40.3 | 30.0 | 46.1 | 23.9 |
| 400 | 41.5 | 37.3 | 29.7 | 43.1 | 22.7 |
| 500 | 37.2 | 33.6 | 29.2 | 39.6 | 21.4 |
| 600 | 34.0 | 30.9 | 28.9 | 37.0 | 20.5 |
| 638 | 33.0 | 30.0 | 28.8 | 36.2 | 20.3 |
| 700 | 31.6 | 28.8 | 28.7 | 35.1 | 19.9 |
| 775 | 30.0 | 27.5 | 28.6 | 33.9 | 19.5 |
| 800 | 29.6 | 27.2 | 28.6 | 33.5 | 19.3 |
| 900 | 27.9 | 25.8 | 28.4 | 32.3 | 18.9 |
| 1,000 | 26.6 | 24.6 | 28.3 | 31.3 | 18.6 |
| 1,144 | 24.9 | 23.3 | 28.2 | 30.0 | 18.2 |
| 2,000 | 19.1 | 18.6 | 27.9 | 26.1 | 17.0 |
| 5,000 | 12.7 | 13.8 | 27.6 | 22.5 | 15.9 |
| 10,000 | 9.7 | 11.7 | 27.5 | 21.2 | 15.6 |

A. General and family practice, internal medicine.
B. General surgery, neurology.
C. "All other" specialties.
D. Pediatrics, obstetrics and gynecology, orthopedic surgery, cardiovascular disease, dermatology, urology, psychiatry, ophthalmology, otorhinolaryngology, and doctors of osteopathy.

Example of use of table: An aggregate estimate of 2 million drug mentions by a cardiovascular disease specialist has a relative standard estimate of 17.0 percent or a standard error of 340,000 drug mentions (17.0 percent of 2 million).

## 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. Relative standard errors of the estimated number of drug mentions are shown in table I and relative standard errors of the estimated numbers of office visits are shown in table II.

Alternatively, relative standard errors for aggregate drug mentions and visits may be calculated using the following general formula, where x is the aggregate of interest in thousands, and A and B are the appropriate coefficient from table V.

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

Standard errors for estimated percent of drug mentions are shown in table III and for estimates of the percent of visits in table IV.

Similarly, relative standard errors for percent 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 V.

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

## 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 significance is based on a two-sided t-test with a critical value of 1.96 (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 and drug mentions 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 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 visit*—A drug visit is a visit in which medication was prescribed or provided by the physician.

*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 utilization rate*—The average number of medications per visit.

*Control status*—Controlled medications, because of their significant potential for dependence or abuse and their possible diversion

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

| Estimated number of office visits in thousands | All | Specialty group | | | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| | Relative standard error in percent | | | | |
| 100 | 68.1 | 56.2 | 41.9 | 59.6 | 31.2 |
| 110 | 64.9 | 53.6 | 40.2 | 57.0 | 30.0 |
| 200 | 48.2 | 40.1 | 31.7 | 43.2 | 23.9 |
| 231 | 44.9 | 37.5 | 30.0 | 40.5 | 22.7 |
| 300 | 39.4 | 33.1 | 27.4 | 36.1 | 20.9 |
| 370 | 35.5 | 30.0 | 25.6 | 33.1 | 19.6 |
| 400 | 34.2 | 29.0 | 25.0 | 32.0 | 19.2 |
| 468 | 31.6 | 27.0 | 23.9 | 30.0 | 18.4 |
| 500 | 30.6 | 26.2 | 23.5 | 29.3 | 18.1 |
| 520 | 30.0 | 25.7 | 23.2 | 28.8 | 18.0 |
| 700 | 26.0 | 22.5 | 21.6 | 25.8 | 16.8 |
| 1,000 | 21.8 | 19.4 | 20.0 | 22.8 | 15.8 |
| 2,000 | 15.6 | 14.9 | 18.0 | 18.7 | 14.4 |
| 5,000 | 10.3 | 11.3 | 16.7 | 15.8 | 13.6 |
| 100,000 | 4.3 | 8.4 | 15.9 | 13.6 | 13.0 |

A. General and family practice and internal medicine.
B. Orthopedic surgery.
C. "All other" specialties.
D. Pediatrics, general surgery, obstetrics and gynecology, cardiovascular disease, dermatology, urology, psychiatry, neurology, ophthalmology, otorhinolaryngology, and doctors of osteopathy.

Example of use of table: An aggregate estimate of 2 million visits to a cardiovascular disease specialist has a relative standard estimate of 14.4 percent or a standard error of 288,000 visits (14.4 percent of 2 million).

**Table III. Standard errors for percents of estimated numbers of drug mentions: National Ambulatory Medical Care Survey, 1990**

| Base of percent drug mentions in thousands | Estimated percent | | | | | |
|---|---|---|---|---|---|---|
| | 1 or 99 | 5 or 95 | 10 or 90 | 20 or 80 | 30 or 70 | 50 |
| | Standard errors in percentage points | | | | | |
| 200 | 5.8 | 12.7 | 17.5 | 23.3 | 26.7 | 29.1 |
| 500 | 3.7 | 8.0 | 11.1 | 14.7 | 16.9 | 18.4 |
| 1,000 | 2.6 | 5.7 | 7.8 | 10.4 | 11.9 | 13.0 |
| 2,000 | 1.8 | 4.0 | 5.5 | 7.4 | 8.4 | 9.2 |
| 5,000 | 1.2 | 2.5 | 3.5 | 4.7 | 5.3 | 5.8 |
| 10,000 | 0.8 | 1.8 | 2.5 | 3.3 | 3.8 | 4.1 |
| 13,000 | 0.7 | 1.6 | 2.2 | 2.9 | 3.3 | 3.6 |
| 20,000 | 0.6 | 1.3 | 1.7 | 2.3 | 2.7 | 2.9 |
| 50,000 | 0.4 | 0.8 | 1.1 | 1.5 | 1.7 | 1.8 |
| 100,000 | 0.3 | 0.6 | 0.8 | 1.0 | 1.2 | 1.3 |
| 600,000 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.5 |

Example of use of table: An estimate of 30 percent based on an aggregate of 13 million drug mentions has a standard error of 3.3 pecent or a relative standard error of 11.0 percent (3.3 percent divided by 30 percent).

**Table IV. 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 errors 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 | 6.4 | 8.6 | 9.8 | 10.7 |
| 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 | 1.0 | 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 | 0.4 |

Example of use of table: An estimate of 30 pecent based on an aggregate of 13 million visits has a standard error of 2.7 percent or a relative standard error or 9.0 percent (2.7 percent divided by 30 percent).

**Table V. 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 |
| Drug mentions | | |
| Overall totals | 0.00259409 | 67.9417652 |
| General and family practice, internal medicine | 0.00856244 | 52.1278030 |
| General surgery, neurology | 0.07521297 | 5.08446943 |
| "All other" specialties group | 0.03885901 | 58.8324479 |
| Doctors of osteopathy, pediatrics, obstetrics and gynecology, orthopedic surgery, cardiovascular disease, psychiatry, ophthalmology, and otorhinolaryngology | 0.02306475 | 11.4657235 |
| Visits | | |
| Overall totals | 0.00138387 | 46.1954141 |
| General and family practice and internal medicine | 0.00669347 | 30.8610803 |
| Orthopedic surgery | 0.02504087 | 15.0649723 |
| "All other" specialties group | 0.01820068 | 33.7058023 |
| Doctors of osteopathy, pediatrics, general surgery, obstetrics and gynecology, cardiovascular disease, dermatology, urology, psychiatry, neurology, ophthalmology, and otorhinolaryngology | 0.01684812 | 8.03232318 |

into illicit channels, are regulated under Federal law by the Department of Justice, Drug Enforcement Agency (DEA). The Controlled Substance Act of 1970 characterizes each controlled drug into one of five schedules. Schedule I drugs, like heroin and LSD, have a higher potential for abuse and no current accepted medical usefulness for treatment in the United States. Schedule I drugs are outside the scope of this report. Each successive schedule, II–V, reflects a decreasing degree of dependence and potential for abuse.

**Trade name disclaimer**

The use of trace names is for identification only and does not imply endorsement by the Public Health Service, U.S. Department of Health and Human Services.

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