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

Health Care in America

Trends in Utilization

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The National Health Care Survey

People use health care services for many reasons: to cure illnesses and health conditions, to mend breaks and tears, to prevent or delay future health care problems, to reduce pain and increase quality of life, and sometimes merely to obtain information about their health status and prognosis. Health care utilization can be appropriate or inappropriate, of high or low quality, expensive or inexpensive. The study of trends in health care utilization provides important information on these phenomena and may spotlight areas that may warrant future indepth studies because of potential disparities in access to, or quality of, care. Trends in utilization may also be used as the basis for projecting future health care needs, to forecast future health care expenditures, or as the basis for projecting increased personnel training or supply initiatives.

The health care delivery system of today has undergone tremendous change, even over the relatively short period of the past decade. New and emerging technologies, including drugs, devices, procedures, tests, and imaging machinery, have changed patterns of care and sites where care is provided (1,2). The growth in ambulatory surgery has been influenced by improvements in anesthesia and analgesia and by the development of noninvasive or minimally invasive techniques. Procedures that formerly required a few weeks of convalescence now require only a few days. New drugs can cure or lengthen the course of disease, although often at increased cost or increased utilization of medical practitioners needed to prescribe and monitor the effects of the medications.

Over the past decade, both public and private organizations have made great strides in identifying causes of disease and disability, discovering treatments and cures, and working with practitioners to educate the public about how to reduce the incidence and prevalence of major diseases and the functional limitations and discomfort they may cause. Clinical practice guidelines have been created and disseminated to influence providers to follow recommended practices. Public education campaigns urge consumers to comply with behavioral recommendations (e.g., exercise and lose weight) and treatment regimens (e.g., take your medications) that may help to prevent or control diseases and their consequences.

Health care utilization also has evolved as the population's need for care has changed over time. Some factors that influence need include aging, sociodemographic population shifts, and changes in the prevalence and incidence of different diseases. As the prevalence of chronic conditions increases, for example, residential and community-based health-related services have emerged that are designed to minimize loss of function and to keep people out of institutional settings.

The growth of managed care and payment mechanisms employed by insurers and other payers in an attempt to control the rate of health care spending has also had a major impact on health care utilization. Efforts by employers to increase managed care enrollment, as well as major Medicare and Medicaid cost containment efforts such as the Prospective Payment System for hospitals and the Resource Based Relative Value Scale for physician payment, created incentives to shift sites where services are provided (3,4). They also created incentives to provide services differently; for example, the increase in capitated payment and use of gatekeepers has been associated with a changing mix of primary care and specialty care (see "Visits to Primary Care and Specialty Physicians") (5). Numerous other factors also influence the type and amount of health care utilization that is provided in the United States (see "Forces that Affect Overall Health Care Utilization") (6,7).

The Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS), Division of Health Care Statistics is charged with conducting surveys of health care providers and facilities. These surveys track the number of encounters these entities provide and describe characteristics of

those who seek care, the content of the encounters, and characteristics of providers. It accomplishes this mission in part by fielding a family of surveys that are collectively called the National Health Care Survey (NHCS). The NHCS produces important information on hospitalizations and surgeries, ambulatory physician visits, and long-term care use in the United States. It can be used to compare services received across different settings, to relate provider characteristics to patient utilization, to compare utilization rates among subpopulations, and, in general, to assess how the health care delivery system is being used and by whom.

Each NHCS component survey obtains information about the facilities that supply health care, the services rendered, and the characteristics of the patients served. Each survey is based on a multi-stage sampling design that includes health care facilities or providers and patient records. Data collected directly from the establishments and/or their records rather than from the patients, identify health care events—such as hospitalizations, surgeries, and long-term stays—and offer the most accurate and detailed data on diagnosis and treatment and institution characteristics. These data are used by policymakers, planners, researchers, and others in the health community for a variety of purposes, including monitoring changes in the use of health care resources, monitoring specific diseases, and examining the impact of new medical technologies (8).

The NHCS includes the following surveys:

- National Ambulatory Medical Care Survey (NAMCS)
- National Hospital Ambulatory Medical Care Survey (NHAMCS)
- National Hospital Discharge Survey (NHDS)
- National Survey of Ambulatory Surgery (NSAS)
- National Home and Hospice Care Survey (NHHCS)
- National Nursing Home Survey (NNHS)

These surveys are the major source of information in the United States on national trends in hospital length of stay and diagnoses associated with hospitalizations, ambulatory physician visits, nursing home stays, and home health and hospice care visits. **Chart 1** shows component surveys of the NHCS, including typical sample sizes and years conducted.

More detail on the component surveys and limitations of the data can be found in "Appendix I." "Appendix II" presents definitions of terms used throughout this report. Only statistically significant differences between population groups or time trends are noted in the text, as well as on each chart.

Computation of rates for hospital discharges and nursing homes, home health agencies, and hospices encounters use estimates of the civilian population of the United States based on the 1990 census and adjusted for underenumeration using the 1990 National Population Adjustment Matrix. Rates of physician, hospital outpatient, and hospital emergency department visits use the civilian noninstitutionalized population of the United States, also based on the 1990 census and adjusted for underenumeration. Although intercensal rates for the 1990s that incorporate data from the 2000 census are now available, they were not available at the time this report was compiled.

The first section of this book uses selected trend data to illustrate how—and to suggest some insights into why—health care utilization has changed over the past decade. The second section presents overall trends in health care, including use of inpatient hospital services; use of physician services in private offices, hospital outpatient departments, and emergency departments; and use of nursing

Chart 1: Characteristics of National Health Care Survey component surveys

Survey	Type of data	Years fielded	Approximate responding sample size
National Ambulatory Medical Care Survey (NAMCS)	Visits to office-based physicians	1973–1981, 1985, 1989–present	1,000–1,140 physicians 21,000–36,000 encounters
National Hospital Ambulatory Medical Care Survey (NHAMCS)	Visits to hospital emergency and outpatient departments	1992–present	440 hospitals 21,000–36,000 ED[1] encounters 29,000–35,000 outpatient visits
National Hospital Discharge Survey (NHDS)	Hospital discharges	1965–present	About 500 hospitals 300,000 discharges
National Survey of Ambulatory Surgery (NSAS)	Ambulatory surgery discharges	1994–1996	500 facilities 120,000 discharges
National Home and Hospice Care Survey (NHHCS)	Agency characteristics, current patients, and discharges	1992–1994, 1996, 1998, 2000	1,100–1,800 agencies 3,400–5,400 current patients 3,000–4,900 discharges
National Nursing Home Survey (NNHS)	Characteristics of nursing homes with 3 or more beds, current residents, and discharges	1973–74, 1977, 1985, 1995, 1997, 1999	1,100–1,900 nursing homes 5,200–8,200 current residents 6,000–6,900 discharges

[1]ED is emergency department.

home, home health care, and hospice care services. Trends for the entire U.S. population are presented first, followed by trends for specific age and race groups (black versus white populations); trends in utilization for specific conditions, drugs, and procedures; and trends in utilization associated with place of death.

In an attempt to show trends in utilization across the spectrum of care measured in our surveys, this book is not organized around specific surveys or specific populations (e.g., racial or age groups). Therefore, those interested in a particular type of care, such as home health care, will find charts illustrating trends in home health care by different population groups throughout the book. Similarly, overall trends in utilization by race appear throughout the book.

When analyzing any of the trends in health care utilization presented in this book, it is critical to remember that all of the health care utilization data (doctor visits, emergency department or outpatient department visits, or discharges from hospitals, nursing homes, and home health agencies) from

the NHCS are derived from establishment- or provider-based surveys rather than population-based surveys. Thus, with the exception of daily census data from nursing homes and home health agencies, data from the surveys represent events, not persons. For example, persons who visited a physician more than once or were discharged from the hospital more than once during the period of data collection would be included multiple times in the list from which the sample was drawn. Utilization rates per capita (or per population) represent the magnitude of health care use by a particular population and can be compared across various population groups, but they cannot be used to examine the amount or type of care provided to individuals. In addition, examination of utilization trends for the entire U.S. population masks many underlying differences in utilization by subpopulation (e.g., race, age, or gender) and/or condition. Many of these underlying trends are presented in charts presented throughout this book.

This book is the first attempt to integrate data from all of the NHCS components into one publication that examines how health care utilization is changing across multiple settings. This book is neither exhaustive nor comprehensive in the utilization trend data it presents. Although it provides examples of overall trends in health care utilization, many other trends in diagnoses, conditions, and discharge disposition across population groups defined by different characteristics are not presented here. Many of these data are available from published reports, and a bibliography of publications using data from the NHCS is included in "Appendix III." Hopefully, this book will serve as a starting point for examining how health care utilization is changing and what data gaps exist in our understanding of the evolving health care delivery system.

Forces That Affect Health Care Utilization

Multiple forces determine how much health care people use, the types of health care they use, and the timing of that care. **Chart 2** identifies some, but certainly not all, major forces that affect trends in overall health care utilization over time. Some forces encourage more utilization; others deter it. For example, antibiotics and public health initiatives have dramatically reduced the need for people to receive health care for many infectious diseases, even though overuse can also increase antibiotic-resistant strains (9). However, other factors, such as increases in the prevalence of chronic disease, may have contributed to increases in overall utilization. Consumer preferences may have altered the amount of treatment obtained outside hospital and nursing home settings. New therapeutic technologies provided in new types of settings, such as corrective eye surgeries, may increase demand. Aging is also associated with increased health care utilization (10–13). Provider practice patterns may shift from emphasizing one type of treatment (e.g., psychotherapy) compared to another (e.g., drug treatment for mental illness). Some factors affect utilization per person (e.g., guidelines that recommend preventive anticholesterol or antidiabetes medications on an ongoing basis or that recommend more preventive services per person). Other factors may have more effect on the total number of people, or percentage of the population, who can receive the service. For example, less invasive cardiac procedures now are performed on very frail or old people or people with many co-morbid conditions, when in the past it was considered too risky to perform the previously more invasive procedures on these populations.

It has been documented that people who cannot pay for health care services, either out-of-pocket, through private or social health insurance (such as Medicare), through public programs such as Medicaid, or through some other means, may not receive needed services in the United States, and there is a large body of literature on the topic (14–16). Still, factors other than ability to pay also affect access to health care services. One paradigm of health care utilization identifies *predisposing*, *enabling*, and *need* determinants of care (17,18). *Predisposing* factors include the propensity to seek care, such as whether an individual's culture accepts the sick role or encourages stoicism, and what types of care are preferred for specific symptoms. *Enabling* factors include depth and breadth of health insurance coverage, whether one can afford copayments or deductibles, whether services are located so that they can be conveniently reached, and other factors that allow one to receive care. *Need* for care also affects utilization, but need is not always easily determined without expert input. Many people do not know when they need care and what the optimal time to seek care is, and many conditions are not easily diagnosed or treated. If all people could obtain unlimited health care, perceived need—by both patient and provider—might be the only determinant of health care utilization, but unfortunately barriers to needed care, such as availability or supply of services, ability to pay, or discrimination, have an impact on utilization overall.

Chart 2: Forces that affect overall health care utilization

Factors that may decrease health services utilization

Decreased supply (e.g., hospital closures, large numbers of physicians retiring)

Public health/sanitation advances (e.g., quality standards for food and water distribution)

Better understanding of the risk factors of diseases and prevention initiatives (e.g., smoking prevention programs, cholesterol-lowering drugs)

Discovery/implementation of treatments that cure or eliminate diseases

Consensus documents or guidelines that recommend decreases in utilization

Shifts to other sites of care may cause declines in utilization in the original sites:
- as technology allows shifts (e.g., ambulatory surgery)
- as alternative sites of care become available (e.g., assisted living)

Payer pressures to reduce costs

Changes in practice patterns (e.g., encouraging self-care and healthy lifestyles; reduced length of hospital stay)

Changes in consumer preferences (e.g., home birthing, more self-care, alternative medicine)

Factors that may increase health services utilization

Increased supply (e.g., ambulatory surgery centers, assisted living residences)

Growing population

Growing elderly population
- more functional limitations associated with aging
- more illness associated with aging
- more deaths among the increased number of elderly (which is correlated with high utilization)

New procedures and technologies (e.g., hip replacement, stent insertion, MRI)

Consensus documents or guidelines that recommend increases in utilization

New disease entities (e.g., HIV/AIDS, bioterrorism)

New drugs, expanded use of existing drugs

Increased health insurance coverage

Consumer/employee pressures for more comprehensive insurance coverage

Changes in practice patterns (e.g., more aggressive treatment of the elderly)

Changes in consumer preferences and demand (e.g., cosmetic surgery, hip and knee replacements, direct marketing of drugs)

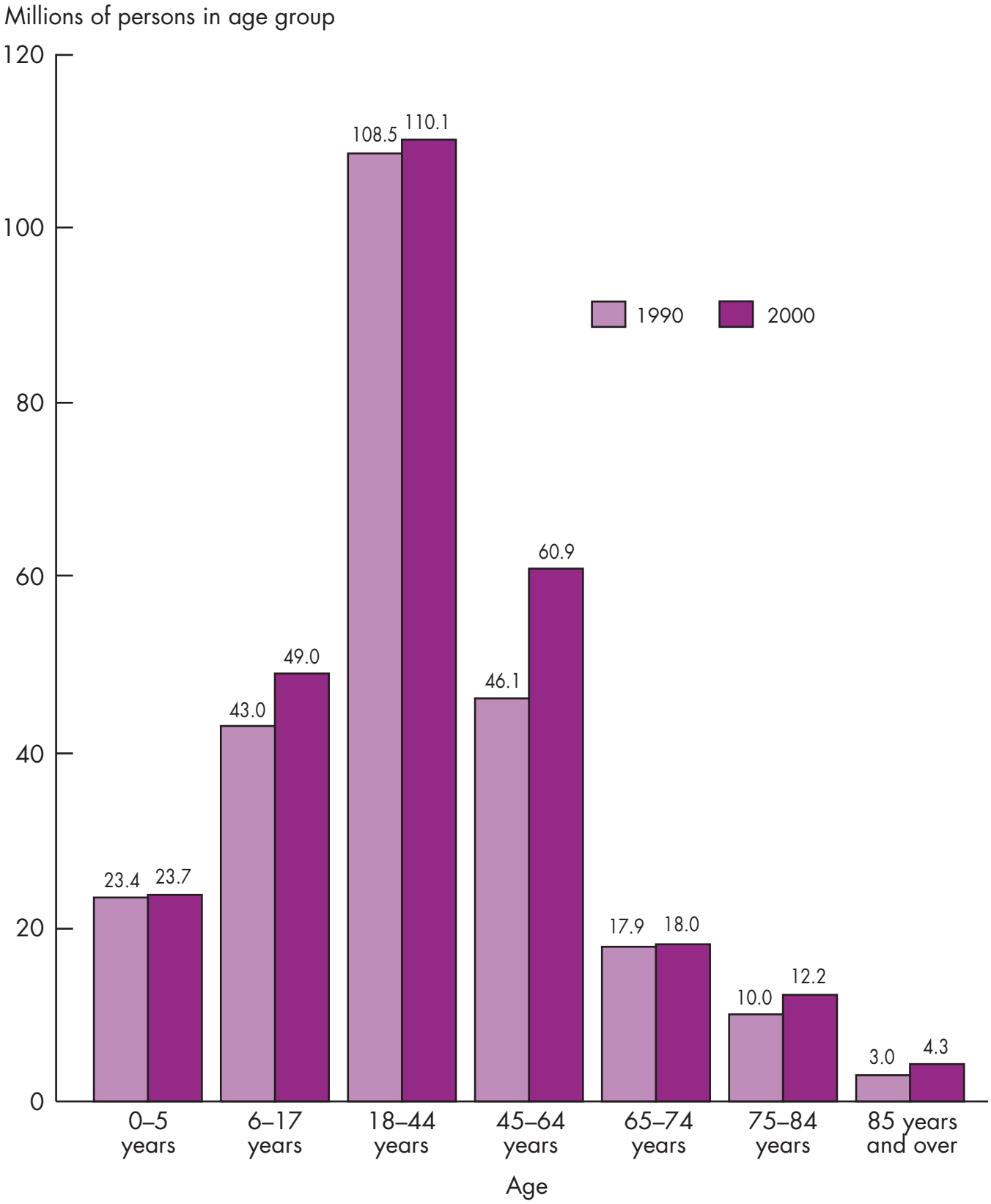
Aging of the Population

The number of persons 65 years of age and over increased from about 31 million to about 34 million between 1990 and 2000. The percentage of the population aged 65 and over remained fairly constant during this period—about 12.4 percent (**chart 3**). The number of the oldest old, aged 85 and over, increased from about 3 million to over 4 million in 2000, or from 1.2 percent to 1.5 percent. In short, although the number of elderly increased during this decade, it did not increase at a very rapid rate (19). Baby boomers are still under age 65, but as they age, both the number and percentage of elderly in the United States will begin to accelerate rapidly. However, baby boomers are currently in their forties and fifties and are beginning to experience the onset of chronic conditions such as diabetes and heart disease.

Aging is associated with an increase in functional limitation and in the prevalence of chronic conditions. As people age, they tend to use more hospital services and prescription medicines. In 1999, people over the age of 65 years experienced nearly three times as many hospital days per thousand than the general population. This ratio goes up to nearly four times for people over the age of 75 (20).

However, the relationship between aging (or any correlate of utilization) and overall health care utilization is not a direct one. Increased longevity can be a result of the postponement of disease onset or a steady rate of functional loss (10–13). The elderly do have a higher rate of many procedures and are prescribed more drugs, but the increase in the use of some drugs may reduce the prevalence of some other conditions and their associated utilization. For example, increased use of glucose-lowering and antihypertensive drugs may reduce complications of diabetes and associated care for some elderly, but it also may be associated with increased utilization of physicians' services. There is also some evidence that the rate of acute care, in general, decreases with advanced age because of co-morbid conditions or unwillingness to perform invasive or traumatic therapies on the very old (21). The independent effect of aging of the population on health services utilization, therefore, is not immediately apparent.

Chart 3: Change in age distribution of the U.S. population: United States, 1990–2000



SOURCE: U.S. Census Bureau civilian population estimates based on the 1990 census.

Major Policy Initiatives Affecting Health Care Utilization

In the United States, there are at least three major payers for health care: governments (Federal, State, and local); employers, through employer-based health insurance; and health care consumers themselves, through out-of-pocket payments. In general, services that are covered by insurance or payment programs are more likely to be utilized than services that must be paid for directly by consumers. Thus, the benefit and payment structure of Medicare and Medicaid programs, private insurers, and managed care plans tend to strongly influence utilization patterns.

Chart 4 shows some of the major Federal payment policy changes that have occurred since 1980. Major Medicare and Medicaid cost-containment efforts, such as the Prospective Payment System for hospitals and the Resource Based Relative Value Scale for physician payment, created incentives to shift sites of services provided (3,4,22). Use of the hospice and ambulatory surgery benefits, as well as the supply of these providers, increased substantially after the Medicare program began to cover these services. Changes in payment policy also created incentives to provide services differently. For example, the increase in a capitated payment and the need to use gatekeepers has been associated with a changing mix of primary and specialty care (5,8). Expansion of the Medicaid program and implementation of the State Children's Health Insurance Program share the goal of increasing utilization of services by poor children and their families.

Managed care in its many incarnations also affects the type and mix of health services available to its covered enrollees. Employers, in particular, work with managed care companies to determine benefit packages offered to employees. Because capitated managed care is paid on a per-person rather than a per-service basis, managed care organizations do not set payment rates for individual services; they have some freedom to substitute services across sites and to be somewhat flexible in the range of services they provide. There is some evidence that capitated managed care plans provided more physician services and fewer hospital services than fee-for-service plans during the first part of the 1990s; however, this differential seems to be leveling off as hospitalization and other provider payment rates decline for all payers (23).

Chart 4: Selected major Federal policy initiatives affecting health care utilization

1982	• Medicare hospice benefits added on a temporary basis.
1983	• Change from "reasonable cost" to prospective payment system based on diagnosis-related groups for hospital inpatient services begins under Medicare.
1985	• Medicare coverage mandated for newly hired State and local government employees. • Emergency Medical Treatment and Labor Act (EMTALA) passed as part of the Consolidated Omnibus Reconciliation Act (COBRA) of 1985 to address the problem of "patient dumping" from emergency departments. • The Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) requires most employers who provide employees with group health plans to offer to continue that coverage under certain circumstances.
1986	• Medicare hospice benefits become permanent.
1987	• Federal Nursing Home Reform Act (part of the Omnibus Budget Reconciliation Act) passed, which creates a set of national minimum standards of care and rights for people living in certified nursing facilities.
1988	• Major overhaul of Medicare benefits is enacted, aimed at providing coverage for catastrophic illness and prescription drugs. • Medicare adds coverage for routine mammography.
1989	• Medicare catastrophic coverage and prescription drug coverage are repealed. • Medicare coverage is added for pap smears.
1992	• Medicare physician services payments are based on fee schedule (Resource Based Relative Value Scale, or RBRVS).
1993	• Under Medicaid, States are required to provide additional assistance to low-income Medicare beneficiaries under the State Children's Health Insurance Program (SCHIP).
1996	• Health Insurance Portability and Accountability Act (HIPAA) enacted to provide health insurance protection for people leaving employment.
1997	• The Balanced Budget Act of 1997 (BBA) creates a new program (SCHIP) and funding source for States to provide health insurance to children. • Medicare+Choice is enacted under the BBA. Major payment adjustments are proposed for nursing homes, home health care, and other covered services. • The BBA also mandates changes in payment to nursing homes, home health agencies, and hospital outpatient departments. • FDA relaxes its rules on mass media advertising for prescription drugs.
1999	• Prospective payment for skilled nursing homes under Medicare (passed with the BBA of 1997) enacted.
2000	• Medicare+Choice Final Rule takes effect. • Prospective payment systems for outpatient services and home health agencies take effect.

Acute Care Supply

Utilization of services is affected by availability of services. Health care providers can accommodate only a finite number of patients. Over the past decade, the overall supply of some types of health care services has remained relatively constant, although the services may be provided in different types of settings. The supply of many other types of providers increased substantially—in particular, facilities specializing in new technological procedures or tests and new types of long-term care residential facilities.

Hospital supply. The number of community hospitals in the United States decreased from 5,384 in 1990 to 4,915 in 2000. The number of beds per 1,000 population also declined, from 4.2 to 3.0 between 1990 and 2000. This reduction in hospital capacity was accompanied by increased staffing. Full-time equivalent personnel increased from about 3,420,000 to about 3,911,400 between 1995 and 2000 (24). Many of the additional staff are not devoted to patient care but to management or administration. Hospitals are also providing a greater percentage of their care on an outpatient basis. Data from the American Hospital Association show that outpatient department visits increased from 860 to 1,852 per 1,000 persons between 1990 and 2000, indicating that their capacity has been expanded over time (24,25). The number of hospital emergency departments (EDs), however, has decreased by about 8 percent between 1994 and 1999, with a large percentage of ED closures in rural areas (26,27).

Physician supply. Unlike hospitals, the number of physicians serving the U.S. population continues to increase. There are also more specialists of all types, except general surgeons and radiologists (28). However, physicians are not evenly distributed throughout the Nation; they are concentrated in urban areas, causing considerable shortages in some rural areas. The Federal government estimates that more than 2,200 physicians would be needed in nonmetropolitan areas to eliminate primary care health professional shortage areas (29).

New Types of Acute-Care Facilities. Not only is the supply of physicians increasing, physicians and other health care providers are also increasingly providing services in new types and sites of care. **Chart 5** shows some of the relatively new types of facilities that the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) accredits. The number of ambulatory surgery centers, for example, has grown rapidly since the 1980s (30). The number of Medicare-certified ambulatory surgery centers alone increased from 1,197 in 1990 to 2,644 in 1998.

Chart 5: Selected Acute Care Providers Accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)

Ambulatory surgery centers
Birthing centers
Cardiac catheterization labs
Community health centers
Dialysis centers
Endoscopy centers
Group medical practices
Hospitals (general, psychiatric, rehabilitation, children's)
Imaging centers
Indian health clinics
Infusion therapy centers
Laser centers
Lithotripsy services
Military clinics
Mobile services
MRI centers
Multispecialty group practices
Occupational health centers
Office-based surgery offices
Ophthalmology/eye practices
Oral and maxillofacial centers
Physician offices
Prison health centers
Radiation/oncology clinics
Sleep centers
Student health services
Urgent/emergency care centers
Women's health centers

Long-Term Care Supply—Nursing Homes

Long-term care (LTC) is defined as a continuum of medical and/or social services designed to help people who have disabilities or chronic care needs. LTC services include traditional medical services, social services, and housing. In contrast to acute care, LTC is designed to prevent deterioration of the recipient and to promote social adjustment to stages of decline. Unlike rehabilitation care, there is not necessarily an expectation that the recipient will "get better." Services may be short or long term and may be provided in a person's home, in the community, or in residential facilities (e.g., nursing homes or assisted living facilities) (31).

Because LTC is a concept, not a facility or place, it is difficult to quantify either the number of LTC providers or the number of people receiving such care. Home health care agencies (see "Postacute, Rehabilitation, and End-of-Life Care Supply") provide some LTC, although they provide more postacute care. Nursing homes provide the bulk of formal LTC. Data from the National Nursing Home Survey (NNHS) show that there has been a slight increase in the number of nursing homes providing nursing care between 1985 and 1999, from 16,900 to 17,900.[a] (See "Use of Nursing Homes.")

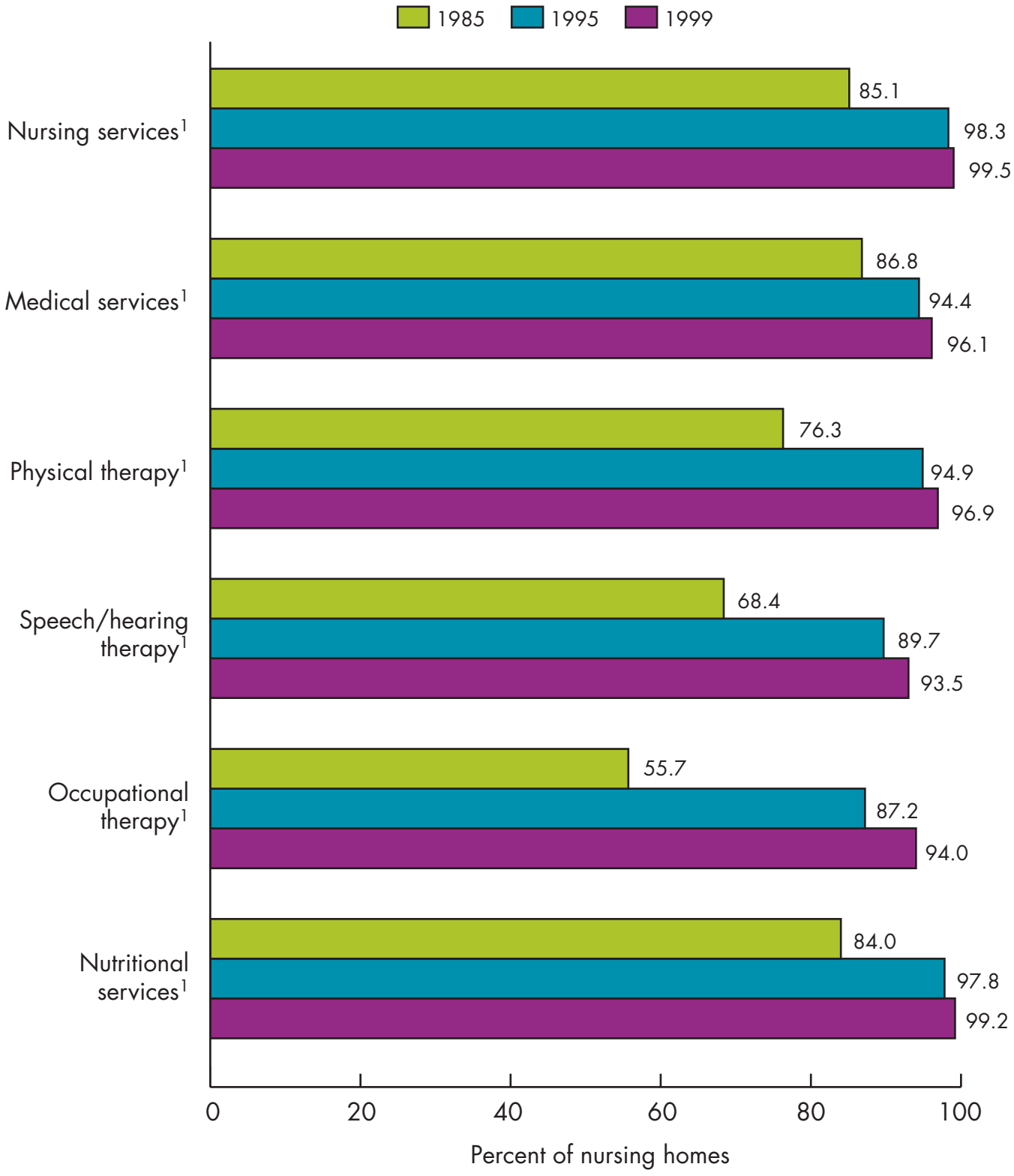
Enactment of The Nursing Home Reform Act of 1987, part of the 1987 Omnibus Reconciliation Act (OBRA87), also created incentives for Medicaid-certified nursing homes to be certified by Medicare. NNHS data show that, between 1985 and 1995, the percentage of nursing homes certified only by Medicaid declined by 55 percent (from 45 percent to 20 percent in 1995), although the percent dually certified by Medicare and Medicaid increased by 94 percent (from 36 percent to 70 percent in 1995, data not shown). By 1999, 82 percent of nursing homes were dually certified by Medicare and Medicaid (data not shown).

Medicare certification requirements include mandated services, often requiring nursing facilities to hire or contract with additional staff. The percentage of nursing homes providing nursing services, medical services, physical therapy, speech and hearing therapy, occupational therapy, and nutritional services also increased drastically between 1985 and 1995 (**chart 6**). These trends continued into 1999. The number of full-time equivalent patient care staff per 100 beds increased by 15 percent between 1985 and 1999, although the number of full-time equivalent registered nurses per 100 beds increased by 49 percent between 1985 and 1999 (data not shown).[b]

[a] The 1985 NNHS excludes an estimated 2,200 residential care homes.

[b] Patient care staff includes administrative, medical and therapeutic staff (dentists, dental hygienists, physical therapists, speech pathologists and/or audiologists, dieticians or nutritionists, podiatrists, and social workers), and nursing staff (registered nurses, licensed practical nurses, nurse's aides, and orderlies).

Chart 6: Rehabilitative and other services offered by nursing homes: United States, 1985, 1995, 1999



[1]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey (NNHS).

Special Care Units and Other Long-Term Care Residences

Nursing homes are diversifying, and the distinction between long-term and other types of care is blurring over time. Although special care units within nursing homes are relatively new, their number is increasing. Nursing home beds devoted to special care units increased from 255,600 beds in 1997 to 343,300 beds in 1999. The number of beds in units designated for rehabilitative or subacute care increased from 105,200 beds in 1997 to 125,700 beds in 1999 (data not shown).

Data on special care units for Alzheimer's disease were not collected in the 1995 National Nursing Home Survey; however, the survey did collect information on distinct special care areas devoted exclusively for the care of cognitively impaired residents. Using this measure, the percentage of nursing homes with special care units for patients with Alzheimer's disease or cognitive impairments increased 35 percent between 1995 and 1999 (18 percent in 1995 to 24 percent in 1999). Beds in these special care units increased 44 percent during the same time period, from 108,400 beds in 1995 to 156,300 beds in 1999. In addition, nursing homes are increasingly providing community-based services (e.g., adult day care, home health care) to nonresidents.

With technological advances that allow more chronically ill and disabled people to be treated outside of institutional settings such as nursing homes, and with the development of new types of assisted living and life care facilities (and communities), it is becoming increasingly difficult to define and describe long-term care and the types of people who receive it. These hybrid facilities include board and care homes, residential care facilities and homes, assisted living residences, life care communities, congregate housing, and other categories that vary by State and locality (see **chart 7** for examples). Estimates of the number of assisted living residences alone (as defined by the State in which they are located) in the United States vary from 10,000 to more than 40,000 (32,33). Impaired elderly who previously may have been confined to a nursing home because alternative care sites did not exist increasingly are entering these new types of places. These facilities are not consistently defined, and no standard or validated national estimates currently exist for them.

Chart 7: Some names of long-term care residences

Selected long-term care facilities regulated by the State of California

Alzheimers's facilities or units

Assisted living facilities

Congregate living

Continuing care retirement communities

Home health care services

Life care communities

Nursing homes

Retirement housing

Residential care

Senior apartments

Selected long-term care facilities/ care regulated by the State of New Jersey

Adult day care

Assisted living programs

Assisted living residences

Comprehensive personal care homes

Nursing homes

Residential health care facilities

Other names for long-term care residences

Adult foster care

Adult homes

Adult living facilities

Board and care homes

Community-based retirement facilities

Domiciliary care

Enhanced care

Group homes

Homes for the aged

Personal care adult living facilities

Personal care homes

Sheltered housing elder care homes

Supportive care

Postacute, Rehabilitation, and End-of-Life Care Supply

The supply of subacute and postacute services has increased rather dramatically over the past decade, in part because of improvements in technology that allow care to be provided outside of a hospital setting, and in part because of payment policy encouraging reductions in inpatient hospital care. Often conditions cannot be successfully cured all at once, and postacute recovery or rehabilitation care is needed to prevent further deterioration in health status, to restore functioning, or to maximize quality of life for those with fatal illnesses.

Medicare pays for postacute or subacute care in a hospital or nursing unit that provides skilled nursing care. Medicare and Medicaid also cover home health care services (in the patients' homes); end-stage renal disease services provided at freestanding dialysis centers; and rehabilitation services in nursing homes, rehabilitation hospitals, rehabilitation units of acute-care hospitals, and Comprehensive Outpatient Rehabilitation Facilities (CORFs). The number of these facilities, some of which are shown in **chart 8A**, continues to increase. CORFs have shown a particularly rapid proliferation and an equally dramatic disenrollment from certification during the decade. Fifty-nine CORFs became Medicare-certified between 1997 and 1998 alone, and the number dropped substantially between 1998 and 1999 (34).

The trend of shorter hospitals stays (following Medicare's change to a prospective hospital payment system in 1983), combined with technological and pharmaceutical advances and relaxation of Medicare eligibility requirements for home health care in the late 1980s, was associated with a shift of services from hospitals to the community and dramatic growth in the home health industry (35). **Chart 8B** shows that the total number of home health agencies varied with the supply of Medicare-certified agencies between 1992 and 2000. In 2000, Medicare-certified home health agencies comprised nearly three-fourths of all home health agencies, and Medicare was the single largest payer for home health services. Since 1997, after the Balanced Budget Act of 1997 reduced home health payment rates, the number of Medicare-certified home health agencies declined by 26 percent (36). Through the 1990s, however, the home health industry was the fastest growing sector in the health care industry.

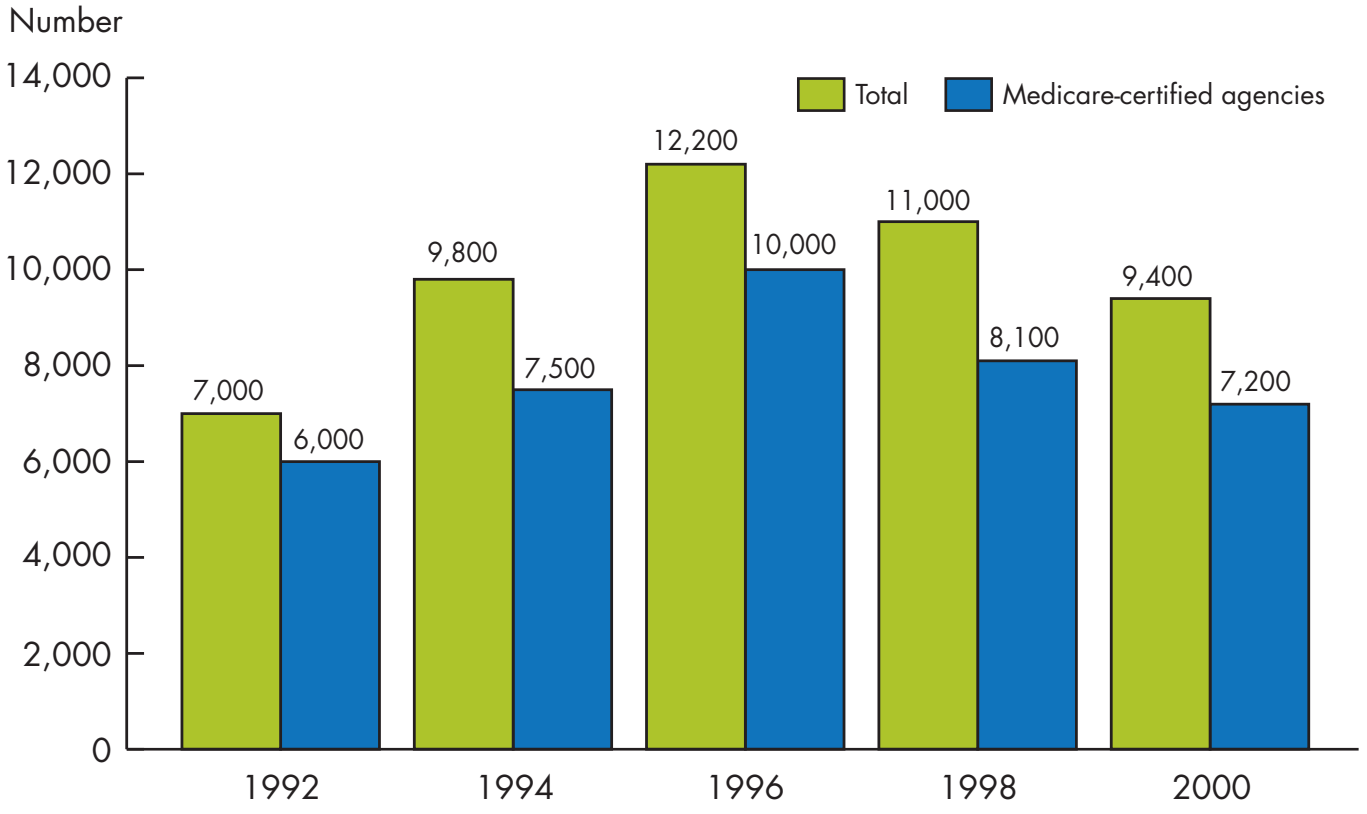
The hospice concept of palliative care was introduced to the United States around 1974. The hospice industry grew as Medicare began covering these services in 1982, and in particular, after a Congressional mandate increased reimbursement rates in the late 1980s. The number of Medicare-certified hospices grew substantially between 1990 and 1999, from 825 to 2,326 (chart 8A).

Chart 8A: Number of Medicare-certified providers: United States, 1985–2000

Type of Medicare-certified provider	1985	1990	1997	1998	2000
End stage renal disease facilities	1,393	1,937	3,367	3,531	3,787
Comprehensive outpatient rehabilitation facilities	72	186	531	590	522
Hospices	164	825	2,344	2,317	2,326

SOURCE: Centers for Medicare & Medicaid Services, *HCFA Statistics*, 1998, 1999, and 2000.

Chart 8B: Home health agencies and Medicare-certified home health agencies: United States, 1992–2000



SOURCES: Haupt B, Hing E, Strahan G. The National Home and Hospice Survey (NHHS): 1992 summary. National Center for Health Statistics. *Vital Health Stat* 13(117). 1994; Jones A, Strahan G. The National Home and Hospice Care Survey (NHHCS): 1994 summary. National Center for Health Statistics. *Vital Health Stat* 13(126). 1997; Haupt B, Jones A. The National Home and Hospice Care survey (NHHCS): 1996 summary. National Center for Health Statistics. *Vital Health Stat* 13(141). 1999; The National Home and Hospice Care Survey (NHHCS), 1998, 2000. National Center for Health Statistics; Basic statistics about home care, online report available at http://www.nahc.org/Consumer/hcstats.html

Overall Use of Health Services

Health care utilization rates are important indicators of what general types of care specific populations seek, and they also indicate how services may be shifting from one site to another. Despite major changes in the health care delivery system, the aging population, and managed care incentives, visits to physicians' offices rates per 1,000 population were relatively stable over the decade, neither increasing nor decreasing significantly between 1990–91 and 2000 (**chart 9**). The emergency department (ED) visit rate has not increased significantly since 1992 (the earliest available year of ED data, with rates between 356 and 394 visits per 1,000 persons); however, the decrease in the number of hospital EDs in the United States has resulted in a concentration of ED visits in the remaining EDs. At the same time, the rate for illness-related visits to EDs rose from 21.0 to 24.0 visits per 100 persons (37).

By contrast, the overall rates of visits per 1,000 persons to hospital outpatient departments (OPDs) increased by 29 percent, from 1992–93 through 2000. In part, this reflects hospitals' greater emphasis on expanding their outpatient services, discussed in "Postacute, Rehabilitation, and End-of-Life Care Supply." Visits to OPDs, however, still comprise a relatively small percentage of the overall number of visits made to physicians (38).

Hospital utilization in the United States, as measured by the number of hospital discharges, peaked in the early 1980s, declined until the late 1980s, then stabilized between 1990 and 2000 (39). The 2000 rate of 114 hospital discharges per 1,000 population has not changed significantly from the 122 per 1,000 population rate of 1990–91. Declining hospital use and length of stay has been attributed to cost containment measures instituted by Medicare and Medicaid programs, other payers, and employers, as well as to scientific and technological advances that allowed a shift in services from hospitals to ambulatory outpatient settings, the community, home, and nursing homes (35). Because certain care currently can be provided only in inpatient settings, hospitalization rates cannot decrease indefinitely.

Overall utilization rates do not tell exactly what services are being provided to specific persons and cannot serve as proxies for either access to specific services or quality of care. A physician's office visit could include tests, procedures, and even surgery, or it could consist entirely of a discussion with a physician. A hospital or nursing home stay could be for diagnostic, palliative, or recuperative care, or for medical or surgical interventions. These trends can, however, spotlight areas that should be investigated in greater depth. The following charts provide examples of trends in the duration and content of specific encounters that may have major cost, quality, access, or provider productivity implications.

Chart 9: Use of health care services: United States, 1990–2000

Year	Office-based physician visits	Hospital outpatient department visits[1]	Hospital emergency department visits	Short-stay hospital discharges
	Rate per 1,000 population[2]			
1990–91	2,777	---	---	122
1992–93	2,925	236	356	119
1994–95	2,643	256	364	117
1996–97	2,865	271	349	114
1998–99	2,931	296	375	117
2000	3,004	304	394	114

--- Data not available.
[1]Time trend is significant ($p<0.05$). [2]See "Appendix I, Sources and Limitations of the Data" for descriptions of the population estimates used.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS), National Hospital Ambulatory Medical Care Survey (NHAMCS), and National Hospital Discharge Survey (NHDS).

Visits to Primary Care and Specialty Physicians

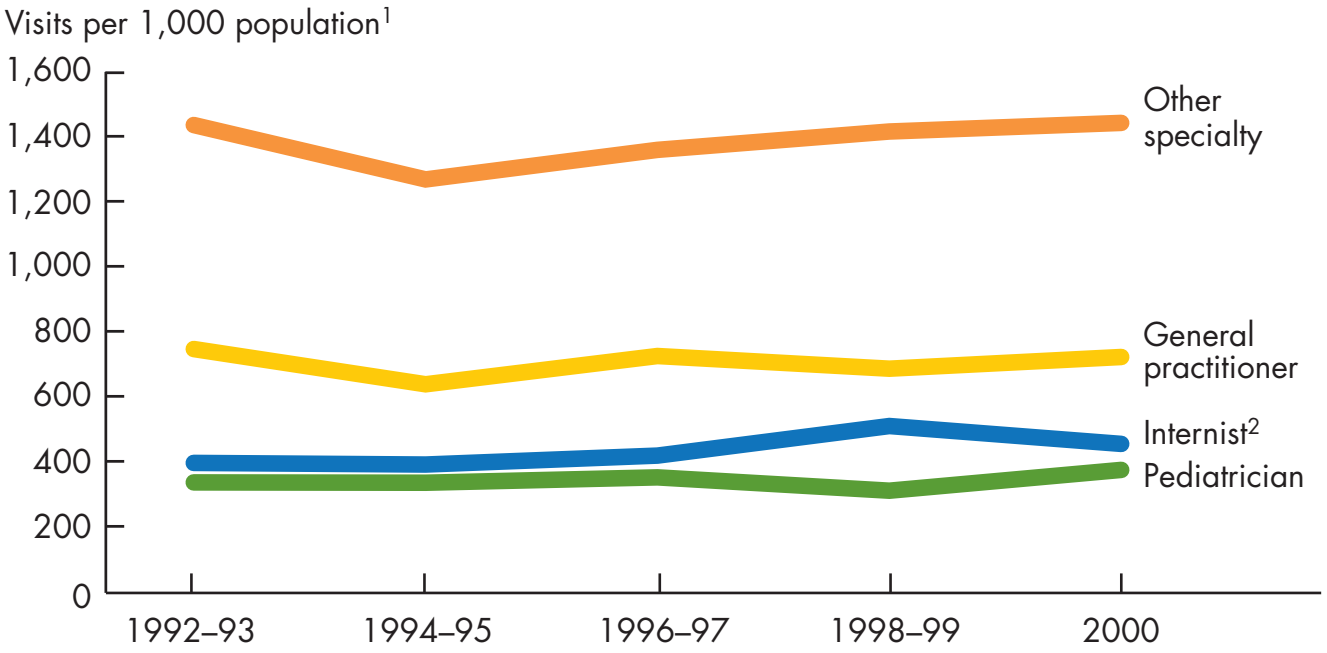
On average, 72 percent of Americans visit an office-based setting for ambulatory care 6.5 times during a year (40). In 2000, about one-half of the approximately 756.7 million visits to office-based physicians were to one of the three types of primary care practices: general and family practice (24 percent), internal medicine (15 percent), and pediatrics (13 percent) (41). According to a recent report by the Institute of Medicine, primary care is defined as "the provision of integrated, accessible, health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of the family and the community" (42). The same report states that, within the parameters of today's health care system, physicians trained in family medicine, general internal medicine, and general pediatrics are most likely to provide primary care. Specialists, however, can and do provide primary care to some patients.

Overall, the visit rate to primary care physicians—defined here as general and family practitioners, general internists, and pediatricians—was statistically similar between 1992–93 (1,488 per 1,000 population) and 2000 (1,560 per 1,000 population). Within specific primary care specialties, visit rates to general and family practice physicians or to pediatricians did not change, but the visit rate per 1,000 population to internists increased from 400 in 1992–93 to 458 in 2000 (**chart 10A**).

Chart 10A also shows similar visit rates to nonprimary care physicians (that is, physicians other than general and family practice doctors, internists, and pediatricians) in 1992–93 and 2000. A previous study noted that efforts to increase primary care rates fostered greater growth in the number of primary care physicians versus nonprimary care physicians during the 1990s (43). It is of interest that the visit rate to nonprimary care specialties increased from 1994–95 through 2000. This is somewhat unexpected because the spread of managed care during the 1990s was hypothesized to discourage use of specialists (44).

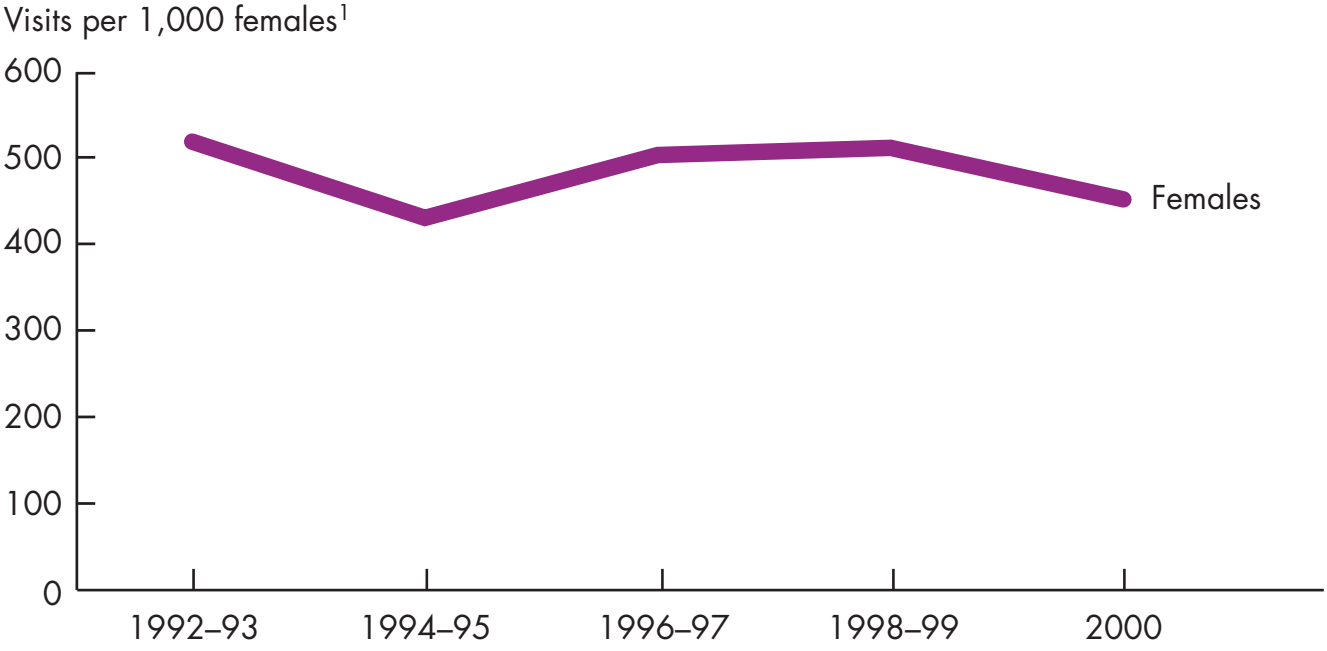
Under various types of managed care arrangements, primary care physicians often serve as patients' gatekeepers for referrals to other specialties. Because many women often rely on obstetricians and gynecologists (OB/GYNs) for a large part of their care, especially during their childbearing years, there has been some pressure to allow access to these physicians without a referral from a primary care gatekeeper (45). At least 42 States and the District of Columbia have guaranteed some form of direct access to OB/GYN care (46). Between 1992 and 2000, however, the female visit rate to OB/GYNs did not change significantly (**chart 10B**).

Chart 10A: Office visits to primary care and specialty physicians: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Chart 10B: Office visits to obstetricians and gynecologists: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

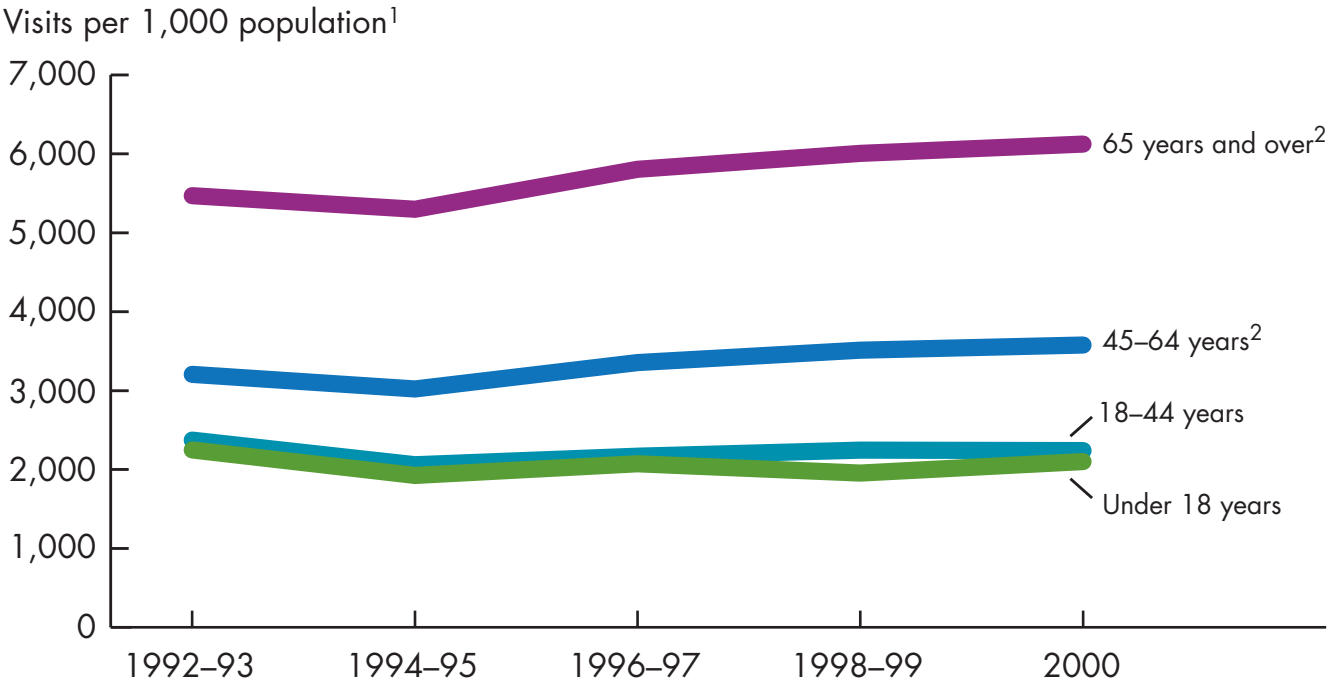
Physician Office and Hospital Outpatient Department Visits, by Age

People of all ages visit physicians' offices and hospital outpatient departments (OPDs) to receive preventive and screening services, diagnosis, treatment, medical counseling, and other ambulatory care. In general, visits to hospital OPDs have been found to be more commonly associated with imaging studies (e.g., mammography, scans), minor surgery, and specialty referrals than those made to physicians' offices (47).

Examining only overall utilization rates for the entire U.S. population, however, may mask important differences in use by population subgroups, such as particular age or racial groups. Between 1992 and 2000, overall utilization rates in physicians' offices for children or young adults 18–44 years of age did not change (**chart 11A**). However, the rate of visits to physicians' offices among the population 65 years of age and over increased by about 12 percent between 1992–93 and 2000 (from 5,470 to 6,125 visits per 1,000 persons). Persons 45 to 64 years of age also had significantly more visits per population over the 1990s. Increases in utilization rates for the population 45 years of age and over may be associated, in part, with greater emphasis on use of cholesterol- and glucose-lowering drugs which require monitoring by a physician, or on diagnostic testing such as mammography that consensus guidelines recommend commence after age 50. It should also be noted that almost all Americans 65 years of age and over become eligible for Medicare coverage, which may improve access to physician care for people who were previously uninsured or under-insured (48).

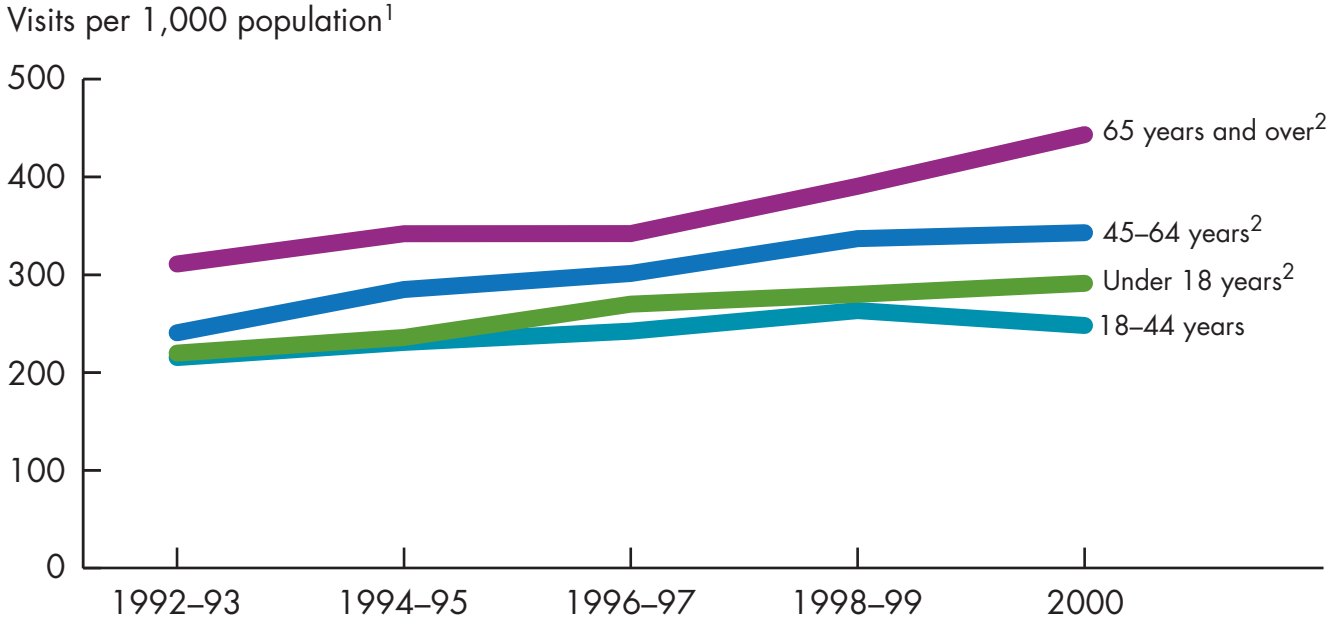
The OPD visit rate for the 45–64 year-old age group also increased, from 241 to 343 per 1,000 population in 2000 (**chart 11B**). Some of the increase for this group may be related to increased use of the commonly provided outpatient services described above, such as imaging services or minor surgeries. The rate for persons 65 years of age and over also increased. Of note, a relatively large copayment is associated with Medicare outpatient services compared to the copayments required for other Medicare-covered ambulatory services. Studies have shown that, between 1987 and 1996, there has been a decrease in the proportion of ambulatory care visits to OPDs among people age 65 and over who did not have private supplemental insurance (49). The rate of OPD visits per 1,000 for children (under 18 years of age) also increased between 1992 and 2000, from 220 to 291. This increase corresponds with expansions in Medicaid and the State Children's Health Insurance Program (SCHIP) in the mid-1990s. Research has shown that disabled children and poor children are more likely to visit hospital OPDs and emergency departments than privately insured children (47,50).

Chart 11A: Physician office visits by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Chart 11B: Hospital outpatient department visits, by age: United States,1992–2000



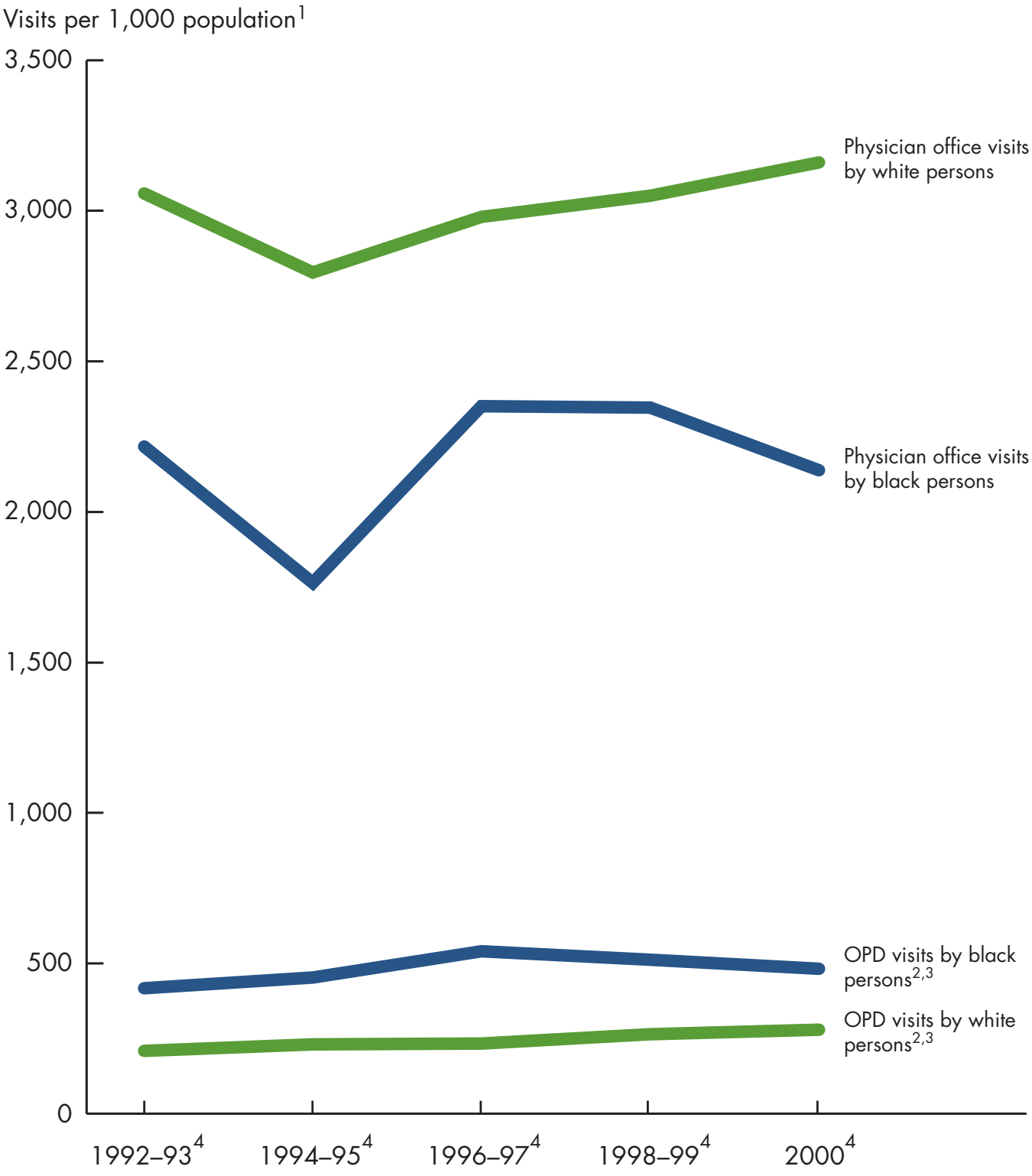
[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

Physician Office and Hospital Outpatient Department Visits, by Race

In 1999, white persons represented 82 percent of the U.S. civilian noninstitutionalized population but made 86.5 percent of all office-based physician visits (51). As shown in **chart 12**, the visit rate for white persons for 2000 was about 48 percent higher than for black persons (3,161 versus 2,139 visits). Some possible reasons behind disparities between black and white persons in the utilization of health care services include historical patterns of the provision of care, perceptions of both providers and care-seekers, and financial and cultural barriers to care (52). For black and white persons, the differential in rates between the two races remained relatively stable over the decade. Other studies have documented that black Americans are more likely to use hospital outpatient departments (OPDs) and clinics as their usual source of care and that a greater percentage of white persons use private physicians' offices as their usual source of care (53,54).

Consistent with greater dependence on hospital-based settings as a usual source of medical care, National Hospital Ambulatory Medical Care Survey data show that, from 1992 to 2000, black persons had a much higher utilization rate of hospital OPDs than did white persons. During the decade, the OPD visit rate for black persons increased, from 418 visits per 1,000 population in 1992–93 to 483 in 2000. During this same period, the outpatient visit rate for white persons also increased, from 210 visits per 1,000 population in 1992–93 to 280 visits in 2000. However, the disparity between black and white OPD utilization did not change.

Chart 12: Physician office and hospital outpatient department visits, by race: United States, 1992–2000



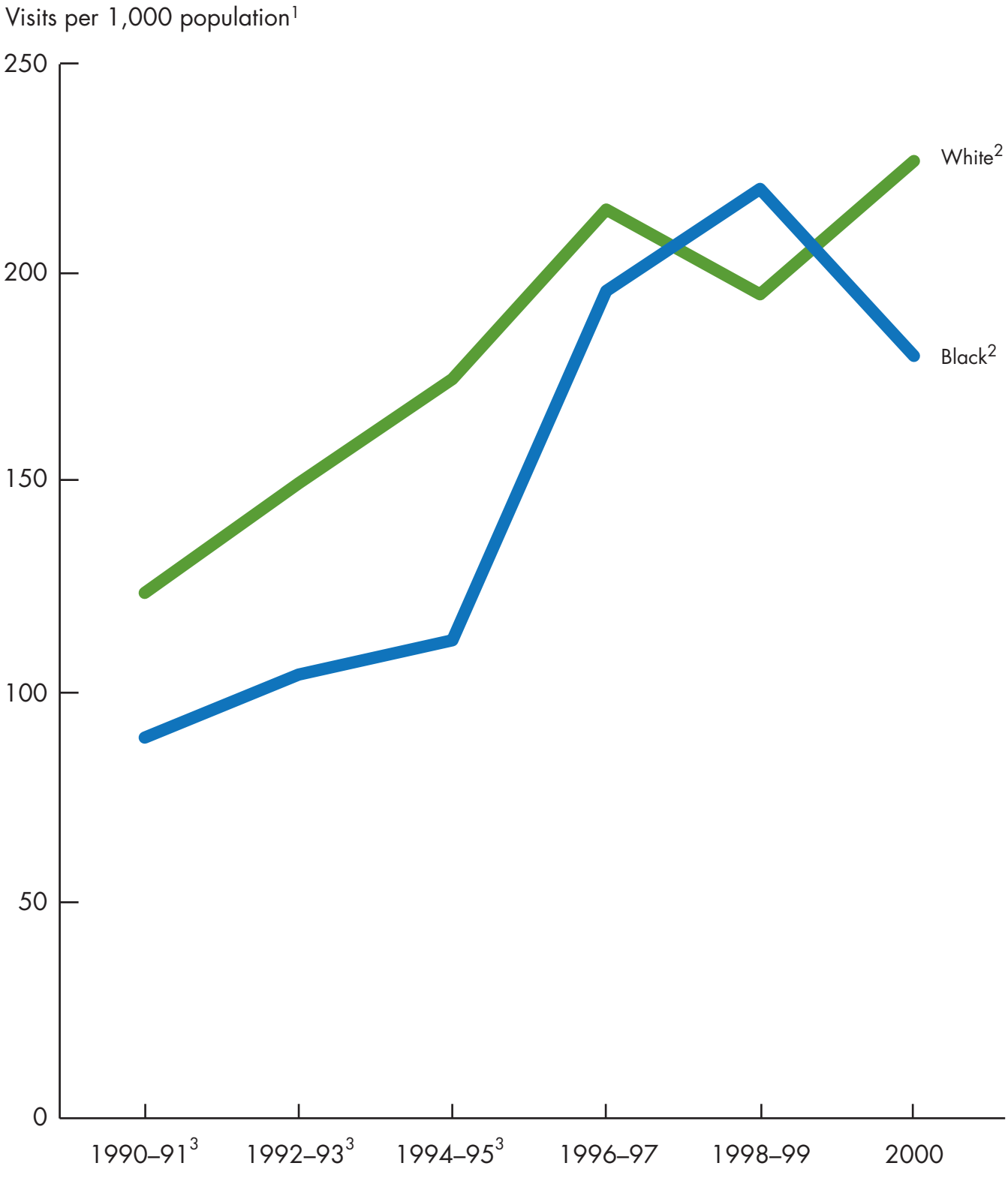
[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$). [3]OPD is outpatient department. [4]Difference between black and white populations is significant for both physician office and OPD visits ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Physician Office Visits for General Medical Exam, by Race

An Institute of Medicine Report documents that racial minorities receive different, often lower-quality medical care than do white Americans. Although some racial, ethnic, and other disparities in care across different population groups have narrowed over time, other major health care utilization disparities remain that are not easily explained by prevalence, incidence, or risk factors. The sources of these differences in care are complex and not immediately apparent, and they may be rooted in historical patterns of the provision of care, perceptions of both providers and care-seekers, financial and cultural barriers to care, as well as numerous other factors (52).

One example of (past or present) disparities in use shows that, although many disparities in utilization of services remain between black and white populations, some are lessening. A general medical examination is the most frequent reason cited for visits to office-based physicians (51). The differential between rates of general physical examinations (as defined by the patients' reason for visit) in physicians' offices for black and white populations has been decreasing over time (**chart 13**) (55). Between 1990 and 2000, the visit rate for a general medical examination increased for both white and black persons. The visit rate among white persons increased from 125 per 1,000 persons in 1990–91 to 228 per 1,000 persons in 2000. Similar trends were also observed among black persons during this period; the visit rate for black persons increased 100 percent, from 91 per 1,000 black persons in 1990–91 to 181 per 1,000 in 2000. In 1990–91, the visit rate for general medical exams was 28 percent lower among black persons than white persons. This difference persisted until 1994–95, and in the following years, the black and white differential disappeared. The difference between black and white visit rates for general medical exams in 2000 appears large (181 per 1,000 black population and 228 per 1,000 white population), but it is not statistically significant.

Chart 13: Office visits with general medical exam as primary reported reason for visit, by race: United States, 1990–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
[3]Difference between black and white population is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Hospital Emergency Department Visits, by Age and Race

Hospital emergency departments (EDs) serve a wide range of medical needs, from treatment of seriously ill patients and life-threatening, injury-related conditions to less serious health conditions, injuries, and other nonemergency care. The past decade saw a notable increase in the volume of ED visits, a 20 percent increase between 1992 and 2000, although the number of these types of facilities was actually decreasing. Seeking care at an ED is associated with several factors, such as possession of health insurance, access to health care providers, and seriousness of condition (37).

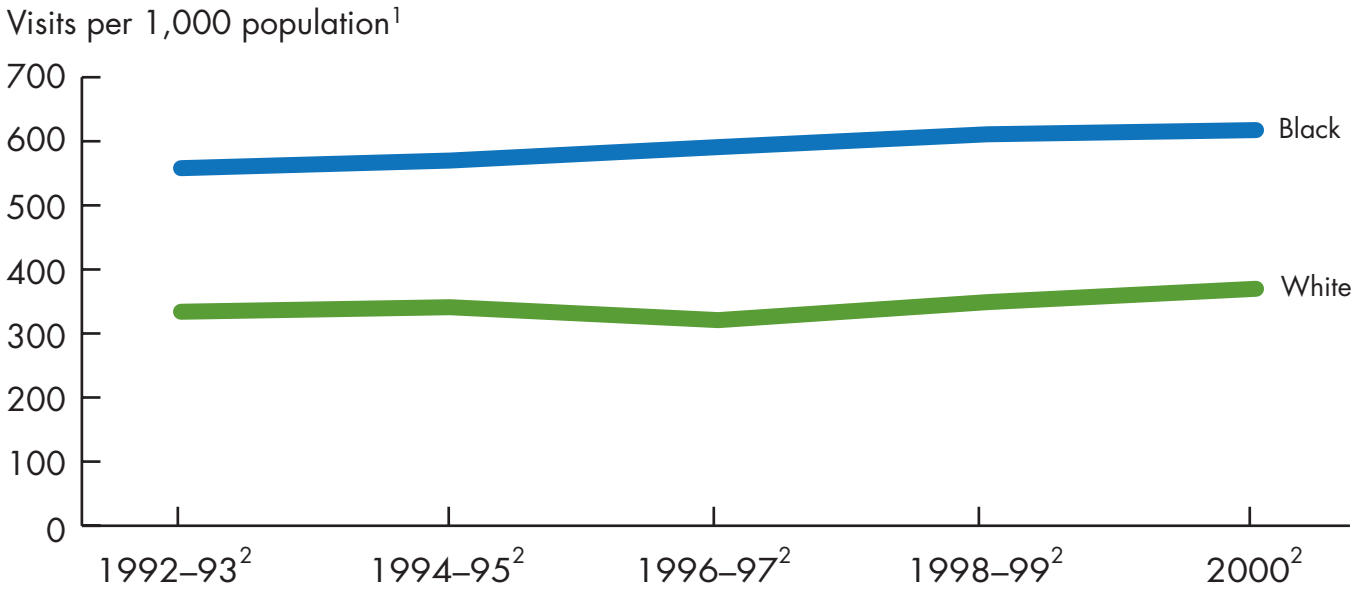
Patterns of use of hospital EDs differ by patient age. Younger people are more likely to visit an emergency room for injuries, although older people are more likely to visit EDs for medical conditions that respond to nonsurgical treatment, in large part because elderly people are more likely to have chronic conditions (37). Between 1992 and 2000, there was a 19 percent increase in ED visit rates for persons 45–64 years of age (from 254 to 303 per 1,000 population) and a 21 percent increase for persons 65 years of age and over (from 409 to 496 per 1,000 population) (56). There was no significant change in ED visit rates for persons under 45 years of age over the decade, although rates per 1,000 population were actually higher throughout the decade for young adults and children under age 18 than they were for the population aged 45 to 64 years old.

In 2000, the rate of ED visits for black persons was 617 per 1,000 persons versus 370 per 1,000 for white persons (**chart 14A**). There was no increase in overall ED use for either race between 1992–93 and 2000. The differential visit rate between the two races also remained about the same throughout the decade, that is, about 68 percent higher for black persons than for white persons overall.

Trends in ED utilization by race varied by age group (**chart 14B**). Among persons aged 45 to 64 years, the ED visit rate for black persons was almost twice the rate found for white persons in 2000. Between 1992–93 and 2000, ED visit rates increased for both black and white persons 45 years of age and over. Among elderly (65 years of age and over) black persons, the rate increased by about 51 percent (from 478 to 721 visits per 1,000 persons), compared to a 19 percent increase among elderly white persons. The ED visit rate for white and black children remained stable (data not shown).

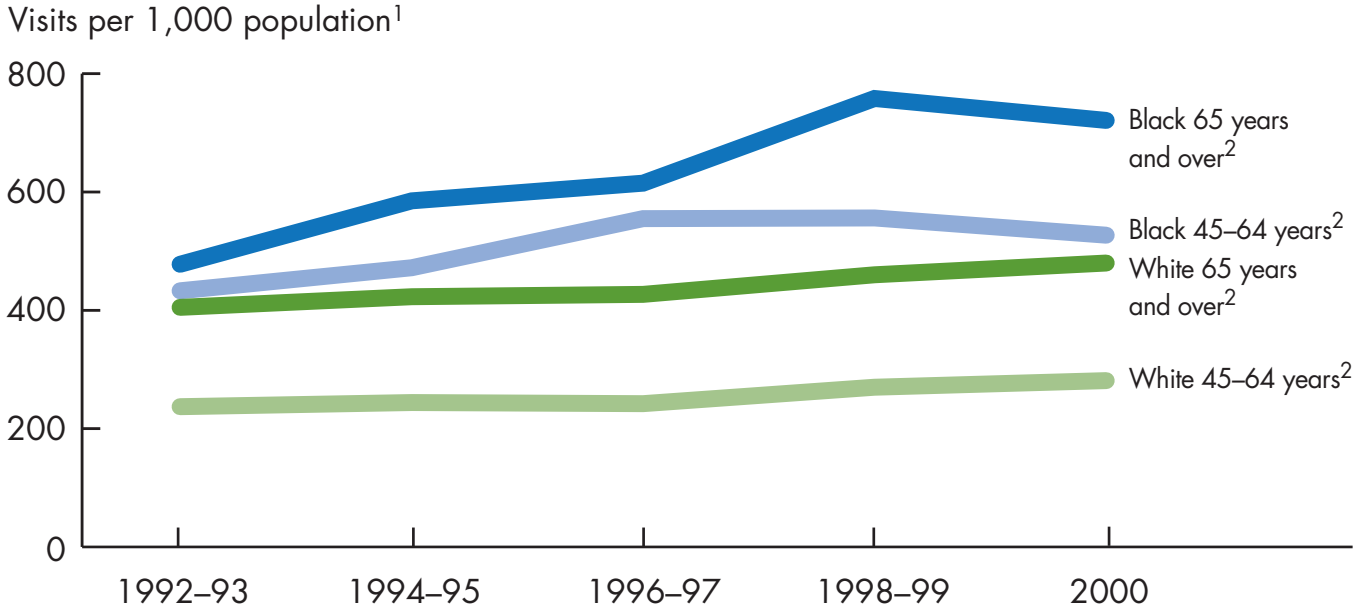
Factors contributing to this difference may include the fact that black seniors are more likely to have only Medicare coverage and thus not have drug coverage; this limits their ability to purchase drugs, which, in turn, contributes to poorer outcomes. In addition, black seniors are likely to encounter greater difficulty finding office-based physicians who are willing to accept new patients (37,42).

Chart 14A: Hospital emergency department visits, by race: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Difference between black and white population is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 14B: Hospital emergency department visits, by race and age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

Hospital Discharges, by Age and Race

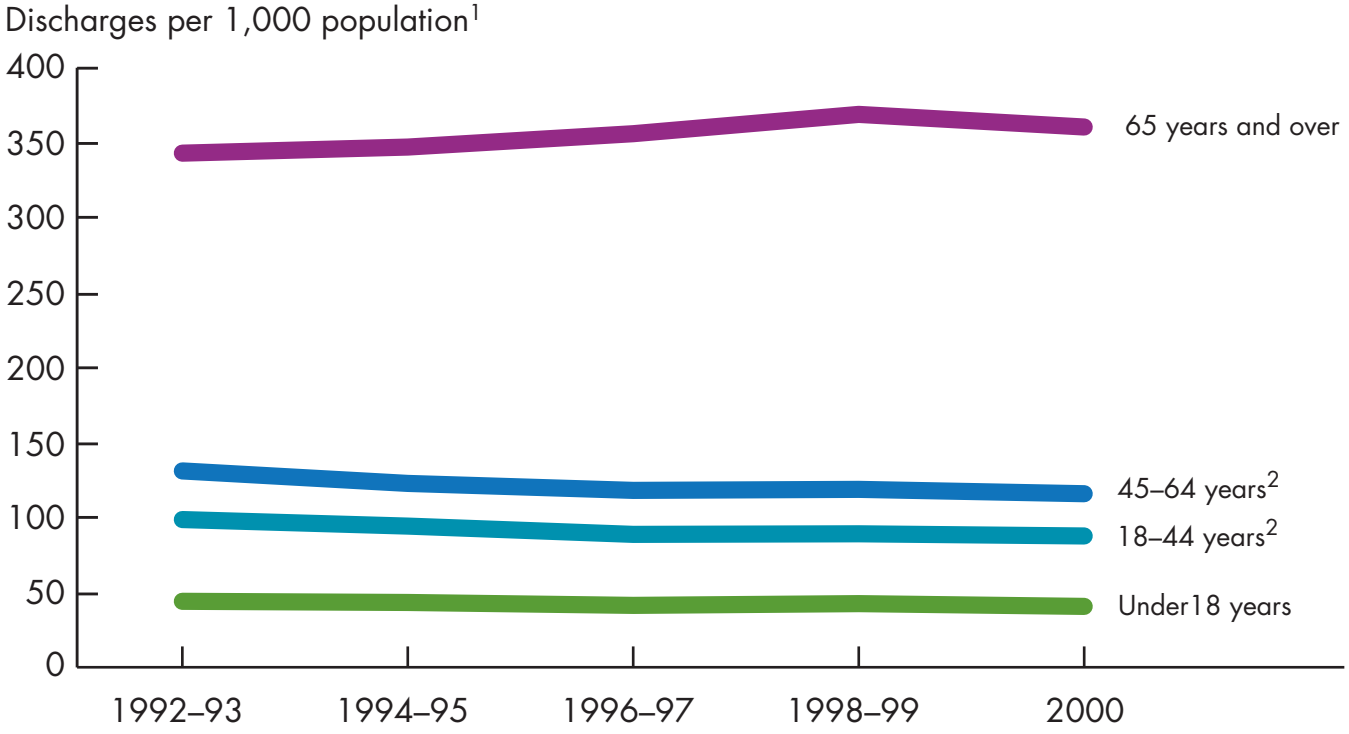
Although spending for hospital care as a share of all personal health care spending in the United States is falling—from 41 percent in 1993 to 37 percent in 1999—hospital care still accounts for a larger percentage of health care expenditures than any other health care service (57). In 1996, about 7 percent of Americans spent one or more nights in a hospital, a slight decrease from 1987, when 9 percent of the population had any expense for inpatient hospital services (58,59).

The rate of hospital discharges per 1,000 population declined between 1992–93 and 2000 for persons 18 to 64 years of age (**chart 15A**). For persons 45–64 years of age, the discharge rate fell about 12 percent, even with increasing rates of cardiac procedures performed on this age group, from a rate of 129 to 114 per 1,000 population over the past decade. The hospital discharge rate for children did not change significantly during this period.

Although it appears that there is a slight upward trend in utilization rates for the population aged 65 years and over, this trend is not significant. Elderly patients use more health care services, including hospital care, than do younger populations in large part because of greater need. Other research shows that they are being treated for more chronic conditions than in the past, and they are receiving an increasing number of medications and complex surgical interventions (e.g., cardiac surgeries such as percutaneous transluminal coronary angioplasty and stent insertion), which may explain why their hospitalization rates did not decrease (21). Between 1992 and 1998, the percentage of elderly Medicare beneficiaries, who comprise over 90 percent of all elderly, who had at least one inpatient stay remained fairly constant, hovering around 18 percent of the population in both years (60).

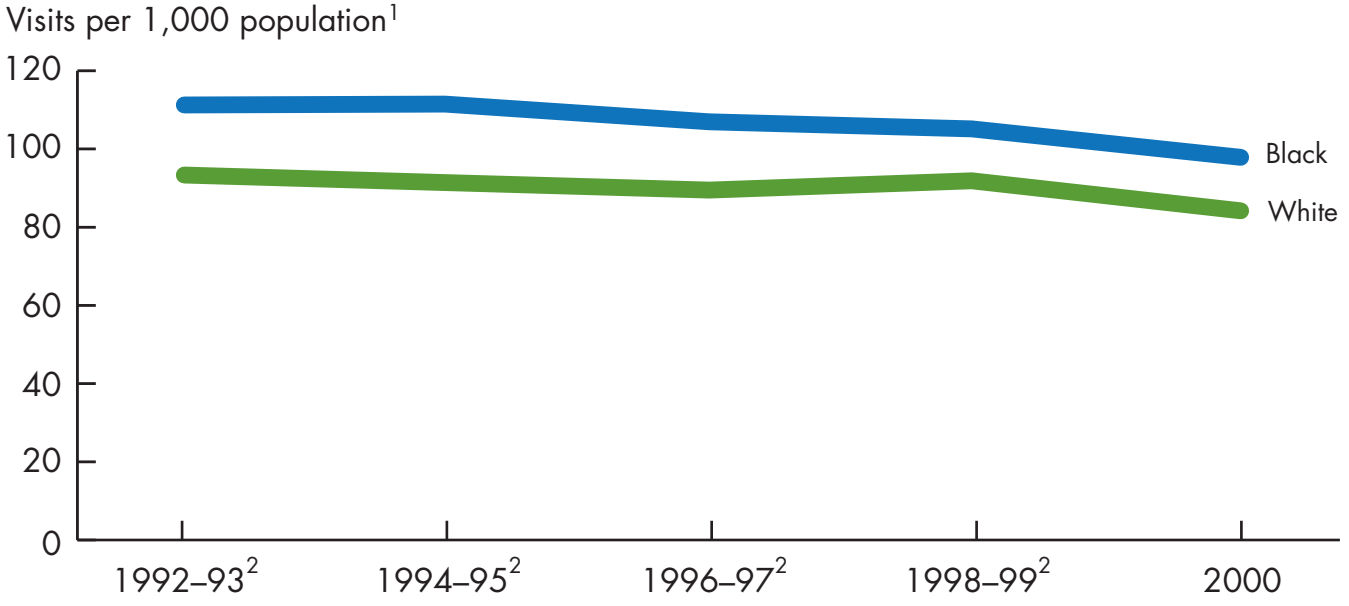
Black Americans had higher hospitalization rates than white Americans during the 1990s, and the difference remained constant across the decade. Although hospitalization rates for both groups appeared to have declined over time, these trends are not statistically significant. The hospital discharge rate per 1,000 population for black persons was 111 in 1992–93 and 98 in 2000. The hospital discharge rate per 1,000 population for white persons was 93 in 1992–93 and 84 in 2000 (**chart 15B**). Medicare program data show that black, Hispanic, and Native American beneficiaries 65 years of age and over have higher hospitalization rates than white beneficiaries, although Asian American beneficiaries have lower hospitalization rates (61).

Chart 15A: Hospital discharges, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Chart 15B: Hospital discharges, by race: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Difference between black and white populations is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

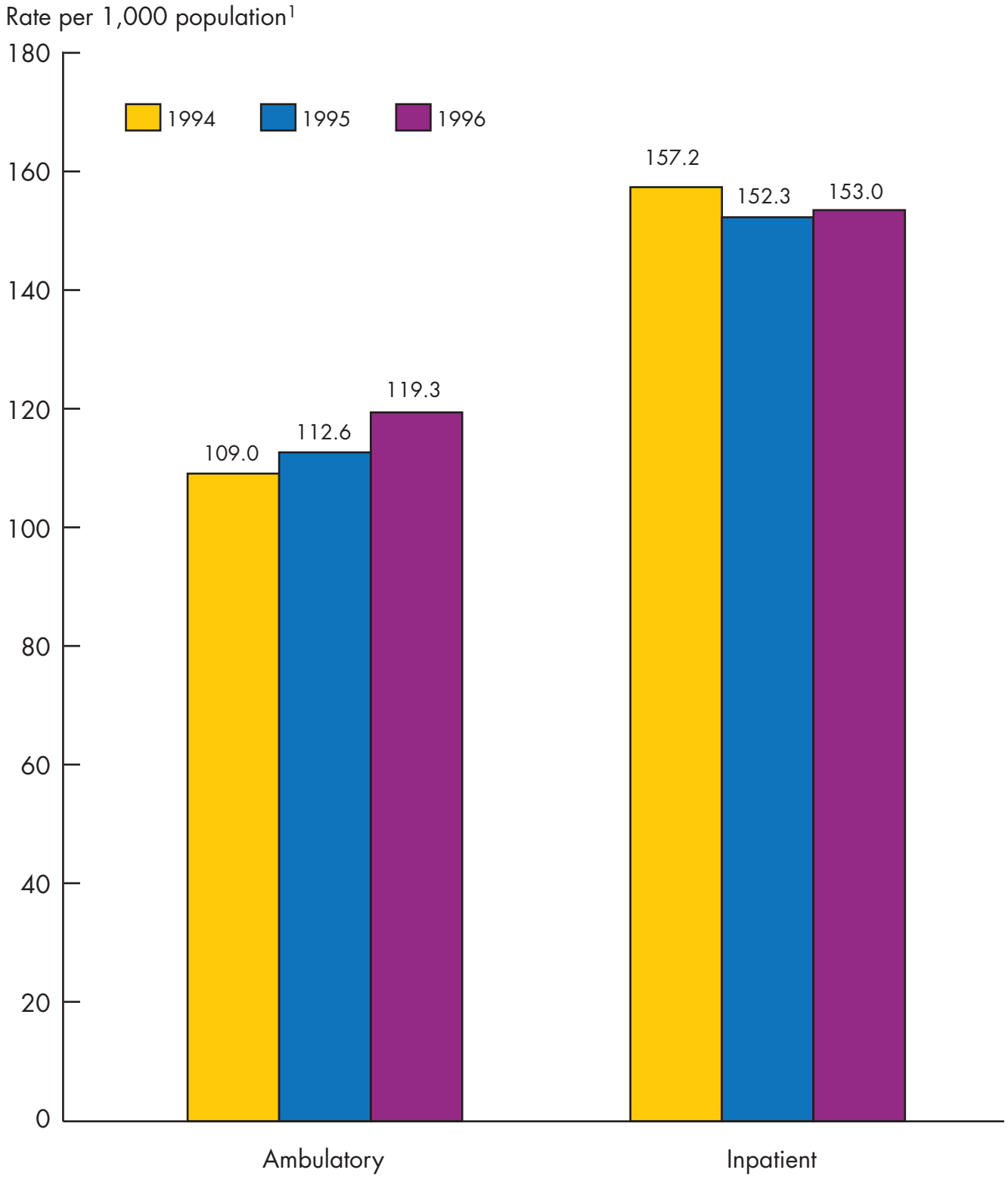
Ambulatory and Inpatient Procedures

Procedures that once were performed only on an inpatient basis are increasingly performed in a variety of outpatient and ambulatory care settings. Advancements in medical technology and the development of noninvasive or minimally invasive surgical and nonsurgical procedures have contributed to growth in outpatient ambulatory surgical care (8). For example, endosurgery and the development of laparoscopic technology dramatically reduced the need for lengthy hospital stays for these procedures. In many cases, surgeries once requiring several days of postoperative observation and care have become same-day procedures. Pressures from payers and employers to contain health care costs also have been associated with the shift to less costly outpatient procedures (62).

The overall number of procedures, ambulatory and inpatient combined, performed in the United States increased from about 3 million in 1980 to 31.5 million in 1996 (62,63). This growth is also evident in population rates (**chart 16**). However, between 1994 and 1996, during which time the National Survey of Ambulatory Surgery was fielded, the rate did not change significantly for ambulatory procedures. For the same 3-year period, the rate of inpatient surgical procedures also did not change significantly. However, a previous study noted that, during the longer period of 1980–95, the rate of inpatient surgical operations decreased significantly, although the rate for ambulatory operations significantly increased (64).

Overall rates of surgical procedures, however, mask shifts from inpatient to ambulatory sites for many specific procedures. The discussion of tonsillectomies and myringotomy (see chart 32) illustrates the shift in location of minor surgeries. The location of most eye operations has also shifted. The rate of inpatient operations on the eye decreased from 14.1 per 10,000 population in 1990 to 4.5 per 10,000 in 1998, although cataracts remain one of the most common procedures paid for by the Medicare program—now on an outpatient basis (8,65). Between 1986 and 1995, the proportion of mastectomies performed on an outpatient basis increased from an undetectable percentage to 10.8 percent (66).

Chart 16: All-listed ambulatory and inpatient procedures: United States, 1994–1996



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS) and National Survey of Ambulatory Surgery (NSAS).

Duration of Hospitalizations, Physician Office Visits, and Hospital Outpatient Department Visits

Time spent with a physician has been found to influence health care costs and patient satisfaction (67,68). Between 1990–91 and 2000, the mean duration for office-based physician visits increased slightly, from 16.7 minutes to about 18 minutes (**chart 17**).[c] This result is somewhat surprising given perceptions of shorter visits associated with managed care and employer and insurer focus on reducing costs and increased productivity (69).

Mean time spent with physicians at outpatient departments (OPDs) remained constant at an average of slightly longer than 18 minutes from 1997–2000 (data not shown). Although the overall average duration of physician and hospital outpatient visits did not decrease, this may mask differences in duration of visit for specific populations and for specific conditions. For example, between 1985 and 1995, office-based psychiatry visits became shorter, and the proportion of visits that lasted 10 minutes or less increased (70). Other research has concluded that, on average, physicians who rely on capitated plans for a large percentage of their income spent slightly less time with their patients compared to physicians who do not (71).

In recent years, the backlash against real or perceived hospital length-of-stay restrictions imposed by managed care policies and insurance companies has resulted in legislation mandating insurance coverage for longer stays for maternity and neonatal patients (72). Transfers of selected procedures from inpatient to outpatient settings also may have contributed to a higher average length of stay for the more complex procedures still treated in the hospital setting (see "Tonsillectomy and Myingotomy" and "Ambulatory and Inpatient Procedures"). Nevertheless, the length of stay in non-Federal, short-stay hospitals peaked in the early 1980s and has been decreasing ever since (39). The average length of stay declined from 6.4 days for the combined years 1990–91 to slightly less than 5 days in 2000.

[c] Duration of visit to a physician's office or to a physician in a hospital outpatient department 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, the duration was recorded as "zero" minutes.

Chart 17: Mean duration of medical encounters for physician office visits and hospital stays: United States, 1990–2000

Year	Office-based physician visits (minutes)[1]	Short-stay hospital length of stay (days)[1]
1990–91	16.7	6.4
1992–93	17.7	6.1
1994–95	17.4	5.6
1996–97	17.2	5.2
1998–99	18.0	5.0
2000	18.1	4.9

[1]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Discharge Survey (NHDS)

Use of Home Health Care Services

Home health care is the provision of services to individuals and their families in their homes for the purpose of promoting, maintaining, or restoring health. Persons using home health care services provided by a home health care agency include the chronically ill and disabled of all ages, those recuperating from a hospitalization or acute illness, and the terminally ill.

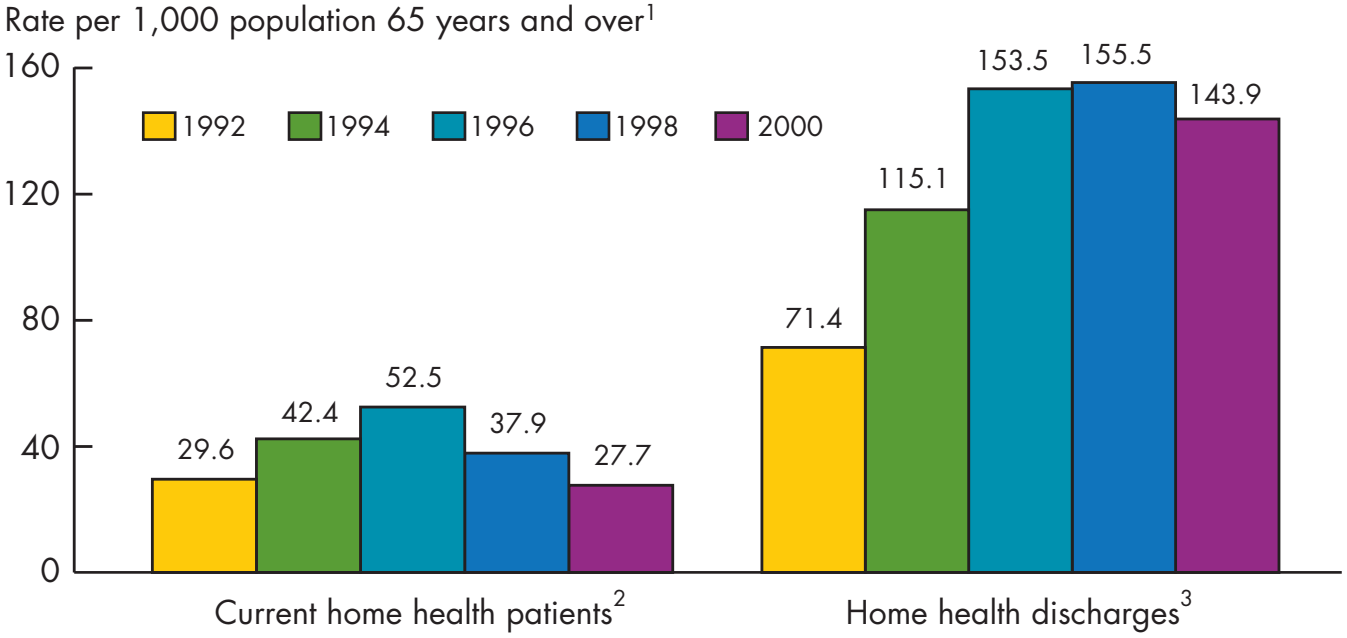
Between 1992 and 1996, the rate of elderly persons using home health services rose from 29.6 per 1,000 persons to 52.5 per 1,000 persons, respectively. After 1996, the rate declined to 27.7 per 1,000 persons in 2000 (**chart 18A**). Because 7 out of 10 home health patients were elderly, rates of home health use for all age groups followed a similar pattern. The overall rate of home health utilization for every 1,000 persons increased from 4.8 in 1992 to 9.1 in 1996 before dropping to 4.9 in 2000 (**chart 18B**).

In 1996, the number of persons receiving home health services on any given day (2.4 million persons) was lower than the estimated 7.2 million persons who received at least one home health visit during the year because it excluded persons with completed episodes of care. The 1996 annual number of discharges from home health agencies (7.8 million discharges) more closely approximates the number of persons with at least one home health visit during the year (73).[d] Chart 18B shows that the rate of home health discharges of all ages per 1,000 population reached a peak at 29 in 1996 and leveled to 25.8 in 2000. Among the elderly, the discharge rate per 1,000 population increased from 71.4 in 1992 to 143.9 in 2000.

The rate of elderly home health patients on any given day per 1,000 population reflects the influence of the Balanced Budget Act of 1997. An evaluation of the home health prospective payment system found that prospectively paid home health agencies significantly reduced the length of time patients remained in home health care as well as the average number of visits (74). Since 1996, the average length of service for all home health discharges declined from 97.9 days to 69.5 days in 2000 (data not shown).

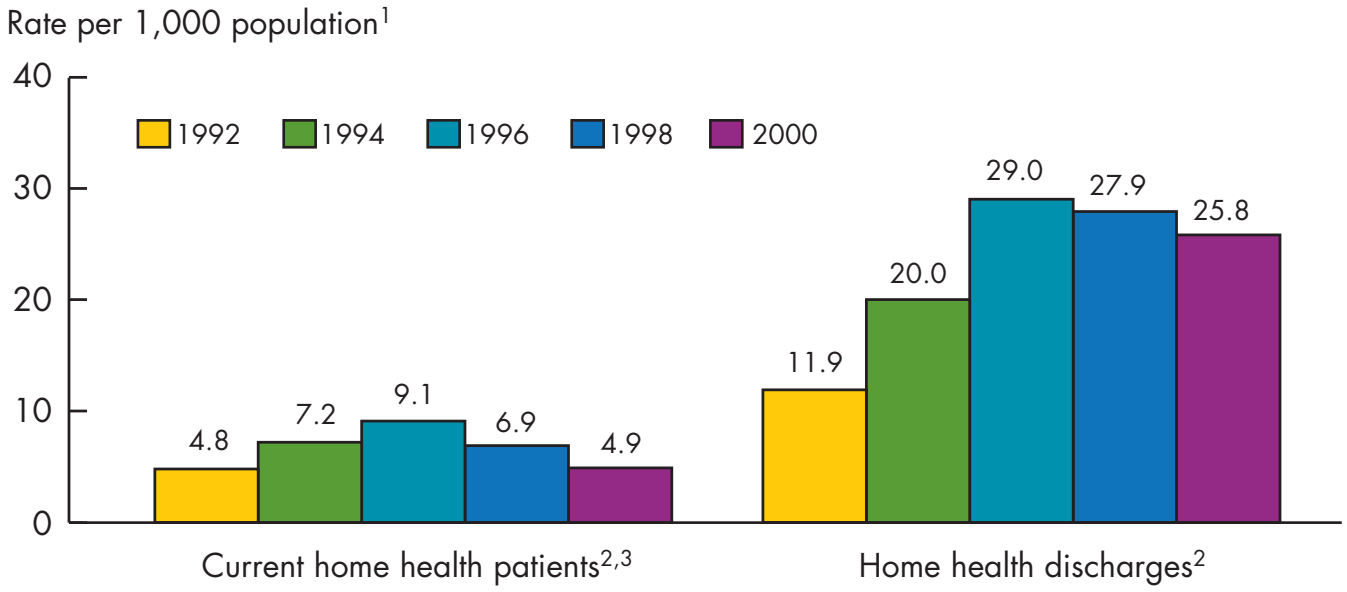
[d] Discharges may include persons discharged more than once from home health agencies during the year.

Chart 18A: Use of home health care by the population 65 years of age and over: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend before and after 1996 is significant ($p<0.05$). [3]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

Chart 18B: Use of home health care by population of all ages: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Upward time trend before 1996 is significant ($p<0.05$). [3]Downward time trend after 1996 is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

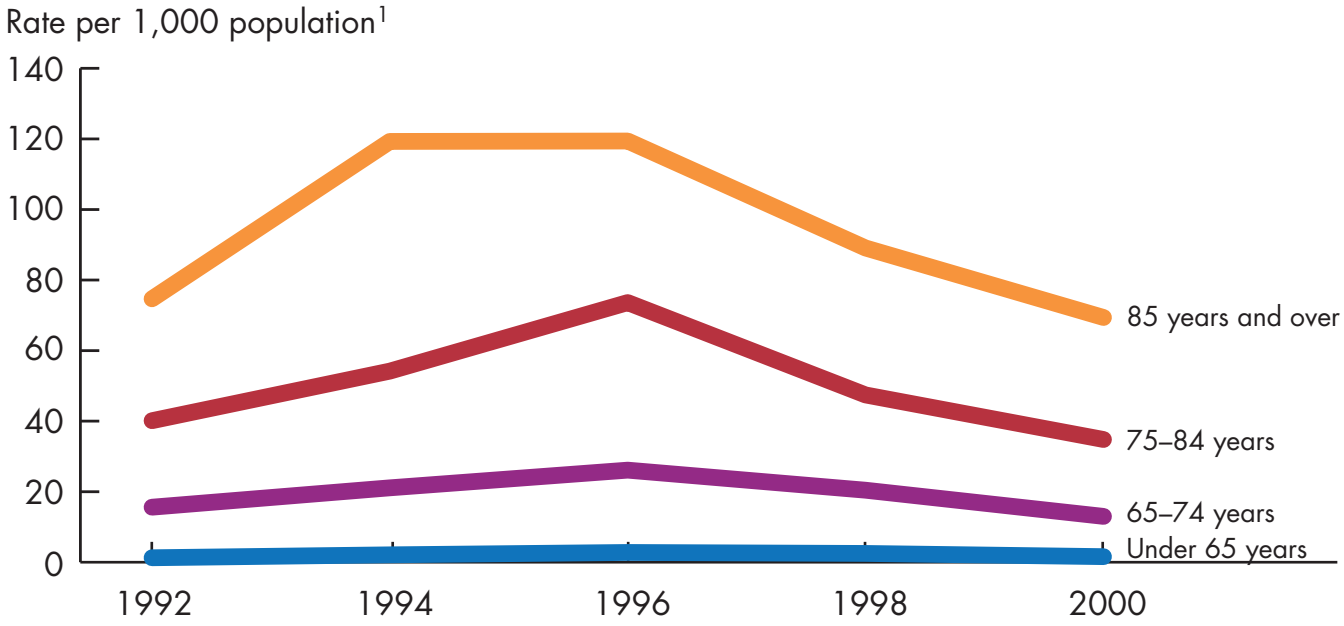
Home Health Patient Characteristics

Between 1992 and 1998, the types of services received by home health patients changed. The percentage of home health patients who received homemaker services peaked at 26 percent in 1996, when Medicare payment was most generous, before dropping back to 22 percent in 1998. Similarly, more patients received high-tech home care services in 1996 than in 1998 (8). *High-tech* home care is the application of technology at home to patients with acute, subacute, or chronic organ diseases, dysfunction, or failure. High-tech diagnostic and therapeutic services available in the home include IV antibiotics, transfusion therapy, chemotherapy, dialysis, enteral and parenteral nutrition, long-term oxygen therapy, hydration, x ray/radiology, mechanical ventilation, and sleep studies (*75*).

Patients receiving home health services on any given day are a subset of all users during the year. Data from this sample of current patients, however, present a cross-sectional picture of typical users. In 2000, 4.9 of every 1,000 persons in the United States were enrolled in a home health program. Among these users, women used home health services (6.2 per 1,000 females) twice as often as men (3.5 per 1,000 males), particularly at 85 years of age and over (data not shown). Across time, (**chart 19A**) rates of home health use for all age groups peaked in 1996, then declined through 2000.

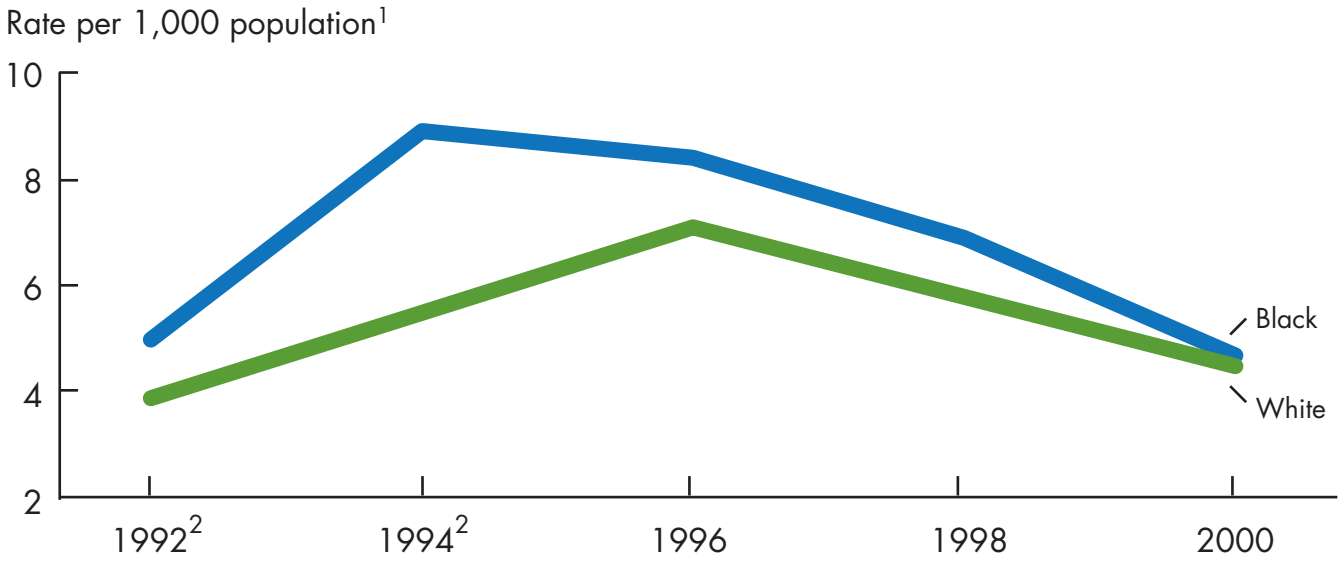
Rates of home health use among white persons also peaked in 1996, increasing from 3.9 per 1,000 white persons in 1992 to 7.1 in 1996, before dropping to 4.5 per 1,000 population in 2000. Previous studies found that during the early 1990s, black persons were more likely than white persons to use postacute care services provided by home health agencies than nursing homes (*76,77*). During 1992–94, rates of current home health use among black persons exceeded that for white persons (**chart 19B**). After 1994, racial differences in rates of home health use narrowed and were practically eliminated by 2000 (4.5 per 1,000 white persons compared with 4.7 per 1,000 black persons). The rate of home health use among black persons peaked earlier in 1994, increasing from 5 per 1,000 black persons in 1992 to 8.9 per 1,000 in 1994 before declining to 4.7 per 1,000 black persons in 2000.

Chart 19A: Current home health patients, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
NOTE: For all age groups, rates increased significantly through 1996 and decreased significantly from 1996–2000.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

Chart 19B: Current home health patients, by race: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.[2]Difference between black and white populations is significant ($p<0.05$).
NOTE: Time trend differences before and after 1996 for white patients are significant. Time trend differences before and after1994 for black patients are significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

Use of Nursing Homes

Nursing homes traditionally provide two types of care: chronic care for the frail elderly and short-term subacute care for persons recuperating from a hospitalization or an acute condition. Subacute care has been defined as a comprehensive, cost-effective inpatient level of care for patients who are medically stable but still require significant health care services. Typically, short-term, subacute care is designed to return patients to the community or transition them to a lower level of care (78).

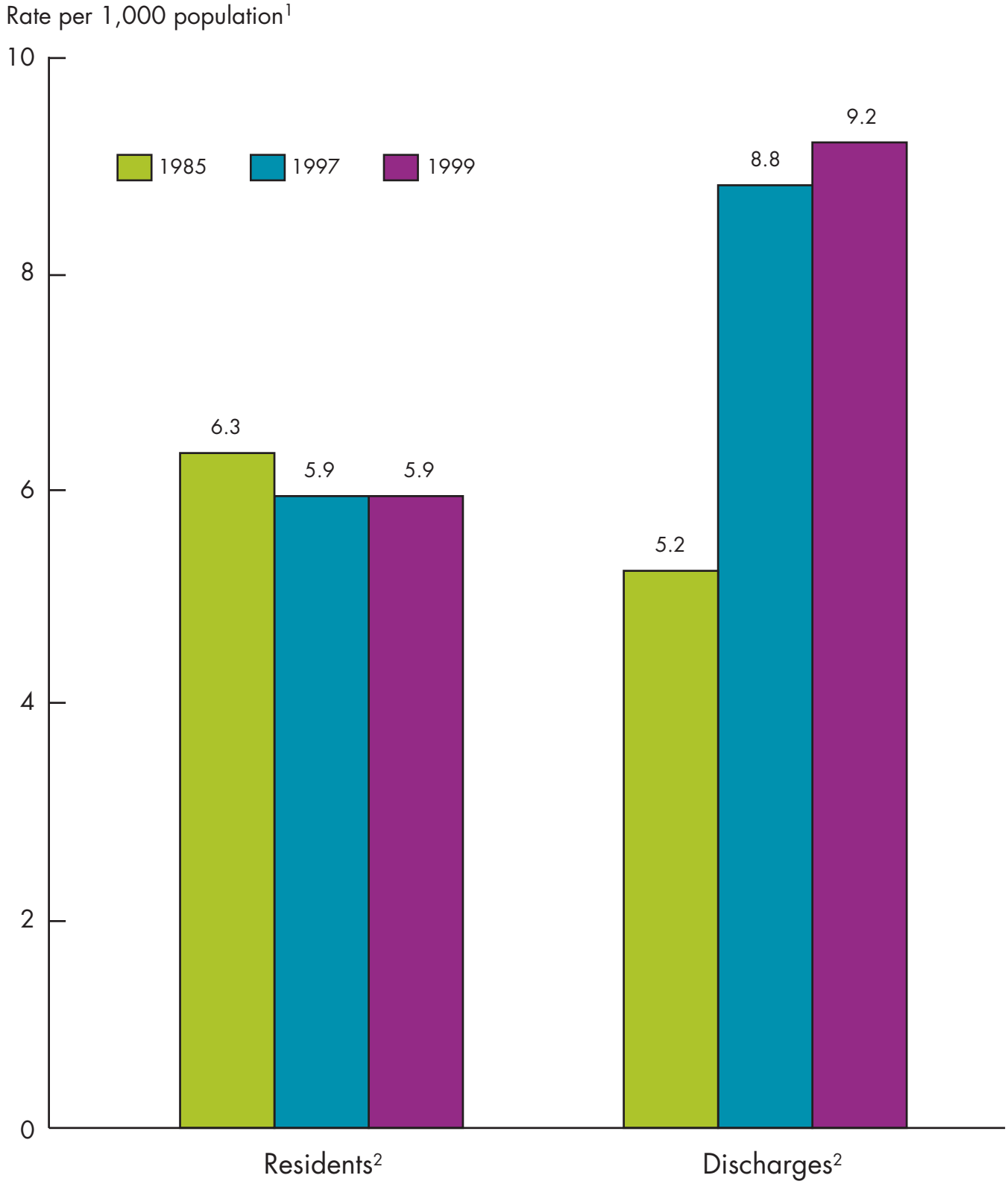
Nursing home patients requiring care for long-term chronic conditions are more likely to be current residents—that is, to be residing in a nursing home as of a given day as captured on the facility's daily patient census—although subacute patients are more likely to have been represented in the National Nursing Home Survey discharge sample (79). Between 1985 and 1999, the rate of current residents in nursing homes per 1,000 population declined by 7 percent, although the rate of discharges from nursing homes per 1,000 population increased by 80 percent during the same time period, from 5.2 to 9.2, respectively (**chart 20**).

Similar trends were found among the elderly population 65 years of age and over, the predominant users of nursing homes. Among the elderly, the nursing home residency rate per 1,000 elderly persons declined from 46 in 1985 to 43 in 1999, although the nursing home discharge rate per 1,000 elderly increased from 38 in 1985 to 65 in 1999 (data not shown).

The shift in focus from custodial to rehabilitative care is reflected in shorter stays for current residents. The average stay for current residents as of the day of the survey declined 16 percent between 1985 and 1999, from 1,059 days in 1985 to 892 days in 1999 (80,81). For discharges, there was a 32 percent decline in length of stay during the same time period, from 401 days in 1985 to 271 days in 1999 (80,81).

A previous study attributed the decline in the nursing home residency rate to increased focus of nursing homes on patients with greater disability and postacute care needs as well as increased preference for alternatives to nursing home care (82). Since the late 1980s, home health and community-based care services became more widely available, and coverage of Medicare home health care expanded (83). It has been hypothesized that increased use of assisted living facilities is substituting for some nursing home care since the late 1980s (See "Special Care Units and Other Long-Term Care Residences").

Chart 20: Nursing home residents and nursing home discharges: United States, 1985–1999



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey (NNHS).

Nursing Home Resident Characteristics

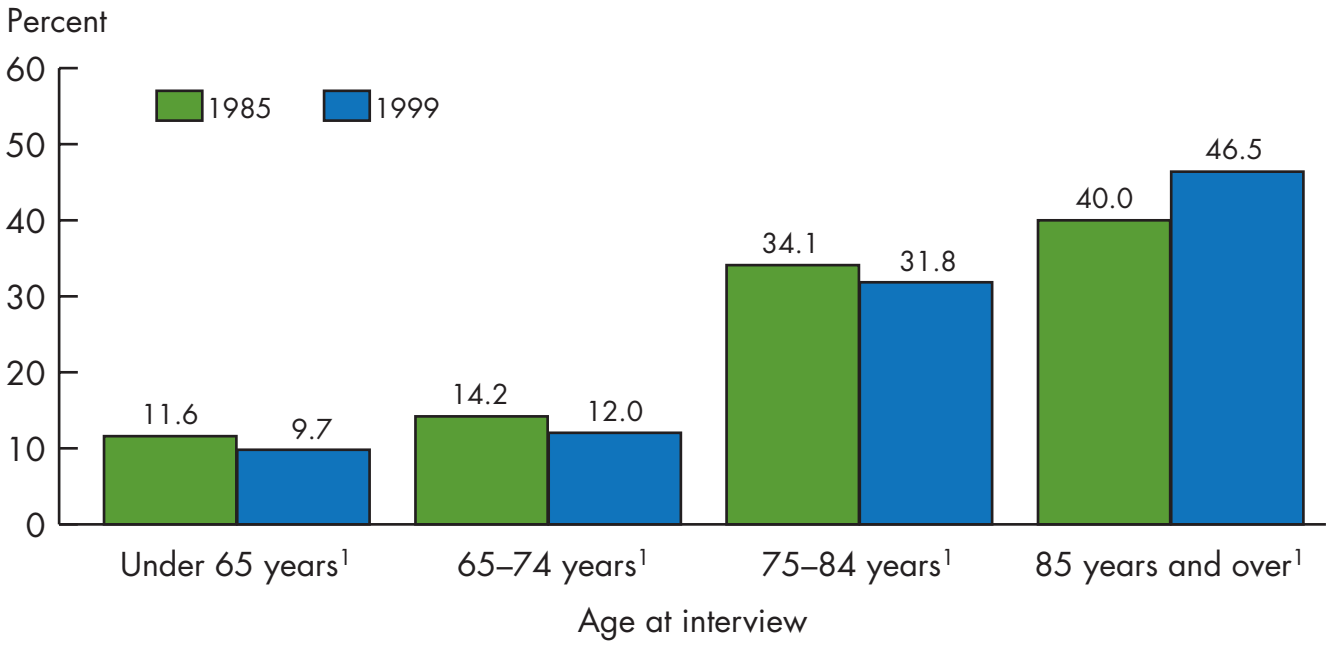
As an increasing number of patients were transferred from hospitals to nursing homes, many nursing homes shifted their focus from primarily custodial to rehabilitative care. At the same time, persons needing primarily custodial care looked for care in less institutionalized long-term care settings (84). In 1999, the nursing home resident population was older and more disabled than were residents in 1985. In 1999, nearly one-half of nursing home residents were 85 years of age or over, compared with 40 percent in 1985 (**chart 21A**). The average age of nursing home residents in 1999 was 81 years (compared with 79 years in 1985). In 1999, three-fourths of nursing home residents received assistance in three or more activities of daily living, compared with 65 percent in 1985, and 65 percent were incontinent, compared with 52 percent in 1985 (85,86).[e] A 1996 Institute of Medicine report concluded, "Sicker patients tend to concentrate in nursing homes" (35).

In 1985, elderly black residents were underrepresented in nursing homes (35 per 1,000 elderly black persons) compared to elderly white residents (47.7 per 1,000 elderly white persons, data not shown) (80). By 1995, however, this disparity had disappeared, and by 1997, the residency rate among elderly black persons was significantly higher than that for elderly white persons (49.4 per 1,000 elderly black persons compared with 43 per 1,000 elderly white persons) (87). This trend continued through 1999 (86,88).[f] **Chart 21B** shows that the nursing home residency rate declined for both sexes among elderly white persons, although the residency rate increased for both sexes among elderly black persons. A previous study found that black persons were more likely to have long-term stays in nursing homes following a hospitalization than were elderly white persons (89). At the same time, assisted living and other combinations of services and living arrangements other than licensed nursing homes may be filling the gap left by declining nursing home use among the elderly white population (82).

Previous research found that short-stay nursing home users most likely to receive postacute services were younger, more likely to be male, married, cognitively intact, bedfast, and to suffer from fractures or cancer than were longer-stay users (90). Compared to 1985, nursing home discharges (who are more likely to receive postacute care and to have shorter stays than are "current residents" as of a particular day) in 1999 were more likely to be married (27.9 percent compared with 22.3 percent in 1985) and less likely to be widowed (48.1 percent compared with 54.7 percent in 1985).

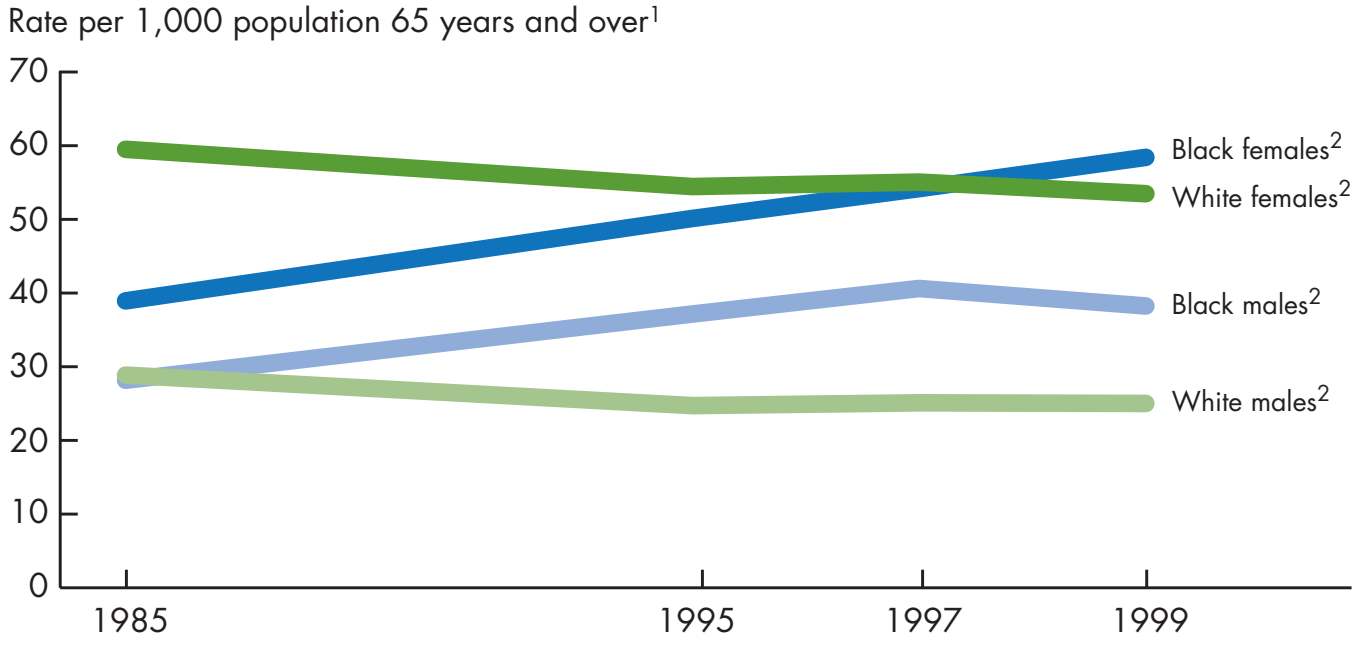
[e] 1985 estimates were recomputed to include five (instead of six) activities of daily living.
[f] In 1999, cases with multiple races are included in the 'other race' category.

Chart 21A: Age distribution of nursing home residents: United States, 1985 and 1999



[1]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statisitics, National Nursing Home Survey (NNHS).

Chart 21B: Nursing home residents 65 years and over, by race and sex: United States, 1985–1999



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey (NNHS).

Injuries

Injuries are a substantial and preventable public health problem that cost the Nation over $200 billion in lost productivity and medical care in 1995 (91). In 1997, there were 34.4 million medically attended episodes of injuries and poisonings among the U.S. civilian noninstitutionalized population, resulting in an age-adjusted rate of 1,289 episodes per 10,000 persons. For 7 percent of these episodes, the injured person was hospitalized (92).

Injury is a major cause of death for the young. In 2000, 75 percent of all deaths among young persons 15–24 years of age were caused by injuries compared with 2 percent of all deaths among those 65 years of age and over (93).

During the 1990s, injury prevention and control activities accelerated in the United States. Along with these efforts, the definition of injury was changed to exclude adverse effects of drugs and complications of medical and surgical care, in order to better identify conditions associated with injuries alone (94). **Charts 22**, **23A**, and **23B** (on injury rates in home health care agencies and nursing homes) incorporate this injury definition. Recent efforts are now underway that will standardize how States report injuries in hospitals (95).

In 1999–2000, physicians' offices and hospital emergency departments (EDs) were the most frequent treatment sites for injuries; the injury visit rate per 10,000 population where injury was the first-listed diagnosis or condition was 1,485 in physicians' offices, 1,062 in hospital EDs, and 179 in hospital outpatient departments. It should be pointed out that some injury visits to physician's offices and clinics might have been followup visits after an initial ED visit; about 40 percent of ED injury visits resulted in a referral to another physician or clinic (96). Between 1992 and 2000, injury visit rates in these three health care settings were relatively stable (chart 22). The stability of the ED injury visit rates during the 1990s, however, masks declines in the injury visit rate for children under 15 years of age and for injuries due to falls (37).

One indicator of the severity of an injury presenting to an ED is whether the injured person is hospitalized. A previous study found that 6 percent of injury visits to EDs resulted in hospitalization. The percentage of admissions increased with patient age. Injuries most likely to result in an admission from the ED to a hospital were caused by firearms, poisoning, falls, and motor vehicle accidents (96).

Chart 22 also shows that the injury hospitalization rate declined 19 percent from 1992–1993 (80 per 10,000 population) to 1999–2000 (65 per 10,000 population). Although hospital ED injury rates were highest at 15–24 years of age, injury hospitalization rates were highest among the elderly. The most common type of injury among hospitalized elderly is fractures (97).

Chart 22: Injury care rates: United States, 1992–2000

Year	Office-based physician visits	Hospital outpatient department visits	Hospital emergency department visits	Short-stay hospital discharges[1]
	Rate per 10,000 population[2]			
1992–93	1,837	142	1,105	80
1996–97	1,704	147	1,029	69
1999–2000	1,485	179	1,062	65

[1]Time trend is significant ($p<0.05$). [2]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
NOTE: Injuries include first-listed ICD–9–CM codes 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, 995.80–995.85.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS), National Hospital Discharge Survey (NHDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS).

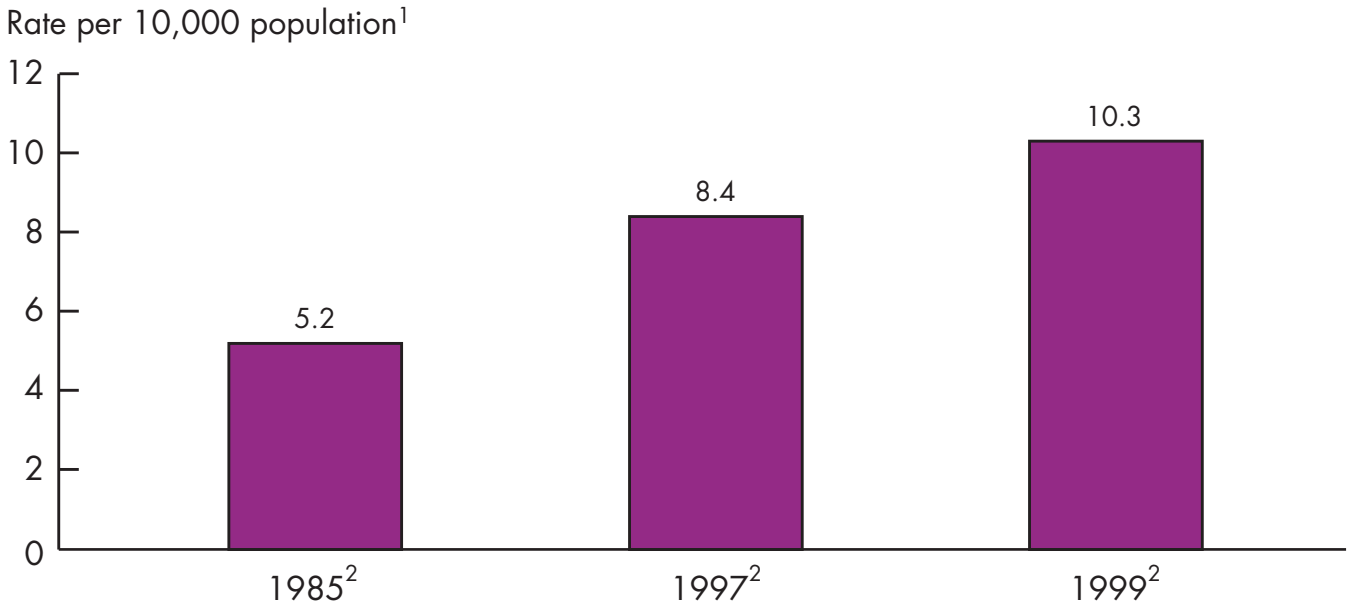
Injuries Treated in Nursing Homes and Home Health Agencies

Between 1985 and 1999, the number of first-listed, injury-related discharges from nursing homes increased from about 122,000 to about 284,000 discharges (data not shown), and the rate per 10,000 population doubled from 5 in 1985 to 10 in 1999 (**chart 23A**). As in the previous section on injuries ("Injuries"), the definition of injury used here excludes adverse effects of drugs and complications of medical and surgical care.

In both 1985 and 1999, about one-half of all injury discharges from nursing homes had a principal (first-listed) diagnosis of hip or other fracture. Based on the Diagnosis Related Group (DRG) classification used by Medicare's hospital Prospective Payment System, persons with conditions involving hip fractures and their repair (DRGs 209, 210, 236) and back and neck procedures (DRGs 214, 215) frequently were transferred to skilled nursing homes and home health agencies for postacute care (98). Analysis of the National Hospital Discharge Survey shows that, between 1990 and 1999, the rate per 100 hospital discharges with injury or poisonings (ICD–9–CM 800–999) as first-listed diagnoses among transfers to long-term care facilities increased from 8 to 15.5; the bulk of injury and poisoning transfers to long-term care facilities were for hip fractures (41 percent) and other fractures (24 percent) (99). During the 1990s, there was a trend toward shorter hospital stays (see "Duration of Hospitalizations, Physician Office Visits, and Outpatient Department Visits"), in part because patients with hip and other fractures and other patients requiring rehabilitation services were transferred to nursing homes and home health agencies for postacute care (35,100). This is supported by the fact that the number of nursing homes with specialized subacute units for residents requiring short-term recovery after serious trauma or accident has been increasing in the last 15 years (101).

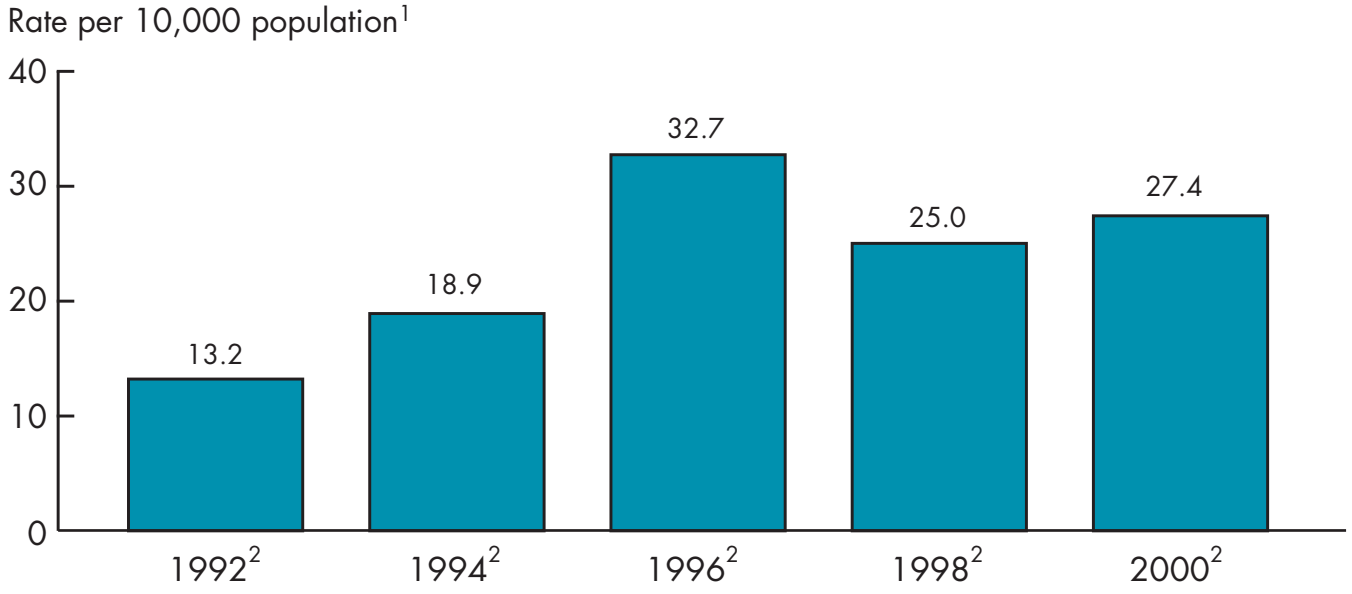
The rate of home health discharges admitted with a first-listed injury diagnosis increased from about 13 per 10,000 population in 1992 to about 33 per 10,000 population in 1996; the differences in the rates between 1996 and 2000 were not statistically significant (**chart 23B**). The lack of difference may be due to small sample sizes, or it may be related to use of multiple sites for postacute care. One study found that, although 51 percent of Medicare postacute care episodes in 1995 occurred only in home health agencies, in 19 percent of episodes the patient was treated in more than one setting, receiving care from some combination of nursing home, home health agency, skilled nursing facility, and/or rehabilitation facility (98).

Chart 23A: Nursing home discharges admitted with injuries: United States, 1985–1999



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Injuries include first-listed ICD–9–CM codes 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, 995.80–995.85.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey (NNHS).

Chart 23B: Home health discharges admitted with injuries: United States,1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend difference between 1992 and 1996 is significant ($p<0.05$).
NOTE: Injuries include first-listed ICD–9–CM codes 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, 995.80–995.85.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD), a common chronic condition associated with aging, is a major cause of death and disability and is consuming increasingly large amounts of health care services. COPD is the fourth leading cause of death in the United States, claiming the lives of over 100,000 Americans annually. Smoking is estimated to cause approximately 80 to 90 percent of COPD cases, and a smoker is 10 times more likely than a nonsmoker to die of COPD (102).

COPD is a major source of health care utilization and expenditures. In 2000, COPD was listed as a diagnosis for an estimated 6.9 million visits to physicians' office-based practices, 675,000 visits to hospital outpatient departments, 1.3 million visits to hospital emergency departments, and 3.3 million hospital discharges. Acute health care utilization rates for COPD in several health care settings have increased over time (**chart 24A**). Outpatient department visit rates have almost doubled, and hospital discharges have increased about 25 percent. For hospital discharges, most of this increase resulted from greater demand among persons 75 years of age and over whose hospitalizations for COPD rose from 681 to 875 discharges per 10,000 population (**chart 24B**). Outpatient department rates per population, however, are quite low compared to rates of visits to physician offices because the great majority of ambulatory care visits are to physicians' offices (38).

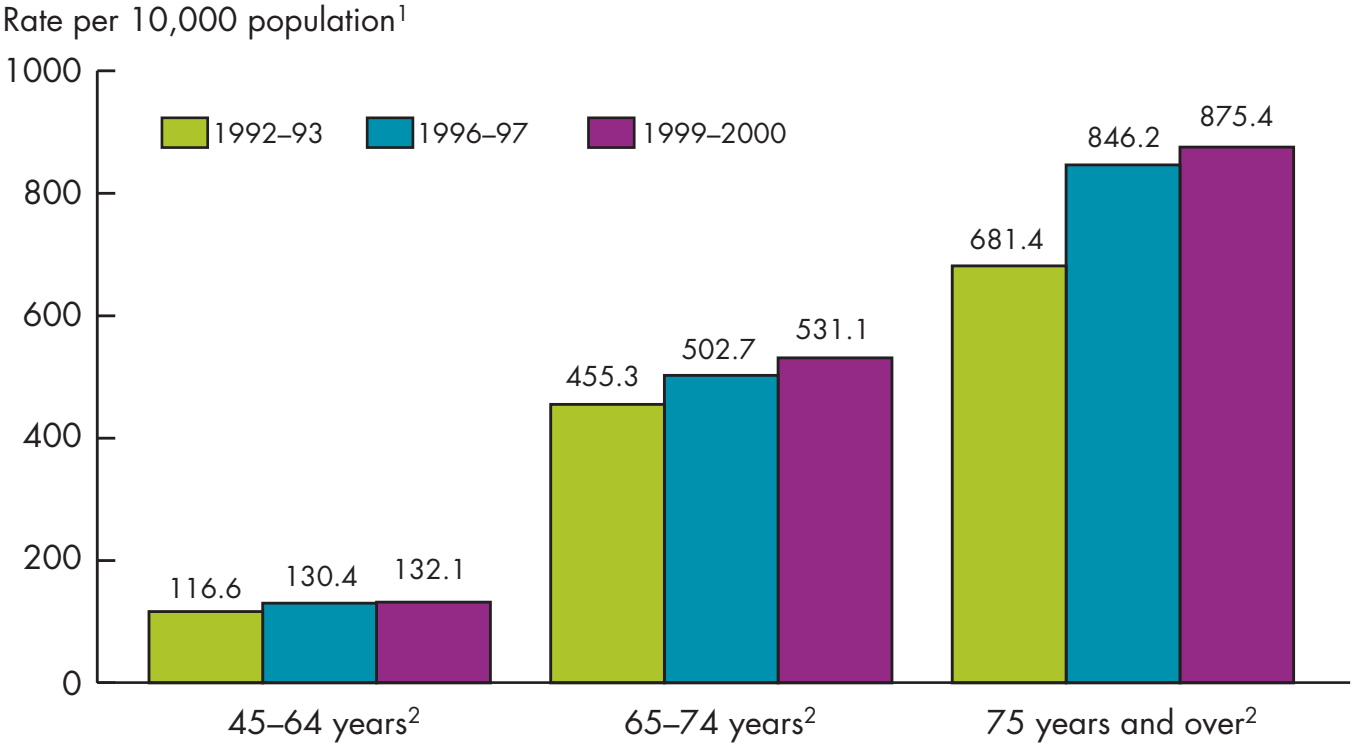
Because COPD is often considered a contributory cause of morbidity and mortality rather than the primary cause, estimates presented here are "any-listed," that is, not limited to encounters where COPD was the first-listed or principal diagnosis. Diagnosis of COPD is made by pulmonary function tests, along with the patient's history, examination, and other tests. There are indications, however, that the disease is underdiagnosed because these tests are underused and because the disease is not usually diagnosed until it is clinically apparent and moderately advanced (103). In addition, coding for COPD is not consistent across data collection activities or classification systems. Cause-of-death coding includes asthma in the COPD definition, although the American Lung Association considers asthma distinct from COPD. COPD is used to describe diseases that are characterized by air flow obstruction, and its definition often includes only emphysema and chronic bronchitis. Emphysema and chronic bronchitis frequently coexist, so the term COPD is frequently used to describe both diseases. In addition, asthma is sometimes diagnosed as chronic bronchitis and vice versa. Statistics presented here exclude all asthma ICD–9–CM codes.

Chart 24A: Chronic obstructive pulmonary disease utilization rates: United States, 1992–2000

Year	Office-based physician visits	Hospital outpatient department visits[1]	Hospital emergency department visits[1]	Short-stay hospital discharges[1]
	Rate per 10,000 population[2]			
1992–93	318	15	29	94
1996–97	342	25	31	113
1999–2000	280	29	44	119

[1]Time trend is significant ($p<0.05$). [2]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
NOTE: Chronic obstructive pulmonary disease includes any-listed ICD–9–CM codes 491.0, 491.2, 491.8, 491.9, 492.8, 493.2, 496.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS), National Hospital Discharge Survey (NHDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 24B: Chronic obstructive pulmonary disease discharges from short-stay hospitals, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Chronic obstructive pulmonary disease includes any-listed ICD–9–CM codes 491.0, 491.2, 491.8, 491.9, 492.8, 493.2, 496.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Diabetes

Diabetes mellitus is another example of a disease associated with aging and with disability. Diabetes is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin secretion, insulin action, or both. Diabetes can be associated with serious complications and premature death, especially if it is not well-controlled. Complications can include disorders of the kidneys, nerves, blood vessels, and eyes, and diabetes is a major contributing factor to blindness, end-stage renal disease, and lower extremity amputations (104). Heart disease is the leading cause of diabetes-related deaths, and adults with diabetes have heart disease death rates about 2 to 4 times higher than adults without diabetes (105). In 2000, diabetes was the fifth leading cause of death by disease (106).

Because early-stage, adult-onset diabetes may be asymptomatic, prevalence rates of diabetes represent an underestimate of the true prevalence of the disease. Results from the National Health and Nutrition Examination Survey in 1988–94 showed that a significant number of adults with diabetes were unaware of their disease and had not been diagnosed. About 3 percent of adults 20 years of age and over without diagnosed diabetes had test results indicative of diabetes (107).

Prevalence rates of diagnosed diabetes have been increasing in recent years, especially among the elderly. Among U.S. adults, diagnosed diabetes increased 49 percent between 1990 and 2000. Similar increases are expected in the next decade and beyond (107). Of particular concern is the rising obesity rate in the United States, which may be related to the rise in diabetes incidence among younger populations and, most alarmingly, among children (108,109).

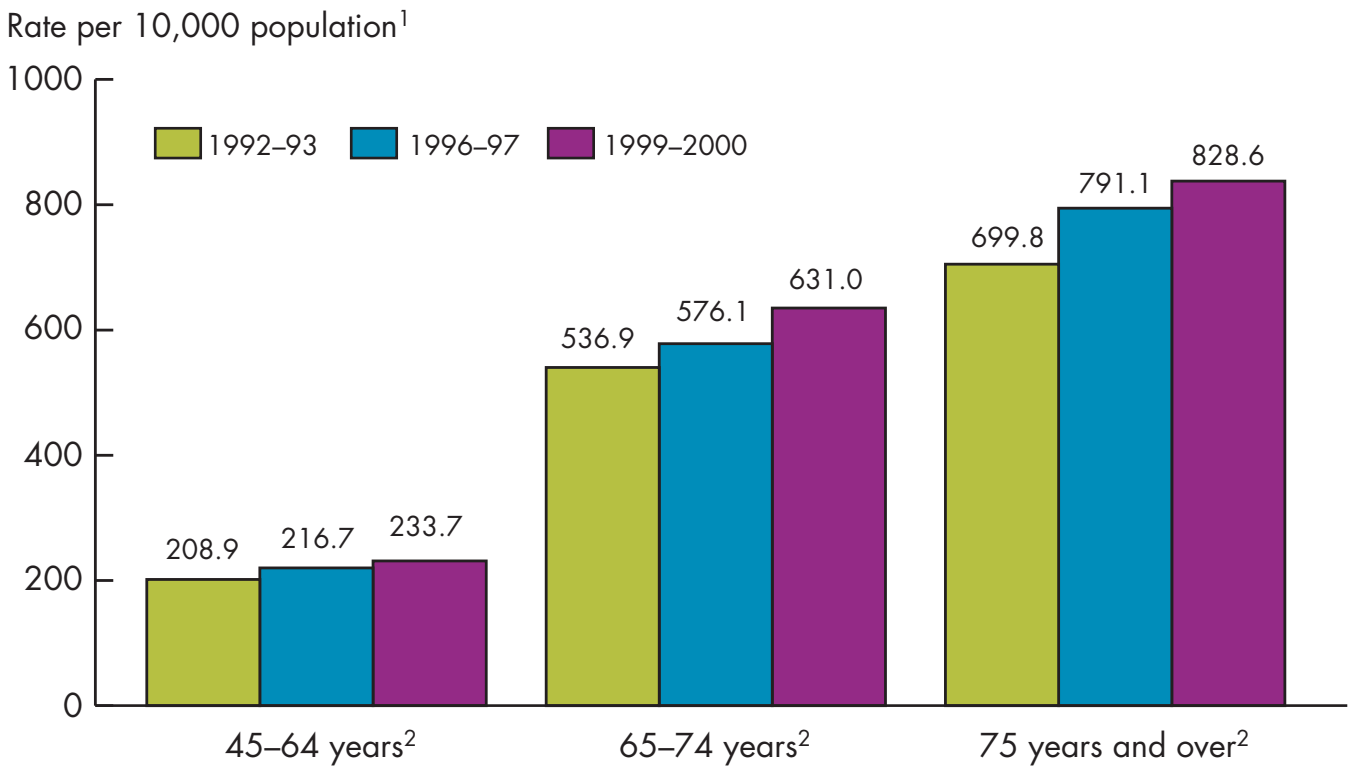
Use of hospital and physician services for persons with an any-listed diagnosis of diabetes has increased since the early 1990s (**chart 25A**). The hospitalization rate per 10,000 persons increased over 20 percent, from 130 in 1992–93 to 157 in 1999–2000, as a result of elevated rates particularly for persons 65 years of age and over (**chart 25B**). Use rates in physicians' offices also increased substantially, as did visits to emergency departments. Increases in use of all types of acute care emphasize the increasing resources devoted to the disease.

Chart 25A: Diabetes care utilization rates: United States, 1992–2000

Year	Office-based physician visits	Hospital outpatient department visits[1]	Hospital emergency department visits[1]	Short-stay hospital discharges[1]
	Rate per 10,000 population[2]			
1992–93	962	84	33	130
1996–97	1,120	157	38	144
1999–2000	1,356	157	48	157

[1]Time trend is significant ($p<0.05$). [2]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used.
NOTE: Diabetes includes any-listed ICD–9–CM code 250 and excludes gestational and neonatal diabetes.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS), National Hospital Discharge Survey (NHDS), and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 25B: Diabetes discharges from short-stay hospitals, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Diabetes includes any-listed ICD–9–CM code 250 and excludes gestational and neonatal diabetes.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

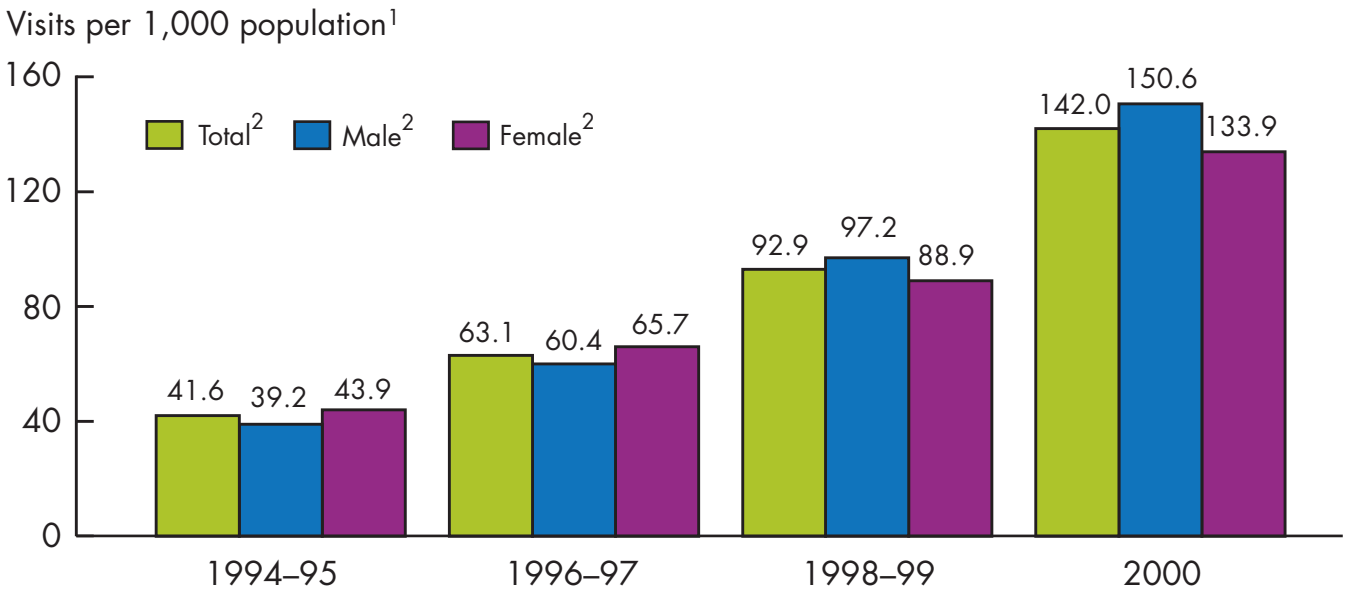
Lipid-lowering and Diabetes Drugs

Rates of anticholesterol medications (also called *hyperlipidemia drugs*) associated with visits to physicians offices or hospital outpatient departments (OPDs) have increased dramatically, rising from 42 visits per 1,000 population in 1994–95 to 142 visits per 1,000 population in 2000 (**chart 26A**). In part, this is due to an increased emphasis on cholesterol as a risk factor for heart disease. The National Cholesterol Education Panel, appointed by the National Heart, Lung and Blood Institute, issued its second adult treatment panel in 1993, with increased emphasis on cholesterol-controlling medications. New recommendations issued in May 2001 increased the number of Americans who are candidates for cholesterol-lowering drugs from 13 million under the 1993 guidelines to about 36 million. This recommendation may be associated with an even greater increase in prescribing of these drugs after 2000 (110).

Research has shown that a fairly low percentage of people who are theoretically candidates for cholesterol-lowering drug treatment actually undergo treatment, and many who start do not follow through with it. Results from the National Health and Nutrition Examination Survey show that, among participants who had high cholesterol based on a blood test or who were currently taking cholesterol-lowering medication, 69.5 percent reported having had their cholesterol checked, and only 12.0 percent were currently on treatment (111). Better use of clinical opportunities to screen for high blood cholesterol could substantially accelerate the progress in identifying persons who are likely to benefit from cholesterol reduction (112).

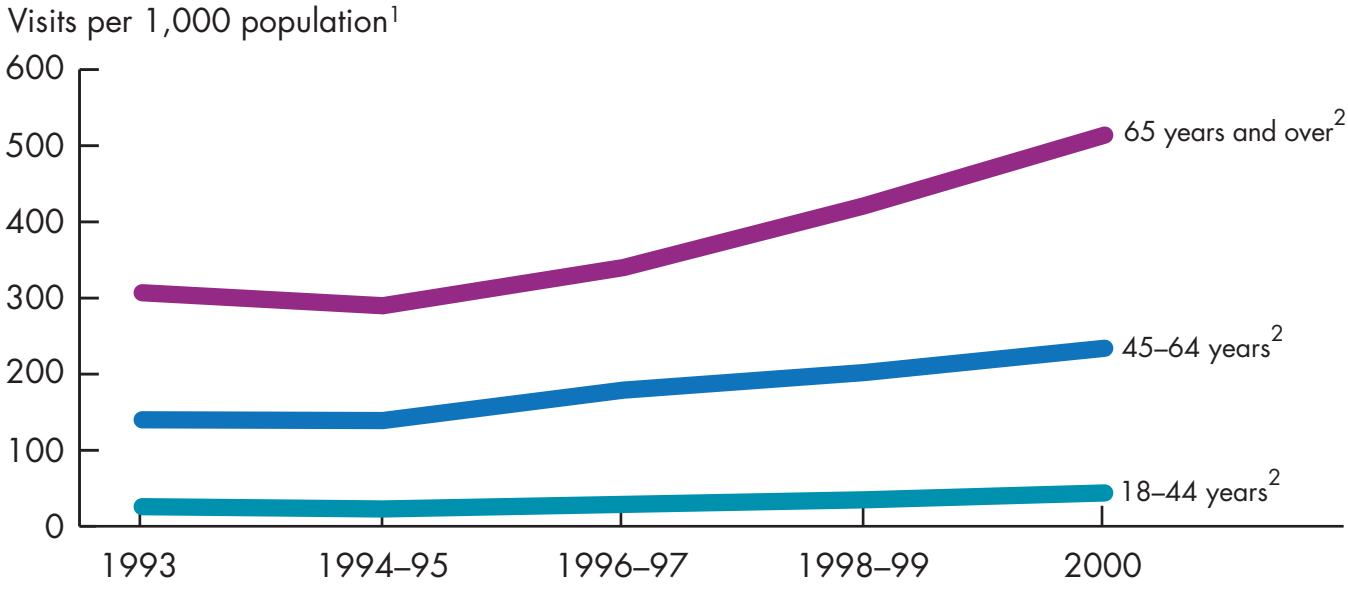
New and better types of oral diabetes medications have also been introduced over the past decade. Improved glucose-control decreases the risk of complications and ultimately decreases health care costs (113). Better control of diabetes reduces the incidence of diabetes-related complications including amputations, flu- and pneumonia-related death, eye disease and blindness, and kidney disease. **Chart 26B** shows that blood-glucose regulators are increasingly being mentioned during physician office and hospital OPD visits for all age groups, with the highest mention rates for the population 65 years of age and over.

Chart 26A: Hyperlipidemia drug mention during physician office and hospital outpatient department visits, by sex: United States,1994–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 26B: Blood glucose regulator drug mention during physician office and hospital outpatient department visits, by age: United States, 1993–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Antidepressant Drug Mentions in Physician Office and Hospital Outpatient Department (OPD) Visits by Age

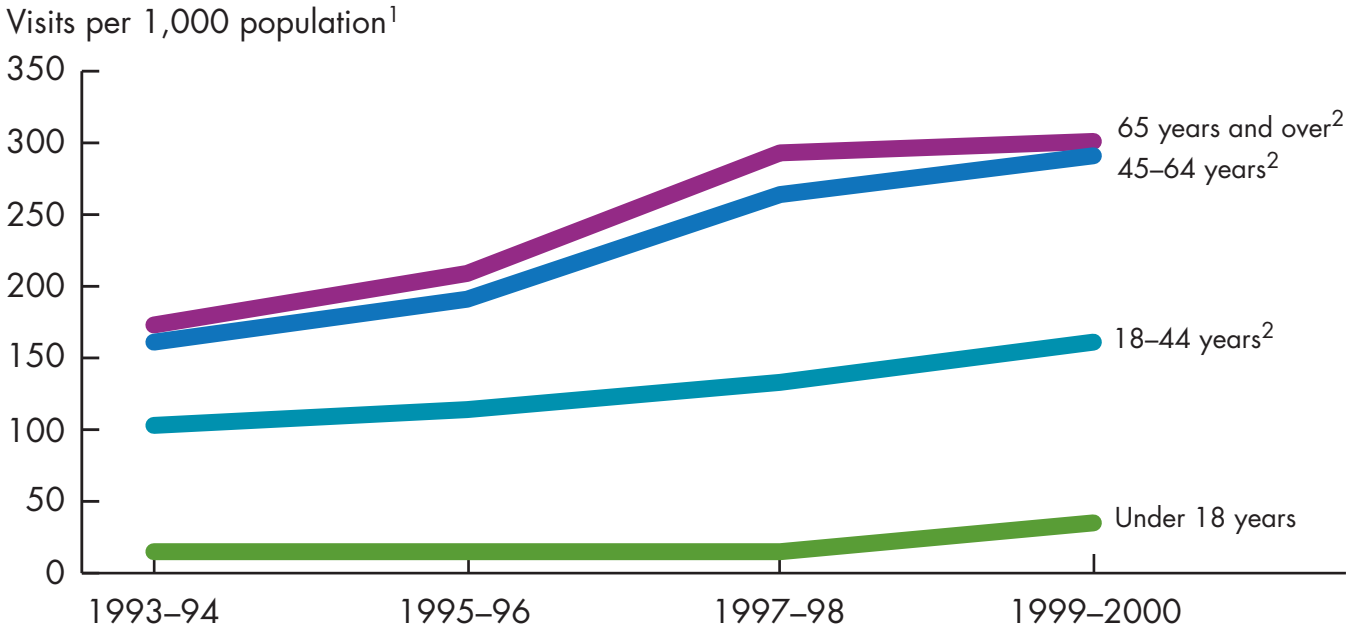
Depression represents a critical public health problem in America today. As many as 1 in 8 Americans experiences an episode of depression that requires treatment in his or her lifetime (114). According to the Council on Scientific Affairs of the American Medical Association, up to 4 percent of people currently suffer from depression. The detrimental effects of depression on quality of life and daily functioning have been estimated to match those of heart disease and to exceed those of diabetes, arthritis, and peptic ulcer disease (115).

In the United States, about 75 percent of persons seeking help for depression go to a primary care physician rather than to a mental health professional (116). Between 1985 and 1994, visits for depression doubled among both primary care physicians and psychiatrists; however, the proportion of visits for depression where antidepressants were prescribed increased only for psychiatrists (117).

Throughout the 1990s, there was a significant increase in the prescription of antidepressants. Research has shown that this upward shift in the prescribing of antidepressants occurred with the introduction of a new class of antidepressants, selective serotonin reuptake inhibitors (SSRIs), such as Prozac, Zoloft, and Paxil. SSRIs have fewer adverse side effects and a reduced risk of suicide-related deaths than older tricyclic and monoamine oxidase-inhibitor antidepressants. These drugs also require less monitoring; thus, they are more commonly prescribed by primary care physicians who see these patients on a less regular schedule than do psychiatrists (118). Concentrated marketing efforts by pharmaceutical companies have also been hypothesized to contribute to increased prescribing and use of these newer drugs (119).

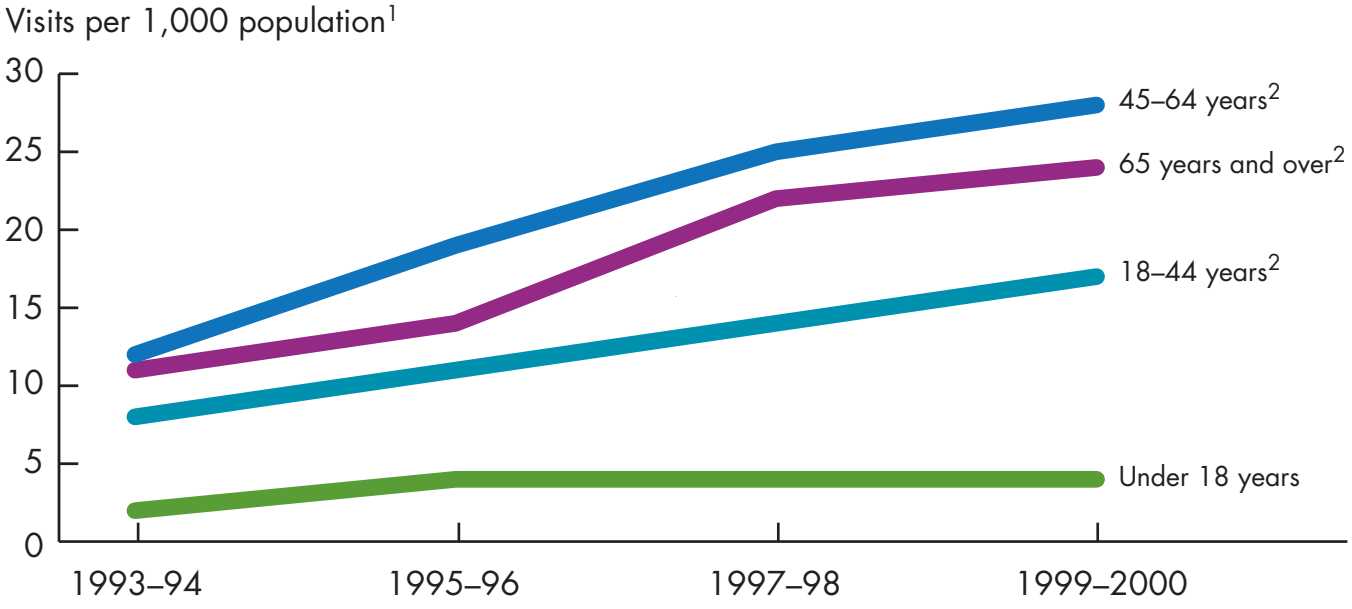
The rate of office-based visits with an antidepressant drug mention increased from 99 per 1,000 visits in 1993–94 to 173 per 1,000 in 1999–2000, a 75 percent increase (data not shown). Among hospital OPD visits, the rate per 1,000 visits increased from 7 in 1993–94 to 17 in 1999–2000, a 113 percent increase (data not shown). Between 1993–94 and 1999–2000, the rate of visits with antidepressants mentioned increased for all age groups for hospital OPD visits (**chart 27B**) and for all age groups among office-based physician visits, except persons under 18 years of age (**chart 27A**).

Chart 27A: Antidepressant drug mention during physician office visits, by age: United States, 1993–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Chart 27B: Antidepressant drug mention during outpatient department visits, by age: United States, 1993–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

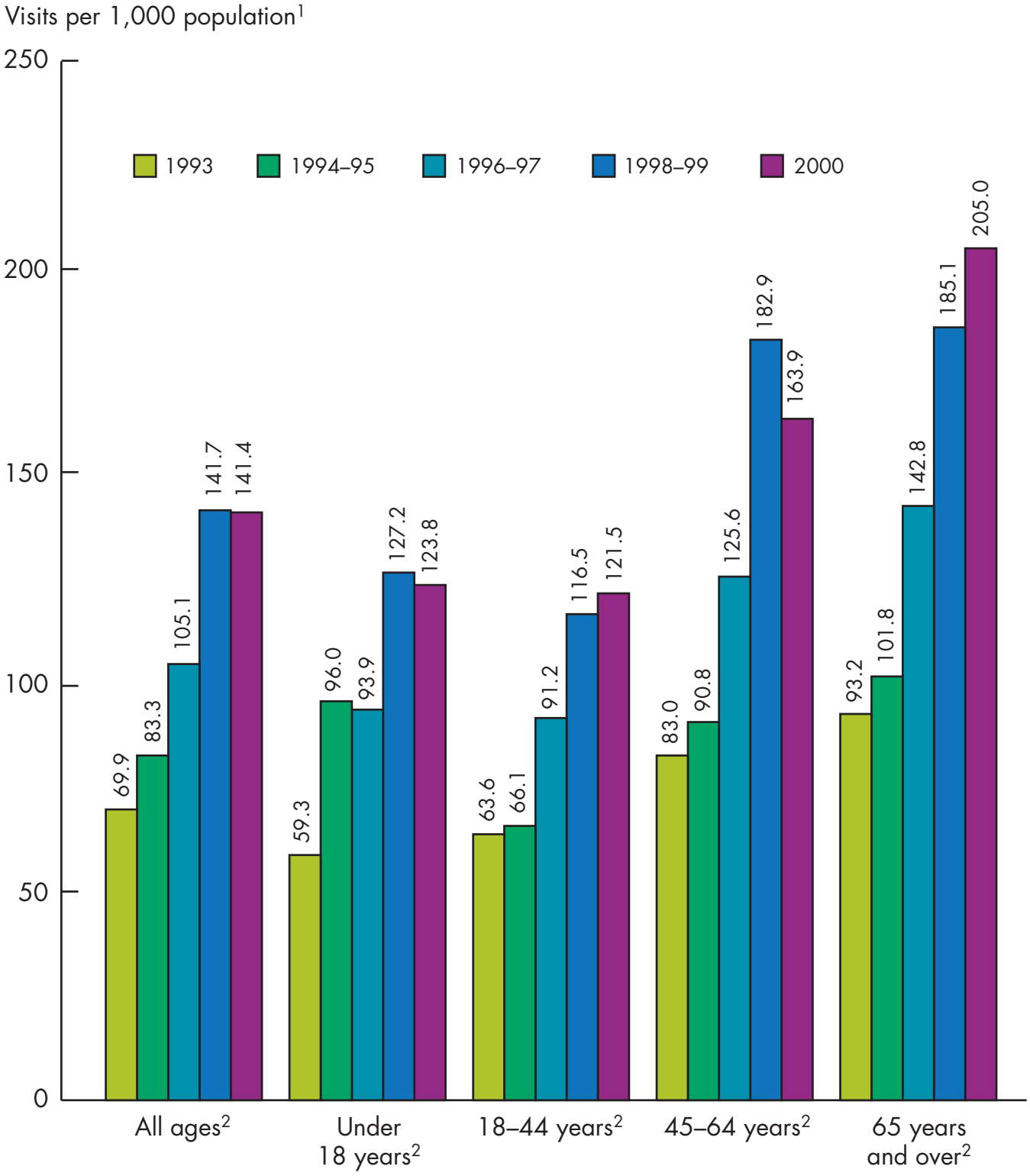
Antihistamines

Antihistamines are being prescribed, continued, or administered during physician and hospital outpatient department visits at an increasing rate (**chart 28**). The overall drug visit rate per 1,000 population rose from 70 to 142 between 1993 and 2000, and this increase holds for all age groups. There are at least two major factors associated with this increase—dissemination of second-generation antihistamines that do not produce the sleepiness and other side-effects of previous antihistamines, and direct marketing of these drugs to consumers (120,121).

The toll exacted by allergies has been greatly alleviated by nonsedating second- and third-generation antihistamines: loratadine (Claritin), terfenadine (Seldane, which was withdrawn from the market), Allegra (fexofenadine), astemizole (Hismanal, also now withdrawn), and cetirizine (Zyrtec). The sedation related to first-generation antihistamine use has been shown to compromise performance at school and at work, impair driving, and decrease the ability to handle tasks that require a high degree of alertness or concentration. Elderly patients may be more susceptible than younger patients to the sedating and anticholinergic effects of first-generation antihistamines. Although less extensively studied in elderly patients, it is probable that second- and third-generation antihistamines are also less likely to induce the adverse central nervous system effects in older patients that are characteristic of the first-generation antihistamines, and this may have contributed to an increase in the utilization rate for the elderly population (122).

Along with the proliferation of these nonsedating drugs, direct marketing efforts are associated with increased market share. A survey of American Academy of Family Physicians concluded that prescription antihistamines and antihypertensive drugs were the drugs patients most commonly requested from their physicians (123).

Chart 28: Antihistamine drug mention during physician office and hospital outpatient department visits, by age: United States, 1993–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

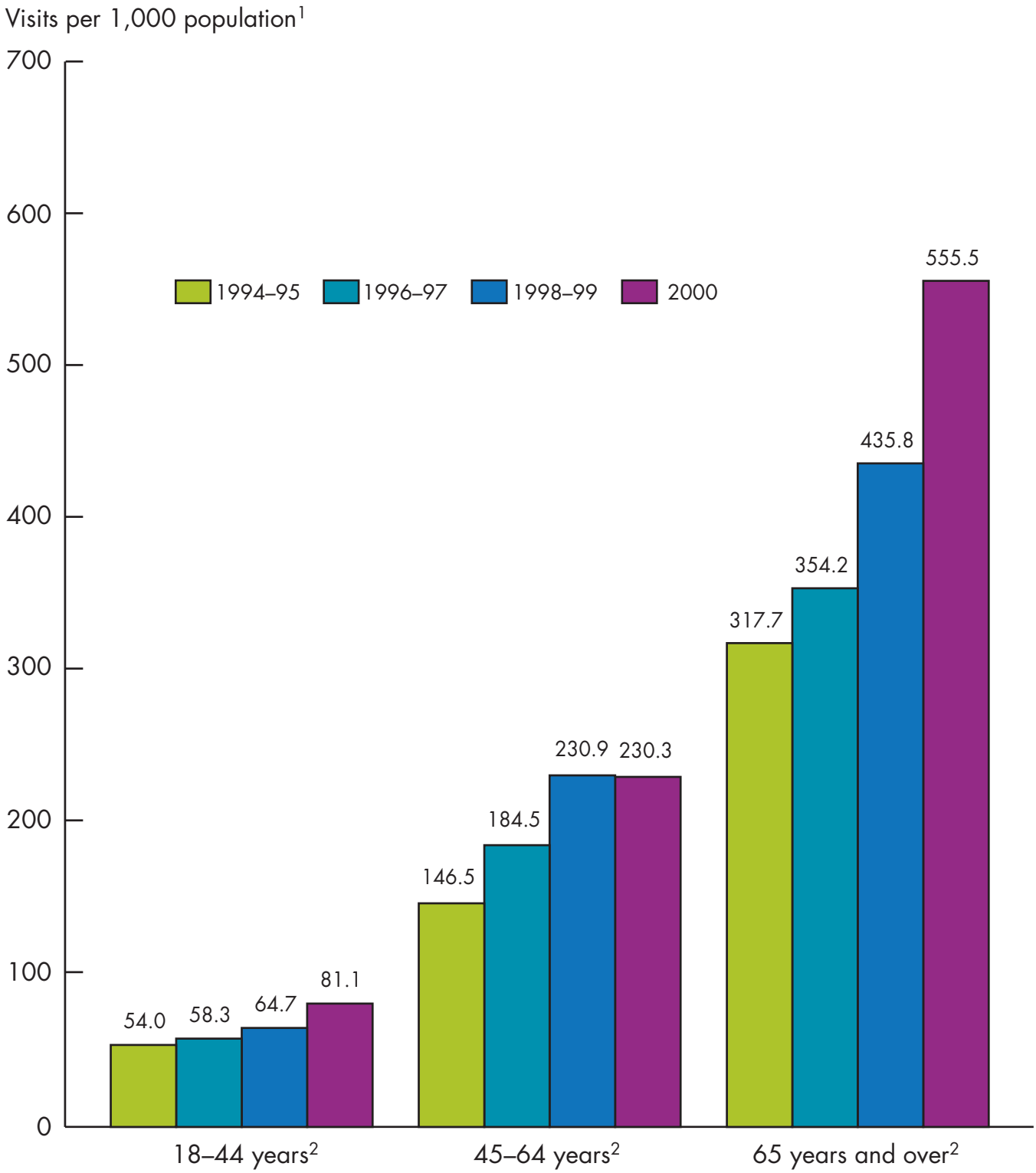
Acid Reducing/Peptic Disorder Drugs

An example of a change in practice patterns and prescribing behaviors is the increase in prescriptions for antacids and peptic ulcer drugs. They are prescribed to control gastric acid secretions that can contribute to peptic ulcers and other gastrointestinal disorders associated with excess production of digestive acids. Included in this category are Prevacid, Tagamet, Pepto-Bismol, Tums, Alka-Seltzer, Gaviscon, Maalox, Mylanta, Reglan, Prilosec, and Zantac. Between 1994–95 and 2000, visits in physicians' offices and hospital outpatient departments where these drugs were mentioned increased 56 percent for the population 45 to 64 years of age, and 75 percent among persons 65 years of age and over (from 318 visits to 556 visits per 1,000 population—**chart 29**) (124). Prilosec rates alone increased from a rate of 7.5 per 1,000 population in 1992–93 to 40 per 1,000 in 1998–99; in 2000, Prilosec was the best-selling drug in the country (125).

An estimated 25 million persons in the United States have had peptic ulcer disease (PUD) during their lifetimes (126). A high proportion (at least 90 percent) of PUD cases are caused by infection with *Helicobacter pylori*—an association first reported in 1983 (127). In addition, estimates of new cases of peptic ulcer disease total between 350,000 and 500,000 per year. Estimated increases in the 45–74 year age group are expected to account for 31 percent of the U.S. population by 2005 and will likely fuel continued strong demand for anti-ulcerants in future years (128). However, these drugs are also commonly prescribed for many conditions other than PUD, including gastrointestinal reflux disease.

Three major factors have been associated with this rapid increase in mentions of acid reducing drugs during visits to physician offices and hospital outpatient departments. First, direct marketing of Prilosec and Zantac may have influenced patient demand (125). In 2000, Prilosec was the second most heavily promoted drug in the United States. Second, peptic disease has been associated with increased use of nonsteroidal anti-inflammatory drugs (NSAIDs)—including Advil, Motrin, and the ibuprofens Aleve, Celebrex, and Vioxx—often used for arthritis or other inflammatory diseases. NSAIDs are associated with gastric erosion and subsequent peptic disease; prevalence of these diseases and, thus, use of NSAIDs, increases with age. Third, an NIH Consensus Panel in 1994 published findings that ulcer patients with *H. pylori* infection require treatment with antimicrobial agents in addition to antisecretory drugs, whether on first presentation with the illness or on recurrence, spurring a public health campaign to educate physicians and consumers about the importance of peptic ulcer treatment, including prescribing acid-reducing drugs (127).

Chart 29: Acid reducing/peptic disorder drug mention during physician office and hospital outpatient department visits, by age: United States, 1994–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Estrogen/Progestin Drug Mentions During Physician Office and Hospital Outpatient Department (OPD) Visits for Women, by Age and Race

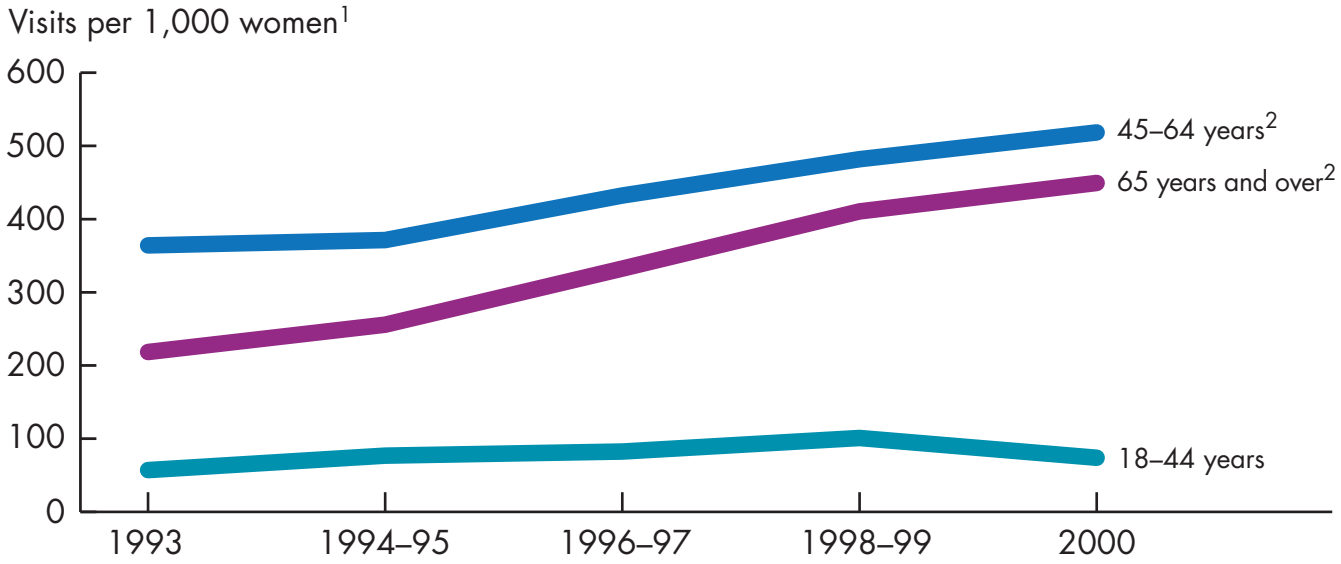
Hormone replacement therapy (HRT), a common treatment for symptoms of menopause, recently has been spotlighted in the research literature. Numerous research studies conducted over the past 2 decades have documented both potential health benefits and associated risks with its use, and several recent studies have raised new concerns about use of this treatment (129–131). Because of these varied findings, guidelines from the U.S. Preventive Services Task Force and several medical professional associations recommend counseling of menopausal women about the benefits and risks of HRT to facilitate more informed decision-making regarding its use. The availability of varied hormone replacement formulations and dosages in recent years has also changed hormone replacement protocols for HRT users.

Chart 30A presents estimates of physician office and hospital outpatient department (OPD) visits by women where an HRT was prescribed during the period between 1993 and 2000. Of women 18 years of age and over, 273 visits per 1,000 women had an HRT mention (data not shown). Proportionately more HRT is prescribed for women between 45 and 64 years of age. The greatest rate of increase since 1993, however, occurred among women 65 years of age and over, doubling from 219 visits to 449 visits per 1,000 women. For women 18 to 44 years of age, the rate did not change significantly.

During the past decade, white women were more likely than black women to receive HRT in physicians' office settings (**chart 30B**). In 1993, white women 45 to 64 years of age had 359 visits per 1,000 compared to 195 visits per 1,000 black women; this differential increased to 487 per 1,000 white women and to 219 per 1,000 black women in 1999–2000. One explanation for the higher rates of estrogen mentions for older white women is that this racial group is at higher risk of osteoporosis, and HRT has been found to have protective effects against this disease (131,132).

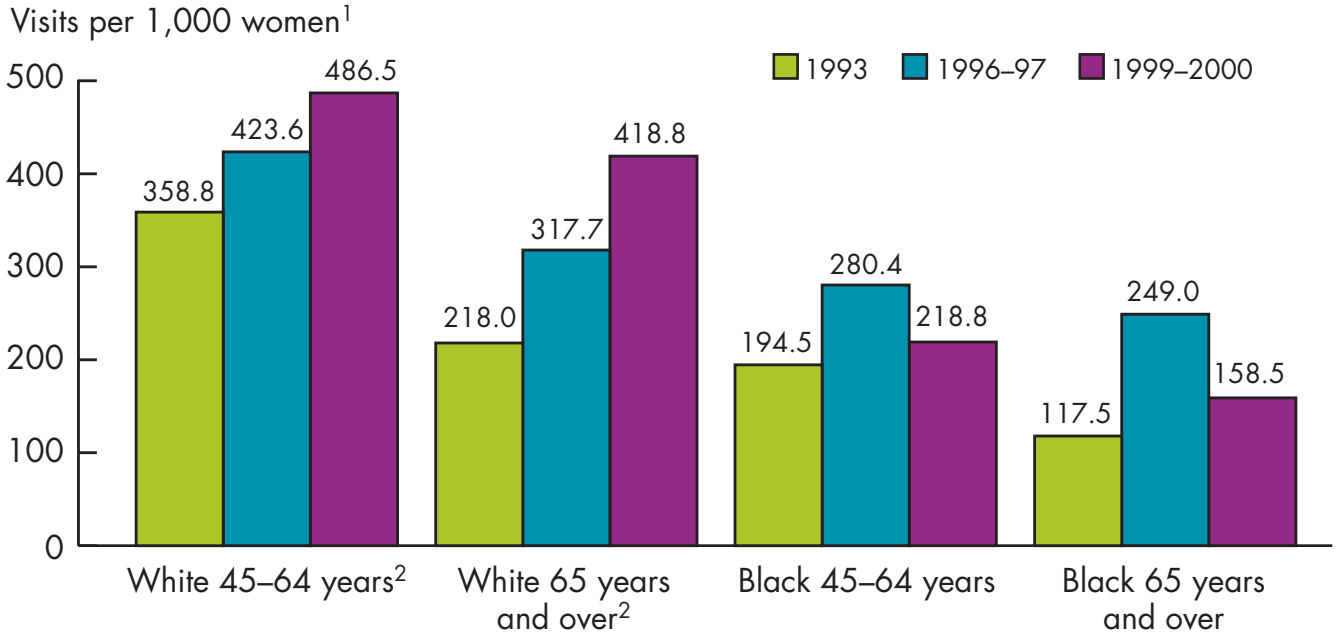
In contrast, when HRT visit rates to hospital OPDs are examined, visits by black women at these facilities were more likely to include an HRT mention (data not shown). In 1999–2000, for example, the HRT rate was twice as high for black women 45 years of age and over as for white women. Among women 18–44 years of age, there was a three-fold difference in the rates—30 visits per 1,000 black women compared to 10 visits per 1,000 white women (data not shown). As with other trends presented in this report (see, for example, "Antidepressant Drug Mentions in Physician Office and Hospital Outpatient Department Visits, by Age"), this could reflect that black women have a greater propensity to seek care at OPDs than white women (38).

Chart 30A: Estrogen/Progestin drug mentions during physician office and hospital outpatient department visits for women 18 years of age and over: United States, 1993–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Prevention and Control, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 30B: Estrogen/Progestin mentions during physician office visits for women 45 years of age and over, by race: United States, 1993-2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Mammograms Ordered or Provided During Physician Office and Hospital Outpatient Department (OPD) Visits, by Race

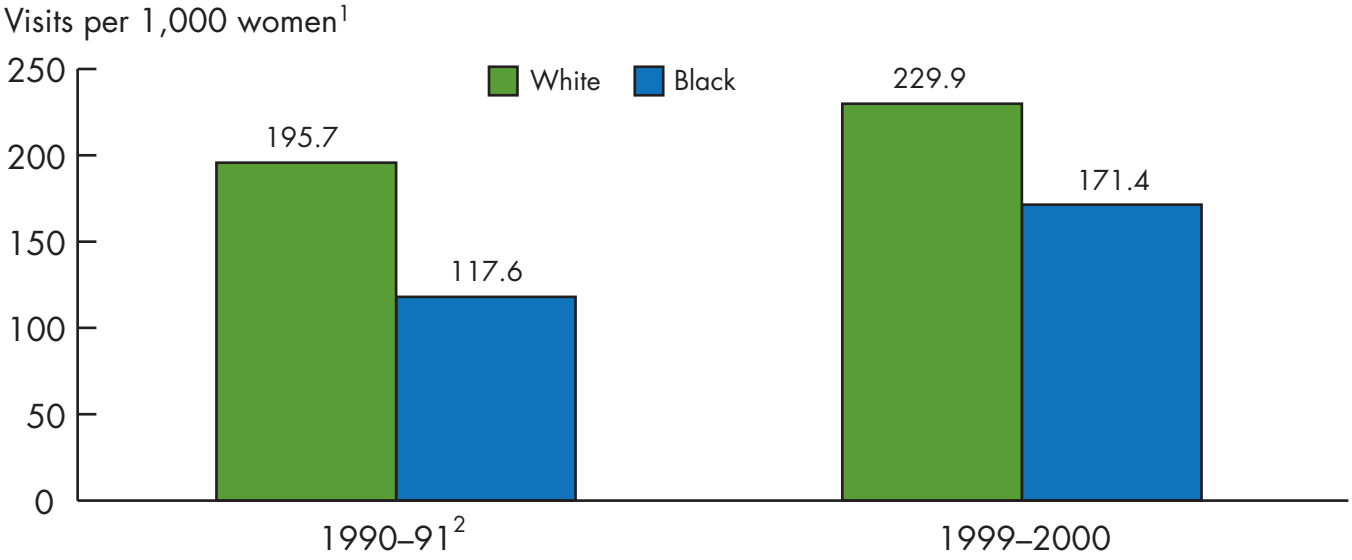
Women are more likely to develop breast cancer than any other form of cancer. During 2003, an estimated 211,300 women will be diagnosed with breast cancer, and 39,800 women will die with the disease (133). Breast cancer incidence among women has risen during the past two decades, although some of this change is attributed to increased mammography screening and physical exams (134). Many clinical practice guidelines recommend routine screening mammography for women over 40 years of age, although the desired timing of mammography varies by guideline (135,136). Nevertheless, many campaigns exist to encourage the use of screening mammography to detect breast cancer at an early stage.

Between 1990–91 and 1999–2000, estimates of physician office visits where mammography was ordered or provided showed no significant change, with 188 and 228 visits per 1,000 women 45 years of age and over, respectively (data not shown). A somewhat different trend is observed for this time period, however, when visit rates are compared by race (**chart 31A**). In 1990–91, there were proportionately more office-based visits for white women where a mammogram was ordered or provided than for black women (196 visits compared to 118 visits per 1,000 women 45 years of age and over). By the end of the decade, the rates were no longer significantly different, 230 visits and 171 visits per 1,000 white and black women, respectively.

Although breast cancer risk rates among women increase with age, rates of physician office visits with mammograms ordered or provided, in contrast, decreased with age (137). In 1999–2000, mammograms were ordered or provided at a rate of 250 office visits per 1,000 women 45–64 years of age. For women 75 years of age and over, the rate dropped to 131 visits per 1,000 women, representing a 48 percent difference for these two age groups (data not shown).

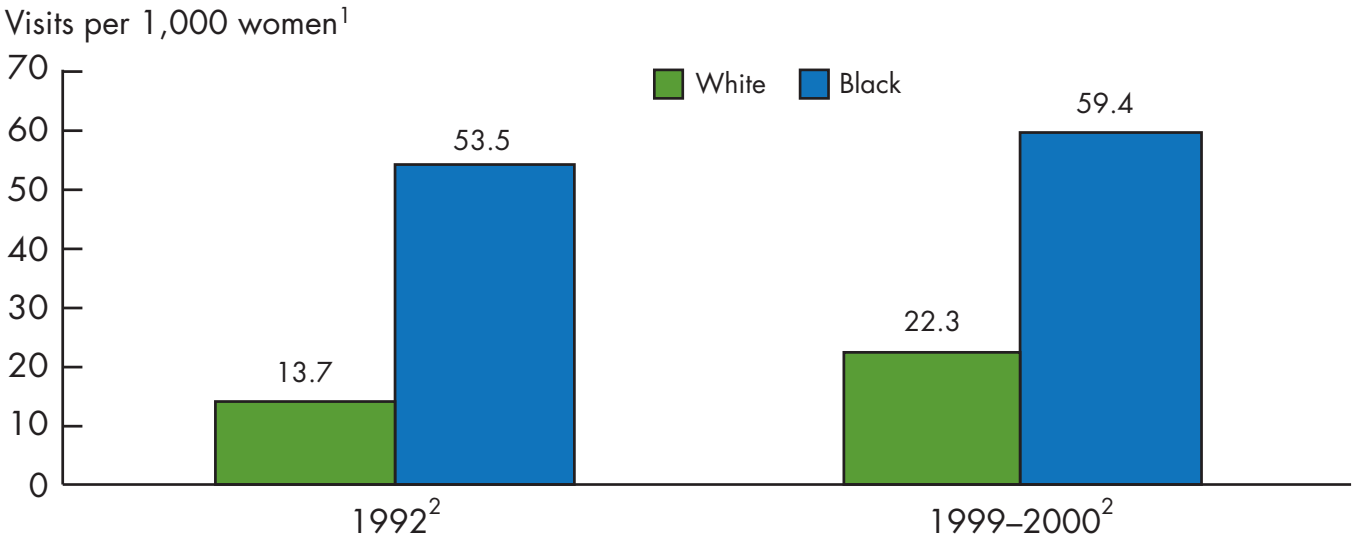
Mammograms are provided or ordered with much greater frequency in physicians' offices than in hospital outpatient departments (OPDs), in large part because more women have more encounters overall, and more gynecological encounters, in office-based practices than in hospital OPDs. The overall OPD rate for visits with a mammogram ordered or provided for all women 45 years of age and over did not increase significantly over the decade, with rates per 1,000 women of 18 visits in 1992 and 27 visits in 1999–2000 (data not shown). However, some differences in treatment patterns are observed by race (**chart 31B**). Unlike physician office visit rates, the OPD visit rates in both 1992 and in 1999–2000 where a mammogram was ordered or provided were significantly higher for black women than for white women. In 1999–2000, for example, there was almost a three-fold difference in these OPD visit estimates for black women compared to white women (59 visits compared to 22 visits per 1,000 women, respectively). This may reflect a greater propensity for black women to seek care in OPDs, outreach programs by OPDs that predominantly serve black women, or other factors (38,138).

Chart 31A: Physician office visits with mammograms ordered or provided for women 45 years of age and over, by race: United States, 1990–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Difference between black and white populations is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey (NAMCS).

Chart 31B: Hospital outpatient department visits with mammograms ordered or provided for women 45 years of age and over, by race: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Difference between black and white women is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

Tonsillectomy and Myringotomy

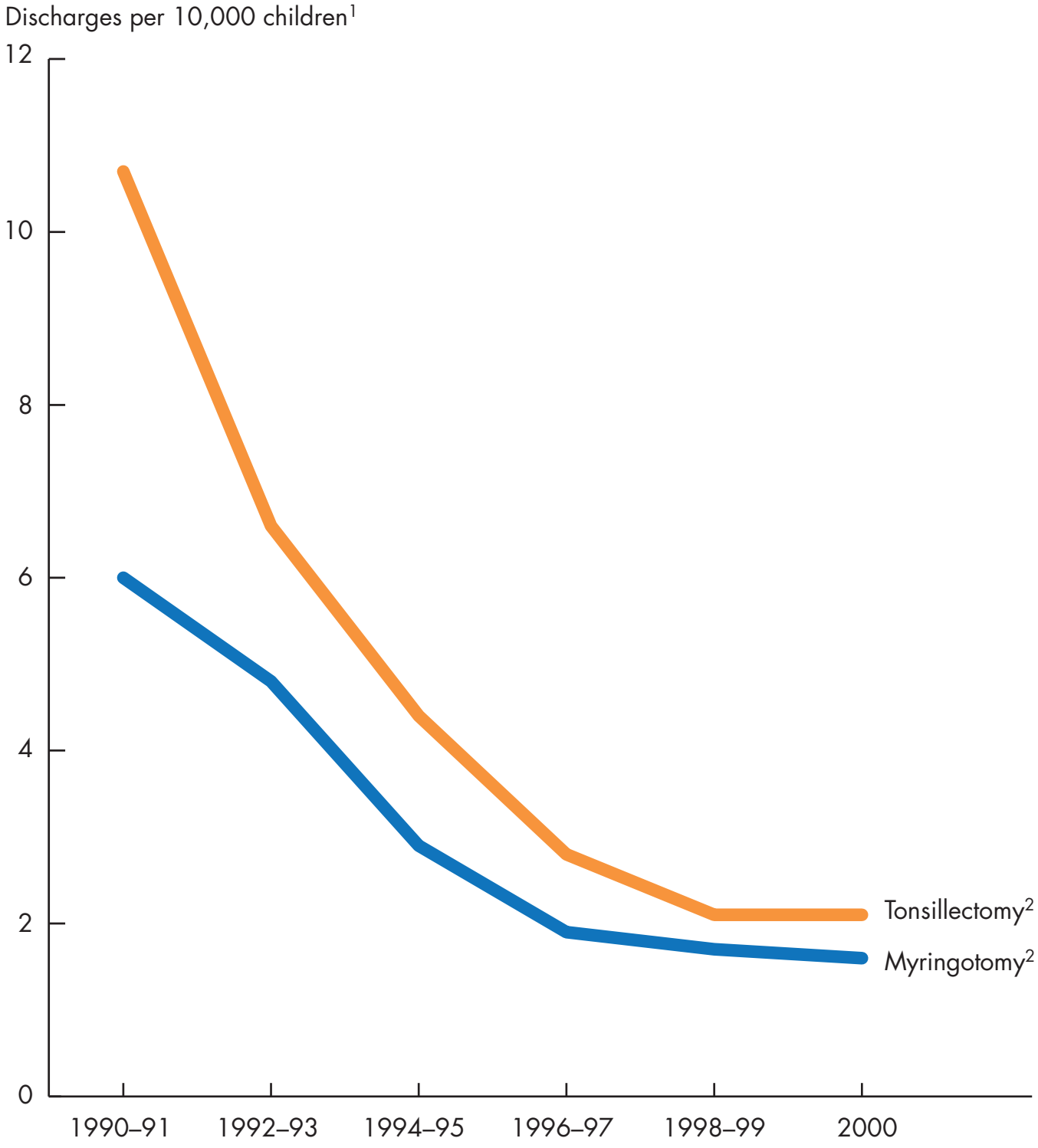
Tonsillectomy and myringotomy are two examples of historically hospital-based procedures that have been transferred almost completely to outpatient settings. With the increased use of antibiotics, tonsillectomies are performed far less frequently today then years ago when they were routinely recommended for many children. Today, tonsillectomies usually are recommended only when patients have persistent or recurring severe episodes of tonsillitis. Although tonsillitis can occur at any age, it is most common in children 5–10 years of age. The American College of Surgeons acknowledges that patients usually can return home 8–10 hours following surgery, thus enabling the use of ambulatory surgery centers and outpatient hospital settings for this procedure and reducing the need for overnight hospital stays.

The National Survey of Ambulatory Surgery, which was fielded in 1994, 1995, and 1996, estimated a tonsillectomy rate of 45.9 per 10,000 children who were under 15 years of age in 1994 (139). In 1996, the estimated rate of tonsillectomies was about the same (45.6 per 10,000 children) (63). In contrast, between 1990 and 2000, the inpatient hospital tonsillectomy rate for children under 18 years of age experienced a dramatic decline, from an estimated 10.7 per 10,000 children during 1990–91 to just 2.1 per 10,000 children in 2000 (**chart 32**). Tonsillectomies performed in ambulatory surgery centers or other sites of care, however, are not reflected in the inpatient rate.

Young children commonly have middle-ear infections (otitis media) that usually either resolve without treatment or after treatment with antibiotics. Some children, however, experience prolonged periods of fluid retention in the middle ear that can result in repeated episodes of ear infections that cause acute hearing loss. Although myringotomy with tube insertion is used to reduce the frequency of ear infections and to restore hearing losses resulting from chronic middle ear inflammations with fluid collection, this procedure has associated risks, and it is not recommended as an initial treatment. Therefore, the Agency for Healthcare Research and Quality, the American Academy of Family Physicians, and the American Academy of Pediatrics have specific guidelines to limit use of myringotomy with tube insertion. Even so, physicians continue to debate about when to perform this procedure. A recent study found no differences in speech delay outcomes of 3-year-olds with early or deferred myringotomies (140).

During the past decade, the hospital inpatient rate of myringotomies with tube insertion dropped from an estimated 6.0 per 10,000 children younger than 18 years of age (1990–91) to a rate of 1.6 per 10,000 children in 2000. This procedure, however, is also performed most often in an ambulatory surgical facility and is the most common surgical procedure performed at these sites on children 15 years of age and younger. Rates for this procedure estimated from the National Survey of Ambulatory Surgery ranged from 96.9 per 10,000 children under 15 years of age in 1994 to 84.9 per 10,000 children in 1996 (63,139).

Chart 32: Hospital inpatient tonsillectomy procedures and myringotomy with tube insertion among children under 18 years of age: United States, 1990–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTES: Tonsillectomy includes any-listed ICD–9–CM procedure codes 28.2 and 28.3. Myringotomy with tube insertion includes any-listed ICD–9–CM procedure code 20.01.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

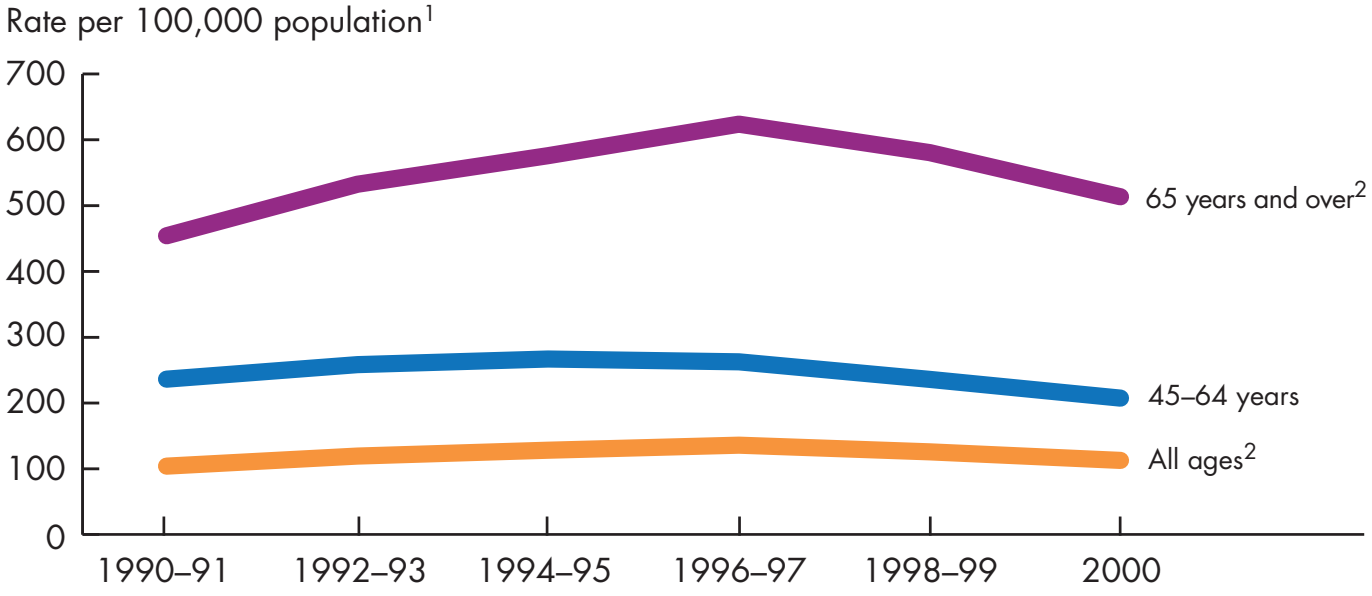
Selected Cardiac Procedures, by Age

Advances in technological treatment of heart attacks include the introduction of coronary artery bypass graft (CABG) surgery (also called cardiac revascularization) in the late 1960s and percutaneous transluminal coronary angioplasty (PTCA) also called balloon angioplasty, introduced in the late 1970s. Both procedures are preceded by cardiac catheterization, a procedure used to measure the location and extent of blockage. Long-term drug therapies also help prevent the development or progression of new blockages. During the 1990s, increasing rates of CABG and PTCA treatment reflect application of these existing technologies to more patients as knowledge increased about which patients would benefit from the treatments and as other innovations reduced complications (118).

Coronary artery blockages (coronary artery disease) are a major cause of heart attacks. In 2000, approximately 1.1 million persons were discharged from hospitals with a first-listed (primary) diagnosis of coronary atherosclerosis or narrowing of the coronary arteries (39). Treatment options for coronary artery disease include thrombolytic therapy (drug treatment to dissolve the blockage), CABG, and PTCA (118). Whether CABG, PTCA, or some other alternative procedure is used depends on various factors such as where the blockage is, how many blockages there are, and the extent of the blockage (141).

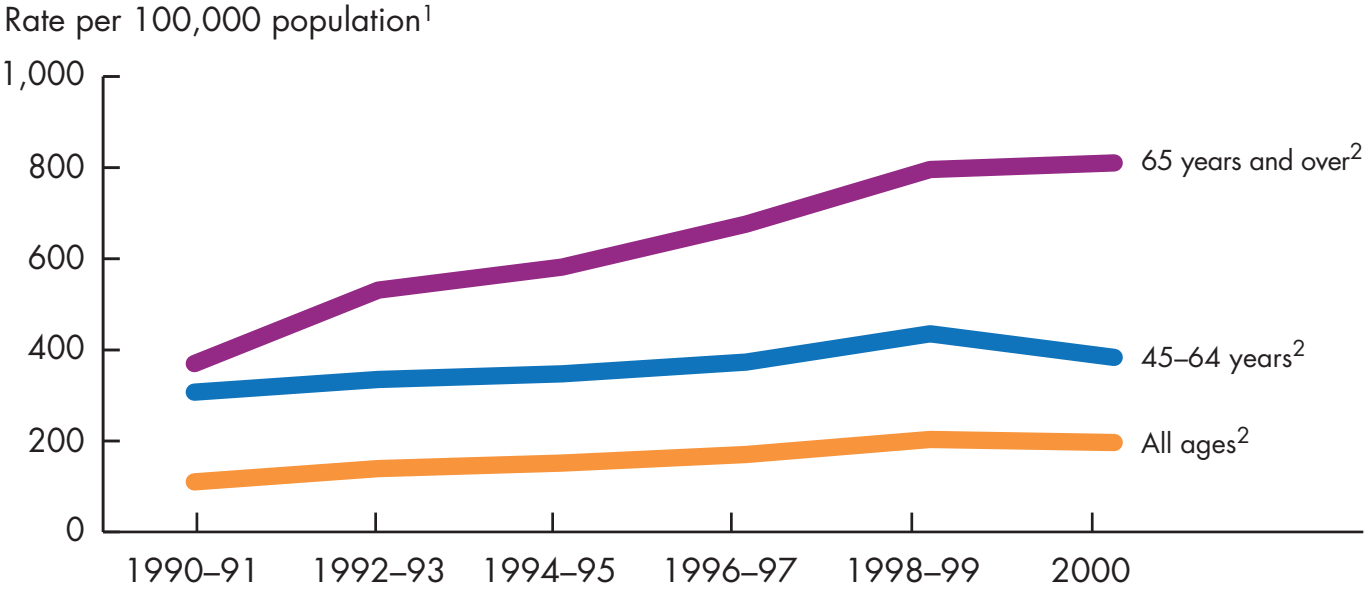
CABG is major open heart surgery involving grafting an artery or vein around the blocked coronary artery (118). In 2000, CABG procedures were performed on an estimated 313,800 hospital discharges. **Chart 33A** shows that CABG surgeries among persons age 65 and over increased between 1990–91 and 1996–97, and stabilized after 1998. CABG offers patients excellent long-term revascularization but is highly invasive. PTCA is a less invasive alternative that uses a balloon catheter to unclog the artery (142). In 2000, PTCA procedures were performed on 547,100 discharges. **Chart 33B** shows that the rate of this operation increased 79 percent, from 110 per 100,000 population in 1990–91 to 197 per 100,000 population in 2000. The rate of this procedure among persons 65 years of age and over increased steadily after 1990. The increased PTCA rate during the late 1990s may be largely due to the advent of coronary artery stenting in 1996, since stenting is performed in combination with the PTCA procedure (see "Stent Insertion by Age"). The overall rate of PTCA procedures, however, may be higher than shown here as studies have found this procedure can be performed safely in outpatient settings for some patients (143).

Chart 33A: Coronary artery bypass graft surgeries for discharges from short-stay hospitals, by age: United States, 1990–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Coronary artery bypass graft includes any-listed ICD–9–CM procedure code 36.1.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Chart 33B: Percutaneous transluminal coronary angioplasty for discharges from short-stay hospitals, by age: United States, 1990–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Percutaneous transluminal coronary angioplasty includes any-listed ICD–9–CM procedure codes 36.01–36.02 and 36.05.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

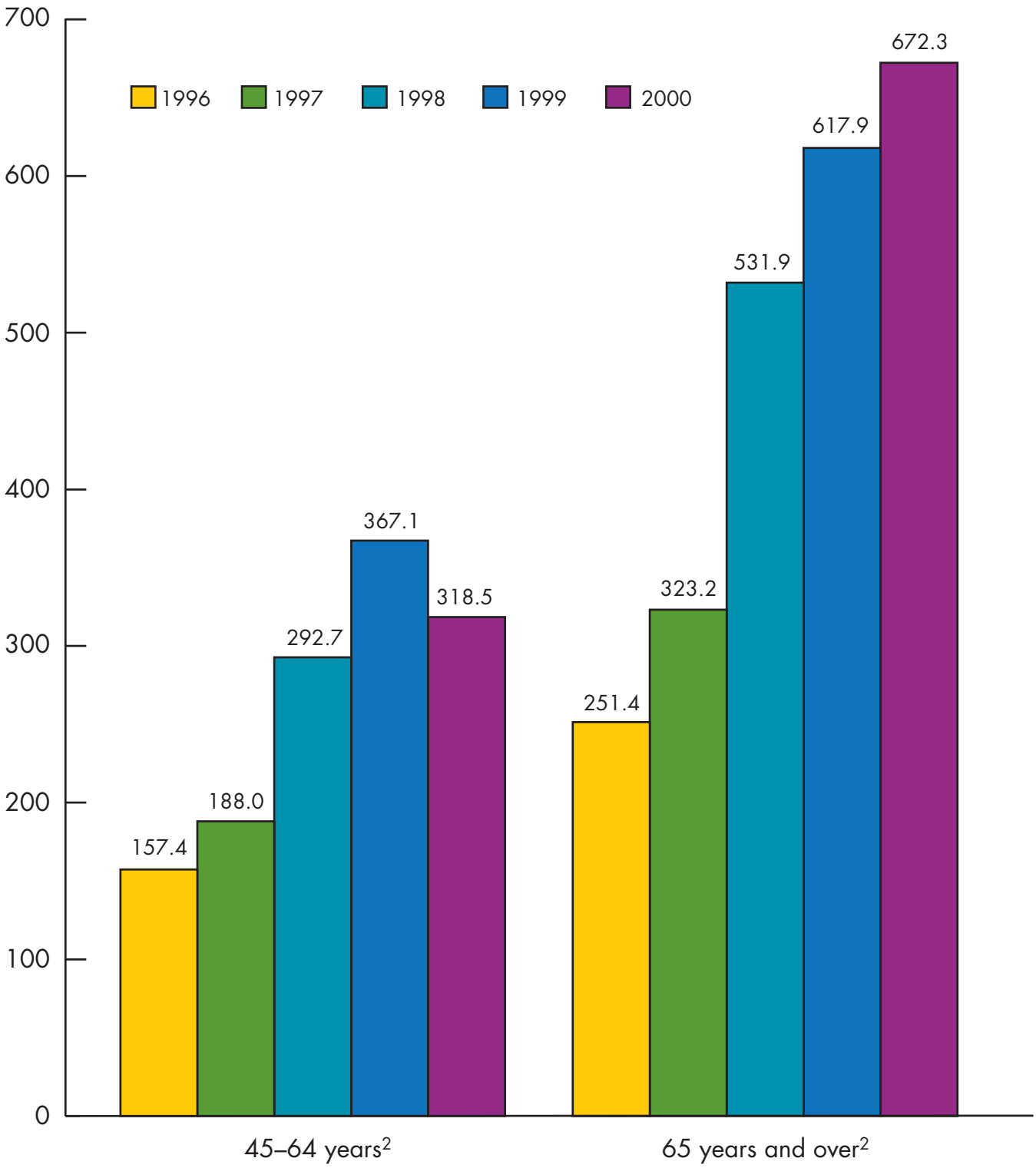
Stent Insertion, by Age

In contrast to bypass surgery and angioplasty, the coronary stent insertion procedure is a new therapeutic procedure introduced during the 1990s. The introduction of intracoronary stents (small wire cylinders that hold a narrowed artery open) in clogged arteries is rapidly replacing angioplasty without stents because of lower rates of renarrowing of opened arteries (restenosis) associated with intracoronary stents (118). According to the American Heart Association, 70–90 percent of percutaneous transluminal coronary angioplasty (PTCA) procedures also involve the placement of a stent (141). Restenosis occurs in about one-third of patients who have had PTCA, usually within 6 months after the procedure. It may also occur among coronary artery bypass graft (CABG) patients in the transplanted blood vessels used to bypass the clogged artery. Prior to 1996, arteries that reconstricted (narrowed) may have been widened by a repeat balloon angioplasty or an atherectomy procedure (insertion of a laser catheter that breaks up plaque buildup in the arteries).

In 2000, about 454,200 hospital discharges had at least one coronary stent insertion procedure performed. **Chart 34** shows the rate of coronary stent insertions from 1996–2000 (1996 was the first year that an ICD–9 code was available for this procedure). The rate of persons with a coronary stent insertion procedure for the entire U.S. population increased 147 percent between 1996 and 2000, from 66 per 100,000 population in 1996 to 163 per 100,000 population in 2000. Among the elderly, use of this procedure increased 168 percent during the same period, from 251 per 100,000 population in 1996 to 672 per 100,000 population in 2000. The rate of stent insertion also more than doubled for the population 45–64 years of age, increasing from 157 to 318 per 100,000 population.

Together, medical innovations such as CABG, PTCA, the intracoronary stent, and other procedures perfected during the last 30 years have contributed to improved survival for heart attack patients. A recent study concluded that around 70 percent of survival improvement in heart attack mortality is a result of these technological changes (118).

Chart 34: Coronary artery stent insertion for discharges from short-stay hospitals, by age: United States, 1996–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Stent insertion includes any-listed ICD–9–CM procedure code 36.06.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

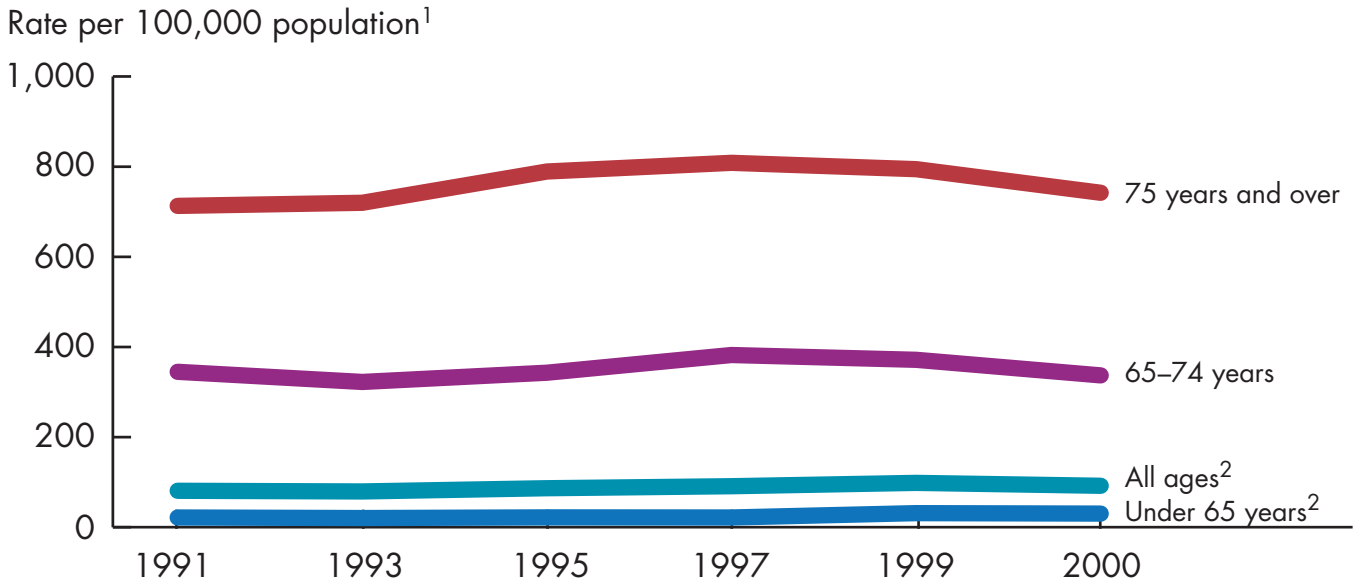
Hip and Knee Procedures, by Age

New and emerging technologies, including drugs, devices, procedures, and tests, have changed patterns of care and sites where care is provided. The growth of ambulatory surgery was influenced by improvements in anesthesia and analgesia and the development of noninvasive or minimally invasive techniques. Procedures that formerly required a few weeks of convalescence now require only a few days (1,2). New drugs can cure or lengthen the course of previously fatal or debilitating diseases, such as HIV/AIDS, although often at enormous cost. Technological advances in the provision of chemotherapy, antibiotic therapy, anticoagulation infusions, blood and blood product transfusions, oxygen therapy, and home dialysis also have spurred shifts in the site of care (144).

One major technological breakthrough is the improvement in recent years in hip and knee prosthetic devices. Surgical techniques and the discovery of materials and procedures that can be used safely in hip and knee replacements have enabled earlier patient mobilization, resulting in fewer complications and better long-term outcomes than in the past. Now considered a relatively low-risk surgical procedure, artificial replacements of hip and knee joints are used to increase mobility and eliminate chronic pain caused by arthritic or severely injured joints. Still, these implants are commonly used only for persons with radiographic evidence of joint damage who have constant pain or mobility restrictions that cannot be reversed by nonsurgical interventions.

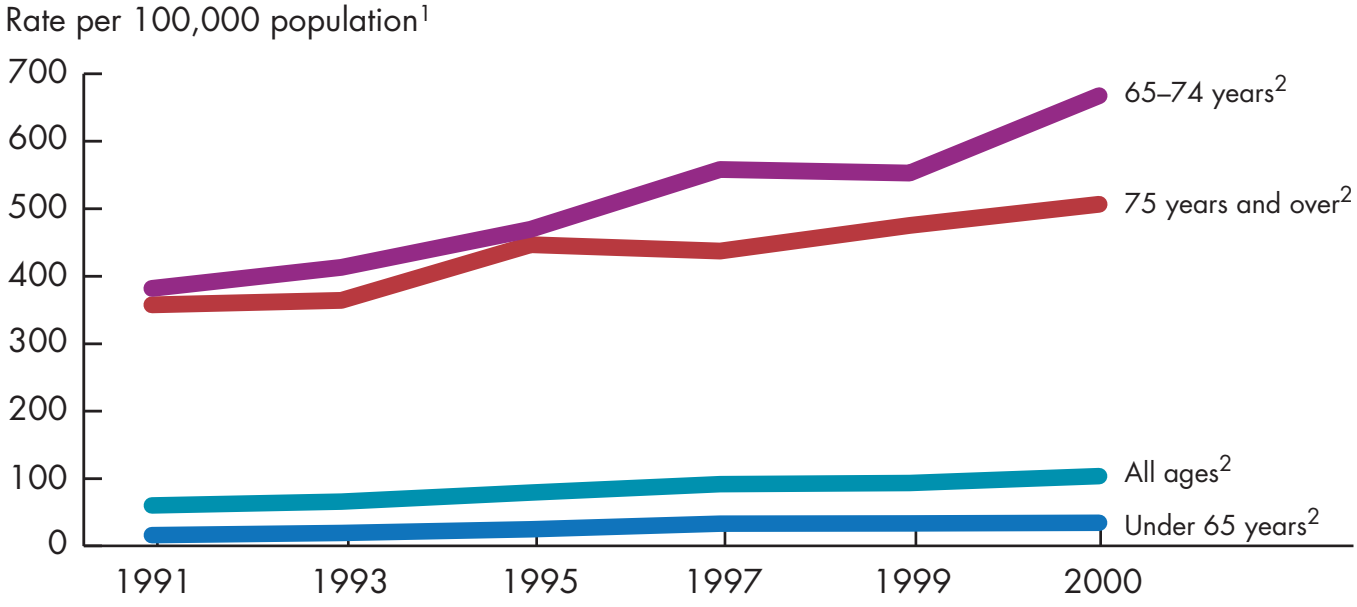
The rate and number of hip and knee replacements increased during the 1990s—from 81 to 92 per 100,000 for hip replacement, and from 60 to 104 per 100,000 for knee replacements (**charts 35A** and **35B**). Rates of knee surgery increased more rapidly throughout the decade than did hip surgery rates, which seem to be leveling. Although persons 75 years of age and over are most likely to have a hip replaced, persons 65–74 years old were most likely to have a knee replaced. In 2000, about 122,000 hip replacements were performed on persons 75 years of age or over (48 percent of the annual total); for knee replacements, the 65–74 year age group comprised about 125,000 (42 percent) of the total number (data not shown).

Chart 35A: Hip replacements performed in short-stay hospitals, by age: United States, 1991–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Hip replacements include any-listed ICD–9–CM procedure codes 81.51 and 81.52.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Chart 35B: Knee replacements performed in short-stay hospitals, by age: United States, 1991–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Knee replacements include any-listed ICD–9–CM procedure code 81.54.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Adverse Effects Following Medical Treatment, by Age

In 1999, an Institute of Medicine report on patient medical safety stated that an estimated 44,000–98,000 persons die each year in the United States as a result of medical errors, the eighth leading cause of death (145). In addition, annual health care costs and lost productivity attributable to medical errors were estimated at $29 billion. The category "adverse effects" includes types of injuries that occur to patients as a result of one of the following:

- Misadventures during surgical and medical care or complications of medical care (ICD–9–CM codes E870–E879); or
- Adverse drug reactions from therapeutic use of drugs, medicinal and biological substances (ICD–9–CM codes E930–E949).

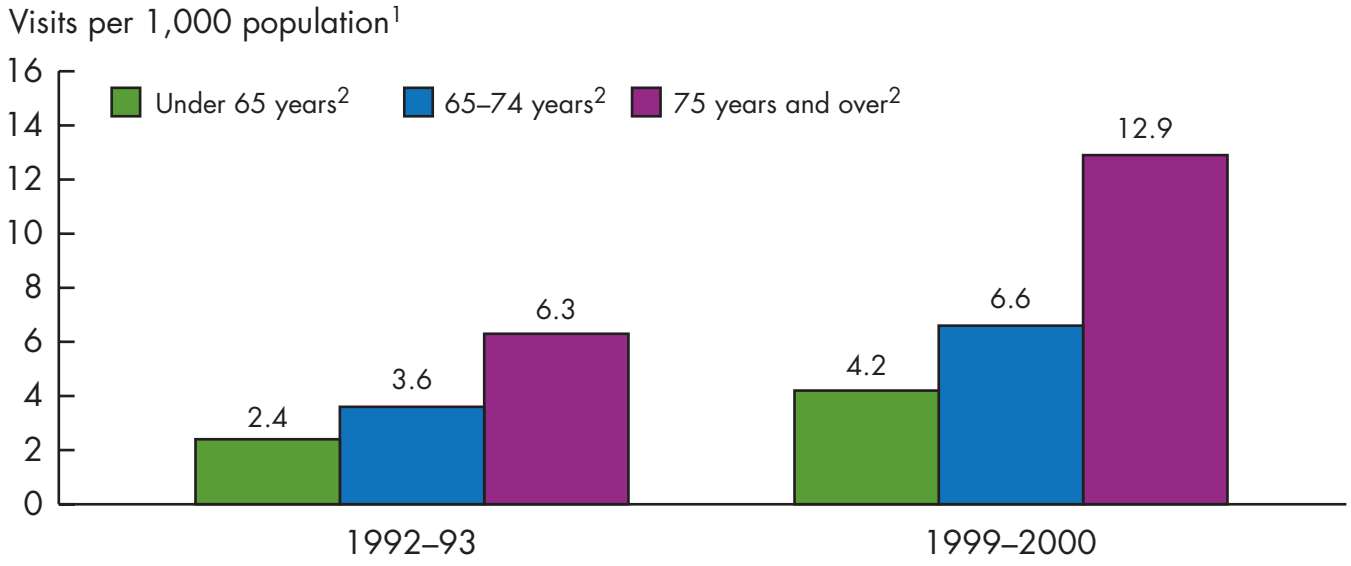
The number of medical errors is difficult to ascertain for several reasons. Although all of these types of injuries result from prior medical treatment or medical intervention, not all are attributable to medical error, and some are not preventable. In addition, these codes have been shown to be underreported, although there is evidence that reporting of these codes is improving (97).

Adverse effects often have sudden onset and can be life-threatening, and they are often treated in emergency departments (EDs). In 1999, approximately 1.4 percent of visits to EDs were for adverse effects of prior medical treatment (146). Between 1992–93 and 1999–2000, the rate of ED visits because of an adverse effect almost doubled, from 2.7 per 1,000 persons to 4.8 per 1,000 persons (data not shown). Examining these rates by several age groups also reveals the same finding, about a two-fold increase over time regardless of age (**chart 36A**). Throughout this period these visits were equally divided between complications of medical or surgical care and adverse drug reactions (146). In 1999–2000, about 13 percent of these visits resulted in a subsequent hospital admission.

Data for both periods show that the risk of an ED presentation with an adverse event substantially increases with age. During 1999–2000, the population 65–74 years of age made 60 percent more ED visits for an adverse effect (6.6 visits per 1,000 population) than persons under 65 years of age (4.2 visits). The increase in adverse effects visits among the elderly is also associated with an increase in the percentage of ED visits with five or more drug mentions (146).

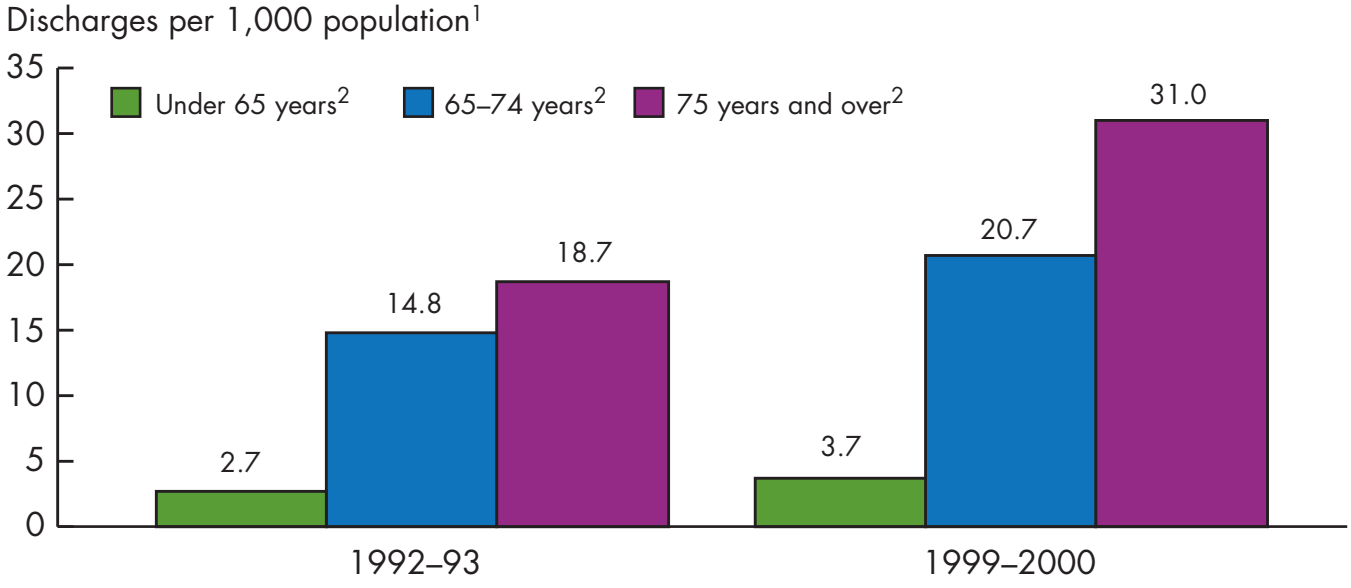
Although ED visits with an adverse effect result from a complication of prior treatment, inpatient hospitalizations with a similar discharge diagnosis may also reflect a complication of that same hospital stay. Nevertheless, somewhat similar patterns emerge when estimates for inpatient hospitalizations associated with adverse effects are compared between 1992–93 and 1999–2000. Hospital discharge rates for conditions coded as adverse events rose from 4.4 discharges per 1,000 persons to 6.4 discharges (data not shown). This upward trend occurred for all age groups (**chart 36B**).

Chart 36A: Emergency department visits with diagnoses of adverse effects of medical treatment, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Includes any-listed ICD–9–CM codes- E870–E879, E930–E949.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS).

Chart 36B: Hospital discharges with diagnoses of adverse effects of medical treatment, by age: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
NOTE: Includes any-listed ICD-9-CM codes E870–E879, E930–E949.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Hospital Transfers to Nursing Homes

During the last 15 years, the trend in shorter hospitals stays has been associated with an increase in hospital transfers to long-term care (LTC) institutions (**chart 37A**).[9] Between 1985 and 2000, the percentage of live hospital discharges transferred to an LTC institution increased 98 percent, from 4.3 percent of live discharges in 1985 to 8.5 percent in 2000. The overwhelming majority of hospital transfers were elderly (82 and 86 percent in 1985 and 2000, respectively). The percentage of transfers among live elderly persons increased 54 percent between 1985 and 2000, from 12.4 percent in 1985 to 19.1 percent in 2000.

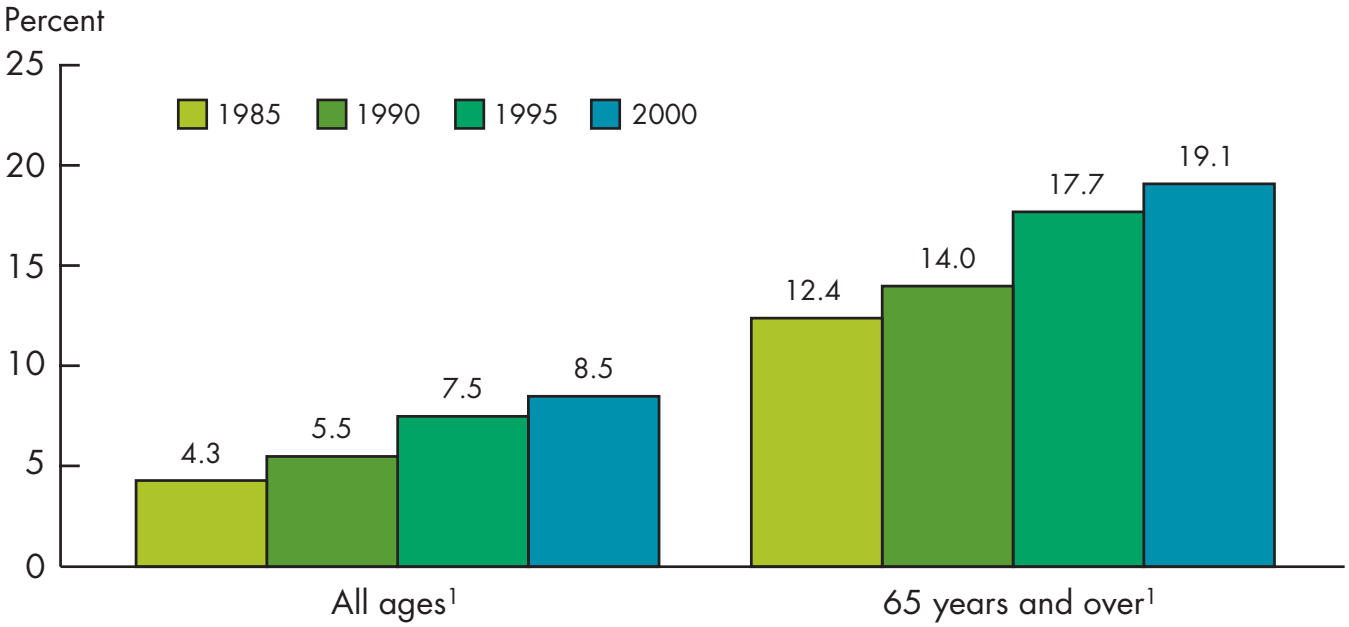
A previous study found that the average hospital stay for discharges transferred to LTC institutions declined from 12.8 days in 1990 to 8.3 days in 1999 (99). The reduction in length of stay was due primarily to an increase in discharges hospitalized for less than 8 days; almost two-thirds of hospital transfers had stays of 1 week or less in 1999, compared with 42 percent in 1990. The reduction in length of stay among discharges transferred to LTC institutions during the 1990s suggests that the care received in the long-term institution after hospitalization substituted for care that would have been received in the hospital 10 years earlier (99).

Nursing homes were the primary recipients of hospital transfers to LTC institutions. Annually, the proportion of nursing home discharges admitted from short-stay hospitals increased by 18 percent between 1985 and 1999, from 55 percent of discharges in 1985 to 65 percent in 1999. Similar trends were also found among the nursing home resident population. Between 1985 and 1999 (the latest year available for the National Nursing Home Survey), the percentage of current residents admitted from a short-stay hospital increased 24 percent, from 37 percent in 1985 to 46 percent in 1999 (**chart 37B**).

Many hospital-to-nursing home transfers received subacute care. *Subacute care* often is defined as a comprehensive, cost-effective inpatient level of care for patients who are medically stable but still require significant ancillary care. Typically, short-term, subacute care is designed to return patients to the community or transition them to a lower level of care (147). Medicare and private insurance are the primary payers for subacute care (148). Between 1984 and 1998, the number of Medicare-covered days in skilled nursing facilities per 1,000 enrollees increased 380 percent, from 296 days per 1,000 enrollees in 1984 to 1,421 days per 1,000 enrollees in 1998 (149).

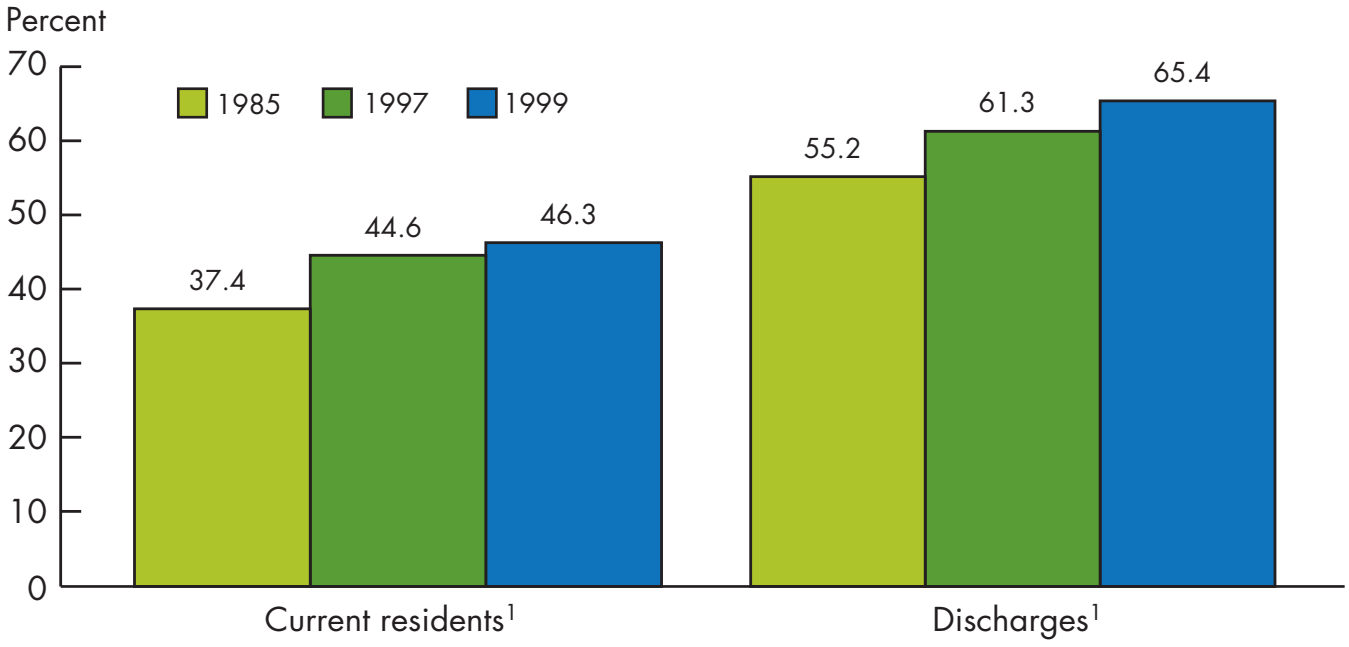
[9] The HDS Survey Manual defines long-term care institutions as nursing homes, skilled nursing facilities, extended care facilities, intermediate care facilities, and custodial care facilities.

Chart 37A: Hospital discharge patients transferred to long-term care institutions: United States, 1985–2000



[1]Time trend is significant ($p<0.05$).
NOTE: Percentages exclude deaths and unknown disposition.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS).

Chart 37B: Percentage of current residents and discharges from nursing homes who were admitted from hospitals: United States, 1985–1999



[1]Time trend is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey (NNHS).

Hospital and Nursing Home Fatality Rates

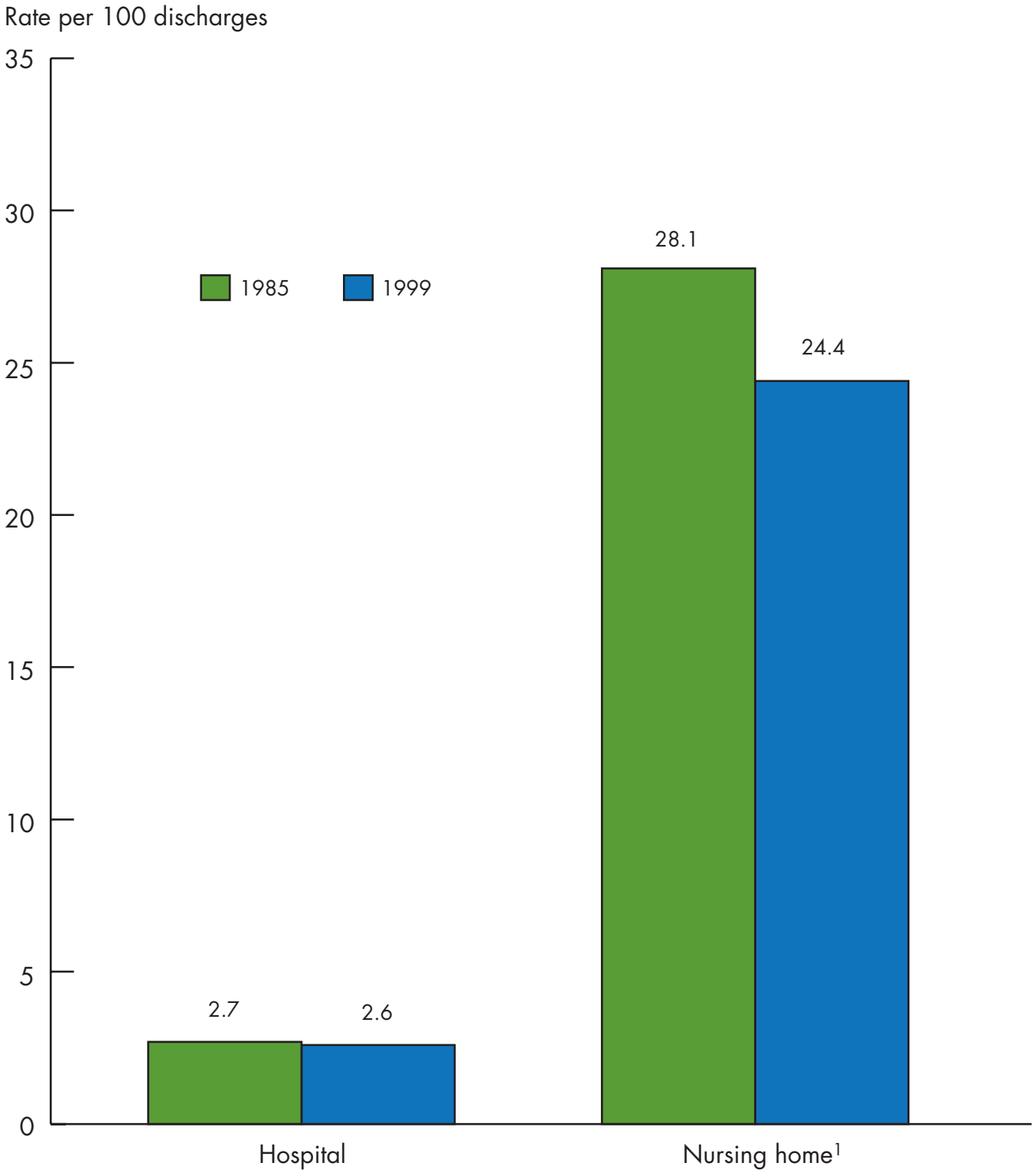
Between 1985 and 1999, the percentage of discharged patients that died during their hospital stay (fatality rate) remained the same, despite the aging of patients discharged from hospitals (from an average age of 46.6 years in 1985 to 52.2 years in 1999) and increasingly sicker patients requiring more complex care (**chart 38**) (150,151).[h] The care provided to these patients became more concentrated in the early days of their stays, allowing them to be discharged earlier, particularly as more technologically demanding and complex care could be provided in the home or in postacute settings. A previous study found that, since 1985, the intensity of hospital services received (for example, days of nursing care, surgeries, or lab tests) increased as hospital length of stay declined. The largest increase in intensity of services occurred between 1985–89, when the intensity per day increased 2.2 percent annually. During that period, low-complexity cases were shifted to outpatient settings, expensive diagnostic procedures such as computed tomography (CT) and MRI scans were widely adopted, and more complex inpatient cases were provided with more intensive services as early as possible during their hospitalizations (100).

Since 1989, much of the change in hospital service level can be linked to site-of-care substitution, from acute to postacute and other settings (100). Between 1985 and 1999, the percentage of live discharges from hospitals transferred to long-term care institutions doubled, from 4.3 percent in 1985 to 9 percent in 1999. As noted previously, nursing homes were the main recipients of these hospital transfers (see "Hospital Transfers to Nursing Homes").

Between 1985 and 1999, the fatality rate among nursing home discharges declined from 28.1 percent in 1985 to 24.4 percent in 1999. This may appear counter-intuitive given the increase in transfers from hospitals. However, changes in characteristics of patients discharged from nursing homes between 1985 and 1999 suggest an increase in number of patients receiving postacute care. These changes include an increased proportion of nursing home discharges with short stays (51.6 percent had stays lasting fewer than 3 months in 1985 compared with 68.3 percent in 1999) and an increase in the proportion discharged alive (71.7 percent in 1985 compared with 75.6 percent in 1999). The proportion of nursing home discharges readmitted to a hospital also declined, from 35.2 percent in 1985 to 28.6 percent in 1999 (80,86).

[h] The fatality rate is defined here as the number of deaths in the institution (hospital or nursing home) divided by the total number of discharges in that institution, multiplied by 100.

Chart 38: Fatality rate among hospital and nursing home discharges: United States, 1985 and 1999



[1]Difference between 1985 and 1999 is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS) and National Nursing Home Survey (NNHS).

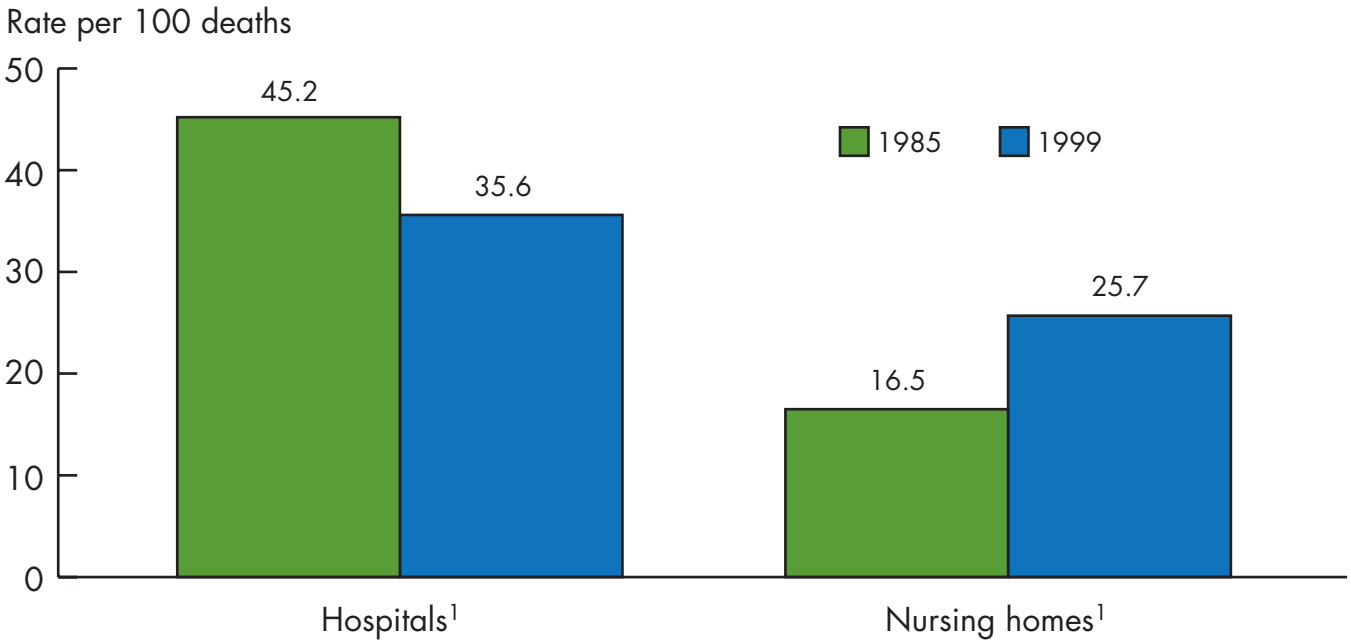
Deaths Occurring in Different Sites of Care

As the structure, financing, and delivery of health care services has increasingly discouraged utilization of acute-care hospitals and encouraged the use of care in ambulatory settings, it is perhaps not surprising that the location at death also shifted from hospitals to other settings. Of the 2.4 million persons who died in 1999, about one-third (35.6 per 100 deaths) or 850,600 deaths occurred in short-stay hospitals (152,153). This rate represents a 21 percent decline since 1985, when 45.2 of every 100 deaths occurred in hospitals (**chart 39A**). During the same time period, the comparable rate of deaths occurring in nursing homes increased from 16.5 per 100 deaths in 1985 to 25.7 per 100 deaths in 1999. This pattern of deaths is consistent with increasing transfers of the elderly from hospitals to nursing homes (see "Hospital Transfers to Nursing Homes"), although these transfers may have been discharged from the nursing home before they died. Between 1992 and 2000, there was not a statistically significant increase in the number and rate of deaths that occurred in hospital emergency departments (**chart 39B**).

Utilization of hospice services has also increased, affecting the setting where people die. Hospice care is a program of palliative care services for persons with terminal conditions. The majority of hospice care is administered within patients' private residences and not in a hospital or other institutional setting; therefore, the percentage of deaths occurring in noninstitutional settings has been increasing over the past decade. In 1992, of the 2.2 million deaths in the United States, 197,400 patients were enrolled in a hospice program at the time of death (or 9.1 per 100 deaths). By 2000, both the number of patients in a hospice care program at the time of death (531,000) and the rate of deaths occurring while enrolled in a hospice care program (22.1 per 100 deaths) had more than doubled.

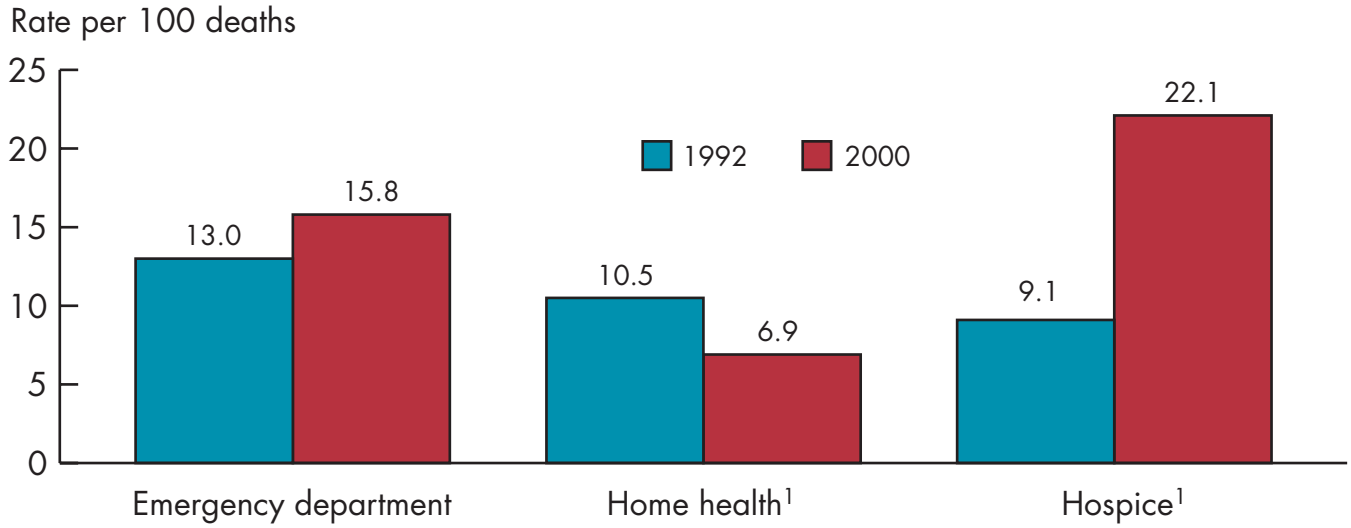
In contrast to hospice care, home health care is provided for rehabilitative or restorative care. Like hospice care, most home health services are also provided in the patients' private residences. Although the rate of home health discharges has increased during the 1990s (see "Home Health Use"), the number of deaths among home health discharges declined from 228,500 deaths in 1992 to 166,500 in 2000 (data not shown). The share of home health deaths among all deaths in the United States also declined (10.5 per 100 deaths in 1992 compared with 6.9 per 100 deaths in 2000). The decline in deaths among persons enrolled in home health care programs may be related to increased use of home health care for postacute services (thus increasing the denominator and making terminally ill patients a smaller percentage of all patients se5rved) or to a substitution of hospice care for home health care services for terminally ill patients.

Chart 39A: Deaths occurring in hospitals or nursing homes: United States, 1985 and 1999



[1]Difference between 1985 and 1999 is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS), National Nursing Home Survey (NNHS), and National Vital Statistics System.

Chart 39B: Deaths occurring during emergency department visits or while enrolled in home health care or a hospice program: United States, 1992 and 2000



[1]Difference between 1992 and 2000 is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS), National Home and Hospice Care Survey (NHHCS), and National Vital Statistics System.

Site of Heart Disease and Cancer Deaths

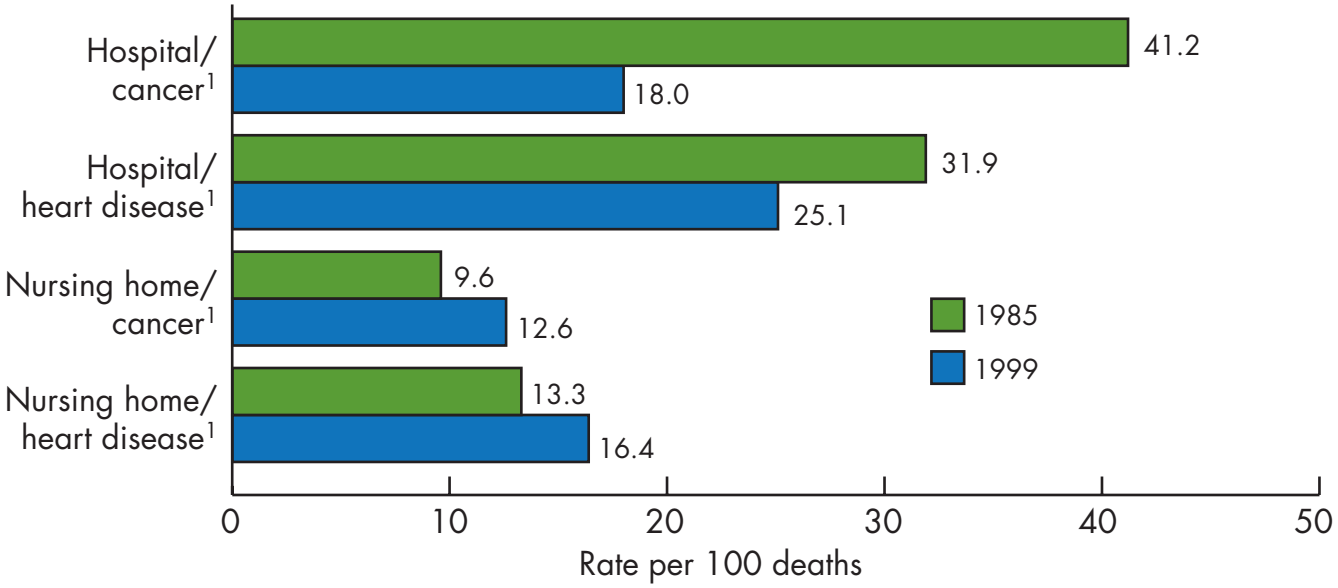
Heart disease and cancer diagnoses are the two leading causes of death in the United States, and they are frequent reasons for hospitalizations and use of hospices (39,154). Between 1985 and 1999, the number of deaths attributed to heart disease in the United States declined by 6 percent, from 771,200 in 1985 to 725,200 in 1999. Heart disease deaths that occurred in hospitals also declined between 1985 and 1999, dropping from 31.9 per 100 heart disease deaths in 1985 to 25.1 per 100 heart disease deaths in 1999. During the same period, the rate of heart disease deaths that occurred in nursing homes increased from 13.3 per 100 heart disease deaths in 1985 to 16.4 per 100 heart disease deaths in 1999 (**chart 40A**).

Between 1985 and 1999, the number of deaths attributable to cancer increased by 19 percent, from 461,600 in 1985 to 549,800 in 1999 (155,156). The change in location of cancer deaths is even more dramatic. In 1985, the rate of cancer deaths that occurred in hospitals was 41.2 per 100 cancer deaths. By 1999, this rate was 18 per 100 cancer deaths. The rate per 100 cancer deaths that occurred in nursing homes increased slightly during this time period, from 9.6 per 100 cancer deaths in 1985 to 12.6 per 100 cancer deaths in 1999.

The major factor affecting the shift in site of cancer deaths, however, was the increasing propensity to enroll in a hospice program. The number of hospice cancer patients discharged dead increased from 147,500 in 1992 to 303,800 in 2000 (157). The rate of these deaths per 100 cancer deaths increased from 28.3 per 100 deaths in 1992 to 55 per 100 deaths in 2000. The comparable rate per 100 cancer deaths among home health patients at the time of death increased from 3.6 per 100 cancer deaths in 1992 to 8.3 per 100 cancer deaths in 2000 (**chart 40B**).

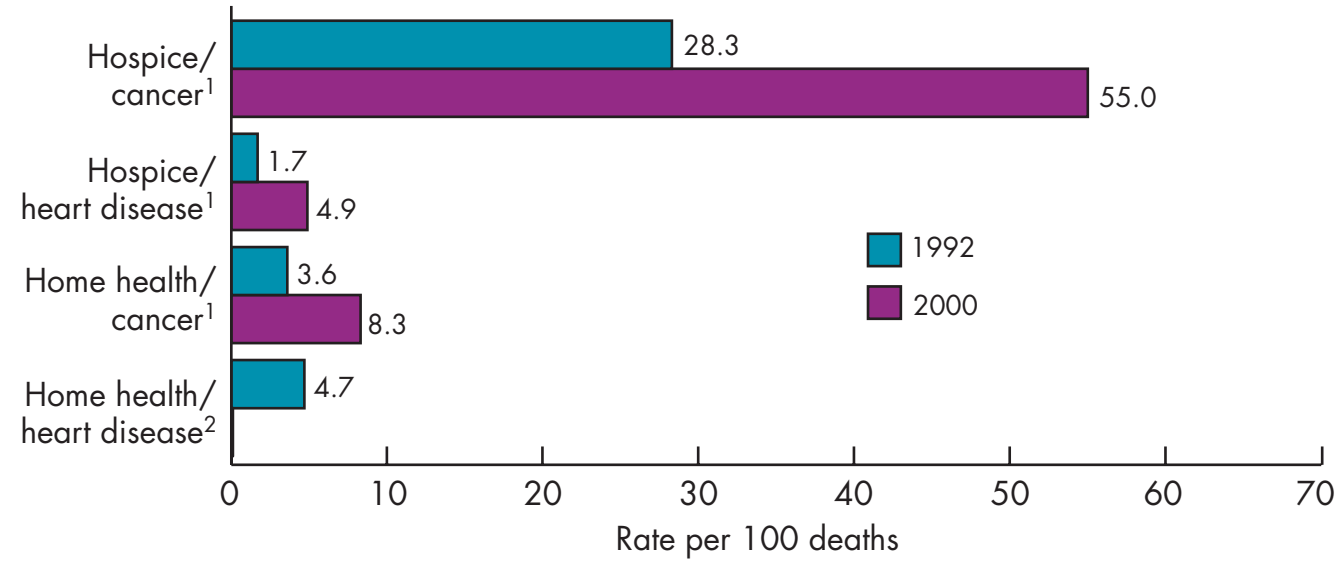
The changing pattern of location at death for cancer patients reflects the growth of the home health industry, the availability of the Medicare hospice benefit beginning in 1982, and the preference of terminally ill patients to be cared for at home. Between 1988 and 1998, Medicare expenditures for hospice care increased from $118 million in 1988 to $2,025 million in 1998 (36).

Chart 40A: Where cancer and heart disease deaths occur: United States, 1985 and 1999



[1]Difference between 1985 and 1999 is significant ($p<0.05$).
NOTE: Numerator of rate based on the primary diagnosis at discharge for discharges from hospitals and nursing homes because of death.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey (NHDS), National Nursing Home Survey (NNHS), and National Vital Statistics System.

Chart 40B: Where cancer and heart disease deaths occur: United States, 1992 and 2000



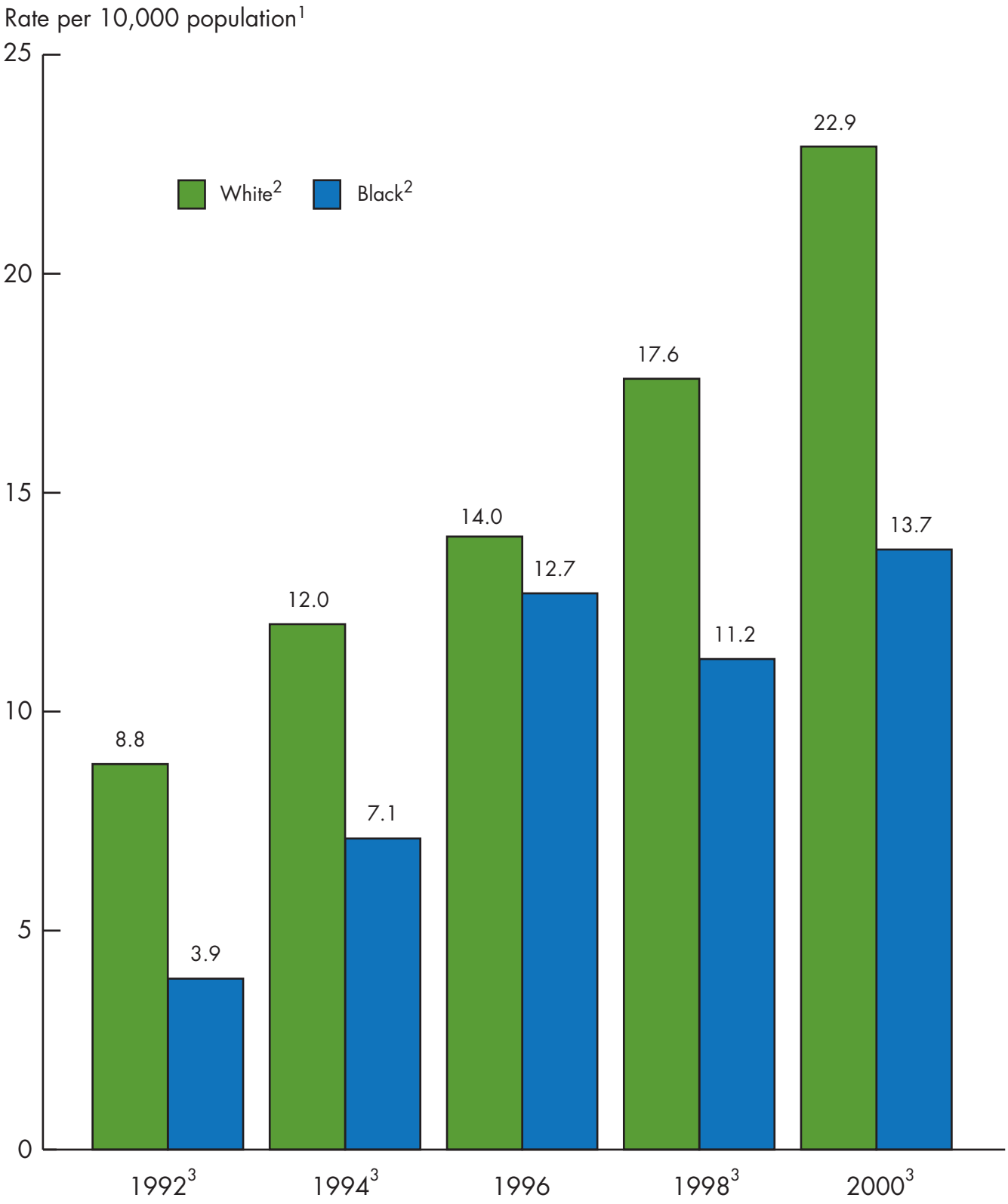
[1]Difference between 1992 and 2000 is significant ($p<0.05$). [2]Rate not provided for 2000 because estimate is based on less than 30 cases.
NOTE: Numerator of rate based on the primary diagnosis at discharge for discharges from home health agencies and hospices because of death.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS), and National Vital Statistics System.

Use of Hospice Services, by Race

Although hospice discharge rates for both black and white persons increased between 1992 and 2000 (**chart 41**), hospice discharge rates among black persons were, on average, 36 percent lower than rates for white persons. Hospice use is highest for patients with cancer. The racial disparity in use of hospice services occurred despite research indicating that black Americans are more likely than any other racial or ethnic group to develop and die from cancer, and the majority of hospice enrollees have a diagnosis of cancer. According to the National Cancer Institute, the 1992–98 average annual incidence rate for all cancer sites was 11 percent higher among black persons than white persons. At the same time, the 1992–98 mortality rate for black Americans for all cancer sites combined was about 33 percent higher than for white Americans (158).

Previous research on disparities in hospice use by black persons found a number of contributing factors for under-utilization. They include unequal access to any medical care, lack of familiarity with the health care system, cultural differences that may make it difficult for black Americans to accept the hospice philosophy (i.e., accepting that death is inevitable, a search for a cure should be stopped, and dying patients should be made comfortable), and financial disincentives built into the Medicare Hospice Benefit program, including copayments that disproportionately limit access by black persons (159,160). Medicare's continuity of care requirement (the requirement that there be a case manager/provider of some sort) for hospice admission is a barrier to care for black persons without a regular doctor as their usual source of care. Black persons are less likely to have a private physician whom they consider their usual source of care and are more likely than white persons to seek health care at emergency departments and health clinics. This trend has widened during the 7 years between 1993 and 2000 (161–163).

Chart 41. Hospice discharges, by race: United States, 1992–2000



[1]See "Appendix 1: Sources and Limitations of the Data" for a description of the population estimates used. [2]Time trend is significant ($p<0.05$).
[3]Difference between black and white populations is significant ($p<0.05$).
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Home and Hospice Care Survey (NHHCS).

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Associated Charts (and Text)

Associated Charts (and Text)

SOURCES

This book consolidates establishment-based health care utilization data collected in the United States. The data cover ambulatory visits to office-based physicians and hospital-based outpatient and emergency departments; discharges from short-stay hospitals; and use of nursing homes, home health agencies, and hospices.

With a few exceptions, utilization data presented in this report come from component surveys of the National Health Care Survey (NHCS). NHCS is a family of surveys that collect data from health care providers and establishments about the use of health services and characteristics of providers and their patients. NHCS components represent the major sectors of the U.S. health care system, providing data on ambulatory, inpatient, and long-term care settings. Each survey in the family is based on a multistage sampling design that includes either the health care facilities or providers and their records. Data are collected through abstraction of medical records, completion of encounter forms, compilation of data from State and professional associations, purchase of data from commercial abstraction services, and surveys of providers. Data from all survey components are collected from the establishment and, in no case, is information received directly from the person receiving care.

Data from NHCS are used by policymakers, planners, researchers, and others in the health community to profile the use of health care services; the epidemiology of health conditions; demand for and patterns of treatment; disparities in treatment; patient disposition following treatment; diffusion of new technologies; and changes in patterns of care and the health care system over time.

This family of surveys includes the following components:

- National Ambulatory Medical Care Survey (NAMCS)
- National Hospital Ambulatory Medical Care Survey (NHAMCS)
- National Hospital Discharge Survey (NHDS)
- National Survey of Ambulatory Surgery (NSAS)
- National Home and Hospice Care Survey (NHHCS)
- National Nursing Home Survey (NNHS)

All estimates presented in this report were weighted to account for the complex sample design of each survey. Standard error estimates and measures of sampling error were computed for all estimates presented in this report using SUDAAN software.[1]

Because survey results are subject to sampling and nonsampling errors, the total error will be larger than the error due to sampling variability alone.

The significance of all trends over time were evaluated using a weighted, least-squares regression analysis at the 0.05 level of significance. The *z*-test or *t*-test with a 0.05 level of significance was used for all other comparisons mentioned in this report. For multiple comparisons between subdomains, the Bonferroni test of simultaneous comparisons was used.

[1] Shah BV, Barnwell BG, Hunt PN, LaVange LM. SUDAAN User's Manual, Release 5.50. Research Triangle Park, North Carolina. 1991.

Medical information about patients collected in all component surveys includes diagnoses and procedures coded to the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) available at http://www.cdc.gov/nchs/about/otheract/icd9/abticd9.htm.

For NHDS, NSAS, NNHS, and NHHCS, rates per population were computed using 1990-based post-censal estimates of the *civilian population* of the United States as of July 1 of each survey year. These estimates are from unpublished tabulations provided by the U.S. Census Bureau and have been adjusted for net underenumeration using the 1990 National Population Adjustment Matrix.

For NAMCS and NHAMCS, rates per population are computed using estimates of the *civilian noninstitutionalized* population of the United States. Estimates for 1990–94 are based on populations estimated from an all-area frame used for the National Health Interview Survey (NHIS). For 1995–2000, post-censal estimates were provided by the U.S. Census Bureau and based on the 1990 census as of July 1 of each survey year. Estimates for 1995–2000 population were adjusted for net underenumeration using the 1990 National Population Adjustment Matrix.

Intercensal estimates of both the civilian and civilian noninstitutionalized populations for 1991 through 2000 that were based on the 1990 census subsequently have been released that incorporate adjustments based on the 2000 census; however, the revised intercensal estimates were not available at the time this report was compiled.

A brief description of each NHCS component survey follows. Additional detail on each survey's design and methodology are available on the Web sites noted in each survey description.

National Ambulatory Medical Care Survey (NAMCS)

The National Ambulatory Medical Care Survey (NAMCS) is a continuing national probability sample of visits made to the offices of non-federally employed physicians (excluding those in the specialties of anesthesiology, radiology, and pathology) who were classified by the American Medical Association (AMA) or American Osteopathic Association (AOA) as "office-based patient care" physicians. Visits made to nurse practitioners, physicians' assistants, and other medical professionals within the sampled physician's practice are also included. Visits to private, nonhospital-based clinics, health maintenance organizations (HMOs), independent practice organizations (IPAs), and other prepaid practices are within the scope of the survey, but those that took place in federally operated facilities and hospital-based outpatient departments (OPDs) were not. Visits to hospital OPDs are included in the National Hospital Ambulatory Medical Care Survey (see below) but not in the NAMCS. Other types of contacts not included are those made by telephone, those made outside the physician's office (for example, house calls), visits made in institutional settings by patients for whom the institution has primary responsibility over time (e.g., nursing homes), visits made to occupational health units, and visits to doctors' offices that are made for administrative purposes only (e.g., to leave a specimen, pay a bill, or pick up insurance forms).

NAMCS uses a multistage probability design that first selects primary sampling units (PSUs), then selects physician practices within PSUs, and finally patient visits within sampled physicians' practices. The PSU sample consists of 112 PSUs used in the 1985–94 NHIS. PSUs are defined as counties, groups of counties, county equivalents (such as parishes or independent cities), towns and townships, or metropolitan statistical areas. At the second stage, a sample of about 3,000 physicians who meet the survey criteria is selected from the AMA and AOA master files each survey year. Typically, 70 percent of sample physicians are in scope and eligible to participate in the survey. Sample physi-

cians are asked to complete patient record forms for a systematic random sample of 30 office visits occurring during a randomly assigned 1-week period. The response rate for past surveys has ranged from 63 to 72 percent. The number of completed patient record forms in past survey years has ranged from 21,000 to 36,000 records.

For more detail on NAMCS, see the Ambulatory Health Care Data Web site at http://www.cdc.gov/about/major/ahcd/ahcd1.htm.

National Hospital Ambulatory Medical Care Survey (NHAMCS)

The National Hospital Ambulatory Medical Care Survey (NHAMCS), initiated in 1992, is a continuing, annual national probability sample of in-person visits made to emergency departments (EDs) and OPDs of non-Federal, short-stay, or general hospitals. Short-stay hospitals are those with an average stay of less than 30 days, and general hospitals are those whose specialty is general medicine or surgery, or children's care, and not care for a specific set of conditions. The NHAMCS sampling frame consists of hospitals that were listed in SMG Marketing Group's April 1991 hospital database.

A four-stage probability sample design is used in the NHAMCS, involving samples of PSUs; hospitals with at least one ED or OPD within PSUs; ED or OPD clinics within hospitals; and patients' visits within EDs or OPD clinics. The PSU sample consists of a 112 PSU subsample of PSUs used in the 1985–1994 NHIS. The hospital sample consists of approximately 500 hospitals, of which 80 percent have EDs and about half have eligible OPDs. The participation rate for EDs has ranged from 93 to 97 percent; the participation rate for OPDs has ranged from 86 to 95 percent.

Within hospital EDs, a sample of ED visits is selected. Hospital staff are asked to complete patient record forms for a systematic random sample of 50 visits occurring during a randomly assigned 4-week reporting period. The number of completed patient record forms for EDs has ranged from 21,000 to 36,000 records in different survey years.

In the NHAMCS OPD survey, a clinic is defined as an administrative unit of the OPD where ambulatory medical care is provided under the supervision of a physician. Clinics where only ancillary services (such as radiology, laboratory services, physical rehabilitation, renal dialysis, and pharmacy) are provided or other settings in which physician services were not typically provided are considered out of scope for the NHAMCS. If a hospital OPD has five or fewer in-scope clinics, all are included in the sample. For hospital OPDs with more than five clinics, a systematic sample of clinics proportional to size is included in the survey. Typically, about 900 clinics are selected from participating hospital OPDs. Within these clinics, hospital staff are asked to complete patient record forms for a systematic random sample of patient visits occurring during a randomly assigned 4-week reporting period. Approximately 150 patient visits were collected for each OPD. The number of patient record forms completed for OPDs has ranged from 29,000 to 35,000 records.

For more detail on NHAMCS, see the Ambulatory Health Care Data Web site http://www.cdc.gov/about/major/ahcd/ahcd1.htm.

National Hospital Discharge Survey (NHDS)

The National Hospital Discharge Survey (NHDS) has been conducted continuously since 1965 and

is the principal source for national data on the characteristics of discharges from non-Federal, short-stay hospitals located in the 50 States and the District of Columbia. Because persons with multiple discharges can be sampled more than once, the NHDS produces estimates for discharges, not persons. Only hospitals with an average length of stay of fewer than 30 days for all patients, general hospitals, and children's general hospitals are included in the survey. Federal, military, and Department of Veterans Affairs hospitals, hospital units of institutions (such as prison hospitals), and hospitals with fewer than six beds staffed for patient use are excluded.

The NHDS collects data from a sample of approximately 300,000 inpatient records acquired from a national sample of about 500 hospitals. Two data collection procedures are used in the survey. One is a manual system in which sample selection and medical transcription from the hospital records to abstract forms is performed by the hospital's staff or by staff of the U.S. Census Bureau on behalf of NCHS. The other data collection procedure is an automated system in which NCHS purchases machine-readable medical record data from commercial organizations, State data systems, hospitals, or hospital associations. Approximately 40 percent of the respondent hospitals provide data through the automated system.

The current NHDS sample began with the 1988 NHDS sample and was selected from a frame of short-stay hospitals listed in the 1987 SMG Hospital Market Data Base. Hospitals with the most beds and/or discharges annually were selected with certainty, but the remaining sample was selected using a three-stage stratified design. The first stage was a sample of PSUs used by NHIS. Within PSUs, hospitals were stratified or arrayed by abstracting status (whether subscribing to a commercial abstracting service or not), and within abstracting status they were arrayed by type of service and bed size. Within these strata and arrays, a systematic sampling scheme with probability proportional to the annual number of discharges was used to select hospitals. Over 90 percent of all sampled hospitals have participated in the NHDS each year. A detailed description of the NHDS is included in "Design and Operation of the National Hospital Discharge Survey: 1988 Redesign," *Vital and Health Statistics*, Series 1, Number 39.

For more detail on NHDS, see the NHDS Web site at
http://www.cdc.gov/nchs/about/major/hdasd/nhdsdes.htm.

National Survey of Ambulatory Surgery (NSAS)

The National Survey of Ambulatory Surgery (NSAS), conducted annually from 1994–96, was a survey of hospitals and freestanding ambulatory surgery centers that perform surgical and nonsurgical procedures on an outpatient basis. There are no plans to conduct the survey in the near future. The sampling frame for hospitals in the NSAS consisted of eligible hospitals, as defined in NHDS, listed in the 1993 SMG Hospital Market Database. The sample for freestanding facilities was selected from ambulatory surgery centers listed in the 1993 SMG Freestanding Outpatient Surgery Center Database and/or Medicare facilities certified in the Health Care Financing Administration Provider-of-Services file. The sample included freestanding centers' general operating rooms, dedicated ambulatory surgery rooms, and other specialized rooms such as endoscopy units and cardiac catheterization labs. Facilities specializing in dentistry, podiatry, abortion, family planning, or birthing were excluded.

All facilities with a high annual volume of ambulatory procedures were included with certainty in the NSAS sample. The remaining sample of facilities was selected using a three-stage stratified cluster

design. The first stage consisted of selecting PSUs used in the 1985–94 NHIS. Facilities were selected at the second stage from the sampled PSUs, and at the third stage, a systematic random sample of ambulatory surgery visits was selected from all locations within a facility where ambulatory surgery is performed. Some 418 hospitals and 333 freestanding ambulatory surgery centers were sampled for the NSAS. These facilities provided about 120,000 sample visits annually. NSAS data collection was done manually by abstraction of information obtained from medical records at selected sample facilities. Response rates for ambulatory surgery centers associated with hospitals were around 88 percent, and response rates for freestanding ambulatory surgery centers were around 77 percent. A detailed description of NSAS is included in "Plan and Operation of the National Survey of Ambulatory Surgery," *Vital and Health Statistics*, Series 1, Number 37.

For more detail on NSAS, see the NSAS Web site at
http://www.cdc.gov/nchs/about/major/hdasd/nsasdes.htm.

National Home and Hospice Care Survey (NHHCS)

The National Home and Hospice Care Survey (NHHCS) is a national probability sample survey of home and hospice care agencies and their current and discharged patients. The NHHCS was conducted in 1992, 1993, 1994, 1996, 1998, and 2000. NHHCS includes all types of agencies that provided home health and hospice care, regardless of whether they were Medicare- or Medicaid-certified.

The sampling frame for the 2000 NHHCS consisted of 15,451 agencies classified as agencies providing home health and hospice care. The universe of home health agencies and hospices was obtained from various national organizations and other sources. The sample consisted of 1,800 agencies selected from this universe. NHHCS fielded in prior years sampled fewer facilities.

The 2000 NHHCS sample design was a stratified two-stage probability design; the first stage was the selection of a stratified sample of agencies, and the second stage was the selection of current patients and discharged patients within each agency. Agencies were selected using systematic sampling with probability proportional to their size. For second-stage sampling, the current patient sample frame contained a listing of all patients on the rolls of the agency as of midnight on the day before the date of the survey. The discharge sample frame contained a listing of all patients discharged from care by the home health agency or hospice during a designated month (including discharges that occurred because of death). Interviewers systematically sampled up to six current patients and six discharges per home health agency or hospice.

Agency information was obtained from personal interviews conducted with agency administrators (or designees) of the sampled home health agency or hospice. Information about current patients and discharged patients was obtained by interviewing the staff primarily responsible for the sampled patients' care; staff referred to patient medical and other records, as necessary. At least 90 percent of all sampled establishments participated in each survey year, with most years surpassing that rate.

For more detail on specific survey years of NHHCS, see the NHHCS Web site at
http://www.cdc.gov/nchs/about/major/nhhcsd/nhhcsd.htm.

National Nursing Home Survey (NNHS)

The National Nursing Home Survey (NNHS) is a national probability sample survey of nursing homes and the people they serve. NNHS was conducted in 1973–74, 1977, 1985, 1995, 1997, and 1999. Currently undergoing a major redesign, the NNHS is currently being pretested in 2003 and will be fielded in 2004. Nursing homes are defined for this survey as facilities with three or more beds that routinely provide nursing care services. Homes providing only personal or domiciliary care are excluded. Included facilities are either certified by Medicare or Medicaid as a skilled nursing or intermediate care facility, or they are not certified but licensed by the State as a nursing home. These facilities may be freestanding or a distinct nursing care unit of a larger facility.

The 1999 NNHS sample design was a stratified, two-stage probability design. The first stage was the selection of facilities, and the second stage was the selection of residents and discharges from those facilities. The primary sampling strata of facilities were defined by bed size and certification status. Within primary strata, facilities were sorted by hospital- and nonhospital-based, ownership, geographic region, metropolitan status, State, county, and ZIP code. Nursing homes were then selected using systematic sampling with probability proportional to their bed size. For the second-stage sampling of current residents and discharges, interviewers constructed two separate frame lists and selected the samples while at each facility. The current resident sample frame contained a listing of all residents on the register of the facility as of midnight on the day before the date of the survey. The discharge sample frame contained a listing of all discharges during a designated month between October 1998 and September 1999 (including decedents). From these lists, interviewers systematically sampled up to six current residents and six discharges per facility.

The facility frame for the 1999 NNHS consisted of 18,400 nursing homes and was derived from the Centers for Medicare and Medicaid Services (CMS) (formerly HCFA, the Health Care Financing Administration) and other national organizations. The sample consisted of 1,496 nursing homes selected from this universe, of which 1,423 nursing homes participated in the first stage by providing facility information. At least 93 percent of all sampled establishments participated in each survey year, with response rates higher in some years.

Facility information was obtained from personal interviews conducted with administrators (or designees) of the sampled nursing homes. Information about current and discharged residents was obtained by interviewing the staff member most familiar with the care provided to the resident. Staff referred to the residents' medical and other records as needed.

For more detail on NNHS, see the NNHS Web site at
http://www.cdc.gov/nchs/about/major/nnhsd/nnhsd.htm.

LIMITATIONS

Data from any survey is subject to various kinds of sampling and measurement errors. Following are some major issues that should be considered when analyzing or evaluating NHCS data.

Sample size considerations

NHCS component surveys are designed to produce representative estimates of the health care utilization experience of the entire U.S. civilian noninstitutionalized population. They are not designed to produce State-level estimates.

Estimates of the entire population presented in this report generally have small sampling errors. When presenting estimates for population subgroups (such as utilization rates for a specific racial or age group, or rates of encounters limited to a specific diagnosis), estimates may be based on small sample sizes; therefore, they may have relatively large sampling errors that make the estimates unreliable. Consequently, estimates of the number and rates of medical encounters in physicians' offices, hospital OPDs, EDs, and hospitals are usually presented as 2-year averages in this report in order to improve the reliability of subpopulation estimates such as specific diagnoses or procedures and utilization by race, age, and sex.

Estimates based on a small number of cases, in addition to being unreliable, may also breach National Center for Health Statistics (NCHS) confidentiality assurances and allow individuals to be identified. Therefore, estimates based on fewer than 30 encounters (visits, discharges, or stays) are not presented.

Comparability of questionnaire items across years

To capture new and emerging public health and health policy issues, new questions may be added, or existing questions modified, each survey year. In terms of survey content, such changes preclude tracking certain trends consistently. For example, selected questions on the data collection instruments for NAMCS and NHAMCS were revised periodically in order to measure new trends (e.g., physician arrangements with managed care organizations (NAMCS) and cause and place of injuries (NHAMCS).) Because this report focuses on trends, many items that were measured inconsistently across survey years could not be included in this report.

Nonsampling errors: Item Response Rates

As in any survey, results are subject to both sampling and nonsampling errors. Nonsampling errors include reporting and processing errors as well as biases due to nonresponse and incomplete response.

Various methodologies are employed by NHCS during data collection to minimize item nonresponse, one potential source of nonsampling error. As a result of these procedures, item nonresponse is low for most survey estimates (5 percent or less). Nonresponse most often occurs when the needed information is not available in the medical record and/or is unknown to the person completing the survey instrument. Nonresponse also can occur when the information is available but survey procedures are not followed and the item is left blank.

The item nonresponse rate for race, one of the main analytic variables shown in this report, is greater than 5 percent for all NCHS Division of Health Care Statistics (DHCS) surveys except the NNHS (see

table I). Analysis of underreporting has not identified misreporting of race, however; although there is a substantial amount of unreported race data, there is no reason to believe that the reported race data are reported incorrectly. Analysis of the underreporting problem in NHDS led to the conclusion that "At present, no ideal solution exists to eliminate the problem of underreporting of race in the NHDS. Therefore, the NHDS race data need to be used cautiously and not over-interpreted. The data can still be useful for some types of analyses."[2]

Table I. Underreporting of race, selected surveys and years

Survey sample (year)	Percent with unknown race
NAMCS (2000)	18%
NHAMCS hospital outpatient departments (2000)	19%
NHAMCS emergency departments (2000)	13%
NHDS (1992)	20%
NNHS (1996)	2%
NHHCS home health care resident (1996)	21%
NHHCS hospice (1996)	7%

NAMCS and NHAMCS surveys use various imputation methods to adjust for missing values, including race, and others present data separately for unknown race. Potential underreporting bias associated with this variable should be considered when using some health-related DHCS estimates by race.

Plans for revisions of future National Health Care Survey components

As the health care infrastructure evolves, so too does the need to obtain information on new and different providers, to address current policy and research issues, and to take advantage of new survey technologies and methodologies. Although NHCS surveys facilities and providers who account for the majority of health care in the United States, technological advances and other factors increasingly are shifting care to new and different places, such as ambulatory surgical centers, community radiology centers, urgent care centers, and new types of long-term care such as assisted living facilities. In addition, NHCS does not survey dentists, psychologists, or other independent health practitioners. Thus, NHCS tells only part of the total health care utilization story in the United States.

To address issues related to utilization in new types of health care facilities and to keep up with current and emerging policy and research topics, NHCS is undergoing ongoing re-evaluation and modification. However, extensive revisions to existing surveys can undermine the ability to produce meaningful trend data. NHCS is attempting to balance the need for new information with the ability to continue presenting important trends in health care utilization, given available resources.

[2] Kozak LJ. Underreporting of race in the National Hospital Discharge Survey. Advance data from vital and health statistics; no 265. Hyattsville, Maryland: National Center for Health Statistics. 1995.

Some major developmental efforts and modifications to the NHCS include:

- National Nursing Home Survey Redesign.
  Questions are being added on medications, palliative care, and other major policy issues. The facility questionnaire is being expanded. The survey is also being converted to a computer-assisted personal interview methodology. In addition, the survey will be linked with the Centers for Medicare and Medicaid Services Minimum Data Set (MDS) to enhance the ability to link facility- and person-level NNHS characteristics not currently on the MDS to the rich clinical information collected in the MDS.

- National Home and Hospice Care Survey Redesign.
  This survey will be modified to put more emphasis on separating the data obtained from home health care and hospice care agencies and clients, and on including recent policy and research issues, such as the effect of payment policy reforms and a growing interest in palliative care. The revised survey will be fielded in 2005 at the earliest.

- Enhancements to the National Ambulatory Care Medical Survey and the National Hospital Ambulatory Medical Care Survey.
  Supplements were added on availability of pediatric-specific equipment in hospital EDs and bioterrorism preparedness in hospital OPDs, EDs, and physicians' offices.

- Enhancements to the National Hospital Discharge Survey.
  Evaluations are currently underway to assess the feasibility of adding information on medications to NHDS.

- Frame development activities.
  Projects are underway to begin building inventories of long-term care residential facilities (e.g., assisted living facilities). Projects to classify these places into a uniform typology are also in progress so that cross-State comparisons can be made. Ultimately other long-term care and postacute care providers will be added to this inventory/sampling frame so that NHHCS and NNHS can be expanded to other types of long-term care and postacute providers.

These planned modifications and additions to NHCS will help CDC/NCHS describe the health care system and the care it provides.

Accreditation–A process whereby a program of study or an institution is recognized by an external body as meeting certain predetermined standards. For facilities, accreditation standards are usually defined in terms of physical plant, governing body, administration, procedures used, and medical and other staff. Accreditation is often given by organizations created for the purpose of assuring the public of the quality of the accredited institution or program. Accreditation may either be permanent or may be given for a specified period of time. See *licensure; certification*.

Acid reducing/peptic disorder drugs–A therapeutic class of drugs prescribed to control gastric acid secretions that can contribute to peptic ulcers and other gastrointestinal disorders associated with excess production of digestive acids. For purposes of this report, acid reducing/peptic disorder drugs are based on NDC class 0874. This therapeutic category includes drugs used to treat gastric secretions, regardless of active ingredient. For example, acetaminophen is classified as a non-narcotic analgesic and as an antipyretic, but it is also the active ingredient in "Bromo-Seltzer," which is classified as an acid reducing/peptic disorder drug. See *National Drug Classification (NDC) Class Category*.

Activities of daily living (ADL)–Activities related to personal care and include bathing or showering, dressing, getting in or out of bed or chair, using the toilet, and eating. In the National Nursing Home Survey and the National Home and Hospice Care Survey, a patient was considered dependent in an ADL activity if he/she received assistance while performing the activity.

Age–Age is reported as age in completed years, as calculated by subtracting the date of birth from a reference date. Age of current residents and current patients included in the National Nursing Home Survey and the National Home and Hospice Care Survey, respectively, was calculated using the day of interview as the reference date. The reference date for patients discharged from nursing homes, home health agencies, and hospices was the date of discharge. For visits to physician's offices, hospital emergency departments and outpatient departments (included in the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Surveys, respectively), the reference date is the date of the visit. For hospital discharges in the National Hospital Discharge Survey, the reference date is the admission date.

All-listed procedure–All occurrences of a procedure listed on the medical record. For example, in the NHDS, a maximum of four procedures is coded for each discharge. A discharge could record multiple fracture procedures, and each would be counted as a separate procedure. Conversely, for "any-listed" procedures, only one fracture procedure would be counted for a hospital discharge that records multiple fracture procedures. See *Any-listed procedure*.

Ambulatory care–All types of health services that are provided on an outpatient basis, in contrast to services provided in the home or to persons who are inpatients. Although many inpatients may be ambulatory, the term "ambulatory care" usually implies that the patient must travel to a location to receive services that do not require an overnight stay.

Ambulatory surgery–According to the National Survey of Ambulatory Surgery (NSAS), refers to previously scheduled surgical and nonsurgical procedures performed on an outpatient basis in a hospital or freestanding ambulatory surgery center's general or main operating rooms, satellite operating rooms, cystoscopy rooms, endoscopy rooms, cardiac catheterization labs, and laser procedure rooms. Procedures performed in locations dedicated exclusively to dentistry, podiatry, abortion, pain block, or small procedures were not included in the NSAS, although any surgery performed outside of a hospital operating room can be considered ambulatory surgery. In NSAS,

data on up to six surgical and nonsurgical procedures are collected and coded. See *Outpatient surgery; Procedure*.

Anti-cholesterol (Hyperlipidemia) drugs–Drugs used to reduce the production of cholesterol in the body. They include Zocor (simvastatin), Lipitor (atorvastatin calcium), Lescol (fluvastatin), Lopid (gemfibrozil), and Pravachol (pravastatin sodium). In this report, these drugs are classified using NDC therapeutic class 0912. See *National Drug Classification (NDC) Class Category*.

Antidepressants–A class of psychotropic drugs used primarily in the treatment of major depressive disorder, dysthymic disorder, and otherwise unnamed depressive disorders as specified in the *International Classification of Diseases*, Ninth Revision (ICD–9). They are also used in treating patients with certain types of schizophrenia and bipolar disorder, panic disorder, obsessive-compulsive disorder, attention-deficit disorder, and some personality disorders. Types of antidepressants include tricyclics, such as Norpramin and Etrafon; monoamine oxidase inhibitor agents (MAOIs), such as Nardil and Parnate; selective serotonin reuptake inhibitors (SSRIs), such as Prozac, Zoloft, and Paxil; and miscellaneous antidepressants, such as Wellbutrin, Serzone, and Effexor. In this report, antidepressants are classified by NDC class 0630. See *National Drug Classification (NDC) Class Category*.

Antihistamines–Drugs that block histamine release and reduce the severity of symptoms. For purposes of this report, antihistamines are classified using NDC class 1944. This therapeutic class does not include nasal corticosteriod inhalants, such as Flonase, which are also used to treat allergies. See *National Drug Classification (NDC) Class Category*.

Any-listed diagnosis–The occurrence of a diagnosis recorded at least once on the medical record or survey abstraction form among all diagnoses recorded, regardless of order.

Any-listed procedure–The occurrence of a procedure recorded at least once on the medical record or patient abstraction form. For example, in the NHDS, up to four procedures are coded. If a hospital discharge records more than one fracture procedure, the fracture procedures are counted only once, that is, the discharge is counted as having at least one fracture procedure.

Assisted living residences–A broad range of residences that provide some assistance with activities of daily living and instrumental activities of daily living but do not provide round-the-clock skilled nursing services. Assisted living facilities and in-home assisted living care stress independence and generally provide less intensive care than that delivered in nursing homes and other long-term care institutions, but there is no standard definition of these places as they are licensed by individual States, if at all. See *Instrumental activities of daily living*.

Average length of service (home health or hospice)–The average length of service is computed by dividing the total number of days patients were enrolled in a home health or hospice program by the number of patients discharged. Average length of service was reported for discharges from home health agencies and hospices in the National Home and Hospice Care Survey.

Average length of stay (inpatient)–The average length of stay is computed by dividing the total number of days of care by the number of patients discharged. Average length of stay was reported for discharges from hospitals in the National Hospital Discharge Survey, nursing home stays in the National Nursing Home Survey, and home health agency stays and hospice episodes (both in the National Home and Hospice Care Survey).

Average length of stay since admission (nursing home)–The length of stay for nursing home residents still receiving care at the time of the survey in nursing homes (current residents) as reported in the National Nursing Home Survey. The average length of stay since admission is computed by dividing the number of days of care since admission up to the interview date by the number of current residents.

Blood-glucose regulators–A class of drugs used to control the amount of sugar (glucose) in the blood, usually prescribed to persons diagnosed with diabetes. This class of drugs includes insulin as well as orally administered drugs such as Glucotrol (glipizide) and Glucophage (metformin). In this report, blood-glucose regulators are classified using NDC class 1036. See *National Drug Classification (NDC) Class Category*.

Certification–The process by which a governmental or nongovernmental agency or association evaluates and recognizes an individual, institution, or educational program as meeting predetermined standards and thus is eligible to receive payment from, or to contract with, a specific program or source. Certification programs do not exclude the uncertified from practice as do licensure programs, but lack of certification may preclude them from receiving specific types of payment. For example, providers not certified by the Medicare program may not receive Medicare payments. See *Accreditation; Licensure*.

Chronic disease or condition–A disease or condition that has one or more of the following characteristics: is permanent; leaves residual disability; is caused by nonreversible pathological alteration; requires special training of the patient for rehabilitation; or may be expected to require a long period of supervision, observation, or care.

Clinic—A clinic is an administrative unit of a hospital outpatient department where ambulatory medical care is provided under the supervision of a physician. The following are examples of clinics included in the National Hospital Ambulatory Medical Care Survey (NHAMCS): general medicine, surgery, pediatrics, obstetrics and gynecology, substance abuse (excluding methadone maintenance), and others (e.g., psychiatry and neurology). Clinics excluded from NHAMCS include ambulatory surgery centers, chemotherapy, employee health service, renal dialysis, methadone maintenance, and radiology clinics. See *Outpatient department*.

Co-morbidities–Conditions that exist at the same time as the primary condition in the same patient (e.g., hypertension is a co-morbidity of many conditions such as diabetes, ischemic heart disease, and end-stage renal disease).

Days of care (hospital)–In the National Hospital Discharge Survey, refers to the total number of patient days accumulated by patients at the time of discharge from non-Federal, short-stay hospitals during a reporting period. All days from and including the date of admission but not including the date of discharge are counted. See *Average length of stay; Discharge; Hospital; Patient*.

Diagnosis–The process of identifying a patient's clinical condition by signs, symptoms, tests, and other methods, and/or the provider's opinion as to what the patient's clinical condition is. See *Any-listed diagnosis; First-listed diagnosis*.

Discharge–In the National Hospital Discharge Survey, National Nursing Home Survey, and National Home and Hospice Care Survey, a discharge from the health care institution (hospital, nursing home, home health agency, or hospice) is the termination of a service from that health care institution

by death or by disposition to a place of residence, hospital, nursing home, or other location. For the National Hospital Discharge Survey, discharges can include stays of 0 nights if a patient was admitted and discharged on the same day.

Drug (NAMCS, NHAMCS)–A pharmaceutical agent, by any route of administration, for prevention, diagnosis, or treatment. Drugs mentioned in the NAMCS and NHAMCS are coded by NDC code entry name, therapeutic class, generic name, ingredients, composition status, prescription status, and control status. For purposes of this report, a specific drug or class of drugs was considered "mentioned" during a visit if it was recorded at least once on the patient record form. See *National Drug Classification (NDC) Class Category*.

Drug mention (NAMCS, NHAMCS)–In the NAMCS and NHAMCS, along with all new drugs, the physician or other health care provider records continued medications if the patient was specifically instructed during the visit to continue the medication. A drug mention is the physician's or other health care provider's entry on the patient record form of a pharmaceutical agent, by any route of administration, for prevention, diagnosis, or treatment. Drug mentions were collected in the National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Care Medical Survey (NHAMCS). Generic as well as brand name drugs are included, as are nonprescription and prescription drugs. Up to five medications may be reported per visit until 1996; in the 1996 and subsequent NAMCS and NHAMCS surveys, up to six medications could be listed.

Emergency department (ED)–Defined by the National Hospital Ambulatory Medical Care Survey (NHAMCS), as a hospital facility for the provision of unscheduled outpatient services to patients whose conditions require immediate care and is staffed 24 hours a day. Off-site emergency departments open less than 24 hours are included if staffed by the hospital's emergency department. See *Emergency department visit*.

Emergency department visit–Defined in the National Hospital Ambulatory Medical Care Survey as a direct personal exchange between a patient and a physician or other health care provider working under the physician's supervision, for the purpose of seeking care and receiving personal health services. See *Emergency department*.

Fatality rate–In hospitals and nursing homes, the fatality rate is the ratio of the number of deaths in these institutions to the number of discharges, multiplied by 100.

First-listed diagnosis–In all of the National Health Care Surveys, this is the first recorded final diagnosis on the medical record face sheet (summary sheet or abstraction form).

Home health care–Home health care as defined by the National Home and Hospice Care Survey is care provided to individuals and families in their place of residence for promoting, maintaining, or restoring health; or for minimizing the effects of disability and illness, including terminal illness.

Hormone Replacement Therapy (HRT)–Medication containing one or more hormones, prescribed by a physician for women during and after menopause. This medication may be in the form of a pill, patch, or vaginal cream. The purpose of the therapy is to decrease the symptoms that may occur during menopause and to help protect against other diseases. In this report, HRT drugs use NDC therapeutic code 1034 (estrogens/progestins). See *National Drug Classification (NDC) Class Category*.

Hospice care–Defined by the National Home and Hospice Care Survey as a program of palliative and supportive care services providing physical, psychological, social, and spiritual care for dying persons, their families, and other loved ones. Hospice services are available in home and inpatient settings.

Hospital–According to the American Hospital Association, a licensed institution with at least six beds whose primary function is to provide diagnostic and therapeutic patient services for medical conditions by an organized physician staff and has continuous nursing services under the supervision of registered nurses. The National Hospital Ambulatory Medical Care Survey and the National Hospital Discharge Survey include hospitals with an average length of stay of less than 30 days for all patients (short-stay) or hospitals whose specialty is general (medical or surgical) or children's general. Federal hospitals, hospital units of institutions, and hospitals with fewer than six beds staffed for patient use are excluded. See *Average length of stay; Days of care; Emergency department; Outpatient department*.

Hospital patient–A person who is formally admitted to the inpatient service of a hospital for observation, care, diagnosis, or treatment. See *Average length of stay; Days of care; Discharge; Hospital*.

Instrumental activities of daily living–Activities related to independent living, including preparing meals, managing money, shopping for groceries or personal items, performing light or heavy housework, and using a telephone. See *Activities of daily living*.

International Classification of Diseases, Ninth Revision, Clinical Modification (ICD–9–CM)–The official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States. Based on the World Health Organization's Ninth Revision, *International Classification of Diseases* (ICD–9), ICD–9–CM consists of a tabular list containing a numerical list of the disease code numbers in tabular form; an alphabetical index to the disease entries; and a classification system for surgical, diagnostic, and therapeutic procedures (alphabetical index and tabular list). The National Center for Health Statistics (NCHS) and the Centers for Medicare and Medicaid Services (CMS) are the U.S. governmental agencies responsible for overseeing all changes and modifications to the ICD–9–CM.

License/Licensure–A permission granted to an individual or organization by a competent authority, usually public (e.g., a State government), to engage lawfully in a practice, occupation, or activity. Licensure is the process by which the license is granted. It is usually granted on the basis of examination and/or proof of education rather than on measures of performance. A license is usually permanent but may be conditioned on annual payment of a fee, proof of continuing education, or proof of competence. See *Accreditation; Certification*.

Mammogram–An x-ray picture of breast tissue. It is used to detect tumors and cysts and to help differentiate benign (noncancerous) and malignant (cancerous) disease.

Managed care–The body of clinical, financial, and organizational activities designed to provide appropriate health care services in a cost-efficient manner. Managed care techniques are most often practiced by organizations and professionals who assume risk for a defined population through capitated payments (fixed payment per enrollee, rather than payment for individual services provided), although some definitions of managed care include plans that require stringent precertification for services and/or utilization review procedures.

Medicaid–Medicaid was authorized by Title XIX of the Social Security Act in 1965 as a jointly funded cooperative venture between the Federal and State governments to assist States in the provision of adequate medical care to eligible needy persons. Medicaid is the largest program providing medical and health-related services to America's poorest people. Within broad Federal guidelines, each of the States establishes its own eligibility standards; determines the type, amount, duration, and scope of services; sets the rate of payment for services; and administers its own program. Thus, the Medicaid program varies considerably from State to State, as well as within each State over time.

Medicare–A nationwide health insurance program providing health insurance protection to people 65 years of age and over, people entitled to Social Security disability payments for 2 years or more, and people with end-stage renal disease, regardless of income. The program was enacted July 30, 1965, as Title XVIII, Health Insurance for the Aged of the Social Security Act, and became effective on July 1, 1966. It consists of two separate but coordinated programs, hospital insurance (Part A) and supplementary medical insurance (Part B).

National Drug Classification (NDC) Class Category–A code used to identify each of 20 major classes to which the drug entry may belong, adapted from "Standard Drug Classifications" in the *National Drug Code (NDC) Directory, 1995*. The two-digit categories are general and represent all subcategories (e.g., antimicrobial agents), and the specific four-digit categories represent the breakouts of the general category (e.g., Penicillin). The general two-digit codes will include medications that do not fit into any of the subcategories (four-digit codes). Starting in 1995, the NDC four-digit classes were changed to include more classes than the previous classification in 1985. Therefore, some drugs switched from a general four-digit class into a more specific four-digit class. Additionally, drugs may be approved for several different therapeutic classes. Some drugs receive approval for additional therapeutic uses after their initial approval; thus, the same drug can change classes because of new uses.

Nursing home–In the National Nursing Home Survey (NNHS), an establishment licensed as a nursing home with three or more beds that routinely provides nursing care services. Homes providing only personal or domiciliary care are excluded. Facilities included are either certified by Medicare or Medicaid, or they are not certified but licensed by the State as a nursing home. These facilities may be freestanding or distinct nursing care units of larger facilities.

Office-based physician–See *Physician*.

Outpatient–A patient who is receiving ambulatory care at a hospital or other facility without being admitted to the facility. Usually, it does not mean people receiving services from a physician's office or other program that also does not provide inpatient care. See *Outpatient department; Outpatient department visit*.

Outpatient department (OPD)–Defined by the National Hospital Ambulatory Medical Care Survey (NHAMCS) as a hospital facility, department, or clinic where nonurgent ambulatory medical care is provided. The following are examples of the types of OPDs excluded from the NHAMCS: ambulatory surgery, chemotherapy, employee health services, renal dialysis, methadone maintenance, and radiology. See *Emergency department; Hospital*.

Outpatient department (OPD) visit–Defined in the National Hospital Ambulatory Medical Care Survey as a direct, personal exchange between an ambulatory patient seeking care and a physician or other health care provider to render personal health services within a hospital facility.

Excluded are visits where medical care was not provided, such as visits made to drop off specimens, pay bills, make appointments, and walk-outs. See *Outpatient department; Clinic.*

Outpatient surgery–Defined by the American Hospital Association as surgery that is performed on patients who do not remain in the hospital overnight and occurs in inpatient operating suites, outpatient surgery suites, or procedure rooms with an outpatient care facility. Outpatient surgery is a surgical operation, whether major or minor, performed in operating or procedure rooms. A surgical operation involving more than one surgical procedure is considered one operation. See *Ambulatory surgery; Procedure.*

Patient–One who receives medical attention, care, or treatment from a trained medical provider or from a medical establishment.

Physician–Though self-reporting, physicians are classified by the American Medical Association (AMA), the American Osteopathic Association (AOA), and others as licensed doctors of medicine or osteopathy as follows:

Active (or professionally active) physicians are currently practicing medicine for a minimum of 20 hours per week. Excluded are physicians who are not practicing, practice medicine for less than 20 hours per week, have unknown addresses, or specialties not classified (when specialty information is presented).

Federal physicians are employed by the Federal Government; non-Federal or civilian physicians are not.

Hospital-based physicians spend the plurality of their time as salaried physicians in hospitals.

Office-based physicians spend the plurality of their time working in practices based in private offices.

Physician office–In the National Ambulatory Medical Care Survey, any location for a physician's ambulatory practice other than hospitals, nursing homes, other extended care facilities, patients' homes, industrial clinics, college clinics, and family planning clinics. Offices in health maintenance organizations and private offices in hospitals are included. See *Physician office visit; Outpatient visit; Physician.*

Physician office visit–In the National Ambulatory Medical Care Survey (NAMCS), any direct personal exchange between an ambulatory patient and a physician or members of his or her staff for the purposes of seeking care and rendering health services. These visits may occur in offices of non-federally employed physicians classified by the American Medical Association (AMA) or American Osteopathic Association (AOA) as "office-based, patient care" physicians. Patient encounters with physicians engaged in prepaid practices (including health maintenance organizations (HMOs), independent practice organization (IPAs), and other prepaid practices) are included in NAMCS. Excluded are visits to hospital-based outpatient departments; visits to specialists in anesthesiology, pathology, and radiology; and visits to physicians who are principally engaged in teaching, research, or administration. Telephone contacts and visits that do not occur in a physician's office are also excluded. See *Outpatient visit.*

Physician specialty–Any specific branch of medicine in which a physician may concentrate. Physicians are classified based on self-reports of their primary area of specialty. The National Ambulatory Medical Care Survey design called for grouping physicians into 15 strata, or specialty groups, for sampling purposes. One stratum, doctors of osteopathy, was based on information from the American Osteopathic Association (AOA). The other groups (general and family practice, internal medicine, pediatrics, general surgery, obstetrics and gynecology, orthopedic surgery, cardiovascular diseases, dermatology, urology, psychiatry, neurology, ophthalmology, otolaryngology, and a residual category of other specialties) were developed based on information from the American Medical Association (AMA). Physician specialty estimates combine doctors of osteopathy with doctors of medicine based on the physician's specialty. See *Physician*.

Population–The U.S. Census Bureau collects and publishes data on populations in the United States according to several different definitions. Various statistical systems then use the appropriate population for calculating rates.

Total population is the population of the United States, including all members of the Armed Forces living in foreign countries, Puerto Rico, Guam, and the U.S. Virgin Islands. Other Americans abroad (for example, civilian Federal employees and dependants of members of the Armed Forces or other Federal employees) are not included.

Resident population includes persons whose usual place of residence (that is, the place where one usually lives and sleeps) is in one of the 50 States or the District of Columbia. It includes members of the Armed Forces stationed in the United States and their families. It excludes international military, naval, and diplomatic personnel and their families located here and residing in embassies or similar quarters. Also excluded are international workers and international students in this country and Americans living abroad. The resident population is usually the denominator when calculating birth and death rates and incidence of disease.

Civilian population is the resident population excluding members of the Armed Forces. However, families of members of the Armed Forces are included. This population is the denominator in rates calculated for the National Hospital Discharge Survey, the National Home and Hospice Care Survey, the National Nursing Home Survey, and the National Survey of Ambulatory Surgery.

Civilian noninstitutionalized population is the civilian population not residing in institutions. Institutions include correctional institutions, detention homes, and training schools for juvenile delinquents; homes for the aged and dependent (for example, nursing homes and convalescent homes); homes for dependent and neglected children; homes and schools for the mentally or physically handicapped; homes for unwed mothers; psychiatric, tuberculosis, and chronic disease hospitals; and residential treatment centers. U.S. Census Bureau estimates of the civilian noninstitutionalized population are used to calculate rates using National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey data.

Primary care–According to a report by the Institute of Medicine, "the provision of integrated, accessible, health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of the family and the community."[3]

[3] Institute of Medicine. *Primary Care: America's Health in a New Era*. Washington DC: National Academy Press. 1996.

Primary care physician–In this report, general and family practitioners, general internists, and pediatricians. Some definitions of primary care physician also include obstetrician/gynecologists who serve as a primary point of contact for many women.

Postacute care–(Also called **subacute care** or **transitional care**)–Type of short-term care provided by many long-term care and rehabilitation facilities and hospitals, which may include rehabilitation services, specialized care for certain conditions (such as stroke and diabetes) and/or postsurgical care and other services associated with the transition between the hospital and home. Residents of these units often have been hospitalized recently and typically have more complicated medical needs. The goal of subacute care is to discharge residents to their homes or to a lower level of care.

Procedure–According to the National Health Care Survey, a surgical or nonsurgical operation, diagnostic procedure, or therapeutic procedure (such as respiratory therapy) recorded on the medical record of discharged patients. A maximum of four procedures per discharge in NHDS and up to six procedures per discharge in NSAS were recorded and coded to the *International Classification of Diseases, Ninth Revision, Clinical Modification*. Procedures are also recorded on the NAMCS and NHAMCS. The distinction between surgical, diagnostic, and nonsurgical procedures has become less meaningful due to the development of minimally invasive and noninvasive surgery. Thus, the practice of classifying procedures as surgical or diagnostic has been discontinued. See *Ambulatory surgery; Outpatient surgery*.

Race–In 1997, new standards were announced for classification of individuals by race within the Federal Government's data systems. The 1997 standards have five racial groups: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or other Pacific Islander, and white. These five categories are the minimum set for data on race for Federal statistics. The 1997 standards also offer an opportunity for respondents to select more than one of the five groups, leading to many possible multiple race categories. As with the single race groups, data for the multiple race groups are to be reported when estimates meet agency requirements for reliability and confidentiality. The 1997 standards allow for observer or proxy identification of race but clearly state a preference for self-classification. All Federal data systems must comply with the 1997 standards by 2003.

Resident–In the National Nursing Home Survey, a person on the roster of a nursing home as of the night before the survey. Included are all residents for whom beds are maintained even though they may be on overnight leave or in a hospital. See *Nursing home*.

State Children's Health Insurance Program (SCHIP)–A program enacted as part of the Balanced Budget Act of 1997, which established Title XXI of the Social Security Act to provide States with $24 billion in Federal funds for 1998–2002, targeting children in families with incomes up to 200 percent of the Federal Poverty Level.

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