

## Chapter I

# Overview of Health Care: A Population Perspective

---

*This chapter provides a general overview of the U.S. health care industry, its policy makers, its values and priorities, and its various responses to health care diseases and problems. A template for understanding the natural histories of diseases and the levels of medical intervention is illustrated. Major influences in the continuing growth and change of the United States's health services system are briefly described in preparation for more extensive discussion in subsequent chapters. The conflicts of interest and ethical dilemmas resulting from medicine's technological advances and the advent of managed care are also noted.*

In recent years, health care, especially its medical or curative aspect, has captured the interest of the public, political leaders, and an attentive media as never before. News of medical miracles, breakthroughs, disasters, deficiencies, and rising costs attracts a consistently high readership. For many, the fortunes and foibles of health care take on deeply serious meanings. There is a widespread sense of urgency among employers, insurers, consumer groups, and other policy makers about the seemingly unresolvable need to correct problems of access and cost without compromising quality of care. The last decade's major economic and social changes in the United States have altered the way Americans think about the role health care plays in their lives and about the strengths and deficiencies of the complex labyrinth of health care providers, facilities, programs, and services.

There is growing recognition that health care is a big business that consumes almost 13 percent of the United States's gross domestic product and now exceeds \$1.3 trillion in costs. The corporatization of the health care industry is creating major opportunities for megamergers and for investors. Many health care providers and institutions have become commercial entrepreneurs beyond all expectations and to the concern of many. The commercialization of health care has created increasing conflicts between providers on one side and policy makers, managed care organizations, and other third-party payers on the other.

---

## 2 ■ OVERVIEW OF HEALTH CARE: A POPULATION PERSPECTIVE

---

Physicians are seeking public support for their concern that managed care may constrain expenditures without adequate regard for the quality of care. Policy makers and care managers assert that physicians expressing concerns over quality is a way to resist scrutiny and accountability without regard for economic efficiency. Against this contentious background, health care policy debates will likely continue to be unproductive. Recriminations from both sides block attempts at constructive dialogue.

### ■ Problems of Health Care

Although there are philosophical and political differences that fuel the debates about health care policies and reforms, there is general agreement that the health care system in the United States, as in most other countries, is fraught with problems and dilemmas. In spite of its impressive accomplishments, the U.S. health care system exhibits inexplicable contradictions in objectives; unwarranted variations in performance, effectiveness, and efficiency; and long-standing difficulties in its relationships with the public and with governments.

The strategies for addressing the problems of cost, access, and quality over the last 30 years reflect the periodic changes in political philosophies. The government-sponsored programs of the 1960s were designed to improve access for older adults and low-income populations without regard for the inflationary effects on costs. These programs were followed by regulatory attempts to address first the availability and price of health services, then the organization and distribution of health care, and then its quality. In the 1990s, the ineffective patchwork of government-sponsored health system reforms was superseded by the emergence of market-oriented changes, competition, and privately organized managed care organizations.

The failure of government-initiated reforms created a vacuum that was filled quickly by the private sector. There is a difference, however, between recent governmental goals for health care reform and those of the market. Although the proposed government programs try to maintain some balance among costs, quality, and access, the primary goal of the market is to contain costs. As a result, there are serious concerns that market-driven reforms may not result in a health care system that equitably meets the needs of all Americans.

As Eli Ginzberg, writing in the *New England Journal of Medicine*, points out, as long as the dominant interest groups—government, employers, the public, and major provider groups—do not agree on how to change the system to accomplish widely desired reforms, the American people will continue temporizing. They are “unwilling to risk the strengths of our existing health care system in a radical effort to remedy admittedly serious deficiencies.”<sup>1</sup>

## ■ Understanding Health Care

Health care policy usually reflects public opinion. Finding acceptable solutions to the perplexing problems of health care will depend on public understanding and acceptance of both the existing circumstances and the benefits and risks of proposed remedies. Many of the communication problems regarding health policy stem from the public's inadequate understanding of health care and its delivery system.

Early practitioners purposely fostered the mystique surrounding medical care as a means to set themselves apart from the patients they served. Endowing health care with a certain amount of mystery encouraged patients to maintain blind faith in the capability of their physicians, even when the state of the science did not justify it. When advances in the understanding of the causes, processes, and cures of specific diseases revealed that previous therapies and methods of patient management were based on erroneous premises, physicians were not held responsible. Although the world's most advanced and proficient health care system provides a great deal of excellent care, the lack of public knowledge has allowed much care to be delivered that was less than beneficial, and some that was inherently dangerous.

Now, however, the romantic naivete with which health care and its practitioners were viewed has eroded significantly. Since the revealing debates over President Clinton's health care reform proposal of 1993 and the public's increasing exposure to the concepts of managed care, attitudes toward health care and its practitioners have changed. Whether or not it was ever true, the long-held assumption by both health care providers and patients that their dictator-follower relationship was inviolate no longer exists.

Rather than a confidential contract between the provider and the consumer, the health care relationship now includes a voyeuristic collection of insurers, payers, managers, and quality assurers. Providers no longer have a monopoly on health care decisions and actions. Although the increasing scrutiny and accountability may be onerous and costly to physicians and other providers, it represents the concerns of those paying for health care—governments, insurers, employers, and patients—about the value received for their expenditures. That these questions have been raised reflects the prevailing opinion that those who now chafe under the scrutiny are, at least indirectly, responsible for generating the excesses in the system while at the same time neglecting the problems of limited access to health care for many.

Cynicism about the health care system has grown as increasing information about the problems of costs, quality, and access has become public. People who viewed medical care as a necessity provided by physicians who adhere to scientific standards based on tested and proven therapies have been disillusioned to learn that major knowledge

## 4 ■ OVERVIEW OF HEALTH CARE: A POPULATION PERSPECTIVE

---

gaps contribute to highly variable use rates for therapeutic and diagnostic procedures that have produced no measurable differences in outcomes. Nevertheless, recent attempts at systemwide reforms repeatedly have demonstrated the enormously complex issues that underlie the health industry's problems and the ineptitude of the system's leadership in addressing them. Writing in a 1996 issue of *Newsweek*, journalist Robert J. Samuelson stated, "We've had enough grand reforms which promise much and deliver little. They will never create our ideal health care system: one that provides all the care people want without huge costs or intrusive controls from either government or business. That system is impossible; too many of its goals collide."<sup>2</sup>

Many health care system employees also have become discouraged. Institutional and agency administrators who say they care about patients but must reflect overriding budget considerations in every action confuse and demoralize health care workers. Most individuals in health care chose a health occupation, not because of the income potential, but because they had a sense of caring and social justice. They made trade-offs and sacrifices for their values only to find that the reality is quite different. Nurses, the largest component of the health care workforce, are especially frustrated with their current role in hospitals. They feel overworked, unable to meet their own standards of quality care, and stressed to the point of leaving the profession. It is hoped that when the health care system again becomes stabilized in a more predictable economic environment, those contradictory messages from higher administrative levels will cease.

### ■ **Why Patients and Providers Behave the Way They Do**

In Chapter 3, the evolution of the U.S. system of hospitals makes clear the long tradition of physicians and other health care providers behaving in an authoritarian manner towards patients. Hospitalized patients, removed from their usual places in society, were expected to be compliant and grateful to be in the hands of someone far more learned than themselves. The fact that submissive patient behavior has characterized even otherwise domineering individuals when they become ill has interested a great many researchers. Because the health beliefs and actions of patients have much to do with their timely and appropriate use of the health care system and their disposition and motivation to cooperate in their treatment, physicians, nurses, and social scientists have studied patient behavior for decades to try to understand the "sick role."

In 1951 Talcott Parson suggested that ill individuals in Western-developed nations demonstrate predictable behaviors, and his theories are still recognized as contributing to the understanding of illness behavior. Frederick Wolinsky stated that Parson's description of the sick

role was “an integral part of the sociocultural definition of health and illness.”<sup>3</sup> Wolinsky reviewed the four major elements of Parson’s assumptions. First, ill people believe they are not solely responsible for their condition and that it is not within their power to get well. Second, by virtue of their diminished function, ill people are exempt from normal personal and social obligations in proportion to the severity of their illness. Third, because illness is undesirable, sick people are expected to take appropriate action and enlist the aid of others in getting well. Fourth, sick people are obliged to obtain competent assistance, usually from a physician, to aid recovery and to comply with the treatment and advice received.

Parson’s description of the sick role explains why patients often abdicate personal responsibility for their condition and recovery to a health care system more than willing to accept the authority to decide what is best for them. More recently, however, recognizing the benefits of more proactive roles for patients and the improved outcomes that result, both health care providers and consumers are encouraging significant patient participation in every health care decision.

## ■ Indexes of Health and Disease

Although health care providers, researchers, analysts, and others in the health services industry have created a detailed and comprehensive taxonomy of diseases and disabilities, definitions of what constitutes “health” are frustratingly ambiguous. The 1958 World Health Organization (WHO) definition, “a state of complete physical, mental and social well-being and not merely the absence of disease,” is hardly measurable and rarely achievable—certainly not for any extended length of time.<sup>4</sup> Thus, much of “health” is so subjective that for all practical purposes, it is determined clinically by the converse—whether individual physical, physiological, and laboratory test values fall within or outside of “normal” parameters.

The body of statistical data about health and disease has grown enormously since the late 1960s, when the government began analyzing information obtained from Medicare and Medicaid claims, and computerized hospital and insurance data allowed the retrieval and exploration of huge files of clinical information. In addition, there have been continuing improvements in the collection, analysis, and reporting of vital statistics and communicable and malignant diseases by state and federal governments.

Data collected over time and international comparisons reveal common trends among developed countries. Birth rates have fallen, and life expectancies have lengthened so that older people make up an increasing proportion of total populations. The percentage of individuals who are disabled or dependent has grown as the health care professions have improved their capacity to rescue moribund individuals.

## 6 ■ OVERVIEW OF HEALTH CARE: A POPULATION PERSPECTIVE

---

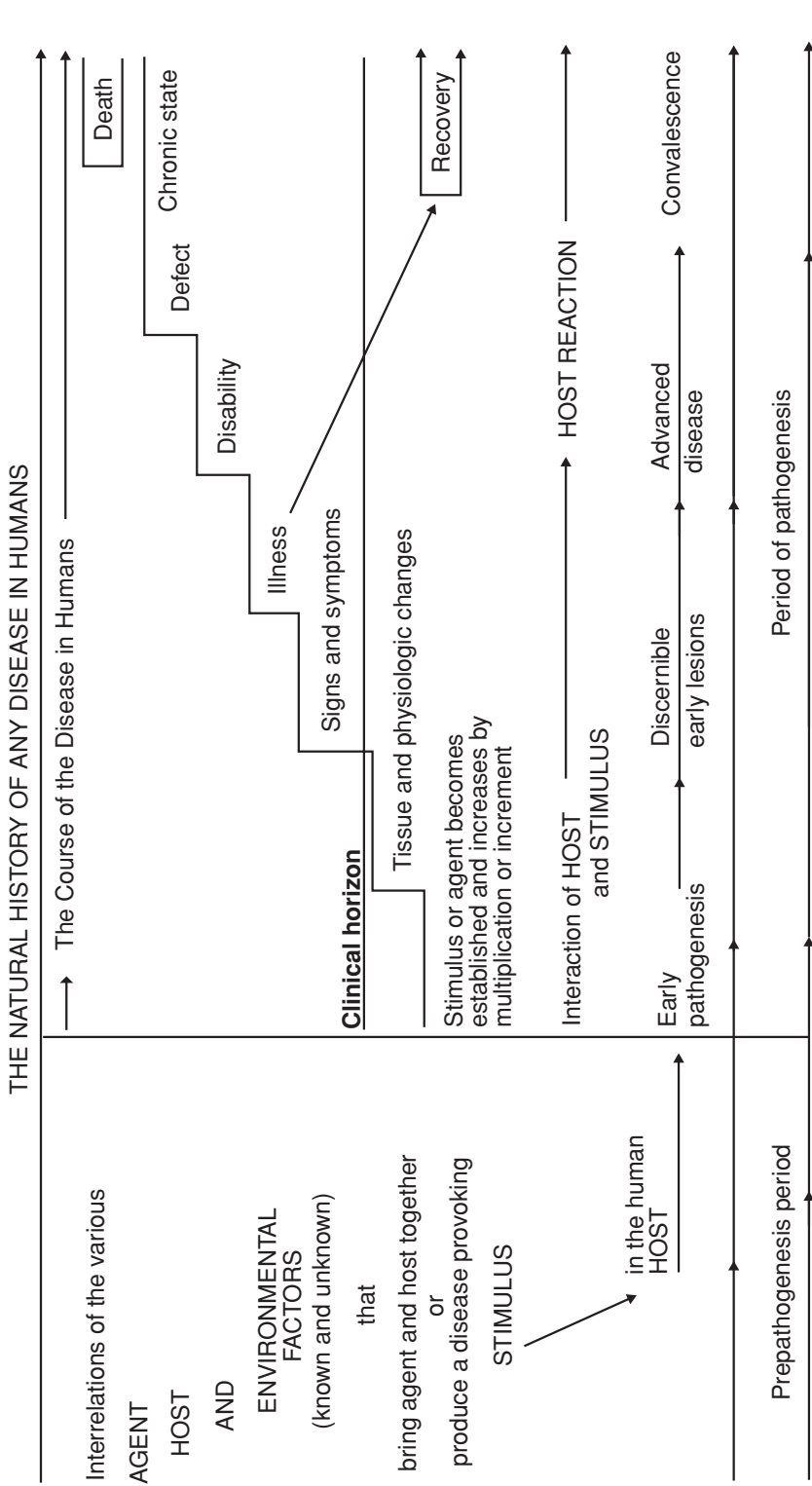
Infant mortality and maternal mortality, the international indicators of social and health care improvement, have continued to decline in the United States, but have not reached the more commendable levels of countries with more demographically homogeneous populations. In the United States the differences in infant mortality rates between inner city neighborhoods and suburban communities may be greater than those between developed and undeveloped countries. The continuing inability of the health care system to address those discrepancies effectively reflects the system's ambiguous priorities.

### ■ **Natural Histories of Disease and the Levels of Prevention**

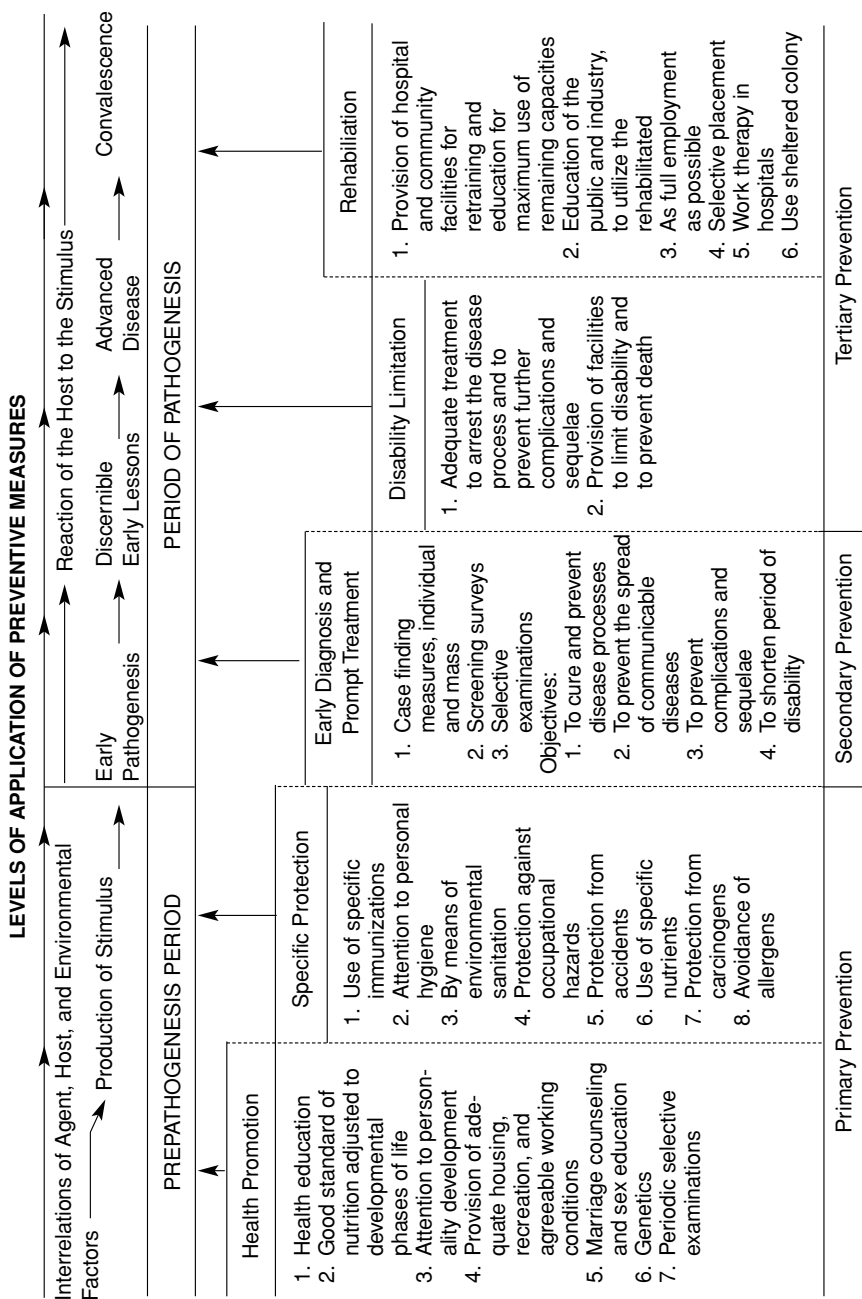
For many years, epidemiologists and health services planners have used a matrix for placing everything known about a particular disease or condition in the sequence of its origin and progression when untreated; this schema is called the natural history of disease. Many diseases, especially chronic diseases that may last for decades, have an irregular evolution and extend through a sequence of stages. When the causes and stages of a particular disease or condition are defined in its natural history, they can be matched against the health care interventions intended to prevent the condition's occurrence or to arrest its progress after its onset. Because these health care interventions are designed to prevent the condition from advancing to the next, and usually more serious, level in its natural history, the interventions are classified as the "levels of prevention." Figures 1-1 through 1-3 illustrate the concept of the natural history of disease and levels of prevention.

The first level of prevention is the period during which the individual is "at risk" to the disease, but is not yet affected. Called the "prepathogenesis period," it identifies those behavioral, genetic, environmental, and other factors that increase the individual's likelihood of contracting the condition. Some risk factors, such as smoking, may be altered, whereas others, such as genetic factors, may not.

When such risk factors combine to produce a disease, the disease usually is not manifest until certain pathological changes occur. This stage is a period of clinically undetectable, presymptomatic disease. Medical science is working hard to improve its ability to diagnose disease earlier in this stage. Because many conditions evolve in irregular and subtle processes, it is often difficult to determine the point at which an individual may be designated "diseased" or "not diseased." Thus, each natural history has a "clinical horizon," defined as the point at which medical science becomes able to detect the presence of a particular condition. Because the pathological changes may become fixed and irreversible at each step in the disease progress, preventing



**Figure 1-1** Natural History of Disease.  
 Source: Reprinted with permission from H.R. Leavell and E.G. Clark, *Preventative Medicine for the Doctor in His Community: An Epidemiologic Approach*, 3rd edition, p. 20, © 1965, the McGraw Hill Companies, Inc.



**Figure 1-2 Levels of Prevention.**  
 Source: Reprinted with permission from H.R. Leavell and E.G. Clark, *Preventive Medicine for the Doctor in His Community: An Epidemiologic Approach*, 3rd edition, p. 21, © 1965, the McGraw Hill Companies, Inc.



each succeeding step of the disease is therapeutically important. This concept emphasizes the preventive aspect of clinical interventions.

Primary prevention, or the prevention of disease occurrence, refers to measures designed to promote health (e.g., health education to encourage good nutrition, exercise, and genetic counseling) and specific protections (e.g., immunization and the use of seat belts).

Secondary prevention involves early detection and prompt treatment to achieve an early cure, if possible, or to slow progression, prevent complications, and limit disability. Most of preventive health care currently is focused on this area.

Tertiary prevention consists of rehabilitation and maximizing remaining functional capacity when disease has occurred and left residual damage. This stage represents the most costly, labor-intensive aspect of medical care and depends heavily on effective teamwork by representatives of a number of health care disciplines.

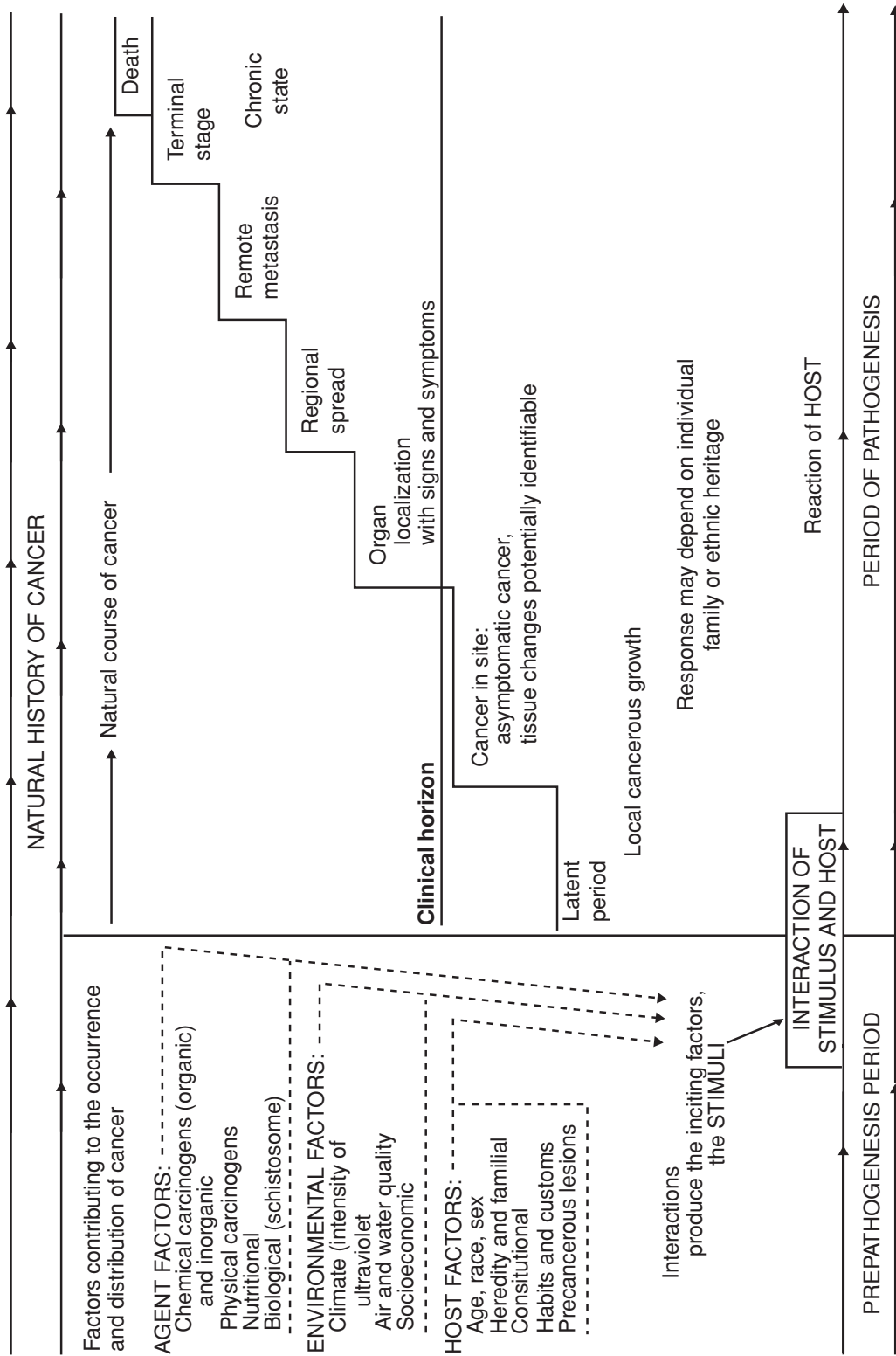
Figure 1–4 illustrates the natural history and levels of prevention for the aging process. Although aging is not a disease, it is a condition often accompanied by medical, mental, and functional problems that should be addressed by a range of health care services at each level of prevention.

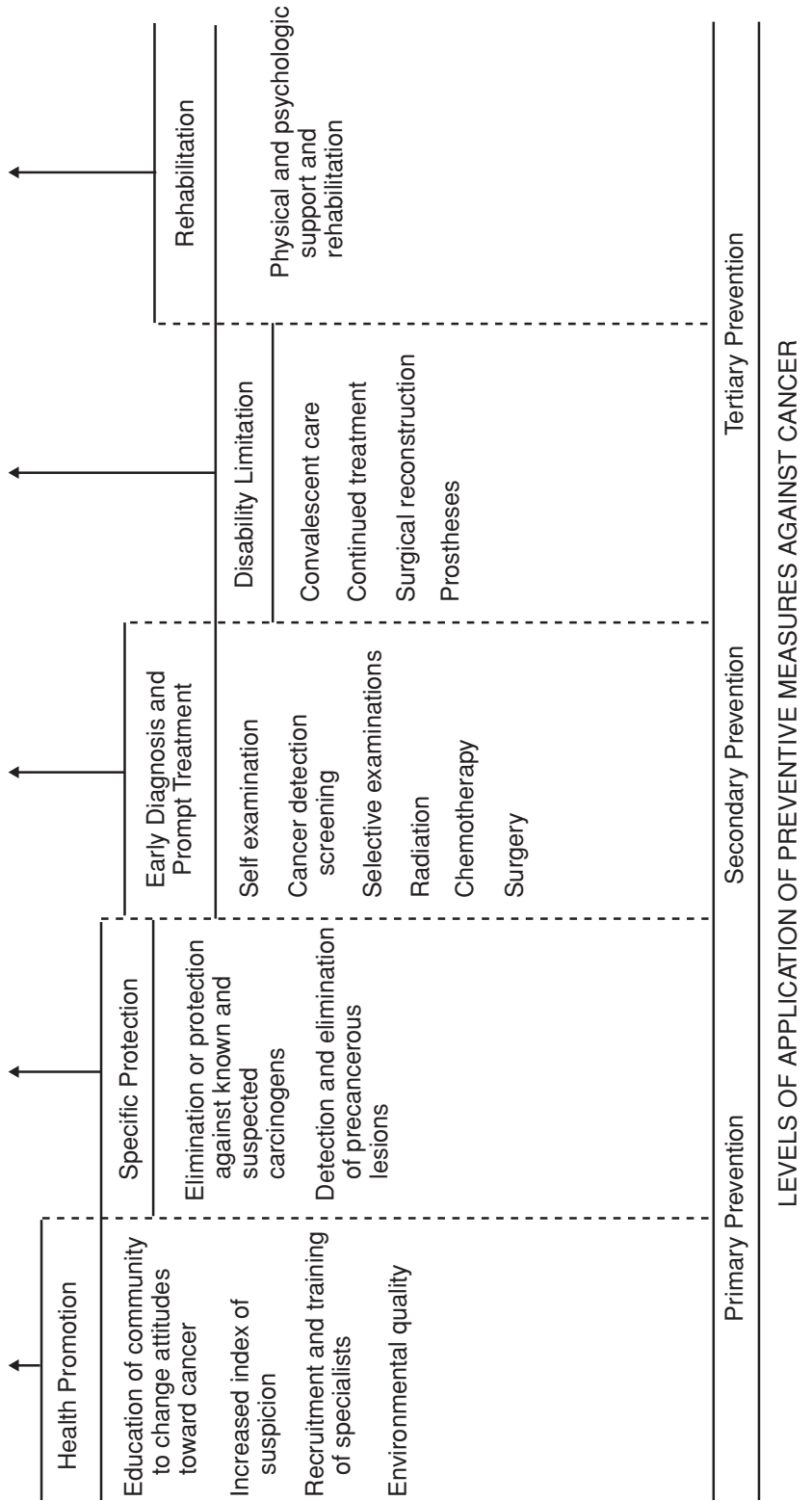
The natural history of diseases and the levels of prevention are presented to illustrate two very important aspects of the U.S. health care system. First, it quickly becomes apparent in studying the natural history and levels of prevention for almost any of the common causes of disease and disability that the focus of health care historically has been directed at the curative and rehabilitative side of the disease continuum. Serious attention has been paid to refocusing the system on the health promotion/disease prevention side of those disease schemas only after the costs of diagnostic and remedial care became an unacceptable burden, and the lack of adequate insurance coverage for over 40 million Americans became a public and political embarrassment.

The second important aspect of the natural history concept is its value in planning community services. The illustration on aging is a good example. That natural history and service levels blueprint provides the planning framework for a multidisciplinary health services planning group to identify and match the community's existing services with those proposed in the idealized levels of prevention. Within this framework, the group begins to plan and initiate the services necessary to fill the gaps.

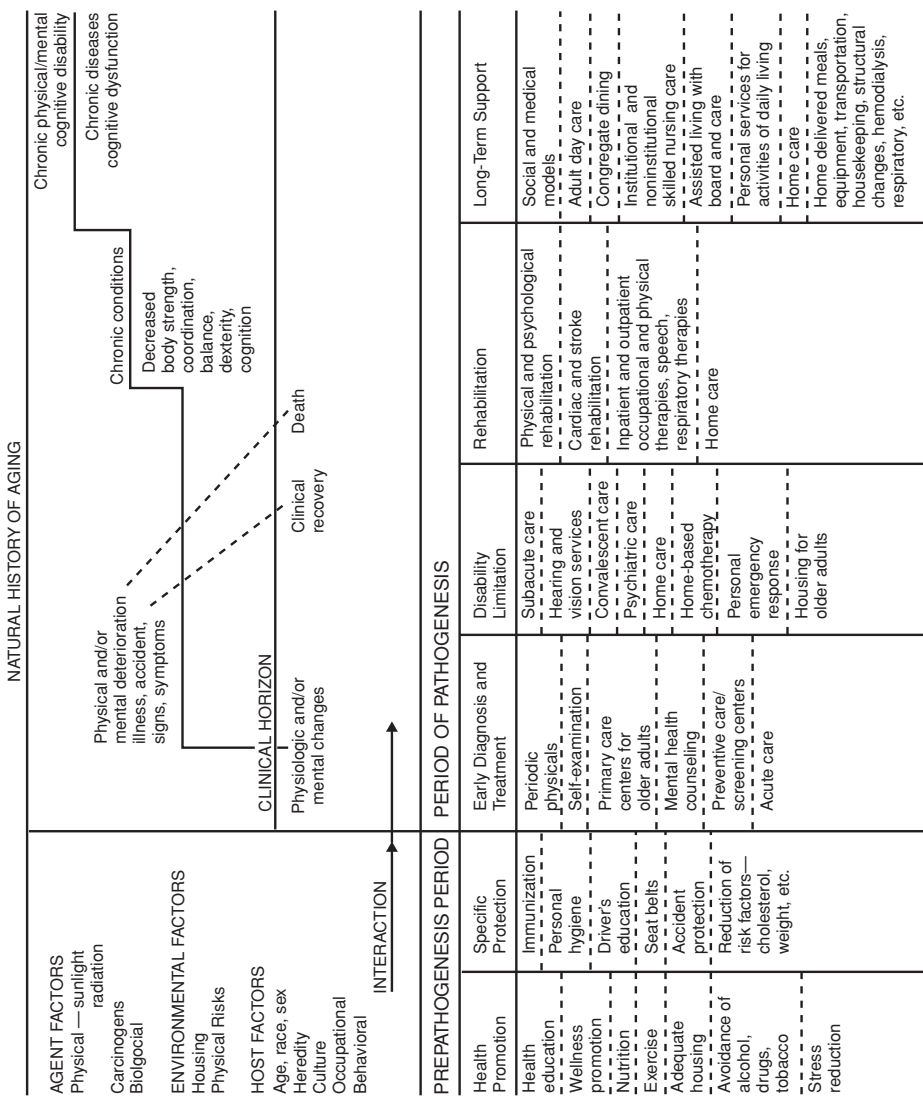
## ■ Major Stakeholders in the U.S. Health Care Industry

It is important to come to an understanding of the health care industry and to recognize the number and variety of its stakeholders. The





**Figure 1-3** Natural History and Levels of Prevention of Cancer.  
 Source: Reprinted with permission from H.R. Leavell and E.G. Clark, *Preventative Medicine for the Doctor in His Community: An Epidemiologic Approach*, 3rd edition, p. 272-273, © 1965, the McGraw Hill Companies, Inc.



**Figure 1-4** Natural History of Aging.  
 Source: Reprinted with permission from H.R. Leavell and E.G. Clark, *Preventative Medicine for the Doctor in His Community: An Epidemiologic Approach*, 3rd edition, p. 272-273, © 1965, the McGraw Hill Companies, Inc.

sometimes shared and often conflicting concerns, interests, and influences of these constituent groups cause them to periodically shift alliances to oppose or champion specific reform proposals.

### **The Public**

First and foremost among health care stakeholders are the patients who consume the services. Although all are concerned with the issues of cost and quality, those who are uninsured or underinsured have an overriding uncertainty about access. It would be unrealistic to assume that the U.S. public will some day wish to treat health care like other inherent rights, such as education or police protection, but there is general agreement that some basic array of health care services should be available to all U.S. citizens. If and when the problem of universal access will be addressed politically in that or any other manner is open to conjecture. In the meantime, however, consumer organizations, such as the American Association of Retired Persons, and disease-specific groups, such as the American Cancer Society, the American Heart Association, and labor organizations, are politically active on behalf of various consumer constituencies.

### **Employers**

Employers constitute an increasingly influential group of stakeholders in health care because they not only are paying for a high proportion of the costs, but also are taking more proactive roles in determining what those costs should be. Large private employers, coalitions of smaller private employers, and public employers now wield significant authority in managed care and other insurance plan negotiations. In addition, employer organizations representing small and large businesses wield considerable political power in the halls of Congress.

### **Providers**

Health care professionals are the core of the industry and have the most to do with the actual process and outcomes of the service provided. Physicians, dentists, nurses, nurse practitioners, physician assistants, pharmacists, podiatrists, chiropractors, and a large array of allied health providers working as individuals or in group practices and staffing health care institutions are responsible for the quality and, to a large extent, the cost of the health care system.

### **Hospitals and Other Health Care Facilities**

Much of the provider activity is shaped by the availability and nature of the health care institutions in which providers work. Hospitals of

different types—general, specialty, teaching, rural, profit or not-for-profit, independent or multifacility systems—are central to the existing health care system. However, they are becoming but one component of more complex integrated delivery system networks that also include nursing homes and other levels of care, medical practices, and managed care organizations.

### **Governments**

Since the advent of Medicare and Medicaid, federal and state governments, already major stakeholders in health care, have become the dominant authorities over the system. Governments serve not only as payers, but also as regulators and providers through public hospitals, state and local health departments, Veterans Affairs medical centers, and other facilities. In addition, of course, governments are the taxing authorities that generate the funds to support the system.

### **Alternative Therapies**

Unconventional health therapies—those not usually taught in established medical and other health professional schools—contribute significantly to the amount, frequency, and cost of health care. In spite of the scientific logic and documented effectiveness of traditional, academically based health care, it is estimated that one in three adults uses alternative forms of health interventions each year and that more office visits are made to alternative care providers than to primary care physicians.

It is estimated that over \$10 billion per year is spent on such alternative forms of health care as rolfing, yoga, spiritual healing, relaxation techniques, herbal remedies, energy healing, megavitamin therapy, the commonly recognized chiropractic, and a host of exotic mind–body healing techniques.<sup>5</sup>

That the public is willing to spend so much time and money on unconventional therapies suggests a substantial level of dissatisfaction with traditional scientific medicine. The popularity of alternative forms of therapy also indicates that its recipients confirm the effectiveness of the treatments by referring others to their practitioners. Whether or not these methods can be rationalized scientifically, if people feel better with their use and they do not deter individuals with treatable diseases from seeking conventional therapy, they serve a beneficial purpose. Insurance companies and managed care organizations are now considering alternative therapies as less expensive and probably equally effective options for keeping their beneficiaries feeling well.

In January 1995, the *Wall Street Journal* reported that several of the largest individual health insurance companies, including Mutual of Omaha and Prudential Insurance Company of America, would begin paying for selected unconventional therapies for heart disease and

other chronic conditions.<sup>6</sup> In addition, the National Institutes of Health (NIH) has established an Office of Alternative Medicine to fund studies of the efficacy of such therapies. Thus, as a somewhat paradoxical development, some of the most ancient concepts of alternative health care are gaining broader recognition and acceptance in an era of the most innovative and advanced high-technology medicine.

More for monetary than therapeutic reasons, a number of hospitals are now offering their patients some form of alternative medicine. According to an American Hospital Association survey, over 15 percent of U.S. hospitals had opened alternative or complimentary medicine centers by the year 2000. With a market estimated to be over \$27 billion and patients willing to pay cash for alternative medicine treatments, hospitals are willing to rationalize the provision of several “unproven” services.<sup>7</sup>

### **Managed Care Organizations and Other Insurers**

The insurance industry has long been a major stakeholder in the health care industry and probably had more to do with defeating the Clinton health care reform plan than any other group. Although the traditional, indemnity-type plans such as Blue Cross and Blue Shield are being replaced rapidly by managed care plans, they still are very much in evidence. Managed care plans may be owned by insurance companies just as the indemnity plans are, or they may be owned by hospitals, physicians, or consumer cooperatives. Managed care organizations and the economic pressures they can apply through the negotiation of capitated fees have produced much of the change that has occurred in the regional systems of health care during the last few years.

### **Long-Term Care**

The aging of the U.S. population will be a formidable challenge to the country’s systems of acute and long-term care. Nursing homes, home care services, other adult care facilities, and rehabilitation facilities will become increasingly important components of the nation’s health care system as they grow in number, size, and complexity. The creation of seamless systems of care that permit patients to move back and forth among ambulatory care offices, acute care hospitals, subacute care services, home care, and nursing homes within a single, integrated network of facilities and services will provide a continuum of services required for the more complex care of aging patients.

### **Mental Health**

The mental health component of health care is often neglected in the debates on system reforms. Yet, psychiatric hospitals, community

mental health facilities, and community-based ambulatory services serve large segments of the population and are critically important to the effectiveness of the health care system. Mental health and physical health are *contiguous* conditions and should, but do not, generate the same concern and unprejudiced funding.

### **Voluntary Facilities and Agencies**

Voluntary not-for-profit facilities and agencies provide significant amounts of health counseling, care, and follow-up and research support, and should be considered major stakeholders in the health care system. It is interesting that, although the voluntary sector traditionally has not received the recognition it deserves for its contribution to the nation's health care, it is now suggested as the safety net to replace the services to be eliminated in cost-cutting proposals.

### **Health Professions Education and Training Institutions**

Schools of public health, medicine, nursing, dentistry, pharmacy, optometry, allied health, and other health care professions have a significant impact on the nature, quality, and costs of health care. As they prepare generation after generation of competent health care providers, these schools also inculcate the values, attitudes, and ethics that will govern the practices and behaviors of those providers as they function in the health care system. The influences of these schools, particularly as they contribute to the leadership of academic health care centers, will be addressed in Chapter 5.

### **Professional Associations**

National, state, and regional organizations representing health care professionals or institutions have considerable influence over legislative proposals, regulation, quality issues, and other political matters. The lobbying effectiveness of the American Medical Association (AMA), for example, is legendary. The national influence of the American Hospital Association and the regional power of its state and local affiliates are also impressive. Other organizations of health care professionals, such as the American Public Health Association, the Group Health Association of America, the American Nurses Association, and the American Dental Association, play significant roles in health policy decisions.

### **Other Health Industry Organizations**

The size and complexity of the health care industry encourage the involvement of a great number of commercial entities. Several, such as the insurance and pharmaceutical enterprises, are major industries themselves and have significant organizational influence. The medical



supplies and equipment business and the various consulting and information and management system suppliers are also important players.

### Research Communities

It is difficult to separate much of health care research from the educational institutions that provide for its implementation. Nevertheless, the national research enterprise must be included in any enumeration of stakeholders in the health care industry. Government entities, such as NIH and the Agency for Healthcare Research and Quality, and not-for-profit foundations, such as the Robert Wood Johnson Foundation and the Pew Charitable Trusts, exert tremendous influence over health care research and practice by encouraging investigations that serve policy decision making and defining the kinds of research that will be supported.

## ■ Development of Managed Care

Managed care refers to arrangements that link health care financing and service delivery and allows payers to exercise significant economic control over how and what services are delivered. Common features in managed care arrangements are:

- *Provider panels.* Specific physicians and other providers are selected to care for plan members.
- *Limited choice.* Members must use the providers affiliated with the plan or pay an additional amount.
- *Gatekeeping.* Members must obtain a referral from a case manager for specialty or inpatient services.
- *Risk sharing.* Providers bear some of the health plan's financial risk through capitation and withholds.
- *Quality management and utilization review.* The plan monitors provider practice patterns and medical outcomes to identify deviations from quality and efficiency standards.

Health plans with these features are called managed care organizations (MCOs). The most common MCOs are health maintenance organizations (HMOs) and preferred provider organizations (PPOs). MCOs may directly employ medical staff, as in a staff model, or contract with independent providers or individual practice associations (IPAs), or any combination of arrangements in between. Whatever the arrangement, however, in managed care, the provider is always economically accountable to the payer.

Prepaid health plans, in which consumers pay a set fee in advance to cover a specified array of services in a particular time period, are not new. They were developed more than 150 years ago for miners and

other isolated workers. Farmers also arranged for prepaid medical care through their rural health cooperatives. Among the early prepaid group practice plans were Group Health of Puget Sound, the Kaiser-Permanente Medical Care Program, and the Health Insurance Plan of New York. Nevertheless, the growth of prepaid plans was constrained by organized medicine, which opposed any reimbursement mechanism other than fee for service, until 1973, when the Nixon administration's Health Maintenance Organization Act was passed. The act encouraged and funded the development of HMOs as a strategy to contain the rising costs of health care. Using the prepayment concept, managed care expanded rapidly during the 1980s as increasing numbers of employers included HMOs among their employee health benefits options.

Enrollment of Medicaid and Medicare recipients in managed care organizations was originally considered a viable strategy for containing costs and improving the access and comprehensiveness of care for the medically disadvantaged and for older Americans. The Balanced Budget Act of 1997 created Medicare + Choice, which gave beneficiaries the option of switching from the original fee-for-service Medicare to membership in a health maintenance organization. The HMO option was attractive to older citizens because it included extra benefits such as prescription drug coverage. After a brief experience with Medicare, however, the large managed care organizations withdrew from the program, citing inadequate government compensation for serving Medicare beneficiaries.

State-authorized Medicaid programs also are unlikely to be successful. Medicaid populations have not been welcomed in many elements of the health care system. Large numbers of Medicaid recipients have used the system episodically and frequently through hospital emergency departments, often because they could see no viable alternative.

Managed care has been confusing and controversial to all segments of the population. The array of new organizations and the state and regional variations in how managed care organizations operate only add to the confusion. In addition, managed care models range from full capitation, in which all providers are paid a negotiated amount per patient regardless of the amount of service, to partial capitation, in which medical specialists still retain the fee-for-service reimbursement arrangement, to total fee-for-service arrangements with a penalty to providers who exceed expense targets. When reimbursement variations are combined with different provider arrangements, it is little wonder that many citizens have difficulty understanding their options. For those who enroll in managed care plans and experience limited provider access and utilization control for the first time, patient education and expeditious grievance procedures become particularly important.

## ■ Rural Health Networks

Rural health systems are often incomplete, with shortages of various services and duplications of others. Federal and state programs have addressed this situation by promoting the development of rural health networks. Although relatively new, most of these networks strive to provide local access to primary, acute, and emergency care and to provide efficient links to more distant regional specialists and tertiary care services. Ideally, rural health networks should assemble and coordinate a comprehensive array of services that include dental, mental health, long-term care, and other health and human services. Realistically, many of those services are lacking, and rural communities sometimes offer various incentives to attract or gain access to specific providers. When successful, however, rural health networks are a significant advantage to their communities. With sufficient structure and administrative capability, the networks can control the development of their service systems and negotiate effectively with managed care organizations.

With costs increasing and populations declining in many rural communities, it has been difficult for rural hospitals to continue their acute inpatient care services; yet, these hospitals are often critically important to their communities. Because a hospital is usually one of a few major employers in rural communities, its closure has economic and health care consequences. Communities lacking alternative sources of health care within reasonable travel distance not only lose payroll and related business, but also lose physicians, nurses, and other health personnel and suffer higher morbidity and mortality rates among those most vulnerable, such as infants and older adults.<sup>8</sup>

Some rural hospitals have remained viable by participating in some form of multi-institutional arrangement that permits them to benefit from the personnel, services, purchasing power, and financial stability of larger facilities. Many rural hospitals, however, have found it necessary to shift from inpatient to outpatient or ambulatory care. The development of ambulatory care services by rural and urban hospitals is a strong health care system trend, as is the increased use of less expensive ancillary personnel. In many rural communities, the survival of a hospital depends on how quickly and effectively it can replace its inpatient services with a productive constellation of ambulatory care, and sometimes long-term care, services.

These rural hospital initiatives have been supported by federal legislation since 1991. This legislation provided funding to promote the essential access community hospital (EACH) and the rural primary care hospital (RPCH). Both are limited service hospital models developed as alternatives for hospitals too small and geographically isolated to be full-service acute care facilities. Regulations regarding

staffing and other service requirements are relaxed in keeping with the rural settings<sup>9</sup> and include allowing physician's assistants, nurse practitioners, and clinical nurse specialists to provide primary or inpatient care without a physician in the facility if medical consultation is available by phone.

The Balanced Budget Act of 1997 included a Rural Hospital Flexibility Program that replaced the EACH/RPCH model with a critical access hospital (CAH) model. Any state with at least one CAH may qualify for the program, which exempts CAHs from strict regulation and allows them the flexibility to meet small, rural community needs by developing criteria for establishing network relationships. While the new program maintains many of the same features and requirements as its predecessor, it adds more flexibility to limited service hospitals by increasing the number of allowed occupied inpatient beds from 6 to 15 and the maximum length of stay before required discharge or transfer from 72 to 96 hours. The new program also allows maintenance of up to 25 total beds, with a swing bed program that allows flexibility in their use. The goal of the CAH program is to enable small rural hospitals to maximize reimbursement and meet community needs with responsiveness and flexibility.

The Balanced Budget Act also serves rural hospitals by providing Medicare reimbursement for "telemedicine" and other video arrangements that link isolated facilities with clinical specialists at large hospitals. Advances in telemedicine technology make it possible for a specialist to be in direct visual and voice contact with a patient and provider at a remote location.

Rural health care organization networks have been formed in response to market changes. They may be formally organized as not-for-profit corporations or informally linked for a defined set of mutually beneficial purposes. Typically, they advocate at local and state levels on rural health care issues, cooperate in joint community outreach activities, and seek opportunities to negotiate with managed care organizations to provide services to enrolled populations.

## ■ Priorities of Health Care

Certainly, the priorities of health care—the emphasis on dramatic tertiary care, the costly and intensive efforts to fend off the death of terminal patients for a few more days or weeks, the heroic and often futile attempts to save extremely premature infants at huge expense while thousands of women go without the prenatal care that would decrease prematurity—contribute to the obvious mismatch between the rising costs of health care and the failure to improve the measures of health status in the United States. It is difficult to rationalize the goals of a system that invests in the most sophisticated and

expensive neonatal services to save premature, high-risk infants while cutting back on the relatively inexpensive and effective prenatal services that would have prevented many of those poor birth outcomes in the first place.

Were health care to be governed by rational policies, the benefits to society of investing in early prenatal care that is unquestionably cost-effective would be compared with trying to salvage extremely low-weight, high-risk infants who often need prolonged care because they are inadequately developed, dysfunctional human beings. Clearly, current priorities favor heroic medicine over the more mundane, far less costly preventive care that results in measurable economic and human benefits.

### **The Tyranny of Technology**

In many respects, the health care system has done and is doing a remarkable job. There have been important advances in medical science that have brought measurable improvements in the length and quality of life. The paradox is, however, that as our technology gets better and more expensive, more people are being deprived of its benefits. Health care providers can be so mesmerized by their own technological ingenuity that things assume greater value than persons. As one example, hospital administrations and medical staffs commonly dedicate their most competent practitioners and most sophisticated technology to the care of terminal patients, while allocating far fewer resources to primary and preventive services for ambulatory clinic patients and other community populations in need of basic medical services. Some community hospitals are recognizing this disparity by conducting outreach and education programs for the medically underserved. As long as reimbursement policies continue to favor illness intervention rather than prevention, however, most institutions will find it difficult to initiate and maintain prevention initiatives and allocate staff to the potentially more productive care of ambulatory clinic populations.

No better example of the pervasive influence of technology exists than that of the continuing advances in diagnostic imaging. Although clinicians still depend on the long-established and relatively simple radiograph technology, they now have at their disposal several new and highly sophisticated computer-assisted imaging techniques that vastly expand their capability to visualize body structures and functions. The total spent on new imaging procedures in the United States is in the billions of dollars and rising annually.

The recurring theme among health services researchers assessing the value of technological advances is a series of generally unanswered questions, such as the following:

- How does the new technology benefit the patient?
- Is it worth the cost?
- Are the new methods better than previous methods, and can they replace them?
- Is treatment planning enhanced?
- Is the outcome from disease better, or is the mortality rate improved?

Although many of the latest advances have gained great popularity and widespread acceptance, the rigorous assessments that address these basic questions have yet to be conducted.

Much of the philosophy underlying the values and priorities of the health care system today can be attributed to the unique culture of U.S. medicine. That philosophy owes much to the aggressive, “can do” spirit of the frontier. The United States’s physicians want to do as much as possible. They order more diagnostic tests than their colleagues in other countries, prescribe drugs frequently and at relatively higher doses, and are more likely to resort to surgery whenever possible. Patients and their physicians regard the body as a machine, like a car, which helps explain their enthusiasm for annual checkups and devices like pacemakers and artificial hearts. Diseases are likened to enemies to be conquered. Physicians expect their patients to be aggressive, too. Those who undergo drastic treatments in order to “beat” cancer are held in higher regard than patients who resign themselves to the disease. Some physicians and nurses feel let down when dying patients indicate they do not want to be resuscitated or stipulate restrictions to palliative care only.

The treatment-oriented rather than prevention-oriented health care philosophy was encouraged by an insurance system that, before managed care, rarely paid for any disease prevention other than immunization. It is also understandable in an era of high-technology medicine that there is much more satisfaction and remuneration from saving the lives of the injured and diseased than in preventing those occurrences from happening in the first place.

The capitation concept and HMOs evolved from the expectation that health care could be improved if the financial incentives could be reversed. Rather than allowing providers to profit from treating sickness, managed care concepts reward providers for keeping patients well. However, the treatment orientation so pervades U.S. health care that even the widespread development and acceptance of HMOs has yet to result in a significant and effective national effort to accomplish health maintenance and disease prevention.

## ■ Social Choices of Health Care

The emphasis on cure also has disinclined the health care professions to address those situations over which they have had little control. Ac-

quired dependence on cigarettes, alcohol, and drugs must be counted among the significant causes of impaired health in our population. The future effects on health and medical care associated with these addictions probably will exceed all expectations. Similarly, the acquired immune deficiency syndrome (AIDS) epidemic is as much a social and behavioral phenomenon as it is a biological one. Yet, outside of the public health disciplines, the considerable influence and prestige of the health care professions have been noticeably absent in steering public opinion and governmental action toward an emphasis on health. Similarly, by comparison with resources expended on treatment after illness occurs, relatively little attention is given to changing high-risk behaviors even when the consequences are virtually certain and nearly always extreme.

## ■ The Aging Population

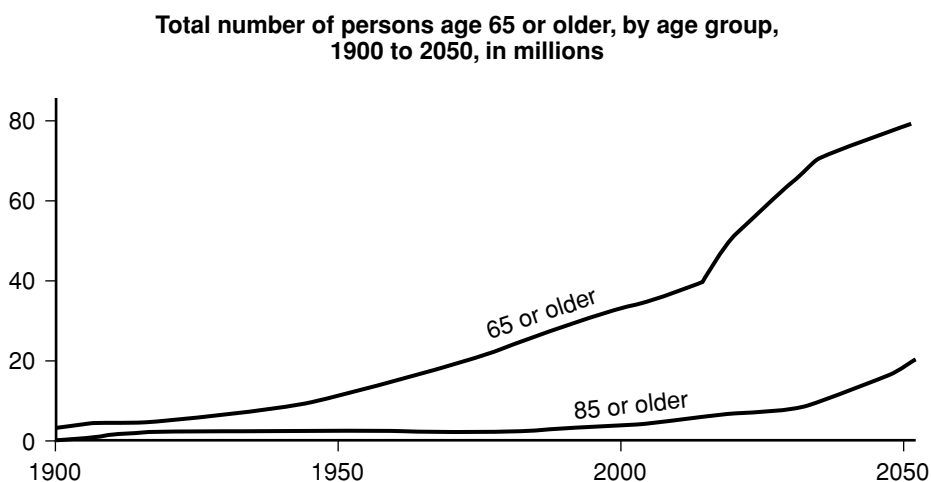
The aging of the U.S. population is of major significance among the health care system's emerging issues. It will increasingly affect every aspect of health care. The rate of aging is five times that of overall population growth. By the year 2050, it is estimated that 30 percent of the U.S. population will be over age 65. The number of persons over 85 will double, but the under-35 population will decline by 10 percent.

The growth of the population 65 and older presents a serious challenge to health care providers and policymakers. Those 85 and older are the fastest growing segment of the aging population. Projections by the U.S. Census Bureau suggest that the population 85 and older will grow from about 4 million in 2000 to 19 million in 2050 (see Figure 1-5).<sup>10</sup> The size of this age group is especially demanding of the health care system because these individuals tend to be in poorer health and require more services than the younger elderly.

The sheer magnitude of the "baby boom" that followed World War II, coupled with the recent levels and composition of immigration to the United States, are important factors in the growth and diversity of the aging population. Seventy-five million babies were born in the United States between 1946 and 1964, which is 70 percent more than during the preceding two decades. The baby boom "bulge" in population is illustrated in Figure 1-6.<sup>11</sup>

Although the current population of older adults is predominately White, there will be more racial diversity and more persons of Hispanic origin within the United States's older population in the coming years. There were relatively large population gains among older adults of Asian and Hispanic origin between 1980 and 1990, and those gains will increase substantially in subsequent decades.<sup>12</sup>

The older Hispanic population is projected to more than double from 1990 to 2010 and to be 11 times greater by 2050. The Hispanic older population, which was less than half the size of the Black older



**Figure 1-5** Total Number of Persons Age 65 or Older, By Age Group, 1900 to 2050, in Millions.

Note: Data for the years 2000 to 2050 are middle-series projections of the population.

Reference population: These data refer to the resident population.

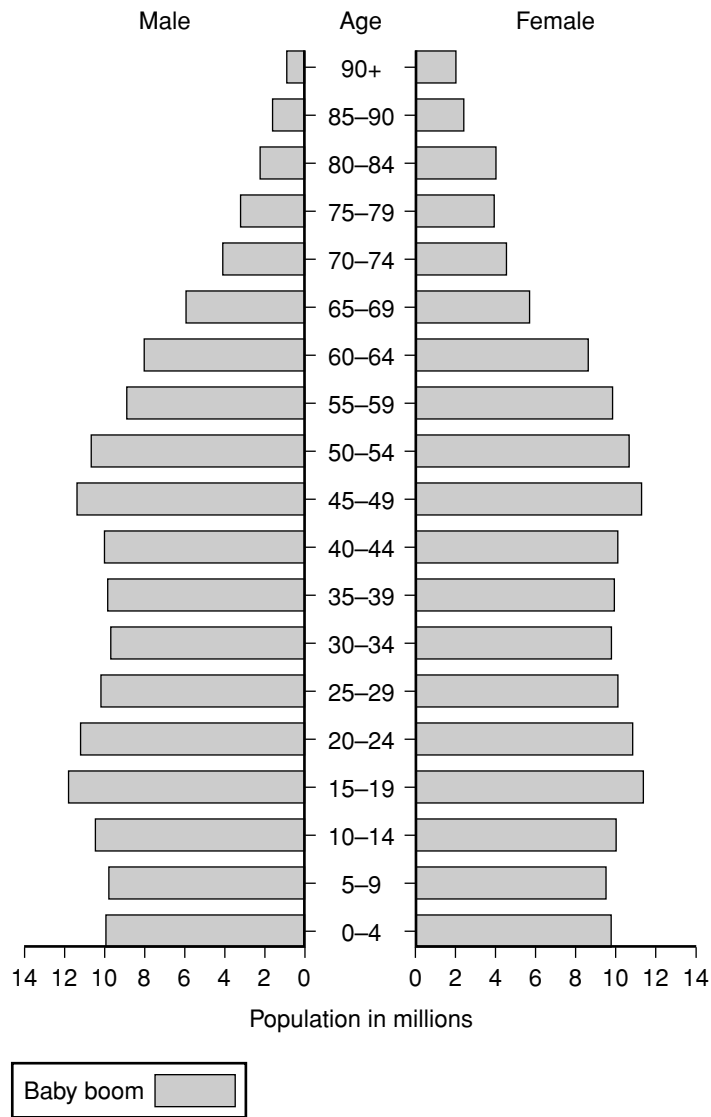
Source: U.S. Census Bureau, decennial census data and population projections.

population in 1990, is growing much faster than the Black older population. By 2030, older Hispanic adults, projected to be 7.8 million, will outnumber the expected 6.8 million older Black adults.<sup>13</sup> A comparable surge in the number of older adults is projected for Asians and Pacific Islanders (see Figure 1-7).

Although the older adults of the future will stay more active after retiring and be better educated, the burden of incurable chronic diseases of later life will be an enormous challenge to the health care system. As medical advances find more ways to maintain life, the duration of chronic illness and the number of chronically ill patients will increase. Consequently, the need for personal support will increase even more. The intensity of care required by frail older adults has the potential of affecting worker productivity. It is common for women to leave the work force or work part-time in order to care for frail relatives at a time when they would like to build retirement benefits for their own old age.

The increased number of elderly with chronic physical ailments and long-term cognitive disorders raises significant questions about the capability of the U.S. health care system. Much has yet to be learned by practitioners serving the aged. Health care professionals are just beginning to recognize and gradually respond to the need to

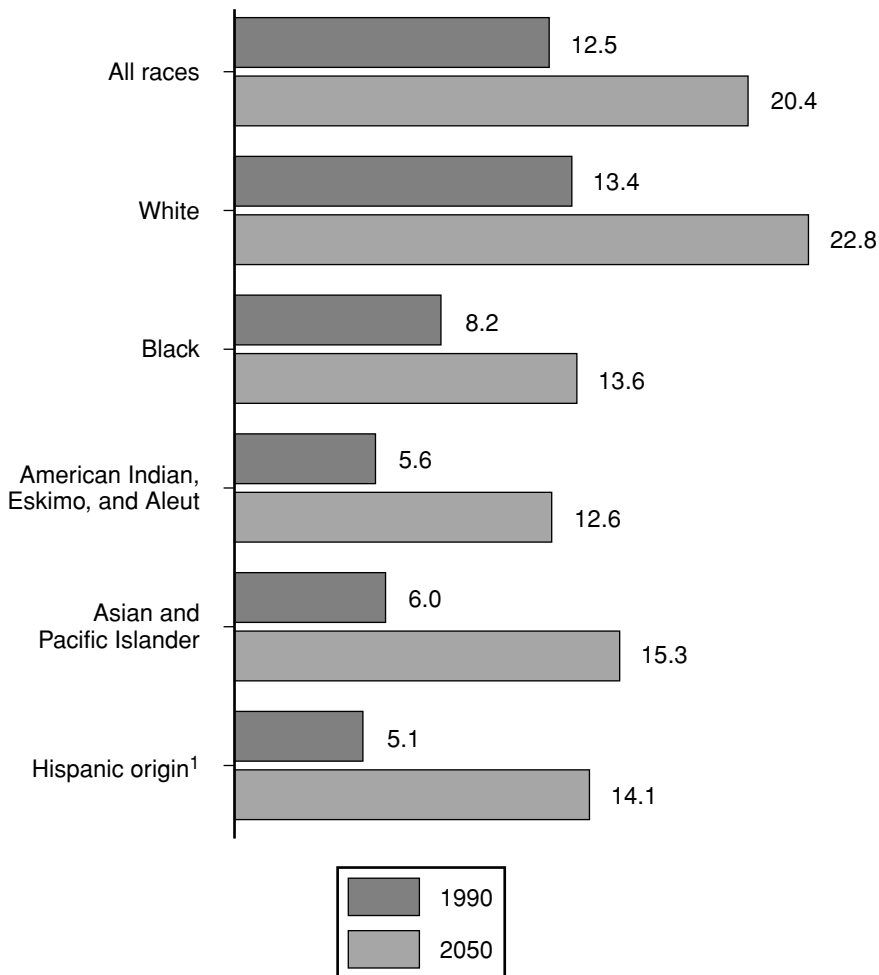




**Figure I-6** Projected Population by Age and Sex.

Source: Reprinted from J.C. Day, U.S. Bureau of the Census, *Population Projections of the United States, by Age, Sex, Race and Hispanic Origin: 1993 to 2050*, Current Population Reports, pp. 25-1104, U.S. Government Printing Office, Washington, DC, 1993 (middle series projections).

focus health care for older adults away from medications or other quick-fix remedies. The system is slowly acknowledging that the traditional medical service model is inappropriate for the care of those with multiple chronic conditions. Chronically ill older patients need a multidisciplinary mix of services that must meet a broad spectrum of physical, medical, and psychosocial needs. This challenge will require



<sup>1</sup>Hispanic origin may be of any race

**Figure I-7** Percent Older Adults by Race and Hispanic Origin: 1990 and 2050.

Sources: Reprinted from U.S. Bureau of the Census, 1990 from *U.S. Population Estimates by Age, Sex, Race, and Hispanic Origin: 1980 to 1991*, Current Population Reports, pp. 25–1095, U.S. Government Printing Office, Washington, DC, 1993; 2050 from *Population Projections of the United States, by Age, Sex, Race and Hispanic Origin: 1993 to 2050*, Current Population Reports, pp. 25–1104, U.S. Government Printing Office, Washington, DC, 1993 (middle series projections).

a large increase in the number of health care providers trained in the special philosophies and skills of geriatric health care. The provisions of the Balanced Budget Act of 1997 that institutionalized the program of all-inclusive care for the elderly (PACE) in the revised Medicare reimbursement scheme symbolize growing acceptance of innovative ways to meet the needs of the older Americans.

The growing number of older adults faces serious gaps in financial coverage for long-term care needs. Unlike the broad Medicare program coverage for the acute health care problems of older Americans, the long-term care services that are needed to cope with the chronic disability and functional limitations of the aging are largely unaddressed by either Medicare or private insurance plans. With the exception of the relatively small number of individuals with personal long-term care insurance, the major costs of long-term care services are borne by the individual older adults and their caregivers.

As a last resort, the Medicaid program has become the major public source of financing for nursing home care. Medicaid eligibility, however, requires that persons of means “spend down” their personal resources to meet the means-test criteria. For those disabled older adults who seek care in the community outside of nursing homes, Medicaid offers limited assistance. Thus, the health policy issues associated with the multidisciplinary long-term care needs of older adults mount with every year’s increase in the proportion of aged Americans and every upturn in the costs of health care.

## ■ Access to Health Care

Much attention has been paid to the economic problems of health care, and considerable investments of research funds have been made to address the issues of health care quality. The third major problem, however—that of limited access to health care among the estimated 40 million uninsured or underinsured Americans—continues to confound decision makers. The issue, of course, is more a moral than an economic one. Unlike most other developed nations, the United States has yet to decide on the ethical precepts that should underlie the distribution of health care. Although references frequently are made to those millions of citizens, including children, who are virtually locked out of the system, only a few professionals have had the courage to address this troublesome issue in open debate.

Polar positions have been taken by those who have addressed the question of whether society in general or governments in particular have an obligation to ensure that everyone has the right to health care and whether the health care system has a corresponding obligation to make such care available. Consider these opposing viewpoints by P.H. Elias and R.M. Sade, respectively.

*Physicians who limit their office practice to insured and paying patients declare themselves openly to be merchants rather than professionals. The mercantile approach has several consequences. First, it demeans the individual physician and cheapens the profession. Second, it puts the third-party payer, as a service purchaser,*

*in a position of greater importance than the patient. Third, it fosters the myth that physicians as a group are greedy and self-serving rather than dedicated and altruistic. And most important, it deprives a large segment of our fellow humans of care. Physicians who value their professionalism should treat office patients on the basis of need, not remuneration.<sup>14</sup>*

*The concept of medical care as the patient's right is immoral because it denies the most fundamental of all rights, that of a man to his own life and the freedom of action to support it. Medical care is neither a right nor a privilege: it is a service that is provided by doctors to others who wish to purchase it. It is the provision of this service that a doctor depends upon for his livelihood. . . . If the right to health care belongs to the patient, he starts out owning the services of a doctor without the necessity of either earning them or receiving them as a gift from the only man who has the right to give them; the doctor, himself.<sup>15</sup>*

Although health care providers debate their individual and personal obligations to provide uncompensated care, the system itself finessed the problem for a long time by shifting the costs of care from the uninsured to the insured. This unofficial but practical approach to indigent care was ethically tolerable as long as the reimbursement system for paying patients was so open-ended that the cost of treating the uninsured could easily be passed on to paying patients. The cost shifting that worked under retrospective reimbursement, however, was not feasible under prospective payment and diagnostic reimbursement guidelines. Under the current price-competitive market pressures, health care providers are in the uncomfortable position of having to apply some kind of government intervention to address the problems of health care access.

Thus, the shifting winds of health care reform only underscore the confusion of the health policy of the United States. At the same time, U.S. health policy makers would like to assure the public that the health care system provides all citizens with comparable access to health care while maintaining the freedom of the providers from government interference in decisions about service production and delivery—and add for good measure that the system exercises budgetary and cost controls in the process.

It is obvious that these goals are contradictory and that attainment of any two leaves the third uncontrolled. Thus, policy makers have been forced to choose among pairs of these goals, or fail to achieve all three. In the 1990s, the government chose to let providers and insurers work out what care would be delivered and how, as long as they met government requirements for budgetary and cost controls. The third goal, equitable access, seems to have been deferred indefinitely. The achievement

of some kind of universal coverage that ensures all Americans have access to a basic level of health care will not be resolved effectively until the system's stakeholders and the supporting public can formulate and reach consensus on the fundamental values underlying the problem.

## ■ Quality of Care

Another health care system problem area relates to variations in the quality and appropriateness of medical care. The uncertainty that pervades current clinical practice is far greater than most people realize. Problems in the quality and appropriateness of a great many diagnostic and therapeutic procedures impact heavily on costs.

Since the November 1999 report of the Institute of Medicine that estimated that medical errors take from 44,000 to 98,000 lives per year, Congress, the president, medical institutions, and the public have been stirred to respond to a problem that has existed for years. The increasing complexity of the health care system, the potency of its pharmaceuticals, the dangers inherent in invasive surgical procedures, and the potential for error in the many information transfers that occur during hospital care combine to put patients at serious risk. The strategies proposed to cope with these problems, as well as the physician report cards, clinical guidelines, and other mechanisms designed to address inexplicable variations in the provision of medical care, are discussed in subsequent chapters.

It is important, however, to recognize the seriousness of the medical error problem. Health care errors are the leading cause of preventable deaths in the United States. Deaths resulting from medical mishaps in acute care hospitals alone are between the 5th and 8th leading causes of all deaths in the United States. The overall burden on society is much greater when both fatal and nonfatal events are counted and when medical mishaps in medical offices, ambulatory centers, and long-term care facilities are considered.<sup>16</sup>

## ■ Conflicts of Interest

One of the greatest advantages of the high-technology health care systems that serve most metropolitan areas in the United States is the ability of physicians and patients to benefit from referrals to a broad range of highly specialized clinical, laboratory, rehabilitation, and other services. The array of comprehensive diagnostic and therapeutic resources available in most communities greatly enhances the clinical capability of health care providers and the care of their patients.

In recent years, however, more and more providers have begun to invest in laboratories, imaging centers, medical supply companies, and

other health care businesses. In many cases, these are joint ventures with other institutions that conceal the identity of the investors. When health care providers refer patients for tests or other services to health care businesses that they own or in which they have a financial stake, there is a serious potential for conflicts of interest. In fact, for the last several years, this referral for profit has been a sensitive medical issue during congressional debates. Both federal and state governments and the AMA have conducted studies that confirm that physician-owned laboratories, for example, perform more tests per patient at higher charges than those in which physicians have no investments. These conflicts of interest undermine the traditional professional role of physicians and significantly increase health care expenditures. Government attempts to limit self-serving entrepreneurial activities of physicians are driven by economic concerns. The ethical implications should be of concern to the medical profession. A major contribution would be made to the code of conduct for health care providers if the AMA provided physicians with a few clear guidelines regarding the growing encroachment of commercialism on medical practice.<sup>17</sup>

## ■ Health Care's Ethical Dilemmas

Once almost an exclusive province of physicians and other health care providers, moral and ethical issues underlying provider/patient relationships and the difficult decisions resulting from the vast increase in treatment options are now in the domains of law, politics, journalism, health institution administrations, and the public. Since the 1970s, the list of ethical issues has expanded as discoveries in genetic identification and engineering, organ transplantation, a mounting armamentarium of highly specialized diagnostic and therapeutic interventions, and advances in technology have allowed the lives of otherwise terminal individuals to be prolonged. In addition, an energized health care consumer movement advocating more personal control over health care decisions, economic realities, and the issues of the most appropriate use of limited resources are but a few of the topics propelling values and ethics to the top of the health care agenda. There is a social dimension to health care that never existed before and that the health professions, their educational institutions, their organizations, and their philosophical leadership are just beginning to address.

Clearly, the rapid pace of change in health care and the resulting issues have outpaced U.S. society's ability to reform the thinking, values, and expectations that were more appropriate in a bygone era. Legislative initiatives are, correctly or not, filling the voids. The 1997 decision of the U.S. 9th Circuit Court of Appeals permitting physician-assisted suicide for competent, terminally ill adults in the state of

Oregon is an unprecedented example. New York State's 1990 passage of health care proxy legislation that allows competent adults to appoint agents to make health care decisions on their behalf if they become incapacitated is another. Living wills that provide advance directives regarding terminal care are now recognized in all 50 states.

Issue by issue, the country is trying to come to grips with the ethical dilemmas that modern medicine has created. The pluralistic nature of this society, however, and the Judeo-Christian concepts about caring for the sick and disabled that served so well for so long make sweeping reformation of the ethical precepts on which health care has been based very unlikely.

As Americans continue to live longer and new technologies vastly improve the treatment of disease, a new generation of health plans will evolve. The basic issues of cost, quality, and access, however, will undoubtedly persist, joined by a host of new concerns. How to improve Americans' health behaviors, how to involve consumers more effectively in health care decisions, and how to determine responsibility for medical management are among the challenges of this decade.

## Notes

1. E. Ginzberg, "Health Care Reform—Why So Slow?" *New England Journal of Medicine* 322 (1990): 1464–1465.
2. R.J. Samuelson, "A Little More Piece of Mind," *Newsweek* 128, no. 17 (1996): 55.
3. F. Wolinsky, *The Sociology of Health Principles, Practitioners and Issues*, 2nd ed. (Belmont, CA: Wadsworth, Inc., 1988).
4. World Health Organization, *The World Health Organization: A Report on the First Ten Years* (Geneva, Switzerland: 1958).
5. D.I. Blumberg et al., "The Physician and Unconventional Medicine," *Alternative Therapies* 1, no. 3 (July 1995): 31–35.
6. B. Carton, "Health Insurers Embrace Eye-of-Newt Therapy," *The Wall Street Journal*, 30 January 1995, B1.
7. R. Abelson and P.L. Brown, "Alternative Medicine Is Finding Its Niche in Nation's Hospitals," *The New York Times*, 13 April 2002, B1, B3.
8. K. Fickenscher and M.L. Voorman, "An Overview of Rural Health Care," in *Improving Health Policy and Management: Nine Critical Research Issues for the 1990s*, ed. S.M. Shortell and U.E. Reinhardt (Ann Arbor, MI: Health Administration Press, 1992), 111–149.
9. Fickenscher and Voorman, "An Overview of Rural Health Care," 111–149.
10. Federal Interagency Forum, <http://www.agingstats.gov/chartbook2000/population.html> (8 September 2000). Accessed 15 September 2002.
11. J.C. Day, *U.S. Bureau of the Census, Population Projections of the United States by Age, Sex, Race and Hispanic Origin: 1993 to 2050, Current Population Reports (middle series projections)*, (Washington, DC: Government Printing Office, 1993), 25–1104.

12. U.S. Bureau of the Census, *U.S. Population Estimates by Age, Sex, Race and Hispanic Origin: 1980–1991, Current Population Reports* (Washington, DC: Government Printing Office, 1993), 15-1095, table 1.
13. J.C. Day, *U.S. Bureau of the Census, Population Projections of the United States by Age, Sex, Race and Hispanic Origin: 1993 to 2050, Current Population Reports (middle series projections)*.
14. P.H. Elias, (Letter to Editor), *New England Journal of Medicine* 314, no. 6 (1986): 391.
15. R.M. Sade, “Medical Care as a Right: A Refutation,” *New England Journal of Medicine* 285 (1971): 1281, 1289.
16. K.W. Kizer, “Patient Safety: A Call to Action: A Consensus Statement from the National Quality Forum,” *National Quality Forum for Health Care Measurement and Reporting*, [www.qualityforum.org](http://www.qualityforum.org) (21 March 2001). Accessed 16 September 2002.
17. A.S. Relman, “Self Referral: What’s at Stake,” *New England Journal of Medicine* 327 (1992): 1522–1524.