

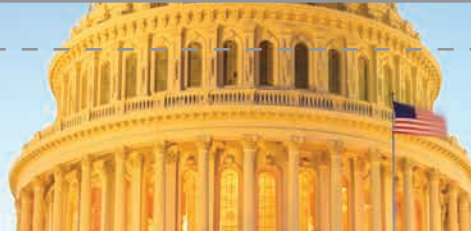


PART 1

System Foundations

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CHAPTER 2

Beliefs, Values, and Health

LEARNING OBJECTIVES

- Study the concepts of health and disease, risk factors, and the role of health promotion and disease prevention.
- Summarize the disease prevention requisites under the Affordable Care Act.
- Get an overview of public health and appreciate its expanding role in health protection both in the United States and globally.
- Explore the determinants of health and measures related to health.
- Understand the American anthro-cultural values and their implications for health care delivery.
- Evaluate justice and equity in health care according to contrasting theories.
- Explore the integration of individual and population health.



"This is the market justice system. Social justice is over there."

► Introduction

From an economic perspective, curative medicine appears to produce decreasing returns in health improvement while increasing health care expenditures (Saward and Sorensen, 1980). There has also been a growing recognition of the benefits afforded to society by the promotion of health and the prevention of disease, disability, and premature death. Even so, progress in this direction has been slow because of the prevailing social values and beliefs, which continue to focus on curing diseases rather than promoting health. The common definitions of health, as well as measures for evaluating health status, reflect similar inclinations. This chapter proposes a balanced approach to health, although fully achieving such an ideal is not without difficult challenges. The 10-year *Healthy People* initiatives, undertaken by the U.S. Department of Health and Human Services (DHHS) since 1980, illustrate steps taken in this direction, even though these initiatives have been typically strong in rhetoric but weak in actionable strategies and sustainable funding.

Anthro-cultural factors reflected in the beliefs and values ingrained in American culture have been influential in laying the foundations of a U.S. health care system that has remained predominantly private, as opposed to a tax-financed national health care program. Discussion of this theme begins in this chapter and continues in the *Evolution of Health Services in the United States* chapter, where failures of past proposals to create a nationalized health care system are discussed in the context of cultural beliefs and values.

This chapter further explores the issue of equity in the distribution of health

services, using contrasting theories of market justice and social justice. U.S. health care delivery incorporates both principles, which are complementary in some ways and create conflicts in other areas.

► Significance for Managers and Policymakers

Materials covered in this chapter have several implications for health services managers and policymakers alike:

- The health status of a population has tremendous bearing on the utilization of health services, assuming the services are readily available. Planning of health services must be governed by demographic and health trends and initiatives toward reducing disease and disability.
- The basic meanings of health, determinants of health, and health risk appraisal should be used to design appropriate educational, preventive, and therapeutic initiatives.
- There is a growing emphasis on evaluating the effectiveness of health care organizations based on the contributions they make to community and population health. The concepts discussed in this chapter can guide administrators in implementing programs that have the greatest value to their communities.
- Quantified measures of health status and utilization can be used by managers and policymakers to evaluate the adequacy and effectiveness of existing programs, plan new strategies, measure progress, and discontinue ineffective services.

► Basic Concepts of Health

Health

In the United States, the concepts of health and health care have largely been governed by the medical model, more specifically referred to as the biomedical model. The **medical model** defines health as the absence of illness or disease. This definition implies that optimal health exists when a person is free of symptoms and does not require medical treatment. However, it is not a definition of health in the true sense. This prevailing view of health emphasizes clinical diagnoses and medical interventions to treat disease or symptoms of disease, but fails to account for prevention of disease and health promotion. Therefore, when the term “health care delivery” is used, in reality it refers to *medical* care delivery.

Medical sociologists have gone a step further in defining health as the state of optimal capacity of an individual to perform his or her expected social roles and tasks, such as work, school, and household chores (Parsons, 1972). A person who is unable (as opposed to unwilling) to perform his or her social roles in society is considered sick. However, this concept also seems inadequate because many people continue to engage in their social obligations despite suffering from pain, cough, colds, and other types of temporary disabilities, including mental distress. Their efforts are counterbalanced by individuals who shirk their social responsibilities even when they may be in good health. In other words, optimal health is not necessarily

reflected in a person’s engagement in social roles and responsibilities.

An emphasis on both the physical and mental dimensions of health is found in the definition of health proposed by the Society for Academic Emergency Medicine. According to this organization, health is “a state of physical and mental well-being that facilitates the achievement of individual and societal goals” (Ethics Committee, Society for Academic Emergency Medicine, 1992). This view of health recognizes the importance of achieving harmony between the physiological and emotional dimensions.

The definition of health developed by the World Health Organization (WHO) is most often cited as the ideal for health care delivery systems; it recognizes that optimal health is more than the absence of disease or infirmity. WHO (1948) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” As a biopsychosocial model, WHO’s definition specifically identifies social well-being as a third dimension of health. For example, having a social support network is positively associated with resilience to life stresses, self-esteem, and social relations. Conversely, many studies show that social isolation is associated with a higher risk of poor health and mortality (Pantell et al., 2013).

WHO has also defined a health care system as all the activities whose primary purpose is to promote, restore, or maintain health (McKee, 2001). As this chapter points out, health care should include much more than medical care. Thus, **health care** can be defined as a variety of services believed to improve a person’s health and well-being.

In recent decades, increased interest has been directed toward **holistic health**, which emphasizes the well-being of every aspect of what makes a person whole and complete. Thus, **holistic medicine** seeks to treat the individual as a whole person (Ward, 1995). For example, within this approach, diagnosis and treatment would take into account the mental, emotional, spiritual, nutritional, environmental, and other factors surrounding the origin of disease (Cohen, 2003).

In addition to the physical, mental, and social aspects necessary for optimal health, the spiritual dimension is incorporated as a fourth element in holistic health (**FIGURE 2-1**). A growing volume of medical literature, both in the United States and abroad, points to the healing effects of a person's religion and spirituality on morbidity and mortality. The importance of spirituality as an aspect of health care is also reflected in a number of policy documents produced by the WHO (2003) and other bodies.

Based on their extensive review of the literature, Chida et al. (2009) concluded that religious practice/spirituality is associated with reductions in deaths from all causes as well as deaths from cardiovascular diseases. Patients with heart disease who attend regular religious services have

been found to have a significant survival advantage (Oman et al., 2002). Religious and spiritual beliefs and practices have been shown to have a positive impact on a person's physical, mental, and social well-being. In addition, many studies have identified a positive relationship between religious practice and protective health behaviors (Chida et al., 2009). Several religious communities promote healthy lifestyles in terms of (lack of) tobacco use, (lack of) alcohol consumption, and diet. An examination of the literature found a reduced risk for cancer in these communities (Hoff et al., 2008). Spiritual well-being has also been recognized as an important internal resource for helping people cope with illness. For instance, in a study conducted at the University of Michigan, 93% of the women undergoing cancer treatment indicated that their religious lives helped them sustain their hope (Roberts et al., 1997). Studies have also found that a large percentage of patients want their physicians to consider their spiritual needs, and almost half express a desire for the physicians to pray with them if they can (Post et al., 2000).

The spiritual dimension is frequently tied to one's religious beliefs, values, morals, and practices. Broadly, this dimension is described as meaning, purpose, and fulfillment in life; hope and will to live; faith; and a person's relationship with God (Marwick, 1995; Ross, 1995; Swanson, 1995). A clinically tested scale to measure spiritual well-being included categories such as belief in a power greater than oneself, purpose in life, faith, trust in providence, prayer, meditation, group worship, ability to forgive, and gratitude for life (Hatch et al., 1998). In addition, several formal assessments have been developed

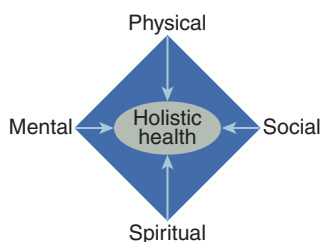


FIGURE 2-1 The four dimensions of holistic health.

to help physicians address the spiritual needs of their patients. One such tool is the HOPE Questions, which enable physicians to speak about spirituality with their patients so as to obtain important information about patients' view of health care and faith (Anandarajoh and Hight, 2001).

Respect for patient values and beliefs is increasingly recognized as an important aspect of culturally appropriate care by the medical community. An increasing number of medical schools and continuing education courses now offer formal courses in spirituality in medicine (Fortin and Barnett, 2004). Furthermore, the Joint Commission (2003) recommends that health care institutions accommodate and assess patients' spiritual beliefs and practices as a routine part of care.

The Committee on Religion and Psychiatry of the American Psychiatric Association has issued a position statement to emphasize the importance of maintaining respect for a patient's religious/spiritual beliefs. In fact, in 2013, "religious or spiritual problem" was included as a diagnostic category for the first time in the most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5). The holistic approach to health also alludes to the need to incorporate alternative therapies into the predominant medical model.

► Quality of Life

The term **quality of life** is used to capture the essence of overall satisfaction with life during and following a person's encounter with the health care delivery system. This term is employed in two ways. First, it is an indicator of how satisfied a person is

with his or her experiences while receiving health care. Specific life domains—such as comfort factors, respect, privacy, security, degree of independence, decision-making autonomy, and attention to personal preferences—are significant to most people. These factors, in turn, are now regarded as rights that patients can demand during any type of health care encounter. Second, quality of life can refer to a person's overall satisfaction with life and with self-perceptions of health, particularly after some medical intervention. The implication is that desirable processes during medical treatment and successful outcomes should subsequently have a positive effect on an individual's ability to function, carry out social roles and obligations, and have a sense of fulfillment and self-worth.

► Risk Factors and Disease

The occurrence of disease involves more than just a single factor. For example, the mere presence of the tubercle bacillus does not automatically mean the infected person will develop tuberculosis. Other factors, such as poverty, overcrowding, and malnutrition, may be essential for development of the disease (Friedman, 1980). Hence, tracing **risk factors**—attributes that increase the likelihood of developing a particular disease or negative health condition in the future—requires a broad approach.

One useful explanation of disease occurrence (for communicable diseases, in particular) is provided by the tripartite model, sometimes referred to as the Epidemiology Triangle (**FIGURE 2-2**). In this model, the **host** is the organism—generally, a human—that becomes sick. Factors associated with the host include

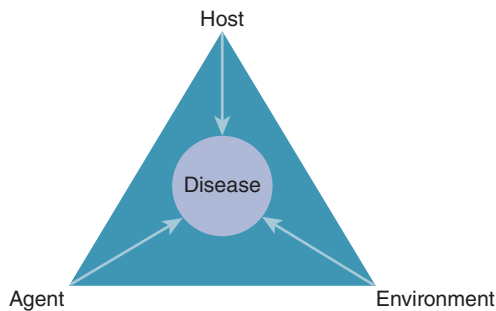


FIGURE 2-2 The Epidemiology Triangle.

genetic makeup, level of immunity, fitness, and personal habits and behaviors. For the host to become sick, an **agent** must be present, although presence of an agent does not ensure that disease will occur. In the previous example, tubercle bacillus is the agent for tuberculosis. Other examples of agents include chemicals, radiation, tobacco smoke, dietary indiscretions, and nutritional deficiencies. The third entity, **environment**, is external to the host and includes the physical, social, cultural, and economic aspects of the environment. Examples include sanitation, air pollution, anthro-cultural beliefs, social equity, social norms, and economic status. The environmental factors play a moderating role that can either enhance or reduce susceptibility to disease. Because the three entities of host, agent, and environment often interact to produce disease, disease prevention efforts should focus on a broad approach to mitigate or eliminate risk factors associated with all three entities.

Behavioral Risk Factors

Certain individual behaviors and personal lifestyle choices represent important risk factors for illness and disease. For

example, smoking has been identified as the leading cause of preventable disease and death in the United States because it significantly increases the risk of heart disease, stroke, lung cancer, and chronic lung disease (DHHS, 2004). Substance abuse, inadequate physical exercise, a high-fat diet, irresponsible use of motor vehicles, and unsafe sex are additional examples of behavioral risk factors. **TABLE 2-1** presents the percentages of the U.S. population with selected behavioral risks.

Acute, Subacute, and Chronic Conditions

Disease can be classified as acute, subacute, or chronic. An **acute condition** is relatively severe, episodic (of short duration), and often treatable and subject to recovery. Treatments are generally provided in a hospital. Examples of acute conditions include a sudden interruption of kidney function and a myocardial infarction (heart attack). A **subacute condition** is a less severe phase of an acute illness. It can be a postacute condition, requiring continuity of treatment after discharge from a hospital. Examples include ventilator and head trauma care. A **chronic condition** is one that persists over time, is not severe, but is generally irreversible. A chronic condition may be kept under control through appropriate medical treatment, but if left untreated, it may lead to severe and life-threatening health problems. Examples of chronic conditions are hypertension, asthma, arthritis, heart disease, and diabetes. Contributors to chronic disease include ethnic, cultural, and behavioral factors and the social and physical environment, as discussed later in this chapter.

TABLE 2-1 Percentage of U.S. Population with Behavioral Risks

Behavioral Risks	Percentage of Population	Year
Alcohol (12 years and older)	52.7	2014
Marijuana (12 years and older)	8.4	2014
Cocaine use (12th graders)	1.0	2014
Cocaine use (10th graders)	0.6	2014
Cocaine use (8th graders)	0.5	2014
Cigarette smoking (18 years and older)	16.8	2014
Hypertension (20 years and older)	30.4	2011–2014
Overweight and obese (20 years and older)	69.5	2011–2014
Serum cholesterol (20 years and older)	12.1	2011–2014

Note: Data are based on household interviews of a sample of the civilian noninstitutionalized population 12 years of age and older in the coterminous United States.

Data from National Center for Health Statistics (NCHS). 2016. *Health, United States, 2015*. Hyattsville, MD: Department of Health and Human Services. pp. 2, 192, 194, 202, 216.

In the United States, chronic diseases have become the leading cause of death and disability. Almost 50% of Americans have at least one chronic illness (Robert Wood Johnson Foundation, 2010), and 8.7 out of every 10 deaths are attributable to chronic disease, with heart disease and cancer accounting for nearly 50% of all deaths (WHO, 2011). Cardiovascular diseases are responsible for one-fourth of all deaths annually. While heart disease is largely preventable, the burden associated with this disease continues to grow.

Approximately half of Americans have at least one of the major clinical

risk factors: high low-density lipoprotein (LDL) cholesterol, high blood pressure, or smoking (Centers for Disease Control and Prevention [CDC], 2011). Other major risk factors include physical inactivity, diabetes, and obesity (Kannel and Abbott, 1984).

Cancer is the second leading cause of death in the United States, with more than 1.5 million people being diagnosed with cancer annually (Xu et al., 2016). The most commonly diagnosed types of cancer are breast cancer, prostate cancer, lung cancer, and colon cancer (CDC, 2016a). Although the specific risk factors

vary by type of cancer, general risk factors include family history, age, exposure to cancerous substances, diet, obesity and tobacco use.

As of 2016, more than 29 million Americans were living with diabetes and another 86 million were living with pre-diabetes, a health condition that increases the risk of type 2 diabetes (CDC, 2016b). The major risk factor for diabetes is obesity.

Chronic diseases have a major impact on the economy, in terms of both medical costs and lost productivity. Approximately 71% of all health care spending is attributable to people with at least one chronic condition (Gerteis et al., 2014). For example, the estimated cost of diagnosed diabetes in 2012 was \$245 billion, which includes \$69 billion in reduced productivity. The high costs of prescription medications, hospital inpatient care, and diabetes supplies contribute to the \$176 billion in medical costs associated with this disease (American Diabetes Association, 2013). The economic burden of heart disease and stroke is also high, with these conditions costing the U.S. economy approximately \$207 billion each year for health care services, medications, and lost productivity (Mozaffarian et al., 2016). In total, cardiovascular disease is responsible for an estimated \$317 billion annually in direct and indirect costs. The direct medical costs for cancer are approximately \$88 billion per year in the United States, and the economic burden of this disease is expected to increase significantly in the future due to the growth and aging of the population, improvements in survival, and increased costs of care (Yabroff et al., 2011).

Three main reasons underlie the rise of chronic conditions in the U.S. population:

- New diagnostic methods, medical procedures, and pharmaceuticals have significantly improved the treatment of acute illnesses, survival rates, and longevity, but these achievements have had the consequence of creating a larger population living with chronic conditions. The prevalence of chronic disease is expected to continue to rise with an aging population and longer life expectancy.
- Screening and diagnosis have expanded in scope, frequency, and accuracy (Robert Wood Johnson Foundation, 2010).
- Lifestyle choices, such as consumption of high-salt and high-fat diets and sedentary lifestyles, are risk factors that contribute to the development of chronic conditions.

Some risk factors that contribute to the most common chronic diseases can be modified through prevention. For example, smoking, obesity, physical inactivity, and poor nutrition are risk factors for most chronic diseases. Proven prevention methods include lifestyle change programs, though such programs are notoriously difficult to sustain. Increasing prevention efforts and awareness of the need to reduce cholesterol levels and hypertension so as to prevent heart disease and stroke remains a challenge (Franco et al., 2011). In the United States, obesity and diabetes rates have increased over the last several decades, at least in part due to changes in food consumption and technological advances, which have reduced energy expenditure in labor-intensive occupations (Caballero, 2007; Finkelstein et al., 2005; Franco et al., 2009). State and local health departments face

challenges in enacting health-promotion programs such as budget restrictions. Moreover, many state and local programs directed at people with chronic diseases have been reduced or eliminated (Johnson et al., 2011). Chronic disease programs are not standardized or comprehensive in most health care settings (Bauer et al., 2014; Maylahn et al., 2013).

The CDC supports strengthened collaboration between public health agencies and private health care providers to prevent chronic diseases and improve population health. One comprehensive initiative geared toward meeting this aim was launched by the DHHS with funding of \$650 million allocated to the American Recovery and Reinvestment Act of 2009. The goal of this initiative, called Communities Putting Prevention to Work (CPPW), is to “reduce risk factors, prevent/delay chronic disease, promote wellness in children and adults, and provide positive, sustainable health change in communities” (DHHS, 2010a). By June 2013, CPPW had met 73% of its objectives (CDC, 2013a). CPPW was successful in increasing access to environments with healthy food and beverage options in communities nationwide. It also created bike lanes in cities, supported the development of walking trails, and provided guidelines for daily physical activity in schools to increase access to physical activity activities. The program decreased exposure to second-hand smoke through expansion of smoke-free areas and expanded smoking cessation services. In addition, CPPW increased local capacity to improve public health interventions, developed products to support public health departments, and guided the development of programs to better support long-term community

health. It is estimated that if these health improvements are sustained in CP PW communities beyond the intervention period, there will be 14,000 fewer deaths and \$2.4 billion in health care costs will be averted through 2020 (Khavjou et al., 2014).

► Health Promotion and Disease Prevention

A program of health promotion and disease prevention is built on three main principles:

- Risk factors associated with host, agent, environment, and their health consequences are evaluated through a process called **health risk appraisal**. Only when the risk factors and their health consequences are known can interventions be developed to help individuals adopt healthier lifestyles.
- Interventions for counteracting the key risk factors include two main approaches: (1) behavior modification geared toward the goal of adopting healthier lifestyles; and (2) therapeutic interventions.
- Adequate public health and social services, as discussed later in this chapter, include all health-related services designed to minimize risk factors and their negative effects so as to prevent disease, control disease outbreaks, and contain the spread of infectious agents.

Various avenues can be used in motivating individuals to alter behaviors that may contribute to disease, disability, or death. Behavior can be modified through educational programs and incentives directed at specific high-risk populations.

For example, in the case of cigarette smoking, health promotion efforts aim to build people's knowledge, attitudes, and skills to avoid or quit smoking. These efforts also seek to reduce the number of advertisements and environmental enticements that promote nicotine addiction. Likewise, financial incentives and disincentives, such as higher cigarette taxes, have been used to discourage purchase of cigarettes.

Therapeutic interventions fall into three areas of preventive effort: primary prevention, secondary prevention, and tertiary prevention. **Primary prevention** refers to activities undertaken to reduce the probability that a disease will develop in the future (Kane, 1988). The objective of primary prevention is to restrain the development of a disease or negative health condition before it occurs. For example, therapeutic interventions can include community health efforts to assist patients in smoking cessation and exercise programs to prevent conditions such as lung cancer and heart disease. Safety training and practices at the workplace can reduce serious work-related injuries. Prenatal care is known to lower infant mortality rates. Immunization has had a greater impact on prevention against childhood diseases and mortality reduction than has any other public health intervention besides providing clean water (Plotkin and Plotkin, 2012). Hand washing, refrigeration of foods, garbage collection, sewage treatment, and protection of the water supply are other examples of primary prevention (Timmreck, 1994). There have been numerous incidents where training on food safety and proper cooking could have prevented outbreaks of potentially deadly episodes, such as those caused by *Escherichia coli*.

Secondary prevention refers to early detection and treatment of disease. Health screenings and periodic health examinations are just two examples. Screening for hypertension, cancers, and diabetes, for example, has been instrumental in prescribing early treatment for these conditions. The main objective of secondary prevention is to block the progression of a disease or an injury—that is, to keep it from developing into an impairment or disability (Timmreck, 1994).

Tertiary prevention refers to interventions that could prevent complications from chronic conditions and prevent further illness, injury, or disability. For example, regular turning of bed-bound patients prevents pressure sores, rehabilitation therapies can prevent permanent disability, and infection control practices in hospitals and nursing homes are designed to prevent **iatrogenic illnesses** (i.e., illnesses or injuries caused by the process of health care).

As shown in **TABLE 2-2**, prevention, early detection, and treatment efforts helped reduce cancer mortality quite significantly between 1991 and 2013. This decrease was the first sustained decline since record keeping was instituted in the 1930s.

► Disease Prevention Under the Affordable Care Act

Prevention and wellness received significant emphasis under the Affordable Care Act (ACA). At least partially as a result of the ACA, an estimated 137 million Americans, including 28.5 million children, received no cost coverage for preventive services (Office of

TABLE 2-2 Annual Percentage Decline in U.S. Cancer Mortality, 1991–2013

Type of Cancer	1991–1995	1994–2003	1998–2007	2001–2010	2009–2013
All cancers	3.0	1.1	1.4	1.5	1.5
Breast cancer	6.3	2.5	2.2	2.2	1.9
Cervical cancer	9.7	3.6	2.6	1.5	0.8
Ovarian cancer	4.8	0.5	0.8	2.0	2.1
Prostate cancer	6.3	3.5	3.1	2.7	3.6

Data from National Center for Health Statistics, Centers for Disease Control and Prevention, National Cancer Institute, SEER Cancer Statistics Review, 1975–2010; National Cancer Institute. 2016. *State cancer profiles*. Available at: <https://statecancerprofiles.cancer.gov/recenttrend/index.php>.

the Assistant Secretary for Planning and Evaluation, 2015).

Other ACA initiatives included the Prevention and Public Health Fund (PPHF) for national preventive efforts and programs geared toward improving health outcomes and enhancing quality of health care (American Public Health Association, 2013). The Office of the Surgeon General developed a National Prevention Strategy to encourage partnerships among federal, state, tribal, local, and territorial governments; business, industry, and other private-sector entities; philanthropic organizations; community and faith-based organizations; and everyday Americans to improve health through prevention (National Prevention Council, 2011).

As one example of a federally driven effort directed toward reducing chronic disease, the CDC established a National Diabetes Prevention Program (NDPP). In 2012, six organizations received \$6.75 million to develop partnerships with the aim of reaching people with prediabetes

(CDC, 2013b, 2013c). Through the NDPP, organizations nationwide offer diabetes prevention lifestyle programs in health care clinics, pharmacies, wellness centers, worksites, and other community centers. These organizations also work to increase awareness of lifestyle changes. Organizations encourage health professionals to refer patients with prediabetes to a lifestyle change program. The program has also increased awareness across employers, some of which now provide coverage for lifestyle change programs as health benefits for their employees. The NDPP is working to ensure quality and standardized reporting and to monitor and evaluate program effectiveness (CDC, 2016c).

In 2011, \$10 million in federal funding was made available to establish and evaluate comprehensive workplace wellness programs (DHHS, 2011b). Beginning in 2014, \$200 million in wellness grants was made available to small businesses to encourage the establishment of wellness programs and employee health-promotion

incentives (Anderko et al., 2012). In 2015, 46.8 million employees worked in firms that offered wellness programs. Although workplace wellness programs are diverse and vary in the services and activities offered, they are all required to promote health and/or prevent disease to qualify for federal funding support. Of the companies that provided health benefits in 2015, 50% offered wellness programs for tobacco cessation, weight control, nutrition, and other lifestyle or behavioral coaching (Mattke et al., 2013). Health-promotion activities, such as on-site vaccination services, biometric screenings, fitness benefits, and health food options at the workplace, are also common. The majority of workplaces that offer wellness programs offer a combination of screening and intervention services. These programs have been shown to generate savings in medical costs of approximately \$3 for every \$1 spent on the program and to reduce absenteeism (Baicker et al., 2010).

► Public Health

Public health remains poorly understood by its prime beneficiaries, the public. For some people, public health evokes images of a massive social enterprise or welfare system. To others, the term means health care services for everyone. Still another image of public health is of a body of knowledge and techniques that can be applied to health-related problems (Turnock, 1997). However, none of these ideas adequately reflects what public health is.

The Institute of Medicine (1988) has proposed that the mission of public health should be understood as fulfilling “society’s interest in assuring conditions in which

people can be healthy.” **Public health** deals with broad societal concerns about ensuring conditions that promote optimal health for the society as a whole. It involves the application of scientific knowledge to counteract any threats that may jeopardize the health and safety of the general population. Because of its extensive scope, the vast majority of public health efforts are carried out by government agencies, such as the CDC in the United States.

Three main distinctions can be seen between the practices of medicine and public health:

- Medicine focuses on the individual patient—diagnosing symptoms, treating and preventing disease, relieving pain and suffering, and maintaining or restoring normal function. Public health, in contrast, focuses on populations (Shi and Johnson, 2014).
- The emphases in modern medicine are the biological causes of disease and the development of treatments and therapies. In contrast, public health focuses on (1) identifying environmental, social, and behavioral risk factors as well as emerging or potential risks that may threaten people’s health and safety; and (2) implementing population-wide interventions to minimize these risk factors (Peters et al., 2001).
- Medicine focuses on the treatment of disease and recovery of health, whereas public health deals with various efforts to prevent disease and counteract threats that may negatively affect people’s health.

Public health activities range from providing education on nutrition to passing laws that enhance automobile safety. For example, public health includes

dissemination, both to the public and to health professionals, of timely information about important health issues, particularly when communicable diseases pose potential threats to large segments of a population.

Compared to medicine, public health involves a broader range of professionals. The medical sector encompasses physicians, nurses, dentists, therapists, social workers, psychologists, nutritionists, health educators, pharmacists, laboratory technicians, health services administrators, and so forth. In addition to these professionals, the public health forum includes professionals such as sanitarians, epidemiologists, statisticians, industrial hygienists, environmental health specialists, food and drug inspectors, toxicologists, and economists (Lasker, 1997).

Health Protection and Environmental Health

Health protection is one of the main public health functions. In the 1850s, John Snow successfully traced cholera outbreaks in London to contamination of the Broad Street water pump (Rosen, 1993). Since then, **environmental health** has specifically dealt with preventing the spread of disease through water, air, and food (Schneider, 2000). Environmental health science, along with other public health measures, was instrumental in reducing the risk of infectious diseases during the 1900s. For example, in 1900, pneumonia, tuberculosis, and diarrhea, along with enteritis, were the top three killers in the United States (CDC, 1999); that is no longer the case today (**TABLE 2-3**). With the rapid industrialization that occurred

during the 20th century, environmental health faced new challenges due to serious health hazards from chemicals, industrial waste, infectious waste, radiation, asbestos, and other toxic substances. In the 21st century, the possession of chemical, biological, and nuclear agents by terrorists and rogue nations have emerged as a new environmental threat.

Health Protection During Global Pandemics

Over time, public health has become a complex global undertaking. Its main goal of protecting the health and safety of populations from a variety of old and new threats cannot be achieved without global cooperation. Influenza is the most common infectious disease on a global scale, affecting nearly 3 to 5 million people annually and resulting in 250,000 to 500,000 deaths (Thompson et al., 2009). It spreads around the world in a yearly outbreak.

The global threat of avian influenza has also elicited a public health response. The CDC launched a website dedicated to educating the public about avian influenza, the means by which it is spread, and past and current outbreaks. This website contains specific information for health professionals, travelers, the poultry industry, state departments of health, and people with possible exposures to avian influenza (CDC, 2007).

Although several strains of influenza exist, the subtypes currently circulating among humans are H1N1 and H3N2 (WHO, 2016a). After a novel H1N1 influenza virus emerged from Mexico in April 2009, U.S. health officials anticipated

TABLE 2-3 Leading Causes of Death, 2014

Cause of Death	Deaths	Percentage of All Deaths
All causes	2,626,418	100.0
Diseases of the heart	614,348	23.4
Malignant neoplasms	591,699	22.5
Chronic lower respiratory diseases	147,101	5.6
Unintentional injuries	136,053	5.2
Cerebrovascular diseases	133,103	5.1
Alzheimer's disease	93,541	3.6
Diabetes mellitus	76,488	2.9
Influenza and pneumonia	55,227	2.1
Nephritis, nephrotic syndrome, and nephrosis	48,146	1.8
Suicide	42,773	1.6

Data from National Center for Health Statistics (NCHS). 2016. *Health, United States, 2015*. Hyattsville, MD: Department of Health and Human Services. p. 107.

and prepared for an influenza pandemic, and these efforts stretched the response capabilities of the public health system. The virus affected every U.S. state, and Americans were left unprotected because of the unavailability of antiviral medications. Since then, a global effort has been undertaken to establish collaborative networks to exchange information and contain global pandemics (WHO, 2013).

Coronaviruses are believed to cause a large percentage of all common colds in adults (Committee on Infectious Diseases et al., 2015). However, two strains

of coronavirus have particularly serious health effects. Severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) coronavirus outbreaks occurred in 2003 and 2012, respectively. In 2003, SARS—a contagious disease that is accompanied by fever and symptoms of pneumonia or other respiratory illness—spread from China to Canada. Worldwide, more than 8,000 people were affected by this infection (CDC, 2012). MERS still occurs in parts of the Middle East. Since 2012, 27 countries have reported cases of MERS, for a total of

1,888 cases and 670 deaths from this disease (WHO, 2016b).

WHO's (2016c) *2016 World Malaria Report* provides estimates of the global prevalence and mortality due to malaria. In 2015, there were an estimated 212 million malaria cases and 429,000 malaria deaths worldwide. The majority of cases were in Africa (90%), followed by southeast Asia (7%). The global incidence of malaria decreased by 21% between 2010 and 2015, and the number of deaths decreased by 29% in the same time period.

The *Global Tuberculosis (TB) Report*, also published by WHO (2016d), provides current estimates of the worldwide TB epidemic. In 2015, there were an estimated 10.4 million incident TB cases worldwide. Sixty percent of cases were concentrated in six countries: India, Indonesia, China, Nigeria, Pakistan, and South Africa. Multidrug-resistant TB cases are especially problematic, with 480,000 new cases in 2015 and an additional 100,000 new cases of rifampicin-resistant TB. An estimated 1.4 million deaths due to TB occurred in 2015. Nevertheless, the number of TB deaths fell 22% between 2000 and 2015, and TB treatment averted 49 million deaths globally. Even so, TB remains among the top 10 causes of death worldwide.

Prevent HIV, Test and Treat All: Progress Report 2016, a WHO (2016e) report, provides estimates of the global human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) epidemic. As of 2015, 36.7 million people were living with HIV/AIDS worldwide; in that same year, 1.1 million people died of AIDS-related illnesses. This mortality was the lowest number of deaths from HIV/

AIDS in 2 decades. The burden of the pandemic is greatest in sub-Saharan Africa, where an estimated 25.5 million people are living with the disease (70% of all people living with HIV worldwide) as of 2017. In 2015, 800,000 people in this region died from HIV/AIDS. Approximately 66% of all new HIV infections occur in this region as well. As of June 2016, 18.2 million people living with HIV globally were receiving life-prolonging antiretroviral therapy (ART), compared to 7.5 million people in 2010 and fewer than 1 million people in 2000. Additionally, access to ART to prevent transmission of HIV from mother to baby is increasing, with new HIV infections among newborns declining by 50% since 2010.

While some types of hepatitis are more problematic (i.e., hepatitis B and C) than others, all variants of this infection are viral in nature and present in the global population. An estimated 400 million people are affected by at least one type of viral hepatitis, and 6 to 10 million are newly infected annually. In total, approximately 1.4 million people die from hepatitis each year globally (GBD 2013 Mortality and Causes of Death Collaborators, 2015; Jacobsen and Wiersma, 2010). Hepatitis B accounts for approximately 686,000 deaths each year, and an estimated 240 million chronic infections. In sub-Saharan Africa and East Asia, 5% to 10% of the population is chronically infected with hepatitis B; in the Middle East and India, an estimated 2% to 5% of the population is chronically infected. Approximately 130 to 150 million people have chronic hepatitis C, and 700,000 die annually from related liver diseases. Africa, Central Asia, and East Asia are the regions most affected by the hepatitis C pandemic.

The most current outbreak of the Ebola virus, which started in December 2013 and ended in April 2016, led to more than 28,000 cases and 11,000 deaths in Africa (WHO, 2016f). The countries most severely affected by the recent major Ebola outbreak—Guinea, Sierra Leone, and Liberia—are all in West Africa. Now that the outbreak has ended, the current focus is on preparedness and prevention of future epidemics (WHO Ebola Response Team et al., 2016). In December 2016, scientists reported highly promising results for an experimental Ebola vaccine (Henao-Restrepo et al., 2017). The first vaccine to prevent infections from this virus, it is estimated to be 70% to 100% effective.

► Health Protection and Preparedness in the United States

Since the horrific events of what is commonly referred to as 9/11 (the terrorism attacks on September 11, 2001), the United States has begun a new chapter in health protection. These efforts to protect the health and safety of Americans began in June 2002 when President George W. Bush signed into law the Public Health Security and Bioterrorism Preparedness Response Act of 2002. Subsequently, the Homeland Security Act of 2002 created the Department of Homeland Security (DHS) and called for a major restructuring of the nation's resources, with the primary mission of helping prevent, protect against, and respond to any acts of terrorism in the United States. It also provided better tools to contain attacks on food and water supplies, protect the nation's vital

infrastructures (i.e., nuclear facilities), and track biological materials anywhere in the United States. The term **bioterrorism** encompasses the use of chemical, biological, and nuclear agents to cause harm to relatively large civilian populations.

Today, health protection and preparedness comprises a massive operation to deal with any natural or human-made threats. Dealing with such threats requires large-scale preparations, which include appropriate tools and training for workers in medical care, public health, emergency care, and civil defense agencies at the federal, state, and local levels. It requires national initiatives to develop countermeasures, such as new vaccines, a robust public health infrastructure, and coordination among numerous agencies. It also requires development of an infrastructure that can handle large numbers of casualties and isolation facilities for contagious patients. Hospitals, public health agencies, and civil defense must be linked together through information systems. Containment of infectious agents, such as smallpox, necessitates quick detection, treatment, isolation, and organized efforts to protect the unaffected population. Rapid cleanup, evacuation of the affected population, and transfer of victims to medical care facilities require detailed plans and logistics.

The United States has confronted several major natural disasters in the 21st century, such as Hurricane Katrina in 2005, Hurricane Sandy in 2012, and tornadoes in Oklahoma in 2013, as well as human-made mass casualties such as the Boston Marathon bombing on April 15, 2013. Health protection and preparedness have become ongoing efforts through revitalized initiatives such as the Pandemic and All-Hazards Preparedness

Act (PAHPA) of 2006, which also authorized a new Assistant Secretary for Preparedness and Response (ASPR) within the DHHS and called for the establishment of a quadrennial National Health Security Strategy (NHSS). The CDC has developed the National Biosurveillance Strategy for Human Health, which covers six priority areas: electronic health information exchange, electronic laboratory information exchange, unstructured data, integrated biosurveillance information, global disease detection and collaboration, and biosurveillance workforce. Based on the National Health Security Strategy developed by the DHHS in 2009, *Healthy People 2020* focused on four areas for reinforcement under an overarching goal to “improve the Nation’s ability to prevent, prepare for, respond to, and recover from a major health incident”: time to release official information about a public health emergency, time for designated personnel to respond to an emergency, Laboratory Response Network (LRN) laboratories, and time to develop after-action reports and improvement plans in states (DHHS, 2010b). A progress report shows that most states and localities have strong biological laboratory capabilities and capacities, with nearly 90% of laboratories in the LRN reachable around the clock (CDC, 2010b).

In 2011, the Health Alert Network (HAN) was established; this nationwide program is designed to facilitate communication, information, and distance learning related to health threats, including bioterrorism (DHHS, 2011a). When fully established, the network will link together local health departments and other components of bioterrorism preparedness and response, such as laboratories and state health departments.

One of the key concepts of preparedness is **surge capacity**, defined as “the ability of a health care facility or system to expand its operations to safely treat an abnormally large influx of patients” (Bonnett and Peery, 2007). The initial response is conducted at a local health care facility, such as a hospital. Strategies for expanding the surge capacity of a hospital include early discharge of stable patients, cancellation of elective procedures and admissions, conversion of private rooms to double rooms, reopening of closed areas, revision of staff work hours to a 12-hour disaster shift, callback of off-duty personnel, and establishment of temporary external shelters for patient holding (Hick et al., 2004).

If the local level response becomes overloaded or incapacitated, a second tier of disaster response can be activated: community-level surge capacity. Cooperative regional planning necessitates sharing of staff and supplies across a network of regional health care facilities (Hick et al., 2004). An important aspect of disaster planning at the community level entails the transportation logistics for the region. The number of ambulances in the area and the means of accessing such resources during an event is crucial to delivering proper care to critical patients (Kearns et al., 2013).

The final tier of disaster response involves federal aid under the National Disaster Medical System (NDMS), which dates back to the 1980s and was designed to accommodate large numbers of military casualties. Disaster Medical Assistance Teams (DMATs) are a vital component of the NDMS that directly respond to the needs of an overwhelmed community. DMATs deploy with trained personnel (in both medical and ancillary services), equipped with tents, water

filtration, generators, and medical supplies (Stopford, 2005).

Developments in technology have made major contributions to advances in disaster preparedness. For example, the United States is using new information and communication technologies to streamline emergency responses among various organizations. Social media is increasingly being used as a tool by governments, communities, and organizations for a range of purposes in disaster preparedness (i.e., detecting an event; connecting individuals following a disaster; and preparing and receiving disaster preparedness information, warnings, and signals) (Houston et al., 2015).

Despite the progress that has been made, disaster preparedness efforts in the United States remain fragmented and underfunded. For example, review, rotation, replacement, and upgrading of equipment and supplies in the system on a regular basis remain challenging (Cohen and Mulvaney, 2005). Given the differences in institutional and local structures, it is difficult to develop clear and objective standards and methods while still respecting local authorities (Nelson et al., 2007). Other challenges include retention of high-quality staff in emergency departments and having insufficient funding and resources to provide education and training opportunities (Walsh et al., 2015).

► Determinants of Health

Health determinants are major factors that affect the health and well-being of individuals and populations. An understanding of health determinants is necessary to plan and implement any positive interventions that improve health and longevity.

Blum's Model of Health Determinants

In 1974, Blum (1981) proposed an “Environment of Health” model, later called the “Force Field and Well-Being Paradigms of Health.” Blum proposed that four major inputs contribute to health and well-being (“force fields”): environment, lifestyle, heredity, and medical care. All of these factors must be considered simultaneously when addressing the health status of an individual or a population. In other words, there is no single pathway to better health because health determinants interact in complex ways. Consequently, improvement in health requires a multipronged approach.

The four wedges in Blum's model represent the four major force fields. The size of each wedge signifies its relative importance. Thus, the most important force field is environment, followed by lifestyle and heredity. Medical care has the least impact on health and well-being.

Blum's model also explains that the four main forces operate within a much broader context, and are affected by broad national and international factors, such as a nation's population characteristics, natural resources, ecological balance, human satisfactions, and cultural systems. One of these factors is the type of health care delivery system. In the United States, the majority of health care expenditures is devoted to the treatment of medical conditions, rather than to the prevention of factors that produce those medical conditions in the first place.

Environment

Environmental factors encompass the physical, socioeconomic, sociopolitical, and sociocultural dimensions. Among physical environmental factors are air pollution,

food and water contaminants, radiation, toxic chemicals, wastes, disease vectors, safety hazards, and habitat alterations.

The positive relationship between socioeconomic status (SES) and health may be explained by the general likelihood that people who have better education also have higher incomes. The greater the economic gap between the rich and the poor is in a given geographic area, the worse the health status of the overall population in that area is likely to be. It has been suggested that wide income gaps produce less social cohesion, greater psychosocial stress, and consequently, poorer health (Wilkinson, 1997). For example, social cohesion—characterized by a hospitable social environment in which people trust each other and participate in communal activities—is linked to lower overall mortality and better self-rated health (Kawachi et al., 1997, 1999). Even countries with national health insurance programs, such as the United Kingdom, Australia, Denmark, and Sweden, experience persistent and widening disparities in health according to socioeconomic status (Pincus et al., 1998). The joint relationship of income inequality and availability of primary care has also been found to be significantly associated with individuals' self-rated health status (Shi et al., 2002).

Lifestyle

Lifestyle factors, also known as behavioral risk factors, were discussed earlier in this chapter. This section provides some illustrations of how lifestyle factors are related to health. Studies have shown that diet plays a major role in most of today's significant health problems. Heart disease, diabetes, stroke, and cancer are some of the diseases with direct links to dietary

choices. Throughout the world, incidence and mortality rates for many forms of cancer are rising, though research has clearly indicated that a significant portion of cancer is preventable. Researchers estimate that 30% to 50% of all cancers and as many as 30% to 35% of cancer deaths are linked to diet (World Cancer Research Fund and American Institute for Cancer Research, 2007). Research also shows that a diet rich in fruits, vegetables, and low-fat dairy foods, and a diet low in saturated and total fat, can substantially lower blood pressure (see, for example, the DASH Eating Plan recommended by DHHS [2006]).

Increasing exercise and physical activity is a potentially useful, effective, and acceptable method for reducing the risk of colon cancer (Macfarlane and Lowenfels, 1994) and many other health problems. Smoking and alcohol consumption are also important lifestyle factors that impact health. In addition to increasing the risk of lung cancer, smoking increases the risk of coronary heart disease and stroke by 2 to 4 times (DHHS, 2014). Half of all cancer deaths and nearly half of all cancer diagnoses could potentially be prevented through a healthy lifestyle that includes not smoking, drinking in moderation, maintaining a healthy weight, and exercising regularly (Song and Giovannucci, 2016).

Heredity

Genetic factors may predispose individuals to certain diseases. While cancer is not entirely genetic, cancer can occur when the body's healthy genes lose their ability to suppress malignant growth or when other genetic processes stop working properly (Davis and Webster, 2002). While people can do little about the genetic makeup they have inherited, their lifestyle and behavior

can significantly impact their progeny. Finally, advances in gene therapy hold the promise of treating a variety of inherited or acquired diseases.

Medical Care

Although the factors of lifestyle, environment, and heredity are more important in the determination of health, medical care is, nevertheless, a key factor affecting health. Though, according to Blum, medical care is the least important factor in determining health and well-being, the United States focuses more on medical research and development of new medical technologies than it does on the other three factors. It can be noted that significant declines in mortality rates were achieved well before the modernization of Western medicine and the escalation in medical care expenditures.

The availability of primary care may be one way in which income inequality influences population-level health outcomes. Research by Shi and colleagues (Shi and Starfield, 2001; Shi et al., 1999) suggests that access to primary care significantly correlates with reduced mortality, increased life expectancy, and improved birth outcomes. Access to primary care includes access to and use of preventive services, which can prevent illness or detect disease at an earlier, often more treatable stage. In the United States, individuals living in states with a higher primary care physician-to-population ratio are more likely to report good health than those living in states with a lower ratio (Shi et al., 2002).

Contemporary Models of Health Determinants

More recent models have built upon and extended Blum's framework of health

determinants. For example, the model proposed by Dahlgren and Whitehead (2006) identifies age, sex, and genetic makeup as fixed factors, but state that other factors can be modified to positively influence population health. While individual lifestyle factors can benefit or damage health, broader social, economic, cultural, and environmental conditions often have greater influence on both individual and population health.

Another model by Ansari and colleagues (2003) have proposed a public health model of the social determinants of health in which the determinants are categorized into four major groups: social determinants, health care system attributes, disease-inducing behaviors, and health outcomes.

The WHO Commission on Social Determinants of Health (2008) concluded that "the social conditions in which people are born, live, and work are the single most important determinant of one's health status" (Satcher, 2010). The WHO model provides a conceptual framework for understanding the socioeconomic and political contexts, structural determinants, intermediary determinants (including material circumstances, social-environmental circumstances, behavioral and biological factors, social cohesion, and the health care system), and the impact on health equity and well-being measured as health outcomes (**FIGURE 2-3**).

U.S. government agencies, such as the CDC and DHHS, have recognized the need to address health inequities. The CDC's National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention adopted the WHO framework on social determinants of health as a guide for its activities.

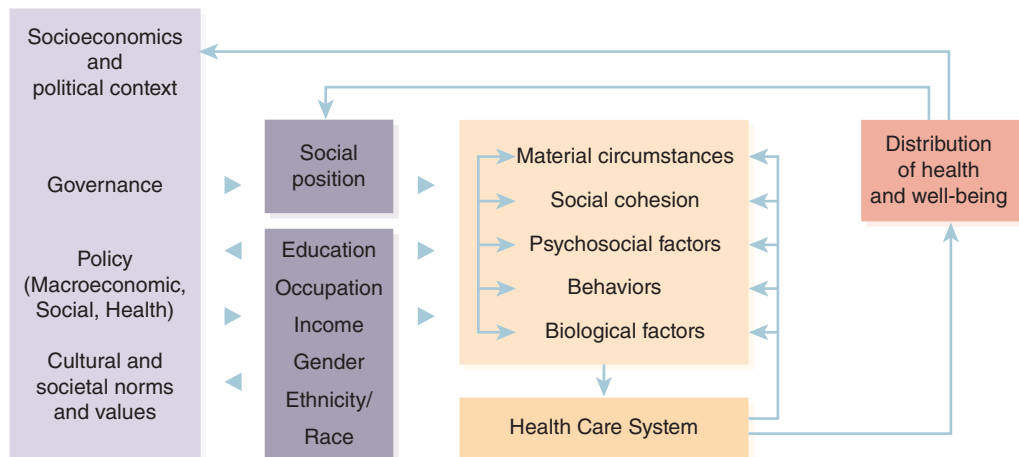


FIGURE 2-3 WHO Commission on Social Determinants of Health conceptual framework.

Reproduced from Centers for Disease Control and Prevention (CDC). 2010a. *Establishing a holistic framework to reduce inequities in HIV, viral hepatitis, STDs, and tuberculosis in the United States*. Available at: <https://www.cdc.gov/socialdeterminants/docs/SDH-White-Paper-2010.pdf>. Accessed April 2017. Modified from Solar, O., and A. Irwin; World Health Organization (WHO). 2010. *A conceptual framework for action on the social determinants of health. Social Determinants of Health Discussion Paper 2 (Policy and Practice)*. Geneva, Switzerland: WHO.

► Measures Related to Health

Certain quantitative measures are commonly applied to health, health status, and the utilization of health care. The conceptual approaches for defining health and its distribution help form a vision for the future, and objective measures play a critical role in evaluating the success of programs and directing future planning activities. Practical approaches for measuring health are, however, quite limited, and mental health is more difficult to quantify and measure than physical health. An objective evaluation of social and spiritual health is even more obscure.

The concept of population, as it applies to population health, has been borrowed from the disciplines of statistics and epidemiology. The term “population” is not restricted to describing the total population. Although commonly used in this

way, the term population may also apply to a defined subpopulation—for example, age groups, marital categories, income levels, occupation categories, racial/ethnic groups, people having a common disease, people in a certain risk category, or people in a certain community or geographic region of a country. The main advantage of studying subpopulations is that it helps trace the existence of health problems to a defined group. Doing so avoids the likelihood that serious problems in a minority group will be hidden within the favorable statistics of the majority. By pinpointing health problems in certain well-defined groups, targeted interventions and new policy initiatives can be deployed in the most effective manner.

Measures of Physical Health

Physical health status is often interpreted through **morbidity** (disease and disability) and **mortality** (death) rates. In

addition, self-perceived health status is a commonly used indicator of health and well-being because it is highly correlated with many objective measures of health status. With this measure, respondents are asked to rate their health as excellent, very good, good, fair, or poor. Self-perceived health status is also a good predictor of patient-initiated physician visits, including general medical and mental health visits.

Longevity

Life expectancy—a prediction of how long a person will live—is widely used as a basic measure of health status. The two common measures are life expectancy at birth (**TABLE 2-4**)—or how long a newborn can expect to live—and life expectancy at age 65—expected remaining years of life for someone at age 65. These measures are actuarially determined and published by government agencies such as the National Center for Health Statistics (NCHS). The U.S. Census Bureau (2016) has projected that life expectancy in the United States will increase from 78.8 years in 2014 to 84.1 years in 2050.

Morbidity

The measurement of morbidity or disease, such as cancer or heart disease, is expressed as a ratio or proportion of those who have the problem and the **population at risk**. The population at risk includes all the people in the same community or population group who could acquire a disease or condition (Smith, 1979).

Incidence and prevalence are two widely used indicators for the number of **cases**, people who end up acquiring a negative health condition. Both incidence and prevalence rates can apply to disease, disability, or death.

TABLE 2-4 U.S. Life Expectancy at Birth—2002, 2007, and 2014

Year	Total	Male	Female
2002	77.0	74.4	79.6
White	77.5	74.9	80.1
Black	72.2	68.7	75.4
2007	78.1	75.5	80.6
White	78.5	76.0	80.9
Black	73.8	70.3	77.0
2014	78.8	76.4	81.2
White	79.0	76.7	81.4
Black	75.6	72.5	78.4

Data from National Center for Health Statistics (NCHS). 2016. *Health, United States, 2015*. Hyattsville, MD: Department of Health and Human Services. p. 95.

Incidence counts the number of new cases occurring in the population at risk within a certain period of time, such as a month or a year (Smith, 1979; **FORMULA 2-1**). It describes the extent to which people in a given population acquire a given disease during a specified time period. Incidence is particularly useful in estimating the significance or

FORMULA 2-1

Incidence = Number of new cases during a specified period/Population at risk

magnitude of conditions of relatively short duration. Declining levels of incidence indicate successful health promotion and disease prevention efforts because they prevent new cases (Ibrahim, 1985). High levels of incidence may suggest an impending **epidemic**, a large number of people who get a specific disease from a common source.

Prevalence determines the total number of cases at a specific point in time, in a defined population (**FORMULA 2-2**). Prevalence is useful in quantifying the magnitude of illnesses of a relatively long duration. Decreased prevalence indicates success of treatment programs by shortening the duration of illness (Ibrahim, 1985).

FORMULA 2-2

Prevalence = Total number of cases at a specific point in time / Specified population

The calculation of rates often requires dividing a small number by a large number representing a defined population. The result is a fraction. To make the fractions meaningful and interpretable, they are multiplied by 100 (to get a percentage), by 1,000 (to get a rate per 1,000 people), by 10,000 (to get a rate per 10,000 people), or by a higher multiple of 10.

Disability

Disease and injury can lead to temporary or permanent, as well as partial or total, disability. Although the idea of morbidity includes disabilities, as well as disease, specific measures of disability have been developed. Some commonly used

measures are the number of days of bed confinement, days missed from work or school, and days of restricted activity. All measures are in reference to a specific time period, such as a year.

One of the most widely used measures of physical disability among the elderly, in particular, is the **activities of daily living (ADLs)** scale. The ADLs identify personal care functions with which a disabled person may need assistance. Depending on the extent of disability, personal care needs can be met through adaptive devices; care rendered by another individual, such as a family member; or care in a nursing facility. Consequently, the ADL scale is appropriate for evaluating disability in both community-dwelling and institutionalized adults. The classic ADL scale, developed by Katz and Akpom (1979), includes six basic activities: eating, bathing, dressing, using the toilet, maintaining continence, and transferring from bed to chair. To evaluate disability in community-dwelling adults, a modified Katz scale, which consists of seven items, is used (Ostir et al., 1999). Five of these items—feeding, bathing, dressing, using the toilet, and transferring from bed to chair—have been retained from the original Katz scale. The additional two items are grooming and walking a distance of 8 feet. Thus, the modified scale includes items measuring self-care and mobility.

Another commonly used measure of physical function is the **instrumental activities of daily living (IADLs)** scale. This scale measures activities that are necessary for living independently in the community, such as using the telephone, driving a car or traveling alone on a bus or by taxi, shopping, preparing meals, doing light housework, taking medicines, handling money, doing heavy housework, walking

up and down stairs, and walking a half-mile without help. IADLs typically require higher cognitive functioning than ADLs and, as such, are not purely physical tests of functional disability. The IADL scale measures the level of functioning in activities that are important for self-sufficiency, such as the ability to live independently.

Mortality

Death rates are computed in different forms as indicators of population health. **Crude rates** refer to the total population; they are not specific to any age group or disease category (**FORMULA 2-3**).

FORMULA 2-3

Crude death rate = Total deaths (usually in 1 year)/Total population

Specific rates are useful because death rates vary greatly by race, sex, age, and type of disease or condition. Specific rates allow health care professionals to target programs at the appropriate population subgroups (Dever, 1984). Examples of specific rates are the age-specific mortality rate (**FORMULA 2-4**) and the cause-specific mortality rate (**FORMULA 2-5**). The age-specific mortality rate provides a measure of the risk (or probability) of dying when a person is in a certain age group. The cause-specific mortality rate provides

FORMULA 2-4

Age-specific mortality rate = Number of deaths within a certain age group/Total number of persons in that age group

FORMULA 2-5

Cause-specific mortality rate = Number of deaths from a specific disease/Total population

a measure of the risk (or probability) of dying from a specific cause.

The infant mortality rate (actually a ratio; **FORMULA 2-6**) is an indicator that reflects the health status of the mother and the child throughout pregnancy and the birth process. It also reflects the level of prenatal and postnatal care (Timmreck, 1994).

FORMULA 2-6

Infant mortality rate = Number of deaths from birth to 1 year of age (in 1 year)/Number of live births during the same year

Demographic Change

In addition to measures of disease and mortality, changes in the composition of a population over time are important in planning health services. Population change involves three components: births, deaths, and migration (Dever, 1984). For example, the migration of elderly individuals to the southern and southwestern states requires planning of adequate retirement and long-term care services in those states. Longevity is also an important factor that determines demographic change. For example, lower death rates, lower birth rates, and greater longevity, taken collectively, indicate an aging population. This section presents measures of births and migration.

Births

Natality and fertility are two measures associated with births. **Natality**, or the birth rate, is useful in assessing the influence of births on demographic change and is measured by the crude birth rate (**FORMULA 2-7**).

FORMULA 2-7

Crude birth rate = Number of live births (usually in 1 year)/Total population

Fertility refers to the capacity of a population to reproduce (**FORMULA 2-8**). Fertility is a more precise measure than natality because fertility relates actual births to the sector of the population capable of giving birth.

FORMULA 2-8

Fertility rate = Number of live births (usually in 1 year)/Number of females aged 15–44

Migration

Migration refers to the geographic movement of populations between defined geographic units and involves a permanent change of residence. The net migration rate (**FORMULA 2-9**) defines the change in the population as a result of **immigration** (in-migration) and **emigration**

FORMULA 2-9

Net migration rate = (Number of immigrants – Number of emigrants)/Total population (during a specific period of time)

(out-migration) (Dever, 1984). This rate is calculated for a specified period, such as 1 year, 2 years, 5 years, and so on.

Measures of Mental Health

Measurement of mental health is less objective than measurement of mortality and morbidity because mental health often encompasses feelings that cannot be observed. In contrast, physical functioning, as reflected in behaviors and performances, can be more readily observed. Hence, measurement of mental health more appropriately refers to assessment rather than measurement. Mental health can be assessed by the presence of certain symptoms, including both psychophysiological and psychological symptoms. Examples of psychophysiological symptoms are low energy, headache, and upset stomach. Examples of psychological symptoms are nervousness, depression, and anxiety.

Self-assessment of one's psychological state may also be used for mental health assessment. Self-assessment can be obtained through self-reports of frequency and intensity of psychological distress, anxiety, depression, and psychological well-being.

Measures of Social Health

Measures of social health extend beyond the individual to encompass the extent of social contacts across various facets of life, such as family life, work life, and community life. Breslow (1972) attempted to measure social health along four dimensions: (1) employability based on educational achievement, occupational status, and job experience; (2) marital satisfaction; (3) sociability, determined by the number of close friends and relatives; and

(4) community involvement, encompassing attendance at religious services, political activity, and organizational membership.

Social health status is sometimes evaluated in terms of social contacts and social resources. **Social contacts** are the number of social contacts or social activities a person engages in within a specified period. Examples are visits with friends and relatives, as well as attendance at social events, such as conferences, picnics, or other outings. **Social resources** refer to social contacts that can be relied on for support, such as relatives, friends, neighbors, and members of a religious congregation. Social contacts can be observed, and they are the more objective of the two categories; however, one criticism of social contact measures is their focus on events and activities, with little consideration of how the events are personally experienced. Unlike social contacts, social resources cannot be directly observed and are best measured by asking the individuals direct questions. Evaluative questions include whether these individuals can rely on their social contacts to provide tangible support and needed companionship and whether they feel cared for, loved, and wanted.

Measures of Spiritual Health

Depending on the person's individual, social, and cultural context, spiritual well-being can have a large variety of connotations. Such variations make it extremely difficult to propose standardized approaches for measuring the spiritual dimension. Attempts to measure this dimension are illustrated in the General Social Survey, which includes people's self-perceptions about happiness, religious experiences, and their degree of

involvement in activities, such as prayer and attending religious services.

A wide range of tools for spiritual assessment are now available. Generic methods of spiritual assessment are not associated with any particular religion or practice, so they do not require a detailed understanding of any particular religious tradition (Draper, 2012). An example of a generic scale is the tool developed by Vella-Brodrick and Allen (1995), which evaluates items such as reaching out for spiritual intervention; engaging in meditation, yoga, or prayer; duration of meditation or prayer for inner peace; frequency of meditation or prayer; reading about one's religious beliefs; and discussions or readings about ethical and moral issues. Quantitative measurement scales are also available to assess dimensions such as general spirituality, spiritual well-being, spiritual needs, and spiritual coping (Monod et al., 2011), but their use has been confined mainly to clinical research.

Measures of Health Services Utilization

Utilization refers to the consumption of health care services and the extent to which health care services are used. Measures of utilization can be used to determine which individuals in a population group do or do not receive certain types of medical services. With this type of measure, a health care provider, such as a hospital, can find out the extent to which its services are used. Managers can use these measures to decide whether certain services should be added or eliminated, and health planners can determine whether programs have been effective in reaching their targeted

populations. For example, managers can use these measures to ascertain how many hospital beds are required to meet the acute care needs of a given population (Pasley et al., 1995). Therefore, measures of utilization play a critical role in the planning of health care delivery capacity. Measures of utilization are too numerous to be covered here, but some common measures are provided (**FORMULAS 2-10 to 2-16**).

Crude Measures of Utilization

FORMULA 2-10

Access to primary care services = Number of persons in a given population who visited a primary care provider in a given year/Size of the population

(This measure is generally expressed as a percentage; that is, the fraction is multiplied by 100.)

FORMULA 2-11

Utilization of primary care services = Number of primary care visits by people in a given population in a given year/Size of the population

(This measure is generally expressed as number of visits per person per year.)

Specific Measures of Utilization

FORMULA 2-12

Utilization of targeted services = Number of people in a specific targeted population using special services (or visits)/Size of the targeted population group

(The fraction obtained is multiplied by 100, 1,000, or a higher multiple of 10 to facilitate interpretation of the result.)

FORMULA 2-13

Utilization of specific inpatient services = Number of inpatient days/Size of the population

(The fraction obtained is multiplied by 100, 1,000, or a higher multiple of 10 to facilitate interpretation of the result.)

Measures of Institution-Specific Utilization

FORMULA 2-14

Average daily census = Total number of inpatient days in a given time period/Number of days in the same time period

FORMULA 2-15

Occupancy rate = Total number of inpatient days in a given time period/Total number of available beds during the same time period
or

Average daily census/Total number of beds in the facility

(This measure is expressed as a percentage; that is, the fraction is multiplied by 100.)

FORMULA 2-16

Average length of stay = Total number of inpatient days during a given time period/Total number of patients served during the same time period

Measures of Global Health

Global monitoring of changes in the health of various populations requires the use of “tried and true” global health

indicators. Global health indicators can be divided into those that directly measure health phenomena (e.g., diseases, deaths, use of services) and indirect measures (e.g., social development, education and poverty indicators); these are also referred to as proximal and distal indicators, respectively. As one example, when using population statistics to describe levels of educational attainment and access to safe water and sanitation, it is possible to accurately categorize a country as having a population with high, medium, or low burden of disease (Larson and Mercer, 2004).

WHO (2015) compiles more than 100 indicators of a broad range of key public health issues. Commonly used indicators of life expectancy and mortality include life expectancy at age 60, healthy life expectancy at birth, infant and under-5 mortality rates, and the adult mortality rate. Cause-specific mortality rates are collected for selected communicable and noncommunicable diseases. Health services indicators reflect the extent to which people receive important health interventions. These services include unmet needs for family planning, prenatal care coverage, births attended by skilled health personnel, vaccination coverage, and other prevention and treatment coverage for common diseases among children. It is also important to report indicators of risk factors that are associated with increased mortality and morbidity. In order to assess the risk of transmission of diarrheal disease, it is important to know the percentage of the population that do not have safe water supplies and sanitation. Use of solid fuels in households is a

proxy indicator for household pollution. Indicators of the prevalence of diabetes, hypertension, and obesity all signal the risk of cardiovascular disease and several types of cancer.

Indirect indicators of global health include health system indicators related to the workforce, infrastructure, medical technologies and devices, and government expenditures on health. Demographic and socioeconomic factors that are major determinants of health include primary school enrollment, population living in poverty, population size, crude birth and death rates, total fertility rates, and per-capita gross national income.

▶ Anthro-Cultural Beliefs and Values

A value system orients the members of a society toward defining what is desirable for that society. It has been observed that even a society as complex and highly diverse as that found in the United States can be said to have a relatively well-integrated system of institutionalized common values at the societal level (Parsons, 1972). Although such a view still prevails, American society now includes distinct subcultures whose membership has increased significantly due to a steady influx of immigrants from different parts of the world.

The current system of health services delivery has roots in the traditional beliefs and values espoused by the American people. This belief and value system governs the training and general orientation of

health care providers, the type of health delivery settings, the financing and allocation of resources, and access to health care in the United States.

Among the main beliefs and values prevalent in the American culture are those outlined here.

1. The United States has a strong belief in the advancement of science and the application of scientific methods to medicine. This belief was instrumental in the creation of the medical model that primarily governs U.S. health care delivery. As a result, the United States has long led the world in medical breakthroughs. These developments have had numerous implications for health services delivery:
 - a. They increase the demand for the latest treatments and raise patients' expectations for finding cures.
 - b. Because medical professionals focus on clinical interventions, they do not provide adequate emphasis on the holistic aspects of health and use of alternative therapies.
 - c. Health care professionals have been trained to focus on physical symptoms rather than the underlying causes of disease.
 - d. Integrating diagnosis and treatment with disease prevention has lagged behind other concerns.
 - e. Most research efforts have focused on the development of medical technology. Fewer resources have been committed to the preservation and enhancement of health and well-being.
 - f. Medical specialists, using the latest technologies, are held in higher esteem and earn higher incomes than do general practitioners.
 - g. The desirability of health care delivery institutions such as hospitals is often evaluated based on their acquisition of advanced technology.
 - h. Whereas biomedicine has taken central stage in the biomedical model, mental health diagnosis and treatment have been relegated to a lesser status.
 - i. The biomedical model has neglected the social and spiritual elements of health.
2. The United States has been a champion of capitalism. Due to the public's strong belief in capitalism, health care has largely been viewed as an economic good (or service), not as a public resource.
3. A culture of capitalism promotes entrepreneurial spirit and self-determination. Hence, individual capabilities to obtain health services have largely determined the production and consumption of health care (i.e.,

which services will be produced, where and in which quantities, and who will have access to those services). Some key implications are as follows:

- a. Upper-tier access to health care services is available mainly through private health insurance. Those with public insurance fall in a second tier. The uninsured make up a third tier.
 - b. A clear distinction exists between the types of services for poor and affluent communities, and between the types of services available in rural and inner-city locations.
 - c. The culture of individualism emphasizes individual health rather than population health. Consequently, medical practice has been directed at keeping the individual healthy, rather than the entire community.
 - d. A concern for the most underprivileged classes in society—the poor, elderly, disabled, and children—led to the creation of the public programs Medicaid, Medicare, and the Children’s Health Insurance Program (CHIP).
4. U.S. health care delivery is guided by principles of free enterprise and a general distrust of big government. Hence, health care delivery is largely in private hands, and a separation

exists between public health functions and the private practice of medicine.

Equitable Distribution of Health Care

Scarcity of economic resources is a central economic concept. From this perspective, health care can be viewed as an economic good. Two fundamental questions arise with regard to how scarce health care resources ought to be used:

- How much health care should be produced?
- How should health care be distributed?

The first question concerns the appropriate combination of health services that should be produced in relation to all other goods and services in the overall economy. If more health care is produced, a society may concomitantly devote fewer resources to producing some other goods, such as food, clothing, and transportation. The second question affects individuals at a more personal level—namely, it deals with who can receive which type of medical service, and how access to services will be restricted.

The production, distribution, and subsequent consumption of health care must be perceived as equitable by a society. No society has found a perfectly equitable method to distribute limited economic resources. In fact, any method of resource distribution inevitably leaves some inequalities in its wake. Therefore, societies try to allocate resources according to some guiding principles that are deemed acceptable by the particular society. Such principles are ingrained in a society’s

value and belief system. It is recognized, for example, that not everyone can receive everything medical science has to offer.

A just and fair allocation of health care poses conceptual and practical difficulties. Hence, a theory of justice is necessary to resolve the problem of health care allocation (Jonsen, 1986). Even though various ethical principles can be used to guide decisions pertaining to just and fair allocation of health care in individual circumstances, the concern about providing equitable access to health services on a population level is addressed by two contrasting theories referred to as market justice and social justice.

Market Justice

The principle of **market justice** leaves the fair distribution of health care up to the market forces in a free economy. Medical care and its benefits are distributed based on people's willingness and ability to pay (Santerre and Neun, 2010). In other words, people are entitled to purchase a share of the available goods and services that they value; they purchase these valued goods and services by means of wealth acquired through their own efforts. This is how most goods and services are distributed in a free market. The free market implies that giving people something they have not earned would be morally and economically wrong.

The *Overview of U.S. Health Care Delivery* chapter discussed several characteristics that describe a free market. These market characteristics are a precondition to the distribution of health care services according to market justice principles. As previously mentioned, health care in the United States is not delivered in a free

market; it is delivered in a quasi-market. Hence, market justice principles are only partially applicable to the U.S. health care delivery system. Distribution of health care according to market justice is based on the following key assumptions:

- Health care is like any other economic good or service, the distribution and consumption of which are determined by the free market forces of supply and demand.
- Individuals are responsible for their own achievements. With the rewards of their achievements, people are free to obtain various economic goods and services, including health care. When individuals pursue their own best interests, the interests of society as a whole are best served (Ferguson and Maurice, 1970).
- People make rational choices in their decisions to purchase health care products and services. Grossman (1972) proposed that health is also an investment commodity—in other words, people consider the purchase of health services an investment. For example, the investment has a monetary payoff when it reduces the number of sick days, making extra time available for productive activities, such as earning a living. Alternatively, it can have a utility payoff—a payoff in terms of satisfaction—when it makes life more enjoyable and fulfilling.
- People, in consultation with their physicians, know what is best for them. This assumption implies that people place a certain degree of trust in their physicians and that the physician–patient relationship is ongoing.
- The marketplace works best with minimum interference from the government. In other words, the market,

rather than the government, can allocate health care resources in the most efficient and equitable manner.

Under market justice, the production of health care is determined by how much consumers are willing and able to purchase health care at the prevailing market prices. Thus, prices and ability to pay ration the quantity and type of health care services that people consume. The uninsured and individuals who lack sufficient income to pay for private health care services face barriers to obtaining health care. Such limitations to obtaining health care are referred to as **demand-side rationing**, or “rationing by ability to pay” (Feldstein, 1994). To some extent, the uninsured may be able to overcome some barriers through charitable services.

The key characteristics of the market justice system and their implications are summarized in **TABLE 2-5**. Market justice emphasizes individual—rather than collective—responsibility for health. It proposes private—rather than government—solutions to social problems of health.

Social Justice

The idea of social justice is at odds with the principles of capitalism and market justice. The term “social justice” was invented in the 19th century by the critics of capitalism to describe the “good society” (Kristol, 1978). According to the principle of **social justice**, the equitable distribution of health care is a societal responsibility, which is best achieved by letting the government take over the production and distribution of health care. Social justice regards health care as a social good rather than an economic good that should be collectively financed and available to all

citizens regardless of the individual recipient’s ability to pay. The main characteristics and implications of social justice are summarized in Table 2-5.

Canadians and Europeans long ago reached a broad consensus that health care is a social good (Reinhardt, 1994). Public health also has a social justice orientation (Turnock, 1997). Under the social justice system, inability to obtain medical services because of a lack of financial resources is considered inequitable. Accordingly, a just distribution of health care must be based on need, not simply on the individual’s ability to purchase such care in the marketplace (demand). Need for health care is determined either by the patient or by a health professional.

The principle of social justice is also based on certain assumptions:

- Health care is different from most other goods and services. Health-seeking behavior is governed primarily by need rather than by ability to pay.
- Responsibility for health is shared. Individuals are not held completely responsible for their condition because factors outside their control may have brought on the condition. Society is held responsible because individuals cannot control certain environmental factors, such as economic inequalities, unemployment, or unsanitary conditions.
- Society has an obligation to the collective good. The well-being of the community is superior to that of the individual. An unhealthy individual is a burden on society. A person carrying a deadly infection, for example, is a threat to society. Society, therefore, is obligated to cure the problem by providing health care to the individual. By doing so, the whole society will benefit.

TABLE 2-5 Comparison of Market Justice and Social Justice

Market Justice	Social Justice
<i>Characteristics</i>	
<ul style="list-style-type: none"> Views health care as an economic good 	<ul style="list-style-type: none"> Views health care as a social resource
<ul style="list-style-type: none"> Assumes free-market conditions for health services delivery 	<ul style="list-style-type: none"> Requires active government involvement in health services delivery
<ul style="list-style-type: none"> Assumes that markets are more efficient in allocating health resources equitably 	<ul style="list-style-type: none"> Assumes that the government is more efficient in allocating health resources equitably
<ul style="list-style-type: none"> Production and distribution of health care determined by market-based demand 	<ul style="list-style-type: none"> Medical resource allocation determined by central planning
<ul style="list-style-type: none"> Medical care distribution based on people's ability to pay 	<ul style="list-style-type: none"> Ability to pay is inconsequential for receiving medical care
<ul style="list-style-type: none"> Access to medical care viewed as an economic reward of personal effort and achievement 	<ul style="list-style-type: none"> Equal access to medical services viewed as a basic right
<i>Implications</i>	
<ul style="list-style-type: none"> Individual responsibility for health 	<ul style="list-style-type: none"> Collective responsibility for health
<ul style="list-style-type: none"> Benefits based on individual purchasing power 	<ul style="list-style-type: none"> Everyone is entitled to a basic package of benefits
<ul style="list-style-type: none"> Limited obligation to the collective good 	<ul style="list-style-type: none"> Strong obligation to the collective good
<ul style="list-style-type: none"> Emphasis on individual well-being 	<ul style="list-style-type: none"> Community well-being supersedes that of the individual
<ul style="list-style-type: none"> Private solutions to social problems 	<ul style="list-style-type: none"> Public solutions to social problems
<ul style="list-style-type: none"> Rationing based on ability to pay 	<ul style="list-style-type: none"> Planned rationing of health care

- The government, not the market, can better decide through central planning how much health care to produce and how to distribute it to all citizens.

Just as true market justice does not exist in health care, so true social justice also does not exist. In the real world, no society can afford to provide unlimited

amounts of health care to all its citizens (Feldstein, 1994). The government may offer insurance coverage to all, but must also find ways to limit the availability of certain health care services. For example, under the social justice principle, the government decides how technology will be dispersed and who will be allowed access to certain types of costly high-tech services, even though basic services may be available to all. The government engages in **supply-side rationing**, which is also referred to as **planned rationing**, or nonprice rationing. In social justice systems, the government uses “health planning” to limit the supply of health care services, although the limited resources are often more equally dispersed throughout the country than is generally the case under a market justice system. The necessity of rationing health care explains why citizens of a country can be given universal coverage but not universal access. Even when a covered individual has a medical need, depending on the nature of health services required, he or she may have to wait until services become available.

Justice in the U.S. Health Delivery System

In a quasi-perfect or imperfect market, such as the market for health care delivery in the United States, elements of both the market and social justice principles exist. In some areas, the principles of market and social justice complement each other. In other areas, the two present conflicts.

The two contrasting principles complement each other in the employer-based health insurance available to most

middle-class working Americans (market justice) and the publicly financed Medicare, Medicaid, and CHIP coverage for certain disadvantaged groups (social justice). Insured populations access health care services delivered mainly by private practitioners and private institutions (market justice). Tax-supported county and city hospitals, public health clinics, and community health centers can be accessed by the uninsured in areas where such services are available (social justice).

Market and social justice principles create conflicts when health care resources are not uniformly distributed throughout the United States, and when there is a general shortage of primary care physicians (an issue discussed in the *Health Services Professionals* chapter). Consequently, in spite of having public insurance, many Medicaid-covered patients have difficulty obtaining timely access, particularly in rural and inner-city areas. This conflict is partly created by artificially low reimbursement from public programs; in comparison, reimbursement from private payers is more generous.

Limitations of Market Justice

The principles of market justice work well for allocating economic goods when their unequal distribution does not affect the larger society. For example, based on individual success, people live in different sizes and styles of homes, drive different types of automobiles, and spend their money on a variety of things. In other cases, the allocation of resources has wider repercussions for society. In these areas, market justice has severe limitations:

- Market justice principles fail to rectify critical human concerns. Pervasive social problems, such as crime, illiteracy, and homelessness, can significantly weaken the cohesion of a society. Indeed, the United States has recognized such issues and instituted programs based on the social justice principle to combat such problems. These programs have added police protection, publicly supported education, and subsidized housing for many poor and elderly populations. Health care is an important social issue because it not only affects human productivity and achievement but also provides basic human dignity.
- Market justice does not always protect a society. Individual health issues can have negative consequences for society because ill health is not always confined to the individual. The AIDS epidemic is an example of how a society can be put at serious risk by illness originally affecting just a few subpopulations. The initial spread of the SARS epidemic in Beijing, China, was largely due to patients with SARS symptoms being turned away by hospitals because they were not able to pay in advance for the cost of the treatment. Similar to clean air and water, health care is a social concern that, in the long run, protects against the burden of preventable disease and disability—a burden that is ultimately borne by society at large.
- Market justice does not work well in health care delivery. On the one hand, a growing national economy and prosperity in the past did not materially reduce the number of uninsured Americans. On the other hand,

the number of uninsured increases during economic downturns. For example, during the 2007–2009 recession, 5 million Americans lost employment-based health insurance (Holahan, 2011).

▶ Integration of Individual and Population Health

It has been recognized that the typical emphasis on the treatment of acute illness in hospitals, biomedical research, and high technology has not significantly improved the population's health. Instead, the medical model should be integrated with a disease-prevention, health-promotion, primary care–based model to produce significant gains in health. Society will always need the benefits of modern science and technology for the treatment of disease, but health promotion and primary care can prevent and delay the onset of many diseases, disability, and premature death. An integrated approach will improve the overall health of the population, enhance people's quality of life, and conserve health care resources.

The real challenge for the health care delivery system is incorporating the medical and wellness models within the holistic context of health. For instance, the Ottawa Charter for Health Promotion mentions caring, holism, and ecology as essential issues in developing strategies for health promotion (de Leeuw, 1989). “Holism” and “ecology” refer to the complex relationships that exist among (1) the individual; (2) the health care delivery system;

and (3) the physical, social, cultural, and economic environmental factors. In addition, as noted by an increasing body of research, the spiritual dimension must be incorporated into the integrated model.

Another equally important challenge for the health care delivery system is focusing on both individual and population health outcomes. The nature of health is complex, and the interrelationships among the physical, mental, social, and spiritual dimensions are not well understood. Translating this multidimensional framework of health into specific actions that are efficiently configured to achieve better individual and community health is one of the greatest challenges that today's health care systems face.

For an integrated approach to become reality, the best American ingenuity must be applied in addressing health-spending reductions and coordination of services among public health agencies, hospitals, and other health care providers. Community hospitals, in particular, are increasingly held accountable for the health status of the communities in which they are located. To fulfill this mission, hospitals must first conduct a health assessment of their communities. Such assessments provide broad perspectives of the local population's health and point to specific needs that health care providers can address. These assessments can help pinpoint interventions that should be given priority to improve the population's health status or address critical issues pertaining to certain subgroups within the population.

Healthy People Initiatives

Since 1980, the United States has undertaken 10-year plans outlining certain key

national health objectives to be accomplished during each of the 10-year periods. The objectives are developed by a consortium of national and state organizations under the leadership of the U.S. Surgeon General. The first of these programs, with objectives for 1990, provided national goals for reducing premature deaths among all age groups and for reducing the average number of days of illness among persons older than age 65. A final review of this program concluded that positive changes in premature deaths had been achieved for all age categories except adolescents, but that illness among the elderly had not been reduced. However, the review set the stage to develop and modify the goals and objectives for the subsequent 10-year program (Chrvala and Bulger, 1999).

Healthy People 2000: National Health Promotion and Disease Prevention Objectives identified three main goals to be reached by the year 2000: (1) increase the span of healthy life for Americans; (2) reduce health disparities and wasteful care; and (3) promote individual responsibility and accountability for one's health as well as improved access to basic services. In a broad sense, these services include medical care, preventive services, health promotion, and social policy to improve education, lifestyle, employment, and housing (**FIGURE 2-4**). According to the final review, the major accomplishments of *Healthy People 2000* included surpassing the targets for reducing deaths from coronary heart disease and cancer; meeting the targets for mammography exams, violent deaths, tobacco-related deaths, and incidence rates of AIDS and syphilis; nearly meeting the targets for infant mortality and number of children

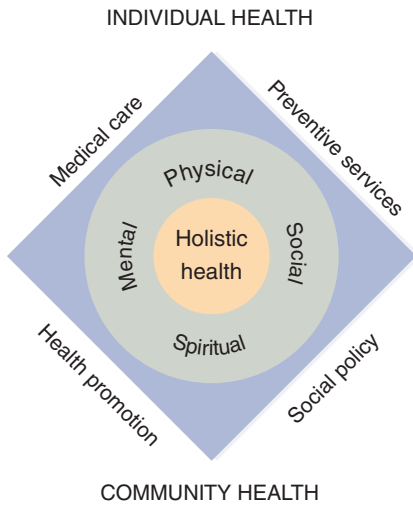


FIGURE 2-4 Integrated model for holistic health.

with elevated levels of lead in their blood; and making some progress toward reducing health disparities among special populations.

The Ottawa Charter has proposed achieving health objectives through social public policy and community action. An integrated approach also necessitates creation of a new model for training health care professionals that forms partnerships with the community (Henry, 1993). The following paragraphs describe examples of community partnerships reflected in community health assessments and *Healthy People* initiatives. **Community health assessment** is a method used to conduct broad assessments of populations at a local or state level. To integrate individual and community health, the assessment is best conducted through collaboration with community members and local authorities (DHHS, 1992).

Healthy People 2010: Healthy People in Healthy Communities continued the earlier tradition as an instrument to improve the health of the American people in the

first decade of the 21st century. It focused on two broad goals: (1) to increase quality and years of healthy life; and (2) to eliminate health disparities. It went a step beyond the previous initiatives by emphasizing the role of community partners (businesses, local governments, and civic, professional, and religious organizations) as effective agents for improving health in their local communities (DHHS, 1998). The final report revealed that 23% of the targets were met or exceeded and that the nation had made progress toward 48% of the targets. Specifically, life expectancy at birth, expected years in good or better health, and expected years free of activity limitations all improved, though expected years free of selected chronic diseases decreased. While many of the targets have been met or are in progress, the goal of reducing health disparities has not been achieved. Health disparities identified in approximately 80% of the objectives have not changed, and they even increased in another 13% of the objectives (NCHS, 2012). Hence, challenges remain in the reduction of chronic conditions and health disparities among population groups.

Healthy People 2020

Launched in 2010, *Healthy People 2020* (DHHS, 2010b) has a fivefold mission: (1) identify nationwide health improvement priorities; (2) increase public awareness and understanding of the determinants of health, disease, and disability and the opportunities for progress; (3) provide measurable objectives and goals that can be used at the national, state, and local levels; (4) engage multiple sectors to take actions that are driven by the best available evidence and knowledge; and (5) identify critical research

and data collection needs. This initiative also has four overarching goals:

- Attain high-quality and longer lives free of preventable disease, disability, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve the health of all groups.
- Create social and physical environments that promote good health for all.
- Promote quality of life, healthy development, and healthy behaviors across all life stages.

These overarching goals are in line with the tradition of earlier *Healthy People* initiatives but place particular emphasis on the determinants of health.

FIGURE 2-5 illustrates the action model to achieve the *Healthy People 2020* overarching goals. This model illustrates that

interventions (i.e., policies, programs, information) influence the determinants of health at four levels and lead to improvements in outcomes: (1) individual; (2) social, family, and community; (3) living and working conditions; and (4) broad social, economic, cultural, health, and environmental conditions. Results are to be demonstrated through assessment, monitoring, and evaluation, and the dissemination of findings will provide feedback for future interventions.

Healthy People 2020 differs from previous *Healthy People* initiatives in that it includes multiple new topic areas to its objectives list, such as adolescent health, genomics, global health, health communication and health information technology, and social determinants of health. *Healthy People 2020* has 42 topic areas, with 13 new areas (**TABLE 2-6**).

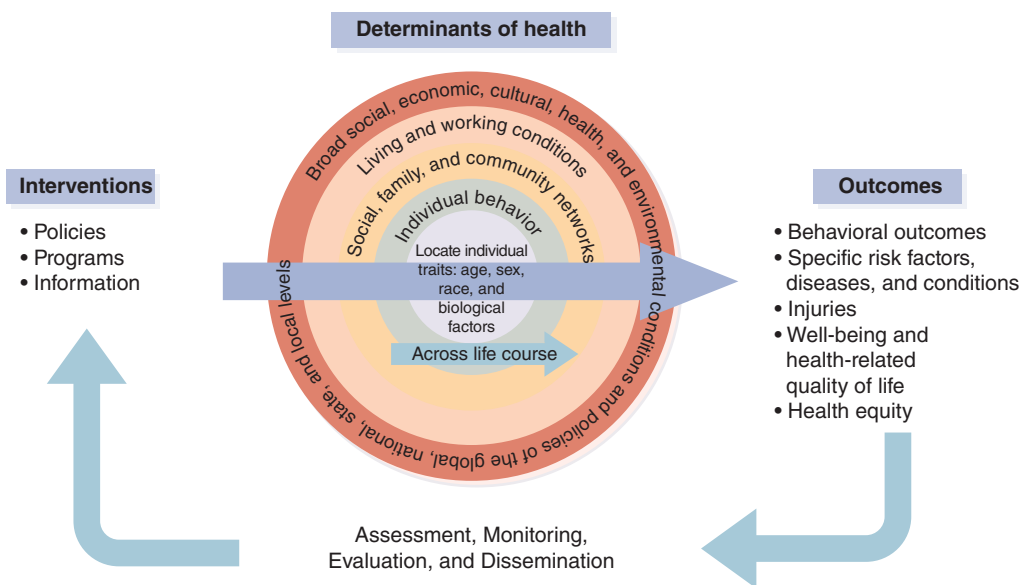


FIGURE 2-5 Action model to achieve U.S. *Healthy People 2020* overarching goals.

Courtesy of Department of Health and Human Services (DHHS). 2008. *The Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020. 2008. Phase I report: Recommendations for the framework and format of Healthy People 2020. Section IV. Advisory Committee findings and recommendations.* Available at: <http://www.healthypeople.gov/2010/hp2020/advisory/phasei/sec4.htm>. Accessed April 2017.

TABLE 2-6 *Healthy People 2020* Topic Areas

1. Access to health services	22. HIV
2. Adolescent health ¹	23. Immunization and infectious diseases
3. Arthritis, osteoporosis, and chronic back conditions	24. Injury and violence prevention
4. Blood disorders and blood safety ¹	25. Lesbian, gay, bisexual, and transgender health ¹
5. Cancer	26. Maternal, infant, and child health
6. Chronic kidney disease	27. Medical product safety
7. Dementias, including Alzheimer's disease ¹	28. Mental health and mental disorders
8. Diabetes	29. Nutrition and weight status
9. Disability and health	30. Occupational safety and health
10. Early and middle childhood ¹	31. Older adults ¹
11. Educational and community-based programs	32. Oral health
12. Environmental health	33. Physical activity
13. Family planning	34. Preparedness ¹
14. Food safety	35. Public health infrastructure
15. Genomics ¹	36. Respiratory diseases
16. Global health ¹	37. Sexually transmitted diseases
17. Health communication and health information technology	38. Sleep health ¹
18. Health care-associated infections ¹	39. Social determinants of health ¹
19. Health-related quality of life and well-being ¹	40. Substance abuse
20. Hearing and other sensory or communication disorders	41. Tobacco use
21. Heart disease and stroke	42. Vision

¹New topic area.

Measurement of *Healthy People 2020*

Healthy People 2020 establishes four foundational health measures to monitor progress toward achieving its goals. The foundational health measures include general health status, health-related quality of life and well-being, determinants of health, and disparities. Measures of general health status include life expectancy, healthy life expectancy, years of potential life lost, physically and mentally unhealthy days, self-assessed health status, limitations of activity, and chronic disease prevalence. Measures of health-related quality of life and well-being include physical, mental, and social health-related quality of life, well-being/satisfaction, and participation in common activities. *Healthy People 2020* defines determinants of health as “a range of personal, social, economic, and environmental factors that influence health status. Determinants of health include such things as biology, genetics, individual behavior, access to health services, and the environment in which people are born, live, learn, play, work, and age.” Measures of disparities and inequity include differences in health status based on race/ethnicity, gender, physical and mental ability, and geography (DHHS, 2010b).

Global health is also an important topic area in *Healthy People 2020*. The measurement of global health focuses on two aspects: (1) measuring the reduction of global diseases in the United States, including malaria and tuberculosis (TB); and (2) measuring “global capacity in support of the International Health

Regulations to detect and contain emerging health threats” (DHHS, 2010b). The indicators include the number of global disease detection (GDD) regional centers worldwide, the number of public health professionals trained by GDD programs worldwide, the number of public health professionals trained by GDD programs worldwide, and the number of diagnostic tests established or improved by GDD programs (DHHS, 2010b).

Achievement of *Healthy People 2020*

Ongoing review has focused on how well the health care system is working toward achieving its delineated goals (*Healthy People 2020*, 2014). The findings of these ongoing studies are compared to the baseline data from the beginning of the 10-year period to determine whether adequate progress has occurred.

In total, *Healthy People 2020* contains 42 topic areas with more than 1,200 objectives. A subset of 26 of the objectives, known as the leading health indicators (LHI), is used to track the progress of the initiative and communicate high-priority health issues. Of the 26 LHIs, 4 indicators have met or exceeded their *Healthy People 2020* targets, 10 show improvement, 8 show little or undetectable change, and 3 are getting worse. One indicator has only baseline data available.

To date, indicators for access to health services show little change in this area. Although the proportion of people with medical insurance increased under the ACA, the target of 100% has not been reached. Similarly, access to a usual-care

provider has increased but has not met *Healthy People 2020*'s target.

Many of the LHIs for clinical preventive services show improvement. The percentage of adults receiving colorectal cancer screenings, adults with hypertension whose blood pressure is controlled, and children receiving recommended vaccines have all increased significantly, moving toward the *Healthy People 2020* target (Egan et al., 2014). In contrast, the rate of adults with diabetes who also have poor glycemic control has not shown any significant improvement.

Some environmental quality indicators have not only met their *Healthy People 2020* goals, but actually exceeded them. The Air Quality Index, which assesses changes in air quality by number and severity of unhealthy days, met its goal. Likewise, the goal for reducing the percentage of children exposed to second-hand smoke has been achieved.

So far, the LHIs for injury and violence show positive progress. Injury deaths have decreased by 43% and the homicide rate has declined by 13%, both of which meet the *Healthy People 2020* targets.

Maternal and child health LHIs are significantly improving, with infant deaths and total preterm live births almost achieving their *Healthy People 2020* targets. Conversely, the LHIs for mental health appear to be significantly worse than those measures at baseline. The suicide rate has increased by 7%, and the percentage of adolescents with major depressive episodes has increased by almost 10%.

The LHIs for nutrition, physical activity, and obesity mostly show little or no detectable change. Rates of obesity among adults, children, and adolescents have all increased between 4% and 5%, although

these changes are not statistically significant. Intake of vegetables remains stagnant. In a promising development, the percentage of adults meeting the federal physical activity guidelines has increased by 13%, exceeding the *Healthy People 2020* target.

In the area of oral health, the LHI is moving away from the target, showing a 6% decrease in the percentage of children, adolescents, and adults who had a dental visit in the past year. In contrast, the LHIs for reproductive and sexual health and social determinants show some progress toward the *Healthy People 2020* goals. Substance abuse indicators are mixed. While the number of adolescents using alcohol or illicit drugs has decreased, the prevalence of binge drinking among adults shows no change. The prevalence of adolescent cigarette smoking has slightly decreased, with the overall cigarette smoking rate showing an even larger decrease of approximately 12%.

► Summary

The delivery of health care is primarily driven by the medical model, which emphasizes illness rather than wellness. Holistic concepts of health, along with the integration of medical care with preventive and health promotional efforts, need to be adopted to significantly improve the health of Americans. Such an approach would require individuals to take responsibility for their own health-oriented behaviors, as well as the establishment of community partnerships to improve both personal and community health. Understanding the determinants of health, providing health education,

utilizing community health assessment, and promoting national initiatives, such as *Healthy People*, are essential to accomplish these goals. *Healthy People 2020*, launched in 2010, continues its goals of improving health and eliminating health disparities in the United States. Public health has drawn increased attention in recent times because of the growing recognition of its role in health protection, environmental health, and preparedness for natural disasters and bioterrorism. Moreover, public health has now become global in its scope.

Programs to address the various facets of health and its determinants, and ongoing initiatives in the areas of prevention, health promotion, health protection, and equality, are complex undertakings and require substantial financial resources. Objective measures play a critical role both in

evaluating the success of various programs and in directing future planning activities.

The broad concern of achieving equitable access to health services can be addressed by considering the contrasting theories of market justice and social justice. Countries offering universal coverage have adopted the principles of social justice, under which the government finances health care services and decides on the distribution of those services. However, because no country can afford to provide unlimited amounts of health care to all citizens, supply-side rationing becomes inevitable in such a system. Many of the characteristics of the U.S. health care system trace back to the beliefs and values underlying the American culture. Under market justice, not all citizens have health insurance coverage, a phenomenon called demand-side rationing.

► Test Your Understanding

Terminology

activities of daily living (ADLs)	health determinants	planned rationing
acute condition	health risk appraisal	population at risk
agent	holistic health	prevalence
bioterrorism	holistic medicine	primary prevention
cases	host	public health
chronic condition	iatrogenic illnesses	quality of life
community health assessment	immigration	risk factors
crude rates	incidence	secondary prevention
demand-side rationing	instrumental activities of daily living (IADLs)	social contacts
emigration	life expectancy	social justice
environment	market justice	social resources
environmental health	medical model	subacute condition
epidemic	migration	supply-side rationing
fertility	morbidity	surge capacity
health care	mortality	tertiary prevention
	natality	utilization

Review Questions

1. What is the role of health risk appraisal in health promotion and disease prevention?
2. Health promotion and disease prevention may require both behavioral modification and therapeutic intervention. Discuss.
3. Discuss the definitions of health presented in this chapter in terms of their implications for the health care delivery system.
4. What are the main objectives of public health?
5. Discuss the significance of an individual's quality of life from the health care delivery perspective.
6. Which "preparedness"-related measures have been taken to cope with potential natural and human-made disasters since the tragic events of 9/11? Assess their effectiveness.
7. The Blum model points to four key determinants of health. Discuss their implications for health care delivery.
8. What has been the main cause of the dichotomy between the way physical and mental health issues have traditionally been addressed by the health care delivery system?
9. Discuss the main cultural beliefs and values in American society that have influenced health care delivery, including how they have shaped the health care delivery system.
10. Briefly describe the concepts of market justice and social justice. In which ways do the two principles complement each other, and in which ways are they in conflict in the U.S. system of health care delivery?
11. Describe how health care is rationed in the market justice and social justice systems.
12. To what extent do you think the objectives set forth in *Healthy People* initiatives can achieve the vision of an integrated approach to health care delivery in the United States?
13. What are the major differences between *Healthy People 2020* and the previous *Healthy People* initiatives?
14. How can health care administrators and policymakers use the various measures of health status and service utilization? Please use examples to illustrate your answer.
15. Using the data given in the table:
 - a. Compute crude birth rates for 2005 and 2010.
 - b. Compute crude death rates for 2005 and 2010.
 - c. Compute cancer mortality rates for 2005 and 2010.
 - d. Answer the following questions:
 - i. Did the infant death rates improve between 2005 and 2010?
 - ii. Which conclusions can you draw about the demographic change in this population?
 - iii. Have efforts to prevent death from heart disease been successful in this population?

Population	2005	2010
Total	248,710	262,755
Male	121,239	128,314
Female	127,471	134,441
Whites	208,704	218,086
Blacks	30,483	33,141
Number of live births	4,250	3,840
Number of infant deaths (birth to 1 year)	39	35
Number of total deaths	1,294	1,324
Deaths from heart disease	378	363
Deaths from cancer	336	342

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