SECTION

I

Overview

Introduction

Above all else in life, the maintenance of health may be the one universal value. Being healthy means being free of disease and having the resources to take active measures to fortify the body against the onset of both chronic and infectious diseases—this level of prevention also provides people with a vitality that leads to productive and satisfying lives. Unfortunately, many societies (including the United States) broadly support recovery from chronic and infectious diseases at the expense of the more complicated task of preventing these problems in the first place. The ethic of placing prevention on the "pedestal of medicine" is a largely unrealized vision. A more practical vision is known as "upstream thinking," which implies that preventing the onset of disease or injury is the greatest priority in public health. The concept of upstream thinking implies that nations should prioritize prevention over treatment.

Upstream thinking is not always an easy paradigm. It demands an understanding of why people place themselves at risk of disease and why they adopt health-protective behaviors. It also demands an understanding of how people manage to successfully adopt health-protective behaviors, especially those behaviors requiring daily repetition. Fortunately, a vast range of theory can be used to traverse the challenges of upstream thinking. Modern theory spans a range from those that locate the behavior and change efforts strictly at the individual level to theories suggesting that behavior is a product of multiple environmental influences.

All theories are ultimately useful in the larger process of changing health-risk behaviors. This process, however, is far more involved than one might first imagine. A central starting point is to empirically identify determinants of health-risk and health-protective behaviors. Determinants that are potentially modifiable can then be conceived as hypothesized mediators of behavior change. Theory can be used to define specific objectives meant to alter these hypothesized mediators in a way that leads to effective behavior change for large numbers of people. The wise selection of theory is,

of course, vital, because the process just described is one that can easily go wrong if program objectives are ill-conceived because of a theory that poorly matches the identified health promotion challenge at hand.

In the first two chapters of the textbook, you will learn much more about the concept of upstream thinking, particularly with respect to the concepts of primary prevention and universal care. Some of what you learn may challenge current beliefs you hold regarding health and medical care, and may even challenge the concept that apparently simple health behaviors may be influenced by a complex web of ecological factors. We suggest that any challenges to your current belief systems be embraced, as this is the first and most critical stage of your growth as a health promotion professional. Further, we suggest that you diligently learn the basic vocabulary of health promotion as shown by the bolded terms in these two chapters. You will soon become proficient at using terms such as construct, proximal influence, distal influence, and multilevel intervention.

We also implore you to study Chapter 3 quite carefully. This chapter will provide you with a widely used framework that is useful for conceptualizing the entire process of planning a health promotion program. As you study Chapter 3, please bear in mind that theory application and program planning are not synonymous. Think of theory application as a subset of program planning. Program planning is a larger concept simply because it includes elements related to problem assessment, goal setting, and evaluation. Chapter 3 introduces a long-standing and highly practical approach known as the PRECEDE–PROCEED Model. For several decades, this planning model has served public health effectively through its ability to achieve targeted and judicious use of resources and health promotion efforts.

An important caveat is warranted before you begin reading these three chapters: public health practice is an activity rather than a specific discipline. This statement reflects the growing tendency of public health practice to implicate a spectrum of likely intervention points for any given health behavior. Thus, public health efforts span a continuum ranging from media-based health communication programs to making products accessible (e.g., condoms, low-fat foods, bicycle helmets, exercise facilities). The continuum spans further to include changes to public policy and laws. It will become apparent that people from numerous professional backgrounds are needed to promote conditions favoring widespread and long-term adoption of health-protective behaviors.

The question you may then ask is, "What holds all of these various professionals together in a unified effort to promote health in an upstream thinking paradigm?" To this question, we respectfully suggest that the concepts you will learn about in the entire textbook represent a type of shared wisdom that indeed defines the work of health promotion. Your dedication to these chapters will have an important influence on your ability to protect the health of the public through prevention of disease and conditions that would otherwise limit the quality and longevity of people's lives.

CHAPTER

1

Health Behavior in the Context of the "New" Public Health

Laura F. Salazar, Richard A. Crosby, and Ralph J. DiClemente

"The health of the people is really the foundation upon which all their happiness and all their powers as a state depend."
— **BENJAMIN DISRAELI, BRITISH POLITICIAN (1804–1881)**

PREVIEW

Unhealthy behaviors contribute to the leading causes of early mortality. As such, if health promotion efforts can prevent people from engaging in many of these behaviors, then health promotion can make a significant impact on rates of early mortality and morbidity. Using a wide range of theories in its endeavors, health promotion seeks to change environments, settings, and individuals so that optimal health can be achieved.

OBJECTIVES

1. Compare and contrast the three levels of prevention.
2. Understand the different types of health behaviors.
3. Define health promotion and understand the multidisciplinary nature of health promotion.
4. Understand the importance of multiple theories in health promotion efforts.
5. Understand that health behavior is highly influenced by the physical, economic, legal, and social environments that define people's daily existence; thus, a broad range of theoretical approaches provides increased assurance of leveraging change.

Introduction

Without question, health should be the most valuable thing in a person's life. An old Arabic proverb states, "He who has health, has hope; and he who has hope, has everything." But what, exactly, is health? Some would argue that health is simply the absence of disease. According to the World Health Organization (WHO), health is not merely the absence of disease or infirmity; rather, **health** should encompass a state of complete physical, mental, and social well-being. Expanding on this definition at a seminal conference in Ottawa, Ontario, Canada, WHO reconceptualized health, in that it should be defined from an ecological perspective to encompass the "extent to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs; and, on the other hand, to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living; it is a positive concept emphasizing social and personal resources, as well as physical capacities" (World Health Organization [WHO], 1986). Using these definitions, health would seem to transcend an individual's state of physical being at any given moment to also include their *ability* to optimize their health and the availability or lack of environmental resources that enable them in doing so. Thus, to embrace these definitions of health requires perhaps a paradigm shift in terms of conceptualizing what health is, what the determinants of health are, and most importantly how to promote health. A basic premise of *Health Behavior Theory for Public Health: Principles, Foundations, and Applications* is that, as Benjamin Disraeli so succinctly stated, an important goal for any nation is the health of its people, but we advocate that the means to this end lie in adopting strategies that modify environments and settings while also targeting the many individual factors that contribute.

Health is not merely the absence of disease or infirmity; rather, health should encompass a state of complete physical, mental, and social well-being.

At the turn of the 20th century (see **Figure 1-1**), the top three causes of death were attributed to infectious disease agents that caused pneumonia, tuberculosis, diarrhea, and enteritis (Centers for Disease Control and Prevention [CDC], 1999). Early public health efforts were very successful in implementing important new biomedical advances (e.g., vaccinations and antibiotics) and developing public health programs that remedied many types of infectious diseases (e.g., water sanitation to reduce cholera), eradicated some diseases (e.g., smallpox), and mitigated many afflictions. However, as the incidence of these diseases decreased, chronic diseases (e.g., cardiovascular disease, diabetes, and cancer) flourished.

Toward the end of the 21st century, individual lifestyle **behaviors**, such as smoking, poor diet and exercise, alcohol consumption, and the use of illicit drugs, were primary contributors to the six leading causes of death (Mokdad, Marks, Stroup, Gerberding, 2004). These behaviors are deemed "lifestyle behaviors" because they take place within the context of individuals' everyday lives. These specific lifestyle behaviors have been cited as **actual causes** of death because they have been linked directly to the top five chronic diseases: heart disease, cancer, cerebrovascular disease, respiratory diseases, and diabetes (McGinnis & Foege, 1993; Mokdad et al., 2004).

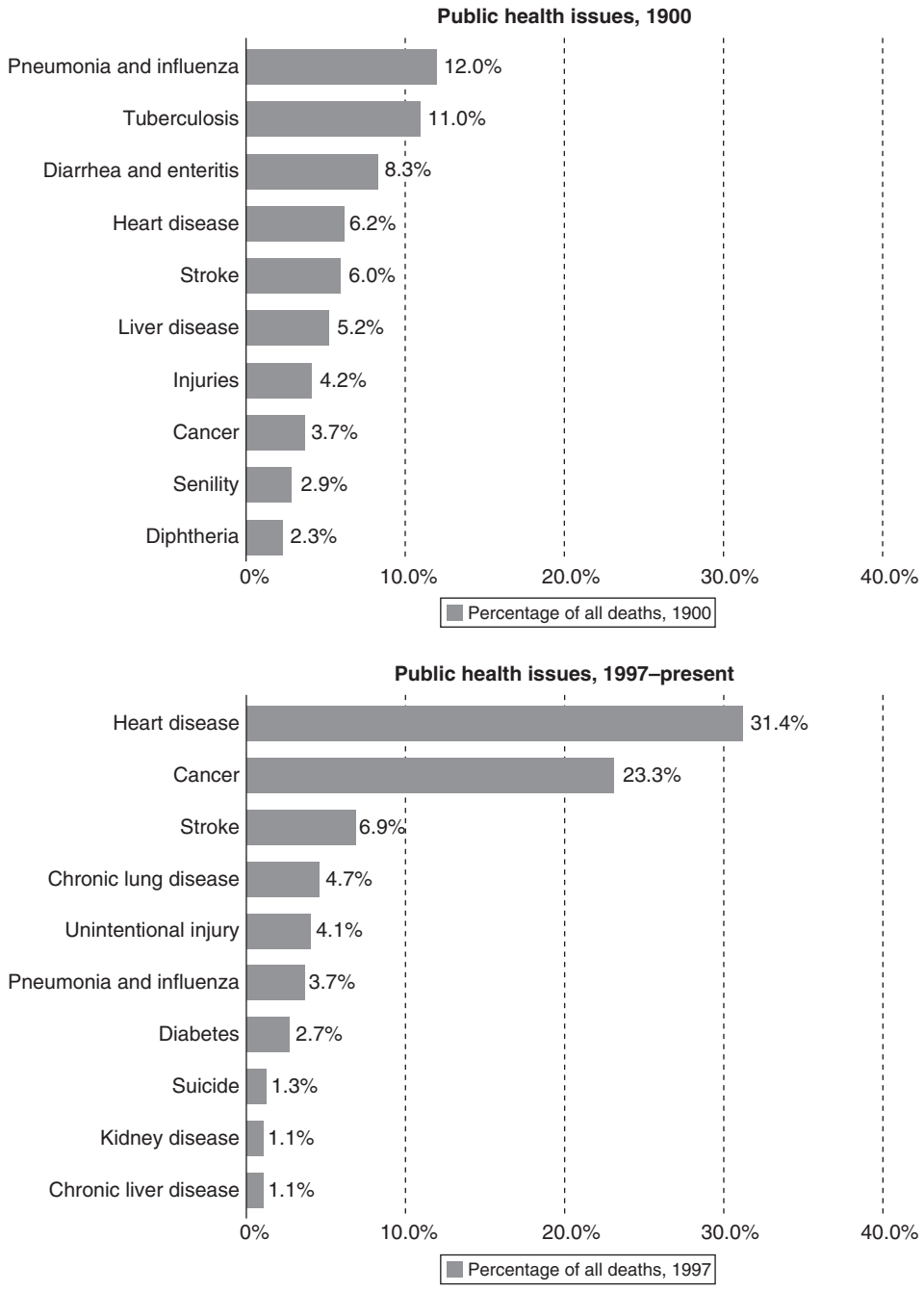


FIGURE 1-1 The 10 leading causes of death, as a percentage of all deaths—United States, 1900, 1997. *Source:* Centers for Disease Control and Prevention, National Center for Health Statistics. Achievements in Public Health, 1900–1999: Control of infectious diseases, 1900–1999. *Morbidity & Mortality Weekly Report, 48,* 621–629.

Clearly, a person who contracts an infectious disease such as cholera, pneumonia, or tuberculosis would most likely hold the perception that they were not healthy; however, it may not be as clear to people who smoke, eat high-fat foods, do not exercise, consume too much alcohol, or use illicit drugs that they are *unhealthy.* They may hold an inaccurate perception of their health, which is most likely due to the *hidden* contribution of engaging in unhealthy lifestyle behaviors to the development of **chronic diseases**, rather than the more noticeable **infectious** or **communicable diseases**.

Chronic diseases manifest over time, are not always apparent, and may be long-lasting or recurring. In **Table 1-1**, we list various chronic diseases that may result from engaging in several unhealthy lifestyle behaviors and are linked to the leading causes of death in the United States. In viewing the associated disease outcomes, you may surmise that many people are unaware that these diseases are significantly linked to these unhealthy behaviors. Although there is no definitive answer as to exactly how many years of unhealthy lifestyle behavior it takes to develop some of these chronic diseases, it is generally agreed that it does take time. Thus, it is understandable why so many people engaging in these lifestyle behaviors may not perceive themselves at risk for disease in the same way as a person who was recently exposed to someone coughing on an airplane or who may have worked in an environment that was harmful (e.g., manufacturing of asbestos textiles).

If the consummate goal is to ensure the health of the people, then individual perceptions of health or what constitutes "unhealthy" may exert some influence on whether appropriate action is taken by society or by the individual. This book emphasizes that public health initiatives to combat both chronic and infectious diseases and improve the health of the public should be multidimensional—that is, it should target individuals, systems, and political structures to affect the underlying health behaviors. This emphasis on the significant role of environmental influences in shaping individual behavior and affecting health is the driving force behind a "new" public health.

Public health initiatives to combat both chronic and infectious diseases and improve the health of the public should be multidimensional—that is, it should target individuals, systems, and political structures to affect the underlying health behaviors.

This chapter provides an overview of the importance of health behavior (i.e., reducing unhealthy behaviors while also promoting healthy ones) in achieving optimal health. We describe how the best approach emphasizes prevention and targets settings where behavior takes place. You have most likely heard the famous adage attributed to Benjamin Franklin: "An ounce of prevention is worth a pound of cure." He believed that it is wiser and more cost-effective to try and prevent a disease from manifesting rather than to treat it. Public health, in general, embraces this adage; its mission is **prophylaxis**, or prevention, of early **mortality**, **morbidity**, and associated negative health outcomes. Changing or modifying health behaviors that are associated with morbidity and early mortality is considered one aspect of a prevention approach. Because health behaviors can contribute significantly to early mortality and morbidity, understanding and changing health behavior and the surrounding conditions that influence behavior are critical to achieving public health's mission.

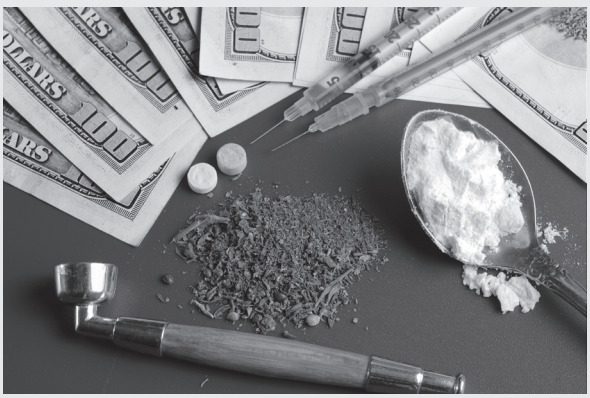
Table 1-1 Chronic Diseases Associated with Unhealthy Lifestyle Behaviors

SMOKING: Acute myeloid leukemia; cancers of the cervix, kidney, bladder, esophagus, larynx, lung, mouth, pancreas and stomach; abdominal aortic aneurysms; cataracts; periodontitis; and pneumonia; chronic lung disease; chronic heart and cardiovascular disease; osteoporosis; peptic ulcers; and reproductive problems.

HIGH-FAT DIET: Coronary heart disease, type 2 diabetes, cancers (endometrial, breast, and colon), hypertension (high blood pressure), dyslipidemia (e.g., high total cholesterol or high levels of triglycerides), stroke, liver and gallbladder disease, sleep apnea and respiratory problems, osteoarthritis (a degeneration of cartilage and its underlying bone within a joint), gynecological problems (abnormal menses, infertility)

ALCOHOL: Cardiovascular disease; liver disease; chronic pancreatitis; pancreatic, breast, liver, oral, colon, and throat cancers

ILLICIT DRUGS: Suicide, homicide, motor vehicle injury, HIV infection, pneumonia, violence, mental illness, and hepatitis



Source: Photos from top to bottom, © Photos.com, © Digital Vision/Photodisc/Thinkstock, © SunnyS/ShutterStock, Inc. © Vladimir V. Georgievskly/ShutterStock, Inc.

We also provide an overview of public health and describe the rationale for public health approaches that target whole populations rather than only those individuals at heightened risk. We articulate the role of health promotion in the context of public health and the basic principles and strategies used. We express that the field of public health is multidisciplinary and involves a process, rather than being a unified field, much like physics or chemistry. Finally, we highlight the role of theory in public health research and practice and the importance of choosing the proper framework.

Key Concepts

Why the Emphasis on Prevention?

Once one is afflicted with a disease, medical approaches must be used for treatment. Treatment can be very costly, not everyone has access to treatment, and furthermore, treatment is not always a panacea; treatment cannot "fix" many health issues (e.g., dead heart muscle tissue). In 2007, the United States spent $2.26 trillion on health care, or $7,439 per person (Centers for Medicaid and Medicare Services [CMS], 2009). As shown in **Figure 1-2**, the United States spends more on health care, both as a proportion of gross domestic product (GDP) and on a per capita basis, than any other nation in the world (WHO, 2009). Given the enormous price tag associated with U.S. healthcare costs, you would imagine that the United States should be getting what they pay for in terms of much lower early mortality and morbidity rates.

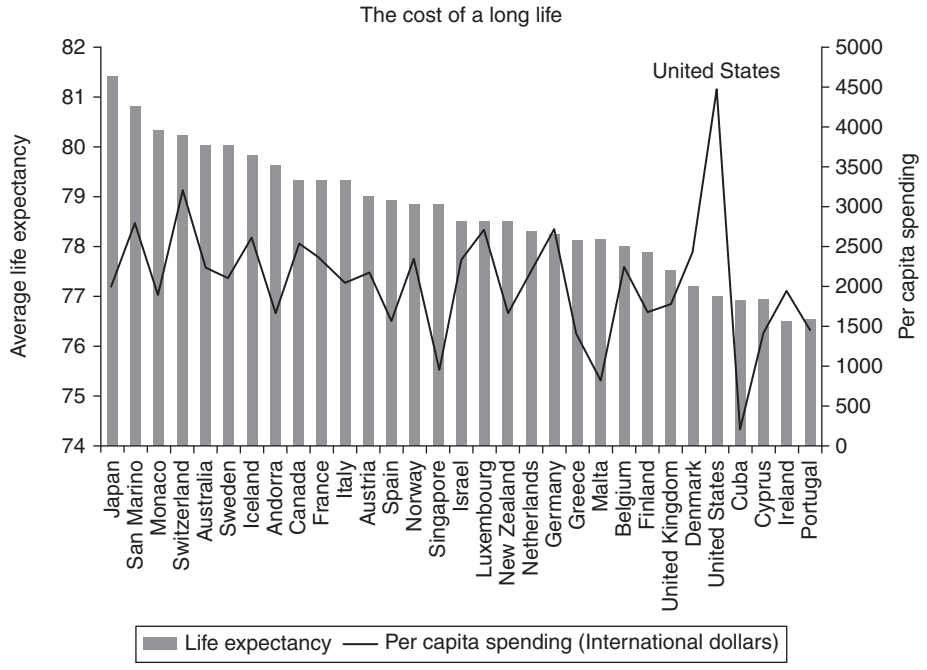


FIGURE 1-2 Per capita healthcare costs and life expectancy around the world. *Source:* UC Atlas of Global Inequality, http://ucatlas.ucsc.edu/spend.php, Health care spending.

Unfortunately, statistics do not support this assertion. In fact, the United States ranks 47th in terms of life expectancy, 9th in terms of cancer death rates, 13th in heart disease death rates, and *1st* in obesity rates (http://www.NationMaster.com). Despite its drastically smaller population size (approximately 300 million), the United States ranks with India (approximately 1.1 billion people) and China (approximately 1.3 billion people) in terms of number of estimated cases of diabetes.

Diabetes is an excellent example of a prime opportunity for improved population-based prevention. Type 2 diabetes is the most common form of diabetes and has been linked to obesity, inactivity, and genetic factors. Ignoring the genetic component (as this is largely not amenable to change), obesity is considered a **modifiable** risk factor as it can be changed. If the rate of obesity and inactivity among the population were somehow reduced significantly, a reduction in the prevalence of type 2 diabetes should be experienced as well, thereby reducing the associated mortality rate. Now consider that 1 out of every 5 U.S. federal healthcare dollars is spent *treating people with diabetes* (American Diabetes Association, 2008). If treating people with diabetes represents 20% of healthcare dollars spent, then a better approach may be to *prevent* diabetes rather than *treat* diabetes. Unfortunately, according to former U.S. Surgeon General Dr. David Satcher, of the total dollars spent on national health care in the year 1999, only 1% went to population-based prevention.

Some estimates suggest that the U.S. government spends $1,390 per person to treat disease, while spending only $1.21 per person on prevention. Although this represents an enormous imbalance in the amount of money spent on treatment versus prevention, the United States does make a concerted effort. To combat many of the lifestyle diseases afflicting its populace in the later part of the 20th century and to enhance the health of its people the United States created a national prevention agenda. The 1979 Surgeon General's Report on health promotion and disease prevention, *Healthy People,* outlined the tremendous gains made in combating infectious diseases in the earlier part of the 20th century, stating that "the health of the American people has never been better." However, he also stated that further improvements could be achieved through a "renewed national commitment to efforts designed to prevent disease and to promote health" (U.S. Department of Health, Education & Welfare, 1979, p. 3). *Healthy People* laid the foundation for a national prevention agenda that spanned a wide range of health goals focused on reducing early mortality and morbidity, such as a reduction in smoking, an increase in physical activity, and a reduction in injuries. Most important is that *Healthy People* as a policy signified that the United States must take responsibility for the health of its people. The agenda has since been updated and goals reexamined. The 1980 *Promoting Health/Preventing Disease: Objectives for the Nation* and *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* both established national health objectives and served as the basis for the development of state and community plans. Presently, *Healthy People 2020* has built on the work of the past three decades and has implemented a 10-year health promotion program with 4 overarching goals:

1. Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.
2. Achieve health equity, eliminate disparities, and improve the health of all groups.

3. Create social and physical environments that promote good health for all.
4. Promote quality of life, healthy development, and healthy behaviors across all life stages.

The focus is on different health areas (e.g., sexually transmitted diseases, substance abuse, tobacco use, diabetes, cancer, HIV), accompanied by 600 public health objectives and leading health indicators to measure the progress toward meeting its goals. The question remains, however, as to whether the U.S. government will balance the scales and devote enough funds toward prevention so that it can meet these goals.

Health Behavior Is Complex

The central question, irrespective of funding, is: How do we work toward achieving these prevention goals? Focusing on type 2 diabetes, specifically, how do we prevent people from becoming obese? How can we motivate people to adopt better dietary habits, lose weight, and exercise more? We may think that all we need to do is tell people that they are at risk and that making people aware of their risks will result in them changing their dietary and exercise behaviors. Unfortunately, changing behavior is not as simple as it seems. Persuading a person to change his or her habits is a major challenge indeed, especially when the behavior is viewed as enjoyable (e.g., eating a juicy hamburger) or when they may not have complete control (e.g., a child whose parent makes the decisions about food). The reality is that human behavior is complex and influenced by many factors; therefore, changing it requires a thorough understanding of the range of influences. For example, changing dietary habits such that whole foods (i.e., foods that are unrefined and unprocessed) compose the majority of the daily caloric intake implies understanding: (1) why people prefer processed foods, (2) what people do not like about whole foods, (3) the benefits that people perceive from consuming less processed foods, (4) the physical, economic, political, and social barriers that people perceive relative to the consumption of whole foods, (5) the barriers to stocking produce and other whole foods among grocery stores, and (6) the national and local policies that translate to the cost-prohibitiveness of providing whole foods.

Before we can change health behavior, we must understand the **determinants** of the behavior, the nature of the behavior, and the motivation for the behavior. Influencers of behavior can theoretically be infinitesimal and can include a range of factors, such as biological characteristics, personality characteristics, family, peers, the community, society, and the built environment. Moreover, the nature of health behaviors can vary along many dimensions. For example, some health behaviors may occur once in a lifetime (e.g., polio vaccine), some on a daily basis (e.g., diet, exercise), and some are conditional to the context (e.g., using a condom). Furthermore, motivation for engaging in a health behavior or to stop engaging in an unhealthy behavior will also be affected by numerous individual and environmental factors.

Before we can change health behavior, we must understand the determinants of the behavior, the nature of the behavior, and the motivation for the behavior.

So, how do we begin to make a dent in achieving the prevention goals of *Healthy People 2020*? Understanding what factors contribute, cause, precede, influence, and motivate health behaviors, and then how to effectively modify those factors so that behavior change is achieved, is the basic premise of health promotion. Health promotion is an integral part of the "new" public health approach and involves two aspects: research and practice. Indeed, public health professionals are increasingly recognizing that the mainstays of epidemiology and healthcare service administration lack the ability to change population-level indicators of health. The realization is that changing behaviors in a population and creating environments conducive to healthy behaviors are possibly the ultimate solutions to the long-standing question of how best to improve the health of the public. Health promotion research is at the forefront of understanding the underlying individual and environmental factors that influence health behavior, while health promotion practice is at the forefront of designing and implementing interventions to modify those factors and to ultimately change behavior. Thus, health promotion can be viewed as a process for which many public health, medical, and education professionals, whether on the research side or the practice side, have a responsibility and play an integral role in promoting health. The tool used for health promotion research and practice is theory. A theory is a set of testable propositions that is used to explain a group of facts or phenomena. In health promotion, theory enables researchers to better understand health behavior and make predictions about how to change behavior. Just as there are a multitude of health behaviors, there are many theories that attempt to explain behavior. Unfortunately, in this textbook we cannot cover all of them; however, we do describe many of the theories widely used today in health promotion research and practice. Before we proceed to the description of these theories, it may be helpful to provide a foundation of health behavior in the context of public health.

Prevention and the Public Health Approach

In broad terms, public health seeks to promote health, prevent early mortality and morbidity, and enhance or ensure quality of life. Achieving these objectives effectively and cost-efficiently entails *preventing* rather than *treating* disease. As such, prevention is the basic principle underlying the public health approach. In fact, the leading public health agency in the United States—the Centers for Disease Control and Prevention (CDC)—has the following mission statement: "To promote health and quality of life by preventing and controlling disease, injury, and disability." From a public health perspective, the essence of prevention is creating healthy populations, meaning that incidence of chronic disease, infectious disease, and injury decline dramatically. In our experience, the implications of a prevention-oriented approach to public health are often difficult for students to fully comprehend without first "divorcing" themselves from a medical orientation to public health. **Figure 1-3** provides a visual depiction suggesting that the prevention of disease entails far more than averting clinically observable illness.

As shown in Figure 1-3, clinically observable illness can be viewed as the midpoint of a continuum ranging from optimal wellness to extreme illness. Coronary vascular disease serves as a good example to illustrate this division. Clinically observable early warning signs of a heart attack, for example, can be diagnosed through a treadmill stress test. Proxy measures of pending blockages in coronary arteries include high serum cholesterol levels, high blood pressure, and

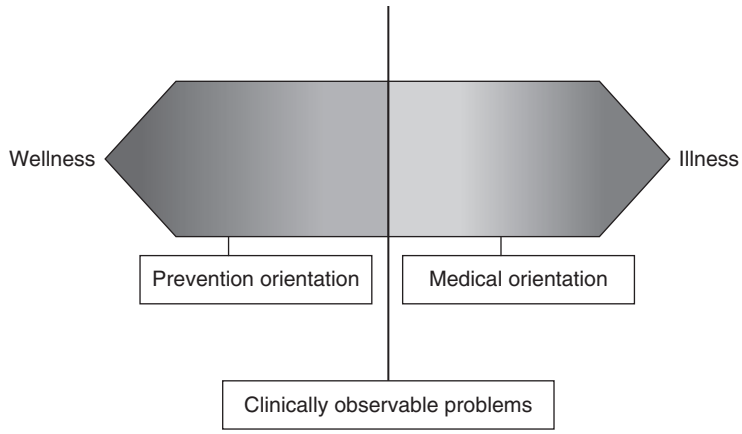


FIGURE 1-3 Wellness–illness continuum.

high body mass index (BMI). From a medical orientation, the prevention of a heart attack is about defining a threshold for high blood serum cholesterol, high blood pressure, and a risky level of body mass index. Once these thresholds are established, any person who exceeds any one threshold can be "treated" under the prevailing medical paradigm. Failure to do so will presumably result in increased coronary occlusion followed by the eventual blockage of the blood supply to the heart, possibly inducing death.

The problem with the "prevention ← medical" orientation is that it begins with a diagnosis and is reactive, thereby restricting the arena of the doctor–patient relationship. This limits the public health approach to changing people literally one at a time. Conversely, the "prevention → medical" orientation (left half of Figure 1-3) lends itself to a population-level approach because it is not predicated on an individual medical diagnosis. Instead, this orientation acknowledges that defining what levels constitute *high* cholesterol, *high* blood pressure, and *high* body mass is problematic and that everyone in a population can benefit from lower cholesterol, lower blood pressure, and less body fat. In this orientation, prevention activities are most often implemented *before* clinically defined levels of risk are reached by people. The intent is to figuratively "pull" people further to the left of the continuum (as far away from illness as possible), and unlike the medical approach, this orientation does lend itself to intervening with entire populations, rather than taking a one-at-a-time approach to public health. Unfortunately, the one-at-a-time approach to prevention has been frequently applied without success to the task of changing health behaviors, as well as changing risk factors (such a high cholesterol) through medication. This individual-level approach to behavior change is not necessarily relegated to the right-end half of the wellness–illness continuum shown in Figure 1-3. Thus, at this juncture, a second figure may be quite useful.

In his book titled *The Strategy of Preventive Medicine,* Geoffrey Rose, a British physician, developed the skewed distribution curve shown in **Figure 1-4**, also known as the Rose curve (Rose, 1992).

This drawing is quite useful because it gives a visual image of those considered "at risk" because of their diet and the associated negative health outcomes as composing the right-end

FIGURE 1-4 Example of a Rose curve. *Source:* Farley, T., & Cohen, D. A. (2005). *Prescription for a healthy nation: A new approach to improving our lives by fixing our everyday world.* Boston, MA: Beacon Press.

tail of the distribution; those not at risk would fall under the rest of the area under the curve. Think of the tail in this curve as being the portion of a population located on the right-end of the wellness–illness continuum. It follows, then, that the remaining area under the curve represents that portion of a population somewhere to the left of the center point in the wellness–illness continuum. The medical orientation can be viewed as a type of intervention that only happens with people located in the tail of the curve. The inherent problem of intervening only at the tail is that even when success occurs and these people join the masses near the mean, more people will continue to move into the tail. Thus, the task of intervening with people who are already ill becomes never ending. Think of Sisyphus rolling his boulder up the hill for all of eternity! The following reference to the Multiple Risk Factor Intervention Trial (MRFIT) depicts this concept.

The inherent problem of intervening only at the tail is that even when success occurs and these people join the masses near the mean, more people will continue to move into the tail.

> [E]very time we helped a man in [MRFIT] to stop smoking, on that day, probably one to two children in a schoolyard somewhere were taking their first tentative puffs on a cigarette . . . So, even when we do help high-risk people to lower their risk, we do nothing to change the distribution of disease in the population because, in one-to-one programs . . . we do nothing to influence forces in society that caused the problem in the first place (Syme, 1996, p. 463).

As a result of the limitations that accompany the at-risk paradigm, public health strategies have increasingly been directed at the goal of moving the population mean to the left on the curve

shown in Figure 1-4. By shifting the mean to the left, everyone in the distribution benefits and ultimately the population as a whole experiences an increase in health behavior, and perhaps a decrease in eventual morbidity and mortality (Syme, 1996). The concept of moving the population mean to the left of the Rose curve corresponds quite nicely with a prevention–orientation goal—the goal is to lower everyone's level of risk rather than targeting only those at greatest risk or those who have manifested the disease. This goal allows intervention to transcend a one-at-a-time approach, thereby allowing for change strategies that can be applied to entire populations. This involvement at the level of entire populations is the essence of public health.

A popular analogy to illustrate the concept of population-based prevention versus individual treatment is the "upstream allegory." In this story, fishermen fishing downstream observe streams of people coming down the river struggling not to drown. The fishermen must spend all their time pulling these individuals out of the river to save them. After exhausting their efforts, they finally decide to move upstream to see why so many people have fallen into the river. They quickly ascertain that there is no protective barrier at the edge of the riverbank; thus, when people are drawn to the riverbank, it is quite easy for them to fall into the raging waters. Consequently, community leaders decide to put up a railing at the edge of the riverbank, which results in significantly fewer people falling into the water. Not only does this benefit the people who would have fallen in, but it also benefits the fishermen, as they do not have to spend their time and resources rescuing people. This "intervention," in turn, benefits the entire community: the community has reduced rates of early mortality; they have more fish to eat; and they sell what is left over to the neighboring community, generating economic revenue. Thus, everyone's quality of life has improved in many ways.

From this story, it is easy to see why the medical approach is considered a downstream approach (treating individuals on a case-by-case basis after falling in), whereas public health is considered an upstream approach (instituting changes to prevent large numbers of people from ever falling in). The upstream approach equates with **primary prevention**, which is one of three levels of prevention identified by epidemiologists Hugh Leavell and E. Guerney Clark (1960), with **secondary** and **tertiary** being the other two levels. Using our analogy, secondary prevention equates with saving people who perhaps have just fallen in, but well before they have been caught up in the current and are drowning. Tertiary prevention in public health targets people who can treat the disease and/or people who have the disease with the goal of mitigating the disease's effects; thus, tertiary prevention would equate with targeting the fishermen and teaching them how to more effectively save drowning people or with targeting the drowning people and teaching them to tread water to buy them more time so that they can be saved. These different levels of prevention equate with the three stages of the disease, injury, or behavioral process, where each stage may require a different prevention strategy. A graphic depiction is provided in **Figure 1-5**.

In primary prevention, efforts are made to intercept the onset or occurrence of disease, injury, or behavior.

The public health approach is predicated on primary prevention. In primary prevention, efforts are made to intercept the onset or occurrence of disease, injury, or behavior. Primary prevention examples include vaccination programs, water fluoridation, abstinence programs, motorcycle helmet laws, bicycle helmet laws for children, mandatory seatbelt and

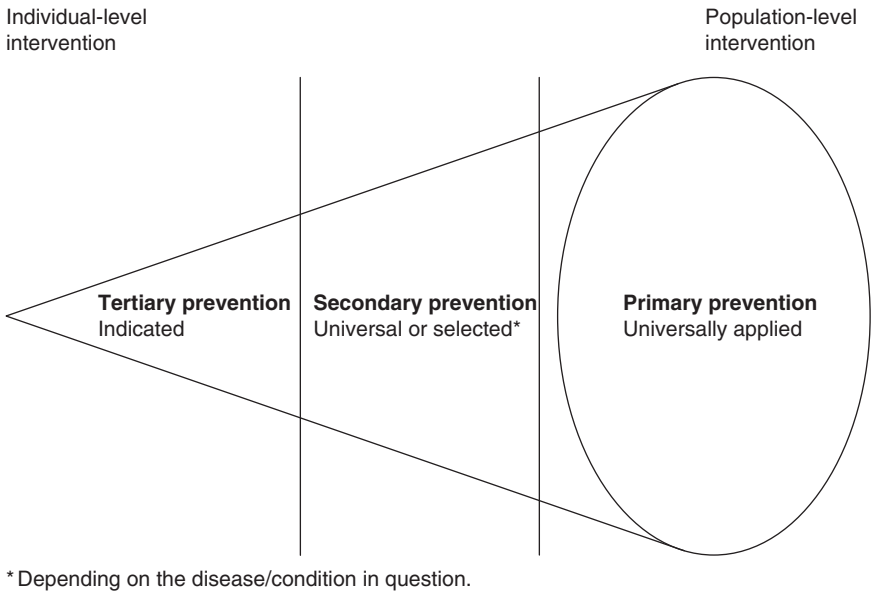


FIGURE 1-5 Three levels of prevention.

child safety seat laws, mandatory minimum smoking/drinking age requirements, and antismoking media campaigns. These are just a few examples, and many of these initiatives have been very effective in reducing associated morbidity and early mortality. For example, increasing price may be the most effective way to prevent teens from becoming daily smokers. A joint study from the University of Illinois at Chicago and the University of Michigan Institute for Social Research conducted an analysis where they matched price hikes of cigarettes with teen smoking rates over a period of six years. They found that a 10% price increase would decrease the number of children who started to smoke between 3% and 10%, depending on their stage of smoking (Chaloupka & Warner, 2000).

Moreover, analyses indicate that in addition to preventing disease, pain, suffering, disability, death, or loss of function, many prevention programs are also cost-effective. Primary prevention involves intervening before disease onset. In the context of public health, it must be broad in scope and aimed at large portions of the population. This is defined as adopting a **universal approach**, and it corresponds with the notion of intervening at the "bell" rather than the tail in the Rose curve shown in Figure 1-4. A universal approach is when an entire population (e.g., a nationwide crime-prevention media campaign) or subgroups of the population (e.g., children 16 years of age and under to enforce bicycle helmet use) are targeted regardless of whether individuals in the group have specific risk factors. Because whole populations are targeted, a large number of individuals are reached and the economic benefits of prevention become substantial, while the economic burden is spread across many. Moreover, if the focus of the preventive effort (e.g., diabetes, obesity, motor vehicle injury, alcohol abuse) corresponds to a high rate within the population, then the universal approach is extremely cost-effective. However, it is important to note that if the rate is infrequent, then an ounce of prevention may not equate with a pound of cure (see Cohen, Neumann, & Weinstein, 2008 for detailed analyses on this subject).

In some situations, instead of taking a universal approach, primary prevention efforts target those in the population who are at heightened risk. This type of approach is called a **selective approach**. Typically, those individuals are targeted on the basis of biological, psychological, social, or environmental risk factors known to be associated with the issue. For example, as mentioned previously, obesity is a risk factor for type 2 diabetes. A selective primary intervention to combat type 2 diabetes would target those individuals whose BMI is above 25, but who have not yet developed type 2 diabetes. Thus, although the focus is on those who are at increased risk, this approach is still considered primary prevention. Indeed, this approach was used by Knowler et al. (2002) in their randomized controlled trial of a primary prevention educational intervention (curriculum to affect diet and exercise behaviors) in preventing type 2 diabetes. They targeted clinic patients who had a BMI above 24 and whose glucose levels were elevated but not diagnostic of diabetes. At the 2-year follow-up, they found the educational intervention was nearly twice as effective as pharmaceutical treatment (metformin) in preventing the onset of diabetes.

Secondary and tertiary are the other two levels of prevention identified by Leavell & Clark. Secondary prevention occurs when a disease process is diagnosed in an early stage of progression, thereby enhancing the odds of treatment success. The focus of secondary prevention is to minimize consequences through early detection and intervention. Screening programs for STDs, cancer, or diabetes and smoking cessation programs are examples of secondary prevention. A good example is the use of mammography to diagnose localized tumors of the breast before these tumors progress. A tumor may indeed form, but with mammography the early diagnosis may lead to a simple lumpectomy as opposed to what may have become a radical mastectomy. Pap testing and colonoscopy are also common forms of secondary prevention because they screen for cervical dysplasia and polyps, respectively.

The focus of secondary prevention is to minimize consequences through early detection and intervention.

Tertiary prevention occurs when a disease state is diagnosed in time to apply treatment that may prevent further organic damage or death. Thus, the difference between secondary and tertiary prevention can essentially be thought of as the difference between early and late diagnosis. Tertiary prevention involves mitigating the consequences of disease or an injury after the fact. The goal is to provide treatment and rehabilitation so that negative impact is reduced and function can be restored. An **indicated approach** is used in tertiary prevention. Examples of tertiary prevention would include providing patients who have type 2 diabetes with educational pamphlets to help them better manage their disease, providing mental health counseling for rape victims, and instituting outreach programs to monitor people with mental disorders who live in the community to ensure they are adhering to their medication regimens. In many ways, tertiary prevention in the public health model is similar to treatment in the medical model.

Tertiary prevention involves mitigating the consequences of disease or an injury after the fact.

Primary, secondary, and tertiary prevention can be integrated with the concepts of universal, selective, and indicated approaches. Figure 1-5 provides a visual depiction of this integration. As shown by the wide angle of this cone, the vast majority of health promotion practice is primary prevention applied on a universal basis. This application can and should occur at the population level. Conversely, the least prevalent form of health promotion occurs with the indicated application of tertiary prevention—this application occurs at the individual level. This bipolar continuum therefore leaves secondary prevention in the middle of the cone, suggesting that it is practiced less often than primary prevention but more often than tertiary prevention. Consistent with our description of a selective approach, secondary prevention may be universally applied to an entire population or selectively applied to a defined subset of a population.

Prioritizing and Conceptualizing Health Behaviors

To fulfill public health's mission of prevention, public health professionals must first have a clear understanding of which diseases and types of injuries are having the greatest impact, so that efforts are correctly positioned. Epidemiologists conduct surveillance studies and analyze records to determine rates of diseases and leading causes of death. Consequently, the causes and contributing risk factors have been well-established. Although in the 21st century chronic diseases are at the top of the list, there are many other public health concerns. Injury from firearms and motor vehicle crashes are on the list, while infectious diseases such as influenza, HIV/AIDS, tuberculosis, chlamydia, human papillomavirus (HPV), and methicillin-resistant *Staphylococcus aureus* (MRSA), to name a few, are also responsible for substantial morbidity and early mortality. From a global perspective, infectious diseases still remain a significant source of morbidity and early mortality. Six infectious diseases—pneumonia, HIV/AIDS, diarrhea, tuberculosis, malaria, and measles—account for half of the premature deaths globally. The top causes of death worldwide are listed in **Table 1-2**.

Although the etiology is quite different for chronic and infectious diseases, as well as for sustaining injury, all can be prevented to some degree. At a minimum, onset can be delayed and the risk of death mitigated. Many of these 21st century "scourges" have underlying health behaviors,

Table 1-2 Top Causes of Death Worldwide, 2004

Cause of Death	Deaths in Millions	Percentage of Deaths
Coronary heart disease	7.20	12.2%
Stroke and other cerebrovascular diseases	5.71	9.7%
Lower respiratory infections	4.18	7.1%
Chronic obstructive pulmonary disease	3.02	5.1%
Diarrheal diseases	2.16	3.7%
HIV/AIDS	2.04	3.5%
Tuberculosis	1.46	2.5%
Road traffic accidents	1.27	2.2%
Prematurity and low birth weight	1.18	2.0%

Source: World Health Organization. (2008). The 10 leading causes of death by broad income group (2004). Retrieved from http://www.who.int/mediacentre/factsheets/fs310/en/index.html

and public health efforts that target these health behaviors are integral to a comprehensive preventive effort. For example, 1 in 4 child deaths from malaria could be prevented if children at risk slept under bed nets at night to avoid mosquito bites (WHO, 1999). In the United States, motor vehicle injuries are the leading cause of death for children aged 4 to 11 years (CDC, 2008). For children aged 4 to 7 years, the use of belt-positioning booster seats reduces this risk by 59%, compared with seat belts alone (Durbin et al., 2003).

"Using a bed net" or "using a booster seat" are merely two types of health behaviors that can be affected or modified to prevent the acquisition of malaria or the risk of auto accident injury, respectively; however, there are other health behaviors that could be changed to prevent malaria and injuries. When conceptualizing health behavior, many people may not perceive that "using a bed net" or "buying a booster seat" should be classified as health behaviors. Generally speaking, when people think of health behavior, they think of things like exercising or taking vitamins. They might not consider that their decision to get a mammogram or to get a flu shot is a health behavior. Furthermore, they might not categorize testing their home for the presence of radon as a health behavior.

Regardless of the general public's perceptions of what constitutes a health behavior, it should be defined so that health promotion research can be used to gain a better understanding of health behavior, and subsequently, health promotion practice can be used to alter it. **Behavior** in the broadest sense is the manner in which something acts, functions, responds, or reacts. This definition can apply not only to individual people but also more broadly to collectives and systems. Along these lines, **health behavior** can be defined as the actions, responses, or reactions of an individual, group, or system that prevent illness, promote health, and maintain quality of life. Examples of individual health behaviors would be using a condom, buckling up the seatbelt, or getting vaccinated; collective health behaviors could be a neighborhood association making changes to the built environment to encourage physical activity (e.g., putting in sidewalks, installing better lighting), initiating a safety patrol, or starting a local co-op farmer's market. Sociopolitical system behaviors could involve instituting a citywide smoking ban, implementation of community-wide condom accessibility/availability programs, or a ban on trans fats in restaurants.

Health behavior can be defined as the actions, responses, or reactions of an individual, group, or system that prevent illness, promote health, and maintain quality of life.

Just as there are different levels to prevention, health behaviors can be similarly qualified according to the nature of the health behavior. Most health behaviors can be classified into three categories: **preventive**, **illness**, or **sick-role** (Gochman, 1988; Kasl & Cobb, 1966). These categories are presented in **Table 1-3**. Generally, the health-related behaviors of healthy people and those who try to maintain their health are considered preventive behaviors and are strongly tied to primary prevention. As indicated, these previous examples of different behaviors can be viewed as preventive health behaviors. Illness behavior is defined as any behavior undertaken by individuals who *perceive* themselves to be ill and who seek relief or definition of the illness. Illness behaviors are linked closely to secondary prevention as the goal is control of a disease that

Table 1-3 Categories of Health Behaviors and Link to Prevention Level

Type of Health Behavior	State of Person	Behavior	Prevention Level
Preventive	Healthy	Exercise, high-fiber diet, colonoscopy at 50, mammogram at 40, wear bicycle helmet	Primary
Illness	Perceives health problem	Doctor visit, alternative medicine therapies, join Weight Watchers®	Secondary
Sick-role	Receives diagnosis	Adherence to treatment regimen (medication, exercise, diet, etc.)	Tertiary

an individual already has. Some examples of illness behaviors would be seeking care from a healthcare provider to obtain a diagnosis, turning to self-help strategies to lose weight if overweight or to reduce anxiety, or seeking help for problem-drinking by going to a 12-step program. Illness behavior stems from the perception that something may be wrong physically and/or psychologically and is therefore subject to an individual's interpretation of the situation or symptoms. Furthermore, even if people perceive that they may be sick, they may not seek care due to lack of health insurance or other resources.

A logical extension of illness behavior is sick-role behavior. Once an individual is diagnosed with a disease, the treatment plan constitutes the sick-role behavior. Sick-role behavior is denoted as any behavior undertaken to get well. Thus, sick-role behavior is typical of patients in clinical settings and is related to tertiary prevention. One example of sick-role behavior would be adherence to a medically prescribed regimen such as highly active antiretroviral therapy (HAART) for patients diagnosed with HIV, or switching to a low-carbohydrate/high-fiber diet and exercise regimen for patients diagnosed with type 2 diabetes or cardiovascular disease. Given that patient adherence with medication regimens may be exceedingly poor, sick-role behavior is increasingly being viewed as necessitating individual and environmental intervention and is fast becoming a public health issue. Numerous behavioral, social, economic, medical, and policy-related factors contribute to poor adherence and must be addressed if rates are to improve. This includes lack of awareness among clinicians about basic adherence management principles, poor communication between patients and clinicians, operational aspects of pharmacy and medical practice, and professional barriers, all of which compromise the effectiveness of therapy. Given all these issues, it is no wonder that adherence to drugs that decrease hypertension and lower cholesterol, for example, is problematic even among people recovering from a heart attack (Ho, Bryson, & Rumsfeld, 2009). As C. Everett Koop, former Surgeon General of the United States, stated succinctly, "Drugs don't work in patients who don't take them."

Health Promotion: Definition and Background

Public health seeks to create healthful living conditions. In the 19th century, the focus was on creating safe and healthy environmental infrastructures to reduce the spread of infectious diseases.

Early in the 20th century, the focus shifted to the individual with large-scale immunization programs. Beginning in the late 20th century and continuing into the 21st century, a new public health movement emerged where both ends of the spectrum were and are continuing to be addressed. Public health initiatives became multidimensional by targeting individuals, systems, and political structures to affect health behaviors. More importantly, a shift occurred that emphasized the significant role of environmental influences in shaping individual behavior and affecting health; said influences included but were not limited to: culture, public policy, areas of technology, work, energy production, and urbanization. Also, along the same lines as the old public health, the new public health considered the influence of not only built environments, but also the natural environment, and so conservation of natural resources became a primary goal. This shift in theoretical perspective and scope has been deemed the "new public health" (Macdonald & Bunton, 1992). Although in some ways the new public health has come full circle from the early beginnings of the old public health (i.e., focusing on environmental structures to affect health outcomes), the new public health also includes an emphasis on how those relevant environmental structures and influences affect individual health behavior, which in turn is linked to health outcomes. The new public health embraces the role of individuals in changing their health behavior while also emphasizing the relevant environmental and structural elements within that person's context to facilitate the adoption of health-promoting behaviors.

The new public health embraces the role of individuals in changing their health behavior while also emphasizing the relevant environmental and structural elements within that person's context to facilitate the adoption of health-promoting behaviors.

Health promotion emerged as a field against this backdrop of the new public health; it arose out of necessity in part from the insufficiency and costliness of biomedical approaches in improving the public's health, but also from the inability of medical professionals to understand fully how to affect health behavior. In simple terms, health promotion can be viewed as a *process* of enabling people to increase control over, and to improve, their health and the conditions that affect their health (WHO, 1986). Thus, health promotion is concerned with not only empowering people to remain free from illness, but also with enhancing their ability to avoid, resist, or overcome illness—moving them to the left-end of the wellness–illness continuum shown in Figure 1-3. By enabling people to recognize health threats and creating conditions that facilitate protective action, health promotion can be viewed as a "behavioral" inoculation in the same way that a traditional vaccine inoculates against infectious agents (Ewart, 1991).

Although there are many other definitions of health promotion, we provide one that is more comprehensive and also "official" in the sense that it was used as part of legislation introduced in the U.S. Senate in 2004. Health promotion is defined as the art and science of motivating people to enhance their lifestyle to achieve complete health, not just the absence of disease. Complete health involves a balance of physical, mental, and social health. The most effective health promotion programs include a combination of strategies to develop cultures and physical

environments that will increase awareness, facilitate behavior change, and encourage and support healthy lifestyle practices.

As a first impression, this definition of health promotion indicates that health promotion's objectives are diverse, broad, and complex, and that it embraces a multifaceted and integrated approach in achieving those objectives (e.g., "facilitate behavior change" and "develop supportive environments"). But, the unanswered question is how does health promotion accomplish such lofty and wide-ranging goals?

Health promotion is defined as the art and science of motivating people to enhance their lifestyle to achieve complete health, not just the absence of disease. Complete health involves a balance of physical, mental, and social health.

Health promotion strategies

In **Figure 1-6**, we depict the different strategies that health promotion uses to achieve goals. As you can see, the strategies are general and are not limited to any one specific health problem or to a specific set of behaviors. Each strategy can be applied to a range of settings, risk factors, population groups, diseases, or negative health outcomes. Moreover, these strategies are not typically applied in isolation, but overlap and are integral to achieving health promotion objectives. For example, research is at the forefront of any health promotion endeavor, and it also informs all of the other strategies shown in the figure. Research can reveal the **epidemiology** (i.e., the scope, causes, and risk factors of disease) of the health issue, the underlying environmental and individual determinants, and the negative outcomes, as well as provide insight into targeted,

FIGURE 1-6 Health promotion strategies.

at-risk populations and their environments. Furthermore, research provides a valid and reliable way to understand the health issue from multiple theoretical perspectives and to inform health promotion activities, whether they are part of a health education program, a social marketing program, or activities involved in policy development.

Research is also critical in determining whether the health promotion initiative was effective in reaching its goals and, if so, research can also show *how* the goals were achieved. This type of research is critical in supporting evidence-based health promotion practice so as to improve the quality and cost-effectiveness of health promotion interventions. Against this research backdrop, advocacy represents an important and related strategy. Advocacy is necessary to gain the political commitment, policy support, social acceptance, and systems support for a particular health program. Advocacy may be carried out through lobbying, social marketing, a health education program, or community organizing. Finally, building community capacity is a key strategy for sustaining health promotion efforts. Community capacity represents the community's ability to do things that promote and sustain its well-being. A number of factors have been proposed as contributing to capacity building, such as leadership, resources, knowledge, skills, and collaboration (Provan, Nakama, Veazie, Teufel-Shone, & Huddleston, 2003). Achieving community capacity by affecting all of these factors may not be feasible, yet many of these factors are modifiable through the use of other health promotion strategies. For example, health education can be used to convey information and knowledge and impart skills to community members and service organizations; social marketing can also be used in tandem with health education efforts to raise awareness of health information or to inform community members about resources; and research can be used to create an inventory of social organizations, agencies, and other stakeholders within the community so that a network of resources can be constructed. Thus, in reviewing these strategies used in health promotion, you can appreciate why health promotion is considered a process that employs multiple strategies in partnership to achieve its goals of optimal health.

Theory in Health Promotion Research and Practice

What is missing from Figure 1-6, however, is the inclusion of another circle that would convey that the cornerstone of all health promotion strategies is theory. Health promotion researchers, policymakers, and practitioners use theory to guide many of their health promotion strategies. Theory informs what variables to measure, how to measure them, and how they are interrelated. Within the context of health promotion, theory is viewed as a tool for enhancing our understanding of complex situations versus something that offers universal explanations or predictions (Green, 2000). This more practical perspective is grounded in praxis and acknowledges that theory should be relative to the context in which it is used. *Health Behavior Theory for Public Health* describes many of the more relevant theories used in health promotion. We acknowledge that, like any tool, theory must be used correctly and with fidelity, but even when it is, different results could be observed depending on the context.

Because health promotion involves a *process* that seeks to change both environments and individuals in order to facilitate behavior change and achieve health, it may not be perceived as a specific field of study in its own right. Rather, health promotion has defined itself more in

terms of its goals and strategies rather than the subject of its inquiries. Therefore, it has had to borrow from other disciplines to create its body of knowledge. Significant contributions from clinical and social psychology, child development, sociology, and education have shaped the discipline of health promotion by providing a wide range of theoretical perspectives to utilize in its inquiries and to guide its strategies. These theoretical perspectives are the driving force behind health promotion research and practice and provide the framework for implementing health promotion strategies in achieving its behavioral, social, environmental, political, and economic goals. Other fields such as philosophy, social policy, and marketing have also made significant theoretical contributions, but not to the same degree (Macdonald & Bunton, 1992).

Significant contributions from clinical and social psychology, child development, sociology, and education have shaped the discipline of health promotion by providing a wide range of theoretical perspectives to utilize in its inquiries and to guide its strategies.

Health Behavior Theory for Public Health aims to educate students, researchers, and practitioners in many of these theories and in their applications to the various health behaviors described in this chapter. Furthermore, we maintain throughout this book that an ecological approach to health promotion involves using multiple theories that help to identify and understand the relationships among the social causes of health within and across multiple levels. This perspective has been referred to as a "theory of the problem" and asserts that no one theory alone can account for an ecological view of health behavior (McLeroy et al., 1993). In addition, an ecological approach requires the development of "intervention theories" or the theory of the solution, which involves gauging the effectiveness of different intervention strategies at different levels of analysis and with different populations (McLeroy et al., 1993). The intervention strategies should also be guided by multiple theories. Although perhaps a daunting task, the end result is the creation of a new body of knowledge that expands the current theoretical boundaries and informs evidence-based practice (see **Figure 1-7**).

This theory-of-the-problem and theory-of-the-solution perspective is presented in response to previous critiques of health promotion and health education efforts that emphasized a "theory of the week" approach, that is not uncommon in the literature, although it is an overly simplistic view in choosing one theory to understand and change health behavior. Indeed, Noar and Zimmerman (2005) conducted a literature review pertaining to health and theory and found that out of 2,901 abstracts reviewed, only 6% (n = 178) included more than one theory in its inquiry. Of those, 47% (n = 84) were empirical in nature and 11% (n = 20) involved an intervention; the remaining articles were either descriptive or "other." We maintain that one theory alone cannot begin to adequately address the complexities involved in attempting to fully understand behavior and to change it; thus, we emphasize that when reviewing and learning about the various theories presented in this textbook, it is important to keep in mind that multiple theories are required for both understanding the problem and providing more complex and effective solutions.

FIGURE 1-7 Great minds struggle to develop a "theory of the solution."
Source: Copyright 2011 by Justin Wagner; with permission.

Take Home Messages

- Health is not only a state of physical, mental, and social well-being, but also includes the opportunity and available resources that enable people's ability to achieve optimal health.
- The new public health of the 21st century deals with the prevention of both infectious and chronic diseases that contribute greatly to rates of early mortality and morbidity. The emphasis is on population-based health conditions where personal health behavior is but one "condition." Thus, for public health to be achieved, changes to relevant environmental factors must also be emphasized.
- The new public health utilizes and embraces strategies from earlier times, but also includes an emphasis on the importance of understanding behavior within the context of our natural and built environments.

- Surveillance initiatives into the prevalence of disease, as well as research into the determinants and mediators, combine to promote healthful behavior.
- Health promotion is a process involving many health and education professions, disciplines, and practices for altering health behavior and conditions that affect health behavior.
- Theory is at the core of effective public health approaches that seek to make changes to the environment, which ultimately will enhance health behavior and achieve the health of the people.

References

American Diabetes Association. (2008). Economic costs of diabetes in the U.S. in 2007. *Diabetes care, 31* (3), 596–615.

Centers for Disease Control and Prevention. (1999). Control of infectious diseases, 1900–1999. *Morbidity & Mortality Weekly Report, 48,* 621–629.

Centers for Disease Control and Prevention. (2008). CDC Childhood Injury Report. Retrieved from http://www.cdc.gov/safechild/images/CDC=childhoodinjury.pdf

Centers for Medicare & Medicaid Services. (2009). NHE summary including share of GDP, CY 1960–2009. Retrieved from http://www.cms.gov/nationalhealthexpenddata/02_nationalhealthaccountshistorical.asp

Chaloupka, F. J., & Warner, K. E. (2000). The economics of smoking. In A. J. Culyer & J. P. Newhouse (Eds.), *Handbook of health economics: Vol. 1* (1st ed.) (pp. 1539–1627). Amsterdam, The Netherlands: Elsevier.

Cohen, J. T., Neumann, P. J., & Weinstein, M. C. (2008). Does Preventive Care Save Money? *The New England Journal of Medicine, 358,* 661–663.

Durbin, D. R., Elliott, M. R., & Winston, F. K. (2003). Belt-Positioning Booster Seats and Reduction in Risk of Injury Among Children in Vehicle Crashes. *Journal of the American Medical Association, 289* (21), 2835–2840.

Ewart, C. K. (1991). How integrative behavioral theory can improve health promotion and disease prevention. In R. G. Frank, A. Baum, & J. L. Wallander (Eds.), *Handbook of clinical health psychology: Models and perspectives in health psychology* (Vol. 3) (pps. 249–289). Washington, DC: American Psychological Association.

Farley, T., & Cohen, D. A. (2005). *Prescription for a healthy nation: A new approach to improving our lives by fixing our everyday world.* Boston, MA: Beacon Press.

Gochman, D. (1988). Health behavior: Plural perspectives. In D. Gochman (Ed.), *Health behavior: Emerging research perspectives* (pp. 3–18). New York, NY: Plenum.

Green, J. (2000). The role of theory in evidence-based health promotion practice. *Health Education Research, 15,* 125–129.

Ho, P. M., Bryson, C. L., & Rumsfeld, J. S. (2009). Medication adherence: Its importance in cardiovascular outcomes. *Circulation, 119,* 3028–3035.

Kasl, S., & Cobb, S. (1966). Health behavior, illness behavior, and sick role behavior. *Archives of Environmental Health, 12,* 246–266.

Knowler, W. C., Barrett-Connor, E., Fowler, S. E., Hamman, R. F., Lachin, J. M., Walker, E. A., . . . Diabetes Prevention Program Research Group. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine, 346,* 393–403.

Leavell, H. D., & Clark, E. G. (1960). *Preventive medicine for the doctor in his community: An epidemiologic approach.* New York, NY: McGraw-Hill.

Macdonald, G., & Bunton, R. (1992). Health promotion: Discipline or disciplines? In R. Bunton & G. MacDonald (Eds.), *Health promotion: Disciplines and diversity* (pp. 6–19). London, England: Routledge Press.

McGinnis, J. M., & Foege, W. H. (1993). Actual causes of death in the United States. *Journal of the American Medical Association, 270* (18), 2207–2212.

McLeroy, K. R., Steckler, A. B., Simons-Morton, S., Goodman, R. M., Gottlieb, N., & Burdine, J. N. (1993). Social science theory in health education: Time for a new model? *Health Education Research, 8,* 305–312.

Mokdad, A. S., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association, 291,* 1238–1245.

Noar, S. M., & Zimmerman, R. S. (2005). Health behavior theory and cumulative knowledge regarding health behaviors: Are we moving in the right direction? *Health Education Research, 20,* 275–290.

Provan, K. G., Nakama, L., Veazie, M. A., Teufel-Shone, N. I., & Huddleston, C. (2003). Building community capacity around chronic disease services through a collaborative interorganizational network. *Health Education & Behavior, 30,* 646–662.

Rose, G. (1992). *The strategy of preventive medicine.* New York, NY: Oxford Press.

Syme, S. L. (1996). To prevent disease: The need for a new approach. In Blane, D., et al. (Eds), *Health and social organization: Toward a healthy policy for the twenty-first century.* London, England: Routledge Press.

U.S. Department of Health, Education & Welfare (1979). Healthy people: The Surgeon General's report on health promotion and disease prevention. Retrieved from http://www.eric.ed.gov/PDFS/ED186357.pdf

World Health Organization. (1986). The Ottawa charter for health promotion. Retrieved from http://www.who.int/hpr/NPH/docs/ottawa_charter_hp.pdf

World Health Organization. (1999). Report on infectious diseases: Removing obstacles to healthy development. Retrieved from http://www.who.int/infectious-disease-report/index-rpt99.html

World Health Organization. (2009). Health systems performance assessment. Retrieved from http://who.int/bulletin/volumes/87/1/08=061945/en/