Ever Wonder...

- why it’s so hard to break a bad habit?
- how much your parents’ health predicts your own?
- what you are most likely to die of?
As individuals, we are all responsible for our own health. Each of us makes choices about how we live—about whether to be physically active, whether to eat a healthy diet, whether to get enough sleep, whether to see a doctor when we need to. And yet to talk about health only as a matter of individual choice assumes that we are always aware of the choices we are making and that we are always “free” to make them. The truth is that not everyone is in the same position—there are differences in how we live and the contexts in which we make decisions.

In this book, we explore personal health within the context of our social, cultural, and physical environment. We recognize that individuals are ultimately responsible for their own health, but we also know that people are able to make healthier choices when their environment supports those choices and at times even provides a nudge in more positive directions.

**Personal Health in Context**

In this section, we consider the meaning of the terms health and wellness, and we explore the factors that shape and influence our personal health.

**HEALTH AND WELLNESS**

Traditionally, people were considered “healthy” if they did not have symptoms of disease. In 1947 the World Health Organization (WHO) broke new ground by defining health as a state of complete physical, mental, and social well-being, not merely the absence of disease and infirmity. Physical health referred to the biological integrity of the individual. Mental health included emotional and intellectual capabilities, or the individual’s subjective sense of well-being. Social health meant the ability of people to interact effectively with other people and the social environment.

More recently, a spiritual domain has been added to the WHO definition, reflecting the idea that people’s value systems or beliefs can have an impact on their overall health. Spiritual health does not require participation in a particular organized religion but suggests a belief in (or a searching for) some type of greater or higher power that gives meaning and purpose to life. Spiritual health involves a connectedness to self, to significant others, and to the community.

Wellness is a slightly different concept. It is generally defined as an active process of adopting patterns of behavior that can lead to improved health and heightened life satisfaction. Like health, wellness is seen as encompassing multiple dimensions: physical, emotional, intellectual, spiritual, interpersonal or social, environmental, and occupational (see Figure 1.1).

Wellness may also be conceptualized as a continuum. One end of the continuum represents extreme illness and premature death; the other end represents wellness and optimal health (see Figure 1.2). Historically, Western medicine has focused primarily on the illness side of the continuum, treating people with symptoms of disease. More recently, approaches to health have focused on the wellness side of the continuum, seeking ways to help people live their lives fully, as whole people, with vitality and meaning.
While each of us has a unique set of individual characteristics that shape our health, our environmental factors, also called the social determinants of health, have an impact on our health and wellness as well.

**THE ECOLOGICAL MODEL OF HEALTH AND WELLNESS**

How do you achieve good health and strive toward wellness? What influences shape your choices and decisions? Where do you fit, as an individual, in the web of forces around you?

Although there are many theories about health behavior and decision making, we focus here on the **ecological model of health and wellness**. As shown in Figure 1.3, the model is a framework that addresses the interrelationships between individuals and their environment, taking into account not just individual choices but all the factors that influence those choices. It recognizes that you have a unique set of characteristics—your genetics, age, and sex, along with your knowledge, beliefs, values, and skills that guide the decisions you make about how to live your life. You also live within an environment, which in this model is defined very broadly as anything external to you. The qualities associated with wellness include self-confidence, optimism, a sense of humor, an active mind, vitality, and joy in life, among many others.

Although most people want to have good health, it typically is not an ultimate goal in and of itself. Usually, people desire good health in order to reach other goals—to be more productive, more attractive, more comfortable, more independent—in other words, to have a higher quality of life. In this sense, wellness and an optimal quality of life can be seen as an ultimate goal, with good health a means to attain it.
environent encompasses your relationships with other people, your interactions with social institutions, your community affiliations, and public policies that impact each of these.

The ecological model takes into account the fact that you cannot make choices independent of friends, family, community norms, public policy, or even global events. In addition, societies can influence your health by shaping your environment in ways that increase or decrease your opportunities for making healthy or unhealthy choices. For example, in most supermarkets candy is placed near the checkout counter, where you (or your child) can grab it impulsively as you’re getting ready to pay. The practice increases sales but discourages healthy choices.

These external environmental factors are also known as the social determinants of health. This term highlights the fact that the conditions in which you live, work, and pursue your life goals influence the options you have available and the choices you make. The social determinants of health include such factors as income, socioeconomic status, educational attainment, literacy, employment status, working conditions, housing, transportation, social support networks, and access to health care services. Your health is also affected by your physical environment. In the built physical environment, you are affected by such factors as the kinds of housing, streets, schools, sanitation systems, and transportation systems that have been constructed. In the natural physical environment, you are affected by such factors as air and water quality, proximity to environmental hazards, and access to parks and natural settings.

How does the ecological model play out in a person’s life? As an example, let’s say you decide you want to have a healthier diet. What influences your ability to achieve this goal, according to the ecological model? You begin with a personal history that includes knowledge, attitudes, and skills—ideas about what constitutes a healthy diet, attitudes toward different foods and diets, skills that enable you to prepare certain foods. In addition, depending on your genetic predispositions, age, and health conditions, you may need to pay attention to certain components of a diet, such as salt if you have high blood pressure or red meat if you have high cholesterol.

Next, your family and friends influence your eating patterns. As you were growing up, you became familiar with the foods and meals your family provided, and you may still prefer those foods and eat them when you go home. Your friends may like to eat out at fast-food restaurants and you may go with them. Or your friends may be vegetarian, so you find yourself eating more vegetarian foods. If your friends are overweight or if they gain weight, it’s likely that you will find weight gain more acceptable for yourself. The social institutions you interact with also influence your choices. Your dining hall may have unlimited soda refills, or your church may serve donuts after services. In your community, you may have opportunities to buy fresh fruits and vegetables, or the corner store may have only candy and liquor. Finally, local, state, and national laws influence the safety of the food you eat, the nutritional labeling it features, and its cost. When all these factors are taken into account, it is clear that choosing a healthier diet is not just a matter of your individual choices—though the choices you make within the context of your environment are still critical.

Both in the United States and worldwide, worse health outcomes are associated with poorer living conditions—with poverty, unemployment, poor housing, low educational attainment, environmental pollution, and other negative social, economic, and physical factors. Addressing these inequities is one of the goals of national and international health policies; this topic is discussed in more detail later in the chapter.

Self and Family: Heredity and Family Health History

Let’s start at the center of the ecological model and consider you as an individual. At conception, you received what is perhaps your biggest inheritance, your genetic makeup. People have long been curious about what their genetic inheritance contributes to their identities versus the contribution of their upbringing—the classic question of “nature versus nurture.” Are people the way they are because of their genetic endowment or because of experiences they have had? The answer isn’t black and white. Who we are as individuals is the result of a complex, ongoing interaction among (1) our genetic inheritance, (2) our lifestyle choices, and (3) environmental factors of many kinds. Even though these influences are woven together in life, in this chapter we treat them separately—genetic inheritance first, then lifestyle choices, and finally environmental factors.

Some people worry that their genetic inheritance predetermines how their life will play out, but this is not generally true. What we can say definitively about genetic inheritance is that it plays a key role in establishing some of the outside parameters of what you can be and do in your life. It gives you the potential to be tall or short; apple-shaped or pear-shaped; brown-eyed or blue-eyed; blonde, brunette, or bald. It gives you a unique bundle of strengths, vulnerabilities, and physical characteristics. You can think of genetic inheritance as your blueprint, or starting point. The blueprint is filled in and actualized over the course of your entire life.

Genetics used to be confined to the realm of scientists. Now, however, due to significant advances, the language of genetics has entered the realm of everyday conversation. You now need to understand some basic genetic concepts to engage in personal health decisions, public debates, and policy decisions.
DNA AND GENES: THE BASIS OF HEREDITY

Our bodies are made up of about 260 different types of cells, each performing different, specific tasks. Almost every cell in the body contains one nucleus that acts as the control center (only red blood cells have no nucleus). Within the nucleus is an entire set of genetic instructions stored in the form of tightly coiled, threadlike molecules called **deoxyribonucleic acid (DNA)**. If we were to uncoil the DNA (and magnify it thousands of times), we would find it consists of two long strands arranged in a double helix—a kind of spiraling ladder (Figure 1.4). DNA has four building blocks, or bases, called adenine (A), guanine (G), cytosine (C), and thymine (T). The two strands of DNA are held together with bonds between the building blocks; an A on one strand always connects to a T on the opposite strand, and a G on one strand connects to a C on the opposite strand. The consistent pairing is important—each strand is an image of the other (see Figure 1.4).

The complete set of DNA is called a person’s **genome**. Within the nucleus, DNA is divided into 23 pairs of **chromosomes** (one set of each pair comes from each parent). One pair of chromosomes—the sex chromosomes—is slightly different and is labeled with an X or a Y rather than a number. Females have two X chromosomes; males have an X and a Y chromosome.

DNA is the body’s instruction book. The four bases are like a four-letter alphabet. Just as the letters in our 26-letter alphabet can be arranged to make thousands of words with different meanings, a series of thousands or millions of A-T-G-C combinations can be arranged to form a distinct message; this message is a gene. Each chromosome contains hundreds or thousands of genes located at precise points along the chromosome. Genes serve as a template and are transcribed into **RNA**, a temporary message that can travel out of the nucleus and is further translated into protein. Proteins, structures composed of amino acids arranged in a specific order, direct the activities of cells and functions of the body.

Although our cells contain the same full set of genes, most of the cells in our body become specialized—that is, they take on characteristic shapes or functions, such as skin, bone, nerve, or muscle. Genes

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**deoxyribonucleic acid (DNA)**
Nucleic acid molecule that contains the encoded, heritable instructions for all of a cell’s activities; DNA is the genetic material passed from one generation to the next.

**genome**
The total set of an organism’s DNA.

**chromosome**
Gene-carrying structure found in the nucleus of a cell, composed of tightly wound molecules of DNA.
turn on or off to regulate this activity in a process called **differentiation**. Once a cell is differentiated, it can no longer become other cell types (it is as if certain “chapters” of the DNA instruction book are locked shut). Unspecialized cells, called **stem cells**, are present in an embryo (embryonic stem cells) and are retained within tissues (adult stem cells).

**GENETIC INHERITANCE**

You inherited one set of chromosomes from each of your parents and thus have two copies of each gene (excluding genes on the sex chromosome). The position of each gene is in a corresponding location on the same chromosome of every human. However, your two copies may be slightly different because every so often, changes occur in a gene; such a change is called a **mutation**. The change may involve a letter being left out (e.g., a series A-T-G becomes A-G), an incorrect letter being inserted (e.g., a series A-T-G becomes A-A-G), or an entire series of letters being left out, duplicated, or reversed. The location of the mutation determines the effect. If we go back to the analogy of the alphabet, consider what happens to the following sentence when a single letter change is made:

“When my brother came home, he lied.”

If we change one letter to a “d,” it can turn the sentence into nonsense:

“When my brother came home, he lied.”

Or it can change the meaning entirely:

“When my brother came home, he died.”

Something similar happens with a mutation in a gene. The change can cause different “meanings” or instructions to be sent to cells. Many mutations are neither harmful nor beneficial (such as changes that lead to blue eyes or brown eyes). Other mutations may be harmful and cause disease. For example, in sickle cell disease, an adenine (A) is replaced by a thymine (T) in the gene for hemoglobin (a protein that carries oxygen in red blood cells). This single change at a crucial spot changes the gene’s instructions and causes it to produce an altered form of hemoglobin that makes red blood cells stiff and misshapen. This leads to an increased risk of red cells causing blocked arteries and causing pain, infection, and damage to organs. Two important things about mutations are that (1) they are passed on from generation to generation, and (2) they allow for human diversity. You share 99.9 percent of the same DNA with your classmates. Slight differences in the remaining 0.1 percent account for all the genetic variation you see in appearance, functioning, and health. *6*

Most characteristics (like height or skin color) are determined by the interaction of multiple genes at multiple sites on different chromosomes. However, some traits are determined by a single gene. To understand the relationship between genes and appearance, let’s consider a single-gene trait. An individual inherits two alleles (alternative forms) of each gene (one copy from each parent). The two alleles can be the same version of the gene or they may be different versions. If they are different, one version may be dominant over the other. This version is then said to be the **dominant allele**, because it will be expressed and will determine appearance. The other version is said to be a **recessive allele**—it is hidden by the dominant allele and is not expressed. A recessive allele is expressed only if both copies of the gene are the recessive version. An example of the simplest type of relationship between alleles, in which a single gene, either dominant or recessive, determines appearance, is shown in Figure 1.5. There are other possible relationships as well. Some alleles have incomplete dominance or codominance, meaning that both alleles affect appearance.
in varying degrees. Many traits have more than two alleles. Most traits involve the interaction of multiple genes, each with multiple alleles.

How does genetic inheritance impact your health? As previously noted, a genetic mutation in just one gene can cause a disease or disorder (as in the example of sickle cell disease). However, the majority of health conditions are caused by interactions among one or more genes and the environment; these are called multifactorial disorders. Many personal characteristics, predispositions, and behaviors are also the results of interactions among genes and multiple environmental factors. Examples of these multifactorial disorders include heart disease, cancer, diabetes, obesity, and schizophrenia.

Because so many diseases with a genetic component are multifactorial, paying attention to the lifestyle and environmental factors that contribute to them is crucial. Figure 1.6 shows the relative contribution of genetic and environmental factors to some common diseases and incidents. Notice that there is no clear distinguishing line between environment and genetics because the precise roles of each are not always clear. For instance, poisoning may seem to have purely environmental causes, but some children may be genetically more predisposed to take risks and thus more prone to eat or drink unknown substances.

You have probably already noticed within your own family that some traits are passed from one generation to the next (see the box, “Genetic Testing Online”). As with the color of your skin, hair, and eyes, you have inherited other traits and predispositions. Your grandmother’s history of colon cancer may mean you have inherited an increased risk for colon cancer. Your uncle’s heart attack at age 40 may mean you have received an increased risk of heart disease from his side of the family. How can you take this information and organize it in a useful way?

Creating a Family Health Tree

A family health tree, also called a genogram or genetic pedigree, is a visual representation of your family’s genetic history. Creating a health

figure 1.5 Dominant and recessive alleles.
A single gene appears to determine whether earlobes are detached (left) dominant or attached (right) recessive. We all have two copies of the “earlobe” gene. Let’s call the two gene versions the “detached allele” and the “attached allele.” The detached allele is dominant, meaning a single copy will make the earlobes appear detached (remember, if a dominant allele is present, it determines appearance). The attached allele is recessive, meaning two copies are required for the earlobes to appear attached. Think about your parents and siblings; can you figure out which alleles you have?

figure 1.6 Relative contribution of environment and genetics.
tree can help you see your family’s patterns of health and illness and pinpoint any areas of special concern or risk for you. To construct your family health tree, you need to assemble information concerning as many family members as you can. (A sample tree is shown in Figure 1.7.) The more detailed and extensive the tree, the easier it will be for you to see patterns. Basic information for each family member should include date of birth, major diseases, and age and cause of death for any deceased relatives. You might include additional data, such as the age of a family member when his or her disease was diagnosed, disabilities, major operations, allergies, reproductive problems, mental health disorders, or behavioral problems. In addition, you can think about lifestyle habits, community factors, and even public policies.
and the roles each may play. Your tree should include parents, siblings, grandparents, cousins, aunts, and uncles. The Personal Health Portfolio activity for this chapter at the end of this book provides detailed instructions on how to put together your own family health tree.

Gathering family health information to construct a tree may not be easy. Only one-third of Americans report that they have tried to gather and write down this information. In recognition of the importance of the task, the U.S. surgeon general has launched a national public health campaign called the U.S. Surgeon General’s Family History Initiative. The initiative encourages families to use any opportunity when they are gathered together to discuss and record health problems that seem to run in the family. This may be easier for some people than for others. In some cultures, it is taboo to discuss the dead or certain diseases, such as cancer, depression, or HIV. Such cultural views may influence the information you are able to collect. In addition, if you were adopted, you may not have the same access to your biological family’s health history. Several organizations can aid in the search for such information.

**WHAT CAN YOU LEARN FROM YOUR HEALTH TREE?**

Certain patterns of illness or disease suggest that the illness is more likely to be genetically linked, as in the following instances:

- An early onset of disease is more likely to have a genetic component.
- The appearance of a disease in multiple individuals on the same side of the family is more likely to have a genetic correlation.
- A family member with multiple cancers represents a greater likelihood of a genetic association.
- The presence of disease in family members who have good health habits is more suggestive of a genetic cause than is disease in family members with poor health habits.

If you discover a pattern of illness or disease in your health tree, you may want to consult with your physician or a genetic counselor about its meaning and implications (see the box, “Janet: A Family History of Breast Cancer”). You may want to implement lifestyle changes, have particular screening tests, or watch for early warning signs. Again, a pattern of illness does not automatically mean that you will be affected. The main use of a health tree is to highlight your personal health risks and strengths.

Self and Lifestyle Choices

Now that you understand something about how your genes influence your health, we turn to the lifestyle choices you can make that affect how your genetic inheritance will play
Janet: A Family History of Breast Cancer

Janet, a college sophomore, lost her mother to breast cancer when she was 10 years old and her mother was just 34. Since then, Janet had felt sure that she too was destined to get breast cancer. In high school, she struggled with decisions about whether to go to college and pursue a career or to start a family as early as she could so she would have at least some time with her children. She chose to go to college, but her ambivalence about that decision was reflected in her often risky approach to contraception. On those occasions when she had sex with her boyfriend without using birth control, she knew that on some level, she hoped she would get pregnant.

A turning point came when Janet learned in one of her classes that some cases of breast cancer are associated with specific genes, referred to as BRCA1 and BRCA2. Genetic tests can be performed to determine if a person has a mutated copy of either of these genes. Learning this empowered Janet to find out more. Using her college library and online sources, she learned about options available to high-risk people like herself. They included starting mammograms (breast screenings) at an earlier age than recommended for the general population, taking certain medications, and even mastectomy (breast removal) to prevent cancer.

For the first time since her mom died, Janet felt she had some control over her future. She couldn’t change her genes, but there were actions she could take to reduce her risk. She had never really talked to her dad about her mom’s health history because she didn’t want to upset him by stirring up sad memories. Now she realized it was important to her own health to get as much information as possible about her mom’s cancer. She decided to talk to him about it the next time she was home. She also decided to make an appointment with a genetic counselor to find out more about testing for the BRCA1 and BRCA2 genes.

- What obstacles—psychological as well as logistical—do you think make it hard for people to find out more about their family health histories?
- What conditions or diseases seem to run in your family? Are there behavioral choices or environmental factors that increase or decrease the likelihood that these conditions will actually occur? If so, what are they?

out in your life. Genes and lifestyle choices are not the only factors contributing to your health, as the ecological model makes clear, but they are critical components. In this section, we look at how your behavior choices affect your health and how people change unhealthy behaviors.

HEALTH-RELATED BEHAVIOR CHOICES

Your health-related behavior choices (or lifestyle choices) are those actions you take and decisions you make that affect your individual health (and, possibly, the health of your immediate family members). They include choices concerning your physical, mental, emotional, spiritual, and social well-being—what you eat, how much you exercise, whether you spend time developing meaningful relationships, and so on. For example, having an apple instead of a bag of chips is a healthy behavior choice, as is quitting smoking. Other examples are getting enough sleep, practicing safe sex, wearing a seatbelt in a car, finding effective ways to manage stress, drinking alcohol in moderation if at all, and getting regular health checkups. Lifestyle choices are what individuals have the most control over in managing their health.

Interesting questions arise when we consider why people make choices that don’t enhance their health and why they don’t change behaviors they know are hurting them. Psychologists have proposed many theories about health behavior choice and change. The Health Belief Model and the Stages of Change Model are especially useful.

THE HEALTH BELIEF MODEL

The Health Belief Model was developed in the 1950s as a framework for understanding why people make the health choices they do. According to the model, health behaviors are influenced by four classes of factors:

- Perceived susceptibility. Do you believe you are at risk for a problem?
- Perceived seriousness of consequences. Do you perceive the problem as serious if it were to occur?
- Perceived benefits of specific action. If you change behavior, do you believe it will reduce the threat?
- Perceived barriers to taking action. What factors will get in the way of your making a change, such as time, money, or beliefs?

To illustrate how this works, imagine that you are a smoker in a family where people are prone to heart disease. Your uncle and grandfather both died from heart disease at relatively young ages, and you know that you too are susceptible to the same fate. You also know that your smoking habit increases your risk for this disease and that the consequence for your continuing the habit could be death. If you quit, the benefits are a reduced risk for heart disease within a few years and a
potentially longer life. You also recognize a huge barrier: Most of your friends smoke, and it would be hard to go out with them and resist a cigarette. According to the Health Belief Model, all of these considerations enter into your decision-making process when you think about quitting smoking.

In the chapters to come, you will come across information and ideas that may prompt you to consider changing your health behavior in one way or another. You will examine a variety of factors that impact your health, such as the nutritional content of your favorite foods, the amount of exercise you get, and your choices around alcohol and drugs. One way to organize your decision-making process is by using the concepts offered by the Health Belief Model.

THE STAGES OF CHANGE MODEL

Developed in the 1990s by psychologists James Prochaska and Carlo DiClemente, the Stages of Change Model, or Transtheoretical Model (TTM), is another widely accepted framework for understanding individual health behavior change. The model is useful because it acknowledges that people are often ambivalent about making significant changes in their lives and because it recognizes that change happens as a process, not a one-time event. It also takes into account not just a person’s knowledge but also her feelings, behaviors, relationships, and perceived self-efficacy (belief that one can perform a certain task). The stages are as follows:

- **Precontemplation.** If you are in this stage, you have no motivation to change a behavior. In fact, you may not even realize or acknowledge that you have a problem. You just want people to quit bothering you about your behavior. You may be helped to see a problem by events that highlight discrepancies between your behaviors and your goals.

- **Contemplation.** You realize you may have a problem behavior. You are thinking that you should make a change in the near future (usually within six months). You are trying to understand the problem and may search for solutions. Often you are weighing the pros and cons of making a change. Self-efficacy becomes important, as you are more likely to prepare for change if you believe in yourself and the fact that you can make a change.

- **Preparation.** The pros have won and you are making a plan for change. You are setting goals and have a start date. You are looking for tools to help support the change. You are building your skill set and supporting your self-efficacy.

- **Action.** You are implementing behavior change. You are committing time and energy to make it work. From this point forward, you can support your efforts to change by rewarding yourself for change, avoiding environments that trigger the unhealthy behavior, and enlisting the help of friends and family.

- **Maintenance.** You have been maintaining the new behavior for at least six months. You are working to prevent yourself from falling back into old habits. You are well on your way! This can be a long, ongoing stage—for some behaviors, lasting a lifetime.

- **Termination.** The new behavior has become such a part of your life that you have no temptation to return to the old behavior, and you have 100 percent confidence in your ability to maintain the behavior.11

Understanding that change is a process with different stages is important because you may need different information or different types of support, depending on where you are in the process (some are included in the list of stages). It’s also important to realize that change is more like a spiral than a linear progression. You can enter and exit the process at any point, and you often cycle back through some or all of the steps (Figure 1.8). Most of us try several times to make changes before they really stick. Relapse is the rule rather than the exception. This should be seen not as failure but as a normal part of the process.

11 The important thing is to keep trying and not get discouraged.

Let’s consider another example of how behavior impacts your health. Say you are determined to get better grades this term, especially in psychology, your major. To improve, you’ve been studying a lot in the afternoons and drinking coffee and energy drinks to stay focused. Unfortunately, you keep oversleeping and missing your 8 a.m. psych class, where surprise quizzes are often given. Because you’ve missed several quizzes, your grade is suffering. The reason you’re oversleeping is that you’re having trouble falling asleep at night, which you’ve been attributing to stress. You don’t make the connection between the caffeine you’re consuming in the afternoon and your insomnia. This sort of behavior marks the precontemplation stage, in which you do not recognize that your caffeine consumption may be causing you a problem.

When a friend mentions that you might sleep better if you cut out the caffeine, your first thought is that you really enjoy those drinks in the afternoon and might not be able to study without them. But then you
Have you ever had an experience like this one? If so, were you able to make the necessary connections and stick with the behavior change you made?

**CREATING A BEHAVIOR CHANGE PLAN**

Research has given us a great deal of information about how behavior change occurs. How can you use this information to change your own behavior? The first step is accepting responsibility for your health and making a commitment to change. Ask yourself these questions:

- **Is there a health behavior I would like to change?** It could be smoking, overeating, procrastinating, being sedentary, eating too much sugar, or a host of other behaviors.

- **Why do I want to change this behavior?** There can be many reasons and motivations, but it’s best if you want to change for yourself.

- **What barriers am I likely to encounter?** Having a plan to deal with barriers will increase your chances of success.

- **Am I ready to change the behavior?** Beginning a behavior change plan when you haven’t fully committed to it will likely result in relapse.

Although making an initial commitment is an important step, it isn’t enough to carry you through the process of change. For enduring change, you need a systematic behavior change plan. Once you have identified a behavior you would like to change, assessed your readiness to change, and made a commitment to change, follow the steps in the box, “Change to a New Behavior.”

Although behavior change theories offer valuable insights into the change process, they also have limitations. The major limitation of the behavior change approach is that it does not take into account health factors beyond the control of the individual, primarily the kinds of social environmental factors in the outer layers of the ecological model illustrated earlier in Figure 1.3. Another complicating factor is the glut of health-related information that inundates our daily lives and environments, especially on television and the Internet. Some of this information is confusing, some is contradictory, and some is even misleading or wrong. To make good choices, you need skills that allow you to access accurate health information, to understand the evidence underlying health recommendations, and to evaluate important health issues in society.

**BEING AN INFORMED CONSUMER OF HEALTH INFORMATION**

Part of taking responsibility for your health is learning how to evaluate health information, sorting the reputable and credible from the disreputable and unsubstantiated—in other words, becoming an informed consumer of health information.
Developing Health Literacy

Do you read and understand the labels on foods you buy? Do you know which clinics are covered by your health insurance plan? If you learn that your dad is taking Lipitor, do you know how to find out more about it and its associated risks? These are all questions that relate to health literacy—the ability to read, understand, and act on health information. Health literacy includes the ability to critically evaluate health information, to understand medical instructions and directions, and to navigate the health care system. Eighty million American adults are said to have limited health literacy skills. Without these skills, they are at risk for poor health outcomes, especially as they receive more conflicting health information from a variety of sources such as Web sites and television.

A particularly perplexing concept for many consumers is health risk, defined as the probability of an exposure to a hazard that can result in negative consequences. Many factors contribute to an individual’s health risk for a particular condition, including age, gender, family history, income, education, geographical location, and other factors that make the person unique. Evaluating health information is complicated by the fact that we process information not just logically but also emotionally, and our emotional responses can affect how we interpret and react to that information. For example, if you have a family history of breast cancer and you learn that 13 percent of women will develop breast cancer in their lifetime, you may feel alarmed and anxious about your risk, based on that information. If you don’t have a health literacy—The ability to read, understand, and act on health information.

health risk—Probability of an exposure to a hazard that can result in negative consequences.
family history of breast cancer and learn the same information, you may feel relieved and reassured about your risk. Recognizing the part played by your emotions can help you assess your risk in more balanced ways.12

As with other skills, health literacy can be developed, and this book will help you develop your own health literacy. In each chapter, you will be introduced to basic health and medical language, coached on how to find accurate information, and encouraged to apply your critical thinking skills to health issues. For some general guidelines related to health literacy, see the box, “Evaluating Health Information on the Internet.”

Understanding Medical Research Studies Being an informed consumer also involves understanding research studies, which inform most of the health recommendations that you hear about on the news or in health journals or magazines. Most sources will cite the study, the researcher, and the journal in which the study appeared, and very often you can look up the study online and read the original article or a summary of it.

A formal research study follows a specific design and tests a specific hypothesis. The research process is clearly enough described in the study that other researchers can replicate it and confirm the results themselves. Formal studies can generally be of three types, with different methods and different goals:

- **Basic medical research.** This type of research typically involves work on a cellular level or in animals. It contributes to a baseline of scientific knowledge, which then can be applied to humans in clinical or epidemiological research.

- **Clinical studies.** This type of research involves human participants, typically individuals who have received screenings, diagnostic tests, treatments, or other interventions. Clinical research proves whether or not an intervention—such as a drug, a product, or a behavior—produces a particular effect. The most significant information comes from randomized, double-blind studies, meaning that study participants are randomly assigned to either the group that receives the intervention or the group that receives a placebo and that neither the participants nor the researchers know until the end of the study who got what.

- **Epidemiological studies.** In this type of research, scientists study large groups of people, using either interviews and surveys or pre-collected data. These studies explore the relationships between risk factors and disease (or health) over time.
Any of these types of medical research studies can serve as credible supporting sources for news stories, product endorsements, and your own personal health decisions, as long as you know the limitations and goals of each type. In addition, when you are considering a health recommendation and the study that supports it, consider the following questions:

- **Is the recommendation based on a formal research study, or is it simply an expert opinion?** Sources often cite experts when no clinical research is available to guide recommendations or when current research results are conflicting. Keep in mind that an expert’s opinion hasn’t necessarily been subjected to any formal testing.

- **If it was a formal clinical study, was it randomized and double-blind?** If the study was randomized, you can be confident that the results were not influenced by factors outside of the treatment, such as differences between participants at the outset of the study. If it was a double-blind study, you can be confident that the results weren’t unduly influenced by researcher bias.

- **Were the people in the study similar to you?** If the participants were different from you in significant ways—for example, if they were all over the age of 65 and you are 20—the results are less likely to apply to you than if the participants were similar to you.

- **How many participants were involved?** Larger studies, involving many participants, are generally more reliable than studies involving a small number of participants.

- **Who sponsored or funded the study?** Some sponsors stand to benefit from certain results, such as drug companies. The most impartial sponsors are research institutes and government agencies.

- **Was the study published in a reputable, peer-reviewed medical or health journal?** Such a study has been evaluated by other researchers in the field, who are in a position to judge the strength of the methods and the accuracy of the results.

The answers to all these questions and more affect how much credence you can put in the research results. Keep in mind that scientists typically consider individual studies stepping-stones in ongoing search for answers to complex questions.

### SELF AND COMMUNITY

The ecological model shows us that personal health is influenced by factors well beyond the control of the individual. Accordingly, responsibility for health and wellness extends beyond the individual to the areas of public health and community health.

**Public Health**

Public health is a discipline that focuses on the health of populations of people (whereas the discipline of medicine focuses on the health of individuals). Public health efforts include both health promotion and disease prevention. **Health promotion** focuses on actions designed to maintain a current health state or encourage advancement to a more desirable state of health (such as campaigns to promote physical activity). **Disease prevention** focuses on defensive actions taken to ward off specific diseases and their consequences (such as food and water protections or flu shot campaigns).

In the United States, nationwide government-sponsored public health initiatives are conducted by the Public Health Service, led by the surgeon general and the Centers for Disease Control and Prevention in Atlanta, Georgia. State, county, and city health departments are involved at the state and local levels, and many public health actions take place at the local, or community, level (see the box, “What Is Public Health?”).

**Community Health**

Community implies an interdependence of people and organizations within a defined grouping. Community health refers to activities directed toward improving the health of those people or activities employing resources shared by the members of the community. Community health tends to

- **Heavy rains and floods periodically necessitate the evacuation of communities.** Extreme weather, natural disasters, and other events that affect whole populations fall into the domain of public health.
The benefits of public health are all around you, reducing your risk for disease and injury and helping you live a healthier life. When you get up in the morning, you brush your teeth with the water from your tap. You don’t have to worry about contracting an infectious disease because tap water in the United States is safe to drink and presents a minimal risk of infectious disease. You have had fewer cavities and dental problems than people did a century ago, because the tap water you drink contains fluoride, which strengthened your teeth when you were younger.

If you drive to campus, you buckle your seatbelt out of habit. Your state has seatbelt laws in place to reduce traffic fatalities, and even if you would prefer not to buckle up, you do not want to get a ticket. If you bike to campus, you can avoid dodging cars by taking the bike lane, which has been put in place to protect bicyclists. You meet a friend for a bagel and cream cheese before class. You don’t worry about eating the food from a coffee shop because sanitation inspectors ensure that all restaurants follow regulations that reduce incidences of foodborne illness.

After breakfast, you continue your commute to school, past “clean buses” that run on emissions-controlled diesel as part of your city’s green energy campaign. A road worker directs you around a lane closure, where construction workers are wearing helmets and hearing protection, following occupational safety and health laws.

You enter your class building, where the air you breathe is fresh and smoke-free. This is due to the fact that tobacco smoke has been recognized as a health hazard and your campus follows regulations that prohibit smoking within 25 feet of public buildings.

After class, you head to the campus health center to pick up a month’s worth of contraceptive supplies. You and your partner are not ready for pregnancy; you’re planning to delay starting a family until after you finish school. While at the center, you pass signs promoting HIV/AIDS awareness and a supply of free condoms. Free vaccinations are available as part of a campaign to reduce students’ risk of illness during the approaching flu season.

Later in the day, you go for a run on a trail in a city park near your home. People are out walking their dogs and obeying the signs to clean up after them in compliance with local ordinances. On your way home, you stop at a local grocery store to pick up some fruit and packaged foods for dinner. You assume the ingredients list printed on the packaged foods accurately reflects what is in them, because food labeling laws have been in place your whole life. When you get home, you know you need to wash the fruit you bought, just as you know you should wash your hands frequently. The wealth of information you have about keeping yourself well and safe comes from the health education you have received in your schools and community.

Ten great public health achievements in the past century include vaccination, motor vehicle safety, safer workplaces, control of infectious diseases, safer and healthier foods, healthier mothers and babies, family planning, fluoridation of drinking water, the recognition of tobacco as a health hazard, and reduced deaths from heart attacks and stroke. Beyond these achievements, innumerable other developments and advances have contributed to your health, including health education initiatives and campaigns. In this book, you can learn more about public health from the “Public Health Is Personal” boxes that appear in each chapter and draw your attention to the different ways that your personal health depends on public health.

To develop public health policies, officials have to know the demographics of the population and its subgroups. **Demographics** are the statistical characteristics of a population in terms of such categories as age, gender, ethnicity and race, income, disability, geographical location, migration patterns, and many others. Information about these characteristics, and about changes in these characteristics, informs policies and planning. For example, the general trend of population migration in the United States has been away from rural areas and into cities. Of the entire U.S. population of 313 million, approximately 82 percent now live in urban centers. But since 2000, the Hispanic population has grown in nonmetropolitan areas, and immigrants in general are dispersing more widely across rural areas. These trends suggest that health resources and services need to be concentrated in urban areas and that services in rural areas increasingly need to be bilingual or multilingual.
Similarly, the overall makeup of the U.S. population is changing in terms of age. With the baby boomer generation (those born between 1946 and 1964) reaching retirement age, the nation is aging. This profile places complex new pressures on society and the economy, as the number of people in retirement facilities changes quickly and drastically, as does the number of people in the workforce, in classrooms, and in various types of housing. Knowing the composition of communities helps policy makers address the needs of all segments of the population.

**THE HEALTHY PEOPLE INITIATIVE**

Another example of the government’s interest in the health of the population is the Healthy People Initiative, an effort among federal, state, and territorial governments and community partners (private and public) to set health objectives for the nation. The objectives are designed to identify the significant preventable threats to health and to establish goals for improving the quality of life for all Americans. The U.S. government issued the first Healthy People report in 1980 and has issued revised reports every 10 years since.

The initiative’s most recent version, Healthy People 2020, envisions “a society in which all people live long, healthy lives” and sets the following broad national health objectives:

- Eliminate 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 healthy development and healthy behaviors across every stage of life.

In a shift from the previous versions, Healthy People 2020 places increased emphasis on “health determinants”—factors that affect the health of individuals, demographic groups, or entire populations. Using the same concepts as the ecological model, the report defines health determinants as social (including factors such as ethnicity, education level, and economic status) and environmental (including natural and human-made environments). The report emphasizes the importance of reducing the negative impact of certain health determinants on individuals and populations.

The Healthy People Initiative further identifies the nation’s “leading health indicators”—a set of priority public health issues that can be targeted and measured. In Healthy People 2020, the initiative reported the leading health indicators as follows:

- Physical activity
- Overweight and obesity
- Tobacco use
- Substance abuse
- Responsible sexual behavior
- Mental health
- Injury and violence
- Environmental quality
- Immunization
- Access to health care

The indicators are intended to motivate individuals and communities to action by helping to determine where action is necessary.
INDIVIDUAL CHOICE VERSUS SOCIETAL RESPONSIBILITY

The ecological model shows us how individual and societal factors are involved in creating outcomes in everyday life. Within this context, some thorny questions arise:

- To what extent are individuals responsible for their choices, given the powerful influence of environment? Does someone who drinks excessively to suppress memories of childhood poverty and trauma have the same right to a liver transplant as a child with liver cancer?

- On the other hand, to what extent should individuals be held accountable if their choices pose a cost to society, such as the cost of fire fighting when a fire is caused by someone smoking in bed, the cost of EMTs at the scene of a motorcycle crash where the rider wasn’t wearing a helmet, or the cost of medical care for a heart attack patient who ignored advice to lose weight and exercise?

- To what extent is government justified in enacting laws, regulations, and policies to “nudge” individuals toward what society considers better choices, as in the case of taxes on tobacco and alcohol or CDC recommendations that girls as young as 11 be vaccinated against HPV infection?

- What are the responsibilities of society to protect individuals and those around them from poor choices, such as drinking and driving? When should society take action to prevent individuals from participating in risky behaviors? When are restrictions on individual rights justified for the sake of the “greater good”?

Your life is influenced by policies related to questions like these. Your choices are constrained by certain policies—think of seat belt laws, speed limits, drinking age laws, gun control laws—and conversely, your choices have effects on others and on society. When you are making decisions, whether choosing a personal behavior or supporting or opposing a public policy, consider this complex web of relationships and interactions. In particular, ask yourself, How great a risk does this behavior pose for the individual and for the community? How strongly do individuals oppose restrictions on their ability to participate in the behavior? How much evidence is there that imposing a restriction will impact the behavior? Use these questions to inform your thinking and guide you in making reasoned, responsible decisions.

Health in a Diverse Society

As a nation of immigrants, the United States has always been a melting pot of different races and ethnic groups, and it will become even more diverse as the 21st century unfolds. Immigration currently accounts for approximately 50 percent of growth in the United States. According to the U.S. Census Bureau, the primary racial/ethnic groups in the country are Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and White. Hispanic origin is treated as a separate category, so people of Hispanic origin may be of any race. Within each group, there is tremendous diversity: Asian Americans, for example, include people from China, Japan, Korea, Vietnam, Laos, Cambodia, the Philippines, and other countries. In 2010, approximately 28 percent of the population consisted of members of racial or ethnic minority groups. In some states and cities, minorities are the new majority—that is, Whites make up less than 50 percent of the population.¹⁶ This is the case, for example, in Hawaii, California, New Mexico, and Texas.

CULTURE, ETHNICITY, AND RACE

Although diversity includes differences among individuals in many areas—including gender, age, sexual orientation, ability or disability, educational attainment, socioeconomic
status, and geographical location—three important dimensions of diversity that impact groups of people are culture, ethnicity, and race. There are many different meanings of the term culture, but we are using the term here to mean a shared pattern of values, beliefs, language, and customs within a group. You may have a sense of belonging to a particular culture or to different subcultures, based on such factors as geographical location, socioeconomic status, religious affiliation, and so on. Your culture helps shape what you view as acceptable and unacceptable (including health-related behaviors) and may even influence how you define or view illness and wellness.17,18

Ethnicity refers to the sense of identity individuals draw from a common ancestry, as well as from a common national, religious, tribal, language, or cultural origin. This identity nurtures a sense of social belonging and loyalty for people of common ethnicity, helping to shape how they think, relate, feel, and behave both within and outside their group. Ethnicity is often confused with race, a term used to describe ethnic groups based on physical characteristics, such as skin color or facial features. Although classifying people by race has been a common societal practice, the fact is that biologically distinct and separate races do not exist within the human species. Genetic traits are inherited individually, not in clumps, groups, or “races.” Thus, it is more accurate to view race as a social category rather than a biological one and to think of similarities or differences among people as a matter of culture or ethnicity.

Health disparities between racial and ethnic groups are largely attributable to social and economic conditions. A poor neighborhood does not provide the same opportunities for a healthy life as a more affluent neighborhood.

Race exists only as a social construct, not as a biological reality. People with biracial backgrounds—like Blake Griffin, whose father is African American and whose mother is White—inherit a random mix of individual traits from each parent.

HEALTH CONCERNS OF ETHNIC AND RACIAL MINORITY POPULATIONS

Over the past 100 years, advances in medical technology, lifestyle improvements, and environmental protections have produced significant health gains for the general U.S. population. These advances, however, have not produced equal health benefits for most of the country’s ethnic or racial minority populations. Morbidity and mortality (rates of illness and death, respectively) for ethnic and racial minority populations are disheartening. Many have higher rates of cancer, diabetes, cardiovascular disease, infant mortality, alcoholism, drug abuse, unintentional injury, and premature death than the general population does (see the box, “Variations in Leading Causes of Death Among Americans”). Most also have significantly higher lifestyle risk factors, such as high-fat diets, lack of exercise, and more exposure to carcinogens and other environmental toxins.19

In line with the ecological model described earlier, much of the disparity can be attributed to social and economic conditions, including poverty, discrimination, and limited access to health information and resources. Several theories have been proposed to explain how these social determinants affect health. For example, one theory suggests that minority populations are disproportionately exposed to racism, which is a source of stress. An ever-growing body of research documents the relationship between stress...
and health outcomes, including heart disease, breast cancer survival, chronic obstructive pulmonary disease, infant mortality, low birth weight, and depression. Reducing or eliminating health disparities is a critical challenge of the 21st century and a specific national health goal.\(^{1,15}\)

Health concerns also vary by factors other than race or ethnicity, such as age, income, educational attainment, and geographical location, among others. For example, the leading cause of death for those between ages 15 and 24 is unintentional injuries (accidents) (see Figure 1.9). For those age 60 and over, the leading causes of death are heart disease and cancer. If we look at the overall leading causes of death for all ages, we see that the major health concerns are chronic diseases—heart disease, cancer, stroke, diabetes, chronic respiratory diseases—and the lifestyle behaviors that contribute to them. They are the focus of both individual behavior change plans and broad public health initiatives.

Looking Ahead

Clearly we have many challenges on both the personal and the community/societal level. Throughout this book, we will ask you to consider your personal health and health choices within the context of your environment. As you read each chapter, reflect on your current level of health in that area. What are your predispositions based upon family history? Which of your behaviors is affecting your health in that area? If there is a behavior you would like to change, assess your readiness to change; then develop a behavior change plan based on the guidelines in this chapter and throughout the rest of the book.

At the same time, think about the influences that shape your decisions. What factors impact your options, whether restricting your choices or supporting them? Consider your family and friends, your classmates and peers, your school

Variations in Leading Causes of Death Among Americans

Compare differences in the overall leading causes of death for Americans across racial/ethnic groups. For example, diabetest is the fifth leading cause of death for African Americans but seventh leading cause overall. Chronic lower respiratory disease is the third leading cause of death for Caucasians but eighth leading cause for African Americans. Can you hypothesize factors that may be contributing to these differences? What social, economic, or cultural components may be involved?

assessments and critical thinking activities for every chapter.

Even if you decide not to make a personal change right now, perhaps you can share health information with a family member or encourage a friend to change a worrisome habit. Maybe you can do something to make a difference in your community, such as participating in a community garden or a recycling drive. Or maybe you will become involved in the health care debate or in activities aimed at improving quality of life for underserved segments of the population. The ecological model of health is not just about how your environment influences you—it's also about how your efforts shape your environment.

and instructors, the community you live in, government policies, and the prevailing socioeconomic and political climate. What do you have to take into account to be successful at behavior change? To help you think more deeply about these issues, we have provided a Personal Health Portfolio section at the end of the book. It includes

Access to Health Care: For Everyone, or Just for Some?
In March 2010, Congress passed the Affordable Care Act, and President Obama signed it into law. This landmark legislation made sweeping changes to the current system of health care insurance in the United States. A primary goal of the bill was to extend health insurance to the millions of uninsured and underinsured Americans, thereby expanding access to health care to nearly all citizens. The bill capped out-of-pocket expenses and required that preventive care be fully covered, and it set rules to rein in certain insurance company practices.

The bill was designed to go into effect in two phases. Provisions in the first phase (2010–2014) include the following:

- Insurance companies may not deny coverage to children based on pre-existing conditions.
- Young adults may remain on their parents’ insurance plans to age 26.
- Adults who are rejected by a health insurance plan may enter a “high risk” pool that will allow them to purchase health care at lower premiums.

Provisions in the second phase (2014–2019) include the following:

- Everyone who can afford it must purchase health insurance (the “individual mandate”); subsidies will be available for people with low incomes.
- Employers with more than 50 employees must provide health insurance (the “employer mandate”); tax credits will be available to make insurance affordable for small businesses.
- Medicaid will be expanded to cover all low-income individuals and families in every state.

The Affordable Care Act was controversial before its enactment and has continued to be the subject of

(continued)
debate and court appeals. Supporters point out that under the previous system, access to health care was limited to those who could afford it. Millions of low-income people received poorer or less timely care, using emergency rooms for primary care and putting off treatment until their conditions were dire. The cost of services for the underinsured or uninsured fell to society, in the form of higher taxes or higher insurance premiums. Supporters of the bill believe that health care is a basic right and that everyone should have equal access, regardless of ability to pay.

Supporters of the bill also point out that the U.S. health care system is the most expensive in the world but the health of Americans does not reflect that expenditure. Compared to countries that spend significantly less on health care, the United States has poorer health outcomes; for example, the country ranks 34th in life expectancy. Proponents of the Affordable Care Act assert that high health care costs and worse-than-expected outcomes are caused by the large numbers of uninsured and the fragmented U.S. health insurance system. They point out that skyrocketing health care costs make the system unsustainable, and they believe the act will remedy these problems to a large extent, containing costs and expanding access.

A primary objection to the law by its opponents is that it unconstitutionally forces people to buy health insurance, infringing on their personal liberties. They believe that individuals have the right to make their own decisions about how they spend their money. If they don’t want to carry health insurance, they shouldn’t have to, and others shouldn’t have to pay for them to do so. Opponents also object to the expansion of government involvement in private life and increases in taxes and regulations. Although they acknowledge the unsustainable costs of the existing system, they don’t believe “big government” is the answer. Referring to the act as “Obamacare,” opponents support repeal of the legislation.

Despite a Supreme Court ruling in June 2012 upholding the individual mandate, the Act remains controversial. Is the Affordable Care Act the right way to solve the nation’s health care problems? What do you think?

**PROS**

- Access to health care is a basic right, regardless of ability to pay. The law ensures access for vulnerable segments of the population, including low-income families and children.
- With everyone required to have insurance coverage, costs will be more fairly distributed across the system.
- Preventive care brings down health care costs; by making preventive care free, the bill increases the likelihood that people will be healthier, need less medical care, and have lower expenses.
- The law regulates the most abusive practices of the health insurance industry, expanding access and helping to control costs.
- The law reflects the moral values of our society regarding care and compassion for all.

**CONS**

- People have the right to choose how to spend their money; if they don’t want to pay for health insurance, they shouldn’t have to.
- Taxpayers and those who have been successful should not have to pay for people who may be living off the system.
- The health insurance industry operates in the private realm, driven by market forces; government involvement increases bureaucracy, costs, and regulation that stifles competition and job creation.
- If the government is willing to impose these policies on the population, it could also impose policies that are morally objectionable to some, such as using taxpayer money to pay for abortions.
- The law is fundamentally at odds with a founding principle of our country: the right to self-determination.

How are health and wellness defined?
Health is defined by the World Health Organization as a state of complete physical, mental, social, and spiritual well-being, not just the absence of disease. Wellness is defined as the process of adopting patterns of behavior that lead to better health and greater life satisfaction, encompassing several dimensions: physical, emotional, intellectual, spiritual, interpersonal or social, environmental, and, in some models, occupational. Very often, people want to have good health as a means to achieving wellness, an optimum quality of life.

What factors influence a person’s health?
Individual health-related behavior choices play a key role in health, but economic, social, cultural, and physical conditions—referred to as the social determinants of health—are also important, along with the person’s individual genetic makeup. Community health and public health actions are needed to ensure the personal health of individuals.

How do genes affect your health?
Although some diseases and disorders are caused by a single gene, most genetic disorders are multifactorial; that is, they are associated with interactions among several genes and interactions of genes with environmental factors, such as tobacco smoke, diet, and air pollution. Even if you have a genetic predisposition for a disease, you may never get that disease if the environmental factors are not present.

What is health-related behavior change?
The process of changing a health behavior (e.g., quitting smoking, changing your diet) has been conceptualized in the Stages of Change Model as unfolding over several “stages of change,” from precontemplation to maintenance of new behavior.

What health-related trends are occurring in our society?
As the United States becomes more multiethnic and multicultural, concepts of health and wellness from other cultures are being integrated into Western health care. At the same time, advances in medicine and health care have not reached many minority groups in the United States. Eliminating health disparities among different segments of the population is one of the broad goals of the national health initiative Healthy People 2020.

What health challenges do we face?
Health challenges for individuals include learning to be more informed consumers of health information and making lifestyle decisions that enhance rather than endanger their health. Health challenges for society include finding a balance between the freedom of individuals to make their own choices and the responsibility of society to protect individuals from poor choices and to offer increasing access to affordable health care.